



Monitoring and Controlling Yarn Clearer Data with PC and Android Phone Using TMS320F2812

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Abstract: A Yarn Clearer System is for monitoring behavior of yarn in textile industries which gives temporary data that will not get stored and utilized for further processing. So, the system is developed to access and store temporary data with wired and wireless modes of communication. The system data will go to PC from TMS320F2812 through Ethernet via ENC28J60 Ethernet Module. ENC28J60 sends data to all connected PCs every time whenever data changes in main system. This will also communicate to the system through mobile phone.

Keywords: Yarn Clearer, TMS320F2812, ENC28J60 Ethernet Module.

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 appropriate 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 sent 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.

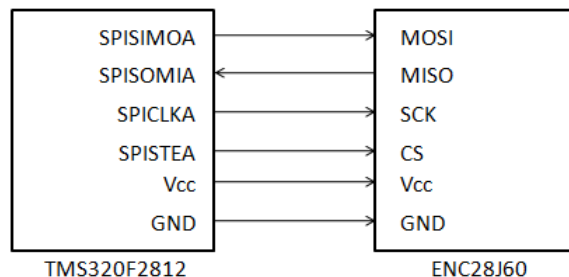


Figure 1: Interfacing between TMS320F2812 & ENC28J60

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.

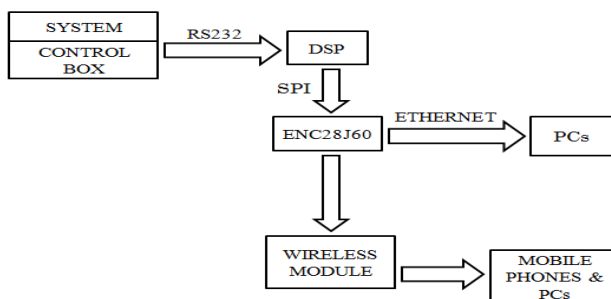


Figure 2: Block Diagram of Proposed System

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:

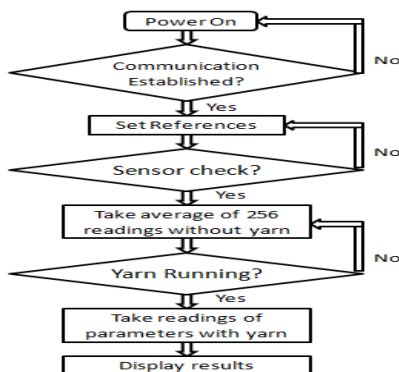


Figure 3: Flow Chart of Proposed System

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.

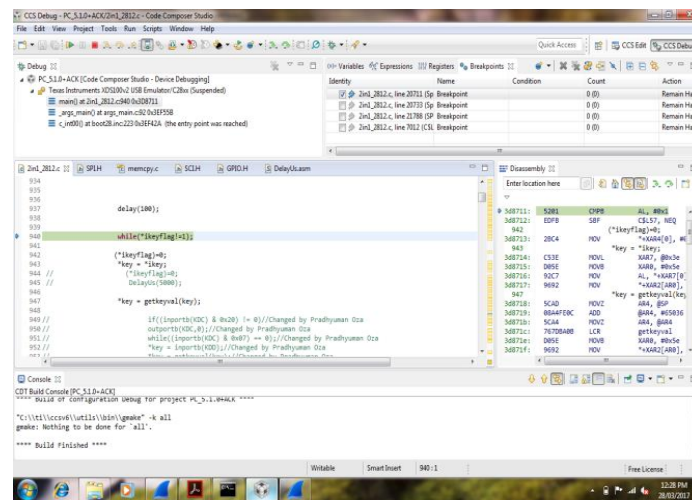


Figure 4: DSP Programming in CCS (v6.1.1)

B) Implementation:



Figure 5: Hardware Implementation

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Administrator: C:\Windows\system32\cmd.exe

Tunnel adapter {isatap.{9B894362-2182-4A33-84BA-6C13FFAB45D5}}:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . : 
Tunnel adapter Teredo Tunneling Pseudo-Interface:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . : 
C:\Users\MY PC>ping 169.254.241.219

Pinging 169.254.241.219 with 32 bytes of data:
Reply from 169.254.241.219: bytes=32 time<1ms TTL=128
Reply from 169.254.241.219: bytes=32 time<1ms TTL=128
Reply from 169.254.241.219: bytes=32 time<1ms TTL=128
Reply from 169.254.241.219: bytes=32 time<1ms TTL=128

Ping statistics for 169.254.241.219:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\MY PC>
    
```

Figure 6: Communication Established between PC and ENC28J60

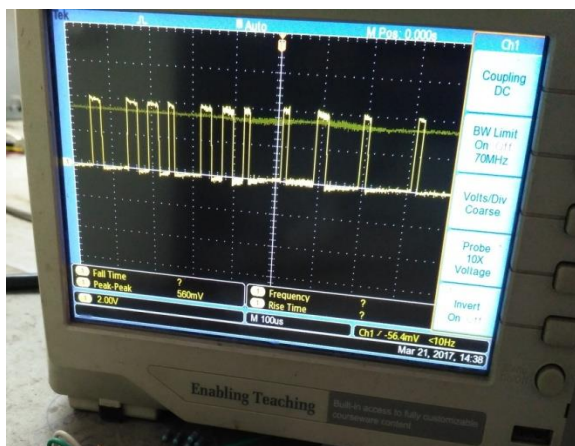


Figure 7: Input at MISO pin from main system to DSP

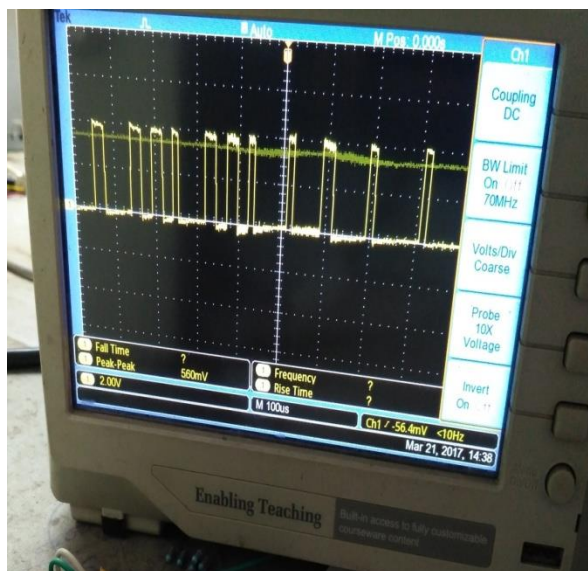


Figure 8: Output at MOSI pin from DSP to ENC28J60

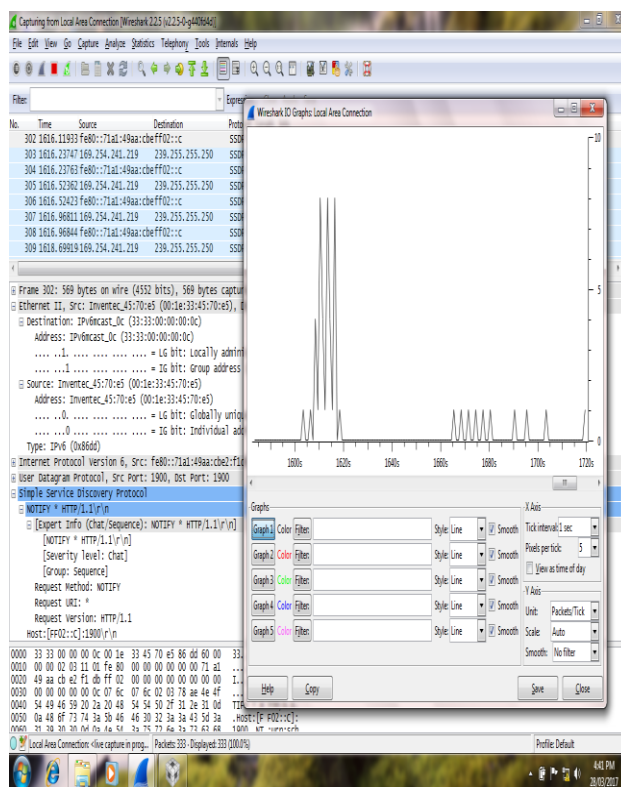


Figure 9: Output on Wireshark (v2.2.5)

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

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