Z2M Part Number:
EMC-00006-A

GPRS GSM Module

(Technical Note)

Introduction

GSM (Global System for Mobile) is a set of protocols that the modern day cell phones and communication devices use. It defines the **digital cellular network**. It is generally referred to as a **second generation cellular network** or simply as **2G**. Today an advanced version of GPS known as GPRS (General Packet Radio Services) also supplies the internet connectivity. GSM/GPRS modules commonly used are the SIM800L. It is frequently used in IOT systems replacing the functionalities of a cellular phone.

Scientific Fact and Applications

GSM system was developed as a digital system using **time division multiple access** (TDMA) technique for communication purpose. A GSM digitizes and reduces the data, then sends it down through a channel with two different streams of client data, each in its own particular time slot. The digital system has an ability to carry 64 kbps to 120 Mbps of data rates. There are various cell sizes in a GSM system such as macro, micro, pico and umbrella cells. Each cell varies as per the implementation domain. There are five different cell sizes in a GSM network macro, micro, pico, and umbrella cells. The coverage area of each cell varies according to the implementation environment.

The GSM network has several functional nodes and specification. Since it connects the whole globe, we have different units responsible for a particular set of tasks like mobile substation, base station subsystem, network switching subsystem, and operation support subsystem. The following diagram clears the basic architecture of the GSM network.

Applications:

Communication Network

It is used for data security and data transmission. The **GSM** technology is used for mobile station, base substation, and the network systems. Mobile station consists of the basic mobile access point or the mobile phone and links the mobile phones with the **GSM** network for communication.

Mobile Phones

GSM/GPRS modules are mainly employed for computer-based SMS and MMS services. They can feature all the functionalities of a mobile phone through a computer like making and receiving calls, SMS, MMS, etc.

Supply Voltage	3.8-4.2V
Power consumption : sleep mode idle mode GSM transmission (average) GSM transmission (peek)	 <2mA <7mA 350mA 2000mA
Interface	UART (max. 2.8V) and AT commands
Supported frequencies:	Quad Band (850 / 950 / 1800 /1900 MHz)
Antenna connector	IPX
Status Signaling	LED
Working temperature	-40 to 85 ° C

GPRS GSM Module

(Application Note)

ZERO2MAKER

Project

Operate a led and blink it ON-OFF using sms via mobile.

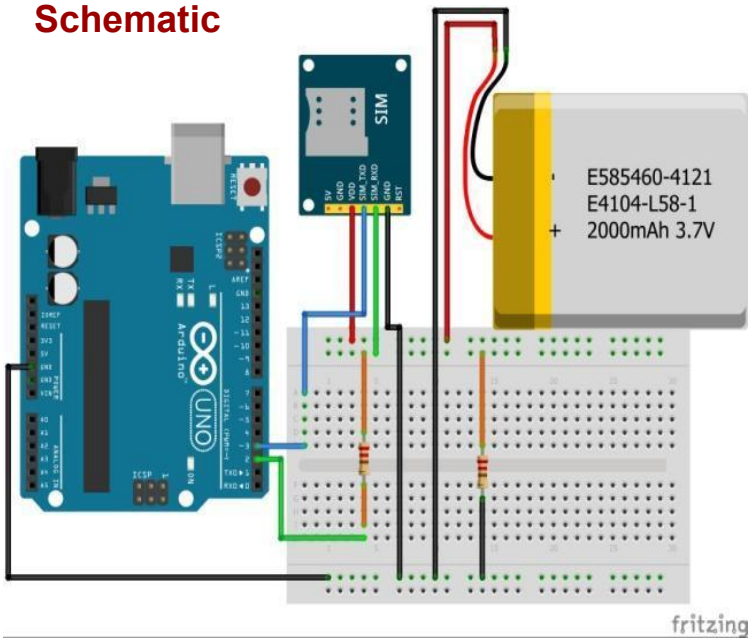
Components Required

Component	Part No.	Qty
Arduino UNO	EMX-00001-A	1
SIM800L GPRS GSM Module	EMC-00006-A	1
1200mAh Li-Po battery	-	1
20kΩ Resistor	-	1
10kΩ Resistor	-	1

Procedure

1. Make the connections as per the circuit diagram.
2. Upload the code.

Schematic



Challenge Yourself

1. Make a smart system that can show the room's current temperature in your mobile phone
2. Design a model for for home automation that can turn on light as soon as a family member enters.

Code

```
#include <SoftwareSerial.h>
SoftwareSerial mySerial(3, 2); /*Tx is connected to arduino #3 & Rx to #2 */

void setup(){
  Serial.begin(9600);
  mySerial.begin(9600);
  mySerial.println("AT"); /*If the handshake test is positive, then OK */
  updateSerial();
  mySerial.println("AT+CSQ");
/*Indicates Signal quality test by values inrange 0-31*/
  updateSerial();
  mySerial.println("AT+CCID");
/*Checks if SIM is plugged or not*/
  updateSerial();
  mySerial.println("AT+CREG?");
/*Checks if it has registered in the network*/
  updateSerial();
}

void loop(){
  updateSerial();
}

void updateSerial()
{
  while (Serial.available()) {
mySerial.write(Serial.read());/*Forward data that Serial received to Software Serial Port*/
  }
  while(mySerial.available()) {
Serial.write(mySerial.read());/*Forward data that Software Serial received to Serial Port*/
  }
}
```