الجامعة الإسلامية العالمية ماليزيا
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA
يونيورسيتي إسلام انتارا بغسا ملسيا

INTERFACING LAB MECHATRONICS

SEM 1/201

MINI PROJECT

GSM 900

MEMBERS : 1. **NOR AFIQAH BINTI NOOR AZAM** **1613770**

2. NUR FIKHIRA BINTI ZAMRI **1611738**

3. NUR AMALINA BINTI MOHD YUSOF **1613994**

4. NIK NURUL HAJARATULASWAT BINTI N MOHD ZAHARI **1614220**

1.0 Introduction

GSM digitizes and compresses data, then sends it down a channel with two other streams of user data, each in its 2 own time slot. Based on this function, we try to make a communication between arduino Mega and GSM 900 in order to observe how the GSM 900 receive and transmit data. We are testing the shield by sending AT commands from the Arduino IDE to SIM 900 that contain how to send and receive SMS and making and receiving phone calls.

2.0 GSM 900 Background

For a short brief , GSM is a mobile communication modem which widely used in communication system .The digital system has an ability to carry 64kbps to 120 Mbps data rates .A GSM digitizes data and reduce it before send it through a channel with two different stream of client. This device also works on frequency of 850/900/1800/1900MHz.GSM Time Division Multiple Access (TDMA) will assign different time slots to each user at the same frequency. This process is the main process that commit to the sending and receiving data in GSM.

The SIM card been put in GSM modem and will receive digit command by SMS then sent the data to the MC through serial communication. While the program is running, the GSM modem receives command ‘STOP’ to develop an output at the MC, the contact point of whicgh are used to disable the ignition switch. So , the command sent by the user is based on an intimation received by him through the GSM modem ‘ALERT’ a programmed message only if the input is driven low.In addition, the GSM900 device integrates an analog interface, an A/D converter, an RTC, an SPI bus, an I²C, and a PWM module.The module is supplied with continuous energy (between 3.2 and 4.8 V- maximized operating range)

There are two ways of connecting GSM module to arduino. The communication between Arduino and GSM module is serial.Use serial pins of Arduino (Rx and Tx).Tx pin of GSM module to Rx pin of Arduino and Rx pin of GSM module to Tx pin of ArduinoIt is need to select two PWM enabled pins of arduino for this method.Then connect power supply and ground to arduino and paired it with GSM .(Appendix 4.1) . Wait until it blinks, after that it can be setup and code.

3.0 Objective

Our main objective is to make a system that can be controlled by mobile phone. As we know, mobile phones are widely used nowadays. To ensure an efficient and convenient controlled system, we use this GSM module because it can directly communicate with the other component. But, for this mini project, we started to make communication between GSM module to arduino in order to see the effectiveness of this GSM module. We only connect this circuit to 2 different color of LED to observe how the arduino received and transmit data from the GSM module.

4.0 Design and Development

We used #include <SoftwareSerial.h> as The SoftwareSerial library has been developed to allow serial communication on other digital pins of the Arduino, using software to replicate the functionality (hence the name "SoftwareSerial"). It is possible to have multiple software serial ports with speeds up to 115200 bps. A parameter enables inverted signaling for devices which require that protocol. we used SoftwareSerial mySerial(9, 10) to declare which port from

GSM that linked with the arduino board which we called RX/TX. mySerial.begin(9600) to allow the GSM can ‘listen’ or receive the instruction from the coding of Arduino. We used serial.begin at first but it failed because of the error in transmitting instruction which is it allow the arduino to get the instruction from the GSM(that is not part of our aim).

When there are more than two options, we use multiple if statements, or the **switch** statement; switch(Serial.read(). Switch allows you to choose between several discrete options. Serial.println("s : to send message"); Serial.println("c : to make a call"); declaration so that we know the keyword to give instruction for example we type ‘s’ and transfer the instruction for sending the message to the specific number.

mySerial.println("AT+CMGS=\"+60164791203\"\r") to declare the receiver’s phone number that will be linked for sending any messages. mySerial.println("ATD+60164791203;"); part of coding to make any call and to ensure the response is accepted by printing the serial.println again in any words like ‘calling..’.

5.0 Result and Discussion

We get the desired output when all the circuit connected. The output depending on the input given by the mobile user. When the GSM received call from the user, the red LED will turn on and automatically turn off when the call end. But we cannot accept any sound that transmit to GSM due to lack of external accessories which is speaker and microphone. But, we able to received message and send message thru the GSM module by arduino. And the Green LED turn on when the message received. Based on our objective, we want to make a safety system for kids

as there are many kidnapped cases occur nowadays. When the kids touch the safety button on their smart watch, it will directly send emergency message to the parents also their coordinate. Also, we try to developed safety system in house. When the windows and the door are opened, the system will directly calls the house owner.

6.0 Potential Future Work

The system can be connected with actuator and sensor for them to be able to sense some movements. The home safety system can also be connected with buzzer to alert other people that there is intruder in the house. It notifies people to be alert with the intruders. The owner of the house can deactivated the system when there are people in their house. This is to avoid fake alarm from happening.

The system also can be connected with some tracker. This is useful for the kids, their own smart watch will send their location to their parents' smart phones. It can avoid many unwanted incident happen. Also connected the system with the buzzer makes people alert that the kids are in danger. When the kids activate their safety system, the buzzer will be activated and at the same time, it will call the parents to notify them that their children are in danger. The device also will send the latest location of their children that has been sent by the tracker.

Instead of sending a fixed message such as "Help", it might be useful if the computer can be acted as handphone, where we can send messages or call to another people without using the phones itself. Some accessories such as speaker and microphone can be added for the device to act according to its function.

This device also can be useful for some authorities such as police. Cooperation with the police officer can be useful which is the data or alarm that has been activated can be sent to the police directly. Action can be taken efficiently and faster response will be recorded for the issues.

7.0 Conclusion

As the conclusion, the basic idea using GSM module is to improve safety by using communication system .Some new features will be added in GSM by upgrading tools with more functions that will reliable it to the market and make it user friendly. Due to the era of technology ,having an excellent communication system give advantages to people . In fulfill the needs of human beings , innovation help people to have simple lifestyle so that they can save more time to do other things. Thus, this project mainly aimed to innovate safety communication device that functions during emergency .

8.0 Appendix

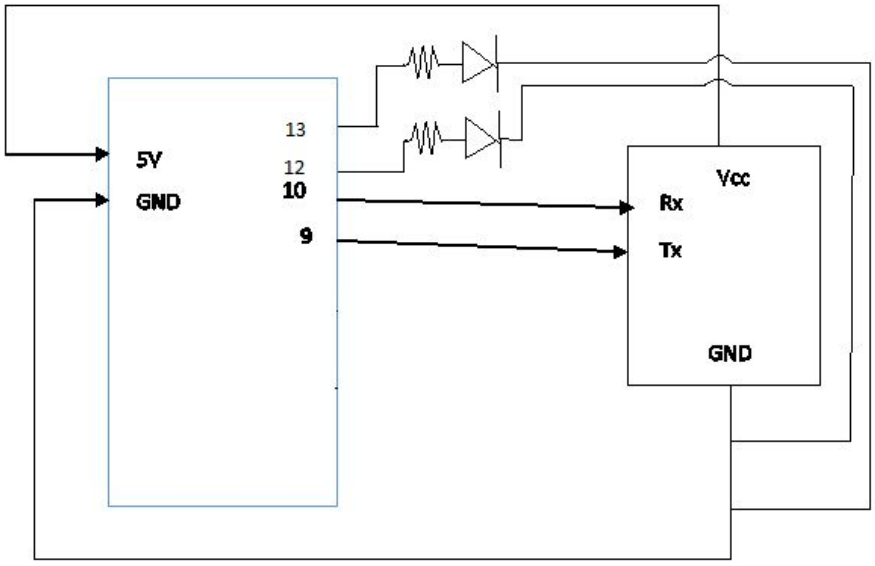

Figure 4.1