WOMEN SAFETY AND SECURITY USING MSP430

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Abstract
The right to be free from abuse, harassment, and discrimination applies to women. By removing the obstacles created by an unsafe workplace, women may demonstrate their potential as people and as contributors to the workforce and economies. The World Health Organization estimates that one in three (35%) women worldwide have experienced physical or sexual violence at some point in their lives. Women's protection can be advanced with the help of the project "WOMEN SAFETY AND SECURITY USING MSP430." Location data in the form of latitude and longitude can be determined using the detection and messaging system. A woman can activate the switch when she is in danger and needs assistance. By hitting the switch, the complete system is enabled, and after a short while, an SMS alert with the latitude and longitude of a few pre-defined numbers is delivered via GSM and GPS. The safety of the women is the project's primary goal.
Keywords: MSP430, GSM Modem, GPS Receiver, Relay Driver

I. INTRODUCTION
Security is the state of being protected from harm or loss. Security and safety are related concepts in general. The difference between the two is a stronger emphasis on security against external threats. The breach of security is caused by people or acts that violate the conditions of protection. Although "security" is sometimes used interchangeably with "safety," in technical terms, it signifies that something has been secured in addition to being secure.

MSP430 was used in the design of this project. In this project, a GPS and GSM modem-based system for detecting women's safety is shown. The technology can inform the neighbours by connecting to an alarm system. Microcontroller, GSM Modem, and GPS receiver make up this detection and messaging system. The GPS receiver receives latitude and longitude data in the form of location data from satellites.

The GSM modem uses the microcontroller to process this information and send it to the user. The MCU is interfaced with a GSM modem. The predetermined mobile number receives an SMS from the GSM modem. A woman can use the switch that is designated for her when she is in danger and needs to defend herself. By pressing the switch, the complete system is enabled, and an SMS containing the concerned person's location and GSM and GPS data is sent right away.

II. LITERATURE REVIEW
The idea behind [2] Basavaraj Chougula's SMART GIRLS SECURITY SYSTEM is to create a portable gadget that looks like a regular belt. It is made out of an Arduino board, GSM/GPS modules, pressure sensors, and an alarm that screams.

A GPS gadget and specialised software are used in [3] Poonam Bhilare's "GPS and GSM based car monitoring and women employee security system" to track the location of the vehicle and provide alerts and messages with an emergency button trigger.

Using GPS and GSM, [4] R.A. Mahajan created a report titled "A Survey on Women's Security System." In this application, the security mechanism is carried out utilising SMS, Audio to Text Transfer, and actual location tracing. The system can send offline and internet emergency SMS messages. If the victim doesn't have access to the internet, they can send an offline SMS directly to a

specific emergency contact number. Also, the application sends the victim's precise position and emergency contact information.

A GPS and GSM-based women's security system was suggested by [5] Ms. Sonali. In this research, a quick reaction mechanism that supports women in difficult situations is proposed. When someone is about to harass her, she only needs to click the button, and a few pre-defined numbers in terms of latitude and longitude will receive an SMS alert with the location information.

[6] Mohamad Zikriya's Smart Gadget for Women Safety using IoT System prioritises self-defense by administering a tolerable electric shock to the aggressor, which lowers the agitated state and aids women in escaping a dangerous situation. We also tend to implement a device that is activated automatically and offers safety for women in public spaces, including workplaces and transportation vehicles like cabs, taxis, buses, and auto rickshaws.

III. EXISTING METHOD

There are apps like "Security alert app" and "Women security app," as shown in figure 1 both of which require an internet connection in order to use GPS to track the user's whereabouts. Only Android smartphones may use these, and they are only available to educated women. There might not be much time left for the woman to unlock her phone, launch the app, and push the SOS button. they have a lot of shortcomings.

Fig.1: Woman Safety alert App (Existing Model)

IV. PROPOSED METHOD

The idea behind this work was to inform the women's parents about their whereabouts at the moment. The victim's current location is tracked using a GPS system, and the message is delivered to the pre-specified numbers via a GSM. The device must be turned ON when the woman detects danger. When the device is turned on, it uses GPS to track the women's present location and usesGSM to transmit emergency alerts to pre-registered mobile numbers. The suggested method consists of a panic button, which a woman can directly hit if she feels threatened. In addition to sending messages to the registered mobile numbers, this device also permits the buzzer to ring in that region. Also, this system is utilised to protect children as well as women because it is so simple to use— children merely need to touch a button.
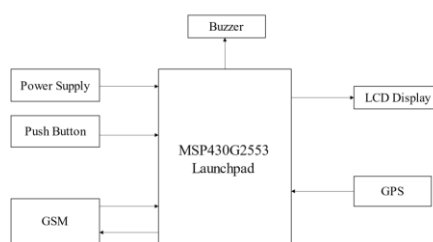
V. WOMEN SECURITY SYSTEM

Fig.2: Block diagram of Women Security System

a) MSP430(MSP430G2553)
b) LCD Display
c) GSM Module
d) GPS Module
e) Power Supply
f) Push Button

a) MSP430

The MSP430 is a 16-bit microcontroller that contains everything needed to start developing on the ultra-low-powerMSP430 microcontroller platform. MSP430 Launchpad is a hardware development tool as shown in figure 3. It is an easy way to start developing on the MSP430 MCUs, with on-board emulation for programming and debugging as well as buttons and LEDs for a simple user interface.

VCC and VSS are the supply voltage and ground for the whole device (the analog and digital supplies are separate in the16 –pin package).

P1.0-P1.7, P2.6, and P2.7 are for digital input and output, grouped into portsP1 and P2.

TACLK, TA0 and TA1 are associated with Timer_A TACLK can be used as the clock input to the timer,while TA0 and TA1 can be it her input so outputs. These can be used on several pins because of the importance of the timer.

A0, A1, and soon upto A4 ,are inputs to the analog-to-digitalconverter.It has four differential channels, each of   which has negative and positive inputs. VREF is the reference voltage for the converter.

ACLK and SMCLK are outputs for the microcontroller's clock signals. The secan be used to supply a clock to external components or for diagnostic purposes.

SCLK, SDO, and SCL are used for the universal serial interface, which communicates with external devices using the serial peripheral interface(SPI) or inter-integrated circuit(I2C) bus.

XIN and XOUT are the connections for a crystal, which can be used to provide an accurate, stable clock frequency.

RST is an active low reset signal.Active low means that it remains high near VCC for normal operation and is brought low near VSS to reset the chip. Alternative notations to show the active low nature are_RST and RST.

NMI is the nonmaskable interrupt input,which allows an external signal to interrupt the normal operation of the program.

TCK ,TMK , TCLK, TDI, TDO, and TEST form the full JTAG interface used to program and debug the device.

SBWTDIO and SBWTCK provide the Spy-Bi-Wire interface, an alternative to the usual JTAG connection that saves pins.

Features:

- Low Supply-Voltage Range: 1.8 V to 3.6 V.
- Two 16-Bit Timer_ A with three compare registers.
- Five power saving modes.
- 16-Bit RISC Architecture, 62.5-ns Instruction(A/D) Conversion Cycle Time.
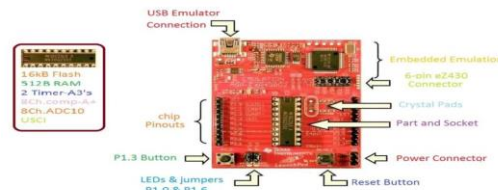

Fig.3: MSP430 Launchpad

b) LCD Display

LCD (Liquid Crystal Display) is a type of flat panel display which uses liquid crystals in its primaryform of operation. It displays the digital format output as shown in figure 4.
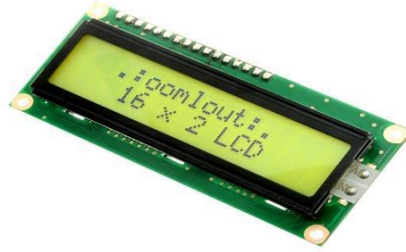
Fig.4: LCD Display

c) GPS Module

GPS receivers are generally used in smartphones, fleet management system, military etc., for tracking or finding location. Global Positioning System (GPS) is a satellite-based system that uses satellites and ground stations to measure and compute its position on Earth. GPS module is as shown in figure 5.

Fig.5: GPS Module

d) GSM Modem

GSM module is designed for wireless radiation monitoring through SMS as shown in figure 6. This module is able to receive serial data from radiation monitoring devices and transmit the data as text SMS to a host server.
1.Receive, send or delete SMS messages in a SIM.
2. Read, add, search phonebook entries of the SIM.
3. Make, receive or reject a voice call.

Fig.6: GSM Modem

e) Power Supply

A power supply is an electrical device that supplies electric power to an electrical load. The main purpose of a power supply is to convert electric current from a source to the correct voltage, current, and frequency to power the load.

f) Push Button

The push button switch is usually used to turn on and off the control circuit as shown in figure 7. These are generally metal or thermoplastic switches that are intended to grant easy access to user.

Fig.7: Push Button

VI. WORKING

The power supply consists of a stepdown transformer 230/12V AC which is converted to DC using a bridge rectifiers. The controller used is MSP430G2553. It is interfaced with a push button, GPS Module, GSM Modem and a 16X2 LCD display. When the switch is pressed, if GPS receives signal, GPS will start calculating the current location in the form of latitude and longitude and those data will be displayed on LCD and send it as SMS to the registered mobile numbers using a GSM modem and display as "EMERGENCY", "PLEASE HELP ME, I'M IN PROBLEM". So that the LCD displays the whole process when the SMS alert is initialized it displays as the "INITIALIZING" and after the message is sent then at last it displays as "NO PROBLEM HERE". And alsodisplays the commands like "AT", "ATE0". "AT+CMGF=1", "AT+CMGF=1, 2, 0,0.
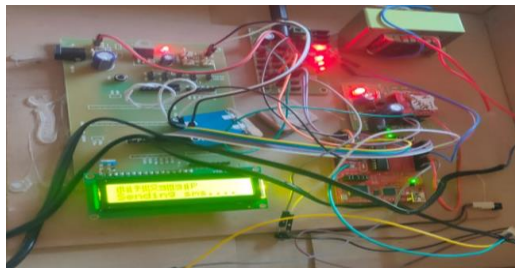
VII. RESULT

Fig.8: Experimental Setup

The power supply is given to microcontroller. The 16×2 LCD display is connected to the microcontroller to display the status of operation. The GPS is connected to P1_6, P1_7. LCD is connected to P2_0, P2_1, P2_2, P2_3, P2_4, P2_5. And GSM, push button, led is connected to Tx(P1_1), Rx(P1_2), P1_5, P1_4. The experimental setup is as shown in figure8 then the location is detected as shown in figure 8.

Fig.9: Location Detected On LCD

As the GPS receives signal, GPS will start calculating the current location in the form of latitude and longitude and those data will be displayed on LCD. The message will be as shown in figure 9.
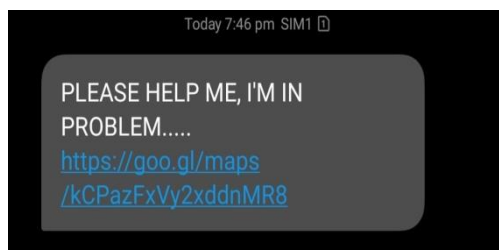

Fig.10: SMS sent to registered mobile number

GSM will send SMS to registered mobile numbers for every 3 seconds like "EMERGENCY", "PLEASE HELP ME, I'M IN PROBLEM" and attached with link of location information that can

be open by google maps as shown in figure 10.

VIII. CONCLUSION

The goal of this project is to design and create a device that can benefit from personal security features and emergency response capabilities that are beneficial for women in criminal situations. It is a low-cost system that can keep the information of the members in a certain area and issue a prompt alarm in the event of a crime against women. Women are given security by this. Today's requirement is to feel safe and secure.

IX. FUTURE SCOPE

With a camera, a microphone, as well as additional functionality. This allows us to photograph and record the audio of a person who is in distress, and then communicate that data using GPS and GSM modules.Connect this system to a laptop, smartphone, or other mobile device.By keeping Nano size materials, the kit size gets reduced.Using wireless GPS Module and wireless Panic button the carrying of the kit can be avoided.

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