DEVELOPED AND IMPLEMENTED THE PROGRAMMER FOR AVR AND PIC MICROCONTROLLERS, BASED ON PIC32MX MICROCONTROLLER THROUGH SPI + DMA

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The purpose of this study is to develop an embedded system , that will have the role of programmer for different microcontrollers from the AVR and PIC family. Two methods of implementing this system have been chosen . The first method aims to read data from an SD Card using the PIC32MX controller and further processing the data at the highest possible speeds using the DMA + SPI module of the microcontroller. The second method aims the source code from the computer via the USB to SPI FT4222H (Master SPI) controller to the PIC32MX microcontroller (SPI slave), which has the role of simulating the reprogramming process. The basic criterion for choosing the type of system is the stability and correctness of the data transmitted at the high speed , such as 5-6Mbit/s, namely for the aforementioned hardware equipment. In order to simulate the sending of the reprogramming code it was necessary to create an automated software system that consist of the receiving and consuming buffers, this software simulate the process of receiving and loading the code on the desired microcontroller. To increase data processing speed and release CPU resources, we used Direct Memory Access (DMA) mode. The Direct Memory Access (DMA) controller is a bus master module that is useful for data transfers between different peripherals without intervention from the CPU. The source and destination of a DMA transfer can be any of the memory-mapped modules included in the PIC32 family of devices. For example, memory, or one of the Peripheral Bus (PB) devices such as the SPI or UART, among others.
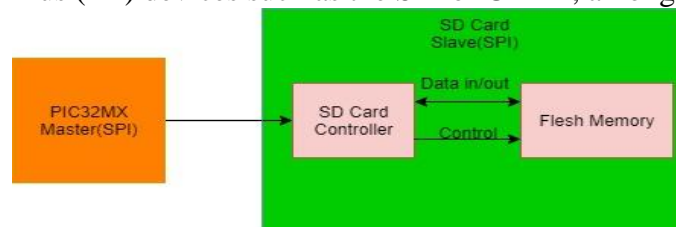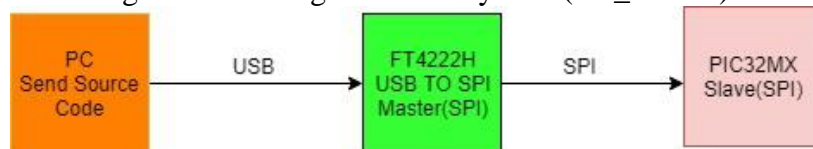

Fig. 1. Block diagram of the system (SD_CARD).

Fig. 2. Block diagram of the system (USB to SPI).

Keywords: *Programmer, DMA, PIC32MX, SPI+DMA, SD Card with PIC32MX.*

References
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