The Electronics Bulletin Board

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Abstract— Today, we are living in mobile world. We would like to do all work using technology like wireless technology so we use GSM technology for this project and we want to make a system which is useful in any institute for messaging system. "THE ELECTRONIC BULLETIN BOARD" is one type of display board which displays the messages but the bulletin board is used SMS from our mobile phone and the message which we are typed in our text box will be received by the system and display it on the LCD display. There is validation stage where the system check the number is valid that means the sender is admin or not then the system will do its work. After validation the message convey to microcontroller through RS232 IC and then the message display on LCD display using interfacing with microcontroller and all messages will be stored in the system and we can display it on the board. The Bulletin Board can be used at any Educational Institutes, Any Corporate Offices, Seminar Halls, Public Areas like (gardens, streets, on roads etc), Advertising sites etc. It uses GSM technology and microcontroller so it is based on Embedded System. We can also implement this project for mobile based robot for mechanical work.

Key words: microstrip, antenna, array, Ku- Band

I. INTRODUCTION

The Electronic Bulletin Board has four main blocks namely
1) GSM Modem
2) RS232
3) Microcontroller
4) LCD Display.

There are at least three interfacing circuits, MAX-232 with microcontroller, LCD display with microcontroller, and MAX-232 with GSM MODEM.

The display boards are usually huge in size and can't be used for simulation purpose. So LCD displays are used for testing. It is not a hidden fact that interfacing a MODEM with a normal PC is quite easy with the help of the AT commands sent to it from the Hyper Terminal window. But we must take into account the fact that the MODEM requires a wired connection at one end and wireless at the other. Dedicating a general purpose computer at each and every site of the display boards, although makes the task a lot easier but is too expensive to be a possibility. Hence we employ Philips P89V51RD2BN microcontroller with 64 Kb EEROM storage memories. The complexity of coding substantially increases, but once programmed the module works at its robust best since it is a dedicated embedded system and not a general purpose computer. The design procedure involves identifying and assembling all the required hardware and ensuring fail safe interfacing between all the components. Then we have the coding process which has to take care of the delays between two successive transmissions and most importantly the validation of the sender's number. The number of valid mobile numbers can be more than one. The limiting constraint is the RAM of the microcontroller rather than the coding complexity.

II. INTERFACING

There are two interfacing with 8051 Microcontroller. First, for collect the information from GSM Modem and second is to display the information on LCD (testing purpose) or LED panel(s).

A. Interfacing with GSM Modem:

GSM modem is a wireless modem which is use cellular network for communication between two objects.

This is widely used in this type of communication.

SIM300 and SIM900 are two types of GSM modem available in market. We are using SIM300 for our prototype. The difference between two GSM modules is band. SIM900 and SIM300 work on quad and tree bands respectively.

The GSM modem is nothing but a mobile phone but GSM modem work through serial connection with computer using AT command sets. Each manufacturer has own AT commands so you have to collect your unique AT command for your device. We have to check our GSM modem using Microsoft hyper terminal and run some fundamental commands like AT, AT+CPIN for ready or not and check for password protection. We will program our microcontroller using AT command of sending message or read messages from inbox of GSM modem.

GSM modem works on serial communication so we have to interface our microcontroller with RS232 which is serial I/O interfacing device. It converts voltage level of microcontroller to TTL logic level

The current terminology classifies data communication equipment as DTE (data terminal equipment) or DCE (data communication equipment). DTE refers to terminals and computer that send and receive data while DCE refers to communication equipment, such as modems, that are responsible for transferring data.

The simplest connection between a PC and micro-controller requires minimum of three pins, TxD, RxD, and ground, as shown in figure 2. Notice that the pins are interchanged.

B. Interfacing with LCD Display:

One of the most common devices attached to an 8051 is an LCD display. Some of the most common LCDs connected to the 8051 are 16x2 and 20x2 displays. This means 16 characters per line by 2 lines and 20 characters per line by 2 lines, respectively. In recent years the LCD is finding widespread use replacing LEDs. This is due to the following reasons like 1) declining prices 2) Ability to display numbers, characters and graphics.3) Ease of programming.

Fortunately, a very popular standard exists which allows us to communicate with the vast majority of LCDs regardless of their manufacturer. The standard is referred to

as HD44780U, which refers to the controller chip which receives data from an external source (in this case, the 8051) and communicates directly with the LCD. The 44780 standard requires 3 control lines as well as either 4 or 8 I/O lines for the data bus. The user may select whether the LCD is to operate with a 4-bit data bus or an 8-bit data bus. If a 4-bit data bus is used the LCD will require a total of 7 data lines (3 control lines plus the 4 lines for the data bus). If an 8-bit data bus is used the LCD will require a total of 11 data lines (3 control lines plus the 8 lines for the data bus).

C. Control Signals for LCD Display:

1) EN (Enable):

The EN line is called "Enable." This control line is used to tell the LCD that you are sending it data. To send data to the LCD, your program should make sure this line is low (0) and then set the other two control lines and/or put data on the data bus. When the other lines are completely ready, bring EN high (1) and wait for the minimum amount of time required by the LCD datasheet (this varies from LCD to LCD), and end by bringing it low (0) again.

2) RS (Register Select):

The RS line is the "Register Select" line. When RS is low (0), the data is to be treated as a command or special instruction (such as clear screen, position cursor, etc.). When RS is high (1), the data being sent is text data which should be displayed on the screen. For example, to display the letter "T" on the screen you would set RS high

3) R\W(Read or Write):

The RW line is the "Read/Write" control line. When RW is low (0), the information on the data bus is being written to the LCD. When RW is high (1), the program is effectively querying (or reading) the LCD. Only one instruction ("Get LCD status") is a read command. All others are write commands--so RW will almost always be low. Finally, the data bus consists of 4 or 8 lines (depending on the mode of operation selected by the user). In the case of an 8-bit data bus, the lines are referred to as DB0, DB1, DB2, DB3, DB4, DB5, DB6, and DB7.

We make no effort to place the Data bus into reverse direction. Therefore we hard wire the *R/W* line of the LCD panel, into write mode. This will cause no bus conflicts on the data lines. As a result we cannot read back the LCD's internal Busy Flag which tells us if the LCD has accepted and finished processing the last instruction. This problem is overcome by inserting known delays into our program. The 10k Potentiometer controls the contrast of the LCD panel. Nothing fancy here. As with all the examples, I've left the power supply out. You can use a bench power supply set to 5v or use a onboard +5 regulator. Remember a few de-coupling capacitors, especially if you have trouble with the circuit working properly.

III. FIGURES

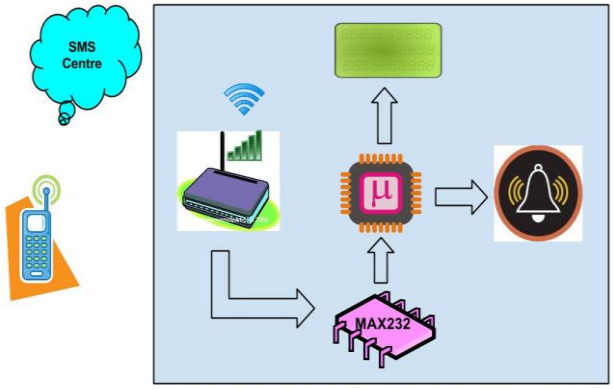

Fig. 1: Design Overview

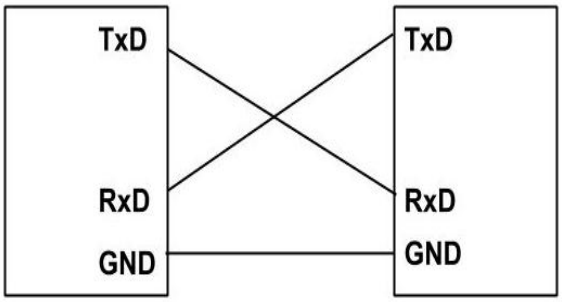

Fig. 2: Null Modem Connection

IV. TABLES

Pin	Symbol	I\O	Description
1	GND	-	Ground
2	Vcc	-	Power Supply
3	Vee	-	Contrast control
4	RS	I	Register Select
5	RW	I	Read or Write
6	E	I	Enable
7	DB0	I\O	The 8 bit data bus
8	DB1	I\O	The 8 bit data bus
9	DB2	I\O	The 8 bit data bus
10	DB3	I\O	The 8 bit data bus
11	DB4	I\O	The 8 bit data bus
12	DB5	I\O	The 8 bit data bus
13	DB6	I\O	The 8 bit data bus
14	DB7	I\O	The 8 bit data bus

Table 1: Pin Configuration of 8 Bit LCD Connections

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