

# Develop MicroBlaze Applications with Three Flexible Hardware Evaluation Platforms



MicroBlaze Development Kits from Memec Design demonstrate the versatility of the MicroBlaze soft processor core in a variety of Xilinx FPGAs.

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Running at 125 MHz, the Xilinx MicroBlaze™ 32-bit soft processor core is the industry's fastest soft processing solution. The MicroBlaze processor delivers a true 32-bit processor, critical for building complex systems for the networking, telecommunication, data communication,

embedded, and consumer markets. The soft processor features RISC architecture with Harvard-style separate 32-bit

instruction and data busses, which run at full speed to execute programs and access data from both on-chip and external memory. With 900 logic cells and 82 D-MIPS, the MicroBlaze processor meets the utilization, performance, and cost targets that most FPGA designers require.

To support the development of MicroBlaze-based applications, Memec Design has introduced three different MicroBlaze Development Kits (MDKs) to

accelerate design, prototype, and evaluation cycles. The three MDKs allow you to quickly prototype your MicroBlaze processor and peripherals in real-world hardware environments. With functioning hardware platforms based on Xilinx FPGAs, you can easily verify design concepts, system interfaces, and real-time functionality.

## Three Families – Three Kits

The Virtex™-II, Spartan™-IIE, and Spartan-II FPGA families are the logical targets for MicroBlaze applications. Therefore, Memec offers specially designed standalone system boards for a device from each of these families.

Additionally, each MDK offers an expansion module that contains common processor peripheral interfaces and memory, a prototype module for creating custom circuits, the Xilinx MicroBlaze processor license, software tools, and a power supply.

- The Virtex-II platform is based on the one million-gate XC2V1000 device (Figure 1). The system board includes 2M x 16 DDR SDRAM and a 16-bit LVDS Tx/Rx port.
- The Spartan-IIE system board is based on the 300K-gate XC2S300E device (Figure 2). This board offers a 10-bit LVDS Tx/Rx port and 82 general purpose I/Os.
- The Spartan-II kit uses the 200K-gate XC2S200 device (Figure 3), which resides on a 32-bit PCI interface, along with 2M x 32 SDRAM. The PCI interface presents an interesting configuration by allowing the MicroBlaze processor to sit on the backend of the PCI bus.

All three platforms include the P160 expansion slot, an ISP PROM, on-board power regulation, and other user support circuits.

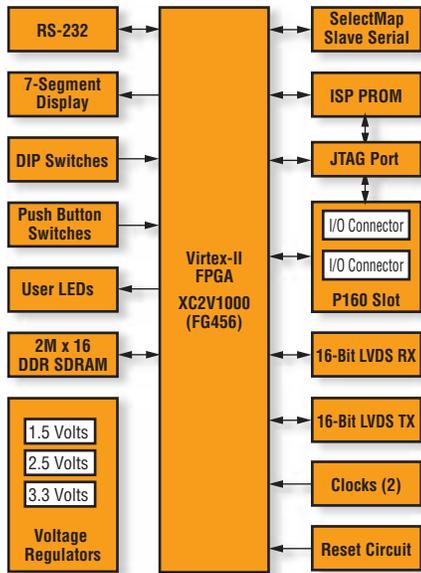


Figure 1 - Virtex-II system board block diagram

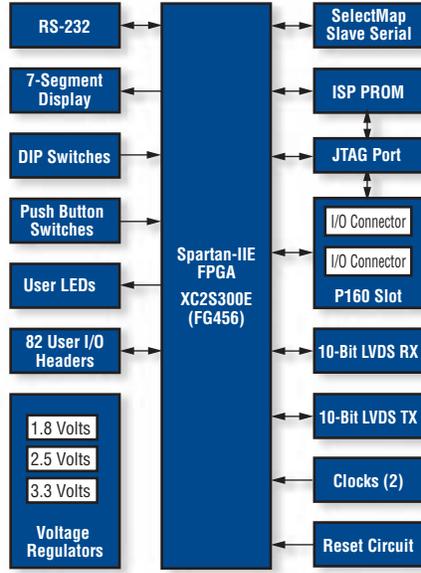


Figure 2 - Spartan-IIE system board block diagram

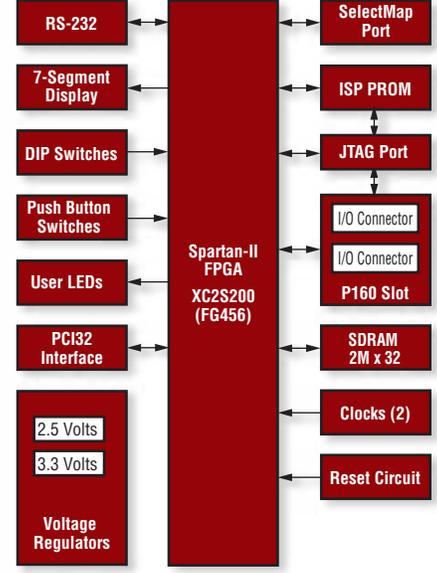


Figure 3 - Spartan-II system board block diagram

### P160 Expansion

The P160 expansion slot provides the flexibility you need in a processor and IP development environment. The expansion slot allows you to easily plug custom peripheral modules into the system board and interface to the FPGA device.

The P160 slot supplies 110 user-defined I/O signals from the FPGA to the user application circuit on the expansion card. By adding a P160 module, you can tailor your development environment and ease hardware verification.

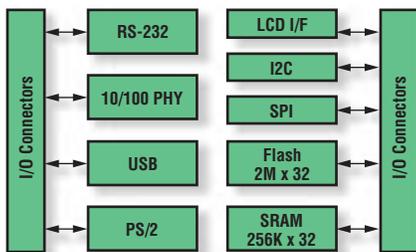


Figure 4 - P160 communications module block diagram

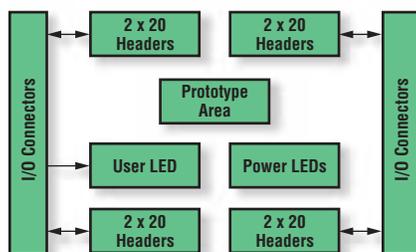


Figure 5 - P160 prototype module block diagram

Two P160 modules are included in the MDKs:

- The P160 communication module (Figure 4) provides interfaces for 10/100 Ethernet, RS-232, USB, PS/2 keyboard, LCD module, I<sup>2</sup>C, and SPI connections. The communication module also includes 2M x 32 flash and 256K x 32 SRAM for off-chip memory expansion by way of the IBM CoreConnect™ on-chip peripheral bus architecture.
- The P160 prototype module (Figure 5) offers general purpose expansion headers for all 110 user I/O signals, as well as a prototype area for building custom circuits.

### Conclusion

As MicroBlaze implementations move into the mainstream, you will need easy to use, flexible, low-cost hardware platforms to verify and validate your design concepts. Supporting Virtex-II, Spartan-IIE, and Spartan-II devices, each Memec Design MDK bundles the essential tools you need to explore MicroBlaze-based designs.

The Virtex-II MDK is priced at \$795. The Spartan-IIE and Spartan-II MDKs are available for \$695. Call 888-488-4133, ext. 235, or go to [www.insight-electronics.com/microblaze](http://www.insight-electronics.com/microblaze) for more information or to order a MicroBlaze Development Kit. ❧

## Memecore Group and Memec Design

In addition to the MicroBlaze Development Kit, Insight Electronics and Impact Technologies offer MicroBlaze design service support through Memec Design. Our Xilinx-dedicated design services group can assist you in MicroBlaze and turnkey FPGA design, CoreConnect peripheral design, customization, integration, and FPGA performance optimization. Furthermore, the Memecore Group focuses exclusively on offering Memec customers the highest quality intellectual property for tomorrow's designs. Memecore offers several CoreConnect-enabled peripheral functions for easy integration into MicroBlaze applications. Visit [www.insight-electronics.com](http://www.insight-electronics.com) or [www.impact.eu.memec.com](http://www.impact.eu.memec.com) for more information on our complete MicroBlaze offerings.

