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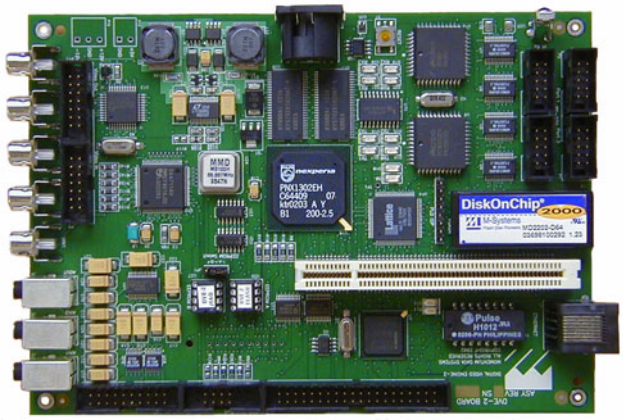


Digital Video Engine - 2

NEXPERIA based, network enabled, multi-media platform

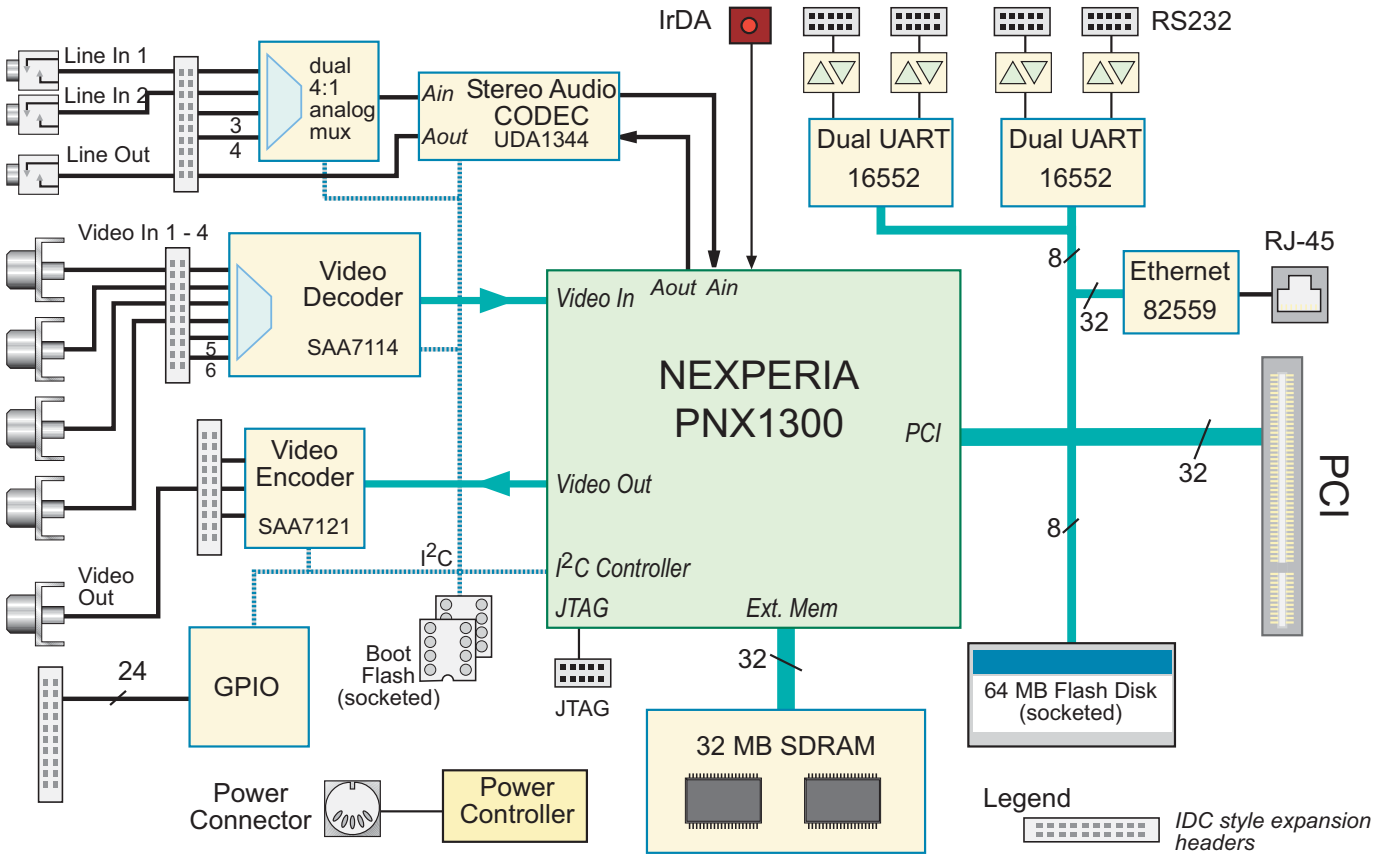
The Digital Video Engine - 2 (DVE-2) is a hardware platform offering a feature set and development environment that simplifies moving applications from hosted systems to an embedded product as well as the fast creation of new embedded applications.

The DVE-2 provides multiple interfaces to real world audio, video, and network I/O. Using a flash memory DiskOnChip® system for non-volatile storage provides a standard 'PC-like' way to store programs and setup data as well as archive data for later retrieval. The 200 MHz Philips NEXPERIA™ pnx1302 (formerly called the TriMedia) is programmed in C/C++ and supported by library functions including audio and video compression, video processing and text/graphics overlay generation. DSPOS' FUSION® protocol suite is available for high performance network applications.

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.

Features

- Multiple multiplexed video/audio input channels allowing multiple sources to be streamed across a network
- Audio/video output for local output of network media streams
- 10/100 Ethernet with optional FUSION® Protocol Suite
- Four RS232 ports allow control of legacy 'dumb' devices via TCP/IP
- 200 MHz TriMedia 32-bit VLIW (up to 5 ops per clock) processor allows audio/video encode/decode and simultaneous network operations
- 16 MB to 576 MB single chip flash DiskOnChip® system
- Infra-red receiver and 24 General Purpose I/O (GPIO) lines
- Development kit has full C/C++ compiler and debugger and includes video, audio and data processing libraries
- Optional industry standard audio and video compression libraries such as MPEG2/4, H.263, and MJPEG.
- Standard PCI expansion connector allows adding virtually any other peripheral device to your system



DVE-2 : NEXPERIA based, network enabled, multi-media platform

Video, audio and data I/O

The DVE-2 has six video input channels (four accessible by jack, all by header) and one video output channel (composite by jack or S-Video by header). The DVE-2 has eight audio input channels (four accessible by two stereo mini-jacks, all by header).

Four RS-232 ports are provided for peripheral control. 24 quasi-bidirectional digital lines are available by header. The 10/100 Ethernet provides for data transfer across networks in a distributed system. The I/O peripherals are supported by library software functions to simplify application programming.

Flash 'DiskOnChip' subsystem

The DVE-2 provides flash memory via M-Systems' DiskOnChip® device with built in EDC/ECC. It can read and write at 1.4 and 0.5 Mbytes/sec, respectively.

The ability of the DVE-2 to implement web and ftp servers is simplified by having the Disk-On-Chip device appear to the TriMedia as a conventional file system, as opposed to a large block of unmanaged memory. The NEXPERIA driver implemented by MDS and M-Systems provides the familiar ANSI-C compatible stdio() library, offering simple portability for developers moving applications from PCs to an embedded platform like the DVE-2.

PCI Expansion slot

Applications requiring a peripheral not included with the DVE (example: IDE drives, 1394, USB, etc.) can quickly be constructed by adding a standard PCI card to the system.

Built in Boot Loader and setup via Serial Port

The DVE-2 board includes a boot loader in the boot flash that loads a simple terminal program from the flash disk. This TM1300 based program provides the XMODEM protocol via a RS232 port, in turn allowing reading and writing the flash disk using standard terminal programs that support the XMODEM protocol, e.g. 'HyperTerminal' for Windows.

If no RS232 activity is detected after reset, the DVE-2 boots from flash disk using a predefined file for TriMedia execution.

The serial console driver supports using one of the serial ports as the destination of printf() calls as well as the source of gets() calls, allowing for limited debugging without the need to use a JTAG emulator.

Complete development software

MDS offers the DVE-2 along with a complete development environment (the NDK) that includes the compiler, debugger, Real Time OS, and basic audio, video, and data management libraries. Combined with the optional audio/video codec and networking libraries and complex applications become simple via a 'building-block' approach.

GENERAL SPECIFICATIONS:

Processor: 200 MHz Philips NEXPERIA PNX1300™, 32 MB SDRAM at 160MHz

Video In: Philips SAA7114 PAL/NTSC/SECAM

- Six analog video inputs, internal analog source selectors
- Automatic switching between PAL/NTSC
- Automatic horizontal/vertical sync detection
- Features are programmable via I^2C bus interface

Video Out: Philips SAA7121 Digital Video Encoder

- Three DACS for C, Y and CVBS, two times oversampled with 10-bit resolution
- Features are programmable via I^2C bus interface

Audio: Philips UDA1344TS Codec

- Sampling frequencies from 8 to 55 KHz
- Full scale input and output of 1.3 V peak
- Controlled via L3 interface

Ethernet: Intel 82559 Controller

- Full duplex support at both 10 and 100 Mbps
- High performance PCI master-mode operation
- Two status LEDs for Speed and Activity/Link

General Purpose I/O: Philips PCF8575 (2 per board)

- 6 lines used on board for control
- 24 quasi-bidirectional lines brought out to IDC style expansion header

IrDA device:

- Sharp GP1UM28YK IR Receiver

Flash Memory:

- 32 pin DIP socket for M-Systems DiskOnChip

Boot flash:

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

PCI Bus (2.1) connector:

- Allows addition of one 3.3/5V (I/O) PCI card
- Note that standard DVE-2 power supply not designed for max. PCI load
- Please be aware that NEXPERIA programs you develop must include an appropriate device driver for whatever device is added via the PCI slot

UART: National PC16552D 2 channel UART (2 per board)

- Dual independent UARTs - 4 ports total
- Fully programmable serial interface characteristics
- Complete status reporting capabilities
- Board includes RS232 level converters
- Shrouded 10 pin headers for use with ribbon cable to standard DB9 pinouts

JTAG

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

Dimensions:

- 17.8 x 12.7 x 2.5 cm (7" x 5" x 1") (excludes connector overhangs)

Power

- Development kit includes Elpac Power Systems Model WRI2731or equivalent with +5 V, 3A (additional + -12 V, 0.5A provided for expansion connectors and PCI bus only). Connects via 5 pin DIN type connector.
- Screw terminals for connection to bench supplies
- On board switcher for 3.3V and 2.5V generation
- 5W typical power consumption excluding PCI

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NEXPERIA Development Kit (NDK)

NEXPERIA™ Development systems from MDS include the core NDK/IADK (Integrated Application Development Kit) components. Optional high level libraries complement the basic IADK functions and provide a total set of software to reduce development time and cost.

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

RTOS:

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

IADK 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 IADK Libraries

The librararies are offered by Philips Semiconductor, please consult the individual datasheets and your local Philips sales office for further details:

- Dolby Digital Decode (AC3 decode)
- Basic Audio (MP3 decode†, MPEG 1/2 layer 1, 2 decode*)
- Audio Encode (MP3 encode†, MPEG 1 layer 2 encode†)
- MPEG4 Audio Decode (MPEG-4 CELP and AAC decode)
- Digital Video Camera (DVC/DV25) decoder (demux, Audio decode, video decode)
- Basic Video (MPEG-1 and 2 PS/TS demux and decoder)
- Video Encoders (MPEG-2 and MJPEG†)
- DVD subsystem (post decoder processing)

† Non-optimized library

* Subset, please contact Philips for exact capabilities

Optimized Image Encoder/Decoder Libraries

Developed by DResearch, a leading German developer of high performance image and video codecs, these libraries have been specifcally optimized for NEXPERIA. Please see the individual library datasheets for more information.

- H.261
- H.263+
- MJPEG
- SpeedWave (wavelet based library for still images or video)
- MPEG4 (video only)

These libraries are available for purchase with the DVE-2.

FUSION Protocol Suite from DSPOS

For applications needing Ethernet connectivity, DSPOS' FUSION delivers a high performance TCP/IP protocol suite and applications for your Philips NEXPERIA development project:

- Robust, feature-rich TCP/IP software
- Mature, well proven code used by a large installed base
- Industry-standard APIs for networking
- Code conforms to the highest level of industry coding standards
- Continually maintained to RFC compliance
- Royalty-free license

The FUSION protocol suite provides you with source code licenses and the NEXPERIA reference port designed by Philips to aid in customizing your application. With FUSION, you choose only those protocol components that you need.

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)

Application Protocols

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

Routing Protocols

- IGMPv2*
- RIP/RIP-2*
- OSPFv2
- 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

*The highlighted protocols indicate the various components of the Philips pnx130x reference port used in the IADK.

DSPOS' FUSION protocol solution is the result of a joint development between Philips, DSPOS, and MDS and was designed specifically for the Philips pnx130x. By using FUSION's high performance, proven protocols, you'll get your real time TCP/IP network-enabled media streaming applications to market faster.

The FUSION stack is available for purchase with the DVE-2.

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Ordering Information (order code is in *Italics*)

DVE-DK-FULL Full Development Kit includes:

- DVE-2 board with 200 MHz pnx1300™, 64 MB DiskOnChip flash, 32 MB 166MHz SDRAM (operated at 160 MHz)
- Philips NDK 1.0 Core Components. Includes compiler tools and basic TSSA software library components
- Documentation on CDROM. Printed manuals for NDK subject to availability from Philips
- Table Top Power Supply with universal 110/220 input. Line cord included for North America only
- TM-JTAG - JTAG based NEXPERIA/TriMedia emulator for use with NEXPERIA/TriMedia debugger (1/2 length ISA card, upgrade to PCI available)
- Audio and video cables
- Standard 90 Day Startup Support

Note: All items in the development kit are available separately for customers that currently own portions of the kit. Please contact MDS for ordering information.

DVE-2-KIT Development board

- 200 MHz PNX1300, 64 MB DiskOnChip flash, 32 MB 166MHz SDRAM
- Supplied with all expansion connectors
- Table Top Power Supply with universal 110/220 input. Line cord included for North America only
- Audio and video cables
- Board manual and examples on CD
- Standard 90 Day Startup Support

DVE-2-OEM OEM version of DVE-2.

- 200 MHz PNX1300, 32 MB 166MHz SDRAM
- No expansion connectors or power supply
- Sockets for M-Systems DiskOnChip® flash and serial boot flash
- For order quantities of 25+

IADK optional libraries

- These libraries are available from Philips directly. Please contact Philips for ordering information. Each library is sold separately, and some libraries require payment of licensing fees to industry consortia

FUSION Protocol Suite

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

DVE-TRN

- 4 day intensive training on NEXPERIA/TriMedia pnx130x Processor and DVE board

DResearch Libraries: Please see the library datasheet for ordering information.

DVE-STD-TRI 90 Day Startup Support (inc. with DVE-DK-FULL and DVE-2-KIT)

- Help with installation of hardware/software.
- Problems in installation.
- How to use/run hardware or software that comes with the DVE. 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

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

PEG-BASE Pegasus Software Development Environment

Advanced TriMedia and DVE related training courses are also available, please see the *Advanced Training* Datasheet.

Custom software and hardware engineering services are available.

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