

Advanced MEMS Controlled Deaf and Dumb Assist Control Unit with Emergency Announcement

Shweta Hangaragi*, Shwetha T M*, Uppara Sangeetha*, Doddavva Beesanakoppa*, Pradeep Kumar K#

* Students, Alva's Institute of Engineering and Technology, Mijar, Moodbidri, Karnataka, India

Assistant Professor, Alva's Institute of Engineering and Technology, Mijar, Moodbidri, Karnataka, India

Abstract: For physically challenged, deaf and dumb peoples there are no such devices are available to pass their needs and emergency intimations in hospitals, homes and many public places. Sometimes they have to use only sign language which may be difficult for common peoples. The method shown in this paper is used to generate a voice from deaf unit to a wireless location and also generates a message to mobile unit in case of needs and emergencies using MEMS sensor it's possible to generate the required signal send the signal depends on movements of the sensor the signal generated from MEMS unit which is interfaced to transmitter and microcontroller unit.

Keywords: MEMS, Sensor, Gestures, Sign language, wireless location

I. INTRODUCTION

Now a days deaf and dumb people uses bell for calling other persons from that they can call person but they cannot pass their message to the normal persons because normal person cannot understand their language, in this paper we are introducing new method to provide efficient communication between deaf and dumb people with normal people using MEMS sensor which converts mechanical movement to electrical signals and it generates the signals, that signal will converted to messages we will assign particular message for particular signal to introducing new method to provide efficient communication between deaf and dumb people with normal people using MEMS sensor which converts mechanical movement to electrical signals and it generates the signals, that signal will converted to messages, we are assigning particular message for particular signal to that dumb and deaf people can convey their needs to the normal people, here we are using two methods to convey their messages one is announcing voice within a building and another is sending message through GSM in emergency conditions. Hence there is no distance problem.

II. BLOCK DIAGRAM

Block diagram consists of two units they are voice transmitter unit and control unit.

1. Transmitter unit
2. Control unit

Transmitter unit:

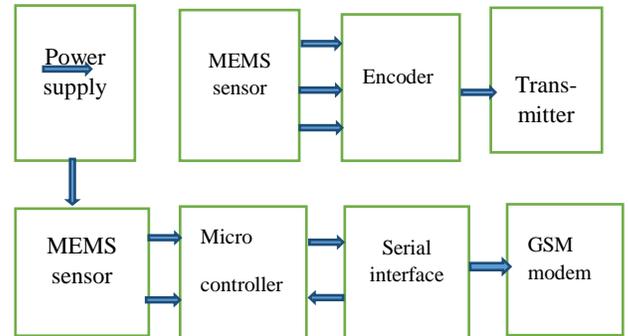


Fig2: Transmitter Unit

In this 7805 regulated power supply is used which consists of 3 terminals which provides positive constant voltage, the input voltage varies from 10V to 35V and provides output voltage of 5V. MMA7260Q is a sensor which consists of 3 axis x, y, z which captures the signals in 3 directions and produces signal. HT12 Encoder consists 8 number of address lines and 4 data lines, the signal coming from the MEMS sensor is transmitted serially on D0-D3 pin and available at data O/P pin. Transmitter is used to send the messages to the receiver unit ASK type transmitter is used and it is tuned at 433 MHz frequency.

The role of microcontroller here is to interface with GSM modem and depending on the I/P port status or request from particular signal from MEMS the message has been send to the mobile number. The logical level of the modem is not compatible with logical status of the controller so need to have logical conversion from module to UART port of controller through MAX232 interface. 900 MHz GSM module is used to communicate with microcontroller with UART protocol.

Control unit:

The receiver is used to fetch the particular voice for particular signals. For an emergency announcement information can be possible to announce through predefined techniques, in voice processor the data's are pre-recorded as the output is derived by the microcontroller the particular signal will be announced, the LM386IC audio amplifier is used which amplifies the signal to high strength.

Decoder converts the serial data to parallel and the same data will be available at the output of the HT12 Decoder.

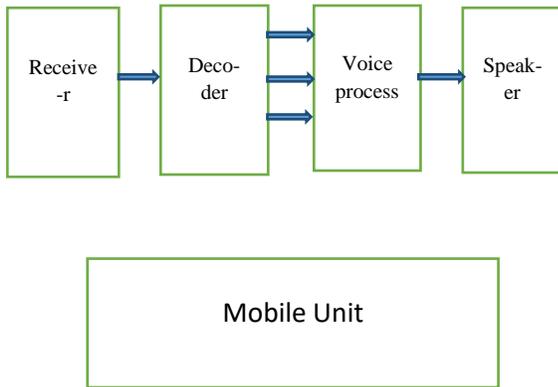


Fig3: Control Unit

III. WORKING OF THE DEVICE

- The AC Voltage of 230V which is coming from main supply is converted to 9V using the step down transformer and it is given to rectifier that converts AC voltage to DC and it will be given to 7805 regulated power supply which converts that 9V to 5V because the microcontroller we have used here supports 5v DC.
- Depending on the movement of chip MMA7260Q MEMS sensor produces reference voltage that will be compared with the input voltage of comparator and produces output and LED starts glowing depending on the LED the micro controller sends message to GSM modem.
- The code will be written in 89V51RD2 microcontroller, we are using only two ports that is port 1, port2 which is also called serial port used to transmit signals serially, this will be given to serial port which is in GSM modem so the GSM modem will send the particular for the phone whose numbers are stored in mobile control unit.
- We are using two sensors one for message sending, one for voice transmission
- When we tilt the sensor voice transmission sensor it produces signal and again it will be compared with the comparator and LED starts glowing depending on the LED the particular signal will be announced, For an emergency announcement like I need water, I need food, I need medicine etc. information's can be possible announce through predefined techniques.

A voice processor circuit is a system where the data's are pre-recorded. As the controlled output is derived by a microcontroller the particular signal will be announced. The recording unit consisting of voice recorder and playback chip APR 9600 in which the pre-recorded voices are stored in the flash memory. At the time of recording the voices regarding different status conditions are stored in the chip when it is in

writing mode and at the time of announcement the chip is in playback mode and depending on its I/p the voices are announced. An announcement of the particular acknowledgement announced. The encoded data bits are connected to the switch i/p of voice processor which goes to fetch the particular voice. The audio amplifier is designed with Im 386 IC which drives and amplify the audio signal to high strength which further connects to the speaker.

IV. MEMS SENSOR

This is a MMA7260Q 3 axis low-g Micro machined Accelerometer module with sensitivity selecting using MMA7260Q accelerometer Sensor from Free scale. The output of accelerometer IC is in terms of variable voltage linear to the acceleration or the tilt angle. So accelerometers can used in lot of applications as two wheel balancing system, vibration sensing machine, tilting remote etc. MMA7260Q Module is suitable for robotic application and other Tilt Measurements



Fig4: MEMS Sensor

.Microcontroller:

89V51RD2 Central Processing Unit, On-chip FLASH Program Memory with In-System Programming(ISP) capability, Boot ROM contains low level FLASH programming routines and a Default serial loader ,Speed up to 33 MHz Full static operation RAM expandable externally to 64 k bytes 4 level priority interrupt 7 interrupt sources, depending on device, Four 8-bit I/O ports, Full-duplex enhanced UART ,Framing error detection Automatic address recognition, Power control modes,Clock can be stopped and resumed,Idle mode,Power down mode Programmable clock out, Second DPTR register, Asynchronous port reset.

V. EXPERIMENTAL RESULT

This method provides an effective communication between deaf and dumb people and normal people. The accuracy is more as it displays the message and announce the message

through speaker. There is no limitation of distance as we used the GSM. These are some messages which has been sent.

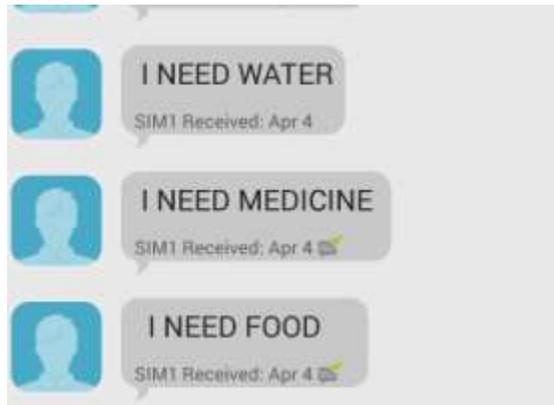


Fig5: Messages

VI. ADVANTAGES

- No assistance is required for deaf and dumb people
- Immediate help possible to support for these peoples.

VII. APPLICATIONS

- Need of help request through voice
- Wireless announcement
- Need of help through GSM in the form of message
- Medical emergency through GSM in the form of message.

VIII. CONCLUSION

As deaf and dumb people and physically handicapped people facing problem to communicate with normal people so we can pass their needs using MEMS sensor as sending the message and also we are announcing message through the speaker, so we can reduce the barrier in between them.

REFERENCE

- [1]. Predeep Kumar B P “dynamic hand gesture recognition” has Published by “IFRSA International Journal of graphics and image processing(IJGIP)”-2012 at International Forum Of Researchers Students And Academician(IFRSA)”, ISSN(22495452) volume2, issue1, april 2012
- [2]. Rafiqul Z. Khan, Noor A. Ibraheem, (2012). “Survey on Gesture Recognition for Hand ImagePostures”, International Journal of Computer And Information Science, Vol.5(3), Doi:10.5539/cis.v5n3p11
- [3]. Kuldeep Singh V Rajput , “Design and implementation of Talking hand glove for the hearing impaired”, IEEE, April 2014.
- [4]. P. SubhaRajam, Dr.G. Balakrishnan,“Real Time Indian Sign Language Recognition System to aid Deaf-dumb People”, ICCT, IEEE, 2011.
- [5]. T. Baudel, M. Baudouin-Lafon, Charade: remote control of objects using free-hand gestures, Comm. ACM 36 (7) (1993) 28–35.
- [6]. J. Kim et.al, “Bi-channel sensor fusion for an automatic sign language recognition”, in the 8th IEEE International Conference on Automatic Face and Gesture Recognition, Amsterdam, 2008, pp 1-6.
- [7]. PatriziaPoli, Giovanni Morone, Giulio Rosati, and Stefano Masiero, Robotic Technologies and Rehabilitation: New Tools for Stroke Patients’ Therapy, Volume 2013 (2013), Article ID 153872, 8 pages
- [8]. Nasser H. Dardas and Emil M. Petriu” Hand Gesture Detection and Recognition Using Principal Component Analysis” international conference on computational intelligence for measurement system and application (CIMSA), pp: 1-6, IEEE,2011.
- [9]. R. Glitman. Startup readies 4-pound stylus pc. *PC Week*, 7(34):17–18, August 27 1990.