

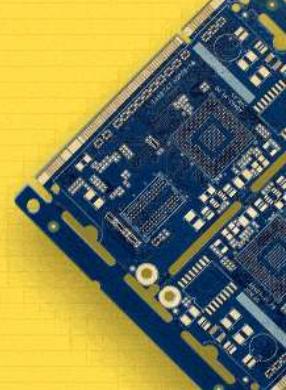
**NextPCB**

## Try Free PCB Prototype

**0\$ for 1-4 layer PCB Prototype**

- 1-4 layers, green mask, Fr-4
- Fast lead time as 24 hours

**Order Now**



Arduino Projects

# Using SIM7600 4G GSM with Arduino | AT Commands, Call, SMS

Interfacing SIM7600 GSM GPS 4G LTE Module with Arduino



Admin Last Updated: August 20, 2022 7 19,131 5 minutes read



**SIM7600 Tutorial**

**AT Commands**

**Make Call**

**Send SMS**

Table of Contents [[hide](#)]

[1 Overview](#)[2 SIM7600 GSM GPS 4G LTE Module](#)[2.1 General features](#)[3 Maduino Zero 4G LTE\(SIM7600X\) Board](#)[3.1 Interface](#)[3.2 Features](#)[4 Using SIM7600 GSM GPS 4G LTE with Arduino](#)[4.1 Setting up Arduino IDE](#)[4.2 Source Code/Program](#)[5 SIM7600 AT Commands Test](#)[5.1 Get the GNSS location](#)[5.2 Send and receive SMS](#)[5.3 Make a call](#)[5.4 HTTP test](#)[5.5 Test the SD card for SIM7600](#)[6 Surfing the Internet using SIM7600](#)[7 Video Tutorial & Guide](#)

## Overview

In this article we will learn how to use **SIM7600 GSM GPS 4G LTE** Module with **Arduino** & use **AT Commands** to make receive **call** or send receive **SMS** or Internet Connection.

Earliier we use 2G GSM Module like **SIM800/900** and also **A9G GSM GPS** module. As we know the **2G GSM/GPRS** is in the stage of closing in most countries or regions like Australia & Canada. But there are indeed some projects that need remotely GSM wireless communication where WiFi is not available. In such regions, the project requires access to the **Internet**, such as remote environmental

monitoring. Considering the investment/risk, for most cases, the **LTE 4G** is still a proper solution by now.

One of the most popular **GSM GPS 4G LTE Module** is SIM7600. The **SIM7600 series** is the LTE module that supports wireless communication modes of LTE. It also integrates multiple satellite high-accuracy positioning **GNSS systems**, with multiple built-in network protocols.

One of the readymade customized **SIM7600 & Arduino** board is designed by **Makerfabs**. This **Maduino Zero 4G LTE** module uses the **SIMCOM7600(E/A) CAT4** module, to help Makers to achieve the 4G connection easily. Besides, this module can be a fully 4G access to your computer or Raspberry Pi, and also for call or SMS.

## **SIM7600 GSM GPS 4G LTE Module**

The SIM7600 Series is Multi-Band LTE-TDD/LTE-FDD/HSPA+/TD-SCDMA and Dual-Band GSM/GPRS/EDGE module solution in a SMT type which supports LTE CAT4 up to 150Mbps for downlink data transfer.



It has strong extension capability with rich interfaces including UART, USB2.0, SPI, I2C, GPIO, etc. With abundant application capabilities like TCP/UDP/FTP/FTPS/HTTP/HTTPS/SMTP/POP3 and MMS, the module provides much flexibility and ease of integration for customers' applications. To learn more about SIM7600 refer to [SIM7600 Datasheet](#).



Consumer Electronics Retailer

Are You Looking for an Electronic Pr

Ad CHIPROCCO

## General features

- Quad-Band TDD-LTE B38/B39/B40/B41
- Tri-Band FDD-LTE B1/B3/B8
- Dual-Band TD-SCDMA B34/B39
- Dual-Band WCDMA/HSDPA/HSPA+ B1/B8
- GSM/GPRS/EDGE 900/1800 MHz
- Control Via AT Commands
- GNSS gpsOne Gen 8B; Standalone; Assisted, XTRA;
- Data Transfer: LTE CAT4 with Uplink up to 50Mbps & Downlink up to 150Mbps
- Interfaces: USB2.0, UART, SIM Card, SPI, I2C, GPIO, ADC, PCM, SDIO

## Maduino Zero 4G LTE(SIM7600X) Board

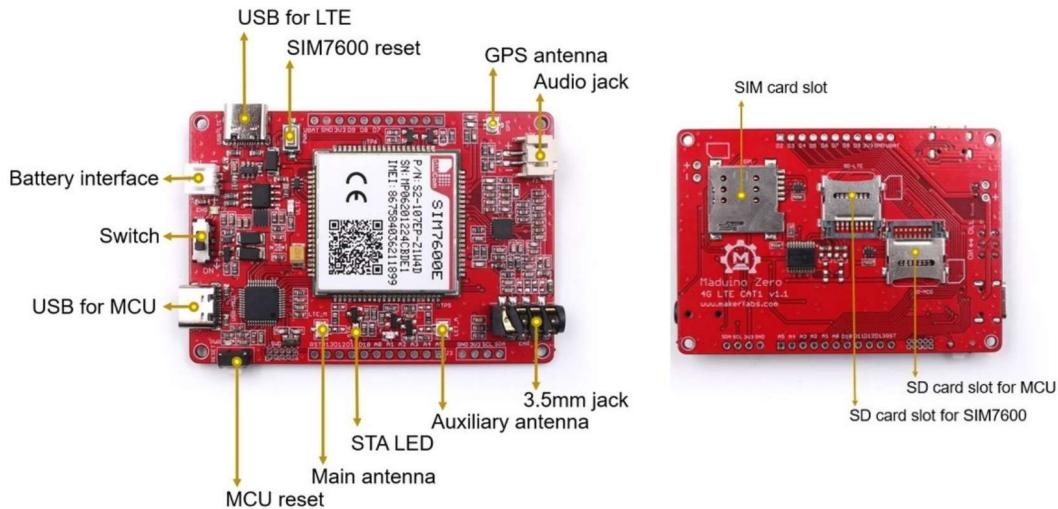
The Maduino Zero 4G LTE integrated two types of the 4G LTE CAT4 module SIM7600A-H or SIM7600E-H. The SIM7600A-H/SIM7600E-H is a complete multi-band LTE-FDD/LTE-TDD/HSPA+/UMTS/EDGE/GPRS/GSM module solution in LCC type. It supports LTE CAT4 up to 150Mbps for downlink and 50Mbps for uplink data transfer, much faster and popular than 2G/3G.



You can purchase this board from [Maduino Zero 4G LTE\(SIM7600X\)](#) as it is manufactured by Makerfabs.

## Interface

Makerfabs Maduino Zero 4G LTE module is based on [ATSAMD21G18A](#) microcontroller, which is Arduino compatible. Hence you can use Arduino IDE to operate and program the SIM7600 Module. The front and back side of the board looks something like this.



On the front side you can connect a 3.7V Lithium-Ion Battery to the battery connector. The switch can be used to turn ON/OFF the module. There are two USB TypeC ports, one for microcontroller and the other for LTE. There are two pushbuttons used for MCU & LTE reset. The stat LED indicates the network connectivity status. You can connect 3 antennas to the board which are the main antenna, auxiliary antenna, and a GPS antenna. A 3.5mm Jack can be used to connect mic or earphones and an audio jack can be used for connecting speakers.

On the backside, there is a micro-sim slot for inserting a 4G SIM Card. There is a pair of SD Card slots, one for Microcontroller and the other for SIM7600.

Don't plug or unplug the Antenna, SIM Cars, SD Card when the device is powered on. It may result in short-circuiting that may burn the IC down.

PCBONLINE

# One-Stop PCB Manufacturer

Advanced PCB manufacturer since 1999, with two manufacturing bases and one assembly factory.

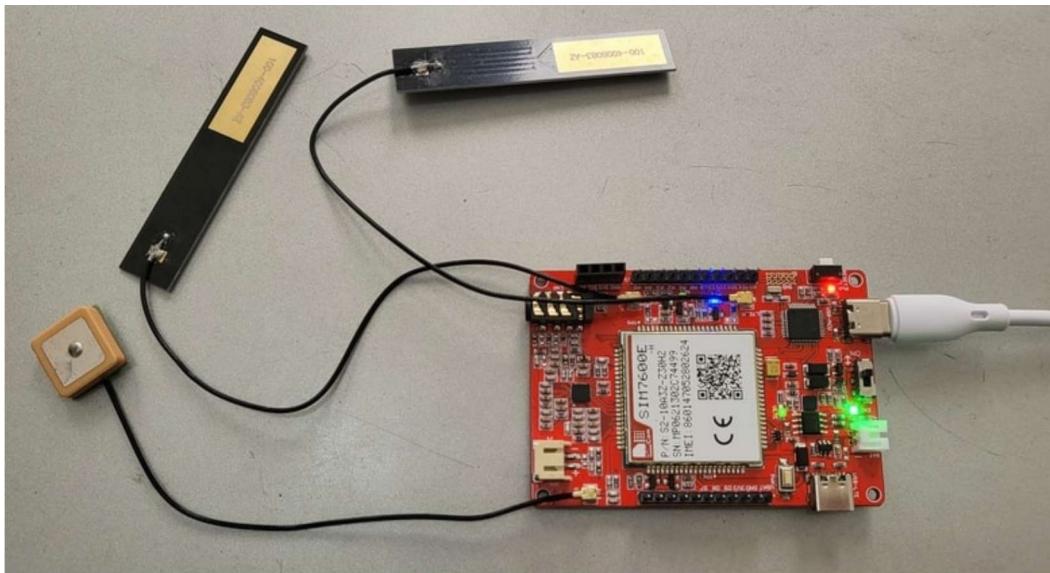
---

## Features

- Supports dial-up, phone, SMS, TCP, UDP, DTMF, HTTP, FTP, and so on
- Dual USB Type C port
- Control Via AT Commands
- Board USB supply voltage range: 4.8~5.5V, 5.0V Typical
- Board Battery supply voltage range: 3.4~4.2V, 3.7V Typical
- 3GPP E-UTRA Release 11
- Onboard charger, up to 1A charge current
- Overcharge protection(OCP), 4.3V
- Over-discharge protection(ODP), 2.5V
- Power Manager, the board can be supplied by USB or battery.
- IPEX Antenna, GSM/UMTS/LTE main antenna. UMTS/LTE auxiliary antenna. GNSS antenna
- SMS support
- Audio support
- On boarder controller: ATSAMD21G18A
- Audio Codec: NAU8810
- Level Shifter: TXS0108E
- Windows and Raspberry Pi support
- Qualcomm MDM9x07 Chipset

## Using SIM7600 GSM GPS 4G LTE with Arduino

Now let us see how we can use the SIM7600 GSM GPS 4G LTE with Arduino to use AT Commands for Call & SMS features.



1. Plug the SIM card into the board.
2. Plug the GPS antenna into the interface.
3. Plug two 4G-GSM antennas into the main antenna interface and auxiliary one.
4. Plug the headphone with the microphone.
5. Plug the SD card into the SD card slot for SIM7600.

When powering the board and the SIM7600 module working, the onboard STA LED(blue) will turn on.

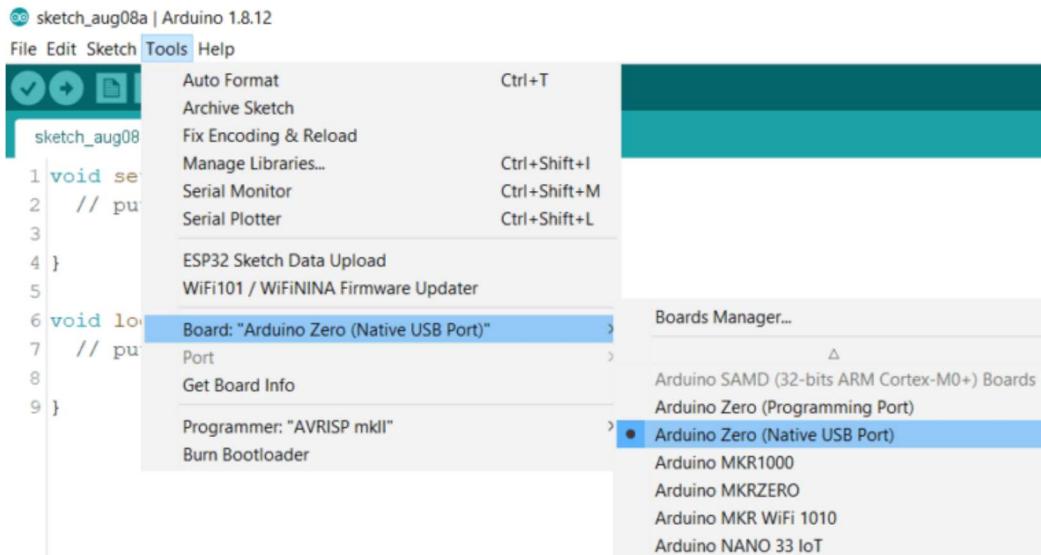
## Setting up Arduino IDE

The **ATSAMD21G18A** board isn't pre-installed in the Arduino IDE. So, we need to install "**Arduino Zero Board**" from the Board Manager.

Open the Boards Manager From the top Arduino IDE menu, select *Tools->Board->Boards Manager...* to open the Boards Manager dialog box. Then **install Arduino SAMD Boards(32-bits ARM Cortex-M0+)**.



Once, installation is completed, you can now select the Arduino Zero board as shown in the image below. To program this Board you need to connect USB TypeC Data Cable.



## One-Stop PCB M

Advanced PCB manufaci  
manufacturing bases, on

PCBONLINE

## Source Code/Program

Now open the Arduino IDE and paste the following sketches below.Verify the code and upload.

```
#include <stdio.h>
#include <string.h>

#define DEBUG true
#define MODE_1A

#define DTR_PIN 9
#define RI_PIN 8

#define LTE_PWRKEY_PIN 5
#define LTE_RESET_PIN 6
#define LTE_FLIGHT_PIN 7

String from_usb = "";

void setup()
{
    SerialUSB.begin(115200);
    //while (!SerialUSB)
    {
        ; // wait for Arduino serial Monitor port to connect
    }

    delay(100);
```

```
Serial1.begin(115200);

//Serial1.begin(UART_BAUD, SERIAL_8N1, MODEM_RXD, MODEM_TX

pinMode(LTE_RESET_PIN, OUTPUT);
digitalWrite(LTE_RESET_PIN, LOW);

pinMode(LTE_PWRKEY_PIN, OUTPUT);
digitalWrite(LTE_RESET_PIN, LOW);
delay(100);
digitalWrite(LTE_PWRKEY_PIN, HIGH);
delay(2000);
digitalWrite(LTE_PWRKEY_PIN, LOW);

pinMode(LTE_FLIGHT_PIN, OUTPUT);
digitalWrite(LTE_FLIGHT_PIN, LOW); //Normal Mode
// digitalWrite(LTE_FLIGHT_PIN, HIGH); //Flight Mode

SerialUSB.println("Maduino Zero 4G Test Start!");

sendData("AT+CGMM", 3000, DEBUG);
}

void loop()
{
    while (Serial1.available() > 0)
    {
        SerialUSB.write(Serial1.read());
        yield();
    }
    while (SerialUSB.available() > 0)
    {
#define MODE_1A
        int c = -1;
        c = SerialUSB.read();
        if (c != '\n' && c != '\r')
        {
            from_usb += (char)c;
        }
        else
        {
            if (!from_usb.equals(""))
            {
```

```

        sendData(from_usb, 0, DEBUG);
        from_usb = "";
    }
}

#else
    Serial1.write(SerialUSB.read());
    yield();
#endif
}
}

bool moduleStateCheck()
{
    int i = 0;
    bool moduleState = false;
    for (i = 0; i < 5; i++)
    {
        String msg = String("");
        msg = sendData("AT", 1000, DEBUG);
        if (msg.indexOf("OK") >= 0)
        {
            SerialUSB.println("SIM7600 Module had turned on.");
            moduleState = true;
            return moduleState;
        }
        delay(1000);
    }
    return moduleState;
}

String sendData(String command, const int timeout, boolean deb
{
    String response = "";
    if (command.equals("1A") || command.equals("1a"))
    {
        SerialUSB.println();
        SerialUSB.println("Get a 1A, input a 0x1A");

        //Serial1.write(0x1A);
        Serial1.write(26);
        Serial1.println();
        return "";
    }
    else

```

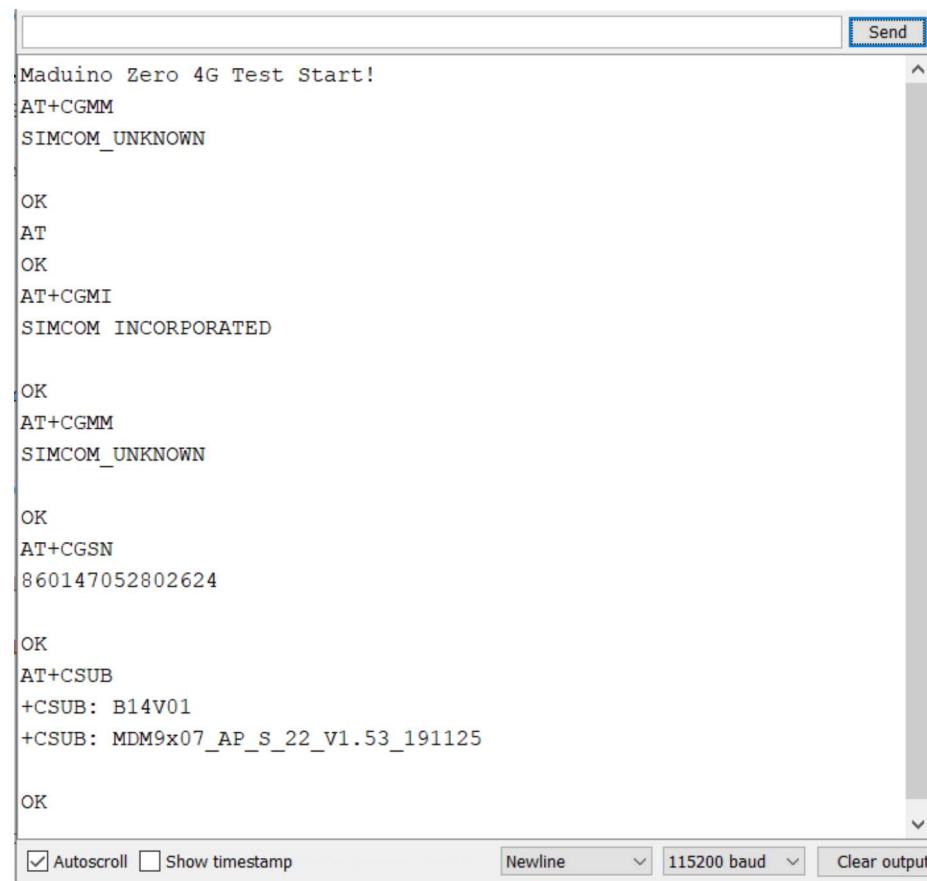
```
{  
    Serial1.println(command);  
}  
  
long int time = millis();  
while ((time + timeout) > millis())  
{  
    while (Serial1.available())  
    {  
        char c = Serial1.read();  
        response += c;  
    }  
}  
if (debug)  
{  
    SerialUSB.print(response);  
}  
return response;  
}
```

After uploading the code, open the serial monitor. You can now send the AT command to the board, and it will print the module response. There are some demos that show how to use the AT commands.

## SIM7600 AT Commands Test

These are some basic functions to test AT Commands.

AT+CGMI	// Request manufacturer identification
AT+CGMM	// Request model identification
AT+CGSN	// Request product serial number identification
AT+CSUB	// Request the module version and chip



The screenshot shows a serial monitor window with the following text output:

```
Maduino Zero 4G Test Start!
AT+CGMM
SIMCOM_UNKNOWN

OK
AT
OK
AT+CGMI
SIMCOM INCORPORATED

OK
AT+CGMM
SIMCOM_UNKNOWN

OK
AT+CGSN
860147052802624

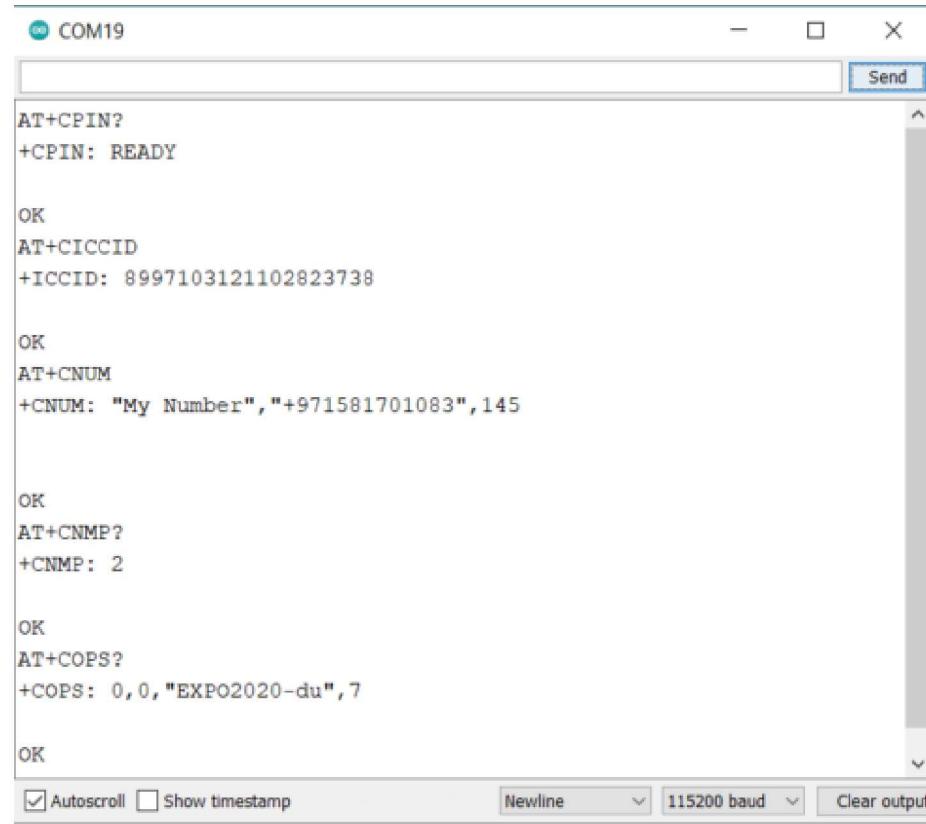
OK
AT+CSUB
+CSUB: B14V01
+CSUB: MDM9x07_AP_S_22_V1.53_191125

OK
```

At the bottom of the window, there are several configuration options:

- Autoscroll
- Show timestamp
- Newline dropdown menu
- 115200 baud dropdown menu
- Clear output button

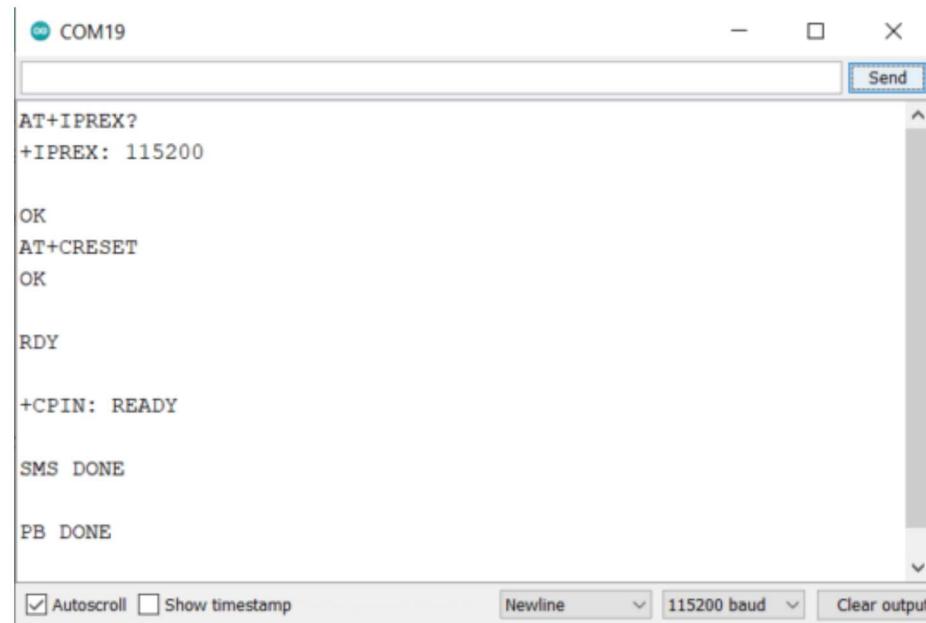
AT+CPIN?	// Request the state of the SIM card
AT+CICCID	// Read ICCID from SIM card
AT+CNUM	// Request the subscriber number
AT+CNMP?	// Preferred mode selection
AT+COPS?	// Check the current network operator



AT+CPIN?  
+CPIN: READY  
  
OK  
AT+CICCID  
+CICCID: 8997103121102823738  
  
OK  
AT+CNUM  
+CNUM: "My Number", "+971581701083", 145  
  
OK  
AT+CNMP?  
+CNMP: 2  
  
OK  
AT+COPS?  
+COPS: 0,0,"EXPO2020-du",7  
  
OK

Autoscroll  Show timestamp Newline 115200 baud Clear output

```
AT+IPREX? // Check local baud rate  
AT+CRESET // Reset the module
```



AT+IPREX?  
+IPREX: 115200  
  
OK  
AT+CRESET  
OK  
  
RDY  
  
+CPIN: READY  
  
SMS DONE  
  
PB DONE

Autoscroll  Show timestamp Newline 115200 baud Clear output

PCBONLINE

# One-Stop PCB Manufacturer

Advanced PCB manufacturer since 1999, with two manufacturing bases, one assembly factory.

## Get the GNSS location

To get the GNSS Location from SIM7600, use the following AT Commands.

```
AT+CGPS=1      // Start GPS session
AT+CGPSINFO    // Get GPS fixed position information
AT+CGPS=0      // Stop GPS session
```



The screenshot shows a serial monitor window titled "COM121". The text area displays the following communication log:

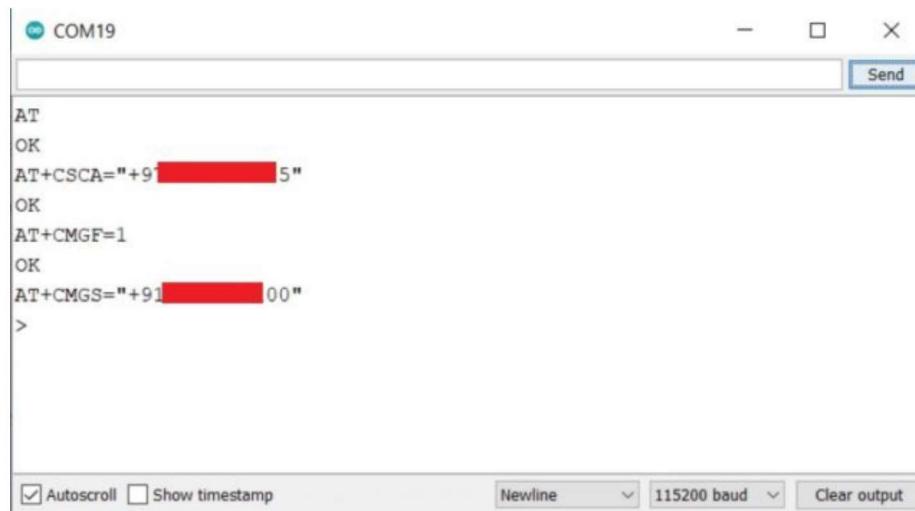
```
14:32:02.646 -> AT
14:32:02.646 -> OK
14:32:06.404 -> AT+CGPSINFO
14:32:06.404 -> +CGPSINFO: 2236.714854,N,11350.111915,E,041121,063206.0,12.7,0.0,236.3
14:32:06.404 ->
14:32:06.404 -> OK
14:32:33.317 -> AT+CGPS=0
14:32:33.317 -> OK
14:32:35.358 ->
14:32:35.358 -> +CGPS: 0
```

## Send and receive SMS

We can send SMS using SIM7600 & Arduino. Is recommended to use other serial monitors not the Arduino IDE one to send the AT command for this demo.

```
AT+CSCA="XXXXXX"      // Set the SMS service centre address
AT+CMGF=1              // Select SMS message format
AT+CMGS="xxxxxx"       // Send message to "xxxxxx"(the receive
```

After sending the above AT commands, it will show ">" and then you can send your message. When you finish your message, you need to send "1A" with the hexadecimal for confirming or send "1B" with the hexadecimal for cancel. This is why it is recommended to use other serial monitor.



AT+CMGR=3	// Read message
AT+CMGD=3	// Delete message

## Make a call

You can make or receive a call with SIM7600 using following AT Commands.

AT+CSDVC	// Switch voice channel device
AT+CSDVC=1	// 1-Handset, 3-Speaker phone
AT+CLVL=2	// Set loudspeaker volume level to 2, the

```

AT
OK
AT+CSDVC=1
OK
AT+CLVL=2
OK
AT+CLVL=?
+CLVL: (0-5)

OK
ATD+91[REDACTED]
NO CARRIER
AT+CHUP
OK
AT+CLIP=1
OK
ATA
NO CARRIER

```

Autoscroll  Show timestamp Newline 115200 baud Clear output

```

ATDxxxxx;          // Call to xxxxx
AT+CHUP           // Hang up the call
AT+CLIP=1         // Calling line identification presentation
ATA               // Call answer

```

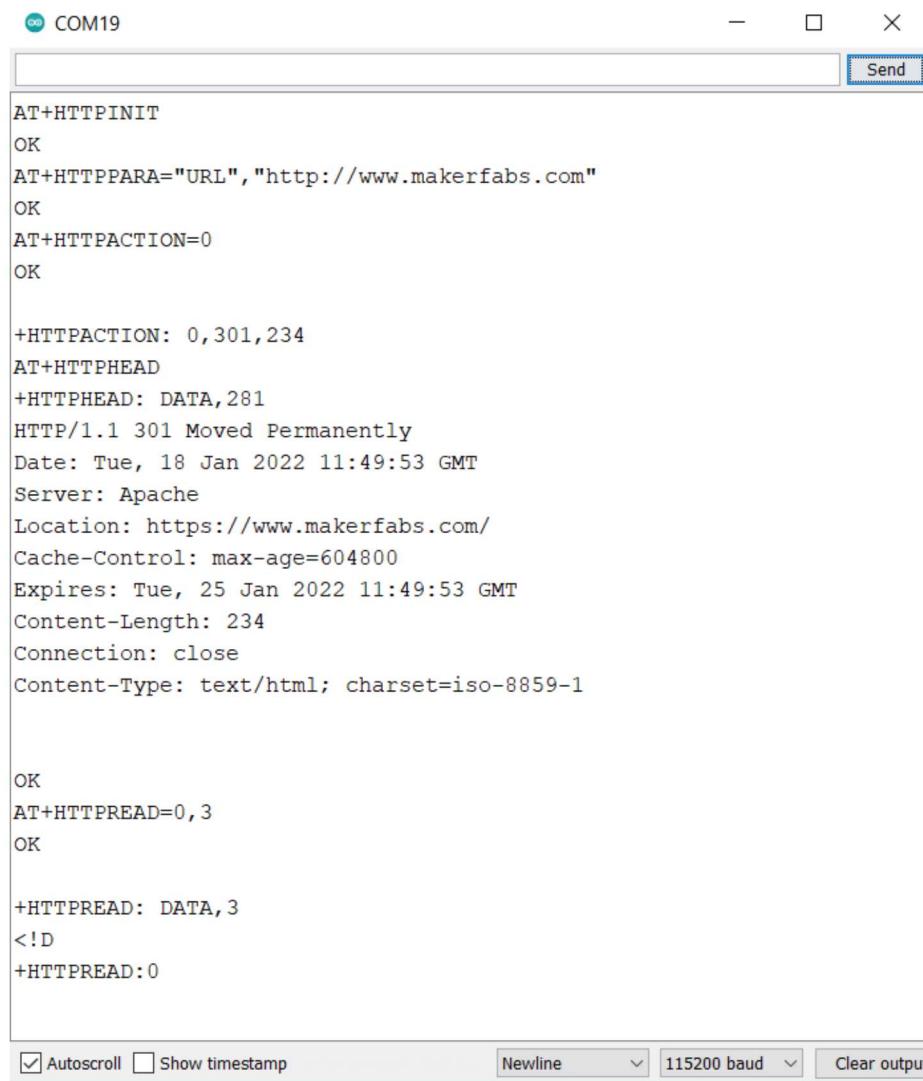
## HTTP test

You can test the SIM7600 LTE HTTP request using following commands.

```

AT+HTTPINIT        // Initialize and start the HTTP
AT+HTTPPARA="URL", "http://www.makerfabs.com" // Set the U
AT+HTTPACTION=0    // Connect the HTTP. (0-get, 1-post, 2-
AT+HTTPHEAD        // Read the response's header.
AT+HTTPREAD=0,3     // Read the content ("3" means the numb

```



The screenshot shows a terminal window titled 'COM19' with the following command history:

```

AT+HTTPINIT
OK
AT+HTTPPARA="URL", "http://www.makerfabs.com"
OK
AT+HTTPACTION=0
OK

+HTTPACTION: 0,301,234
AT+HTTPHEAD
+HTTPHEAD: DATA,281
HTTP/1.1 301 Moved Permanently
Date: Tue, 18 Jan 2022 11:49:53 GMT
Server: Apache
Location: https://www.makerfabs.com/
Cache-Control: max-age=604800
Expires: Tue, 25 Jan 2022 11:49:53 GMT
Content-Length: 234
Connection: close
Content-Type: text/html; charset=iso-8859-1

OK
AT+HTTPREAD=0,3
OK

+HTTPREAD: DATA,3
<!D
+HTTPREAD:0

```

At the bottom of the terminal window, there are several configuration buttons:  Autoscroll,  Show timestamp, Newline, 115200 baud, and Clear output.

A detailed guide on how to make HTTP Post with SIM7600 is discussed on this article: [Send Data with HTTP Post Method](#).

## Test the SD card for SIM7600

When you plug an SD card into the SD card slot for SIM7600, You can use the following commands to check it.

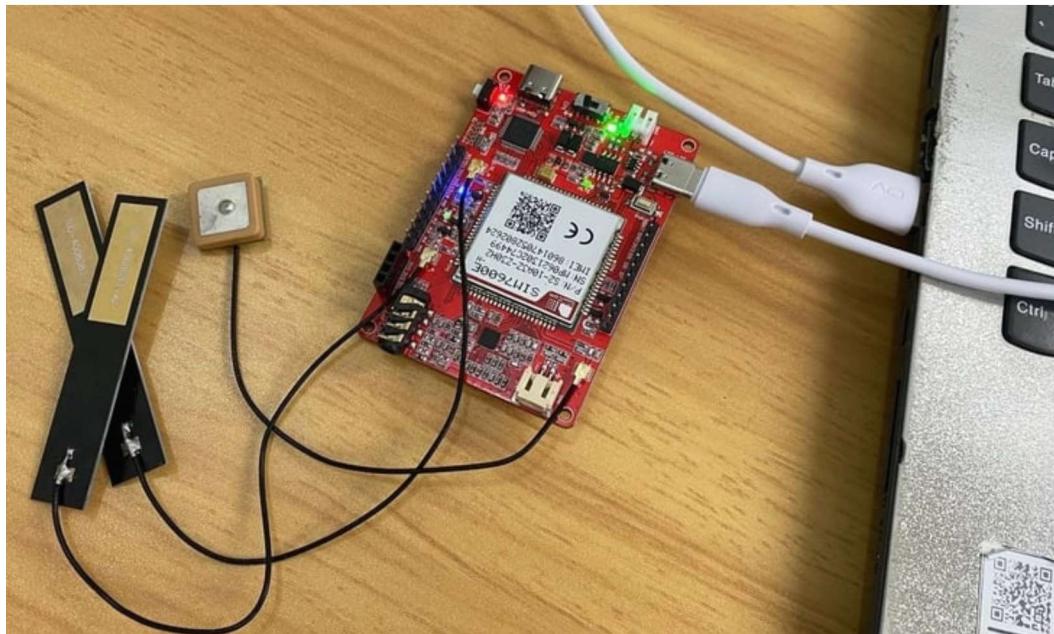
AT+FSCD=D:	// Select SD card directory
AT+FSLS	// List directories/files in
AT+CFTRANRX="D: TEST.txt",10	// Transfer a file to EFS
AT+CFTRANTX="D: TEST.txt"	// Transfer a file from EFS

	GIẢM GIÁ		
108.000đ	19.000đ	95.000đ	26.000đ

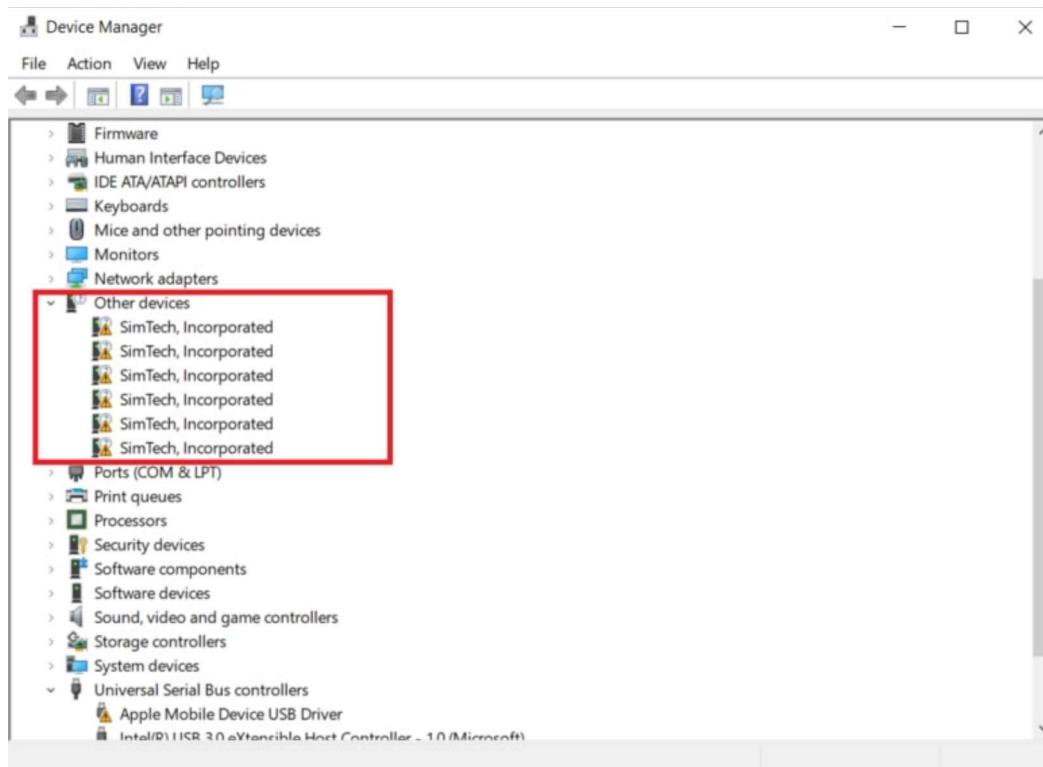
Linh kiện điện tử gì cũng có  
Điện Tử Nshop

## Surfing the Internet using SIM7600

The SIM7600 Arduino Modem can be a wireless networking device to support the PC or Raspberry PI surfing the internet. Use Type-C USB cable to connect the board(USB-LTE) and PC.

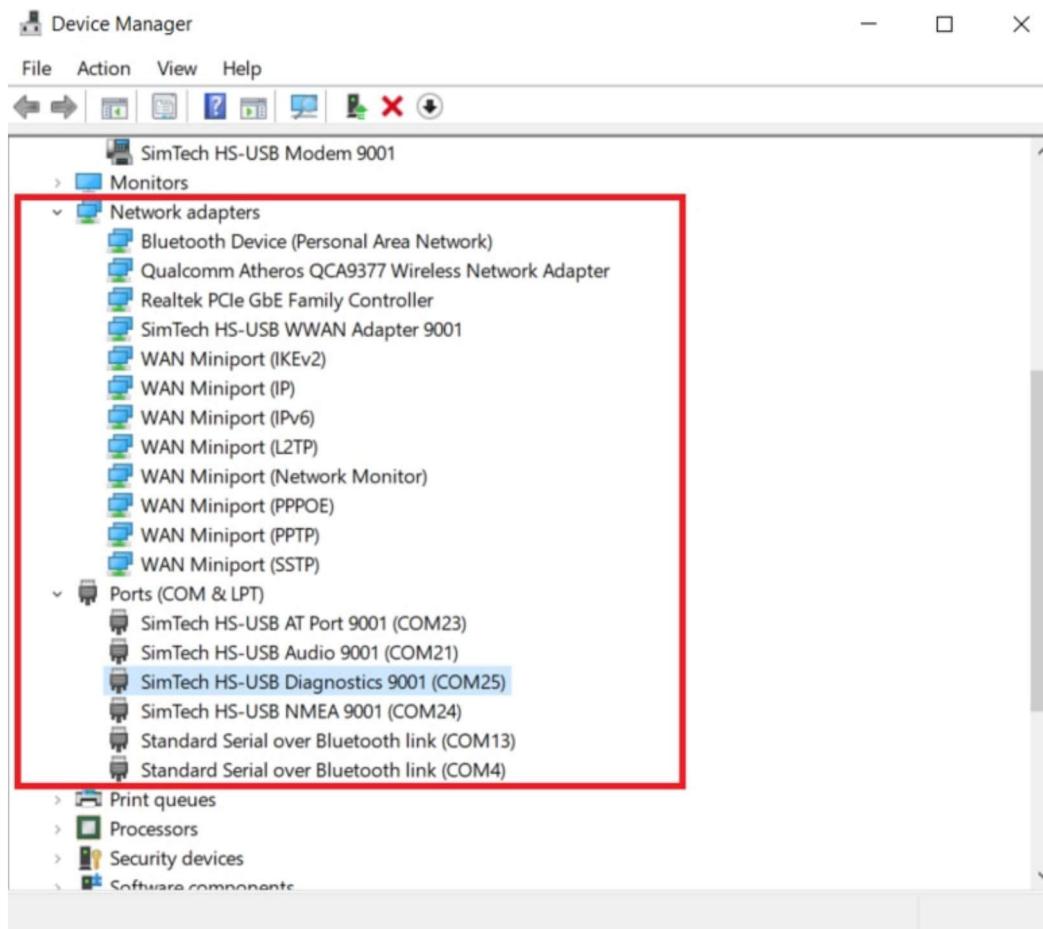


For surfing the internet you need to install the SIM7600 driver to the PC. The driver is available on [resources](#).



Open Device Manager --> Other equipment --

>"SimTech,Incorporated"- > Update the driver --> Browse my computer to find driver files --> Select a path for saving the driver file based on the system- >The installation is complete.



Install all the drivers that show as the yellow exclamation marks.

If the PC does not connect to the internet through this device, please open the serial monitor and send the AT command to start the networking.

```
AT$QCRMCCALL=1,1
```

The network icon will then appear as a cellular network.



If you are still not able to connect to the internet, please use the PPP dial-up connection way to start networking. More info you can get from [GitHub](#).

## Video Tutorial & Guide

SIM7600 4G LTE GSM Modem Tutorial with Arduino | AT Commands, Call, SMS, HTTP Internet

[Watch this video on YouTube.](#)

**Automotive PCB  
Manufacturing**

Ad PCBONLINE

**Board Arduino  
Nano V3.1  
LGT8F328P**

Ad Điện Tử Nshop

**Omni-directional  
site antenna**

Ad Step Global

**low  
unif**

Ad rfec

**Industry 4.0 -  
AKusense digital  
sensor**

Ad akusense.com

**R&D and  
production of xPON**

Ad V-SOL

**SMT Assembly  
Machines - SMD  
Assembly Machines**

Ad autotronik-smt.de

## 7 Comments

---

Marco

February 28, 2022 at 2:53 PM

Hi , is it possible to use tinygsm library instead of sending all the AT command ?

Loading...

Reply

Admin

February 28, 2022 at 2:53 PM

The Tinygsm library might not work with this module. But you can give a try

Loading...

Reply

tormodwarren

May 9, 2022 at 5:15 PM

Hi Admin!

I get error message "SerialUSB" was not declared in this scope.

It is urgent that I fix this for work. Do you kindly have a solution?

Thank you!

Loading...

Admin

May 9, 2022 at 5:19 PM

SerialUSB command is not supported by Arduino UNO or ATmega328 based board. SerialUSB command is for ATSAMD based 32 bit controller.

Loading...

---



## Tuan Trung

April 3, 2022 at 11:01 AM

Hi Admin

I used SIM7600GH and Andruino Uno R3 but when I open the Arduino IDE and paste the following sketches below.Verify the code, It's indicated:

'SerialUSB' was not declared in this scope

So how to fix t, please?

Loading...

Reply

---



## tormodwarren

May 9, 2022 at 5:12 PM

Hi Tuan! I have the same issue, and it is urgent to fix it for work. Did you get a solution?

Thank you, have a good day!

Loading...

Reply

---



## ericdeath

November 9, 2022 at 1:00 AM

No questions – this is just a brilliant web page. Congradualtions!

Loading...

Reply