Ultimodule ®
Embedded Modular
Systems & Software

Solutions for Actel Platforms

Actel ®
Application Brief

Intelligent Data Acquisition System

Features

- HTTP Server: Host Web Pages from Embedded Device, Featuring SOAP and CGI Interfaces
- Data Acquisition Engine: Capture Data and Communications from the Field
- FTP Server: Manage Files and Make Data Available to Remote Users
- ISaGRAF Engine: Control I/O Using this IEC 1131 Compliant Soft PLC Engine
- Includes DDR Memory Controller
- Interfaces to MIPS or ARM CPUs. Other CPU Interfaces Can Be Added on Request.
- Code and Data Stored in Fusion On-Chip Flash Memory
- Security: Design Secured with 128-bit AES Encryption in Fusion Devices
- Low Power Design Based on Flash FPGA Architecture

Applications

- Building Automation (security and surveillance)
- Advanced Instrumentation (test and measurement, medical)
- Commercial Transport (truck, marine, aviation)
- Automated Control (manufacturing and processing equipment)
- Consumer Automation (kiosks, vending machines, and ATMs)

Description

The Ultimodule intelligent data acquisition system helps you get a jump start on your system design. It is based on The Actel Fusion™ FPGA, which offers exceptionally high security through its 128-bit AES encryption. This reference design provides all you need to web-enable your device.

The web services features are provided by the Ultimodule runtime software called IDAL, the Intelligent Data Acquisition Library. The real power behind IDAL lies in its data acquisition engine. The DAQ engine allows you to make data and local communications available to the internet or local network via TCP/IP. The data acquired from multiple sources can be stored on the Fusion on-chip Flash memory. This nonvolatile storage can be effectively utilized for black-box like applications to recover the data from the Fusion FPGA chip.
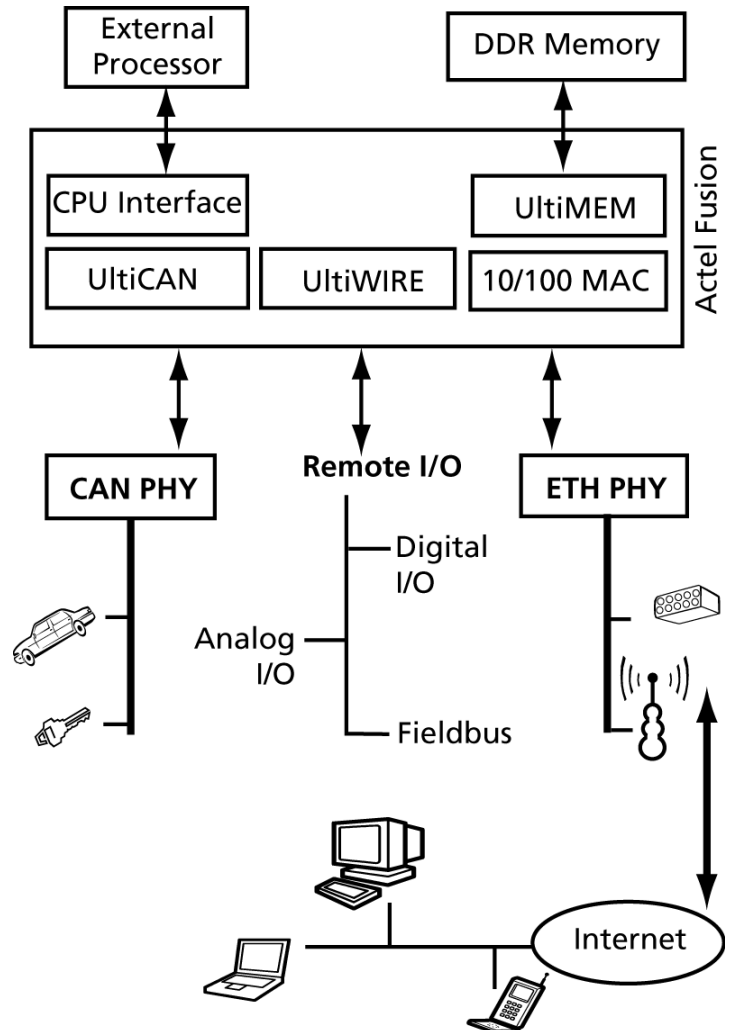
Ultimodule System Blocks

UltiCAN	CAN 2.0B compatible network controller; for automotive and industrial applications. CANOPEN protocol available.
UltiWIRE	48 Mbps single-wire multi-topology I/O bus
UltiMEM	DDRAM memory controller
Core 10/100	10/100 Ethernet core from Actel

The Ultimodule IPmiX™ Advantage

Ultimodule pre-packages and pre-tests popular mixes of IP blocks as IPmiX designs. Downloading a selected IPmiX design into an FPGA quickly creates a system solution that is optimized to fit a specific application. Designers can re-use any IPmiX solution and combine with DirectCores and CompanionCores offered by Actel.

Using Fusion FPGAs also provides numerous benefits: ease of integrating peripheral logic and optimized IP to cut NRE costs and time to market; avoidance of design obsolescence through a flexible, reusable platform; and ASIC-like single-chip and low power features. Fusion SoC components that combine Analog inputs, on-chip Flash memories, and clock generators with proven Flash FPGA fabric offer multiple component replacement opportunities for reducing overall design cost.

Solution Comparisons

There are several data acquisition ASSP solutions available from multiple vendors. However, the advantage of using the Ultimodule Actel-based Flash FPGA solution is the flexibility engineers gain for upgrading, migrating, or replacing products. This especially applies to Fieldbus solutions. Implementing a new Fieldbus in an ASSP-centric design typically requires a board redesign, even if the design is based on a module.

Using the Ultimodule FPGA centric design approach, engineers can implement the new Fieldbus in the programmable FPGA fabric, and add additional hardware (i.e., physical layers) on a module.

Examples of Fieldbus and network ASSP devices:

- Philips – CAN 2.0B SJA1000
- Crystal – Ethernet CS8900A
- Cypress – USB 1.1 SL811HST

All of these functionalities can be implemented in the FPGA. This means if the original specification did not require these functionalities, the hardware can be upgraded later to implement them. The design on the Fusion FPGA can be programmed either on-site or through remote programming methods. The Ultimodule solution has the advantage that it can be customized to the user's requirements and can be easily upgraded.

Advantages

- An integrated solution offering Fieldbus and network connectivity, along with the required software to implement a complete remote data acquisition system
- An easily customizable solution that allows users to modify and optimize the features to fit their product.
- An upgradeable solution through reprogramming the Fusion devices allows launch of the basic solution initially, then enhancing or upgrading functionality as new technologies or standards are introduced.
- An obsolescence-proof solution that makes it possible to produce and maintain long-life products. This can be particularly critical for industrial equipment or instrumentation, where life cycles can be a decade or more.
- Secure programmable chip solution, which consumes considerably lower power compared to other programmable solutions.
- Fusion is an ASIC-like device that is live at power-up. This FPGA consolidates several SOC blocks, enabling mixed-signal programmable design integration.

About Actel

Actel Corporation is a supplier of innovative programmable logic solutions, including field-programmable gate arrays (FPGAs) based on antifuse and Flash technologies, high-performance intellectual property (IP) cores, and software development tools and design services targeted for high-speed communications, application-specific integrated circuit (ASIC) replacement, and radiation-tolerant markets.

The company is traded on the NASDAQ National Market under the symbol ACTL and is headquartered at 2061 Stierlin Court, Mountain View, CA, 94043-4655. Telephone: 888-992-2835.

About Ultimodule

Ultimodule offers embedded building blocks for prototyping to volume production with hardware, software, and pre-configured IPmiX designs. Smart Controller Modules are small-form-factor hardware systems containing FPGA, CPU, memory, peripheral control, and OS. IP blocks are pre-packaged as popular IPmiX designs, and downloading a selected IPmiX design into an FPGA creates a system that is optimized to fit a specific application. Ultimodule targets display control applications for industrial automation, building automation, advanced instrumentation, and industrial transportation.

Ultimodule, Inc.
Phone: 1-408-734-2300
Email: sales@ultimodule.com
Http://www.ultimodule.com