



ENABLING DETERMINISTIC NETWORKING,
ENERGY-EFFICIENT MOTORS, AND
EMBEDDED PROCESS INTEGRATION
WITH XILINX FPGAS

XILINX INDUSTRIAL COMMAND AND CONTROL SOLUTIONS

➤ Industrial Command and Control Design Challenges

- Demand for real-time, deterministic equipment connectivity
- Pressure to reduce energy consumption
- Higher embedded processing integration

➤ The Xilinx Solution

- Integrated hardware processing blocks for high performance
- Optimize motor control algorithms utilizing fast parallel processing
- Scalable standardized embedded programming environment and tools

Manufacturing equipment systems demand higher energy efficiency, more complex processing, and robust networking connectivity. For future generation platforms, developers are looking beyond the typical microprocessors, DSPs, and ASICs, to enable more functions running at higher speeds. Xilinx provides a flexible development infrastructure that extends the lifecycle of manufacturing equipment while reducing the cost of ownership.

The Xilinx Targeted Design Platform approach brings together key elements needed to design FPGA-based factory automation and control systems — providing design engineers with industry proven devices, IP, tools and reference designs to build reliable designs and achieve shorter time-to-market. Xilinx focus areas within industrial command and control include industrial Ethernet, motor control, and embedded processing.

Xilinx FPGAs at the Center of Industrial Automation Systems

Industrial systems built on next-generation Xilinx FPGAs offer designers the ideal combination of performance and flexibility. Leveraging the Xilinx low-cost Spartan®-6 FPGA architecture with its integrated digital signal processing (DSP) blocks, distributed block memories, flexible power management, a hardened PCIe block, and embedded processor, industrial designers can develop SoC-type characteristics with processing power and computationally-intensive control required in next generation manufacturing equipment.

The increasing demand to reduce energy consumption while integrating more functions in industrial control systems is stretching the capabilities of typical design approaches. The latest techniques in motor efficiency such as field oriented control algorithms, and variable frequency drive technologies require complex computational processing that can easily be offloaded to a Xilinx FPGA fabric. The hardware accelerated functions are then coupled with Xilinx's 32-bit MicroBlaze soft processor and a powerful suite of embedded tools, to fine tune algorithms and optimize motor performance.

The adoption of open protocol fieldbus networks on low-cost Ethernet allows tight synchronization between time-critical processes and equipment. Xilinx devices provide the performance required to support these leading real-time networking protocols. Xilinx and its Alliance members offer a rich library of IP cores to enable designers with the necessary building blocks to build systems incorporating real-time protocols. Applications such as gateways or protocol bridging are simplified by offering a flexible infrastructure to comply with constantly changing industry standards.

Sample Industrial Command and Control Intellectual Property

System Processing IP

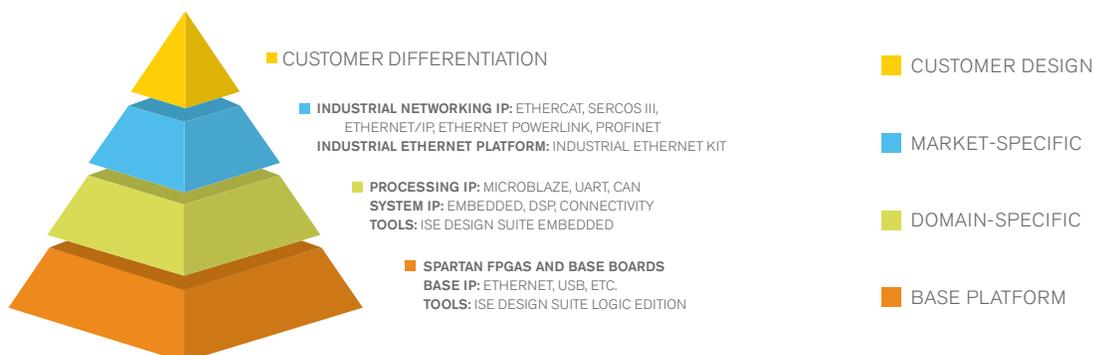
- Multi-Port Memory Controller
- MicroBlaze™ Processor
- DSP IP Cores
- uC/OS-II RTOS

Bus Interface and I/O IP

- Ethernet MAC (Lite, TEMAC)
- PCIe® Integrated Block
- PLB Bus Support
- IIC Bus Interface, UART , CAN
- Realtime Ethernet Protocols

Enabling Design Differentiation and Success with Targeted Design Platforms

The platform image below highlights the FPGA devices, industrial development hardware platform with modular, expandable infrastructure, software design tools, reference designs, and IP that industrial automation designers can choose from for their system design.



Take the NEXT STEP

For more information on Xilinx industrial command and control solutions, please visit www.xilinx.com/esp/ism.htm

Corporate Headquarters

Xilinx, Inc.
2100 Logic Drive
San Jose, CA 95124
USA
Tel: 408-559-7778
www.xilinx.com

Europe

Xilinx Europe
One Logic Drive
Citywest Business Campus
Saggart, County Dublin
Ireland
Tel: +353-1-464-0311
www.xilinx.com

Japan

Xilinx K.K.
Art Village Osaki Central Tower 4F
1-2-2 Osaki, Shinagawa-ku
Tokyo 141-0032 Japan
Tel: +81-3-6744-7777
japan.xilinx.com

Asia Pacific Pte. Ltd.

Xilinx, Asia Pacific
5 Changi Business Park
Singapore 486040
Tel: +65-6407-3000
www.xilinx.com



© Copyright 2009 Xilinx, Inc. XILINX, the Xilinx logo, Virtex, Spartan, ISE and other designated brands included herein are trademarks of Xilinx in the United States and other countries. All other trademarks are the property of their respective owners.

Printed in the U.S.A. PN 2411-1