

A Paper on IOT Based Digital Notice Board using Arduino ATmega 328

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1. Abstract

LED display system is aimed at the colleges and universities for displaying day-to-day information continuously or at regular intervals during the working hours. Being GSM based system, it offers flexibility to display flash news or announcements faster than the programmable system. The LED display system mainly consists of a receiver and a display board which can be programmed from an Arduino. It receives the message through serial port and display the desired information after necessary code conversion. It can serve as an electronic notice board and display the important notices without any delay thus avoiding the latency. The LED display is easy to expand and it allows the user to add more displays at any time and at any location depending on the requirement. **Keywords: P10 LED Display, Arduino, Android Phone, Bluetooth HC05, GSM module.**

2. Introduction

Now-a-days LED message scrolling displays are very popular. These displays are used in shopping malls, theaters, schools, traffic signs, public transportation etc. The problem of this display is to carry a computer or for generating and sending message to LED moving display board is big problem and it can also increase the cost. To make the LED display more portable, a GSM mobile phone is used instead of computer for generating message to LED display. A text message is typed in the GSM mobile and send it by using SMS service of the mobile to LED display. A arduino board is connected to LED display is used to receive the message and send it to the controller circuit of the LED display. Then controller circuit of LED display

is display the text message .By using arduino it is possible to change the message in the LED display from anywhere in the world. It can be reduces the cost .The project uses a arduino board at the display side with Atmel 328P microcontroller to send text to drive the LED display board. Along with these a power supply unit and supporting hardware for microcontroller is used.

3. Objective

The main objective of the project using GSM module we can send message to any distant location and to develop a wireless notice board that display notice in the form of text. Consume less power and easy to operate also notification can be delivered in within second. The voice calling feature can be added with the proposed system as a further enhancement for using the system.

4. Literature Review

Electronic Notice Board with Multiple Output Display

Prof. Kruthika Simha Shreya Chethan Kumar, Parinitha C, Shashidhar Tantry (Department of Electronics and Communication Engineering, PES Institute Of Technology, Bangalore College of Engineering Belagavi, India)

In this paper simha, it can be easily integrated with general purpose display board to provide its mobility. The system accept the message from of SMS and display on the notice board.

Development of Simple and Low Cost Android Based Wireless Notice Board

Neeraj Khara, Divya Shukla, Shambhavi Awasthi In this paper the technological advancement of the notice board is purposed that will help to save time and resources. Also it makes the information available fast to the person.

GSM based Smart Home and Digital Notice Board

This paper is based on home controlling application and notice displaying using android has been built. This project is based on the LCD display and LPC2148 Microcontroller.

5. Block Diagram

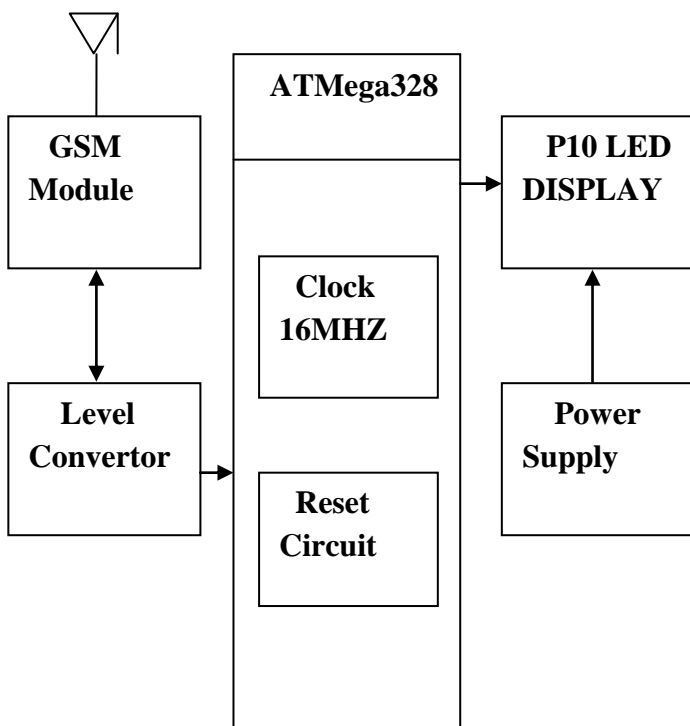


Figure: Digital Notice Board (IoT based).

6. Hardware Details

1) Power Supply:-

It requires 5 Volts 10 Amp current. Power supply is a step down transformer. For getting +5 Volts supply we are using SMPS.

SMPS:

SMPS stands for Switched Mode Power Supply. The input to SMPS is 230 Volts ac and output is +5 Volts. A Switched mode power supply is an electronic power supply that incorporates a switching regulator to convert electrical power efficiently.

2) GSM Module:-

GSM is a mobile communication modem. It stands for Global System for Mobile communication. It is widely used in mobile communication system in world. A GSM modem is a specialized type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone. GSM modem devices for both sending and receiving SMS and MMS messages. GSM is an open and digital cellular technology used for transmitting mobile voice and data services operates at the 850MHz, 900MHz, 1800MHz and 1900MHz frequency bands. GSM modem is usually preferable to a GSM mobile phone.



Fig. GSM Module

2) P10 LED Display:-

This large, bright 512 LED matrix panel has on board controller circuitry designed to make it easy to use straight from your board. Clocks, Status displays, graphic readouts and all kind of impressive display project are easy to create using this display. The distance between two points are 10mm then it is called as P10 LED display. P stands for



Fig. P10 LED Display

pixel and pixel stands for dot. It displays 16 rows and 32 columns total 512 led shown in one led display. P10 led display contain shift register ICs and data transfer serial in parallel out. It is tough frame material.

4) ATmega328:-

Arduino board is important in our project. ATmega328 is basically an advanced virtual RISC microcontroller. It receives the data from GSM, and gives signal to P10 LED display. Arduino is an open-source platform used for building electronic projects. It supports the data up to 8bits. ATmega328 has 32KB internal built in memory. The device operates between 1.8 to 5.5 volts. The most common implementation of this chip is on the popular Arduino development platform,

namely the Arduino Uno and Arduino Nano models.

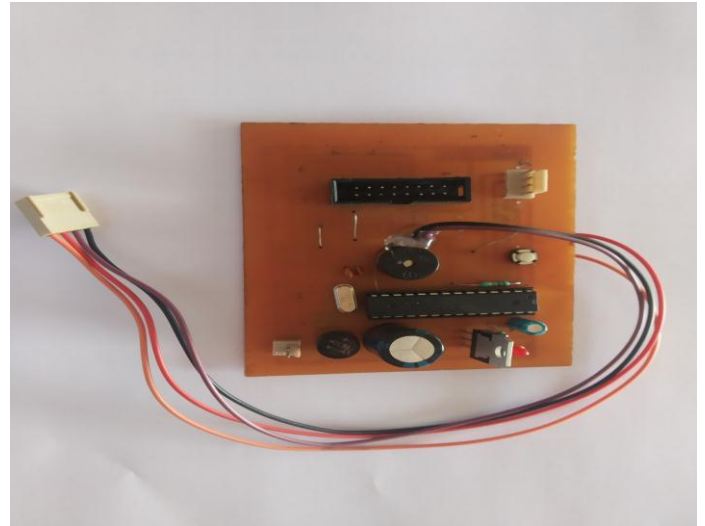


Fig. ATmega328

Features:

- High performance.
- Non programmable data and program memory.
- Low power consumption.
- Fully static operation.
- 32KB Flash memory.
- Advance RISC Architecture.
- 2kb SRAM.

5) RTC(Real Time Clock):-

The RTC stands for Real Time Clock i.e. a Real Time Clock (RTC). This module has 56bytes on Non-volatile memory available for use, is able to store and provide date of complete information as day of week, day, month, year and beyond of course, the functions of hours, minutes and seconds, the formats of 12 or 24 hours. Months with less than 31 days and leap years are automatically adjusted. This tiny RTC module is based on the clock chip DS1307 which supports the I2C protocol. It uses a Lithium cell which ensures that the data is preserved even without an external power, and is automatically activated in

case of power failure in the module.

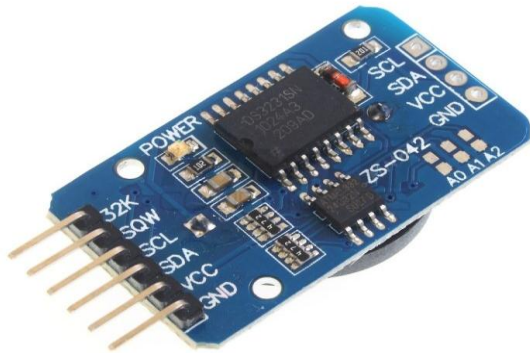


Fig. Real Time Clock

6) Bluetooth HC05:-

HC-05 embedded Bluetooth serial communication module has two work modes: order-response work mode and automatic connection work mode. And there are three work roles (Master, Slave and Loopback) at the automatic connection work mode.

When the module is at the automatic connection work mode, it will follow the default way set lastly to transmit the data automatically. When the module is at the order-response work mode, user can send the AT command to the module to set the control parameters and sent control order.

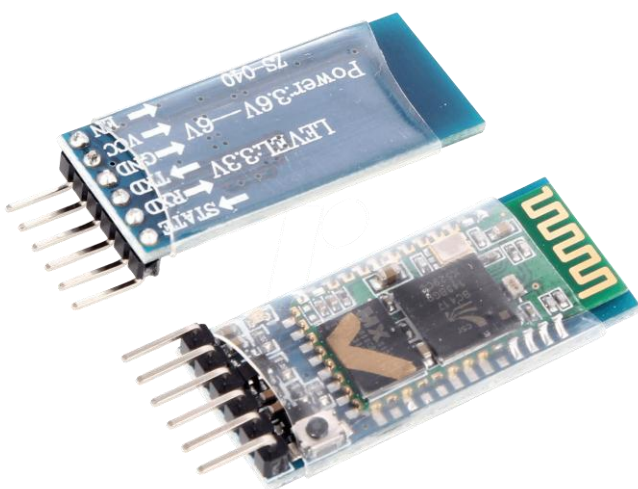


Fig. Bluetooth HC05

7) Level Convertor:-

The logic level convertor is also called as level shifter, level translator. Level convertor is a small device that safely steps down 5 Volt signals to 3.3 Volt and step up 3.3 Volt signals to 5 Volt.

7. Working

The GSM Module used consist of a SIM Card of some number. The message transmitted by any number to this number is received and saved in the memory of the SIM card.

The module works with the AT –commands. RxD and TxD pins of this GSM module are connected to the TxD and RxD of the ATmega328 respectively so that the information or message is transmitted.

The message received by GSM module is retrieved by the ATmega328 by using suitable AT commands. The message is transferred to the display board.

8. Problem Definition

The proposed system “IOT Based Digital Notice Board” is cheap, quick reliable and secured for any organization that requires to circulate notice regularly and reduce physical efforts. We are using GSM technology so there is no problem of the range i.e. distance. We can send notice from any location. The proposed system uses SIM900, LED Display, GSM module, ATmega328. It has proposed its advantage in advertisement.

9. Conclusion and Future Scope

As the technology is changes every day the, display board system are changing from normal display to digital LED display. The GSM based wireless notice board system is technological advancement of the notice board is proposed that will helps in saving time and resources and making the information available instantly to the intended person. The system is simple low cost

and easy to use that interacts with the intended users instantly. The system can be used in various applications like banking, schools, restaurants, offices, hospitals, score boards for sports etc.

10. References

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