

Automatic Call Answering Machine Using GSM Module

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Abstract -- In today's modern world we all depend on mobile phones as our primary means of wireless communication. But, we all have faced situations during which we might not be able to attend our calls, these calls might be an important personal call or a urgent business call and you could have just missed that opportunity since you were not able to answer that call at that particular time. This project aims to solve this problem by creating an Automatic Call answering Machine by using Arduino and GSM module. whenever you change to a new phone number or out for a long pilgrimage trip or enjoying a well deserved vacation with your family just use this machine to record your voice stating the reason for absence and all your calls will be automatically answered by this machine and your recorded voice message will be played to them. This can also be used for your business numbers to answer to your customer's calls during non-office hours.

Indexed Terms: voice recording, call answering, playing message, unavailability

I. INTRODUCTION

The project "Arduino and GSM Based Automatic Answering Machine" is designed to answer the phone call with prerecorded message when we are unable to attain call. Sometimes in this busy world, we might not be able to attain phone call due to several reasons (generally we are in bathroom or watching a movie or forget mobile at home). These calls might be important i.e., call might be from office or business call which cannot be ignored. Thus, in this project, the call will be received after 3 rings and play the pre-recorded message which you had already recorded and saved in ISD 1820 voice module.

II. METHODOLOGY

1. GSM SIM900:

GSM module acts as a communicating medium. It is used to interact with GSM network using a computer. GSM module only understands AT commands, and

can respond accordingly. This module could make all actions that our normal mobile phone could do, like making/receiving a call, sending/receiving a SMS, connecting to internet using GPRS etc.

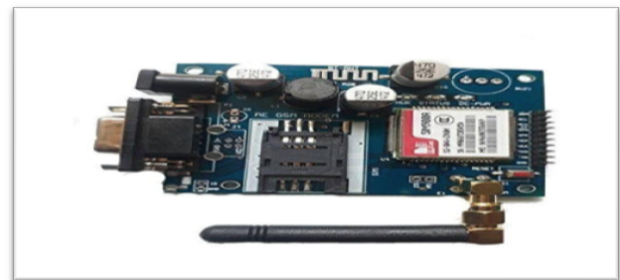


Fig. 1: GSM Module

2. ARDUINO UNO:

The Arduino UNO is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino. cc. The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits. The board has 14 Digital pins, 6 Analog pins, and programmable with the Arduino IDE (Integrated Development Environment) via a type B USB cable. It can be powered by a USB cable or by an external 9 volt battery, though it accepts voltages between 7 and 20 volts. It is also similar to the Arduino Nano. The Uno board is the first in a series of USB Arduino boards, and the reference model for the Arduino platform. The ATmega328 on the Arduino Uno comes pre-programmed with a boot loader that allows uploading new code to it without the use of an external hardware programmer.

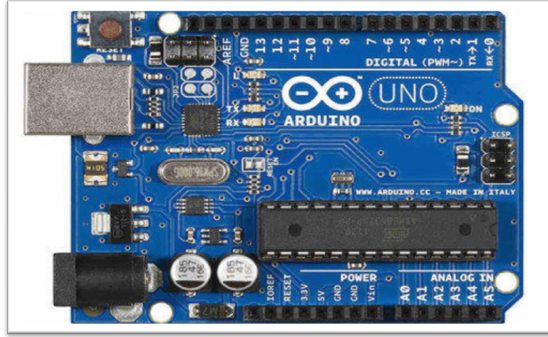


Fig. 2: ARDUINO UNO

3. VOICE MODULE:

The ISD 1820 Voice module is really a cool module that could spice up your Projects with Voice announcements. This module is capable of recording an Audio clip for 10 seconds and then playing it when required. The module itself comes with a microphone and a speaker (8ohms 0.5watts) and it should look something like this shown below. The module works on +5V and can be powered using the berg sticks on the left. It also has three buttons at the bottom which are Rec. button, PlayE. Button and PlayL. Button respectively. You can record your voice by pressing the Rec. button and play it using the PlayE button. The PlayL will play the voice as long as you hold the button. When interfacing with a MCU, we can use the pins on the left. These pins are 3V-5V tolerable and hence can be directly driven by Arduino/ESP8266. In our project we are controlling the PLAYE pin using the D8 pin of our Arduino module. So that we can play the recorded voice when a call is detected and received by the GSM module.



Fig. 3: ISD 1820 voice module

III. WORKING

The way of automatically answering the calls is described in this methodology. This system detects the call and responds quickly and accurately. All the internal functioning of the system is done in ARDUINO software using GSM library. Various algorithms are used at distinct functions of the programming.

The description of the proposed methodology using detection functions is as shown in the below fig.

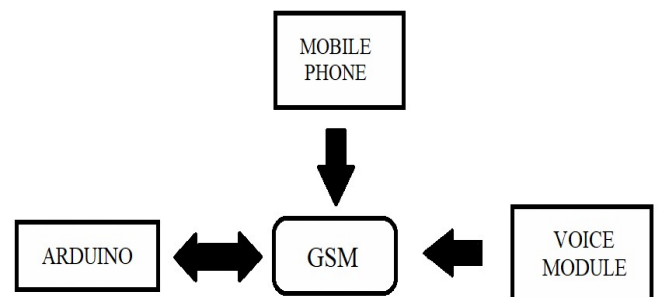


Fig. 4: Block diagram of methodology

The SIM which receives the call has to be inserted into the GSM module. After a while, connection between GSM and the mobile network will be established.

We can record any message with maximum length of 10 seconds by pressing REC. button on ISD1820 module and the Arduino is programmed with the appropriate code for that purpose. This code also includes algorithms for 'Recording message', 'Lifting the call', 'Delay', 'Playing the recorded message', and also to 'Hang up!'

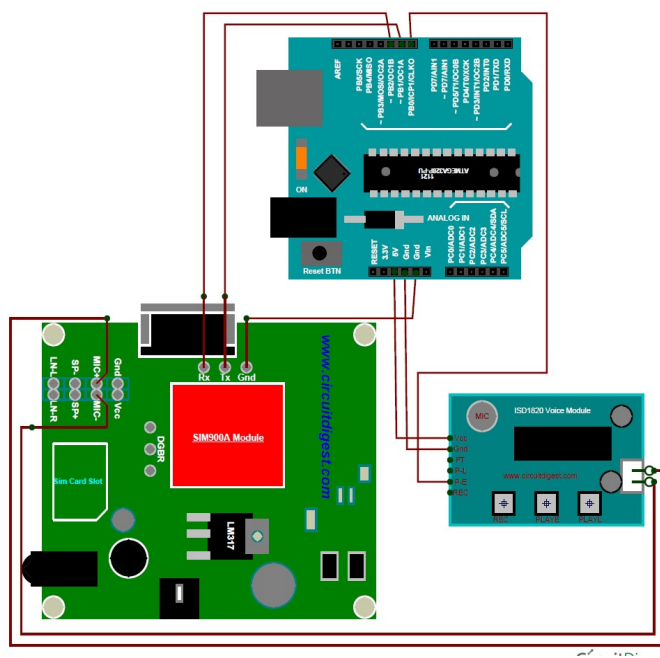
Since we know we can record anything on our voice module by pressing the REC. button and this will get played when P-E is pressed, this recorded message is sent to the microphone of the GSM module. Here, we connect the speaker of the Voice module to the microphone of the GSM module.

Here, the Arduino and GSM module are connected serially. The Tx pin of Arduino is connected to pin 9 and Rx pin is connected pin 10. This will help the Arduino to listen to the GSM module. When a call

arrives to the GSM module the Arduino will listen to the call and ask the GSM module to answer the call.

The Arduino is responsible for the call to be active for specified amount of time and then plays the recorded voice message on the voice module by making the pin 8 which is connected to P-E of voice module, go high for 200ms. The recorded message can be changed dynamically by utilizing the compatibility of the voice module.

IV. CIRCUIT DIAGRAM



The complete circuit diagram of this Automatic Voice Call answering Machine project is given above. As you can see the connections are really simple. We power the GSM module with a 12V 1A adapter and Arduino with 9V battery, the ISD Voice module is powered by the +5V pin of the Arduino. As we know we can record anything on our voice module by pressing the rec button and this will get played when P-E is pressed, this audio has to be sent to the microphone of the GSM module. So we connect the speaker pin of the Voice module to the microphone pin of the GSM module.

V. RESULT

The call is answered automatically and the plays the pre-recorded message with no instantaneous consent of the receiver.

The proposed methodology is processed in the ARDUINO version of 1.8.1. ARDUINO software has the capability of programming both GSM and voice module.

Using the detection functions and algorithms code is written in the ARDUINO software. After the code is run, the final outputs are displayed as shown in the below figures.

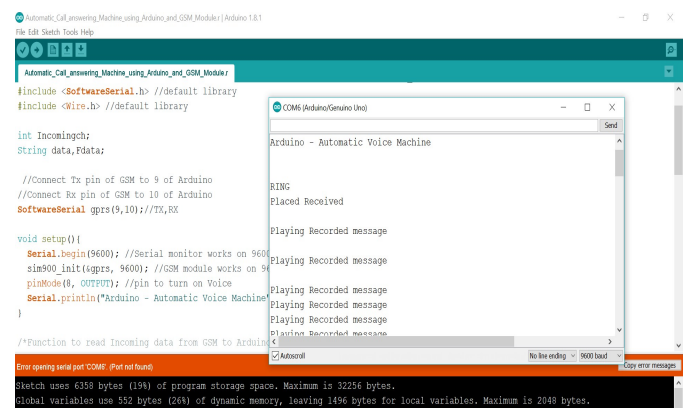


Fig. 5: Serial monitor showing that the call is lifted and the message is played

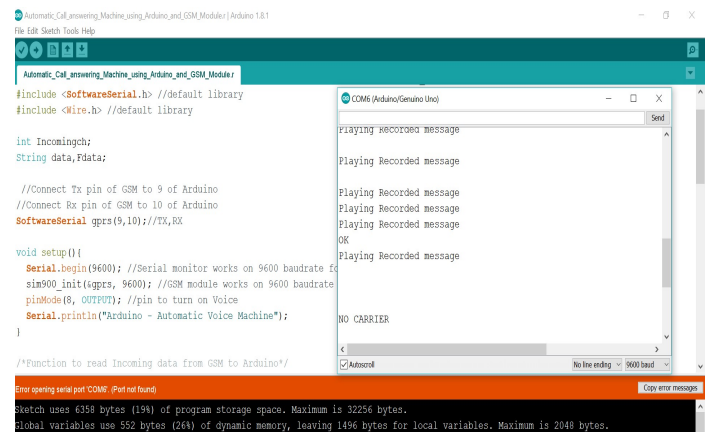


Fig. 6: Serial monitor showing call is hung up

VI. CONCLUSION

Using ARDUINO software and standard algorithms, the automatic call answering machine is designed successfully. This system gives the quick and

accurate results. This can also be implemented in reality in the future.

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