



---

## ***BADGER*** **BitSim Accelerated Display Graphic Engine Reference**



---

### **General**

The *BADGER* board is a HW platform to evaluate, develop and demonstrate BADGE solutions. BADGE is an IP for FPGAs. BADGE provides Hardware Acceleration for 2D Graphics & Text for Embedded systems. BADGE can be configured to handle single or multiple Video streams. Text, symbols and menus can be overlaid on the video windows. Optionally, the graphic content can be stored as compressed data.

The FPGA hosts the BADGE Graphics Engine and optionally other functionality. Examples are communication modules or blocks dedicated to specific image or graphics processing.

Video signals and displays can be directly connected to the board. Only a single +12V supply is needed to run the board.

The *BADGER* platform is capable of embedded Linux and WinCE. It can run configured with both the ARM-processor and a soft processor in the FPGA. Or have only one of them active.

### **Features**

- Cost effective, feature rich FPGA
  - Altera Cyclone II - C50
- Host Controller with peripherals
  - Atmel ARM 9, AT91RM9200
- Flexible communication and debug interfaces
  - Ethernet, USB, RS232, JTAG
- Video signals directly into the board
- Plenty of digital I/O
  - Connectors for Displays, GPIO, debug and extensions
  - Over 200 possible IOs
- Versatile memory interface
  - 128-256 Mbytes 133MHz SDRAM
  - 2 + 8 Mbytes Serial FLASH

### **Applications**

- Medical Instrumentation
- Automotive
- Industrial Equipment
- Defense
- Instrumentation & Measurement
- Gaming and Amusement



---

### **BADGER platform**

The *BADGER* platform serves can serve as a tool to shorten development cycle. It can help development teams to focus on product optimization, improved functionality and lower product cost.

*BADGER* is delivered with an evaluation version of BADGE. This gives your team a flavor of BADGE's potential. Highly performance and cost optimized solutions can be tailored together with BitSim. Optimization and Adaptation to specific customer requirements are services provided by BitSim.

BitSim supply development teams with IP solutions, Graphic and Video Know-How and engineering services.

### **FPGA Interfaces**

- Display interfaces
  - LVDS and LVTTTL
- Memory
  - SDRAM : 2 x SODIMM, 256 Mbytes, 133MHz
  - 2 Mbytes Serial FLASH
  - 2 Mbytes PROM
- 3 Video inputs
- Status & Debug, RS232
- User IOs
  - 6 General purpose IOs
  - 128 Extension IOs (Optional)

### **Interfaces to the ARM processor**

- Memory
  - SDRAM, 1 x SODIMM, 128 Mbytes, 133MHz
  - 8 Mbytes serial Flash
  - 2 Mbytes serial Flash
- Communication
  - Ethernet
  - ICE/ JTAG
  - RS232
  - USB Host x 2, Device x 1
- User IOs
  - 5 General purpose IOs
  - 64 Extension IO (Optional)

### **Video inputs**

Three video sources can be connected to the board with standard phono connectors. The video signal is translated into ITU-R BT.656 by an Analog Devices ADV7180 device on the board.

### **Display interface & IO options**

Connectors for an LVDS and an LVTTTL display are available on the board.

There are two connectors for GPIO, communication or other user defined purposes. It is possible to equip the board with IO extenders allowing an additional 172 IOs.

### **BADGER Demo version and reference**

The demo shows examples of applications mixing video and graphics.

The reference platform gives full access to the BADGE API on the processor. The user can use the full feature and command set of BADGE. Load pictures and graphic elements onto the board; Move them into graphic memory; Build text, graphics and pictures; Display it as overlay on video windows.

### **Deliverables**

#### BADGER board with:

- BADGE 2D & Video, Demo version
- *BADGER*, Demo program

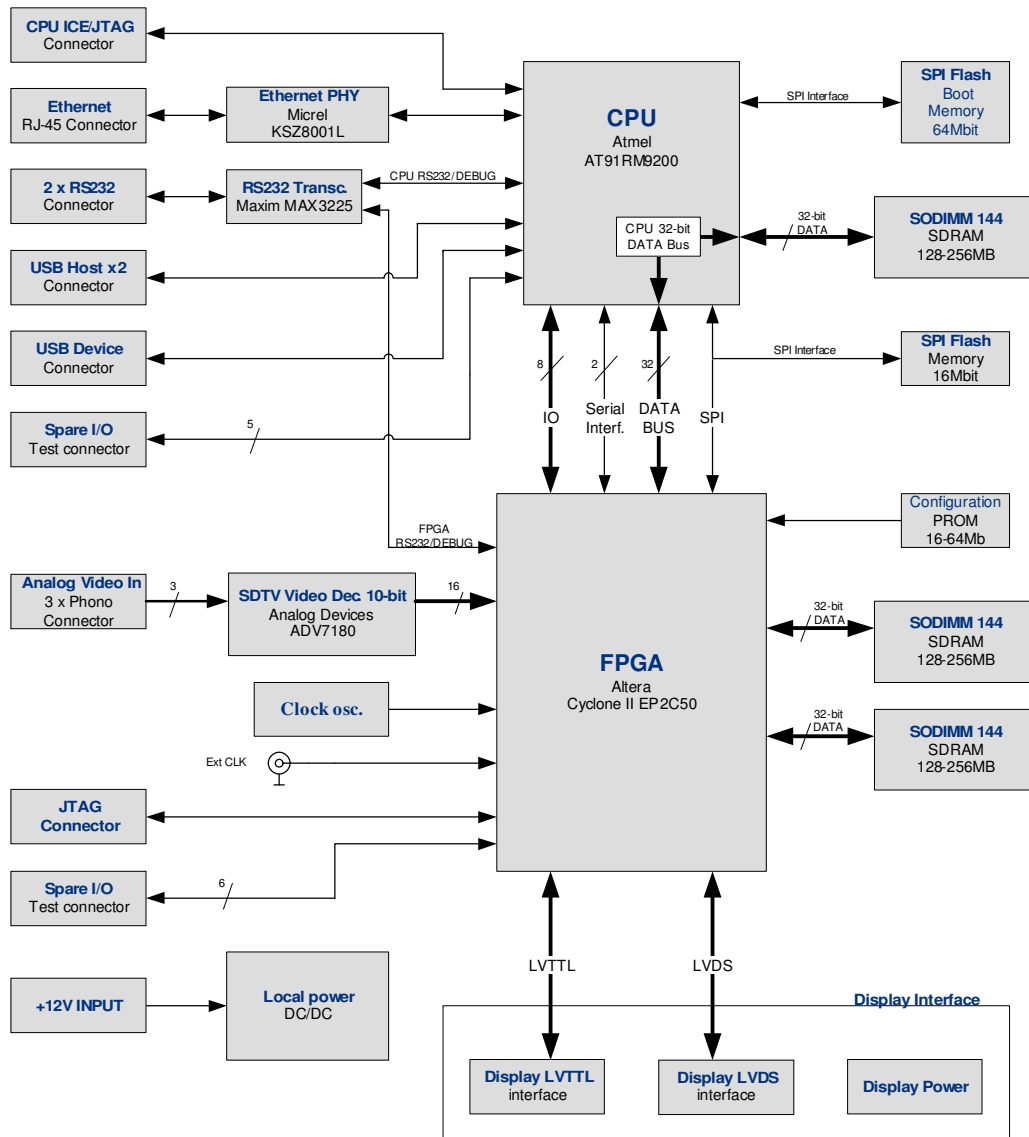
#### CD with:

- *BADGER* Getting Started Guide
- BADGE Programmers Guide
- BADGE User Guide
- FPGA design
- Demo application software in C source code
- Design and software quick-loader application
- BADGER schematics
- Data Sheets for support components

*For more information on BADGER & BADGE, contact: [badge@bitsim.com](mailto:badge@bitsim.com)*



## Block Diagram



## Contact information

Head Office  
 S:t Eriksgatan 63  
 SE-112 34 Stockholm  
 Sweden

Tel. +46 (0)8-54 55 56 00  
 Fax. +46(0)8-54 55 56 11  
[www.bitsim.com](http://www.bitsim.com)  
[sales@bitsim.com](mailto:sales@bitsim.com)