SMS Based Wireless Access Device With Enhanced Security

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***Abstract*—This paper proposes and implements a low cost security system device using GPS and GPRS. The system reads the current position of the user using GPS and the address is sent via the GSM network. A mobile application is developed using J2ME. The current available software products in the market like VithU[1], only sends the messages to the respective numbers. But in the worst case scenario, it is not possible to open that application and send messages. This application is not feasible in the worst case scenario.**

In our proposed system we are providing the new features like connecting hardware belt with software which tracks the location using GPS[2]-[4]. This system sends the messages to the nearest police station and predefined numbers by pressing the single key placed on the hardware belt.

***Index Terms*— GPS, Microcontroller, Bluetooth Modem**

I. INTRODUCTION

Now a days there are number of facilities which provides a security for individuals, but on our research we concluded that these are not enough secure applications. The rate of women rape, child kidnapping in many countries are increasing at a higher rate[5]. Self defense and self protection are an important priority for individuals. The objective of this system is to provide more security to an individuals using single key placed on hardware. Global Positioning System(GPS) is a 24-hour world wide service. It provides accurate, three-dimensional information of the location as well as precision velocities and timing services. The service is free of cost to everybody. Google Map is used for mapping the location. Using this feature we tracks the users current location and send the fetched information to the predefined numbers using GSM service. GSM/GPRS is one of the best possible communication media for the present and the future.

II. SYSTEM OVERVIEW

User starts the mobile software and enter a predefined password to start the device .The mobile will start sending ping command to microcontroller after starting Bluetooth and wait for response. The microcontroller will response to each ping query to ensure the connectivity between Bluetooth modem and mobile. The microcontroller also keeps on monitoring the mobile's Bluetooth for its continuity and also monitors the key. When key is pressed, the signal sends to the mobile and mobile will fetch the current GPS location and will send this information to the predefined numbers using SMS method.

III. PROCESS FLOW DESCRIPTION

- Initialization sequence algorithm:

1.Start the mobile software and enter a predefined username and password to start the device.
2.The mobile will start and it will start sending ping command to microcontroller using Bluetooth and wait for response of the mobile device to start communication.
3.The microcontroller will response to each ping query to ensure the connectivity between Bluetooth modem and mobile.
4.The microcontroller also keeps on monitoring the mobile bluetooth for its connectivity and also monitores the key.
5.When the key is pressed, the signal sends to the mobile. and mobile will fetch the current GPS location and will send this information to the predefined numbers using SMS .

- Operational sequence algorithm:

1.If user press the key then goto step 4 else monitor the key press.
2.If user's belt loop is disconnected then goto step 4
3.If bluetooth connection get disconnected then goto step 4 else monitor the bluetooth.
4.GPS will fetch the current location of user Using Longitude and Latitude, create SMS Packet including address and send it to the predefined numbers[6].

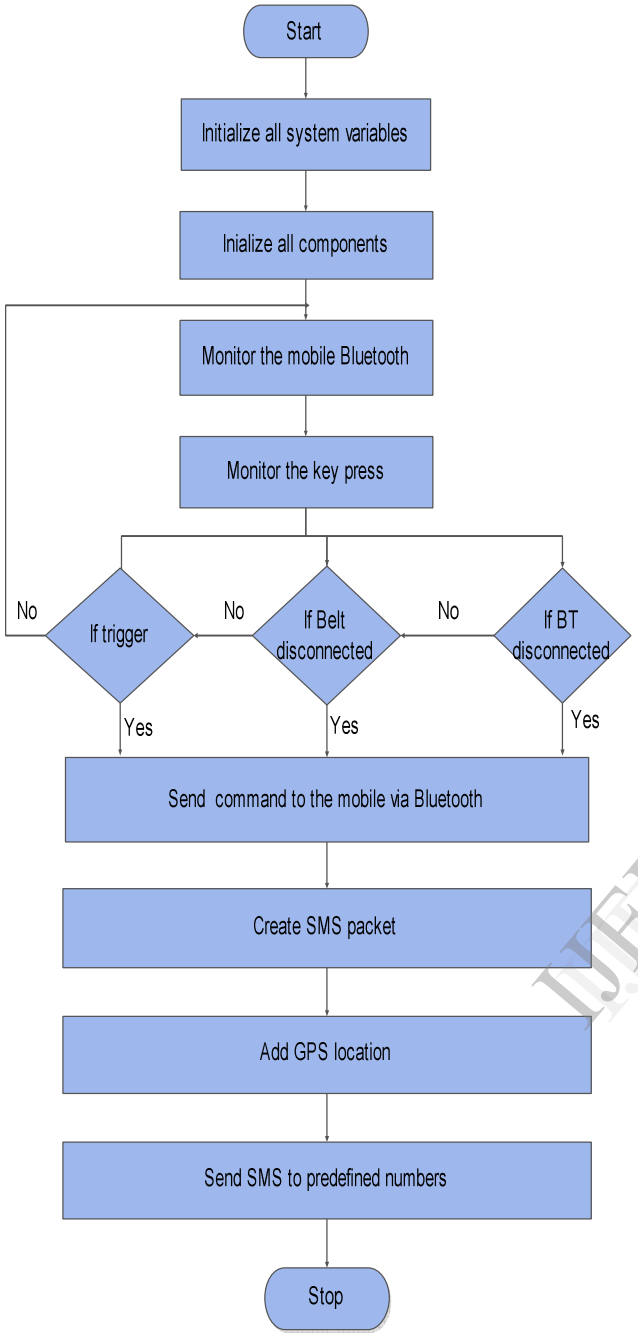

Fig. 1. System Flow Diagram

IV. HARDWARE SPECIFICATION

The single board module designed here consists of the microcontroller, Bluetooth modem, Battery, Key. The block diagram of the system is as shown in the Figure 1.

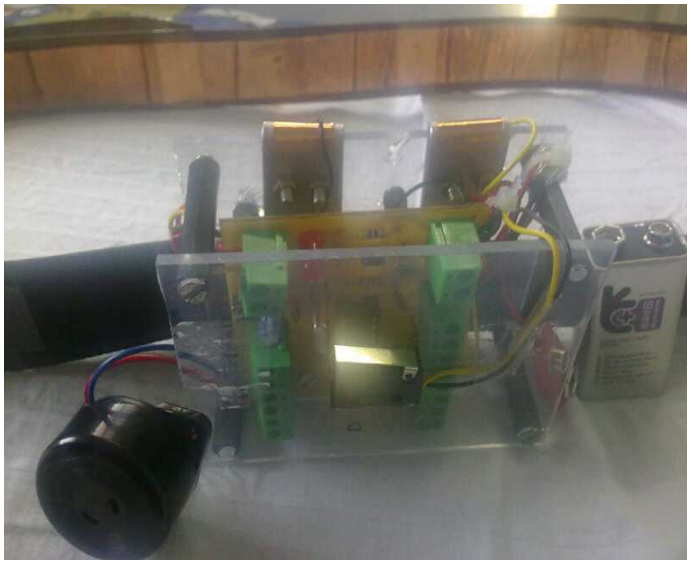

Fig. 2.Image of the circuit

The 20 pin 8051 Microcontroller[7] used has high performance & low power consumption device. Logic functions allows microcontroller to mimic sophisticated electronics circuits. Microcontroller program will help to make decision and perform functions based on situations and events. The RN-42 Bluetooth modem has Low power sleep mode, perfect for short range(its range is about 10 to 100 meter).It can be used for fast data communication with the mobile device. 8051 microcontroller and Bluetooth modem require power supply 5V and 3.3V respectively.

This hardware device is placed on a belt with a conducting loop.

When user wants to unlock the belt on its own, he/she has to enter the password which is set by the user. To start the device enter the predefined password on the mobile software. The microcontroller keeps on monitoring the mobile bluetooth for its connectivity and also monitores the key.

V. SOFTWARE SPECIFICATION

A mobile application is developed using J2ME. Java Platform, Micro Edition, or Java ME, is a Java platform designed for embedded systems (mobile devices are one kind of such systems). Target devices range from industrial controls to mobile phones (especially feature phones) and set-top boxes. Java ME was formerly known as Java 2 Platform, Micro Edition (J2ME).

Java ME devices implement a profile. The most common of these are the Mobile Information Device Profile aimed at mobile devices, such as cell phones, and the Personal Profile aimed at consumer products and embedded devices like set-top boxes and PDAs. Profiles are subsets of configurations, of

which there are currently two: the Connected Limited Device Configuration (CLDC) and the Connected Device Configuration (CDC) [8].

The Connected Limited Device Configuration (CLDC) contains a strict subset of the Java-class libraries, and is the minimum amount needed for a Java virtual machine to operate. CLDC is basically used for classifying myriad devices into a fixed configuration.

A configuration provides the most basic set of libraries and virtual-machine features that must be present in each implementation of a J2ME environment. When coupled with one or more profiles, the Connected Limited Device Configuration gives developers a solid Java platform for creating applications for consumer and embedded devices. The configuration is designed for devices with 160KB to 512KB total memory, which has a minimum of 160KB of ROM and 32KB of RAM available for the Java platform.

Designed for mobile phones, the Mobile Information Device Profile includes a GUI, and a data storage API, and MIDP 2.0 includes a basic 2D gaming API. Applications written for this profile are called MIDlets. Almost all new cell phones come with a MIDP implementation, and it is now the de facto standard for downloadable cell phone games. However, many cell phones can run only those MIDlets that have been approved by the carrier [9]

In our mobile to Start the application user has to enter predefined password. The application will start and it will start sending ping command to microcontroller using Bluetooth and wait for response of the mobile device to start communication.

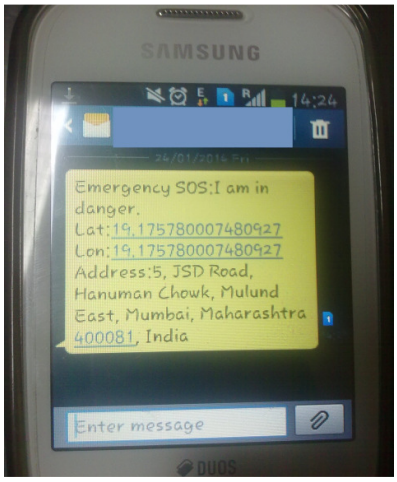

Fig 3.Example of received SMS

The microcontroller will response to each ping query to ensure the connectivity between Bluetooth modem and mobile. The microcontroller also keeps on monitoring the mobile bluetooth for its connectivity and also monitores the key.When the key is pressed, the signal sends to the mobile. and mobile will fetch the current GPS location and will send this information to the predefined numbers using SMS. The received message will be looked like shown in above fig 3.

The interface of our application is look like a following. The Connect BT button is use for connecting the Bluetooth modem with the mobile Bluetooth. There are some predefined mobile number on which we want to send alert message. By pressing the SOS button also, the message will be sent to the predefined numbers. To activate and deactivate the application or the whole system user has to enter a predefined password and can activate or deactivate the application. After activating the application the GPS will fetch the current LOG and LAT of that area and according to that the address will be fetched.

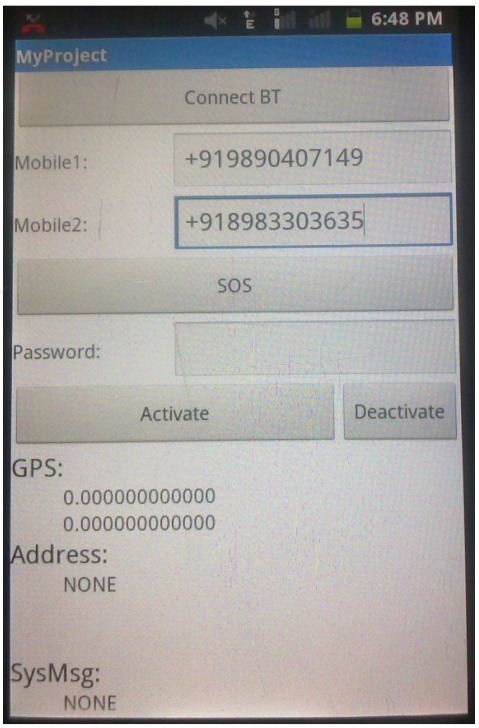

Fig.4. Interface of mobile application

VI. CONCLUSION

Till date, technology was used for the ease of humans. But being the need of the hour, now its time for using it for the sake of safety also. The idea of protection belt is just an example of that. This is a perfect device which will prevent every individual from becoming a victim of any kind of assault.

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