# To Sign Language Translator Using GSM Tracking

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**Abstract:** *In general, deaf and dumb people have difficulty in communicating with others who do not understand sign language. The sensors output a stream of data that varies with degree of bend made by the fingers. Flex sensors are sensors that change in resistance depending on the amount of bend on the sensor. They convert the change in bend to electrical resistance - the more the bend, the more the resistance value. The output from the sensor is converted to digital and processed by using microcontroller. Hardware Components used are Microcontroller (AT89S52), LCD display (16x2), flex sensors, GSM Tacking and Power supply).*

**Keywords:** Flex Sensor, Microcontroller (AT89S52), GSM Tracking Module.

## 1. Introduction

A Sign language is a language which is used for communication between the normal people and disabled people. It is a combination of fingering and movements of different parts of the body. There is three flex sensor is used and each are fitted with length of each finger and thumb. The output from the sensor is converted to digital and processed by using microcontroller. It is portable and easy to handle. [1] The intension of the sign language translation system is to translate the normal sign language into speech and to make easy contact with the dumb people. In order to improve the life style of the dumb people the proposed system is developed. Sign language uses both physical and non-physical communication [2]. The physical gesture communication consist of hand gestures that convey respective meaning, the non-physical is finger movement. Sign language not a universal language and it is different from country to country.

## 2. Proposed System

There are approximately 70 million people world-wide who are deaf-dumb. They struggle to communicate with normal people since most people don't understand their sign language. This creates a large communication gap between deaf-dumb and normal people.

This system has Global Positioning System (GPS) which will receive the coordinates from the satellites among other critical information. Tracking system is very important in modern world. This project uses only one GPS device and a two way communication process is achieved using a GSM modem. GSM modem, provided with a SIM card uses the same communication process as we are using in regular phone.

**Figure 1 :** Block Diagram of SLT

Figure shows the flow of algorithm used in the proposed
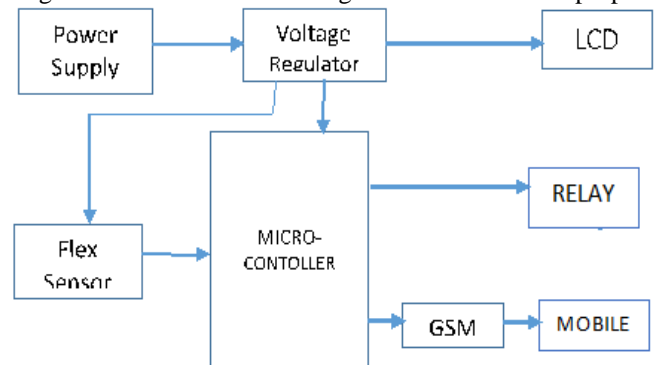


system of this paper. The gloves are fitted with flex-sensors so as to trace the correct movement of the fingers. For each flex sensor the required voltage will be supplied initially. According to the movement of the fingers there will be a voltage drop associated with it because of the variation in the resistance.

The voltage thus obtained will be analogy in nature. This analogy voltage is converted to digital voltage using an analogy to digital converter (ADC) and this voltage is fed to microcontroller AT89S52. Our hardware requires 5V and hence a voltage regulator of 7800 series is used. A crystal oscillator with 12MHz is used which provides the microcontroller with frequency clock pulse. The microcontroller connected with GSM Tracking system it is used in tracking the known of person of thorough message.

The main electric board will contain a microcontroller that handles the program used to detect the analog voltage levels

captured from the sensors, converts them to digital using the ADC of the microcontroller, and makes the recognition of the letter signed. Microcontroller will compare the input voltage with pre-defined program voltage and accordingly it will display the output characters on the LCD screen. The text then can be converted to speech by using a text to speech maker software in microcontroller.

## 3. System Hardware

A system hardware consists of an accelerometer and Flex sensors attached to the glove which are the input devices. Flex sensors made up of resistive carbon element shows the property of change in resistance according to the bending of sensor (fingers). The output of the Flex sensor is the varying resistance which is converted into a voltage signal using a voltage divider bias circuit.

The received output from the sensors is continuously monitored processor is interfaced with a memory IC which acts as an input/output device.

## 3.1 Hardware Design

**Figure 2 :** Hardware Setup

The figure shows hardware model of sign language translator which consists of transmitter and receiver modules. Flex sensors and the accelerometer are mounted on the hand-talk glove, the input is directly fed to the ADC of the PIC. To simulate home automation a DC bulb is connected using a relay, the bulb will turn on and off when the corresponding symbols are shown. The transmitter module contains a GSM module.

We are using a 40 pin ATmega microcontroller. It has four input–output ports. Each pin transmits different sign language signal. In this also used Flex sensor to provide the input command. LCD is used to display the corresponding output, thus serves an important role for displayed.

## 3.2 Flex Sensor

**Figure 3 :** Flex Sensor

A simple flex sensor 2.2" in length. Flex means bend or curve. Sensor refers to a transducer which converts physical energy into electrical energy. Flex sensor is a resistive sensor which changes its resistance as per the change in bend or curvature of it into analog voltage. The resistance of the flex sensor changes when the metal pads are on the outside of the bend.

The Flex Sensor patented technology is based on resistive carbon elements. As a variable printed resistor, the Flex Sensor achieves great form-factor on a thin flexible substrate.

## 3.3 GSM Tracking Module

**Figure 4 :** GSM Tracking Module

The applications of is GSM tracking your vehicle and keeps regular monitoring on them. This tracking system can inform you the location and route travelled by vehicle, and that information can be observed from any other remote location. It also includes the web application that provides you exact location of target.

This system enables us to track target in any weather conditions. The paper includes the hardware part which comprises of GPS, GSM, at mega microcontroller and software part is used for interfacing all the required modules and a web application is also developed at the client side. Main objective is to design a system that can be easily installed and to provide platform for further enhancement.

## 4. Conclusion and Future Scope

Due to the fact that there are different sign languages in India, sign languages fail to deliver ideas and eliminate the communication gap between normal people and deaf-dumb. That's where the hand-talk glove finds its importance. Hand-talk glove converts any sign language to a globally recognizable language such as English, so that any person who can read and write can understand the deaf-dumb. This

possibly eliminates or considerably reduces the communication gap between normal people and deaf-dumb.

Future works include to the face detection for security purpose, addition of external memory so that a large number of signs could be recognized. With little modifications hand-talk glove can be used to play games and simulate virtual reality.

## 5. Acknowledgement

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