ISSN No: - 2456 - 2165

A Review of CMOS Design based Encoder

Munesh Tripathi
M.Tech Scholar
Rajasthan Institute of Engineering and Technology
Jaipur , Rajasthan
munesh.jnu@gmail.com

Gajendra Sujediya
Professor
Rajasthan Institute of Engineering and Technology
Jaipur ,
Rajasthan

Abstract :- Encoding processes are getting more significant in communication. Methods such as Miller, Manchester, and FM0 encoding can be applied in different applications. Each method has a different processes which are based on their needs. Each encoding system should be applied without losing any of its parameters. The fully-reused VLSI architecture of FM0, Manchester, and Miller encoders has reduced the number of transistors and keeps the DC balance. In this Paper, working for the Manchester and Miller Encoder. Manchester and Miller Encoder can work in High Frequency without use sophisticated circuit structure.

Keywords—*RFID, Manchester code, Miller code.*

I. INTRODUCTION

As per ease and monetary advantages, Radio Frequency Identification (RFID) uses have been significantly used lately. Conversely, RFID is not a novel method. The oldest initiation was used during World War II to detect military aircrafts. Together with technical advancement and ongoing enhancement, RFID emerges in novel domains and develops more novel uses, like in human trailing or biomedicine (with a detector) [1], [2]. In RFID framework, the information is sent via modulation between the mark and the reader. The information is encrypted prior to modulation so as to lower the rate of error and enhance the proficiency. Generally, the Manchester and Miller codes may be used in multimedia and are frequently utilized in the RFID framework. Figure 1 depicts block diagram of an RFID framework. The block highlighted in yellow shows a task block of Manchester or Miller encoders. In fact, the Miller code holds 'timing' data, which may be retrieved from the clock data in a different location, in other words, the code having an auto-timing feature. So, the Miller code has superior implementation against setback error and buzz interruption. Hence, it is an essential investigation how to proficiently develop the Miller code conduit.

In public literature, there are very few investigations in the devising of a CMOS Miller encoder. Past plans of the encoder conduit were significantly more intricate compared to the one in this research work. Here, a conduit simulation of Manchester and Miller encoder was initially suggested by Shan and Zhou (2005) [3] [4]. The circuit has a basic conduit arrangement to give Manchester as well as Miller codes.

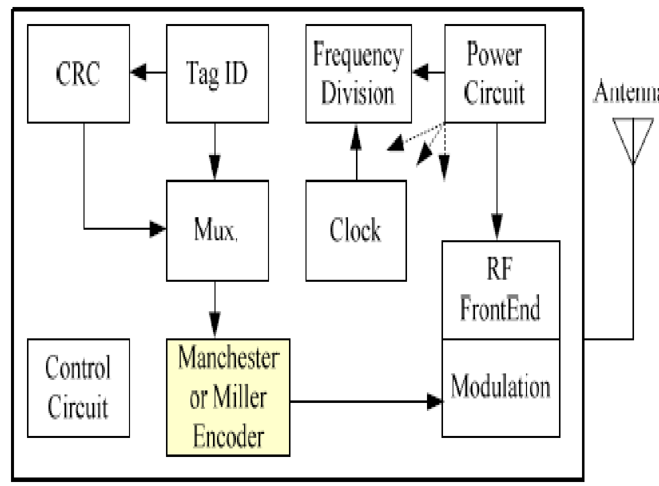

Fig. 1. Structure of RFID system

II. CODING

In a twofold framework, the logical values '1' and '0' may be coded in different ways. The RFID framework usually utilizes one of these encryption techniques, namely: Manchester code, Non-Return-to-Zero code (NRZ), and Miller code. The three encryption techniques are shortly explained in this part. To start, a most basic encryption structure, namely NRZ code. This code utilizes consequent voltage level to denote logic 1 and inferior voltage level to denote logic 0, just like those utilized by the broad digital logic conduit. It is rather basic; though the code does not have timing data. When the information with a set of '1' bits or '0' bits is sent from dispatcher to recipient, the latter quickly lose concurrent data, particularly for a rapid transmission. Consequently, the rate of error of NRZ will be augmented with rapid processing. A different code, the Manchester code, is further termed splitphase coding or dual-phase coding as it utilizes the negative descending border of the up-to-down stage transition to denote logic 0 and the positive ascending border of the down-to-up stage transition to denote logic 1. Figure 2 depicts a case for different codes. Trace 1 is a timer waveform; trace 2 is a model of NRZ coding. Trace 3 depicts the Manchester code matching with the NRZ code. The Miller code, on the other hand, the logic '1' is denoted by either the positive or the negative border of the semi cycle. Table 1 illustrated in the following page recapitulates the encryption laws. In case bit *i* is logic '1', the initiation voltage stage of bit *i* remains unchanged, though the waveform has to leap after the moiety of a cycle. The moment two zeros are sent endlessly, the voltage stage of the Miller code gets modified at the beginning of the cycle. For instance, the trace 4 in Fig. 2 is depicted as Manchester code matching to the trace 2 Information input. For the information model, the associations of these encryption techniques are registered in Table 2. It is noteworthy that logic '0' in Table 2 is denoted by Miller code either as '11' or '00'. Miller code denotes logic '1' as either '01' or '10', according to the last bit situation. In this conduit, the conduit may create Manchester code (VM1) as well as Miller code (VM2).

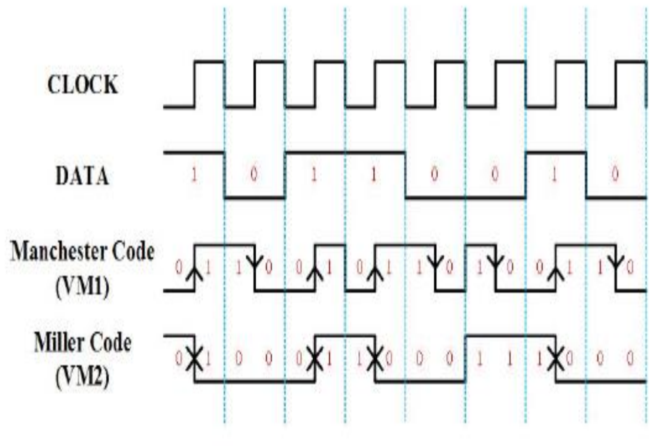

Fig. 2. Waveform samples for various coding.

Table 2 Coding relationship

DATA	1	0	1	1	0	0	1	0
Non-Return-to-Zero	1	0	1	1	0	0	1	0
Manchester Code	01	10	01	01	10	10	01	10
Miller Code	01	00	01	10	00	11	10	00

III. CIRCUIT DESIGN AND IMPLEMENTATION

In this part, the conduit actualization for the Miller encoder was devised according to the laws illustrated in Table 1. Shan and Zhou (2005) suggested a conduit arrangement for the model Manchester and Miller encoder, as depicted in Fig. 3 [3]. This conduit considers the VM1 as the contribution signal of the T-sort flip-flop, which offs the matching VM2. The conduit is mostly made up of two kinds of flip-flop (DFF1 and TFF1) and two logic gates (XOR1 and INV1). A surplus T-sort flip-flop may be used so as to attain the frequency splitting by 2, thus incorporating two timing signals of Timer and Timer2 (dual frequency of Timer) [5].

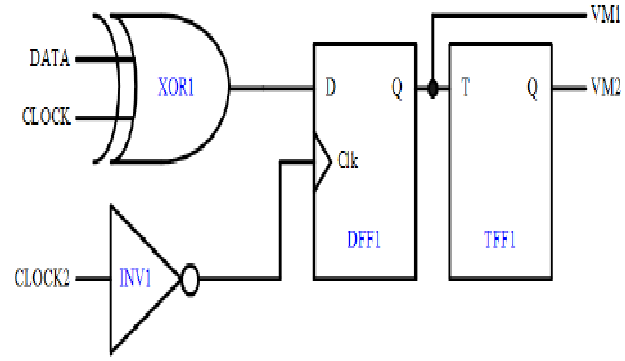

Fig. 3. Prototype Manchester and Miller encoder circuit structure [3].

To additionally enhance the rapidity of the encoder, two similar encoders work in mingled to ameliorate the general rapidity, as depicted in Fig. 4. Clearly, it may be anticipated that the information optimum rate will double compared to single level of Fig. 3. Figure 5 depicts the complete conduit diagram in full. We get the benefit of twice rapidity improvement, though, at the price of twice hardware region. To maximize the hardware price and power usage, some conduit blocks illustrated in Fig. 3 may be distributed and additionally shortened. The grey block in Fig. 5 may be shortened and re-structured.

Figure 6 depicts an altered Manchester and Miller encoder. The process of the conduit is depicted as below. The information is initially converted quickly in sequence into two lone DFFs with the de-multiplexer level. Next, the information is operated consecutively by top information way and bottom information way correspondingly. After D-sort flip-flop, the treated information is blended as VM1. A solitary T-flip-flop level is useful distributed between top information way and bottom information way. To conclude, VM2 are acquired at the end of the distributed T-flip-flop level.

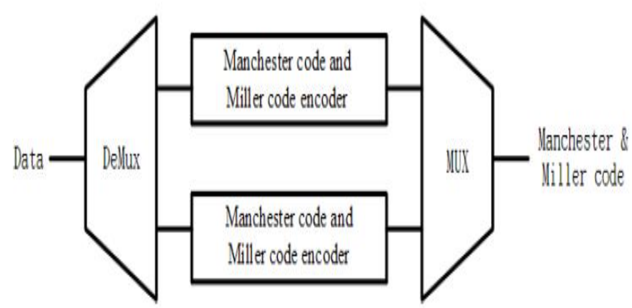

Fig. 4. Conceptual diagram of double throughput rate

III. CONCLUSION

In this paper Miller encoding and Manchester encoding architecture are design for the application of Dedicated Short Range Communication (DSRC). These encoders have same similarities and clock rate embedded within the transmitted data. This encoding concept will be used in various applications as future work.

References

[1]. P. Benabes, A. Gauthier, J. Oksman, "A Manchester code generator running at 1 GHz," in Proc. of IEEE International Conference on Electron, Circuits Systems, vol. 3, pp. 1156-1159, Dec. 2003.

[2]. H. Zhou, A. Aziz, "Buffer minimization in pass transistor logic," IEEE Trans. Comput. Aided Des. Integr. Circuits Syst., vol. 20, no. 5, pp. 693-697, May 2001.

[3]. I. Ismail, A. Ibrahim, "Modeling and Simulation of Baseband Processor for UHF RFID Reader on FPGA," International Journal of Electrical and Electronic Systems Research, vol. 6, pp. 54-66, Jun. 2013.

[4]. S. Suresh "Vhdl Implementation of Manchester Encoder and Decoder," International Journal of Electrical, Electronics and Data Communication, vol. 1, no. 2, pp. 2320-2084, Apr. 2013.

[5]. Xilinx, "Manchester Encoder-Decoder for Xilinx CPLDs XAPP339 (v1.3)," 2002.

[6]. A. Bletsas, et al., "Single-Antenna Coherent Detection of Collided FM0 RFID Signals," IEEE Transactions on Communications, vol. 60, no. 3, Mar. 2012.

[7]. S. Wang, et al., "Simulation Study for the Decoding of UHF RFID Signals," Piers online, vol. 3, no. 7, 2007.

[8]. J. Maki, Y. Inadomi, T. Takami, "One-sided Communication Implementation in FMO Method," Computing and Communications Center, Kyushu University, Japan, 2006.

[9]. J.-B. Eom, T.-J. Lee, "Accurate tag estimation for dynamic framedslotted ALOHA in RFID systems," IEEE Communication Letters, vol. 14, no. 1, pp. 60-62, Jan. 2010.

[10]. Books Carlson, A. Bruce, "An Introduction to Signals and Noise in Electrical Communication", Third Edition, Printed in Singapore, McGraw-Hill Communication Systems.

[11]. W. Shen "Wireless Power in Passive RFID Systems" Bachelors Thesis, Information Technology, May 2010.

[12]. E. Sardini, "Self-Powered Wireless Sensor for Air Temperature and Velocity Measurements with Energy Harvesting Capability," IEEE Transactions on Instrumentation and Measurement, vol. 60, no. 5, may 2011.

[13]. N. Chaimanonar, et al., "Two-Channel Passive Data Telemetry With Remote RF Powering for High-Performance Wireless and Batteryless Strain Sensing Microsystem Applications," IEEE sensors journal, vol. 10, no. 8, Aug. 2010.

[14]. K. Finkenzeller, RFID Handbook: Fundamentals and Applicationsin Contactless Smart Cards and identification, 2nd ed. New York: Wiley, 2003.

[15]. M. Brandl, J. Grabner, K. Kellner, F. Seifert, J. Nicolics, S. Grabner, and G. Grabner, "A low-cost wireless sensor system and its application in dental retainers," *IEEE Sensors Journal*, vol. 9, no. 3, pp. 255-262, March 2009.

[16]. Shan and Zhou, "A Simple and Practical Manchester and Miller Encoder," HeFei University of Technology, China, 2005.

[17]. Shan and Chai, "Techniques and implementation of Miller encoder in RFID," HeFei University of Technology, China, 2005.

[18]. Y.-C. Hung, M.-M. Kuo, and C.-K. Tung, "1.8-V 50-MHz CMOS Manchester and Miller codes realization for RFID application," in Proc. 3rd *Intelligent Living Technology Conference* (ILT'08), Taichung, Taiwan, pp. 1064-1068, June 2008.