SEMIHALF
EMBEDDED SYSTEMS

DB-1B

DB-1B

DB-1B complements and extends the main HASE-1 video processing module hosting the Texas Instruments Digital Multimedia system-on-chip, and allows for rich connectivity options to be used with the main processing module.

HASE-1 combined with DB-1B deliver much more than any evaluation board: besides the extensive set of interfaces (including FireWire) and built-in flexibility (on-board FPGA), the device is ready to use in end product out of the box, it is robust, compact and elegant in design.

DB-1B overview

- Multimedia extension daughter board for HASE-1 module
- Digital video input (DVI, FireWire, CCD/CMOS, CameraLink)
- Digital video output (FireWire, LCD)
- Raw 24-bit digital video input and output
- Analog video input and output (PAL, NTSC, SECAM)
- Stereo audio input (line, mic)
- Stereo audio output
- Lattice FPGA programmable logic
- miniSD flash storage
- Battery backed RTC
- System configuration EEPROM
- Temperature monitor
- Configuration flexibly managed from the HASE-1 host
- Unencumbered interfaces for development and debugging
- Dimensions: 95mm x 100mm x 20mm
- Complete software support

DB-1B features

Versatile and rich video interfaces

With DB-1B extension board the full multimedia processing power of HASE-1 is unleashed. There is a complete set of video interfaces available on the board, both analog (PAL, NTSC, SECAM; Y/C, YPbPr, RGB) and digital (LCD, CCD/CMOS sensor; DVI), for which mixed configurations are possible, all controlled from the HASE-1 host.

Custom transformations of digital stream

The programmable FPGA logic unit is placed on the digital processing path and allows for multiplexing, redirecting and other custom modifications of inbound and outbound digital signals (for example, real-time video color space conversion). Its function can be reprogrammed in run-time (bitstream permanently stored in local SPI memory).

FireWire 400 (IEEE 1394a-2000)

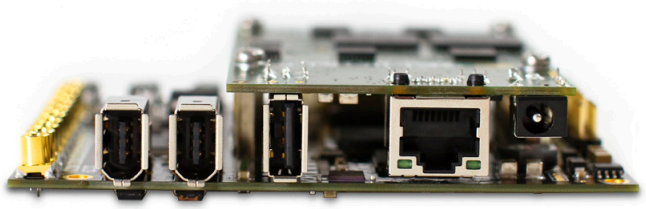
In order to further expand base functionality, the DB-1B board features FireWire connectivity, which allows for digital input (industrial cameras, consumer media peripherals) and output. It is designed to comply with 1394-based Digital Camera Specifications (IIDC/DCAM) and IEC 61883 (Digital Interface for Consumer Electronic Audio/Video Equipment).

Camera Link

The system can take advantage of Camera Link interface, which is a standard for scientific and industrial video and imaging instruments (cameras, scanners, frame grabbers), often found in most demanding machine vision applications. Camera Link requires an additional adapter.

Demanding environmental requirements

The device has been assembled from high quality materials, electronic components and mechanical elements, so that it can operate under very demanding environmental conditions. DB-1B together with HASE-1 have been designed to operate in extended and industrial temperature and humidity ranges.



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DB-1B multimedia

Digital video output
- up to 1024x768@60
- up to 720p60 or 1080i60

Analog video
- input: up to 576i50 or 480i60
- output: up to 576p50 or 480p60

Video encoding
- H.264: up to 576p25 or D1@30
- MPEG-2: up to 576p25 or D1@30

Video decoding
- H.264: up to 576p25 or D1@30
- MPEG-2: up to 720p30

Audio
- 96 kHz sampling
- 24-bit resolution

DB-1B applications

Prototyping and development platform

Education, evaluation tool

Machine vision
- Industrial, scientific
- Robotics

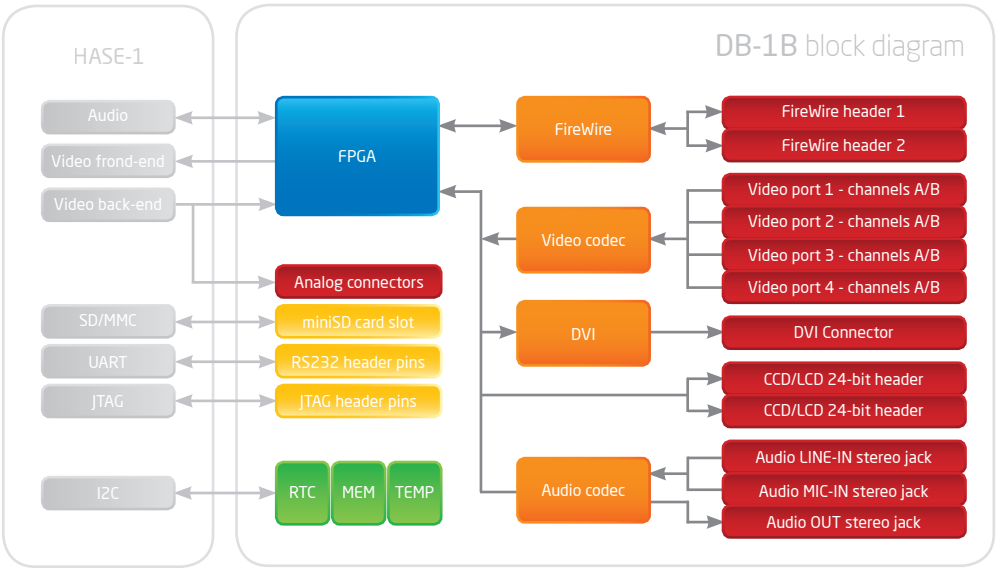
Ready to use in multimedia end-products
- Digital signage platform (advertising)
- IP set-top boxes, digital TV, video phones
- Intelligent kiosk/point of sales
- Decoding, recording, streaming solutions

Signal diagnostics and testing tool
- Reference/test signal generator
- Analysis, diagnostics of inbound stream
- Custom transformations of audio and video

DB-1B hardware specification

Major components

- Lattice EC/ECP FPGA
  - Dedicated SPI memory for bistream storage
  - With optional DSP blocks
- FireWire 400 controller
  - IEEE 1394a-2000
  - IEC 61883 Digital Interface for Consumer Electronic Audio/Video Equipment
- Audio codec
  - Stereo, low-power



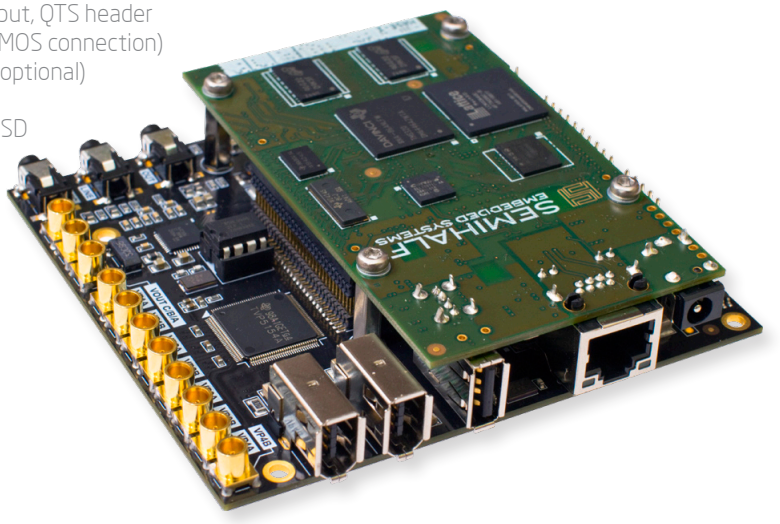
- Video decoder
  - 4 channel, low-power
  - PAL, NTSC, SECAM
- Video transmitter
  - Digital Visual Interface (DVI)
  - VGA through UXGA modes
- Others
  - RTC
  - EEPROM
  - Temperature monitor

Connectivity

- Analog video input
  - 4 ports, 2 channels each
  - 8 MCX7 (75 Ohm) jacks
- Analog video output
  - 3 MCX7 (75 Ohm) jacks
- Digital video input
  - FireWire 6-pin (alpha) socket
  - 24-bit raw input, QTS header (direct CCD/CMOS connection)
  - Camera Link (optional)
- Storage
  - miniSD, 4-bit SD
- Digital video output
  - DVI
  - FireWire 6-pin (alpha) socket
  - 24-bit raw output, QTS header (direct LCD connection)
- Analog audio input and output
  - 2 mini jacks (line-in and mic)
  - 1 mini jack (output)
- Debugging, diagnostic
  - UART console
  - CPLD/FPGA JTAG
  - CPU/DSP JTAG

Environmental

- Wide power supply range: VDC 6 to 36V
- Dimensions: 95mm x 100mm x 20mm
- Power consumption: max. 8W (total with HASE-1)



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