Fuzzy Systems and Soft Computing
ISSN : 1819-4362

WIRELESS ELECTRONIC NOTICE BOARD FOR SEAMLESS INFORMATION DISSEMINATION

[#1] VOLADRI PRAVEEN KUMAR, Assistant Professor
[#2] PENCHALA SRI POOJITHA, [#3] PARREY PURNACHANDER
Department of Electronics & Communication Engineering
Sree Chaitanya Institute Of Technological Sciences, Karimnagar

ABSTRACT: An innovative and intriguing method of communication is outlined in this article as the use of a GSM-synchronized wireless electronic bulletin board. With short message service (SMS), you can transmit any message in near real-time. Comparatively speaking, this is a more contemporary and dependable alternative to the antiquated practise of pinning a note to a bulletin board. Many locations could benefit from the proposed technology. These include large buildings, public areas, and shopping centers. It has the potential to reduce danger, increase awareness of emergencies, and guide people away from potentially harmful situations. The primary objective of this project is to design and build a mobile-device-compatible wireless e-notice board. Messages sent by users are received by a GSM modem in the receiver unit, which requires a SIM card to be inserted. Interfacing with the shift register integrated circuit, the microcontroller was linked to the GSM modem. An electronic notice board with a display unit attached sends the message to the microcontroller as soon as it receives it, providing additional visual stimulation. An electronic bulletin board featuring an 8x40 LED display linked to a dot matrix controller also shows the data. This controller receives commands from the CPU and converts them into signals that activate or deactivate lights in the matrix, resulting in the desired display.
KEYWORDS:ArduinoUno,GSM,LED,Shiftregister.

1.INTRODUCTION

The advent of wireless communication has significantly facilitated global travel. Simply put, we desire complete control without the need to exert any effort. The significance of notice boards in disseminating public information within airports, train stations, and bus terminals cannot be overstated. Nevertheless, maintaining daily updated notices in such locations is difficult. In lieu of an automatic display board that utilizes the short message service (SMS), a paper-based display may be implemented. Bulletin boards are an effective means of advocating against the worldwide issue of deforestation due to their capacity to facilitate the dissemination of information to a large audience without the need for physical paper. Considerable environmental protection will result from these inventive solutions. A microcontroller that is linked to GSM systems and a text-transmitting wireless electronic bulletin board are present. Online communications are visible in public spaces. A functional mobile phone is required to configure the GSM receiver and display unit of the system. Data is transmitted from the GSM receiver to the display unit (LED) for SMS presentation. The primary objective of the project is to enable remote management of global message boards via a GSM network. This enables the remote display of data on a specialized LED screen, accessible from any location globally.

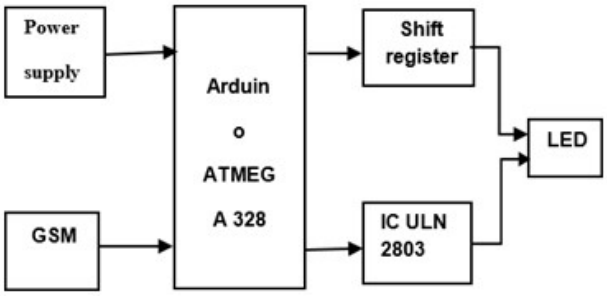

Fig.1.Blockdiagram

Thecomponentsusedare

- ArduinoUno(ATmega328)
- Powersupply
- ULNIC2803
- GSMModule
- LEDDisplay
- 74HC595ShiftRegister

ArduinoUno(ATmega328)

The Arduino board executes its operations using an ATMEGA 328 microcontroller. There are approximately twenty-eight pins in total. You can modify the inputs via the 28 pins by transmitting and receiving data from an external source. Additionally, it operates via pulse width modulation (PWM). By utilizing this type of PWM, the entire signal is transmitted via pulse modulation. Vcc and Gnd are the input power supplies that are utilized. The vast majority of these integrated circuits' inputs are analog or digital. An additional power source is integrated into Arduino microcontrollers. The power supply port of the Arduino microcontroller is located in one of its corners. By connecting the input pins to an external power source (an ac power supply) or a direct current (dc) power source, this device can be powered. The Arduino microcontroller receives an active signal from these power sources. The Arduino microcontrollers are capable of receiving power from an extensive variety of sources. The Arduino microcontroller will commence operation upon establishing the proper connection. Verify that the power cord is securely connected and inspect every input port. Whether external devices are permitted to connect to the outputs of the pins is dependent on their intended function. Numerous laboratories and organizations implement the Arduino ATMEGA328 microcontroller. For robotics, these Arduino ATMEGA 328 microcontrollers are superior. A wide variety of tasks can be accomplished with Arduino ATMEGA 328 microcontrollers in the process and automation industries.

Fig. 2. Arduino Uno(ATmega328)

Power Supply

A power supply facilitates the transfer of electrical energy from a power source to a power load. To provide power to a load, a power supply must convert the generator's current into the precise voltage, current, and frequency required by the load. As a consequence, power supplies are occasionally referred to as electric power converters. Certain categories of power supplies function as independent entities, while others are fully integrated into the appliances they supply power to. Power can be supplied to a power supply through one or more power input connections, and power can be discharged to a source through one or more power output connections. In order to achieve the required level of direct current (dc), the voltage of the alternating current (ac) is reduced. This is typically 220V rms. A diode rectifier converts the direct current voltage produced by a simple capacitor filter into a full-wave rectified voltage. Typically, ripples or fluctuations in the ac voltage are present in the resulting dc voltage.

ULN IC2803

A set of Darlington transistors operating at 50 V and 500 mA constitutes the ULN2803A. Together, the device's eight NPN Darlington pairs and common-cathode clamp diodes generate high-voltage outputs capable of switching relay loads. In the collector, each pair of Darlington transistors discharges 500 mA of current. This connection is frequently used to supply power to lamp drivers, relay drivers, and other devices that manage substantial current flows. By channelizing the Darlington-connected NPN transistors in the ULN2803 ultralinear rectifier, an exceptionally high current gain is achievable. With a high output current drive, low GPIO voltages are feasible due to the high value of β. A 2.7 kΩ resistor is positioned in the path between the input and base of the Darlington NPN pre-driver. This resistor converts GPIO voltage to base current (or current).

In the absence of sinking (when the NPN drivers are deactivated), the coil supply is supplied with reverse current via the kick-back diode. Thus, the inductive load is activated. Additionally, to reduce the kick-back voltage, diodes are positioned between the output and COM pins.

Fig. 3. ULN IC2803

GSM Module

Tablets and smartphones are powered by second-generation (2G) digital cellular networks. The Global System for Mobile Communications (GSM) standard, established by the European Telecommunications Standards Institute (ETSI), provides a description of these networks. Similar to a cell phone, a GSM modem operates using a SIM card and requires a mobile operator subscription. GSM modems are perceived by mobile service providers in the same manner as cell phones. Although some of these GSM modems have the capability to transmit and receive text messages, their primary function for users is to establish mobile internet connections. The utilization of the SIM GSM module was feasible. An affordably priced modem that incorporates sophisticated functionalities to facilitate texting and other GSM wireless communications. The GSM modem operates similarly to a standard cell phone; it accepts SIM cards from any GSM network provider and is assigned a unique phone number.

Fig. 4. GSM module

LED display

Video is displayed on LED displays, which are a subtype of flat panel displays, via light-emitting diodes. A small display or a component of a larger display may comprise an LED display panel. LED diodes are manufactured as components of LED displays. Additionally, storefront signs and billboards feature LED displays. LED displays are a prevalent form of screen display technology among businesses. LED displays are ideal for portable and rechargeable electronic devices such as smartphones and tablets due to their low power consumption and high performance. An LED display consists primarily of an LED panel, which is composed of numerous LEDs.

74HC595 Shift Register

An instance of a shift register that is compatible with the Serial IN Parallel OUT protocol is the 74HC595. By connecting the microcontroller to the output terminals via parallel pins, serial data can be transmitted to them. It is feasible to add eight more output pins to a single chip.

Fig. 6. 74HC595 shift register

Organizations and groups with an emphasis on education. Improving the resistance of vehicles to motion. The applications provide some degree of utility.

- 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

Due to the rapid pace of technological advancement, display board systems are transitioning from manual writing to digital display. Let us continue discussing wireless signage. This article describes the development of a wireless message board system capable of displaying a user's preferred SMS message in densely populated areas. In addition to the system, a GSM modem is provided. The primary objective of this endeavor was to develop an electronic bulletin board capable of SMS message reception. Future implementations of this proposed system may benefit education, transportation, advertising, law enforcement, and traffic management. The three most advantageous features of the application are its extensive range, user-friendly interface, and rapid data transfer speed. Adopting the proposed methodology will fortify the security infrastructure, heighten public consciousness regarding perilous circumstances, and facilitate the circumvention of numerous risks.

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