**VideoCube IP Core**
Seamless real-time video integration in TFT displays

---

## General description

VideoCube is a highly customizable video mixer. VideoCube mixes data coming from an analog video capture device with data displayed by a microprocessor in a low-cost TFT display. VideoCube shows the video in the selected area of the display and allows the processor to show any other information on the remaining area. Through an standard communication interface the processor controls the video visualization.

---

## Applications

By its implementation flexibility and simplicity VideoCube may be used in a wide range of applications. Among other product fields where VideoCube can be directly used, highlight:

- Video-intercoms
- OnScreenDisplay
- Vending machines
- Electronic scales
- Man-machine interfaces
- Infotainment

---

## Resource utilization

VideoCube has been described using VHDL language to facilitate the implementation in different FPGA families and devices. As a reference, VideoCube IIC-UART requires approximately an 80% of the resources available in the smallest device of the Spartan-3E family (xc3s100e) and a 50% of the smallest device of the Spartan-6 (xc6slx4).

---

## Support and licensing

VideoCube IP core can be adapted to customer specific requirements, such as SPI communication, different configuration interfaces or specific TFT display interfaces. VideoCube can be combined with other IP cores in the FPGA in order to offer functionalities as video compression or Video IP. VideoCube IP core is offered in several license and maintenance options.
**Block diagram**

*Video cube* is composed by three main modules:

- Communication interface with video capture ADC device. This module establishes the communication between *Video cube* and the ADC. The *Video cube* IIC-UART version implements an IIC master interface to control a wide range of commercial video capture ADCs.
- Communication interface with the microprocessor. This module receives configuration data from the microprocessor. The *Video cube* IIC-UART version has an RS232 compatible communication interface.
- Video processing unit. This module receives data from the ADC and from the microprocessor and, according to selected configuration, generates the mixed data to be displayed in the TFT display.

Among other possible configurations, the IP core presents to the associated microprocessor a transparent configuration of the ADC, thus allowing a fine tuning. The communication interface between *Video cube* and the TFT display is a standard parallel 16 bit and the IIC interface is speed configurable.

**Video cubeEB : Evaluation and development board**

In order to facilitate the evaluation of *Video cube* IP Core and the development of custom systems based in this solution, SoCe has available a specific Evaluation Board. *Video cubeEB* is based on a low-cost ST ARM Cortex-M3 processor (STM32F101) and a Xilinx Spartan-6 FPGA (XC6SLX4). It allows two video analog inputs and includes an Ethernet connection. More information about this Evaluation Board is available at System-on-Chip engineering Web Site.

**About the company**

SoCe (www.soc-e.com) offers specialized design services of FPGAs, SoPCs, IPs and embedded systems. The staff at SoCe is formed by an interdisciplinary group of professionals with a proven experience in the design of FPGA based systems and embedded systems in general. SoCe is involved in constant activities of R+D with cutting-edge research groups and possesses a well established net of partners and suppliers.

**Ordering information and contact**

For any further question, ordering information, quotation or licensing options contact SoCe:

socevideo@soc-e.com

*System-on-Chip engineering*

Zitek Bilbao (ETSI)

Alameda Urquijo s/n

48013 Bilbao SPAIN

Tlf: +34 944420700