RT - RK
COMPUTER BASED SYSTEMS

White paper

# Evaluation of complex hardware solutions

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## Customer

The customer is international company which products play significant role in educational programs of technical faculties worldwide. One of the faculties which use this platform for embedded system design projects is College of Engineering of University of Wisconsin-Madison.

Please, check this link for pictures:

*http://eceserv0.ece.wisc.edu/~morrow/ECE453/photos/s08/index.html*

## Project Overview

The goal of the project was development of advanced development platform for generating and evaluation of complex hardware solutions.

The main challenges of the project were:

- Robust and reliable system with high durability of all its components
- Support for expansion modules
- Low per-unit price
- To keep system as simple as possible to maintain

The idea was developing FPGA based hardware platform surrounded with all necessary peripheral components thus providing solid base for developing hardware solutions just with VHDL/Verilog code or by extending its hardware capabilities with easy to develop add-on boards. Monitoring, maintenance and control of the platform and its components should be done from developers work station, and be as simple as possible by using only one communication interface.

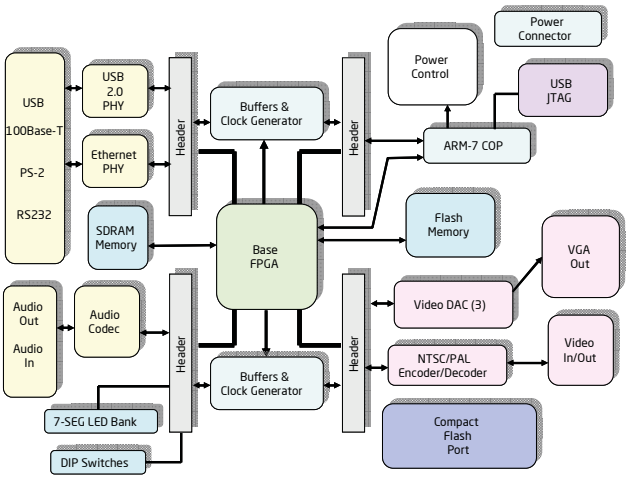
Platform supports different clocking of the main board components and extension boards thus enabling developer to combine and synchronize devices which are working on different clock rates.

Communication with work station is established for controlling and maintenance of the platform. Micro controller is responsible for establishing communication with the host, sensing all vital parameters of the board thus preventing potential damages. Micro controller performs configuring of on-board FPGA thus turning away the necessity for expensive programming equipment.

Work station software provides to developer all vital data of the platform and possibility to configure all available components of the board.

Main idea is provided from the customer, while the final design of the hardware and all the details were finalized by RT-RK. Assemblies of all ordered platforms are done by RT-RK hardware department. Firmware and work station software was completely designed, implemented and tested by RT-RK engineers.

The durability, stability and safety requirements were taken into account during device design and component selection. The thermal dissipation of the electronic components was managed in order to ensure safe and robust operation. The platform was tested with numerous FPGA configurations which performed testing of all platforms peripheral components.




*Block diagram of the platform*

The development lasted six months. It has involved a hardware engineer for schematics and PCB design, one software engineer, one test engineers and a project manager.

## Benefits

The project covered the complete development from the product idea until the manufactured and tested boards ready for shipment. All development steps and board manufacturing were either conducted or organized by RT-RK in correspondence with the customer.

The final solution fulfills the customer requirements both in terms of price and performances. The complete development process and costs were transparent to the customer via regular meetings and appropriate reports.

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