

## Introduction

The PDA platform provides a robust and feature-rich platform for FPGA designers and developers.

The PDA Development Board has been designed for developing and testing customer System-On-a-Chip (SoC) designs. It provides the user with all required hardware needed to implement and test their RTL code.

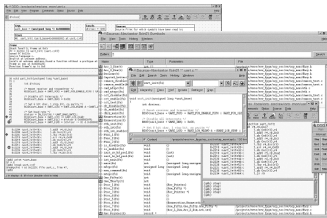
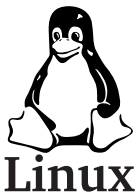
This board is particularly suited for applications requiring a RISC processor with accompanying peripherals: memory controller, LCD/VGA interface, audio, Ethernet access, UART, etc.

Applications:

- PDA
- Digital Camera
- Set-top Boxes
- Hand Held Devices
- Etc.

## Features

- OpenRISC 32 bit processor
  - configurable data and instruction caches
  - configurable data and instruction MMU
  - debug interface
  - integrated interrupt controller
  - integrated timer
- Virtex-E XCV1600E FPGA
- Virtex-II XC2V1000 FPGA
- C/C++/Java GNU compiler
- GDB debugger with JTAG connection
- OpenRISC architectural simulator
- RedHat's Source Navigator IDE
- Linux, uClinux, RTEMS support
- Peripheral drivers (UART, Ethernet...)
- 2 Ethernet 10/100 interfaces
- USB interface
- ATA/IDE interface with CompactFlash expander
- VGA video (LCD module and 15-pin VGA connector)
- IrDA link
- 2 UART serial interfaces
- SPI serial interface
- Audio codec compliant with AC97 2.1
- Amplified stereo audio output (for MP3 codecs)
- Interface available for a GSM module

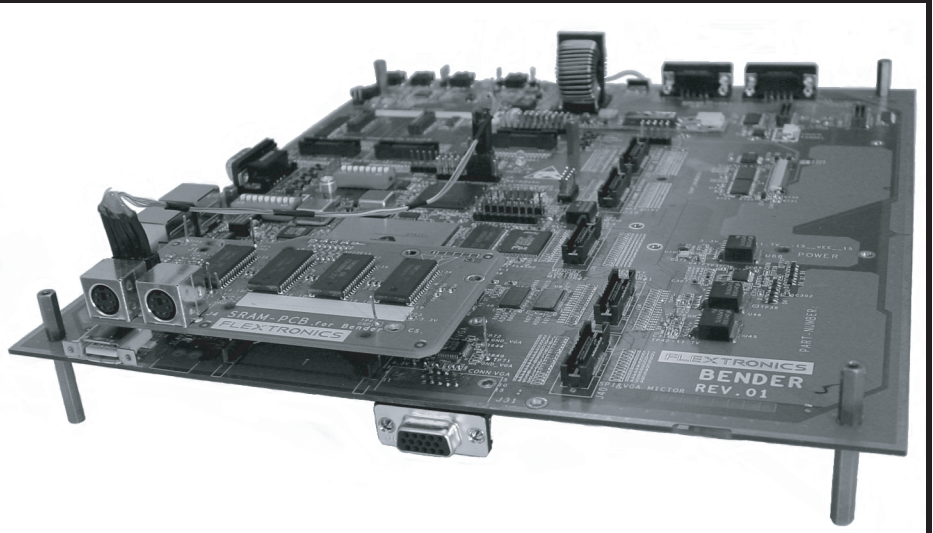


The Flextronics PDA Development Board features Linux running on the FPGA.



Simply Better Results

Flextronics' PDA Development Board was developed using Synplicity's Synplify Pro® software. Synplicity is the market leader in FPGA synthesis and is known for fast runtimes and producing the best results.



## General Description

The PDA Development Board is a single board, measuring 287mm x 251mm, that contains all the required hardware to test a wide range of RTL code and IP cores.

It contains two FPGA devices from Xilinx (Virtex-E XCV1600E and Virtex-II XC2V1000) with designated hardware attached to each FPGA.

The Virtex-E is used for the implementation of the main embedded Processor with standard interfaces:

- Memory controller
- ATA/IDE controller
- VGA digital output
- 2 Ethernet MACs
- USB interface
- 2 UART controllers
- Master/Slave I2C controller
- IrDA
- General Purpose I/O (GPIO)

The Virtex-II provides the platform for dedicated logic and interface development. Here are a few of many possibilities:

- GSM and Bluetooth radio interfaces
- SPI serial interface
- AC97 audio codec and audio amplifiers
- Digital camera

Communication between the two FPGAs is available via two serial interfaces and a 57-bit user-definable parallel interface and some control signals.

Various IP cores are combined with the RISC core providing the embedded features of the embedded processor:

- Glueless interface with SDRAM (JDEC standard), SSRAM, FLASH, and SRAM. 8 individual chip select signals are available.
- ATA/IDE controller supporting true IDE mode of operation. No external interface components are implemented.
- VGA engine providing a digital output for each of the three colors (RGB) with an 8-bit resolution for each.
- Dual Ethernet MACs providing a glueless interface with 10/100Mbit Ethernet PHYs supporting the MII communications standard.
- Various serial interface controller cores providing several options for serial communications applications.
- General Purpose I/O Controller to provide easy access to and control of I/O signals.

A video output is available in two ways, namely the TFT-color LCD module or 15-pin D-Type connector that may be used to connect the board to a VGA display monitor.

Connectors are available for interfacing with GSM and Bluetooth radio communication modules.

A CompactFlash module is also available for mass storage.

**PDA Board Block Diagram**

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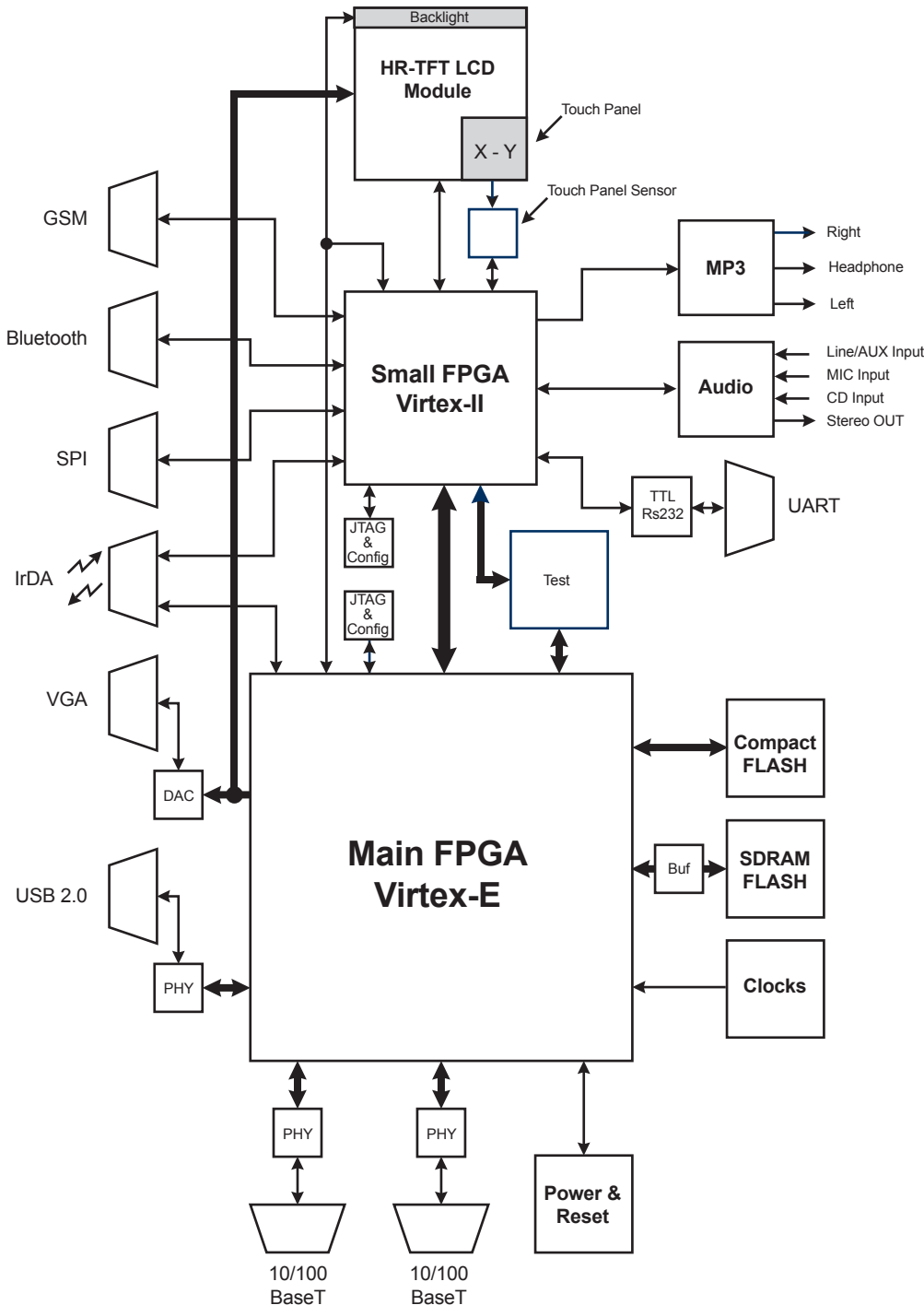
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