



## CHILD TRACKING DEVICE

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### ABSTRACT:

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### [1] INTRODUCTION

Embedded system is a computer system with specified functions within large devices with real time computations. It is the combination of both hardware and software. Embedded systems play a vital role in the development of technologies. The integration of hardware and software can be used in many fields such as industries, automobiles, medical and other commercial applications especially in the field of automation. One of the main driving forces to start this wearable device is that the children are more vulnerable to danger, and they are frequently kidnapped. In this modern world everyone is chasing behind money so that the parents cannot look after their children on the whole day and also, they cannot restrict the children to stay inside the confined area. So, for the continuous monitoring of the children's location this device can be used. If the child is missed in any crowd, then they can also alert their parent and neighbours. The devices present in the present world to monitor the location and activities of the children uses Bluetooth and Wi-Fi. These are the main drawbacks as these technologies cover only a small coverage area. To reduce these shortcoming SMS (short message service) is used to provide reliable communication. The platform on which the project runs is Atmel89s52 microcontroller. The sending of latitude and longitude information to the parents can be achieved using GSM (Global System for Mobile communication) module. The exact coordinate points can be found using the GPS (Global Positioning System).

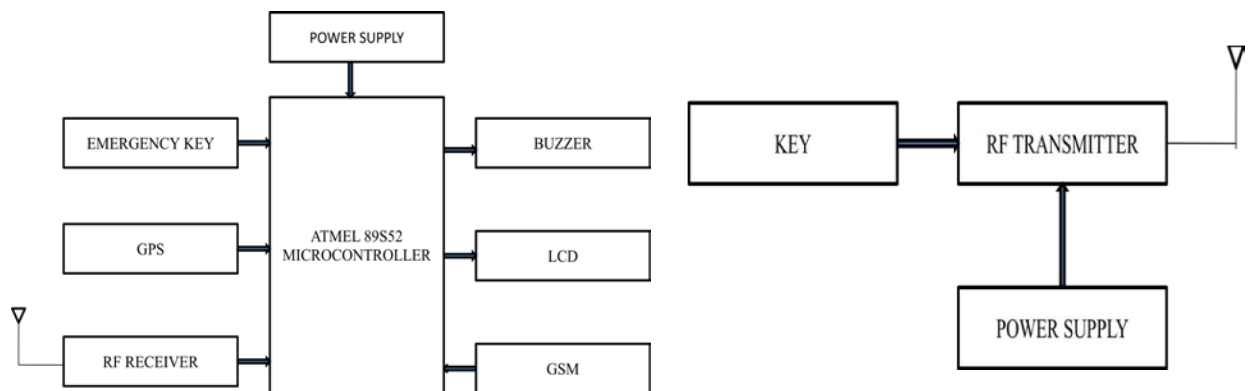
The other improvement in the system is that the device is user friendly, and the parents are not in the compulsion to remember any code just by pressing the key the position can be found. The

buzzer in the device is to indicate the presence of missing child in the crowd or to show that the child is in danger to the by passers. This device can be made into wearable form like watch and wristband so that the children can use it in an efficient manner.

This device consists of two modules. The first module is with the parents. It comprises of RF transmitter and key which are connected to the battery. The second module is the child module, and it is the rest of the device. It comprises microcontroller, emergency key, GPS, GSM, buzzer and LCD display. The LCD display is used to indicate the operation that the device performs. Thus, the main objective of this paper is to help the parents to easily track the location or rescue their children when they are in danger.

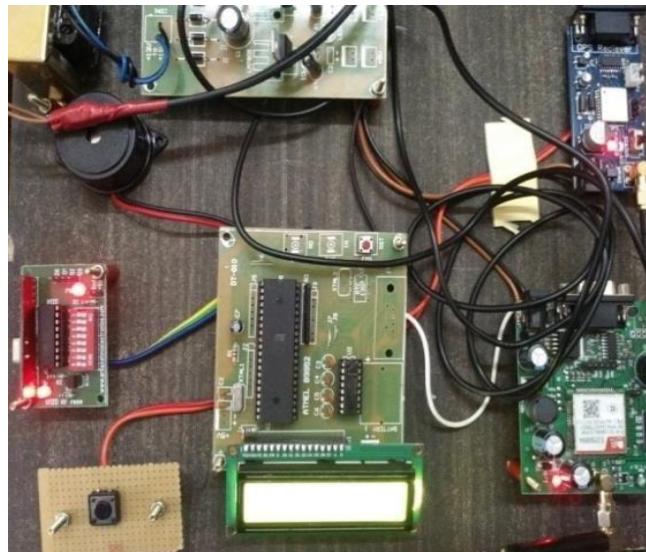
## [2] SYSTEM DESIGN AND ARCHITECTURE

The following section deals with the child and parent module of child tracking device.



## [3] HARDWARE USED

The system is controlled by ATME89S52 microcontroller. The power supply is used to provide +5V to the microcontroller and RF receiver and +12V to GPS and GSM. The GPS module is being triggered by the GSM shield [1]. The GSM is connected to the pin 1 of port 3. The RF receiver is connected to pin 3 of port 1 and it is used to receive the signal from the parents. If the key is pressed by parent or child, the GSM stimulate the GPS to obtain the location and the SMS with the latitude and longitude of the child is sent to the parent mobile. The parents can make use of the coordinates to find the location of the children and distance between them. The additional key factor is the activation of buzzer by the children. This helps the parent to identify the children in the crowd. The LCD data pins are connected to the entire port 2. The use of LCD is to display the present working condition of the device.



### 1) Microcontroller

The microcontroller used in the device is ATME89S52. It is a 40 pins microcontroller working in the voltage range of +4V to +5.5V. It is low power, high-performance device which can be reprogrammed many numbers of times. It consists of four ports, and they be used for dual purpose. One is for input/output operation and the other is to sense the externally connected sensors or switches.

The RF receiver, GPS and key gives input to the microcontroller. The output is displayed in LCD, activation of buzzer and the SMS is sent via GSM. The microcontroller is connected to the +5V power supply. The ATME89S52 is programmed using Embedded C. The controller works based on the programs.

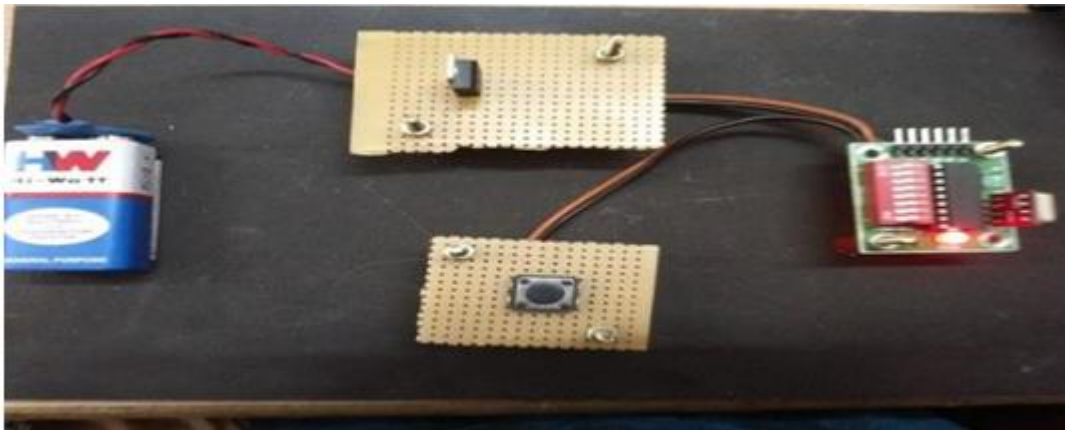
### 2) RF Transmitter and Receiver

Radio frequencies are used mainly because of the following reasons. It does not require the Line of Sight for communication, and it has a wide range of operating voltage. The RF transmitter and receiver module is made with HT12E and HT12D. It operates normally in 433 MHz RF frequency. The carrier frequency is fully suppressed, and the transmitter draws no power when the logic 0 is sent. The carrier is about 4.5mA when the logic 1 is sent. The transmitter sent the data in the serial way, and it is received by the tuned receiver. The RF transmitter is used to send the signal from parents that they need to know the location of their children.

### 3) Emergency Key

The emergency key is associated with the child. If they feel insecure or lost in the crowd, they can activate the buzzer by just pressing the emergency key. Once the key is pressed the location is sent to the parents. This helps the parents to find the children and rescue them if it is necessary.

The parent also has the key with them. When this key is pressed the RF transmitter transmits signal which activates the child module and in turn the location of the children is obtained.



#### 4) GSM Module

The GSM Module used is SIM800A. It is interfaced to microcontroller via RS232 which is used to convert the serial data to TTL logic. This is needed because the microcontroller can work only with TTL logic. The primary reason for using the GSM shield as the mode of communication over Wi-Fi and Bluetooth was that this device was aimed at being accessible to any cell phone user and not necessarily an expensive Smartphone user [1]. It is user friendly so there is no need for the parent to learn about new technology.

#### 5) LCD

The LCD used to display the function of the device is 16x2 LCD. 16x2 represents it can display two lines. Each line can hold 16 characters. The LCD contains command and data registers. If the value of RS=0 then command register is activated and RS=1 data register is activated. The address 0x40 to 0x47 contains the first character and prints it to the screen by sending 0 command and the address 0x48 to 0x55 contains the second character and it gets printed when command 1 is given to LCD.



#### [4] CONCLUSION

This Child Tracking Device can be used to obtain the real time location of the child by parents. The location can be sent to desired number of users. The alarm can indicate the discomfort of the child and the persons near them can help the child. This device uses SMS based technology, so the parents can use it more efficiently. In future this device can be improved in battery lifetime. The camera can also be attached so that the accurate environment where the child lies can be monitored by the parents.

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