3) Interface Management (MIIM) to control the PHY.
4) An independent, RAM buffer for storing packet that has been received packets that are to be transmitted.
5) An arbiter to control access to the RAM buffer for storing packet that has been receives and packet that is to be transmitted.

Refer figure 3 for Microcontroller to RJ-45 Ethernet Jack block diagram.

The PHY module provides separate output to drive the standard Ethernet indicator.

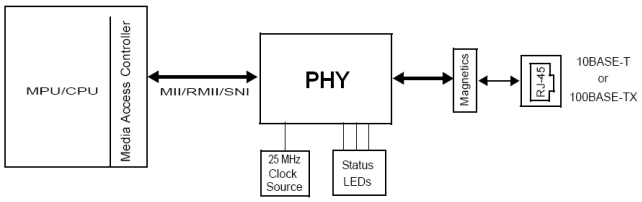

Figure 3: Microcontroller to Ethernet RJ45 jack Diagram

5. Software

In this design, software environment are divide into two parts, the first part is C programming language. These language is use to design the microcontroller algorithm to monitor Temperature Channel and control hooter and Electrical Switch. C language has become popular choice for microcontroller programming compare to assembly language. This is because C language is more systematic and easy to arrange compare to assembly language. The second part is the web programming language, it consist of the HTML language. This web programming language is used to design the GUI for the temperature monitor and control application. The communication between the board and the PC client in the system is accomplished by using Transmission Control Protocol/Internet Protocol (TCP/IP).

5.1. Ethernet Communication:

This design used TCP/IP as a communication protocol between the board and the PC client in the network. TCP/IP is a widely used communication protocol for internet. It allows Total location independence and interoperability to any embedded application. In our design for Ethernet communication is based on Microchip TCP/IP stack application for communication between the physical network port and application we want to use. This board application is configured as the web server or HTTP server stores the web pages content in local memory where it capable to serving HTML page to web browser through the network. By this application, we can use this board for status monitoring, remote management, and data retrieval application.

5.2. Web bases application

The web page is used as a GUI which runs on remote client computer to communicate between the user and the board. It allows the web server module to accept data from user through a network. This data can be used to control system memory or output. When the client inserts the address of the board, the web page will be appear. These web pages will send the HTTP request to the board using GET or POST request method.

6. Block Diagram And Experimental set up of System:

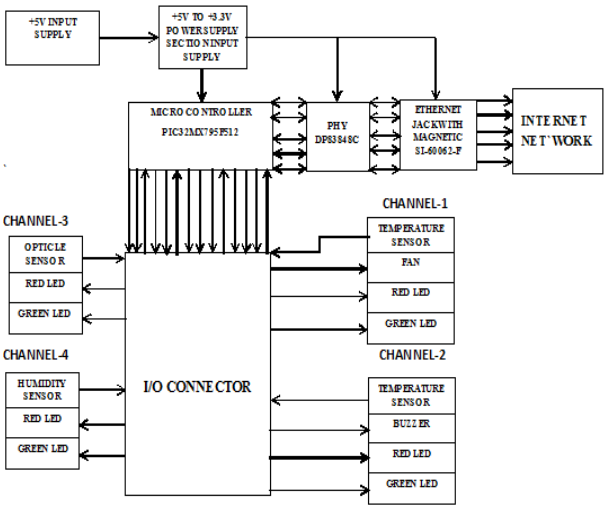

Figure 4: Block diagram of system

Ref fig.4 This is block diagram Section of Ethernet Project. System has +5V DC input supply section. +5V input go to +3.3V regulator supply section, which generate +3.3V regulated supply for PIC32MX795F512L, DP83848C, Ethernet Jack. There are two sections in microcontroller functioning. Ethernet Section & I/O Section .In Ethernet Section MAC layer of Microcontroller is connected to PHY layer DP83848C and output of DP83848C is connected to Ethernet jack, who has built in magnetics and further it connected to network to get remote access. In I/O section of PIC32MX795F512L microcontroller is connected to temperature, humidity, optical sensors for input signal and output connected to LED, Hooter, and Fan etc.

Refer fig.5 for Experimental setup of the project.

Figure 5: Experimental Setup

7. Result

Ref fig. 6, window to monitor and control the industrial Parameter through which particular parameter is monitored and controlled.

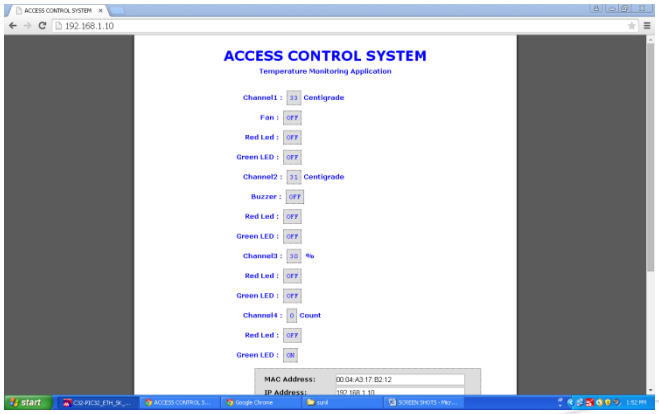

Figure 6: WEB Page for monitoring from remote location

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The test result for the set up is as below-

7.1. Normal temperature Channel-Channel 1-

a. Indicate Required temperature
b. Red Led get blow if high condition appears
c. Green LED blows in normal operating condition
d. Buzzer get ON for high condition

7.2. Advance Temperature channel with control application- Channel II-

a. Indicate Required temperature
b. Red Led get blow if high condition appears
c. Green LED blows in normal operating condition
d. Fan get ON for high condition and OFF during normal operation

7.3. Humidity Channel, Channel III-

a. Indicate required Humidity
b. RED LED blow if high condition appears
c. GREEN LED blow in normal operating condition

7.4. Optical sensor channel, Channel IV-

a. Indicate for availability of obstacle and count from 0-99
b. RED LED blow if obstacle available
c. GREEN LED blow for non-availability of obstacle

8. Conclusion

A low cost approach of the present developed work is novel and has achieved the target to monitor process parameter like temperature, humidity, obstacle remotely using the Ethernet. With the help of the different sensors which can act as a network node using LAN to SPI communication. LAN provides higher data transfer rates and lack of leased telecommunication lines. Workstations can share peripheral devices thus cheaper. Again installation of Ethernet is easier and less expensive than the other network protocols, also provides connectivity to backbone. SPI provides full duplex communication, higher throughput, simple hardware interfacing and typically requires lower power. The system designed in this paper provides the characteristics of low cost and strong processing ability while the electronic unit is simple and reliable. The system is low cost as compared to the previously existing systems like GSM, Wi-Fi with an accuracy of +or -1^{o}C.

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