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FPGA Altera Programmer

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INTRODUCTION

- The primary goal of this project is to create programmer of FPGA.
- This programmer was created and developed for the application in project DIGIREP.
- The main benefit of this programmer is full access control to EPCS memory. Commercial programmers do not support this.
- Project DIGIREP needs to communicate with FPGA programmer with the application of the embedded device based on Linux OS via serial com-port. Commercial programmers don't have drivers for application of this device under Linux OS running at ARM microcontroller.



INTRODUCTION

- FPGA programmer is a device able to write data into memory compatible with FPGA Altera series.
- FPGA programmer is divided into two parts – Control software and physical device – programmer.
- Main part of this development is the physical device based on RAM microcontroller STM32F4 series.
- The control software is located in personal computer. Final version will be located in embedded device with operating system based on Linux.
- Communication with programmer is based on the serial communication port.



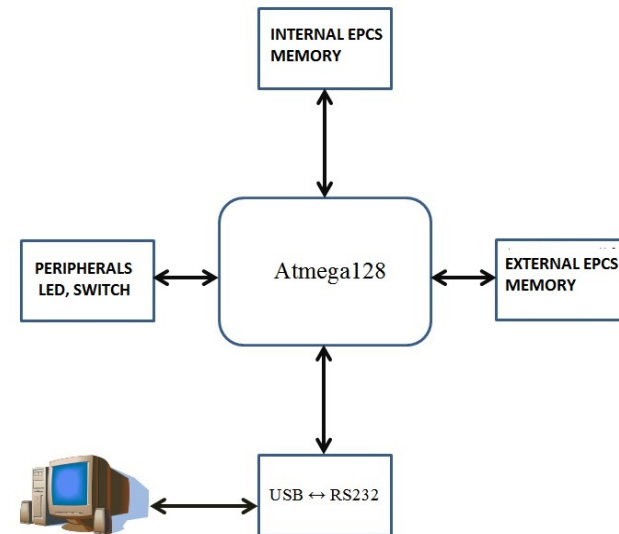
OBJECTIVES

- The first aim of this project is to create a device which is able to write data into memory compatible with FPGA Altera.
- The second aim is to develop a new version of programmer with faster communication.



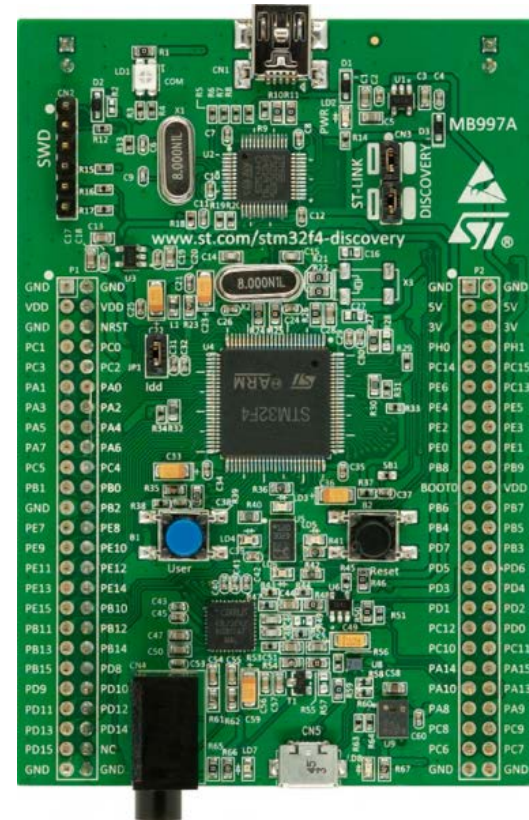
MATERIAL & METHOD

- First prototype of programmer is based on AVR 8bit microcontroller.
- Communication with programmer is via serial communication port with use FT232RL.
- For final version is this version of programmer unsuitable – too slow communication.



MATERIAL & METHOD

- Second version of programmer is based on 32bit ARM development kit with microcontroller STM32F4 series.
- Communication with programmer runs via virtual serial communication port.
- This version of programmer is faster than the first version of programmer
- This version has two communication interfaces – USB and serial com port.



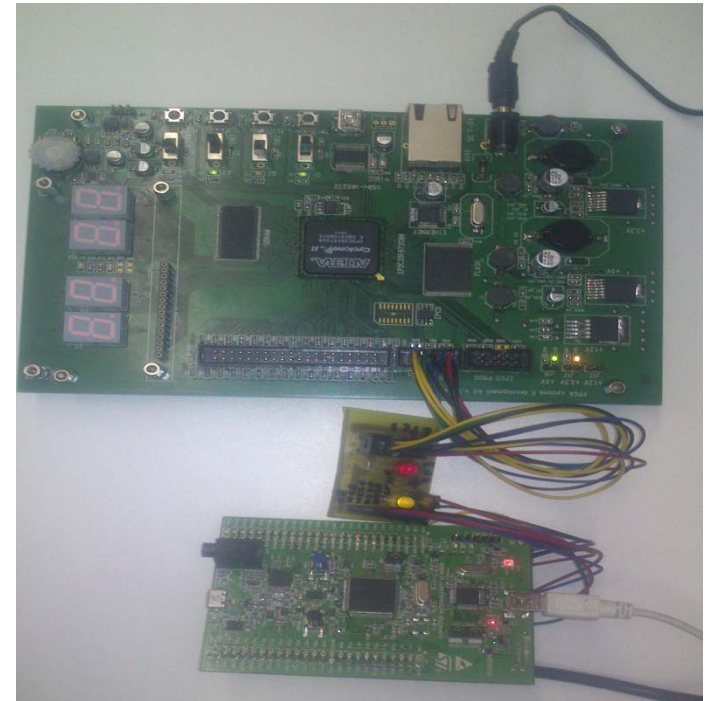
RESULTS

- First version of programmer is based on AVR 8bit microcontroller and this microcontroller is for final version unsuitable.
- Second version is based on ARM 32-bit microcontroller and it will be suitable for the final version it
- Second version of programmer has two communication interfaces – Virtual serial port and USB protocol.
- Programmer is able to read and write memory, recognize connected EPCS type, erase all data from memory, erase user-defined sector, read and write status out of/into memory, read and write memory lock-bits.
- Control software is prepared to compile at Linux OS for using in embedded system.



RESULTS

- The picture shows prototype programmew with connection between programmer and development kit with Cyclone II.
- This version of programmer is able to write all the data into EPCS memory in 15s – (EPCS 1Mbit).
- This version supported EPCS memory size in capacity 1 Mbit, 4 Mbit , 16 Mbit and 64 Mbit.
- This version of programmer is tested at FPGA Cyclone II development kit with 16Mbit EPCS.



ACKNOWLEDGEMENT & CONTACT

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Knights take a shining fight into the dangerous world of a man who does not exist. Michael Knight, a young boy on a crusade to change the world for the better, the highest his world of children who operate above the law.

Thunder, thunder, thunder, All Thunderers are on the move. Thunderers are here, feel the rage, hear the roar. Thunderers are here, Thunder, thunder, thunder. Thunderous! Thunder, thunder, thunder, Thunderous! Thunder, thunder, Thunderous! Thunder, thunder, Thunderous! Thunder, thunder, Thunderous! Thunder, thunder, Thunderous! Thunder, thunder, Thunderous! Thunder, thunder, Thunderous! Thunder, thunder, Thunderous!

Ughs, Ughs. Scouring through all the galaxies, in search of Earth, flying in the night, Ughs, Ughs. Fighting and and trying with all his power and with all his might. Ughs, no-one else can do for things you do. Ughs, she a bolt of thunder from the blue. Ughs, always fighting of the evil forces through power and justice and...

Just the good of days, when wasn't no harm. Some of you've ever been in trouble with the law since the day they was born. Stay clear of the cops, that's the way. Some day the cops will get on the back of you and will hear of their way, the way they know how that get a line of men from the wall, down the good of days, wouldn't change if they could, fight the cops like a true modern day Robin Hood.