

Intelligent Display Control System

Features

- Configurable Display Controller Supports Different Kinds of LCD, EL, and Plasma Display Panels
- Various Display Resolutions and Color Depth Combinations Can Be Supported.
- Touch Input/Resistive Touch Screens Are Supported.
- Includes SDR/DDR Memory Controller for Display Buffer
- Interfaces to CPU, Ethernet Controller, SDRAM and Flash, and Interrupt Controller
- Available with Compact PCI and PC104 Interfaces. Other Interfaces Can Be Added on Request.
- On-Chip ADC Input Channels for Touch Sensing
- Design Secured With 128-Bit AES Encryption in Fusion Devices.
- Low Power Design Based on Flash FPGA Architecture.

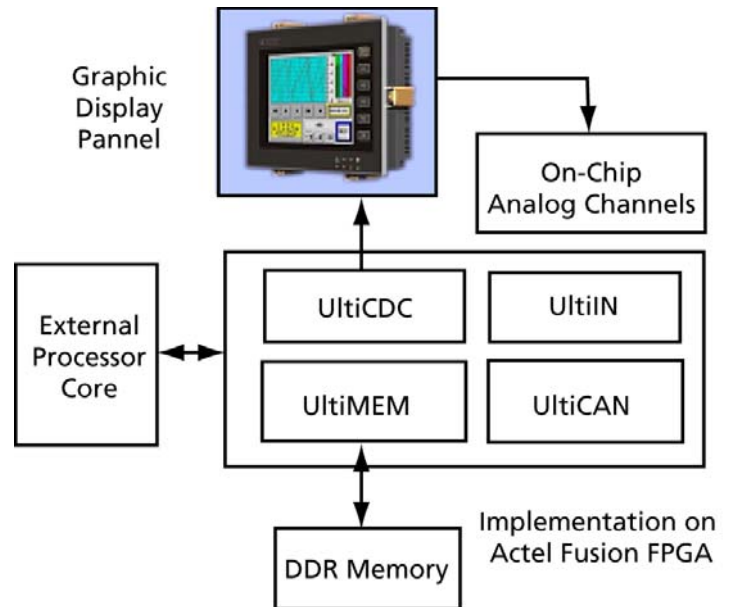
Applications

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

Description

The Ultimodule versatile display control solution can be implemented on Actel Fusion™ devices, which have a Flash-based FPGA architecture. This family of devices offers mixed-signal capability with multiple Analog channels, on-chip clock generator, and Flash memory. These SoC features are effectively used in this application with a mix of IP cores from Ultimodule. The analog circuitry required for touch input can be implemented in the Fusion FPGA as part of the UltiIN core. The design is secured with exceptionally high security through its 128-bit AES encryption on Fusion devices.

The display function can be enhanced by including



the UltiBitBlk bitmap graphics acceleration core, which works seamlessly with the UltiCDC and UltiMEM cores. The FPGA can be reconfigured with new functionality remotely over the network.

Peripheral IP cores can be added to suit the particular requirements of a specific market segment. The Ultimodule standard FPGA-based solutions are available with an UltiCAN core that provides CAN2.0B network connectivity. These cores can be interfaced with a variety of IP cores offered by Actel through DirectCores and CompanionCores.

Ultimodule System Blocks

UltiCDC	Compact Display Controller (supports STN, DSTN, TFT LCD, and other panel displays such as EL and Plasma)
UltiBITBLK	Bit Block – 2D Graphic Accelerator (optional)
UltiMEM	DDR SDRAM Memory Controller
UltiCAN	CAN 2.0B Network Controller (optional)
UltiIN	Matrix Keyboard / Touch Controller

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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. Using IPmiX solutions gives designers the ability to configure products that closely match their required functionality for the lowest possible cost. Designers can re-use any IPmiX solution.

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; 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 popular display/LCD control ASSP solutions available on the market today from Epson. The S1D13504 chip is comparable to the Ultimodule display control solution, with respect to the display features and technologies.

The SmartASIC SD1000 is another similar example of an ASSP solution for display/LCD control. One of the major issues in selecting an ASSP-based solution is the availability over an extended period of time—for the life of the equipment. This can be particularly critical for industrial equipment or instrumentation, where life cycles can be a decade or more. Popular ASSP devices may actually go obsolete rather quickly because there is pressure on the manufacturer to provide more features and reduce cost to take advantage of technological advancements.

The Fusion FPGA-based reconfigurable solution protects the user from standard chip obsolescence. A particular benefit of using a Flash FPGA technology for display control solution is that multiple options can be offered in different products, all based on the same silicon. Such an approach reduces inventory and achieves better pricing due to the increased volume of one FPGA device.

Advantages

- LCD interface can differ between different panels based on the technology, the type, or the vendor.
- By selecting the LCD-based display controller that is either chip-based or included as part of the micro-controller functions, the user is restricted to the list of panels that are supported by that chip.
- The Ultimodule display control solution is tested and supported on many leading LCD panel technologies and vendors. However, the key difference is that this solution can be easily reconfigured to support any LCD panel, offering the user flexibility to integrate the panel of their choice, depending on their relationship with the display manufacturer, the display features, and the price point.
- Fusion offers a secure programmable chip solution, which consumes considerably lower power compared to other programmable solutions.
- Fusion is live at power-up and 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.