

INDUSTRY MONITORING AND CONTROLLING BASED ON EMBEDDED WEB SERVER

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Abstract: Data acquisition is the sampling signals which measure physical conditions and converts into binary values which manipulated by a computer. To processing the signals data acquisition system is used which cnverts analog to digital signals. Previously internet is limited to only computers but because of the advancement in technology especially in mobile communication, now internet is completely being accessed by latest phones like Smart phones. The proposed method a new application is created to monitor the industry parameters like monitoring temperature, voltage and current from webpage. At industry side we have Ethernet module, micro controller, temperature sensor, LDR sensor and humidity. The communication between internet and micro controller is established using Ethernet module and ARM7 based LPC2148 32 bit controller.

Index terms: data acquisition, microcontroller, LDR sensor, ARM7

1. INTRODUCTION

An embedded system ware and software which performs specific function like vending machine, printer and mobile phone and so on. Each embedded system has a processor and hardware to meet the requirements for an application. The firmware is the software is used to embedded in the hardware applications such as playing games, word processing, accounting, software development and so on.

Now a day's so many useful technologies are coming out to make our life style more comfort, luxurious and secure. Especially internet technology brings up many applications and advantages for present and future generations. Present world mostly is being controlled by internet. Previously internet is limited to only computers but because of the advancement in technology especially in mobile communication, now internet is completely being accessed by latest phones like Smart phones.

The system is totally designed using ETHERNET module and embedded systems technology. ARM7TDMI is modern and well developed controller which monitor the parameters repeatedly and display it on the LCD.

2. IMPLEMENTATION

Figure 1 represents the proposed embedded design which consists of power supply unit, sensor module, microcontroller, ETHERNET, LCD.

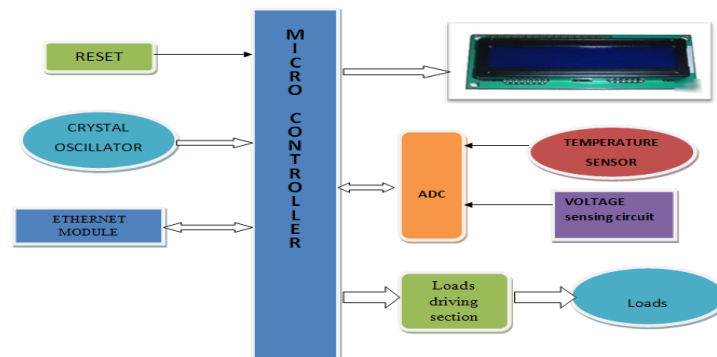


Figure 1: Proposed model design

The proposed design can be implementation in

- Hardware
- Firmware

In Hardware implementation schematic can be drawn as per the application, the design can be tested on breadboard using various ICs and check whether design meets the required specifications and finally preparing the board and testing the design hardware.

In firmware, where the programming can be done on microcontroller to control the operation of ICs present in hardware. In the proposed model, Orcad design software is used for PCB design, the Keil μ v3 software in which the source code can be written in C language and compile it. The Proload programmer has been used to dump the compile code into the ARM7TDMI controller.

Typical Application Setup

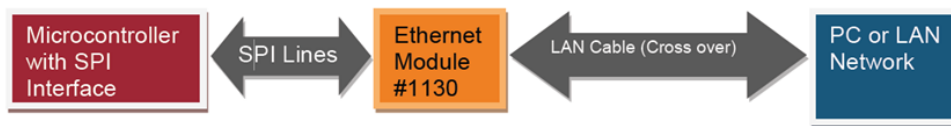


Figure 2: Typical application setup

The microcontroller and Ethernet module is connected through Serial Peripheral Interface and Ethernet module and the PC are interconnected through LAN cable. The hardware schematic is developed for the application setup which is shown in below figure 3.

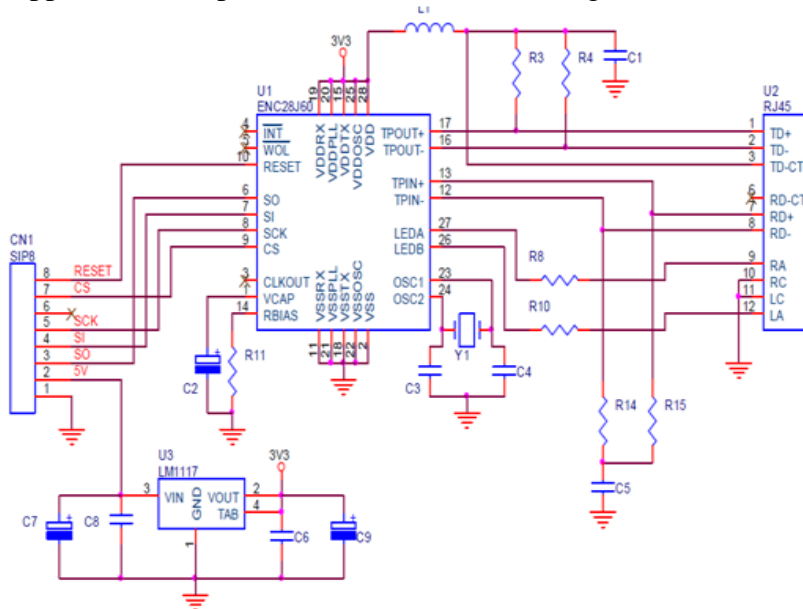


Figure 3: Board schematic of an application

Required Tools

- Orcad
- Keil μ Vision4
- Flash Magic

Orcad is used to draw the schematic diagram. Keil μ v4, Flashmagic are the two software tools used to program ARM7TDMI controller. Keil compiler is software used where the C programming can be written and compiled. After compilation, the C source code is converted

into machine language file (.hex) which contains the original program in hexadecimal format and which is to be dumped into the ARM7TDMI controller.

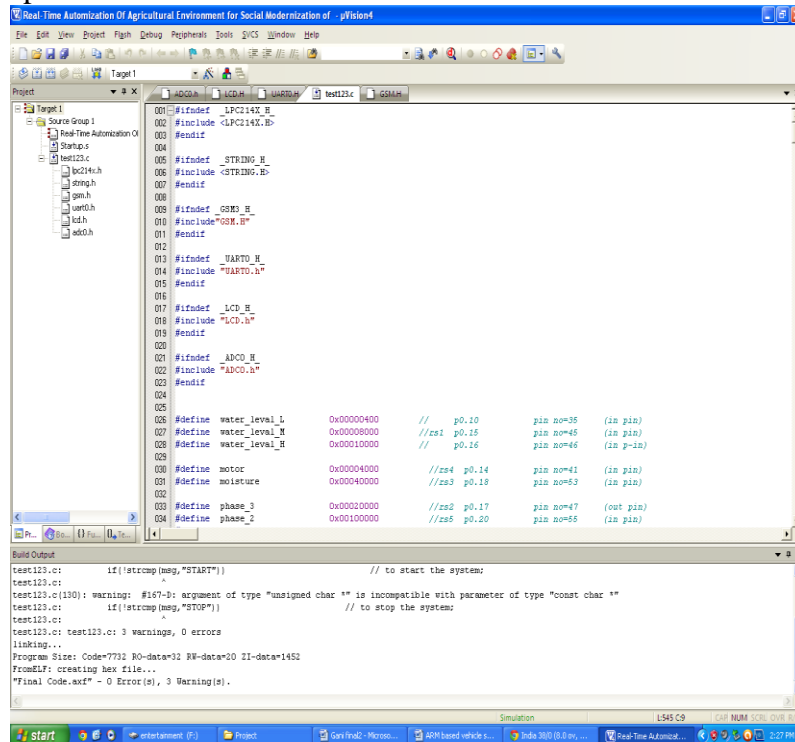


Figure 4: Program compilation process

If no errors and warnings displayed on the window then run the program, the system performs all the required tasks and behaves as expected the software developed. If not, the whole procedure should be repeated again.

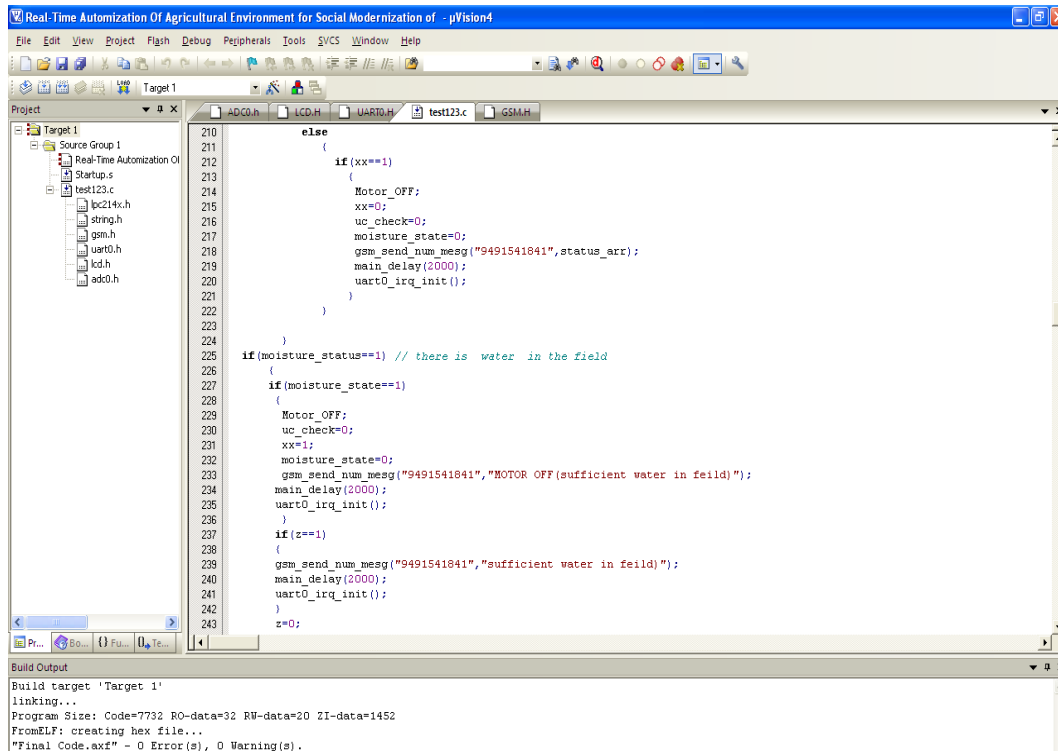


Figure 5: Process of RUN on compiled code

Flash magic

Flash Magic is a PC tool where programming can be done for ARM7TDMI controller from [NXP](http://www.nxp.com) using Ethernet protocol. The figure 6 & figure 7 b shows how the baud rate is selected for the controller and how the registers erased before the device is programmed respectively.

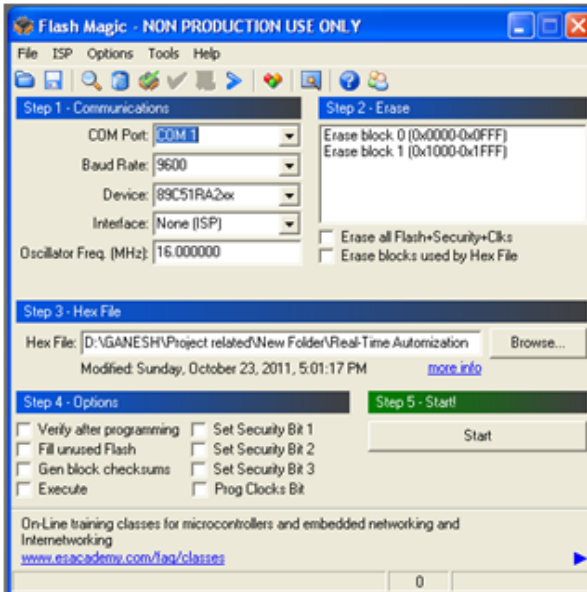


Figure 6: Dumping of code into ARM7

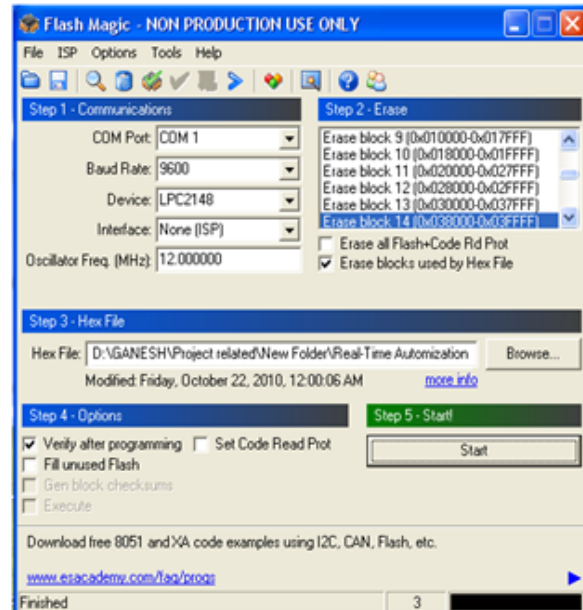


Figure 7: Dumping process finished

3. RESULTS



- [5] www.keil.com/dd/docs/datashts/.../lpc2141_42_44_46_48.
[6] en.wikipedia.org/wiki/TRIAC