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FSM based Manchester Encoder

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Abstract - Literature reported radio frequency identification system (RFID) which is becoming one of the most popular system in wireless technologies. The UHF RFID tag emulator is a part of RRFID testing tools. The UHF RFID tag emulator would be imitating the behavior of RFID tag. The RFID tag emulator (860 MHz to 960 MHz) is aimed for testing the RFID systems and also act as a general-purpose data transport device for other RFid systems. The tag emulator belongs to the EPC class - III (semi-passive) tags, but it implements the Class -1 Generation II (C1G2) air interface protocol for communicating with the reader. In this work, we have presented RTL design of Manchester encoder. AS motivated by finite state machine (FSM) and RTL implementations of encoder are discussed with particular focus to use the RFID emulator as data transport device and debugging tool. The synthesis results shows that FSM design in efficient (less area and high speed) and it operates at a maximum frequency of 256.54 MHz.