MOMENTUM DATA SYSTEMS

Networked "Thin" Media Client Reference Design

MDS' DMA-THIN (Digital Media Adapter) design is a "Thin Client" version of MDS' full featured DMA platform.

MDS' DMA-THIN is available both as a demonstration platform and as a complete reference kit supplied with schematics, bill of materials, and gerber files. MDS enhances this hardware platform with a rich selection of software offerings and development tools.

Unlike networked media clients with limited resolution, the DMA supports true 720x480/586 (NTSC/PAL) decode/display that can be deinterlaced and scaled to standard 720p (or 1080i with no deinterlacing) resolutions.

The pnx1500 processor's built in deinterlacing and video scaling hardware provides true high quality display of standard definition content scaled to standard 720p or 1080i resolutions. The pnx1500's output processor provides picture quality enhancement.

While not included in the demonstration unit, the mini-PCI expansion connector can be used to add user developed 802.11 capability.

The basic hardware platform can be ordered with optional audio and video codec libraries, including MP3, MPEG2, MPEG4, Divx, WMT, and H.264. Please see the MDS website for more information on libraries.

Thin client with less than US$ 50 PCB BOM

The DMA-THIN uses a minimal number of components. In large volumes the typical BOM is less than US$ 50. For further details please see the MDS website page for this product.
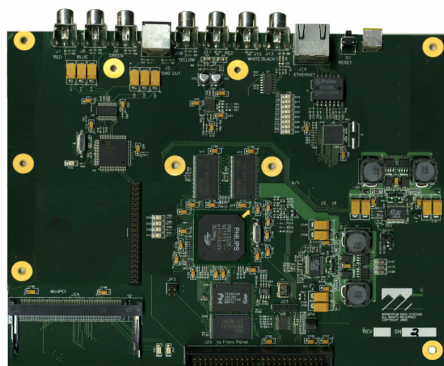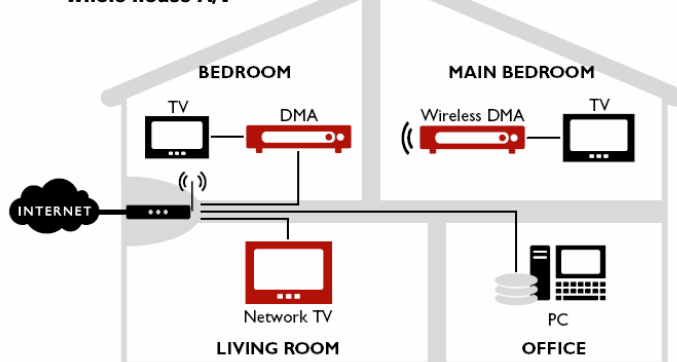
Off the shelf application software

Third party middleware and player environments from companies such as MediaBolic and Ant Limited are available to reduce development cost and time to market. Having been already ported to the DMA platform, you can be up and running the latest media standards in days instead of months. For more information on complete platforms designs with software please see the MDS web site.
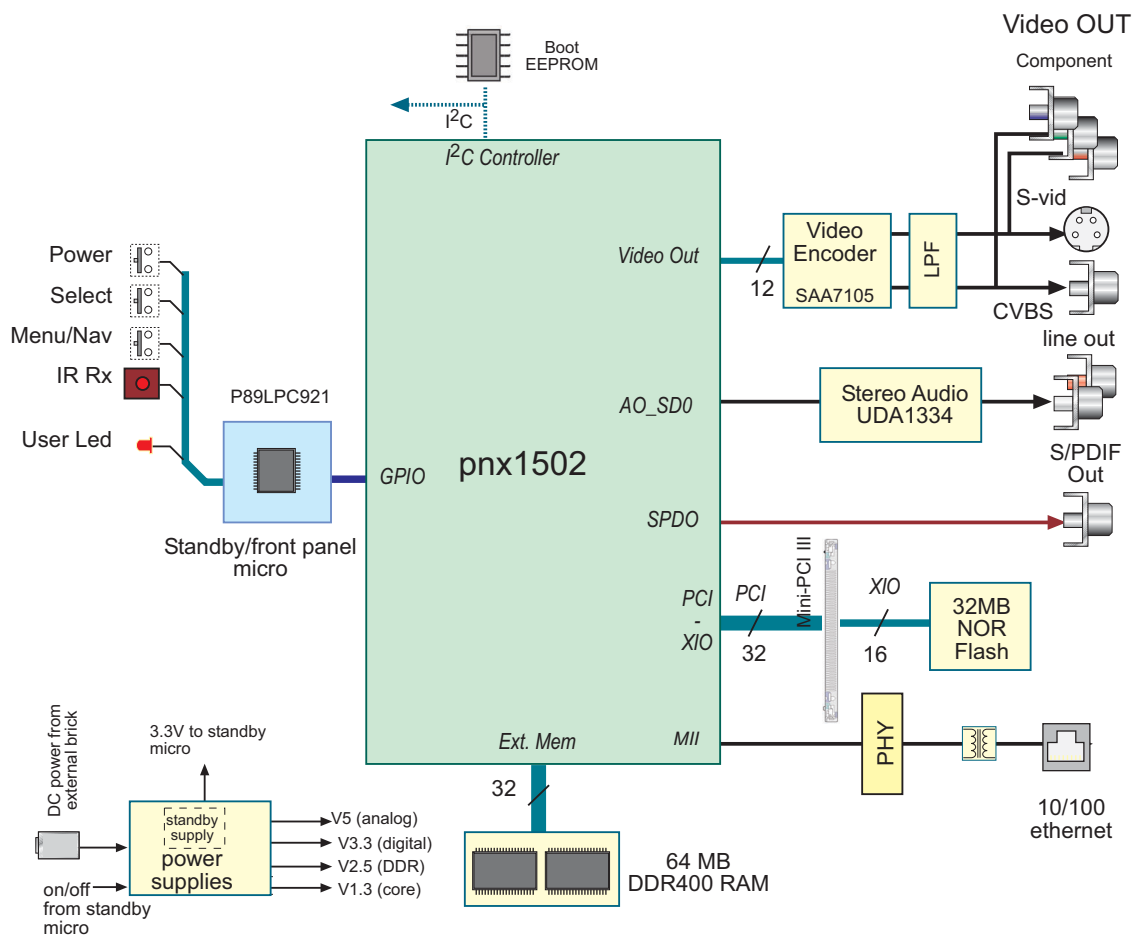
Software development

While off the shelf middleware and end-to-end software packages offer a very fast route to market, there are some companies that will want to harness the power of this platform with their own custom software.

Software for the pnx1502 series is compiled using Philips' NDK tools and downloaded to the board via JTAG. Software is written using Philips innovative TSSA (TriMedia Streaming Software Architecture) architecture. By using this tool set and methodology complex video applications can achieve a level of platform feature independence that is unmatched by any other media processor vendor.

Low cost, high performance whole house A/V

Boot EEPROM

Video OUT
Component

I^2C

I^2C Controller

pnx1502

Video Out — 12 — Video Encoder SAA7105 — LPF — S-vid / CVBS

S-vid

CVBS

line out

AO_SD0 — Stereo Audio UDA1334

S/PDIF Out

SPDO

Power
Select
Menu/Nav
IR Rx
User Led

P89LPC921

GPIO

Standby/front panel micro

PCI - XIO

PCI 32

Mini-PCI III

XIO 16

32MB NOR Flash

Ext. Mem

MII

PHY

10/100 ethernet

DC power from external brick

3.3V to standby micro

standby supply

power supplies

V5 (analog)
V3.3 (digital)
V2.5 (DDR)
V1.3 (core)

on/off from standby micro

32

64 MB DDR400 RAM

The MDS DMA-THIN platform is a high performance

thin client design

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Software

As all codec implementations on a pnx1500 are software based, products can be created that have a wide range of decode capability to avoid the need to transcode source files. The following libraries are optionally available for media playback or encoding.

Codecs

- Video decode: (up to D1 resolution, 30 frames/sec) MPEG-1, MPEG-2, MPEG-4 (SP,ASP), DivX-3/4/5, WMV9
- Video decode: (up to CIF resolution, 30 frames/sec) AVC/H.264
- Audio decode: MP2, MP3, Dolby Digital®,AAC,WMA9, Ogg Vorbis
- Image decode: JPEG (GIF, BMP, PNG via application level decoders)

Other Libraries

- Communications: TCP/IP

All are available from MDS, please see http://www.mds.com for more details. MDS also works with a wide range of Nexperia software development companies, if you need something not listed please contact us.

Support that makes a difference

For over 8 years Momentum Data Systems has been offering cutting edge tools for developers of TriMedia/Nexperia applications. In addition to the Philips supplied compilation tools and examples, MDS creates additional examples and extensive documentation on how to get started using the tools.

For example, for the pnx1502, MDS has developed our "XA" development architecture which decouples your product software from needing to be changed with each Philips update, allowing you to develop faster and more efficiently. That environment is now a standard feature of the NDK.

pnx170x generation

Philips has announced the pnx170x processor series, which is source code compatible with the pnx1500, as well as being pin compatible. The MDS DMA-THIN design supports use of pnx170x; DMA units and corresponding software libraries will be released late 1Q06.

The pnx1702 offers improved speed over the pnx1500, allowing playback of ED (480p) MPEG2/4 content and D1 resolution h.264 content.

Reference package

In addition to DMA-THIN demonstration units, MDS offers the unit with all hardware design information. Schematics are provided as both pdf and PCAD schematic and layout source files. Gerbers, bill of materials, along with data sheets for all major components are provided.

Packages are available including the NDK-4 compiler and a MDS JTAG card so that the flash can be modified and/or new programs downloaded and executed.

To develop customized versions of the software to create an actual product, or to operate the software on a different hardware configuration, the NDK compiler tool is required along with libraries for video/audio codecs (i.e., MPEG2, 4, MP3, etc.) as well as the GUI (either a 3rd party or your own).

MDS includes 10 hours of consulting assistance with our engineering staff to answer questions about the hardware design and/or software configuration. Extended consulting can also be purchased.

Companies undertaking their own software development should consider taking the TriMedia training classes, please see http://bores.com/ for the current schedule.

Summary Specifications

Processor & Memory

- 300 MHz pnx1502, 64 MBytes DDR400 memory, 16 MBytes NOR flash, 32 MBytes NAND flash. (see pnx1500 datasheet for more information on the processor)

A/V Outputs

- Line level stereo audio
- SPDIF out
- CVBS (PAL/NTSC)
- S Video

Front panel

- Ir Rx
- User Led
- Power button and 2 user buttons

Other connectivity

- TriMedia JTAG port
- 10/100 Ethernet

Miscellaneous

- External 12V supply.
- Chassis size: Approx. 10" (250mm) width, 8" (200mm) deep by 1" (25mm) high

Ordering information

DMATHIN15-KIT: DMA-THIN demonstration unit.

- DMA-THIN unit with cables (A/V out, S video out), remote, and universal input AC supply
- Preconfigured with MediaBolic's client software or Ant's PurePlay
- Other examples can be downloaded via JTAG (emulator not included)

DMATHIN15-DESF: DMA-THIN design transfer fee.

- Schematics (pdf and PCAD) and layout files (PCAD 2002), BOM, gerbers
- 10 hours of engineering support

Suggested tools (available from MDS, see website for more information)

- NDK4 compiler/linker for pnx150x
- MDS PCI or USB JTAG for TriMedia

Suggested libraries (available from MDS, see website for more information)

- Philips Decoders Library - MPEG2, MPEG4, and MP3 audio decoder
- Philips DivX Decoder, Dolby AC3, H.264 decoder
- WMA/WMV
- Target TCP/IP stack
- Contact MDS for information about MediaBolic or Ant software products, or see:
  http://www.antlimited.com/
  http://www.mediabolic.com/
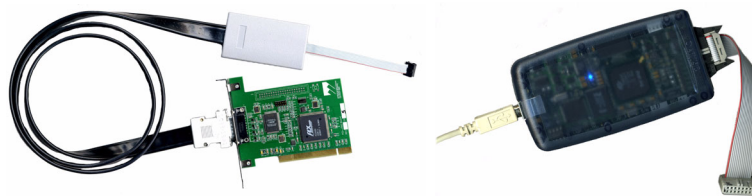
PCI or USB JTAG: These MDS products were specifically designed for Nexperia developers and offers unmatched code download speed.

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