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 through fast parallel processing
- Scalable standardized embedded programming environment and tools
- Complete Spartan-6 FPGA-based development kit for industrial applications for reduced time to market

Manufacturing equipment systems have an ever increasing demand for energy efficiency, computationally 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 platforms.

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. Integrating these elements, the Spartan®-6 FPGA Industrial Ethernet Kit is a comprehensive design environment for rapid prototyping and development of leading edge industrial applications in connectivity, motor control, and embedded processing. The kit comes with a daughter card that supports multiple real-time industrial Ethernet protocols and legacy serial connectivity, as well as a device-locked version of Xilinx ISE® Design Suite: Embedded Edition for embedded design development. Out of the box, the kit enables OEMs and engineers to produce more reliable designs on shorter cycles and with fewer resources.

Xilinx FPGAs at the Center of Industrial Automation Systems

Next Generation Industrial Control

Next generation industrial systems built on 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 leading edge manufacturing equipment.

Design-In Energy Savings

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.

XILINX®

Deterministic Connectivity

The adoption of fieldbus protocol networks to 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

32-bit MicroBlaze™ Soft Processor

Flexible DSP IP Cores

Multi-Port Memory Controller

uC/OS-II RTOS

Bus Interface and I/O IP

10/100/1000 Ethernet MAC

PCIe®

PLB Bus Structure

Realtime Ethernet Protocols, UART , CAN

Spartan-6 FPGA Industrial Ethernet Kit

Photo representation only. Actual kit content appearance may vary.

For more information and a complete list of kit features, please visit **www.xilinx.com/s6iek**

Comprehensive development environment for rapid prototyping and development of algorithms supporting real-time industrial Ethernet protocols and legacy serial connectivity.

Kit Features Overview

▪ Spartan-6 LX150T FPGA Development Board

▪ Industrial Networking daughter card

  - Dual Port 10/100 Ethernet (IEEE1588 Capable PHY Interfaces)

  - Dual CAN PHY Interfaces

  - Legacy Serial Interface (RS-232, RS-485)

▪ Xilinx ISE Design Suite: Embedded Edition (Device Locked for Spartan-6 LX150T)

▪ Reference Designs

  - EtherCAT Slave Bitstream

  - MicroBlaze with MPMC

▪ Manuals/User guides

  - Getting Started guide

  - Hardware guides

  - Reference Designs guide

▪ Power Supply and Cables

Take the NEXT STEP

For more information on Xilinx industrial imaging solutions, visit: **www.xilinx.com/esp/ism.htm**