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Vehicle Survillence System Using Wireless Technology

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Abstract: The main objective of this project is to develop an embedded system, which will track the vehicle using GPS and send an SMS to a Remote device (our mobile) through and lock the engine and gives loud alarm and SMS the theft position of the vehicle when the vehicle theft is happened. It also measures the engine temperature which gives us the information that if our vehicle is running or is at rest.

The process of working of this project is explained as follows, this total equipment of this project is placed in a vehicle. The authorized person details with mobile number and some predefined parameters are stored in the SMS or a missed-call to GSM modem from the authorized mobile after registering with the GSM modem. Then we can send a SMS to the modem to block the vehicle. Whenever we find that our vehicle is missing then simply sends an SMS then vehicle will not move forward anymore. Then the microcontroller gets the location of vehicle found by the GPS modem and sends the message to the same mobile using GSM modem. the message includes the location at which the vehicle is present at that particular instant of time using the GSM modem. This project is implemented on microcontroller based GSM communication.

Keywords: GPS (Global Positioning System), GSM (Global Service for Mobile Applications), SMS (Short Message Service), Microcontroller.

I Introduction

Now a days the vehicle theft rate has been increasing day by day, when compared to previous decade the theft rate has been increased by 54% in order to avoid this vehicle theft we have designed our project to provide security to the vehicles. Main aim of our project is to provide security to the vehicle in very reasonable cost so in this project we are using the basic microcontroller AT89C51 for cost effective and also for easy understanding. In this project we used assembly programing for better accuracy. This project consist of GPS and GSM modules which helps use to trace the vehicle any where on the globe. Here we are using American 24 standard satellite system which consist of space segment, user segment and control segment to trace the vehicle perfectly using triangulation method and here GSM is used to send the exact location of the vehicle to our remote devices(mobile phone).here we use heat sensor(thermistor) to measure the engine temperature which gives the exact information that our vehicle is motion or in rest. Here relay is connected to fuel tank and whenever we find that our vehicle is missing then we send lock command relay automatically on the fuel lock and the buzzer which is connected to the relay automatically beeps this will threatens the thief and it blows until we send the POS command and then it indicates the theft position.

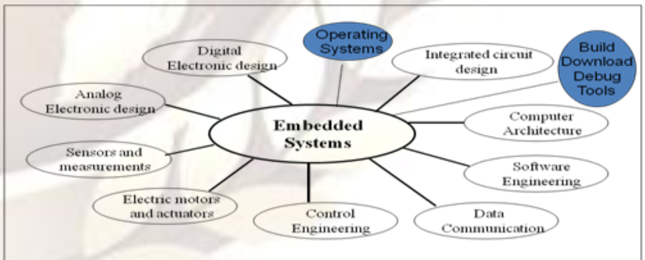
By this project we can save our vehicles from theft and this project is implemented o microcontroller based GSM communication.

II Introduction To Embedded Systems

Embedded System is a combination of hardware and software used to achieve a single specific task. An embedded system is a microcontroller-based, software driven, reliable, real-time control system, autonomous, or human or network interactive, operating on diverse physical variables and in diverse environments and sold into a competitive and cost conscious market.

An embedded system is not a computer system that is used primarily for processing, not a software system on PC or UNIX, not a traditional business or scientific application. High-end embedded & lower end embedded systems. High-end embedded system - Generally 32, 64 Bit Controllers used with OS. Examples Personal Digital Assistant and Mobile phones etc .Lower end embedded systems. Examples Small controllers and devices in our everyday life like Washing Machine, Microwave Ovens, where they are embedded in.

1.1.2Systemdesigncalls



Embedded system design calls on many disciplines

Figure :1.1 Embedded system design calls on many discilplines

1.2 Introduction to GSM

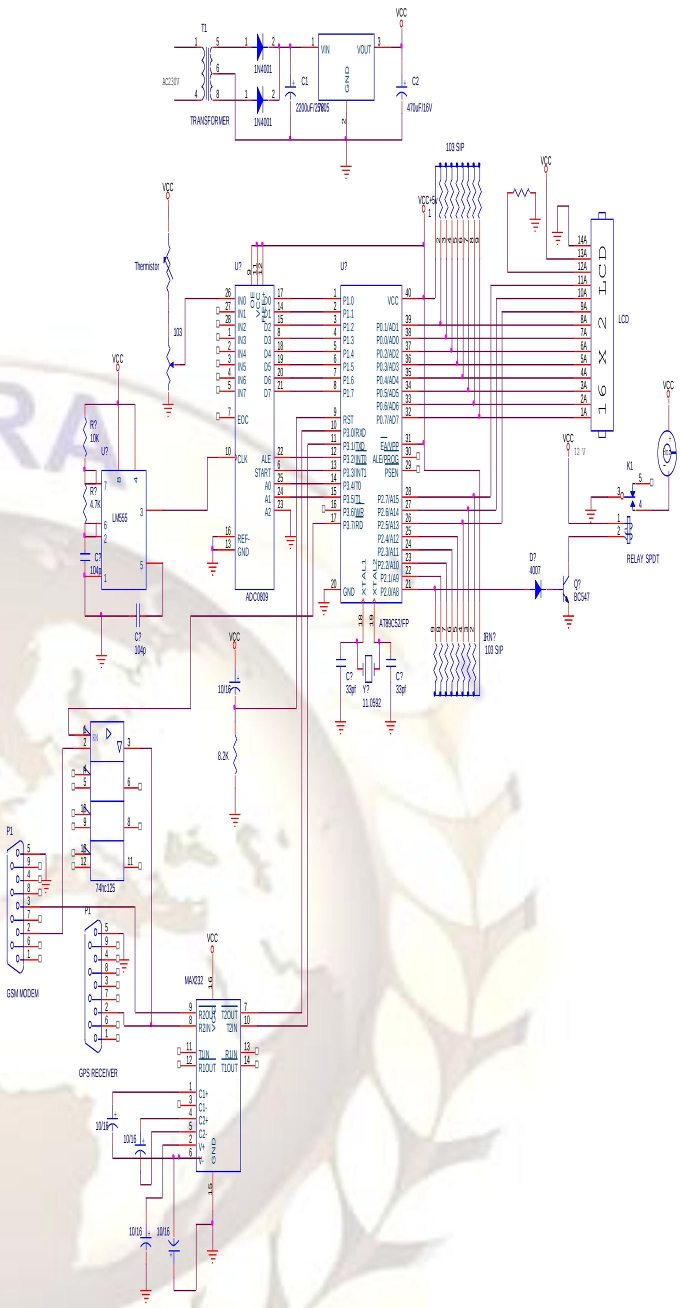
Global system for mobile communication (GSM) is a globally accepted standard for digital cellular communication. GSM is the name of a standardization group established in 1982 to create a common European mobile telephone standard that would formulate specifications for a pan-European mobile cellular radio system operating at 900 MHz, It is estimated that many countries outside of Europe will join the GSM partnership. Cellular is one of the fastest growing and most demanding telecommunications applications. Throughout the evolution of cellular telecommunications, various systems have been developed without the benefit of standardized specifications. This presented many problems directly related to compatibility, especially with the development of digital radio technology. The GSM standard is intended to address these problems.

From 1982 to 1985 discussions were held to decide between building an analog or digital system. After multiple field tests, a digital system was adopted for GSM. The next task was to decide between a narrow or broadband solution. In May 1987, the narrowband time division multiple access (TDMA) solution was chosen. GSM provides recommendations, not requirements. The GSM specifications define the functions and interface requirements in detail but do not address the hardware. The reason for this is to limit the designers as little as possible but still to make it possible for the operators to buy equipment from different suppliers. The GSM network is divided into three major systems: the switching system (SS), the base station system (BSS), and the operation and support system (OSS).

2.3 POWER SUPPLY:

The power supply section is the important one. It should deliver constant output regulated power supply for successful working of the project. A 0-5V Vcc is used for our purpose; the primary of this power is connected in to main supply through on/off switch & fuse for protecting from overload and short circuit protection. The secondary is connected to the diodes convert from 12V AC to 12V DC voltage, which is further regulated to +5v, by using IC 7805.

2.2 SCHEMATIC DIAGRAM



3.1 Micro Controller (AT89C52):

The AT89C52 is 80C51 microcontrollers with 128kB Flash and 1024 bytes of data RAM.A key feature of the AT89C52 is its X2 mode option. The design engineer can choose to run the application with the conventional 80C51 clock rate (12 clocks per machine cycle) or select the X2 mode (6 clocks per machine cycle) to achieve twice the throughput at the same clock frequency. Another way to benefit from this feature is to keep the same performance by reducing the clock frequency by half, thus dramatically reducing the EMI.

The Flash program memory supports both parallel programming and in serial In-System Programming (ISP). Parallel programming mode offers gang-programming at high speed, reducing programming costs and time to market. ISP allows a device to be reprogrammed in the end product under software control. The capability to field/update the application firmware makes a wide range of applications possible. The AT89C52 is also In-Application Programmable (IAP), allowing the Flash program memory to be reconfigured even while the application is running.

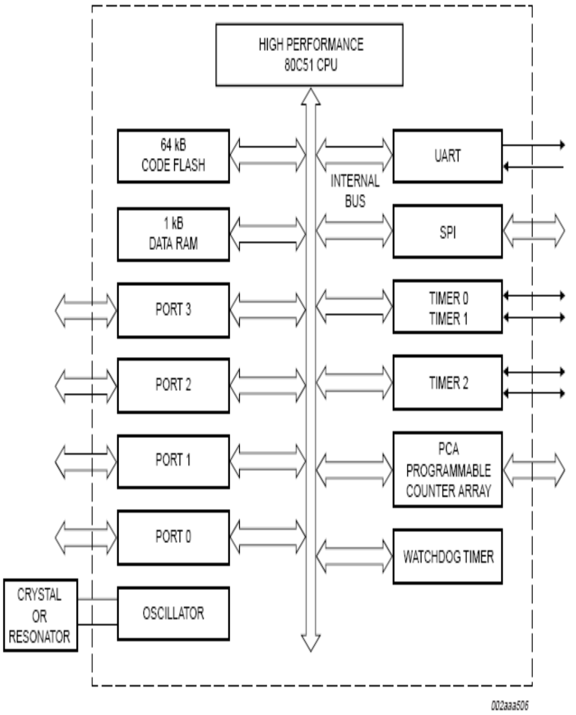


Figure 1.2 Block Diagram Of Micro Controller

3.2 Functional Description:

Power-On reset code execution

Following reset, the AT89C52 will either enter the Soft ICE mode (if previously enabled via ISP command) or attempt to auto baud to the ISP boot loader. If this auto baud is not successful within about 400 ms, the device will begin execution of the user code.

3.3 In-System Programming (ISP)

In-System Programming is performed without removing the microcontroller from the system. The In-System Programming facility consists of a series of internal hardware resources coupled with internal firmware to facilitate remote programming of the AT89C52 through the serial port. This firmware is provided by Atmel and embedded within each AT89C52 device. The Atmel In-System Programming facility has made in-circuit programming in an embedded application possible with a minimum of additional expense in components and circuit board area. The ISP function uses five pins (VDD, VSS, TxD, RxD, and RST). Only a small connector needs to be available to interface your application to an external circuit in order to use this feature.

Input/output (I/O) ports 32 of the pins are arranged as four 8-bit I/O ports P0–P3. Twenty-four of these pins are dual purpose with each capable of operating as a control line or part of the data/address bus in addition to the I/O functions. Details are as follows:

Port 0 : This is a dual-purpose port occupying pins 32 to 39 of the device. The port is an open-drain bidirectional I/O port with Schmitt trigger inputs. Pins that have 1s written to them float and can be used as high-impedance inputs. The port may be used with external memory to provide a multiplexed address and data bus. In this application internal pull-ups are used when emitting 1s. The port also outputs the code bytes during EPROM programming. External pull-ups are necessary during program verification.

Port 1: This is a dedicated I/O port occupying pins 1 to 8 of the device. The pins are connected via internal pull-ups and Schmitt trigger input. Pins that have 1s written to them are pulled high by the internal pull-ups and can be used as inputs; as inputs, pins that are externally pulled low will source current via the internal pull-ups. The port also receives the low-order address byte during program memory verification. Pins P1.0 and P1.1 could also function as external inputs for the third timer/counter i.e.:

(P1.0) T2 Timer/counter 2 external count input/clockout

(P1.1) T2EX Timer/counter 2 reload/capture/direction control

Port 2: This is a dual-purpose port occupying pins 21 to 28 of the device. The specification is similar to that of port 1. The port may be used to provide the high-order byte of the address bus for external program memory or external data memory that uses 16-bit addresses. When accessing external data memory that uses 8-bit addresses, the port emits the contents of the P2 register. Some port 2 pins receive the high-order address bits during EPROM programming and verification.

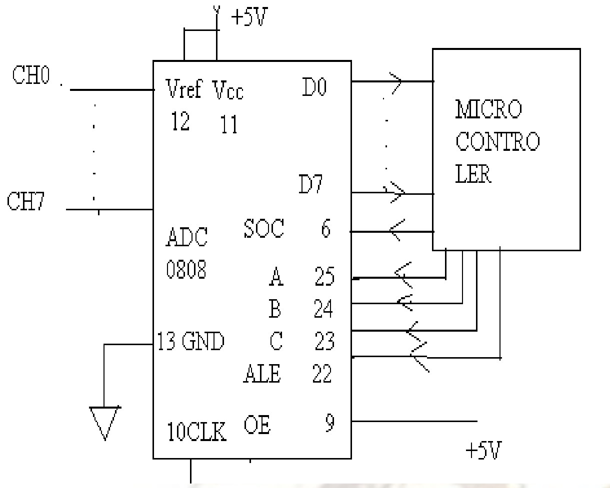
Port 3: This is a dual-purpose port occupying pins 10 to 17 of the device. The specification is similar to that of port 1. These pins, in addition to the I/O role, serve the special features of the 80C51 family *B.*

4.1 ADC 0808

The function of an ADC is to produce a digital word which represents the magnitude of some analog voltage and current. Our application is using the type, Successive approximation ADC. Commonly available converters have analog multiplexers on their inputs. This allows the one converter to digitize any one of the 8 input signals. The in put channel to be digitized is determined by a 3-bit address applied to the address inputs of the device. An ADC with a multiplexer on its inputs is often called a data acquisition system, or DAS. In addition to the data lines, there are two other successive approximation ADC signals we need to interface to the microcomputer for the data transfer. The first of these is a START CONVERT signal which you output from the microcomputer to the ADC to tell it to do a conversion for you. The second signal is an EOC signal which the ADC outputs to indicate that the conversion is complete and that the word on the outputs is valid. If the time between input and output is more, then we use EOC signal. The OE signal is used to connect the output data lines. If it is grounded, the output will be zero.

The ADC 0808 is used as an 8-input DAS. You tell the device which input signal you want digitized with a 3-bit address you send to the ADC, ADB and ADA inputs. This 8-input device was chosen so that other control loops could be added later.

The voltage drop across an LM329 low-drift zener is buffered by an LM308 amplifier to produce a Vcc and a Vref of 5.12V for the ADC. With this reference voltage, the ADC will have 256 steps of 20mV each. The 3-bit address of the desired input.



555 timer will send an interrupt signal approximately once every second. An interrupt procedure is used to keep a count of how many interrupts have occurred. This count is equal to the number of seconds that have passed. In the mainline we setup stack and data segments. We initialize the data segment register, stack segment register, and stack pointer register as before. Each time, it receives an interrupt from the 555 timer, it executes the interrupt-service procedure for the interrupt. In this procedure we decrement the seconds count in the named memory location and test to see if the count is sown to zero yet. If the seconds count is not zero, execchannel is first sent to the multiplexer inputs. After at least 50ns, the ALE input is sent high. After another few seconds, the SOC input is sent high and then low. Thin the ALE input is brought low again. Then the 8-bit value can be read in.

4.2 555TIMER

The 555 timer circuit is not very accurate, but it is inexpensive, and it is good enough for this application simply returns to the mainline program until the next interrupt from the 555 or from some other source occurs. The advantage of this approach is that the interrupt-service procedure takes only a few micro seconds. The rest of the time , it is free to run the mainline program.

4.3 DC Specifications

DC SPECIFICATIONS

Symbol	Parameter	Test Conditions V_{CC} (V)			Value T_A = 25 °C 54HC and 74HC Min.	Typ.	Max.	-40 to 85 °C 74HC Min.	Max.	-55 to 125 °C 54HC Min.	Max.	Unit
V_{IH}	High Level Input Voltage	2.0			1.5			1.5		1.5		V
		4.5			3.15			3.15		3.15		
		6.0			4.2			4.2		4.2		
V_{IL}	Low Level Input Voltage	2.0					0.5		0.5		0.5	V
		4.5					1.35		1.35		1.35	
		6.0					1.8		1.8		1.8	
V_{OH}	High Level Output Voltage	2.0	V_I = V_{IH} or V_{IL}	I_O=-20 μA	1.9	2.0		1.9		1.9		V
		4.5			4.4	4.5		4.4		4.4		
		6.0			5.9	6.0		5.9		5.9		
		4.5		I_O=-6.0 mA	4.18	4.31		4.13		4.10		
		6.0		I_O=-7.8 mA	5.68	5.8		5.63		5.60		
V_{OL}	Low Level Output Voltage	2.0	V_I = V_{IH} or V_{IL}	I_O= 20 μA		0.0	0.1		0.1		0.1	V
		4.5				0.0	0.1		0.1		0.1	
		6.0				0.0	0.1		0.1		0.1	
		4.5		I_O= 6.0 mA		0.17	0.26		0.33		0.40	
		6.0		I_O= 7.8 mA		0.18	0.26		0.33		0.40	
I_I	Input Leakage Current	6.0	V_I = V_{CC} or GND				±0.1		±1		±1	μA
I_{OZ}	3 State Output Off-state Current	6.0	V_I = V_{IH} or V_{IL} V_O = V_{CC} or GND				±0.5		±5		±10	μA
I_{CC}	Quiescent Supply Current	6.0	V_I = V_{CC} or GND				4		40		80	μA

5. RS-232

Information being transferred between data processing equipment and peripherals is in the form of digital data which is transmitted in either a serial or parallel mode. Parallel communications are used mainly for connections between test instruments or computers and printers, while serial is often used between computers and other peripherals. Serial transmission involves the sending of data one bit at a time, over a single communications line. In contrast, parallel communications require at least as many lines as there are bits in a word being transmitted (for an 8-bit word, a minimum of 8 lines are needed).Serial transmission is beneficial for long distance communications, whereas parallel is designed for short distances or when very high transmission rates are required.

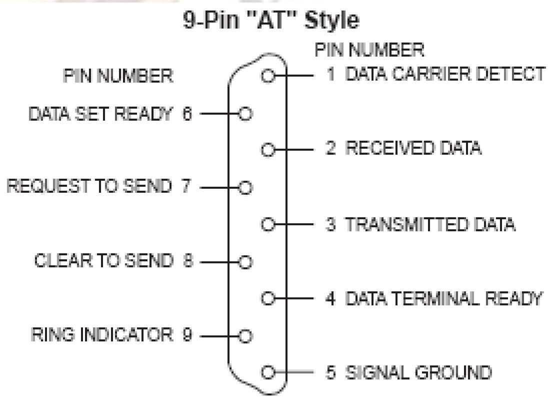
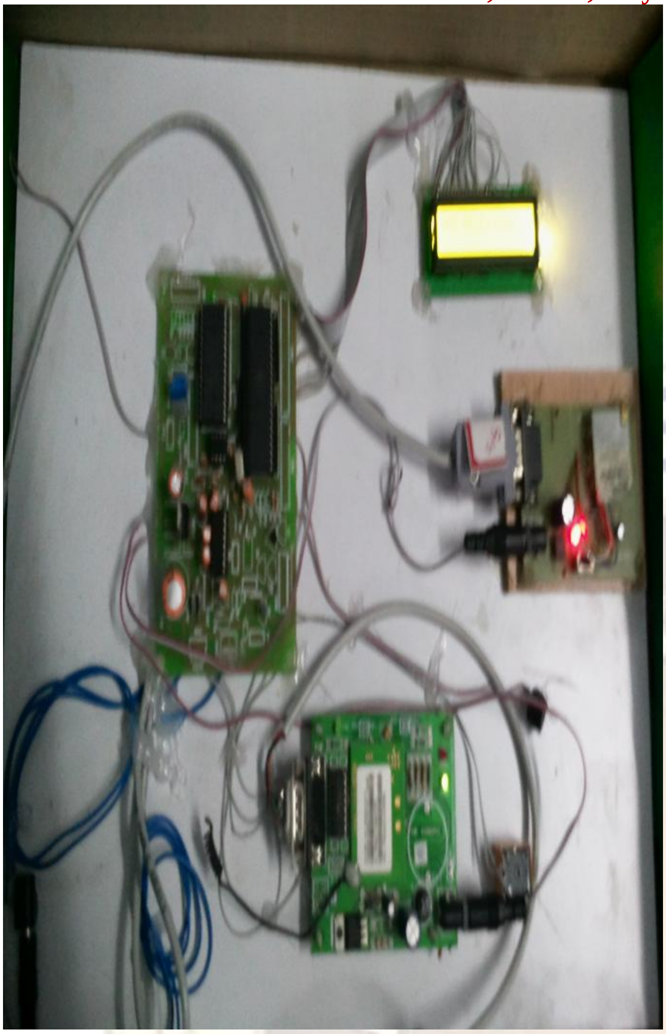


Fig:1.4 RS-2329-PIN

6. Kit Diagram



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