

MICROCONTROLLER BASED POWER SYSTEM STABILITY CONTROL BY USING GSM TECHNOLOGY

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Abstract:

This paper focuses on the design and implementation of the Smart Grid (SG) through efficient use of the accessible resources with slight modification. The main part of the our work is the fabrication of a cost effective GMS based smart energy meter which displays readings on LCD, the instant power consumption at user side, sends and receives information from Grid through GSM modem. The power consumption on grid station of each user is continuously monitored through SMS. A specified load is permitted to each user; if the load exceeds the limit then a warning is send to the specific user by SMS Caster to reduce the load within specified limits to avoid electricity cut off after 5 minutes. Home Energy Management unit is designed and fabricated for easy monitoring and control of house hold appliances on the Graphical User Interface to facilitate the user, it involves the implementation using GSM.

Keywords: GMS, LCD, SMS Caster.

1. INTRODUCTION

Work continued and a launch date for the new GSM system of 1991 was set for an initial launch of a service using the new cellular technology with limited coverage and capability to be followed by a complete roll out of the service in major European cities by 1993 and linking of the areas by 1995.

Existing System	Proposed System
<ul style="list-style-type: none"> ➤ In existing system, the EB workers will go and check whether normal or overload ➤ There is no scheduling method is available. <p>Drawbacks</p> <ul style="list-style-type: none"> ➤ Power demand is high. ➤ Power loss is high. ➤ System will overload. ➤ Manpower is needed. 	<ul style="list-style-type: none"> ➤ In this system we will track whether the load is normal or over load. ➤ GSM technology is quickly sent the messages to EB section. So it help to reduce the overload. ➤ So we can easily maintain our electricity power consumption. <p>Advantages</p> <ul style="list-style-type: none"> ➤ Low cost ➤ Reduce the power demand. ➤ Efficient power distribution

Meanwhile technical development was taking place. Initial trials had shown that time division multiple access techniques offered the best performance with the technology that would be available. This approach had the support of the major manufacturing companies which would ensure that with them on board sufficient equipment both in terms of handsets, base stations and the network infrastructure for GSM would be available. The aim to launch GSM by 1991 proved to be a target that was too tough to meet. Terminals started to become available in mid 1992 and the real launch took place in the latter part of that year. With such a new service many were sceptical as the analogue systems were still in widespread use. Nevertheless by the end of 1993 GSM had attracted over a million subscribers and there were 25 roaming agreements in place. The growth continued and the next million subscribers were soon attracted.

2. OPERATION

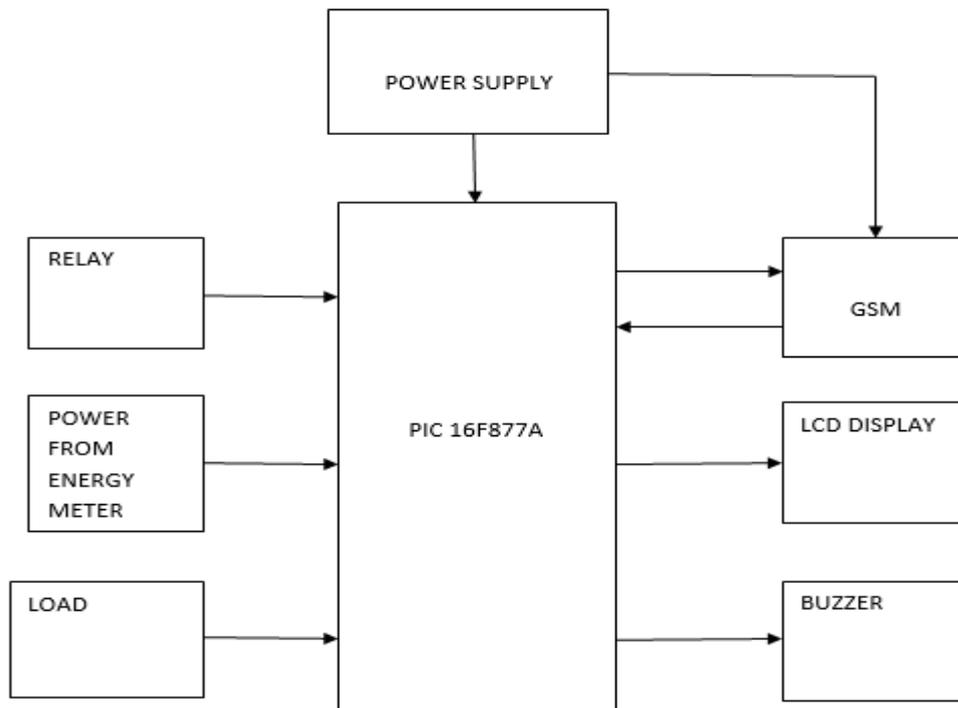


Fig.1. Block Diagram

The PIC16F877A CMOS FLASH-based 8-bit microcontroller is upward compatible with the PIC16C5x, PIC12Cxxx and PIC16C7x devices. It features 200 ns instruction execution, 256 bytes of EEPROM data memory, self programming, an ICD, 2 Comparators, 8 channels of 10-bit Analog-to-Digital (A/D) converter, 2 capture/compare/PWM functions, a synchronous serial port that can be configured as either 3-wire SPI or 2-wire I2C bus, a USART, and a Parallel Slave Port. The stack operates as a circular buffer. This means that after the stack has been PUSHed eight times, the ninth push overwrites the value that was stored from the first push. The tenth push overwrites the second push (and so on). Each time the main program execution starts at address 0000 - Reset Vector. The address 0004 is "reserved" for the "interrupt service routine" (ISR). If we plan to use an interrupt, our program will begin after the Interrupt Vector; and if not we can start to write from the beginning of

the Reset Vector. Some of the memory is divided into the pages that are designed for write/burn the program into them; the remaining memory (Stack, Interrupt Vector, and Reset Vector) is hardware registers.

3. CIRCUIT CONFIGURATION

A GSM modem is a wireless modem that works with a GSM wireless network. A wireless modem behaves like a dial-up modem. The main difference between them is that a dial-up modem sends and receives data through a fixed telephone line while a wireless modem sends and receives data through radio waves. The working of GSM modem is based on commands, the commands always start with AT (which means ATtention) and finish with a <CR> character.

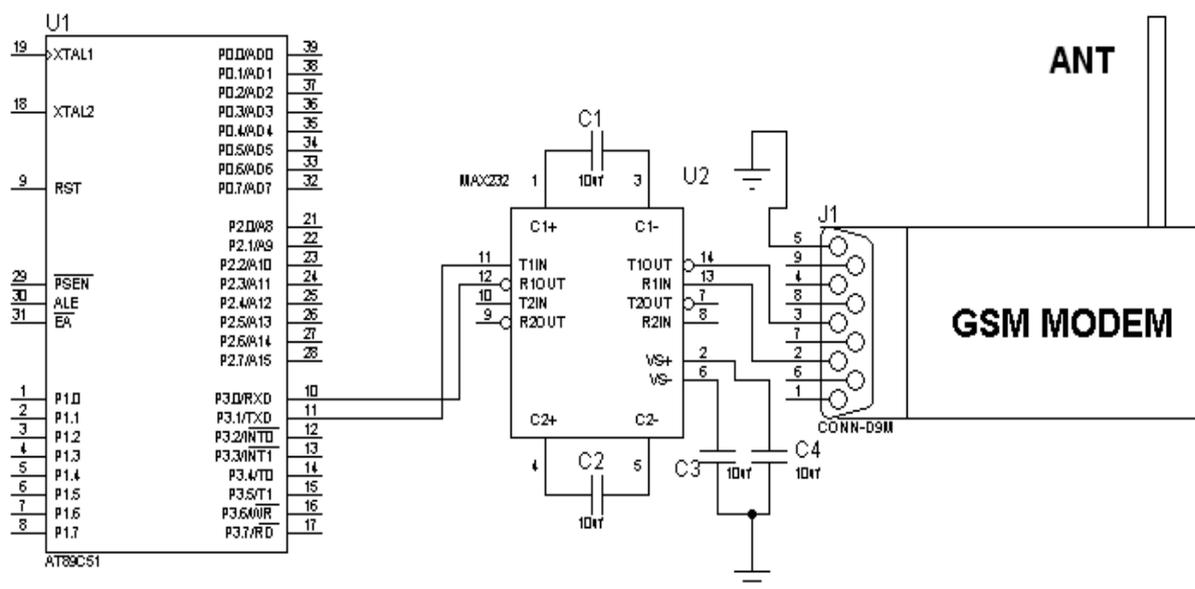


Fig.2.Circuit Configuration

For example, the dialing command is ATD<number>; ATD3314629080; here the dialing command ends with semicolon. The AT commands are given to the GSM modem with the help of PC or controller. The GSM modem is serially interfaced with the controller with the help of MAX 232. Here max 232 acts as driver which converts TTL levels to the RS 232 levels. For serial interface GSM modem. Global system for mobile communication (GSM) is a globally accepted standard for digital cellular communication. GSM is the name of a standardization group established in 1982 to create a common European mobile telephone standard that would formulate specifications for a pan-European mobile cellular radio system operating at 900 MHz.

With GSM being used in many countries outside Europe this reflected the true nature of the name, which had been changed from Group Special Mobile to Global System for Mobile communications. The number of subscribers grew rapidly and by the beginning of 2004, the total number of GSM subscribers reached 1 billion. Attaining this figure was celebrated at the Cannes 3GSM conference held that year. Figures continued to rise, reaching and then well exceeding the 3 billion mark. In this way, the history of GSM has shown it to be a great success. A GSM modem is a

wireless modem that works with a GSM wireless network. A wireless modem behaves like a dial-up modem. The main difference between them is that a dial-up modem sends and receives data through a fixed telephone line while a wireless modem sends and receives data through radio waves.

CONCLUSION

As mentioned in earlier sections of this SMS tutorial, computers use AT commands to control modems. Both GSM modems and dial-up modems support a common set of standard AT commands. You can use a GSM modem just like a dial-up modem. A specified load is permitted to each user; if the load exceeds the limit then a warning is send to the specific user by SMS Caster to reduce the load within specified limits to avoid electricity cut off after 5 minutes. Home Energy Management unit is designed and fabricated for easy monitoring and control of house hold appliances on the Graphical User Interface to facilitate the user, it involves the implementation using GSM.

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