Abstract

This last project proposes enhancement Universal Asynchronous Transmitter Receiver (UART) and Serial Peripheral Interface (SPI) for improving of speed and scalability node performance in Internet of Things (IoT) platform. Implementation of UART communication protocol on IoT in microcontroller has limitation of Serial Hardware scalability so it must do bit banging which can affect performance and lack of speed. SPI require change of SPI Control Register (SPCR) to become SPI Slave which can affect speed and also have limited of Slave Select socket. There are previous methods that have been proposed to solve this problem. However, they are lack of scalability and speed aware. The proposed method use parallelism concepts by implementing hardware environment. Base on some experiment, this research succeeded to implement UART which have speed 67,3 % faster than microcontroller *ATmega328* and able to reach four UAR. SPI Slave have speed 73.43 % faster microcontroller *ATmega328* and able to expand to two SPI Slave.

Keywords: Microcontroller, UART, SPI, FPGA, IoT