Embedded Web Client on Arduino Due

PG Student Ashwini Pathade, Assistant Professor Poonam Soni
Department of Electronics and Telecommunication Engineering
Deogiri College of Engineering,
Aurangabad, Mahaarashtra, India

Abstract-Nowadays, monitoring and controlling is important aspect in industry and home automation. On that basis many systems are measuring and controlling parameters like temperature, humidity, voltage, gas leakage etc. and result displays on different format. Embedded web client is the system which is used to monitor and control parameters like temperature and humidity. Embedded web client gives output in the form of offline mode as well as online mode. On the result basis on two systems are available in embedded web client one is online system and other is offline system. In Embedded web client controller receives data from sensors and transmit it to server periodically as well as perform certain useful functions like to display ADC value and controlling increased temperature. In embedded web client AT SAM 3X8E and NODE MCU used as a controller and display output on LCD as well as web page using XAMPP server. Embedded web client uses wi-fi module instead of router or Ethernet. Embedded web client is easy in construction, robust and gives real time application.

Key words - Arduino due, Node MCU, LCD, SAM 3X8E, XAMPP

I. INTRODUCTION

Embedded web client is a microcontroller based embedded system for monitoring and controlling of parameters like temperature and humidity. Embedded web client is able to serve small data dynamically from the sensor and transmitted server periodically, as well as perform useful function that is display ADC value. Most of the internet application based on client/server architecture therefore in these systems embedded web server used. In embedded web client power consumption is low as well as size and cost are less.

Web server is hosts web page and provides serves for any requesting clients. Web server can be embedded in device to provide remote access to the device from web browser. A client can access industries data through internet by using wi-fi module. Digitally acquired data are uploaded on web server and stored in data based. Whenever client access data, it sends a request to server these requests is taken by wi-fi module which is connected to the internet. Web process request made and finally connect to the desired web server, access the requested data and sends data to client. All the task are managed by real time operating system such as measuring signal A/D conversion, data-based objecting, and sending HTML pages. [1]

Embedded system is device that has computer intelligent dedicating performing group of tasked. Embedded system performs monitoring and control function such as gathering and reporting sensor reading or controlling motor and switches. Embedded system also performs analog to digital conversation. Web technology used to monitor system or electronic device through web page. Web based technology is more based technology is in the world for browsing and sharing data. Web server is a system which hosts web site and provides serves for any requesting client. The general-purpose web server composes on operating system, web pages or web application and a huge amount of energy and a special hardware. Embedded web client is combination of embedded device and internet technology, which provides flexible remote device monitoring and management function based on internet browser and it has become an advanced development trend embedded technology [2].

II. LITERATURE SURVEY

There are many systems available for monitoring Temperature as well as Humidity. Different systems are available with other various components but main drawback of that system is no controlling techniques are available as well as no database creation. Cost of the system as well as Maintenance are very important criteria for using the system.

Many of systems measures parameters like temperature, pressure, gas leakage and may more but database creation is not available with all existing systems. Existing system uses different controller which may affect the cost of system as well as not so user friendly. Existing system having monitoring and controlling parameters but not create database with real time values.

he paper presented by the Aamir. M. Parkar and Prof. S.I. Nipanikar 2015 conveys us through the facts of system is used to monitor boiler parameters remotely such as

temperature, pressure, water level and gas leakage. These parameters are monitored from anywhere through internet. The system is executed using ARM 7 processor and Ethernet controller. The sensors used in the system can match the actual boiler specifications. [3].

In the paper presented by AmitaThakareand Pooja R. Gandhe Feb 2017, a clarification design and implementation of an interactive kitchen monitoring kitchen monitoring system with the control, communication and web-enabled measurement and control systems. The web centered monitor and automatic control of tools is creating a development in automation field. Replacing computer with low-cost sole chip processor can make supervisors to acquire parameters of different remote sensor and direct control information to field tools at every interval over Internet. The complete system is secured through a login and Webpage password-based authentication [4].

Mr. VagishAdhav, Prof. S. R. Gulhane 2016. In this paper authors described the trend going on in ubiquitous computing, everything is going to be connected to the Internet and its data will be used for several advanced resolutions, making not only evidence from it, but also information and even knowledge. They have reported an effective implementation for Internet of Things used for monitoring and controlling regular domestic conditions by means of low-cost ubiquitous sensing system. The explanation about the integrated network architecture and the communicating mechanisms for consistent amount of factors by keen sensors and transmission of data via Internet is being obtainable [5].

J. Damodhar et al., S. SWATHI gives plan and the progress of a collaborative kitchen monitoring system with the GSM, WI-FI communication and Web-based extent and control systems. The Web based monitor and programmed mechanism of tools is forming an automation field. Exchanging computer with low-cost single chip processor can make supervisors to acquire factors of different remote sensor and send control information to kitchen factors at every time over Internet. The GSM is a brilliant choice for this owing to its widespread exposure of the entirely parameters. Then SMS is a text based protocol, even the utmost simple GSM systems make variations on these conditions. The comprehensive system is secured over a login E-mail and Webpage password built validation. The plan is entirely combined and wireless with the software to method a low cost, consistency and effortlessly treatable system. WI-FI communication types the system to install easily. The GSM, E-mail and Web based communication system delivers a result building device idea for edition to some kitchen situations [6].

Tatsiopoulos and Ktena (2009) have projected a Smart ZigBee based wireless sensor meter system. The

temperature, humidity and light are observed with indoor and outdoor ecological circumstances. In this design the heart of the smart meter is a microprocessor processor using the ZigBee protocol is used to transfer the data conveyed by commercial wireless sensors [7].
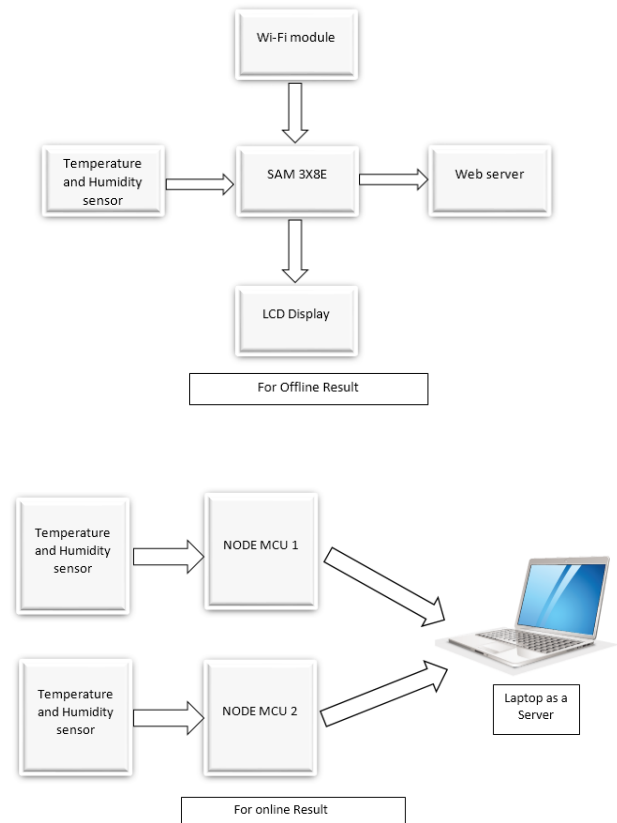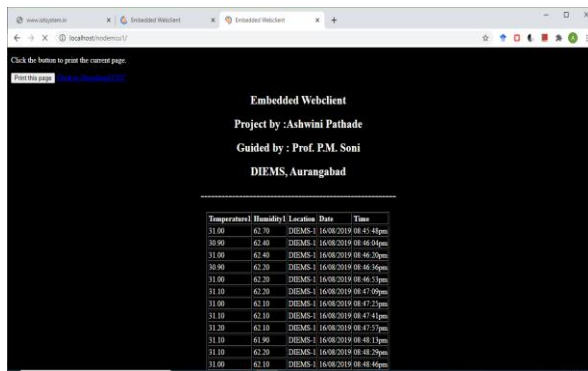
III. PROPOSED METHODOLOGY

Figure 1. System Overview

Embedded web client is a real time monitoring and controlling system for different parameters like temperature and humidity. The system consists of two different modes of operation. First mode of operation is offline and second mode of operation is online. In offline system DHT11 is used as input of AT SAM 3X8E controller and output displays on LCD as well as web page. Wi-fi module is used for connecting to internet and display web page. In online system two DHT22 is used as input to two different Node MCU and output displays on internet in the form of webpage by using inbuilt Wi-fi module. For online system XAMPP control panel is used as a server. In embedded web client continuous readings updated which means real time data updated with date and location.

Figure 2. Complete Experimental Set Up of System

IV. PERFORMANCE ANALYSIS
PERFORMANCE ANALYSIS

Figure 3. Output of Online System-1

IV. CONCLUSION

There are some application where not only temperature measurement but also controlling is needed. In our system, embedded web client increase in temperature starts fan to minimize the excess temperature. We also have implemented a system that monitoring and controlling based on web browser so that it operates from anywhere in the globe. This system can be used in data acquisition in industry. The system can be integrated with software to form a low cost, robust and easily operable system. Embedded web client will be easy and robust system to create database for industry.

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