

# International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 9, Issue 3, March 2020

## GSM Based Industrial Automation

Priyanka Vijaykumar Gobbur<sup>1</sup>, Minakshee Saybu Dhotre<sup>2</sup>, Kajal Vasant Mane<sup>3</sup>, V.S. Patki<sup>4</sup>

U.G. Student, Department of Electronics Engineering, Walchand Institute of Technology, Solapur, India<sup>1</sup>

U.G. Student, Department of Electronics Engineering, Walchand Institute of Technology, Solapur, India<sup>2</sup>

U.G. Student, Department of Electronics Engineering, Walchand Institute of Technology, Solapur, India<sup>3</sup>

Assistant Professor, Department of Electronics Engineering, Walchand Institute of Technology, Solapur, India<sup>4</sup>

**ABSTRACT:** The mobile communication has expanded to a great extent such that it can be applied for controlling of electrical devices. These projects make use of this capability of mobile phone to control three electrical devices with some use of embedded technology which can be extended up to eight devices. Apart from controlling it also does the sensing of the devices. Here in the project controlling and sensing is done for three electrical devices only. According to the user need both of this can be expanded.

**KEYWORDS:** Device Control, GSM, Mobile Phone, Short Messaging Service (SMS), Device Status Monitor, Microcontroller AT89s51.

### I. INTRODUCTION

In fast moving world, time is most important factor. You can turn on/off device in the industry by sending SMS through cell phone. It will save time as well as manpower required to control industrial devices. By using smscommand we can control six devices. This is more advantages, when we have to turn on the machinery at night when we got order. In this case we can turn on machinery by giving simply sending SMS command through cell phone. Consider another case that, boiler is taking one hour to become ready for operation. To start working at 9:00 A.M. we have to start boiler at 8:00 A.M. in such case it is necessity to reach field at 8:00 A.M. then by sending SMS through cell phone we can turn on boiler. There is no need to go to field.

### II. LITERATURE SURVEY

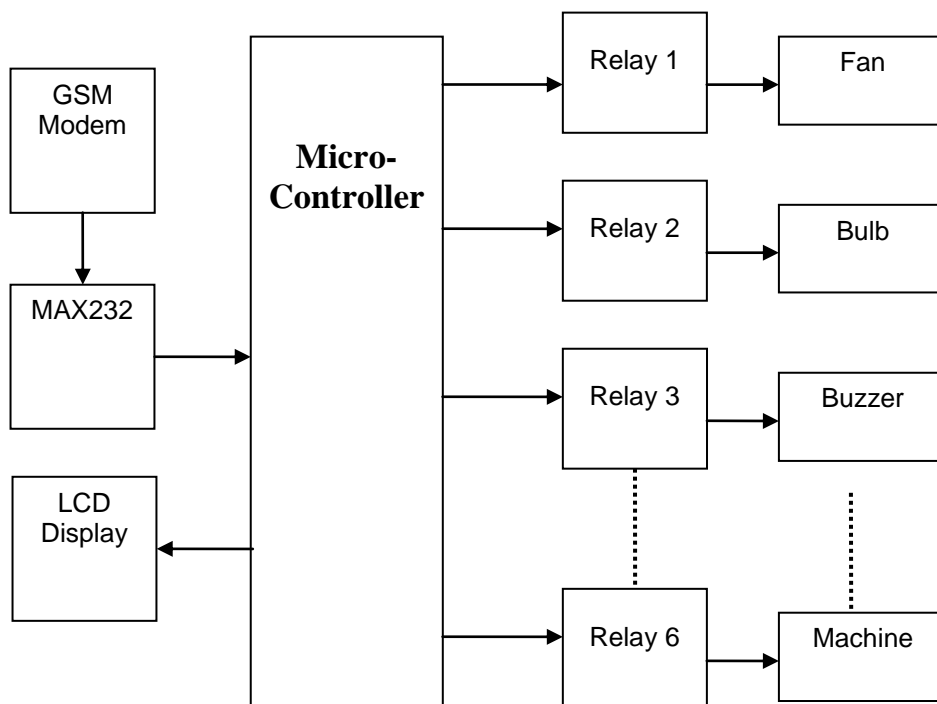
We have undergone a detailed study about the GSM application and implementation. As a part of our circular activity we are making the project whose title is "SMS based Device controlling". We have used 8051 Microcontroller as a main component of the project. Now a Microcontroller has become a main component of many of the electronic circuits.

#### GSM System has following advantages over RF control:-

- RF control has limitations that it has small range and less controls.
- Our project has overcome these limitations since the devices are controlled by mobile it can be operated as far as the service provider has range.

The controls are also more than RF modules.

### III. BLOCK DIAGRAM



- **MICRO-CONTROLLER (8051):-**

It is the major part of the system. It maintains the temperature, humidity and light intensity to the desired value. The 8051 has one serial port that receives and transmits data. Transmission and reception can take place simultaneously. The four communication modes possible with 8051 present the system designer and programmer with opportunities to conduct very sophisticated data communication network. It is the heart of the system which controls all the inputs and the controlling action to be taken at the output. Microcontroller used here is the AT89S51.

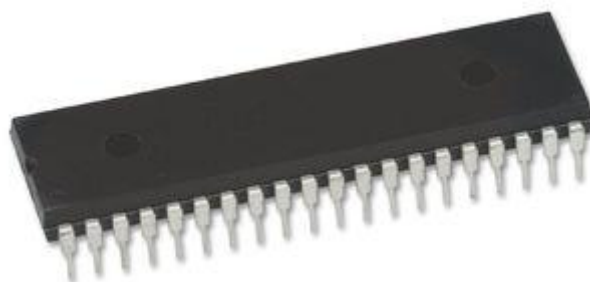


Figure: Photograph of an 89s51 microcontroller.

## International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 9, Issue 3, March 2020

### • LCD DISPLAY:-

It is used to display the current values of the measuring quantities. It can be used to display the various options and all the readings that have been stored in the EEPROM. LCD or 7 segment LED display can be used. Here the LCD used is the 16×2 line LCD. We can also use 16×4 line LCD. Liquid Crystal Display which is commonly known as LCD is an Alphanumeric Display it means that it can display Alphabets, Numbers as well as special symbols thus LCD is a user friendly Display device which can be used for displaying various messages unlike seven segment display which can display only numbers and some of the alphabets. The only disadvantage of LCD over seven segment is that seven segment is robust display and be visualized from a longer distance as compared to LCD. Here I have used 16 x 2 Alphanumeric Display which means on this display I can display two lines with maximum of 16 characters in one line.

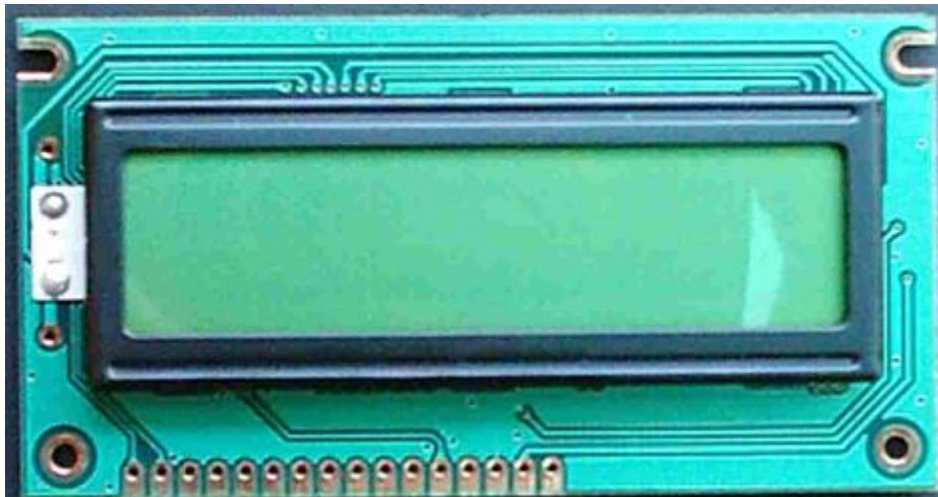


Figure: Photograph of A typical 16 by 2 alphanumeric LCD display

### • GSM INTERFACE:-

GSM interface is the main feature of this system. SMS are received in this GSM modem. Then microcontroller communicates with this GSM modem to read the SMS. We have to insert a GSM simcard into this modem.

### • Relay:

Relay is used to control the on/off operation of device. Relays are driven by the transistors. We are using single pole double throw (SPDT) relay.

To perform switching of relay transistor BC 548 is used:

- 1) Relay can switch AC & DC, where as transistor can only switch DC.
- 2) Relays can switch high voltage, transistor can not.
- 3) Relays are a better choice for switching large currents (i.e.>5A).
- 4) Relays can switch many contacts at once.

Relay acts as a switch which is used to control the 230 volt AC supply. This relay will be turned off if there is no person inside the room. This relay can be used to turn off the electrical appliances like fan, tubes etc.

# International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 9, Issue 3, March 2020



Figure: Photograph of a typical 12volt relay

## IV. INTRODUCTION TO GSM MODEM

GSM (Global System for Mobile Communications) is world's most famous Mobile platform. Mobile phones with SIM cards use GSM technology to help you communicate with your family, friends and business associates. Interfacing of GSM unit is done through a serial communication link with microcontroller 89S51. Whatever data is to be sent to GSM unit is done through this RS 232 link. Level translator Translates TTL voltage level to RS-232 compatible level. It is realized with MAX 232.

GSM systems have following advantages over basic land line telephony systems:

1. Mobility
2. Easy availability
3. High uptime
  - SMS



## International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 9, Issue 3, March 2020

We use communication feature of Telephone landlines for internet, e-mail, data connectivity, remote monitoring, computer to computer communication, security systems. In the same way we can use GSM technology and benefit from its advantages.

- **Uses GSM technology for following applications:**

1. Access control devices: Access control devices can communicate with servers and security staff through SMS messaging. Complete log of transaction is available at the head-office Server instantly without any wiring involved and device can instantly alert security personnel on their mobile phone in case of any problem.
2. Transaction terminals: EDC (Electronic Data Capturing) machines can use SMS messaging to confirm transactions from central servers. The main benefit is that central server can be anywhere in the world.
3. Supply Chain Management: With a central server in your head office with GSM capability, you can receive instant transaction data from all your branch offices, warehouses and business associates with nil downtime and low cost.

- **GSM UNIT:**

The GSM Modem supports popular "AT" command set so that users can develop applications quickly. The product has SIM card holder to which activated SIM card is inserted for normal use. The power to this unit can be given from UPS to provide uninterrupted operation. This product provides great feasibility for devices in remote location to stay connected which otherwise would not have been possible where telephone line do not exist.



**Figure: GSM UNIT**

### V. APPLICATIONS

#### A) INDUSTRIAL CONTROL -

1. It is used to control or switch on any automatic process control machinery.
2. Electric grid could be controlled remotely.
3. Automatic production machinery could be controlled even during odd hours with your mobile phone.

#### B) HOME AUTOMATION –

1. To monitor status of home appliances.
2. To control (ON/OFF) the home appliances according to there status when we are going away from home.

# International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 9, Issue 3, March 2020

## C) FARM AUTOMATION -

1. To control & monitor the various irrigation equipment's in the farm.

## VI. CONCLUSION

With the knowledge of new techniques in 'Electronics' we are able to make our life more comfortable. One such application of electronics is used in "SMS based Device controlling" The approach we followed and which is explained in this project report is novel and has achieved the target of "SMS based Device controlling" satisfying user needs and requirements.

SMS based Device controlling is automatic versatile system. It can be implemented in industry, home, agricultural field, remote and hazardous applications. It provides the flexibility & system reliability with low cost as well as less maintenance. It provides remote access to the system to deliver service at any time of the day. With this system, we can control as well as monitor the devices at remote location.

The development of this project has shown how much hard work goes into the creation of a system. "SMS based Device controlling" was a project based on microcontroller, due to which hardware requirement is reduced. Embarking of this project has helped us in developing a team spirit, patience and time management necessary for today's technical professionals.

Hence we can conclude that the required goals and objectives of our project have been achieved. This project has built in us confidence that any problem can be solved with sheer determination, hard work and optimism. We feel that our product serves something good to this world and we like to present it before this prosperous world. By doing this project, we were better able to understand the various facets of doing an embedded system project which is emerging as one of the most 'in demand' technologies right now.

## REFERENCES

- [1] A. Anon. (2014), "Architecture of a SPST Relay", <http://www.instructables.com/id/Controlling-AC-light-using-Arduino-with-relay-modu/step3/NC-COM-NO-of-Relay>, Accessed: March 6, 2016.
- [2] MarAnon. (2015b), "Linksprite SIM900 GSM900", [http://linksprite.com/wiki/index.php5?title=SIM900\\_GPRS/GSM\\_Shield](http://linksprite.com/wiki/index.php5?title=SIM900_GPRS/GSM_Shield), Accessed: March 5, 2016.
- [3] Yassin "Short Message Service", <http://www.searchmobilecomputing.techtarget.com/definition/Short-Message-Service>, Accessed: February 13, 2016.
- [4] Eftychios A. "Microcontroller", <http://en.wikipedia.org/wiki/microcontroller>, Accessed: February 18, 2016.
- [5] "An Internet Based Wireless Home Automation System for Multifunctional Devices". IEEE Consumer Electronics, Vol.51, No.4, pp. 1169-1174.