MOMENTUM DATA SYSTEMS

http://www.mds.com

MDS-810

pnx8950 Software Development Platform

Complete high performance development platform for Set Top Box, IPTV, and embedded media processing

Based on NXP Semiconductor (formerly Philips) pnx8950 (pnx8550) Nexperia home entertainment engine, the MDS-810 product offers a rich platform for the development of video products needing support for analog and digital (SD and HD) standards.

The system comes with video decoders that support:

- SD and HD MPEG2 decode (up to 1080i with ATSC or DVB profiles)
- SD MPEG4 (ASP) and DivX
- SD WM9

as well as the corresponding audio formats including MP3, WMA, and Dolby AC3.

Third party encoders for MPEG2 or MPEG4 and SD H264 decode (up to MP@L3 2mbps CABAC) are available as an option to allow PVR capability of legacy analog NTSC/PAL content.

The pnx8950 has a MIPS32 core and is supplied with a Linux 2.6 kernel. Alternatively Monta Vista Linux can be used. The pnx8950 includes dedicated hardware for video processing, including:

- MBS - used for scaling and hugh quality deinterlacing
- QVCP - 5 layer image composition processor supports picture quality improvement for direct connection to output device (LCD, etc.).
- Second (standard def) output allows HD content on main output to be scaled.
- Two TriMedia cores allow custom algorithms

Standard Linux APIs are used to control video and audio decoding and display.

The platform is based on Philips STB810 reference design, and provides the following connectivity:

- Video input: CVBS or S video (NTSC/PAL)
- Video output: CVBS or S (NTSC/PAL), HDMI, or component (720p/1080i)
- Audio input: Stereo analog and SPDIF
- Audio output: Stereo analog and SPDIF
- Connectivity: USB 2.0, 10/100 Ethernet, serial port (RS232)

Internal to the system is an SATA interface for a disk drive (supplied) to support PVR applications.

The box includes internal expansion options:

- dual transport stream or raw 656 style video inputs (for tuner connection, for example)
- PCI slot is provided for general expansion
- miniPCI slot for 802.11 NIC

While in standby a small 8 bit micro allows the unit to meet local governmental energy usage requirements.

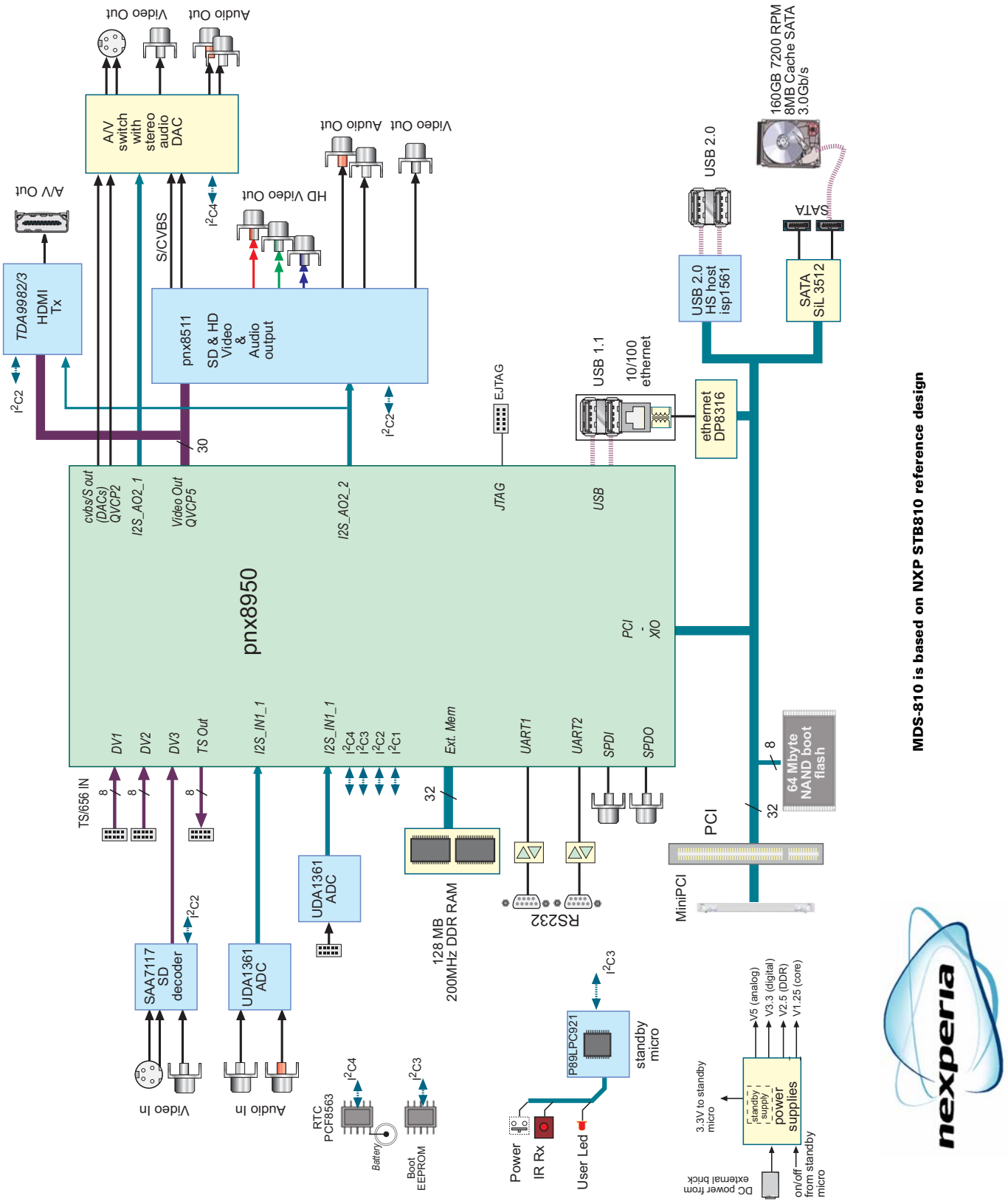
What's included

- MDS-810 unit
- Cables, power supply, and remote
- Schematics (cadstar and pdf), BOM, and gerbers
- Currently released NXP developed Linux kernel, drivers, tool chain, and Linux utilities.
- Extra utilities for reflashing the unit
- NXP developed sample programs with sources

Other items not included

- MIPS EJTAG for boot flash reprogramming (normally not needed to use MDS 810)
- flash programmer for 8 bit standby micro
- NDK 4.3/MPTK 1.2 (used for custom TriMedia development and modification of video peripheral support). Available from MDS. Requires Windows PC.
- MPEG2 or MPEG4 encoder library (available from MDS).

A PC with Fedora Core 3 or later is required for development of the MIPS processor code. A workstation class machine is suggested.



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Special Notices

A NXP Non Disclosure Agreement (NDA) must be executed prior to delivery of software, design information and datasheets for the pnx8950.

Purchaser is responsible for all third party patent holder fees and payments (MPEGLA, Thomson, etc.). There are no royalties to MDS or NXP.

Verification of Dolby, DivX, and/or Windows Media licensing required before access to those libraries can be provided.

Support

All MDS-810 units include MDS' standard 90 day getting started support, details of this may be found on the MDS website, but is summarized here specifically for the MDS-810:

- Answer questions regarding installation of the supplied MIPS development environment onto a Linux PC (FC3 or FC5). By default the MDS-810 will boot off the local hard drive.
- Answer questions regarding rebuilding the provided examples and running them.
- Answer questions regarding the peripheral chips.
- Answer general questions about the unit's capabilities and modifying the design

Specifically not covered are Linux related questions. If assistance is needed with Linux MDS suggests using the MontaVista tool chain (which is the officially announced provider) or any other Linux kernel vendor that you prefer. If assistance with Linux kernel driver modifications or development is needed MDS can offer the names of companies familiar with the NXP MIPS32 implementation.

Development Support

NXP Semiconductors does not offer direct support for users of the pnx8950 device. Support for pnx8950 application development is provided by customer contract to third party companies such as MDS.

As all of the MIPS based code is provided as source (note a separate license with NXP may be required in some cases) developers are free to use any resource they see fit.

Public support for TriMedia (and to a lesser extent the pnx8950) can by found on the TriMedia User Group (TMUG) yahoo group.

The MPTK (decoder libraries) are provided as object code only. The TriMedia framework that the libraries execute from is provided as source.

The decoder libraries are provided "as is" and as such it is recommended to evaluate them on your specific files/ streams before starting development.

MDS maintains a web site for customers of MDS-810 products for support. (available Jan 07). This website site is used for all support. Questions outside of the scope of the 90 day getting started support will be answered if there is a known answer. If the question involves research/ investigation MDS will supply an estimate as to the cost and time needed for MDS to develop a solution.

Note regarding platform features versus STB-810

The MDS-810 corresponds to the NXP "Timoniere" version of the STB-810 platform. This unit does not include headphone output, and is configured with RCA and S video jacks instead of SCART connectors.

Development for TriMedia cores

The standard software included with the system treats the two TriMedia cores as a "black box" hardware resource.

Applications are normally created using standard Linux APIs that are provided with the unit, these APIs have a custom backend that communicates with the underlying hardware/ firmware resources.

The firmware running on the cores is specifically developed for the hardware environment of the MDS-810 platform. Changes to that environment (such as a different video decoder) require modification of the "black box" functionality. Purchase of the NDK/MPTK is required in that case.

Users looking to change the standard functionality and new to TriMedia development may want to consider first developing on a platform like MDS' PCI based LCP-1500, which supports the NDK 4.3 environment used on the MDS-810 platform.

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Ordering information

MDS810-KIT: MDS-810 development unit. All software and design information is delivered electronically.

- MDS-810 unit with cables (A/V out, S video out), remote, and universal input AC supply. pnx8950 with 270 MHz TM cores, 128 MB DDR400 memory.
- Linux tarball for MIPS with drivers for pnx8950 and video decoders. Note support for licensed IP (DivX, WMT, Dolby) is available separately with proof of third party license.
- Example applications.
- Design information.
- 90 Day Getting Started Support

Units with SCART connectors instead of RCA/miniDIN are available on special request. Minimum order 3 units.

Please note that two different case styles are used and units may appear different than shown here. Functionality is the same regardless of the case.

NDK4-810: NDK 4.3 compiler for TriMedia core with device libraries for pnx8950

MPTK810-BASE: MPTK 1.2 decoder object code library bundle for use with NDK 4.3 compiler for TriMedia core. No license fees to MDS or NXP, end user responsible for IP holder fees (MPEGLA, etc.). Includes MPEG2/4, DivX, Dolby AC3, and WM decoders.

Note that the NDK and MPTK must be purchased as a bundle. Owners of NDK for other NXP products only need to purchase the MPTK810.

DivX, Dolby, and WM decoders only supplied after appropriate licensing confirmed.

Please contact MDS for ordering information for MPEG2 or MPEG4 encoder or H264 decoder libraries.

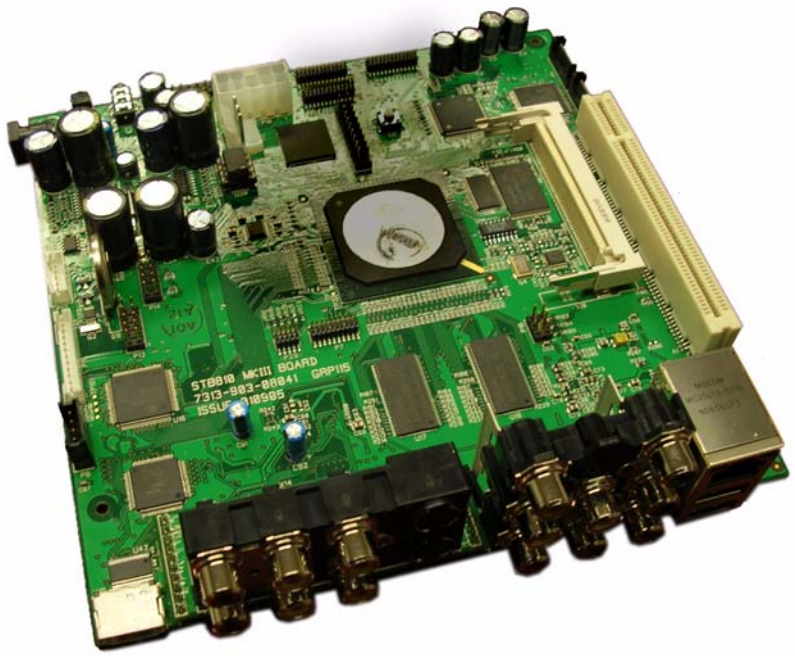
In conjunction with Bore's Signal Processing, MDS offers training on MDS-810 software development at our Fountain Valley, California facility. Please contact MDS for course dates.

Suggested device programming tools

There are a large range of tools available, the following are only meant as suggestions and do not imply specific endorsement.

89LPC921 programming: Keil MBC900

MIPS EJTAG: Ashling Opella



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