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Design and Development of Dynamically Pattern Based Fountain Control with Multicolor LED Through Single Motherboard

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Abstract: ***This project provide an innovation and attractive view of fountain which integrated with multiple LEDS. Any Human interaction with in the fountain area also allow, further in project many number of output can be controlled using the single motherboard, which provide many patterns to underground valve of that fountain which are very coordinated with RGB LEDs.***

Keywords: ***Underground jets, Laminar jets, Solenoid valves, Single motherboard.***

I. INTRODUCTION

The measured parameters from yarn clearer system is temporary data. So, it will not get stored and utilize it for further processing. If we want to use it, then we have to note first then only we can utilize it for further processing. So, the final result will be transferred to TMS320F2812 through RS232 cable. DSP is connected to ENC28J60 Ethernet module through SPI interface and this ENC28J60 will send data to PC through Ethernet cable.

II. SYSTEM DESCRIPTION

A) CLASSIKLIN-Main Yarn Clearer System:

Yarn Clearer system is online yarn fault classification system which monitors yarn and gives the results of different parameters i.e. Timing information-Current time & Shift time, multiple groups of spindles, different pre-set and user defined black & white and colour curves, length & base diameter of yarn, maximum & minimum breaks in yarn, hairiness and loop parameters. The main system displays results of all these parameters which are temporary data. This data will transfer to PC and mobile phone through ENC28J60 Ethernet module.

B) TMS320F2812 & ENC28J60 Ethernet Module:

TMS320F2812 is 32-bit DSP manufactured by TI. It is appropriative Fixed Point DSP with 150MHz operating frequency, Harvard bus Architecture, 256Kb Flash, 32Kb RAM, 56 GPIO, 3.3V operating voltage, 16 channels 12-bit ADC, 3 32-bit timers, SPI, SCI, eCAN, McBSP peripherals interfacing. DSP is mainly used for controlling the limits of different parameters which is monitored by system. The output of DSP is send to ENC28J60 Ethernet module through SPI interface. SPI interface works in master-slave mode and it includes four signals: MOSI, MISO, SCLK and SS. MOSI is Master output, Slave input. MISO is Master input, Slave output. SCLK is common clock in entire SPI bus. SS is used to mark slave. ENC28J60 Ethernet module is manufactured by Microchip and it is compatible with 10 Base-T networks.

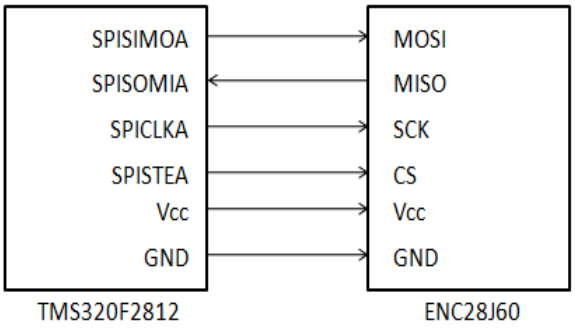

Figure 1: Interfacing between TMS320F2812 & ENC28J60

III. PROPOSED SYSTEM DESIGN

A) Block Diagram:

As yarn clearer gives temporary data which we cannot store and utilize it directly for further processing. So, we developed system to access and store the temporary data for further processing with wired and wireless modes of communication. This temporary data will transfer to PC from control box i.e. CLASSIKLIN system.

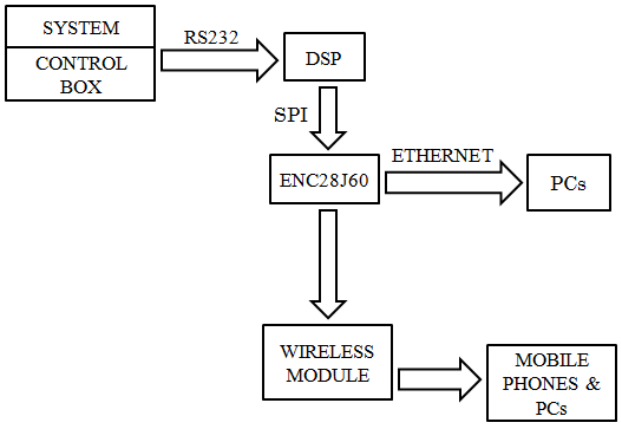

Figure 2: Block Diagram of Proposed System

The control box is connected to the main yarn clearer system and it is also connected to DSP – TMS320F2812 through RS232 cable. The data from control box is transferred to DSP through RS232 and DSP will set the limits of different parameters and control the output. The output data of DSP will transfer to ENC28J60 through SPI interface. This ENC28J60 sends data to PC via Ethernet and also through wireless, every time whenever data changes in system. The data will transfer to all connected PCs and the changes in behavior of yarn made at any time, it will make change in all the connected systems. This is also communicating to the system through android phone.

B) System Flow:

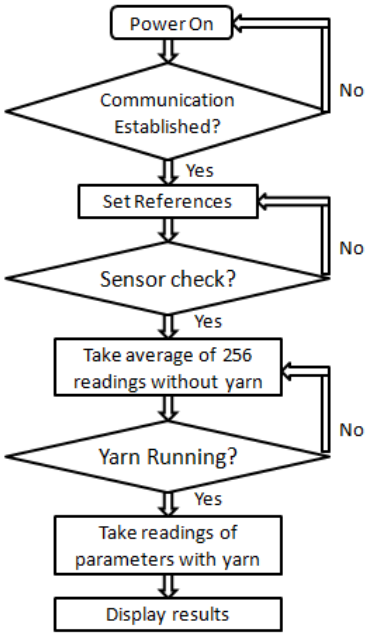

Figure 3: Flow Chart of Proposed System

First of all, the system will power on. After it will check about the establishing of communication between yarn clearer machine and CLASSIKLIN system. If communication is established, then only the system will set the references for parameters that will be measured by the yarn clearer system. Otherwise it will again check for the communication
establishment. If references are set then it will check for sensor connection. If sensor is connected to the system, then it will start processing and take the average of 256 readings of parameters without yarn. Otherwise it will continuously check for sensor. Now, it will check that yarn is running or not. If yes, it will start tacking readings of parameters with yarn. If no, it will check for the yarn. At the end, the measured parameters will be displayed on LCD screen of CLASSIKLIN.

IV. RESULTS

A) DSP Programming:

DSP programming includes measuring different parameters of yarn with the help of different set limits.

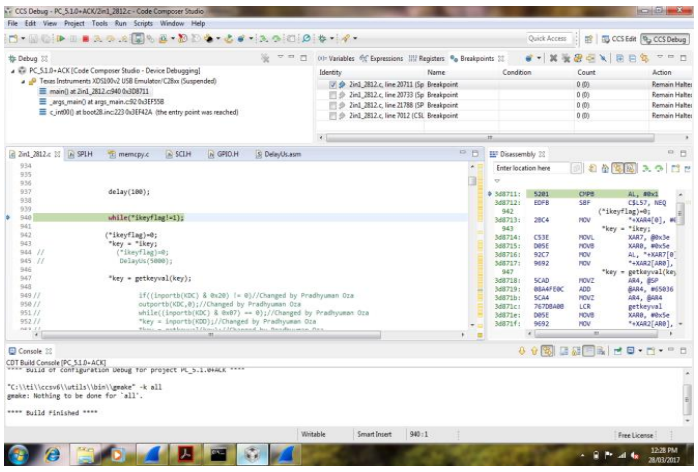

Figure 4: DSP Programming in CCS (v6.1.1)

B) Implementation:

Figure 5: Hardware Implementation

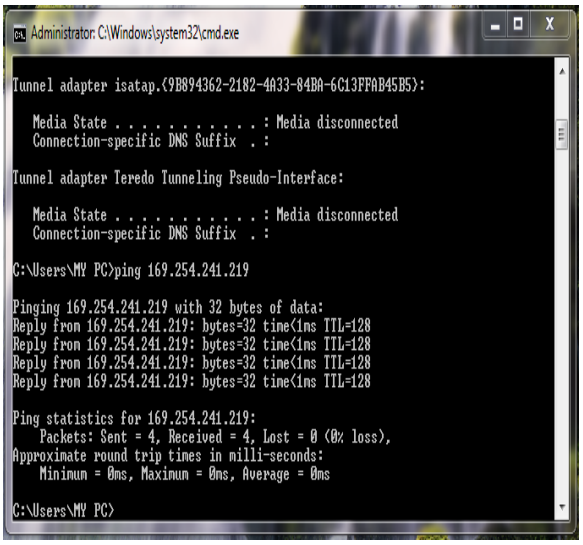

Figure 6: Communication Established between PC and ENC28J60

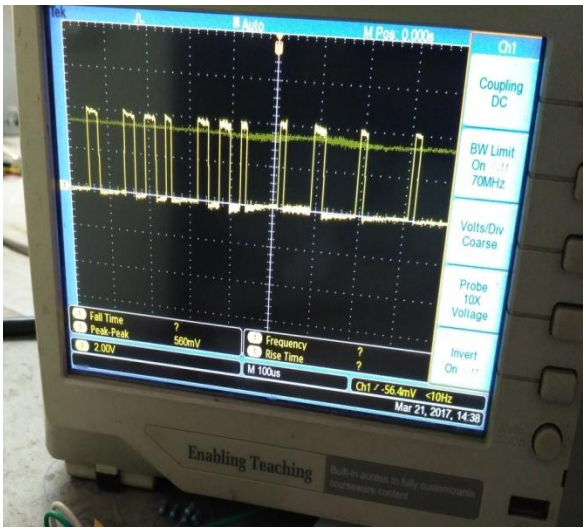

Figure 7: Input at MISO pin from main system to DSP

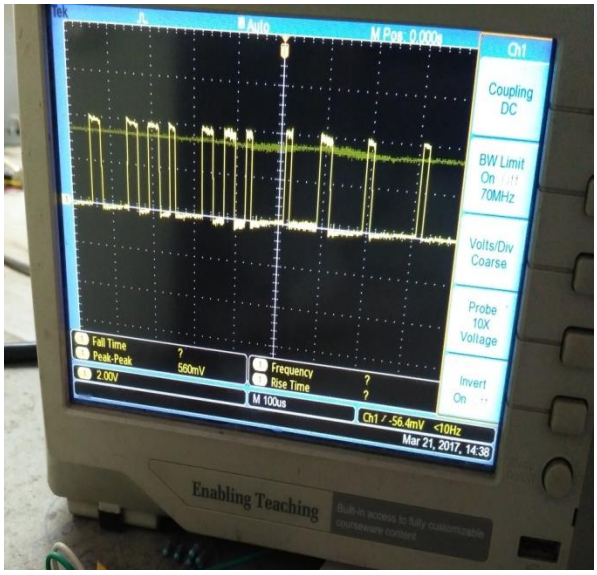

Figure 8: Output at MOSI pin from DSP to ENC28J60

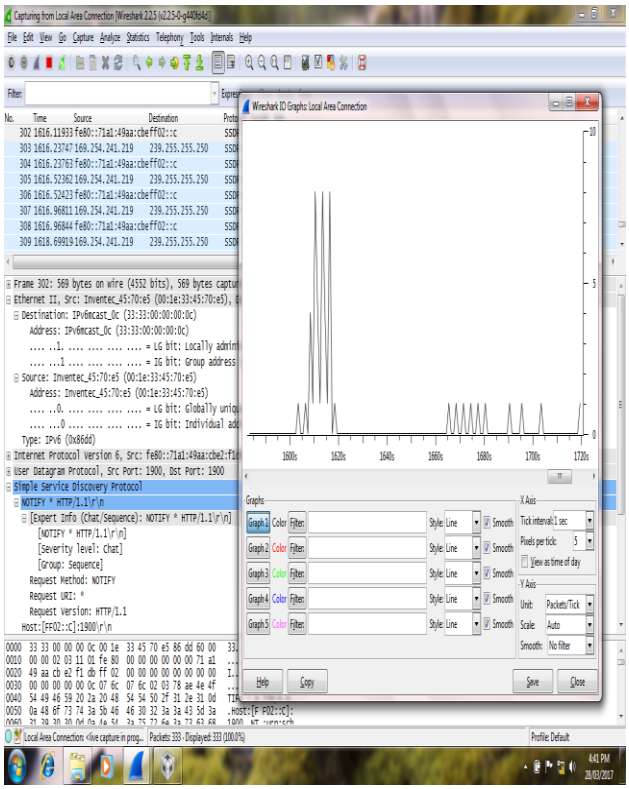

Figure 9: Output on Wireshark (v2.2.5)

V. CONCLUSION & FUTURE WORK

DSP – TMS320F2812 is required to monitor the
whole yarn clearer system. Through DSP, one can set the parameters which are measured by the main system. ENC28J60 Ethernet module is used for the Ethernet communication of measured data between system and PC. The results of the system will be transferred to PC
through Ethernet cable. So, the data can be stored on PC and easily accessible for further processing. This data will also observe on mobile phone through wireless communication.

VI. REFERENCES

[1]. Wang hong-you, Zhao san-ping,"The Predigest Project of TCP/IP Protocol Communication System Based on DSP Technology and Ethernet", Elsevier-International Conference on Solid State Devices and Materials Science, 2012

[2]. Yogita P Dhole, Dr. Vijayshree A More, "Embedded Ethernet Microcontroller Prototype for Different Parameter Monitoring and Control", International Journal of Science and Research, 2013

[3]. Dong Wu, Lu Likun, Li Yeli, Liu Xiaoqing,"The Design of USB Communication Interface System Based on TMS320F2812", 2010 International Conference On Computer Design And Appliations, IEEE, Volume-4, 2010

[4]. Javed Sheikh, Sumedh Gawande , Sachin Charbhe,"Design and Implementation of Microcontroller-Based Ethernet Communication", International Journal of Application or Innovation in Engineering & Management, 2013

[5]. Kumbhar Trupti Sambhaji, Prof. Patil S.B.,"Design of PIC Based Ethernet Interface to Control the Industrial Parameters",International Journal of Engineering Research and Applications, Vol. 2, Issue 4, 2012

[6]. "Methods and Systems for DSP Based Receivers", Oscar Agazzi, Venugopal Gopinathan, US2007/0263673 A1, Jul. 16, 2007

[7]. Christopher E. Peters, Maria A. Power, "TCP/IP control system interface development using microchip brand microcontrollers", Germany, 2014
[8]. Timo Kiravuo, Mikko S¨arel¨a, and Jukka Manner, "A Survey of Ethernet LAN Security", IEEE communications surveys & tutorials, vol. 15, no. 3, 2013
[9]. Jean-Dominique Decotignie, "Ethernet-Based Real-Time and Industrial Communications", IEEE, vol. 93, no. 6, 2005
[10]. D.C.Shah, U.D.Dalal, "Real time Wireless Data Acquisition and Fault Monitoring using DSP processor TMS320F2812 with CPLD interface", International Journal of Computer Applications, 2011
[11]. TMS320x28xx, 28xxx DSP Serial Peripheral Interface (SPI) Reference Guide, Texas Instruments