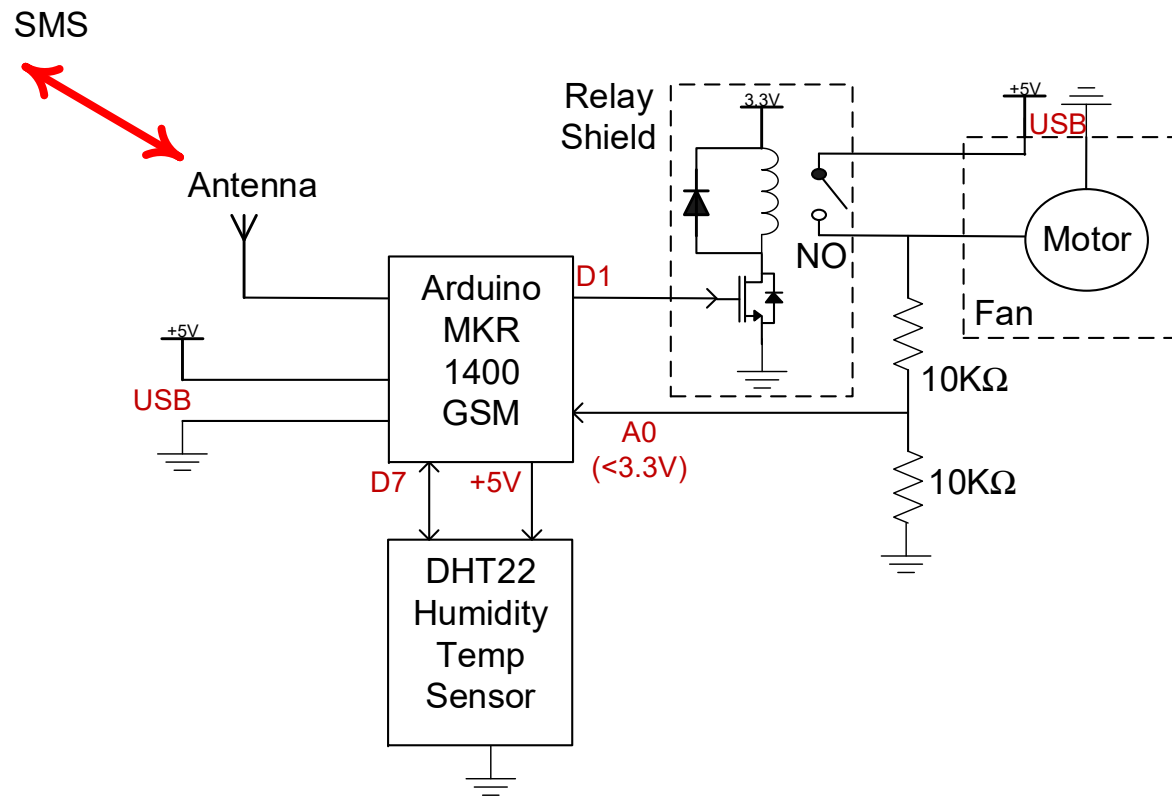


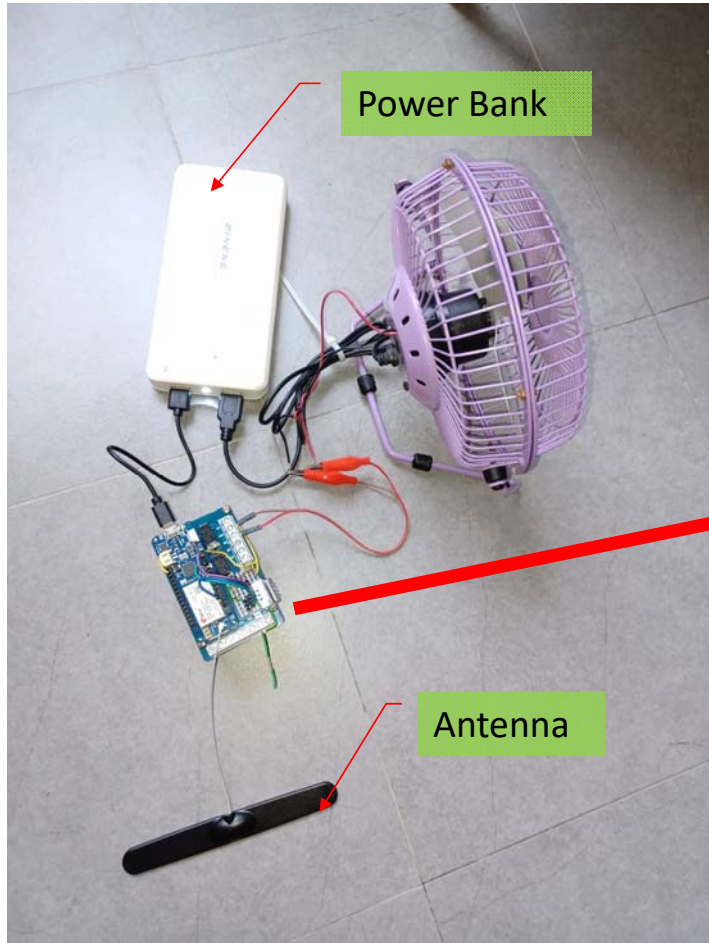
Using Arduino MKR 1400 GSM (SMS) for Remote Control and Sensing

By Tan See Teck

System Overview

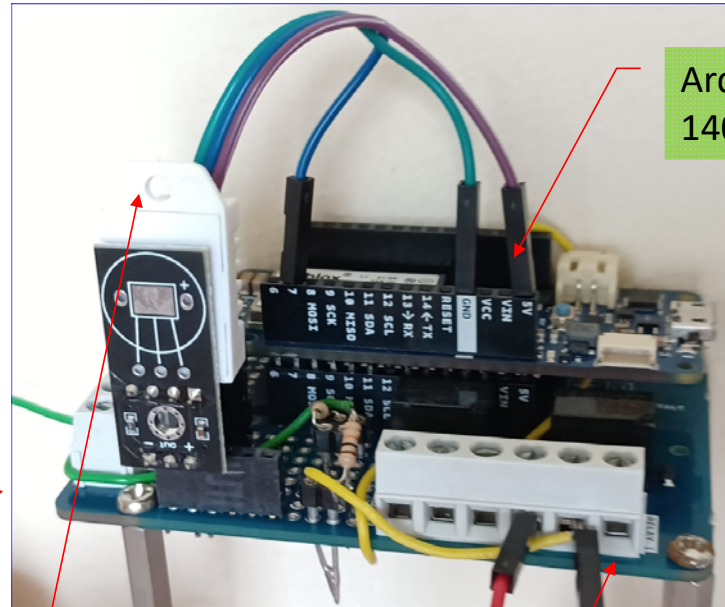


Hardware Setup



Power Bank

Antenna



Arduino MKR 1400 GSM

DHT22 Humidity & Temperature Sensor

Relay Shield TSX00003

SMS Commands

☐ You can SMS to 81321464

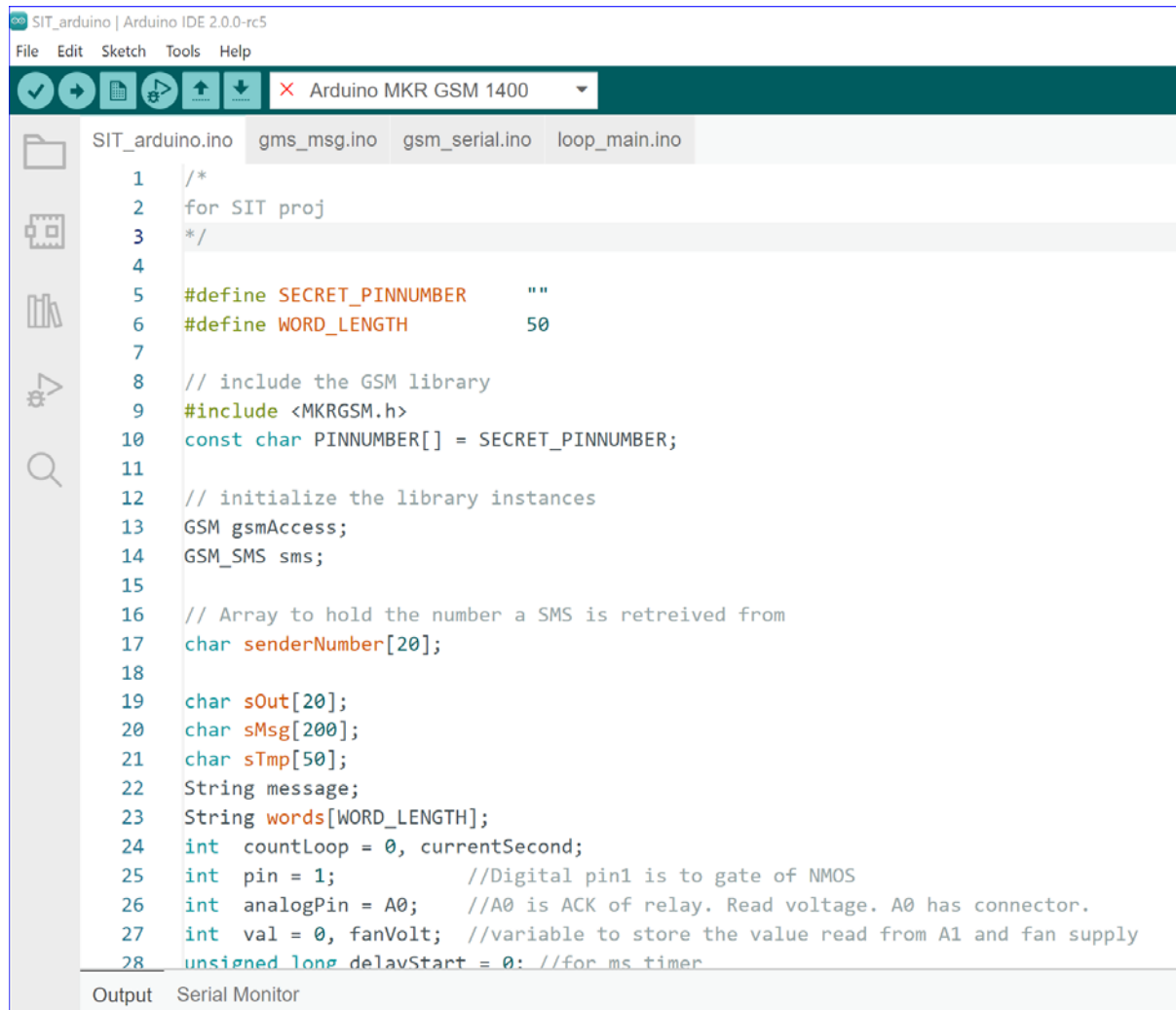
SMS Command	Expected Reply
time	 A screenshot of an SMS conversation. The sender's message is a green bubble containing the word "time". The receiver's reply is a grey bubble containing "cur time 2082 sec". The time "1:46 pm" is shown on both sides.
on	 A screenshot of an SMS conversation. The sender's message is a green bubble containing the word "on". The receiver's reply is a grey bubble containing "Fan on". The time "1:00 pm" is shown on both sides.
off	 A screenshot of an SMS conversation. The sender's message is a green bubble containing the word "off". The receiver's reply is a grey bubble containing "Fan off". The time "1:06 pm" is shown on both sides.
sense	 A screenshot of an SMS conversation. The sender's message is a green bubble containing the word "sense". The receiver's reply is a grey bubble containing "Supply:4350mV", "Humi:79.2%", and "Temp:27.8degC". The time "1:05 pm" is shown on both sides.

Software Overview

```
void setup() {  
  setup Timer  
  setup GSM Connection  
  setup Digital OUT Pin for Relay  
  setup Analog IN Pin for Voltage  
  setup DHT Sensor  
}  
  
void loop() {  
  calculate Current Time  
  blink LED & delay 2sec  
  read Voltage, Humidity, Temperature  
  if (have SMS Message) {  
    record Sender Number  
    action()  
  }  
}
```

```
void action() {  
  if ("sense")      { sendSMS(v,h,t) }  
  if ("time")      { sendSMS(time) }  
  if ("on" or "off") {  
    on/off Fan accordingly  
    delay 1sec  
    read Voltage  
    is fan on/off?  
    sendSMS("fan on/off")  
  }  
}
```

Arduino IDE



```
SIT_arduino | Arduino IDE 2.0.0-rc5
File Edit Sketch Tools Help
Arduino MKR GSM 1400
SIT_arduino.ino gms_msg.ino gsm_serial.ino loop_main.ino
1  /*
2  for SIT proj
3  */
4
5  #define SECRET_PINNUMBER    ""
6  #define WORD_LENGTH        50
7
8  // include the GSM library
9  #include <MKRGSM.h>
10 const char PINNUMBER[] = SECRET_PINNUMBER;
11
12 // initialize the library instances
13 GSM gsmAccess;
14 GSM_SMS sms;
15
16 // Array to hold the number a SMS is retrieved from
17 char senderNumber[20];
18
19 char sOut[20];
20 char sMsg[200];
21 char sTmp[50];
22 String message;
23 String words[WORD_LENGTH];
24 int countLoop = 0, currentSecond;
25 int pin = 1;          //Digital pin1 is to gate of NMOS
26 int analogPin = A0;  //A0 is ACK of relay. Read voltage. A0 has connector.
27 int val = 0, fanVolt; //variable to store the value read from A1 and fan supply
28 unsigned long delayStart = 0; //for ms timer
Output Serial Monitor
```

- Software is free
- How about Hardware?

Cost

Component	Cost (\$)	Link
Arduino MKR 1400 GSM (With antenna)	<120	Lots of sources But this product is no more in production (about 6 months ago)
TSX00003 relay shield	24	TSX00003 relay shield
DHT22 Humidity & Temperature Sensor	7	shopee
Total	<131	

- SIM Card (3G/4G \$20)
- Design & Development Effort
- Any Ready Product? Cost?

Available Product

5. Technical specifications

Parameter item	Reference scope
DC Power supply	9~36VDC, recommend 12VDC1A, optional 110~220VAC @50Hz
Power consumption	12V input Max. 400mA/Average30mA, standby 20mA ;
Cellular Frequency	2G: 850/900/1800/1900Mhz 3G version Optional: (UMTS/HSDPA) W:900/2100@UMTS 900/1800@GSM; C:850/1900@UMTS 850/900/1800/1900@GSM; T:850/2100@UMTS 850/900/1800/1900@GSM; 4G LTE Version Optional 3G/4G optional
SIM Card	Supporting 3V SIM Card
GSM/3G/4G Antenna	50 Ω SMA Antenna interface
Relay Outputs	2 Relay Outputs 7A@125VAC 5A@125VAC 20A@14VDC

- King Pigeon
- US\$80 per unit
- Shipment Cost US\$45



Possible Application

- ❑ Remote Control

- Fan, Lighting, Water Flow, etc.

- ❑ Remote Sensing

- Temperature, Humidity, Water Level, door open/close, etc.

- ❑ Event Trigger

- When server room heat up

- When server room too wet

**Thank you
&
Question?**