

Intelligent Display Control with Video 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.
- Multi-Channel Video Inputs ITU656
- Includes DDR Memory Controller for Display and Video Buffers
- Interfaces to MIPS or ARM CPUs. Other CPU interfaces can be added on request.
- Code and Data Stored in Fusion On-Chip Flash Memory.
- Design Secured with 128-Bit AES Encryption in Fusion Devices
- Low Power Design Based on Flash FPGA Architecture.

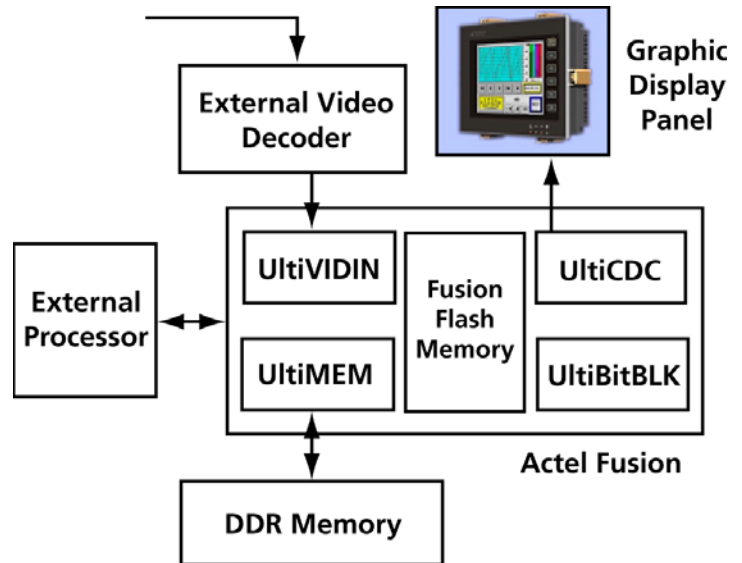
Applications

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

Description

Ultimodule intelligent display and video overlay solution can be implemented on Actel Fusion™ FPGA hardware. The standard solution is offered with an external MIPS processor, but it can be easily ported to the ARM7™ processor. The ARM7 processor can reside off-chip and can later be implemented as a soft core on Fusion devices. That enables the user to reduce cost and chip count.

The UltiVIDIN core provides multi-channel video processing and multiplexing capability for overlaying different video frames on the same display panel. The video processing features include scaling and cropping an individual video stream.



The on-chip Flash memory on Fusion parts can be used to buffer video data. Additional DSP algorithms can be implemented in the FPGA to process images or video streams that can be added to the existing video processing IP cores.

Multiple display window areas can be manipulated easily through the UltiBitBLK core that performs the bitmap graphics acceleration at hardware level.

Ultimodule System Blocks

UltiCDC	Compact Display Controller (supports STN, DSTN, TFT LCD, and other panel displays such as EL and Plasma)
UltiVIDIN	Multi-Channel Video Processing and Multiplexing
UltiBITBLK	Bitmap Graphics Accelerator
UltiMEM	DDR SDRAM Memory Controller
UltiCAN	CAN 2.0B Network Controller (optional)

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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; and ASIC-like single-chip and low power features. Fusion SOC components that combine on-chip Flash memories and clock generators with proven Flash FPGA fabric offer multiple component replacement opportunities for reducing overall design cost.

Combining IPmiX solutions with FPGAs means designs can be built fast. IPmiX solutions are delivered with the complete set of application notes, reference designs and software tools, allowing the designer to create application hardware quickly.

Solution Comparisons

Several of the display and video control ASSP solutions available from silicon vendors are listed:

- Silicon Motion – SM501
- Genesis Microchip Inc. – GM1601
- Philips – SAA6713H
- SmartASIC – SD2000

The Silicon Motion SM501 and Genesis GM1601 are comparable to the Ultimodule display and video control solution, with respect to the display technologies, features, and video input capability.

All of these ASSP solutions differ mainly in their video processing capability and some value-added features, such as DVI and specialized video processing for MPEG4 and H.264.

The other difference is in the support for specific video interfaces, although that can be worked around easily by adding a suitable external decoder chip.

The design on Fusion FPGAs 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 display control and multiple video stream overlay as one complete solution.
- An easily customizable solution that packages as many video input channels as the user requires (up to 8 max.).
- An upgradeable solution that allows a design team to launch a basic solution initially and then enhance the display or video functionality as new standards are introduced.
- Using an FPGA-based solution helps the customer avoid obsolescence, so products can remain operational and upgradeable for a longer life. This can be particularly critical for industrial equipment or instrumentation, where life cycles can be a decade or more.
- Secure reprogrammable Fusion FPGA chip solution to ensure protection of design IP.
- Fusion parts consume considerably lower power compared to other programmable solutions. The FPGA can be put to sleep and the wake-up cycles can be controlled through on-chip clock features.
- Fusion is an ASIC-like device, which is live at power-up. This FPGA consolidates several SOC blocks, including on-chip Flash memory for processor code and data storage.

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 the 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.