



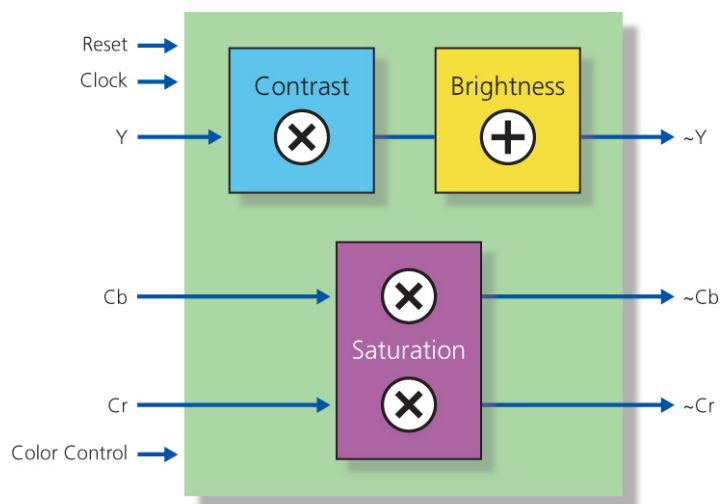
Color Management Core



Some YCbCr video sources do not have a mechanism to adjust color properties. In these cases, the Color Management Core is implemented to do the task. Applications include localized color adjustment of video feeds for automotive entertainment systems, image enhancement for medical applications, and color control of camera sources.

Contrast, brightness, and saturation can be independently managed via a color-control interface. The same control inputs are able to queue Attodyne's OSD core to provide visual feedback to the user.

Block Diagram



Features

Color Adjustment

- Contrast
- Brightness
- Saturation
- 32 steps of adjustment each

Multiple instances

- Independently adjust multiple sources

8-Bit Color Depth

- High quality results

Pipelined Architecture

- Maximize pixel throughput

Applications

- In-car entertainment
- Medical monitors
- Surveillance systems
- Handheld devices
- Kiosks
- Image processing

A pipelined architecture allows the math operations to occur at wire-speed. Built-in clamping and error detection cause softer clipping when the modified color component values exceed permitted limits.

The core's settings reset to unity adjustment. If user settings need to be retained after power cycling, then either serial flash or an external MCU is required to initialize the settings.



Color Management Core



Device Utilization

Family	Device	Tiles	Clock Globals	I/Os	PLLs	Block RAM	Utilization
IGLOO™	AGL125	920	1	57	0	0	30%
ProASIC®3	A3P125	920	1	57	0	0	30%
Fusion	AFS250	920	1	57	0	0	15%

Deliverables

- Complete IP Datasheet
- Actel Optimized Netlist
 - Netlist for target FPGA in EDIF, Verilog, or VHDL format
- RTL Source Code
 - VHDL or Verilog source code
 - Functional verification testbench
 - Complete Libero® Integrated Design Environment (IDE) project

About Attodyne

As an Actel Solution Partner, Attodyne licenses IP cores relating to the processing, transmission, distribution, and display of video data. Attodyne's design experience and capabilities span from ultra-low noise analog circuits to 4 Gbps fiber optic communications; however, video-related FPGA work is its primary focus. In addition to licensing IP cores, Attodyne also offers reference designs, prototypes, design consultation, and product development.

Attodyne will help guide you early in your project to extract the maximum feature set that will minimize the design cost for both hardware and firmware/software. Attodyne recommends Actel's FPGAs, as Actel's Flash based FPGA architecture is uniquely suited to video/LCD applications. Actel also provides superior support and creative flexibility to match its customer's needs. Due to a close working relationship with Actel, Attodyne has extensive knowledge of its Flash FPGAs as well as Actel's roadmap. This base of knowledge is extremely important when making long-term product and manufacturing decisions.