International Journal of Research in Engineering, Science and Management
Volume 4, Issue 7, July 2021
https://www.ijresm.com | ISSN (Online): 2581-5792

Wireless Electronic Notice Board using GSM

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***Abstract*: This paper deals with an innovative rather an interesting manner of intimating the message to the people using a wireless electronic display board which is synchronized using the GSM technology. This will help is in passing any message almost immediately without any delay just by sending a SMS which is better and more reliable than the old traditional way of attaching the paper on notice board. This proposed technology can be used in many public places, malls or big buildings to enhance the security system and also make awareness of the emergency situations and avoid many dangers. The main objective of this project is to develop a wireless e-notice board that displays messages send from the user's mobile. When a user sends a message, it is received by a SIM inserted in GSM modem at the receiver unit. The GSM modem interfaced with shift register IC to microcontroller. The message received is sent to the microcontroller that further displays it on electronic notice board which is equipped with a display unit interfaced to a microcontroller. It is further displayed on an electronic notice board which equipped with 8x40 light emitting diodes display interfaced to the dot matrix controller which converts instructions from a processor into signals which turns on or off lights in the matrix so that the required display is produced.**

***Keywords*: Arduino Uno, GSM, LED, Shift register.**

1. Introduction

Wireless communication has announced its arrival on big stage and the world is going mobile. As we wish to control everything and without moving an inch. The importance of placing notice boards in institutions or organizations and public utility places like airports, bus stations and railway stations to display and pass information can never be overemphasized. However, day-to-day changing of notices in these places is a difficult task. The main objective of this project will be to design a SMS driven automatic display board which can replace the currently used paper based display. Notice boards effectively tackle the global problem of deforestation by conveying messages at large without the use of paper. Such innovative measures will go a long way in adapting the damage to the environment. Wireless Electronic Notice Board is used for transmission of text data through wireless GSM interfaced with microcontroller. It displays online message on public places. The system consists of a GSM receiver and a display unit which can be programmed from an authorized mobile phone. The GSM receiver receives the information to be displayed as SMS which is then displayed on the display unit (LED). The main focus of the project is on displaying information to a dedicated LED display by the any part of world using GSM network, which facilitate to control any message board globally from any location.

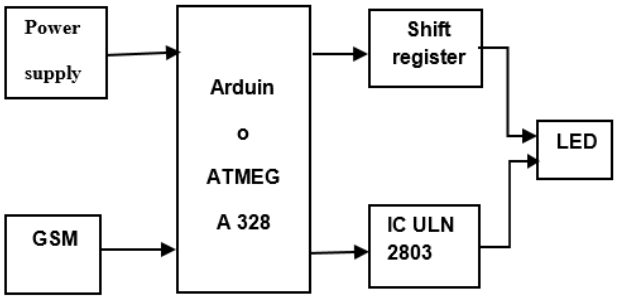

Fig. 1. Block diagram

The components used are

1. Arduino Uno(ATmega328)
2. Power supply
3. ULN IC2803
4. GSM Module
5. LED Display
6. 74HC595 Shift Register

1) Arduino Uno (ATmega328)

ATMEGA 328 microcontroller, which acts as a processor for the arduino board. Nearly it consists of 28 pins. From these 28 pins, the inputs can be controlled by transmitting and receiving the inputs to the external device. It also consists of pulse width modulation (PWM). These PWM are used to transmit the entire signal in a pulse modulation. Input power supply such as Vcc and Gnd are used. These IC mainly consists of analog and digital inputs. There is an additional power supply source present in Arduino microcontroller. Power supply port is present at the corner of the arduino microcontroller. Either we can use this power supply port by connecting with external power supply. (i.e., ac power supply), or by connecting an dc power supply through input pins. These power supplies produce an active form to the arduino microcontroller. These arduino

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microcontrollers can accept a range of power supply. The working of arduino microcontroller is where the proper connection is made. Checking all the input ports as well as the power supply connection. The output of the pins can be connected with the external devices according to their applications. Thus, the Arduino ATMEGA328 microcontroller can be used for various applications such as industrial and laboratory applications. These Arduino ATMEGA 328 microcontrollers are the most suitable microcontroller for the robotic applications. These Arduino ATMEGA 328 microcontrollers can be widely used in automation process industries.

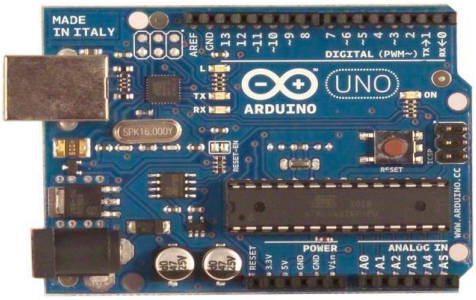

Fig. 2. Arduino Uno(ATmega328)

2) Power Supply

A power supply is an electrical device that supplies electric power to electrical load. The primary function of a power supply is to convert electrical current from a source to the correct voltage, current, and frequency to power the load. As a result, power supplies are sometimes referred to as electric power converters. Some power supplies are separate standalone pieces of equipment, while others are built into the load appliances that they power. All power supplies have a power input connection, which receives energy in the form of electric current from a source, and one or more power output connections that deliver current to the load. The ac voltage, typically 220V rms, is connected to a transformer, which steps that ac voltage down to the level of the desired dc output. A diode rectifier then provides a full-wave rectified voltage that is initially filtered by a simple capacitor filter to produce a dc voltage. This resulting dc voltage usually has some ripple or ac voltage variation.

3) ULN IC2803

The ULN2803A device is a 50 V, 500 mA Darlington transistor array. The device consists of eight NPN Darlington pairs that generate high voltage outputs with common-cathode clamp diodes for switching relay loads. Each Darlington pair has current rating of is 500 mA across the collector. It is mostly connected for high current loads in such as in relay drivers, lamp drivers etc. Each channel of ULN2803 consists of Darlington connected NPN transistors that creates the effect of a single transistor with a very high current gain. The very high β allows for high output current drive with a very low input current, essentially equating to operation with low General-Purpose Input / Output (GPIO) voltages. The GPIO voltage is converted to base current through the 2.7 kΩ resistor connected between the input and base of the pre- driver Darlington NPN. The diodes connected between the output and COM pin are used to suppress the kick-back voltage from an inductive load that is excited when the NPN drivers are turned off (stop sinking) and the stored energy in the coils causes a reverse current to flow into the coil supply through the kick-back diode.

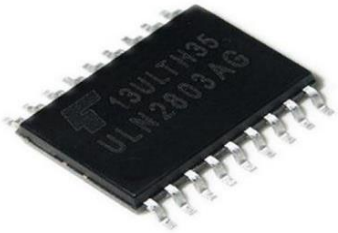

Fig. 3. ULN IC2803

4) GSM Module

The Global System for Mobile Communications (GSM) is a standard developed by the European Telecommunications Standards Institute (ETSI) to describe the protocols for second-generation (2G) digital cellular networks used by mobile devices such as mobile phones and tablets. 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. From the mobile operator perspective, a GSM modem looks just like a mobile phone. These GSM modems are most frequently used to provide mobile internet connectivity, many of them can also be used for sending and receiving SMS and MMS messages. We have used SIM GSM module. It is an Advanced Low cost modem for wireless GSM communications which includes sending and receiving text messages. This GSM Modem can accept any GSM network operator SIM card and act just like a mobile phone with its own unique phone number.

Fig. 4. GSM module

5) LED display

An LED display, or light emitting diode display, is a flat panel display that uses light emitting diodes as the video display. An LED display panel can be either a small display or part of a larger display. LED diodes are used in order to make up an LED display. LED displays are also used in billboards and store signs.

LED Display is one of the main screen displays that are being commercially used. The biggest advantage of the LED display is its efficient and low-energy consumption, which is especially needed for handhelds and chargeable devices such as mobile phones and tablets. An LED display consists of a number of LED panels that, in turn, consist of several LEDs.

Fig. 5. LED display

6) 74HC595 Shift Register

74HC595 is a shift register which works on Serial IN Parallel OUT protocol. It receives data serially from the microcontroller and then sends out this data through parallel pins. We can increase our output pins by 8 using the single chip.

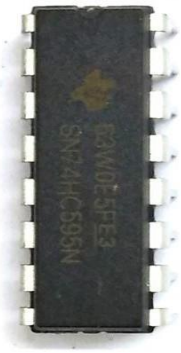

Fig. 6. 74HC595 shift register

Educational institutions & organizations. Managing traffic.

The applications used for,

- Educational institutions & organizations.
- Managing traffic.
- Advertisement conference hall.
- Bus/railways station.
- Any public utility places.

2. Results

Fig. 7. Results displayed through LCD display

3. Conclusion

As the technology is advancing every day the display board systems are moving from Normal hand writing display to digital display. Further to Wireless display units. This paper develops a wireless notice board system with GSM modem connected to it, which displays the desired message of the user through an SMS in a most populated or crowded places. The aim of this project was to create an electronic notice board to which data can be sent through SMS. This proposed system has many upcoming applications in educational institutions and organizations, crime prevention, traffic management, railways, advertisements etc. Been user friendly, long range and faster means of conveying information are major bolsters for this application. By using this proposed methodology, we can enhance the security system and also make awareness of the emergency situations and avoid many dangers.

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