International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 06 Issue: 06 | June 2019 www.irjet.net p-ISSN: 2395-0072

SPEAKING MICROCONTROLLER FOR DEAF AND DUMB PEOPLE

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ABSTRACT - *Micro controller based speaking system for deaf and dumb is designed to give the signs, which are preloaded in the device. It is a micro controller based device, which gives the alert sounds just by pressing the control buttons, which are given some redefined messages like asking for water, washroom etc., here the person can just press the control button which indicates the sign of water (example) then the device sounds the same with some output volume.*
Micro controller is the heart of the device. It stores the data of the needs of the person. So that it can make use of the data stored whenever the person uses the device. This device helps the deaf and dumb people to announce their requirements. By this the person who is near can understand their need and help them. This saves the time to understand each other and ease in communication.

Keywords:

1. Arduino Uno Board (ATmega 328 Microcontroller)
2. 16x2 character LCD display.
3. Speaker.
4. Voice module ISD 1820.
5. LEDs and keys.

Power Supply (Transformer and Regulator IC 7805

INTRODUCTION

Micro controller based speaking system for deaf and dumb is designed to give the signs, which are preloaded in the device. It is a micro controller based device, which gives the alert sounds just by pressing the control buttons, which are given some redefined messages like asking for water, washroom etc., here the person can just press the control button which indicates the sign of water (example) then the device sounds the same with some output volume. Micro controller is the heart of the device. It stores the data of the needs of the person. So that it can make use of the data stored whenever the person uses the device.

This device helps the deaf and dumb people to announce their requirements. By this the person who is near can understand their need and help them. This saves the time to understand each other and ease in communication his device is designed to provide with a greater advantage producing voice based announcement for the user i.e. the user gets the voice which pronounces his need as and when it is required.

The main features of this project

1. User-friendly interaction with the use.

2. Reliable for dumb people.

3. Easy to operate.

MATHODOLOGY:

Proposed system is used for deaf and dumb people, in system voice module, keyboard 1x4, Arduino controller and display 16x2 are interfaced with arduino board. In this system the keyboard 1x4 is used for giving input by deaf and dumb people. Four keys are used for displaying different messages with sounds. The voice module ISD 1820 speaks the different messages according to the keys which are pressed. In this module we store the 20 seconds time of message. The same

message will be displayed on the display 16x2.This system helps for communication between deaf and dumb people and well people. For this system we not need to learn the sign language. Thus, it reduces the misunderstanding between the dumb peoples. A micro-controller Atmega 328 8 bit controller is used for reading the inputs from the deaf and dumb people and gives respective message on display with sounds. Arduino uno board requires the 5V DC voltage, this voltage is generated from the 230 V 50Hz AC voltage by using the Linear power supply.

System Components:

1. Arduino Uno Board (ATmega 328 Microcontroller)
2. 16x2 character LCD display.
3. Speaker.
4. Voice module ISD 1820.
5. LEDs and keys.
6. Power Supply (Transformer and Regulator IC 7805)

General Power Supply:

The power supply circuits built using filters, rectifiers, and then voltage regulators. Starting with an ac voltage, a steady dc voltage is obtained by rectifying the ac voltage, then filtering to a dc level, and finally, regulating to obtain a desired fixed dc voltage. The regulation is usually obtained from an IC voltage regulator unit, which takes a dc voltage and provides a somewhat lower dc voltage, which remains the same even if the input dc voltage varies, or the output load connected to the dc voltage changes.

Transformer

The potential transformer will step down the power supply voltage (0-230V) to (0-6V) level. Then the secondary of the potential transformer will be connected to the precision rectifier, which is constructed with the help of op–amp. The advantages of using precision rectifier are it will give peak voltage output as DC, rest of the circuits will give only RMS output.

Bridge rectifier

Bridge rectifier is used to maintain the proper DC polarity at the input to the circuit, irrespective of telephone line polarity. It comprises of four diodes connected to form a bridge. It uses the entire AC wave (both positive and negative sections). 1.4V is used up in the bridge rectifier because each diode uses 0.7V when conducting and there are always two diodes conducting.

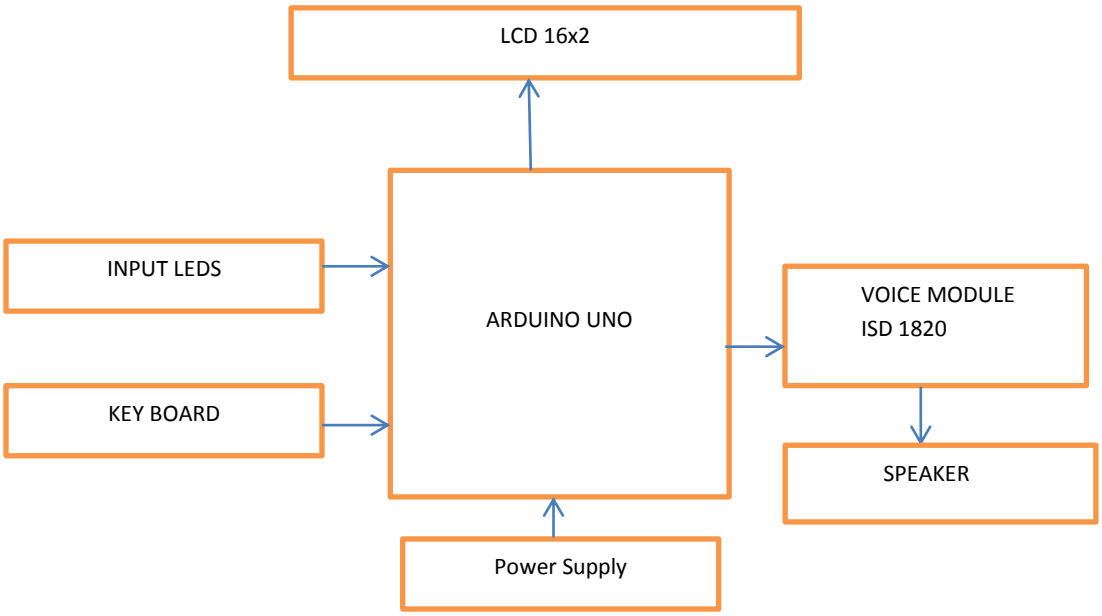

Fig. Block diagram of SPEAKING MICROCONTROLLER FOR DEAF AND DUMB PEOPLE

Circuit Diagram

1) **16x2 character LCD display:**

Fig. 16x2 character LCD display:

- 5 x 8 dots with cursor
- Built-in controller
- + 5V power supply (Also available for + 3V)
- 1/16 duty cycle

1) **ISD 1820 Voice module:**

Voice Record Module is base on ISD1820, which a multiple-message record/playback device.

It can offers true single-chip voice recording, no-volatile storage, and playback capability for 8 to 20 seconds. The sample is 3.2k and the total 20s for the Recorder. This module use is very easy which you could direct control by push button on board or by Microcontroller such as Arduino, STM32, ChipKit etc. Frome these, you can easy control record, playback and repeat and so on.

Fig. ISD 1820 Voice module.

Features:

- Push-button interface, playback can be edge or level activated
- Automatic power-dwon mode
- On-chip 8Ω speaker driver
- Signal 3V Power Supply
- Can be controlled both manually or by MCU
- Sample rate and duration changable by replacing a single resistor
- Record up to 20 seconds of audio
- Dimensions: 37 x 54 mm

Actual System:

The complete system of image is shown below. In this system the different sections present

1) Power supply section: In which the 230 V 50Hz input AC supply voltage is given to the transformer; at the output of transformer we get the 12V AC voltage.
2) The 12V AC is applied to the bridge rectifier, which is build using the four diodes 1N4007 and output from the bridge rectifier we get 10.6 V DC voltage but in which contains the spikes. This spike contained dc voltage for filtering and getting smoothed voltage applied to the filter. Output of the filter is given to the Regulator IC 7805 which is convert to the 10V DC to the 5V DC. This regulated 5V dc is given to the controller.
3) Display and Voice Module ISD 1820: In this system 16x2 display is used for displaying the messages and same message is voiced using the voice module, they are interfaced with controller.
4) Arduino Uno board: On this board the Atmega 328 controller is used. Which is 8 bit controller, 32 Dip IC, it is the heart of the project. It process the input signal and takes decision according to it.

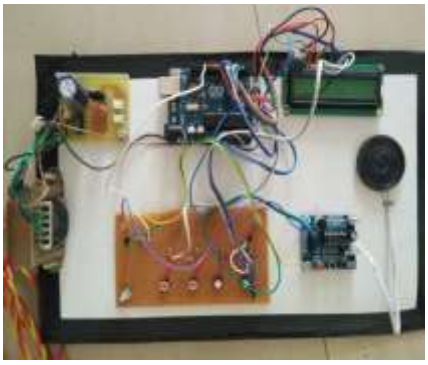

Fig. Proposed system for Deaf-Dumb people

PROPOSED SYSTEM FOR RESULT AND CONCLUSION:

The following chart shows the results of the project. In this chart the input is given using the input keys, total four keys are present for applying input. Pressing any key out of four keys then respective message is displayed on the LCD 16x2 and voice module speaks same message which is shown on the display.

In this study, the hardware and software features of Microcontroller Atmega 328 based system designed and developed for deaf and dumb people. This system aims to lower the communication gap between the deaf or community and the normal world. The project proposes a translational device for deaf-mute people using voice module ISD 1820 for speaking needful messages and displaying same message on the display 16x2 with Keyboard 1x4 for giving input.

Sr .No	Input Key Number	Message Displayed on LCD	Voice message
1	Input Key 1	"PLEASE GIVE ME DRINKING WATER"	"PLEASE GIVE ME DRINKING WATER"
2	Input Key 2	"PLEASE GIVE ME BLOOD PRESS TAB "	"PLEASE GIVE ME BLOOD PRESS TAB "
3	Input Key 3	"WHERE IS MY STUDY BOOKS "	"WHERE IS MY STUDY BOOKS "
4	Input Key 4	"WHERE IS MY COLLEGE UNIFORM "	"WHERE IS MY COLLEGE UNIFORM "

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