IOT BASED WOMEN SAFETY   JACKET

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Abstract: In today's world, women safety has become a major issue as they can't step out of their house at any given time due to physical/sexual abuse and a fear of violence. Even in the 21st century where the technology is rapidly growing and new gadgets were developed but still women's and girls are facing problems. Even today in India, women can't move at night in secluded places and even at day time crowded places hundreds and thousands of incidents of physical/sexual abuse happens to every day women in this country. Among other crimes, rape is the fastest growing crime in the country today. In this paper we have implemented women safety system on microcontroller via GSM & GPS modem and zapper circuit.

This paper focuses on a security system that is designed solely to serve the purpose of providing security to women so that they never feel helpless while facing such social challenges. The system consists of various modules such as GSM shield (SIM 900A), Arduino ATMega328 board, GPS (GY-GPS6MV2), screaming alarm (APR 9600), a set of pressure sensors for activation and power supply unit. The Delhi Nirbhaya case that triggered the whole nation was the greatest motivation for this system. It was high time we women needed a change.

Index Terms: IOT, Auto-configuration, GSM module, GPS, safety jacket, Electro shock circuit

I. INTRODUCTION

This is an intelligent security system for women.Women all over the world are facing much unethical physical harassment. This acquires a fast pace due to lack of a suitable surveillance system. Our project is a venture to resolve this problem. The systems mainly consist of a monitoring device, the output of which is processed to identify insecure environments. Upon identifying unsafe environments system will send message to near-by control room also turn on alarms placed all around the area letting help from others. The Internet of Things (IOT) is the inter-networking of physical devices, vehicles (also referred to as "connected devices" and "smart devices"), buildings, and other items embedded with electronics, software, sensors, actuators, and network connectivity which enable these objects to collect and exchange data. Once it is established that the person is in danger, the proposed fear sensing system strobes Androidbased mobile phone to send a message to preselected number Simultaneously.

The IOT allows objects to be sensed or controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into computer-based systems, and resulting in improved efficiency, accuracy and economic benefit in addition to reduced human intervention.

When IOT is augmented with sensors and actuators, the technology becomes an instance of the more general class of cyber-physical systems, which also encompasses technologies such as smart grids, virtual power plants, smart homes, intelligent, transportation in smart cities. This paper focuses on a security system that is designed solely to serve the purpose of providing security to women so that they never feel helpless while facing such social challenges. The system consists of various modules such as GSM shield (SIM 900A), Arduino ATMega328 board, GPS (GY-GPS6MV2), screaming alarm (APR 9600), a set of pressure sensors for activation and power supply unit. The Delhi Nirbhaya case that triggered the whole nation was the greatest motivation for this system. It was high time we women needed a change.
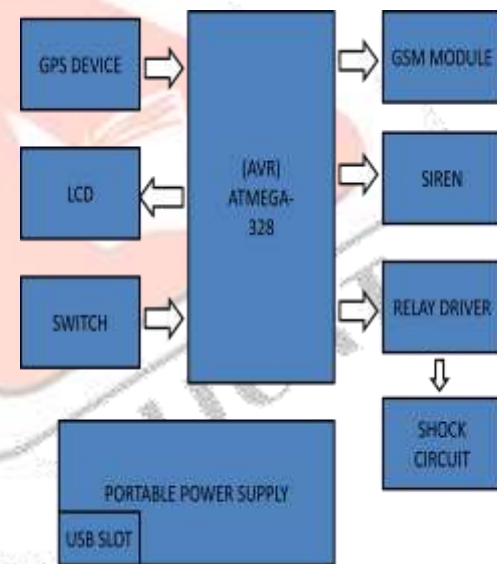
II. BLOCK DIAGRAM AND MODULES DESCRIPTION

Fig.1. Block Diagram

A. Modules and Description
1. Regulated Power Supply

The power supplies are designed to convert high voltage AC ma ins electric ity to a suitable low voltage supply for electronic circuits and other devices. A power supply can by broken down into a series of blocks, each of wh ich performs a part icular function. A DC power supply which ma intains the output voltage constant irrespective of AC mains fluctuations or load variations is known as "Regulated DC Po wer Supply". The 5V regulated power supply system as shown below:
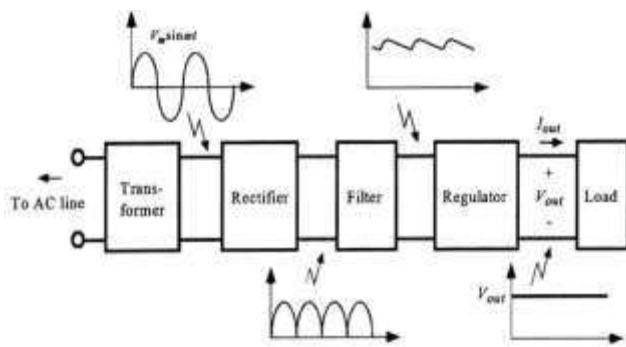
Fig.2. Components of a typic al linear power supply

2. Microcontroller AVR ATMEGA328

ATmega328 is commonly used in many projects and autonomous systems where a simple, low-powered, low-cost micro-controller is needed. Perhaps the most common implementation of this chip is on the popular Arduino development platform, namely the Arduino Uno and Arduino Nano models.

Specifications

The Atmel 8-bit AVR RISC-based microcontroller combines 32 kB ISP flash memory with read-while-write capabilities, 1 kB EEPROM, 2 kB SRAM, 23 general purpose I/O lines, 32 general purpose working registers, three flexible timer/counters with compare modes, internal and external interrupts, serial programmable USART, a byte-oriented 2-wire serial interface, SPI serial port, 6-channel 10-bit A/Dconverter (8 channels TQFP and QFN/MLF packages), programmable watchdog timer with internal oscillator, and five software selectable power saving modes. The device operates between 1.8-5.5 volts. The device achieves throughput approaching 1 MIPS per MHz.

Features:

☐ High Performance, Low Power AVR® 8-Bit Microcontroller.

☐ Advanced RISC Architecture 131 Powerful Instructions – Most Single Clock Cycle Execution

☐ 32 x 8 General Purpose Working Registers

☐ Fully Static Operation– Up to 20 MIPS Throughput at 20 MHz,– On-chip 2-cycle Multiplier.

☐ High Endurance Non-volatile Memory Segments. 4/8/16/32K Bytes of In-System Self-Programmable --- Flash progam memory.

☐ 256/512/512/1K Bytes EEPROM (ATmega48PA/88PA/168PA/328P)

☐ 512/1K/1K/2K Bytes Internal SRAM (ATmega48PA/88PA/168PA/328P)

☐ Write/Erase Cycles: 10,000 Flash/100,000 EEPROM

☐ Peripheral features

–Two 8 bit Timer\counter with separate prescaler and compare mode.

–One 16-bit Timer/Counter with Separate Prescaler, Compare Mode, and Capture

Mode,– Real Time Counter with Separate Oscillator,– Six PWM Channels,– 8-channel 10-bit ADC in TQFP and QFN/MLF package, Temperature Measurement.

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☐ **Scalability**
• Architecture designed for C
• 32 general registers
• C-like addressing modes
• 16- and 32-bit arithmetic support
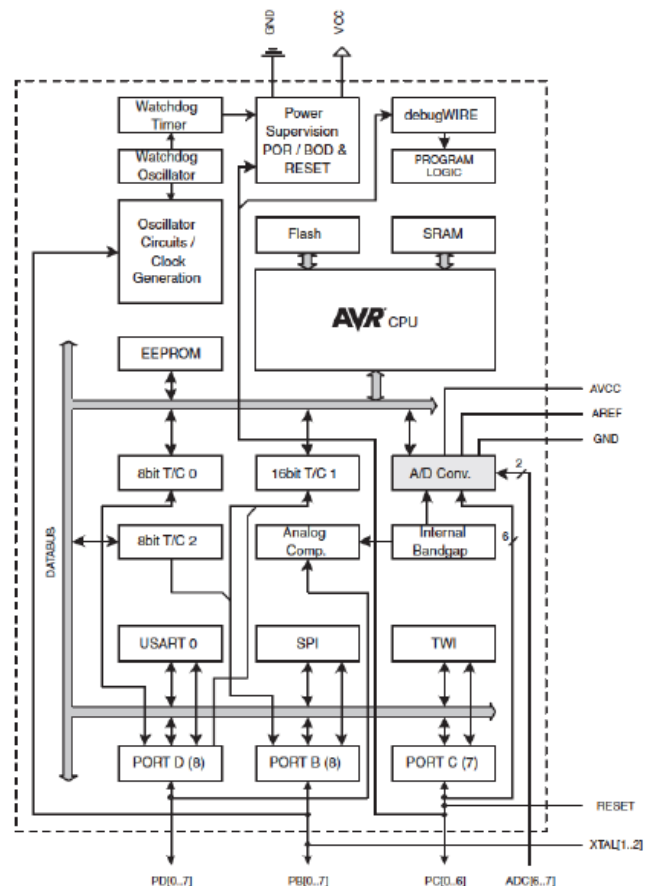• Linear address maps

Fig.3. Block di agram of ATMEGA328

Architectural Overview:

ATmega 328 has 1KB Electrically Erasable Programmable Read Only Memory (EEPROM). This property shows if the electric supply supplied to the micro-controller is removed, even then it can store the data and can provide results after providing it with the electric supply. Moreover, ATmega-328 has 2KB Static Random Access Memory (SRAM). Other characteristics will be explained later. ATmega 328 has several different features which make it the most popular device in today's market. These features consist of advanced RISC architecture, good performance, low power consumption, real timer counter having separate oscillator, 6 PWM pins, programmable serial USART, programming lock for software security, throughput up to 20 MIPS etc. ATmega-328 is mostly used in Arduino. ATmega328 is an eight (8) bit micro-controller. It can handle the data sized of up to eight (8) bits.
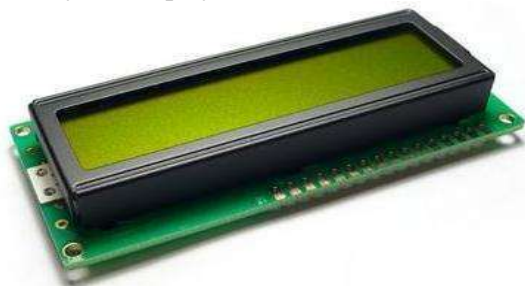
3. Liquid Crystal Display (LCD)

Fig.4. Li qui d Crystal Dis play

Liquid crystal displays (LCD s) have materia ls which combine the properties of both liquids and crystals. Rather than having a me lting point, they have a temperature range within which the molecules are almost as mobile as they would be in a liquid, but are grouped together in an ordered form similar to a crystal. An LCD consists of two glass panels, with the liquid crystal material sand witched in between them. The inner surface of the glass plates are coated with transparent electrodes which define the character, symbols or patterns to be displayed polymeric layers are present in between the electrodes and the liquid c rystal, wh ich makes the liquid crystal molecu les to ma intain a defined orientation angle. One each polarize ris pasted outside the two glass panels. These polarizers would rotate the light rays passing through them to a definite an gle, in a particular d irection. When the LCD is in the off state, light rays are rotated by the two polarizers and the liquid crystal, such that the light rays come out of the LCD without any orientation, and hence the LCD appears transparent. When sufficient voltage is applied to the electrodes, the liquid crystal mo lecules would be a ligned in a specific direct ion. The light rays passing through the LCD would be rotated by the polarizers, which would result in activating / highlighting the desired characters. The LCD"s are lightwe ight with only a few millimete rs thickness. Since the LCD"s consume less power, they are compatible with low power e lectronic circuits, and can be powered for long durations.

The LCD s won"t generate light and so light is needed to read the display. By using backlighting, reading is possible in the dark. The LCD"s have long life and a wide operating temperature range. Changing the display size or the layout size is relat ively simp le which makes the LCD"s more customer friendly. The LCD s used exc lusively in watches, calculators and measuring instruments is the simple seven -segment displays, having a limited amount of numeric data. The recent advances in technology have resulted in better legibility, mo re informat ion displaying capability and a wider temperature range. These have resulted in the LCD s being extensively used in teleco mmunications and entertainment electronics. The LCD s has even started replacing the cathode ray tubes (CRTs) used for the display of text and graphics, and also in small TV applications.
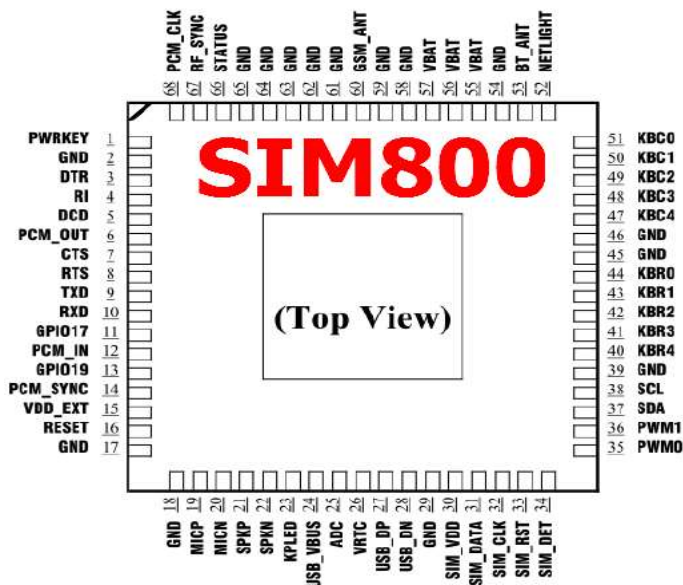
4.GSM Module SIM800

Fig.5. GSM Module SIM800

SIM800 is a quad-band GSM/GPRS module designed for the global market. It works on frequencies GSM 850MHz, EGSM 900MHz, DCS 1800MHz and PCS 1900MHz. SIM800 features GPRS multi-slot class 12/ class 10 (optional) and supports the GPRS coding schemes CS-1, CS-2, CS-3 and CS-4. With a tiny configuration of 24*24*3mm, SIM800 can meet almost all the space requirements in users' applications, such as M2M, smart phone, PDA and other mobile devices. SIM800 has 68 SMT pads, and provides all hardware interfaces between the module and customers' boards. SIM800 is designed with power saving technique so that the current consumption is as low as 1.2mA in sleep mode. SIM800 integrates TCP/IP protocol and extended TCP/IP AT commands which are very useful for data transfer applications.

4. GPS MODULE

Fig.6. GPS Module

A GPS navigation device, GPS receiver, or simply GPS is a device that is capable of receiving information from GPS satellites and then to calculate the device's geographical position. Using suitable software, the device may display the position on a map, and it may offer directions. The Global Positioning System(GPS) uses a global navigation satellite system(GNSS) made up of a network of a minimum of 24, but currently 30, satellitesplaced into orbit by the U.S. Department of Defense.The GPS was originally developed for use by the United States military, but in the 1980s, the United States government allowed the system to be used for civilian purposes. Though the GPS satellite data is free and works anywhere in the world, the GPS device and the associated software must be bought or rented. A GPS device can retrieve from the GPS system location and time information in all weather conditions, anywhere on or near the Earth. A GPS reception requires an unobstructed line of sight to four or more GPS satellites, and is subject to poor satellite signal conditions. In exceptionally poor signal conditions, for example in urban areas, satellite signals may exhibit multipath propagation where signals bounce off structures, or are weakenedby meteorological conditions. Obstructed lines of sight may arise from a tree canopy or inside a structure, such as in a building, garage or tunnel. Today, most standalone GPS receivers are used in automobiles. The GPS capability of smartphones may use assisted GPS (A-GPS) technology, which can use the base station or cell towers to provide the device location tracking capability, especially when GPS signals are poor or unavailable. However, the mobile network part of the A-GPS technology would not be available when the smartphone is outside the range of the mobile reception network, while the GPS aspect would otherwise continue to be available.

5. Electro-Shock Circuit

Electric shock is the physiological reaction, sensation, or injury caused by electric current passing through the (human) body. It occurs upon contact of a (human) body part with any source of electricity that causes a sufficient current through the skin, muscles, or hair.Very small currents can be imperceptible. Stronger current passing through the body may make it impossible for a shock victim to let go of an energized object. Still larger currents can cause fibrillation of the heart and damage to tissues. Death caused by an electric shock is called electrocution.
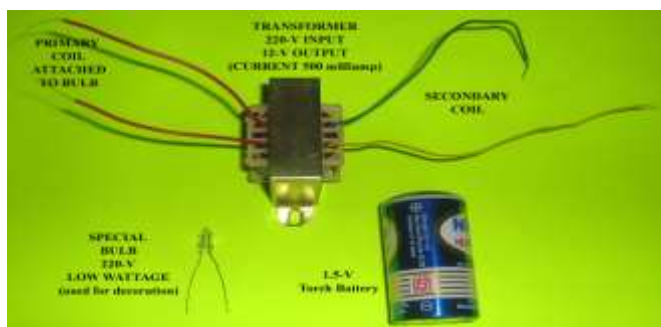

Fig.7. Electro-Shock Circuit

Electric shock is often used to describe an injurious exposure to electricity. Electrical currents can travel through the nervous system and burn out tissue in patches along the way. This can leave bizarre symptoms anywhere on the body and may lead to complex regional pain syndrome. Shocks can be caused by direct or indirect contact. Contact with an exposed conductive part under fault conditions is called direct contact. IEC requires certain degrees of ingress protection against direct contact. Indirect contact protections can be achieved by earthed equipotential bonding and automatic disconnection of supply by using Residual Current Devices.

6.Relay
What is a Relay?

It's a electrical device that functions something like a wired remote control switch. Instead of having the switch you push/flip/whatever do the work of supplying power to whatever you wanted it to, you have it control a relay which then does the real on/off switching work. A mechanical relay does this through the use of an electro magnet - a magnet that is only "on" when there's power running through it - that pulls a set of spring loaded contacts to make or break the connection and achieve the on-off effect. This is called the "coil" or trigger wire - the other wire coming out of the coil is connected to ground. Whenever you apply power to the other coil wire (the trigger), the relay is on. As soon as power to this trigger is turned off, the relay turns off. Simple , huh? There are a lso "solid state" relays that achieve the same effect through transistors. Either one functions the same way, the solid state stuff just has no moving parts to wear out, but they tend to be more expensive and not as readily available since the regular mechanical ones are inexpensively and readily available as very high quality, durable units.

Why is this useful?

For one big reason - some devices use a lot of power and that means large wires and heavy duty contacts inside all of the switches and connectors are needed. And you want to use as little wire (in length/distance) as possible. It's more expensive and heavier that smaller low-power wires and it's harder to work with. If the wire develops a short, it's a much bigger problem - and the longer the wire involved, the more chances you have for something to go wrong. Additionally, heavy-duty switches are large, cumbersome, and generally have a very poor "feel" to them. By "feel", I mean the tactile sensation you get from using the switch - is it a smooth silky operation with a nice delicate "click" to tell you what's happening, or is it more like Igor straining to flip a massive and cumbersome switch to turn on the power to bring Dr. Frankenstein's creature to life? You get the idea. It's easier and cheaper to make a low power switch in the quality you would expect in a fine automobile. And it will last longer. That's a good thing, A relay alleviates this by using a single relatively small and low power wire to control the on-off of electrical flow. You mount the relay near

the device it controls, and run a simp le large power wire to the relay. Then you run a small wire back to the switch. The switch you flip just supplies power to the relay coil and functions as a trigger - if the coil has power, the magnet energizes and the relay contacts move to make (or brea k - it can work both ways) the high power connection to your device
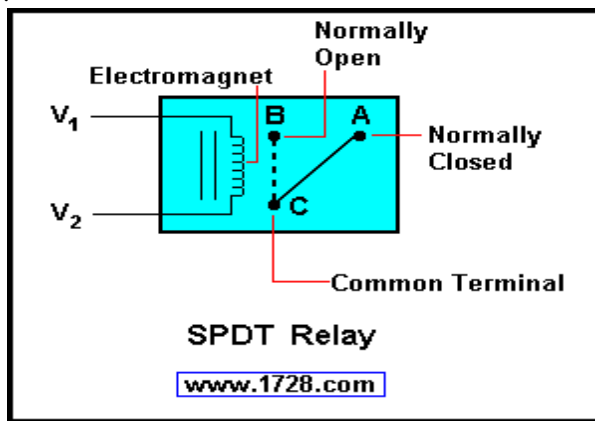
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Fig.9. Relay

III. RESULTS

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I.CONCLUSION and FUTURESCOPE
CONCLUSION:

The project IOT based women safety jacket has been successfully designed and tested. With respect to the consumer market for IOT based applications have existed for a long time but are not yet universally used. With regard to smart families as an example, costs, system installation and operational complexity affect consumer acceptance. The seamless binding of wireless technologies to all types of home appliances, elimination of the cumbersome setting, and causing users to feel that using a remote control is as simple as using a cell phone may provide new opportunities related to the IOT. In th is work, Intelligent security system for women is a surveillance system aimed to ensure the safety of women in public places.Upon detecting violence situation the system will sent a message to the control room. Our project has been developed with such a motivation that the women are provide with safe environment under all circumstances.
Finally we conclude that Smart Configuration System For Smart   Environ ment is an emerging fie ld and there is a huge scope for research and development.

FUTURE S COPE:

The circuit can be made complex and small in size for regular use of it in day to day life.

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