

# Create Real-World Designs with MicroBlaze Development Kits

Four new MicroBlaze Development Kits from Avnet Design Services provide processing power, memory, and high-speed I/Os inside FPGAs.

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With the introduction of the Xilinx MicroBlaze™ soft processor core, high-performance processing power has moved inside the FPGA itself – bringing new classes of applications and architectures within your reach. FPGAs have grown sufficiently in capacity and functionality to support complete platforms on a single chip. In addition to MicroBlaze processors, more memory and high speed I/Os can now be implemented on a single FPGA.

Designs such as sequential data processing algorithms, which previously involved large and complex VHDL or Verilog™ code, can now be implemented in a standard high-level language, such as C. In many cases, this results in quicker design time and lower gate counts.

## Kits Are Feature Rich

Avnet Design Services has created a suite of MicroBlaze Development Kits that speed development of applications based on the MicroBlaze soft processor core. The kits include:

- MicroBlaze Development Environment

- Full-featured hardware development boards based on:

- Virtex™-II FPGAs
- Virtex-E FPGAs
- Spartan™-IIE FPGAs

- A set of additional IP cores for popular MicroBlaze-compatible peripherals and memories.

The kits offer a complete set of hardware, software, and IP that will enable you to start building real-world applications in your target FPGA device without the need to create prototypes (Table 1).

## Virtex-II Kit

The Virtex-II based development kit starts with a PCI/PCI-X form factor board (Figure 1) and contains 128 MB of 133

Part Number	Description	Price
ADS-XLX-MB-DEV1500	Virtex-II development board with XC2V1500, Communications/Memory board, and MicroBlaze IP Core License	\$1,400
ADS-V2-MB-DEV4000XP	same as above with XC2V4000	\$3,000
ADS-V2-MB-DEV6000XP	same as above with XC2V6000	\$6,400
ADS-SP2E-MB-EVL	Spartan-IIE evaluation board with XC2S200E, Communications/Memory board, and MicroBlaze IP Core License	\$650
ADS-VE-MB-DEV	Virtex-E development board with XCV1000E, Communications/Memory board, and MicroBlaze IP Core License	\$1,650

Table 1 - MicroBlaze Development Kits – price and availability

MHz Micron DDR (double data rate) SDRAM in a SODIMM (small outline dual in-line memory module) format, and 8 MB of flash memory. It has I/Os for JTAG, RS-232, and Xilinx System ACE™ MPM (message passing memory) connectors.

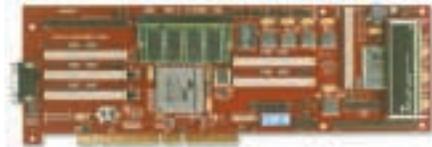


Figure 1 - Virtex-II development board

Virtex-II devices available on the kit include the XC2V1500, XC2V4000, or the XC2V6000 FPGAs – making these kits appropriate for even your most complex designs. Additionally, as many as 541 user-accessible I/O pins are available for expansion.

#### Expansion Board

The MicroBlaze development kit also comes bundled with the communications/memory expansion card (Figure 2). This card includes 64 MB of Micron SDRAM, 16 MB of Micron flash memory, 1 MB of high-speed Cypress SRAM, a 10/100/1000 National Ethernet PHY, a Cypress USB 2.0 transceiver, IrDA, mouse, keyboard, and PCMCIA slot.

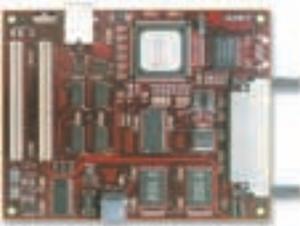
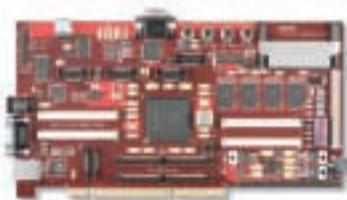


Figure 2 - Communications/memory expansion board

#### Virtex-E Kit

The Virtex-E based development kit starts with a PCI form factor board (Figure 3) and contains a XCV1000E-6FG1156 Virtex-E FPGA, 64 MB SDRAM, 32 MB flash memory, PC card interface, video RAM DAC, USB 2.0 PHY, CAN bus, audio

Figure 3 - Virtex-E development board



DAC, video decoder, 10/100 Ethernet, and PCI and PMC interfaces. The wide range of hardware native to the board makes this kit an excellent development platform for a variety of host, end-point, or bridging applications in the networking, audio, video, industrial control, and consumer markets. The native hardware can be augmented with expansion cards if needed.

#### Spartan-IIE Kit

The Spartan-IIE-based evaluation kit starts with a low-cost expansion board (Figure 4) and contains a XC2S200E-6FT256C Spartan-IIE FPGA with LVDS I/O, multimedia audio codec, and LCD interface. The kit features a variety of push buttons, LEDs, and four high-capacity expansion connectors. This MicroBlaze development kit comes bundled with the



Figure 4 - Spartan-IIE evaluation board

same communications/memory expansion card described above. This development kit has been optimized for low-cost applications, such as consumer and industrial control, and provides all the hardware required to develop complete applications.

Additional expansion boards are available from Avnet Design Services, making it easy to configure just the right set of hardware for specific applications (Table 2).

All MicroBlaze Development Kits ship with the complete software development tools for MicroBlaze micro-processor development, a MicroBlaze IP core license, and detailed design documentation (including layout and bill of materials) sufficient to easily create customized designs for specific applications and hardware form factors.

Visit [www.ads.avnet.com](http://www.ads.avnet.com) to get all the details on our expanding suite of development kits and reference designs, or contact your local Avnet FAE. ✉

### Expansion Cards for Avnet Design Services Development Kits

**Communications/Memory Module:** 10/100/1000 Enet, 16 MB flash, 1 MB SRAM, 64 MB SDRAM, IrDA, PC Card, USB 2.0 on keyboard/mouse port.

**Motorola 857T Processor Module:** MPC857T PowerQUICC™ processor, 10/100 Enet, USB 1.1, RS-232, 16 MB flash, 64 MB SDRAM, 1 MB SRAM, 4 Kb EEPROM, Linux-based embedded OS and board support package.

**RLDRAM Memory Module:** 200 MHz memory controller card with DDR access to Infineon and Micron RLDRAM devices in a Virtex-II FPGA.

**USB 2.0 to SCSI Module:** Spartan-IIE based USB 2.0 to SCSI interface is plug-and-play compatible with Windows 2000.

**Xilinx IRLTM PMC Platform:** Virtex-based IRL platform using the PAVE Framework. PMC connector is compatible with other development boards.

**CoolRunner™-II Evaluation Board:** Expansion card features the XC2C256, serial A/D converter and user interface.

**Spartan-IIE Evaluation Board:** Features XC2S150-5PQ208 FPGA, digital thermometer, and user interface.

**Virtex-II Evaluation Board:** Features XC2V1000 FPGA, digital thermometer, and user interface.

**Virtex-E Evaluation Board:** Features XCV100E-6PQ240C FPGA, infrared transceiver, digital thermometer, and user interface.

**Breakout Module:** Expansion headers to create customer connections to a variety of external signals – uses 6 MICTOR connectors and four 50-pin headers.

**User Prototyping Module:** Features a .1" grid prototype area and surface mount footprints.

**Adapter Module:** Connects to on-board connectors for easy interface.

Table 2 - Expansion boards for use with Avnet Design Services MicroBlaze Development Kits