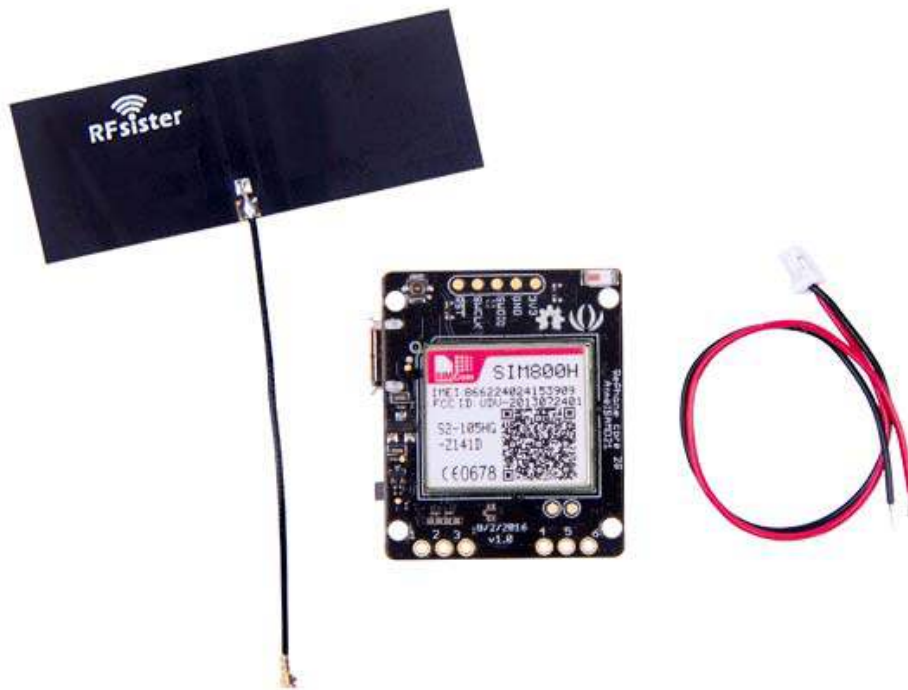# Rephone Core 2G-AtmelSAMD21

SKU 102040046

Introduction

RePhone is one of the most unique and interesting development board platform that created by Seeed Studio, ever since its first show on the stage of KickStarter, it has received tons of attention and support from makers all over the world because with RePhone you can not only DIY a special phone for yourself, but also enchant things around you with cellular connectivity.

The RePhone Core 2G-AtmelSAMD21 v1.0 is a new Arduino compatible RePhone core 2G board, which is based on Atmel's SAMD21 and SIM800H, Most features of RePhone Core 2G-AtmelSAMD21 v1.0 is the same as Xadow – GSM+BLE, such as offering rich range of communication protocols – GSM, GPRS, and Bluetooth, supporting quad-band 850/900/1800/1900Mz, and supporting 2G Nano SD card. But the solution of Atmel's SAMD21 plus SIM800H has dropped power consumption a lot comparing to Xadow – GSM+BLE. If you are looking for a high-performance and low power consumption Rephone core to enchant the world, the this new RePhone core 2G module is the best choice.

Note

The RePhone Core 2G-AtmelSAMD21 v1.0 is compatible with all the Xadow v2.0 except the Xadow 1.54 inch Touchscreen Please connect a battery to the board if you want to use the GSM or GPRS function in case the power form USB is not enough and fail to communicate.

Warning

This product **DOESN'T** include a lopo-battery, and there's no lipo-battery sold at our Bazaar as well, any 3.7V lipo-battery will work.

This product **DOESN'T** include a Mic, Speaker and 3.5mm handset input, you need to buy a Xadow Audio for those function.

Features

Arduino/Processor

- ATSAMD21G18 @ 48MHz with 3.3V logic/power
- Arduino compatible (based on Arduino Zero bootloader)
- Embedded with lithium battery management chip
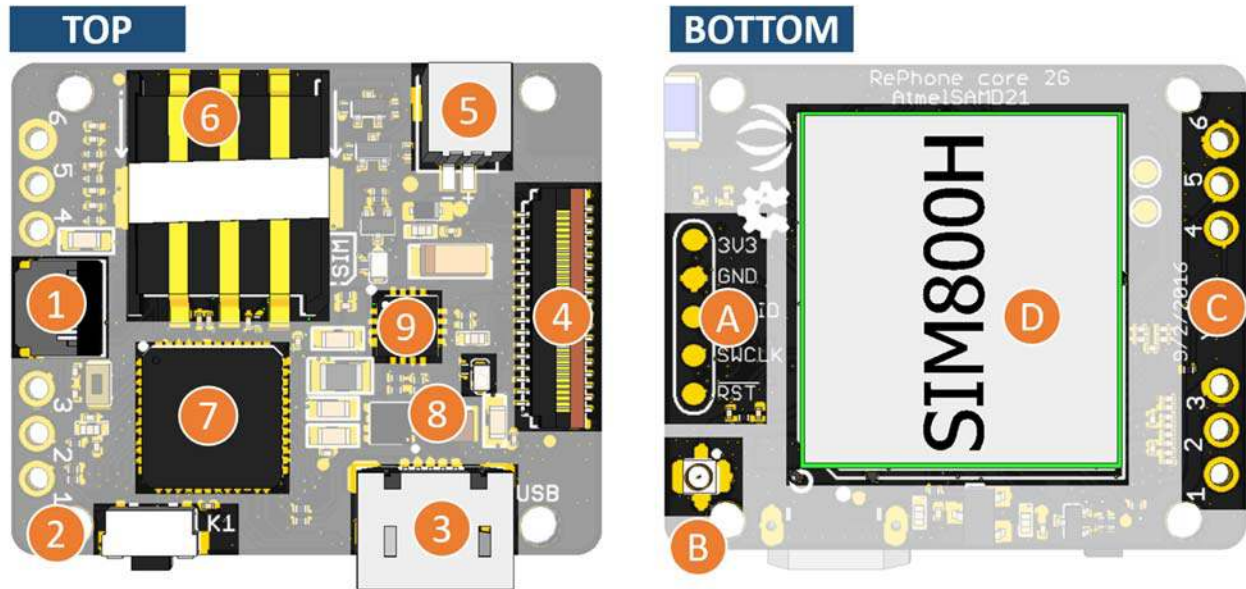- User button

SIM800H

- Quad band850/900/1800/1900MHz
- GPRS multi-slot class 12/10
- GPRS mobile station class B
- Meet the GSM 2/2 + standard

- o Class 4 (2 W @850/900MHz)
- o Class 1 (1 W @1800/1900MHz)
- bluetooth:compatible3.0+EDR
- FM:band limits 76~109MHz,Tuning step by step 50KHz
- Via ATcommand control 3GPP TS 27.007, 27.005 and SIMCOM enhance ATcommand set
- SIM USAT
- Low power
- Operating temperature range : -40 ~+85 °C

Specification

Item	Value
Microcontroller	ATSAMD21G18, 32-Bit ARM Cortex M0+
Operating Voltage	3.3V
DC Current per I/O Pin	7 mA
Flash Memory	256 KB
SRAM	32 KB
EEPROM	None
Clock Speed	48 MHz
Lenght	68 mm
Width	30 mm
Weight	12 gr.

Hardware Overview

- **1-** 11pin Xadow Connector
- **2-** User Button(D3)
- **3-** Micro USB connector for programming and power
- **4-** 35pin Xadow Connector
- **5-** Jst1.0 Battery Connector
- **6-** Nano Sim Card (same to iPhone 5/6/7)
- **7-** ATSAMD21G18 IC
- **8-** Charge status monitor LED
- o blink - no battery insert
- o on - charging
- o off - charge done
- **9-** IC - ETA6003(datasheet)
- **A-** SWD Debug port
- **B-** Antenna Connector
- **C-** I/O PIN pad
- **D-** SIM800H

Pin map
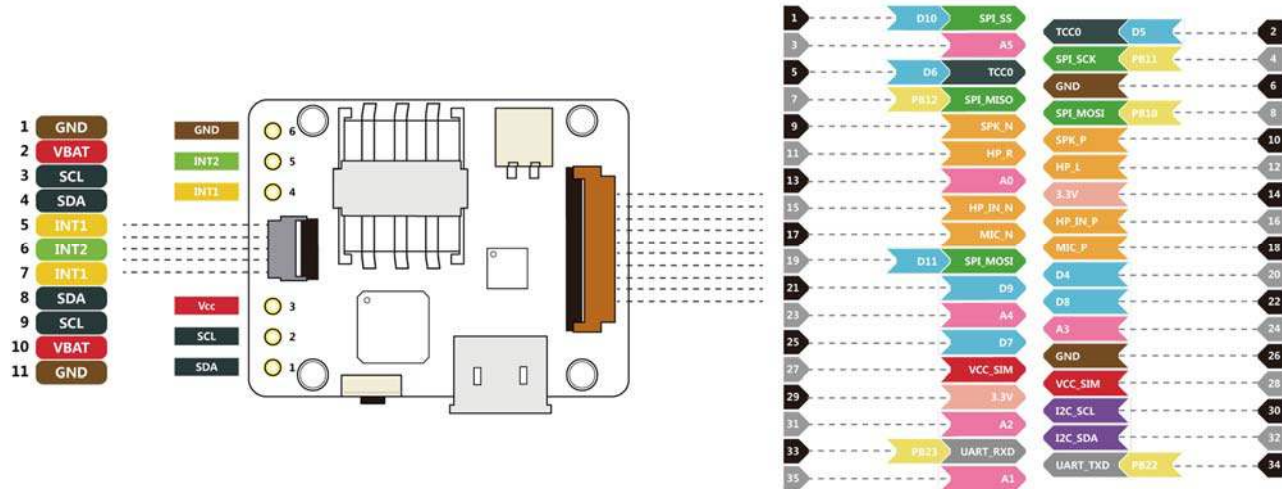
- INT1 connect to D7
- INT2 connect to D12

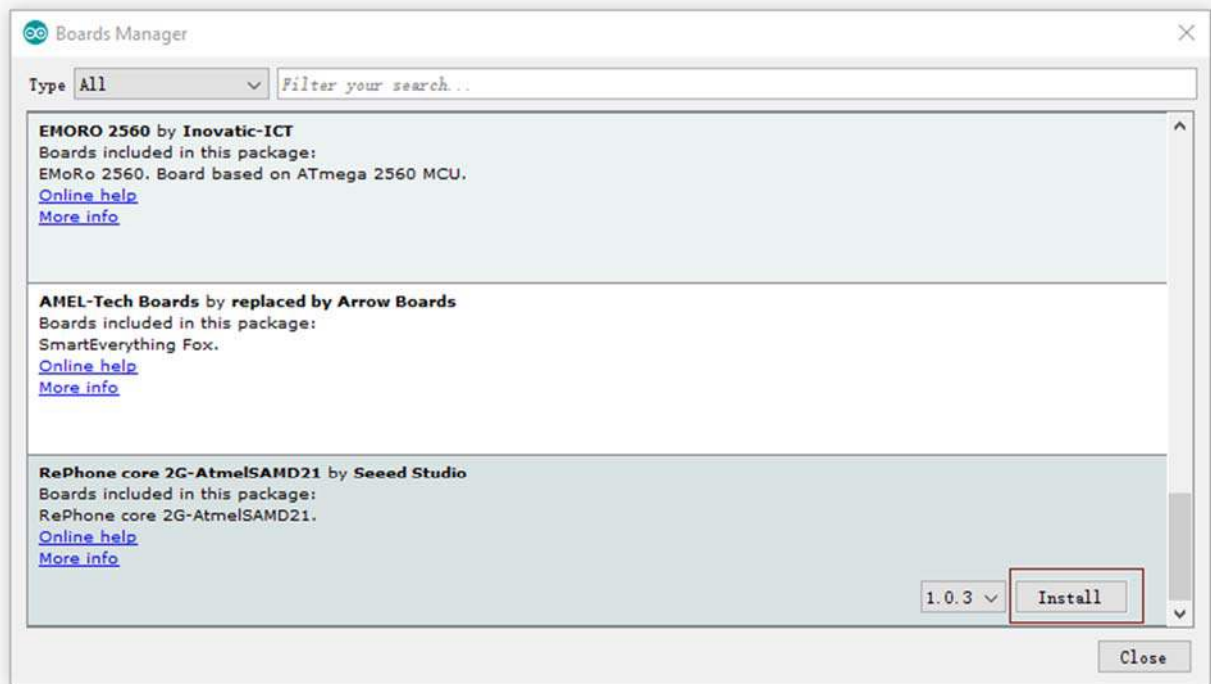## Arduino IDE

After you download and install the latest Arduino IDE, there's something need to set up. Open your Arduino IDE, and click on **File > Preferences** Copy blow code to **Additional Boards Manager URLs**, and then **OK**

```
https://raw.githubusercontent.com/Seeed-
Studio/Seeed_Platform/master/package_seeeduino_boards_index.json
```
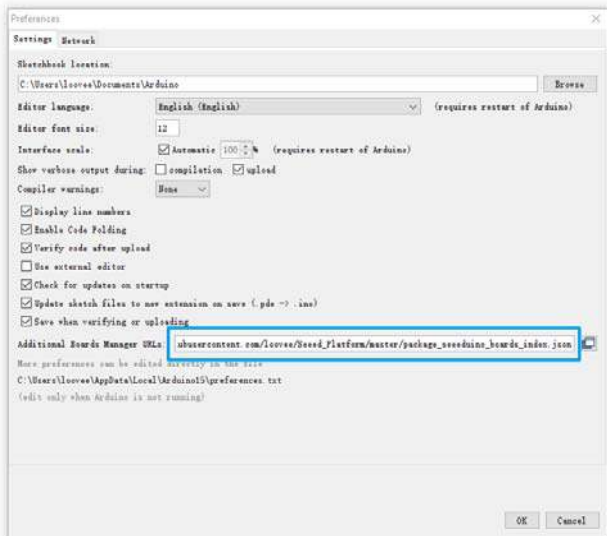
Then let's go to **Tools > Board > Boards Manager**

Click on the **Install** button and wait for minutes before the board is installed.

After the install is completed, you can find RePhone core 2G-AtmelSAMD21 at the bottom of **Tools > Board**.
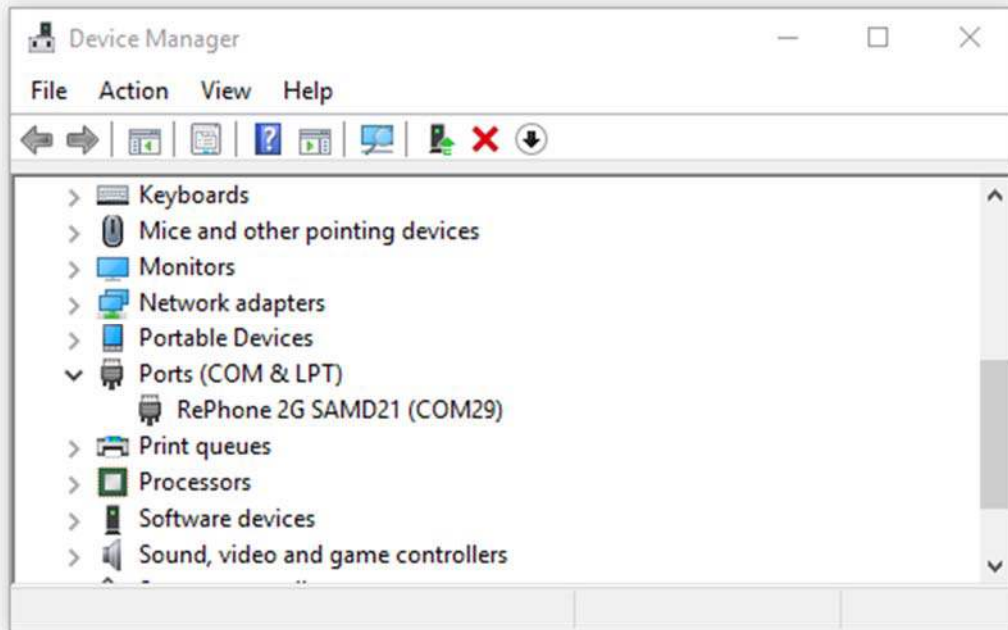

Install the Driver (For Windows)

When the first time to insert the board, you should get a USB COM device name RePhone 2G SAMD21 that need to install a driver. Click on the below button to download driver for the board.

To make sure the driver was installed successful, open your Device Manager to see if **RePhone 2G SAMD21** exists.

Hello World

Now we can upload our first demo - Hello World to the board.

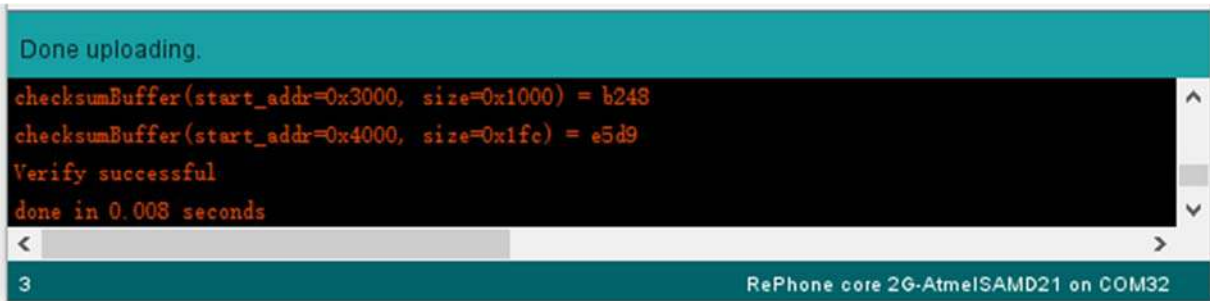Open your Arduino IDE copy the blow code:

```
void setup()
{
    SerialUSB.begin(115200);
}

void loop()
{
    SerialUSB.println("Hello world!");
    delay(1000);
}
```

And Then,

- Click on **Tools > Board > RePhone core 2G-AtmelSAMD21**
- Click on **Tools > Port** to select a right port number. (*Don't choose COM1*)

Then click on the **Upload** button on the left-top of Arduino IDE, seconds later the sketch was uploaded successful.

If the uploading is success, you should the some info in red.

Open Serial Monitor of your Arduino IDE and you will get "Hello World" printed per seconds.

AT Command Mode

RePhone core 2G board support AT command mode. TX/RX of SIM800H is connected to Serial1(D0/D1) of AtemlSAMD21.

Copy the below code and upload to your board.

```c
#include "atmelsamd21_gprs.h"

void setup()
{
    SerialUSB.begin(115200);
    while(!SerialUSB);

    SerialUSB.println("RePhone core 2G - AtmelSAMD21 AT Command Test");
    gsm.preInit();                      // power on

    while(0 != gsm.init())
    {
        SerialUSB.println("GSM init error.");
        delay(2000);
    }

    SerialUSB.println("GSM init ok.");
}

void Loop()
{
    while(SerialUSB.available())Serial1.write(SerialUSB.read());
    while(Serial1.available())SerialUSB.write(Serial1.read());
}
```
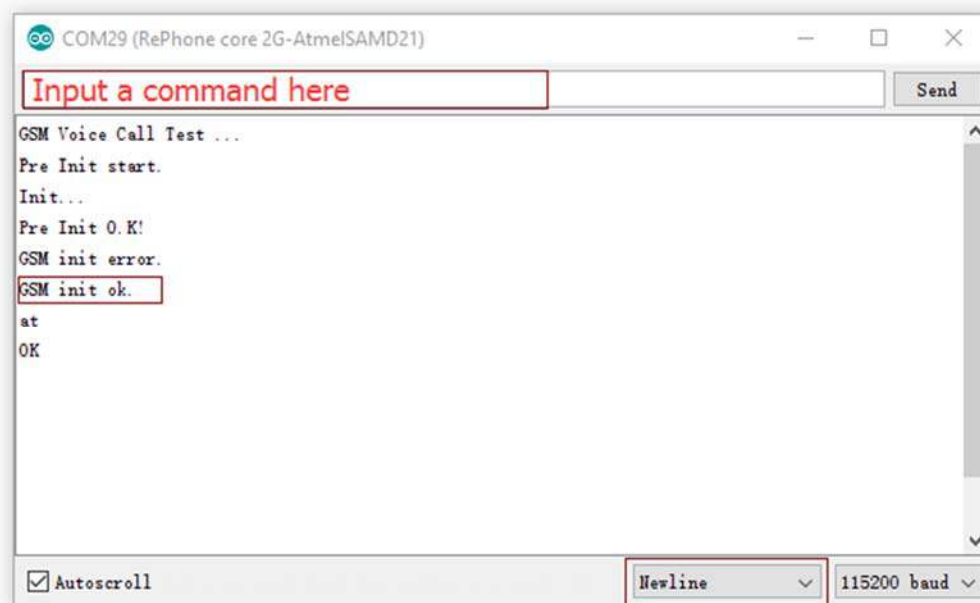
Open your Serial monitor and wait for **GSM init ok.** printed on the monitor, then you can input a command. Try to input an "AT" to get an "OK".

All command must be end with a new line(\r\n).

Click on below button to get detailed AT command documentation.

Examples

We had made many examples to show you how this module work. At the every beginning, please

1. Insert a nano SIM card
2. Insert the antenna
3. If you got a lipo-battery, insert it to the board as well

Click on **File > Examples** then you can open those examples.

AtmelSAMD21_SIM800

- **Bluetooth_AT_Command_And_Music_Play**: Play music via bluetooth
- **GSM_GPRS_HTTP_GET**: Http get hello.txt from mbed.org
- **GSM_Receive_SMS**: Receive SMS
- **GSM_Voice_Call**: Receive voice call

RePhone_API_for_Arduino

- **gps_test**: Xadow GPS v2 example
- **ledmatrix_test**: Xadow LED 5x7 example
- **nfc_test**: Xadow NFC v2 example
- **sensorhub_test**: Xadow Basic Sensors example
- **ws2812_test**: Xadow Duino example

rephone_button

- **button_test**: On-board button test

rephone_lcm

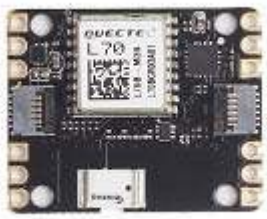- **lcm_display_test**: LCD display exampledkdsafdfds

rephone_menu_all

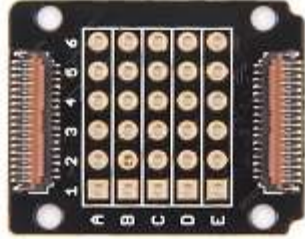- **rephone_menu_test**

TwilioMessage

- **message_test**: Twilio Message Send/Receive

RePhone Family

There are several chainable add-on modules to extend the features and functionalities – Xadow Audio, Xadow LED 5x7, Xadow Basic Sensors, Xadow Duino, Xadow GPS v2 and Xadow NFC v2.

GPS v2	Basic Sensors	NFC v2

LED 5 x 7	Audio	Xadow GSM Breakout

Help us make it better

Thank you for choosing Seeed. A couple of months ago we initiated a project to improve our documentation system. What you are looking at now is the first edition of the new documentation system. Comparing to the old one, here is the progresses that we made:

- Replaced the old documentation system with a new one that was developed from Mkdocs, a more widely used and cooler tool to develop documentation system.
- Integrated the documentation system with our official website, now you can go to Bazaar and other section like Forum and Community more conveniently.
- Reviewed and rewrote documents for hundreds of products for the system's first edition, and will continue migrate documents from old wiki to the new one.

An easy-to-use instruction is as important as the product itself. We are expecting this new system will improve your experience when using Seeed's products. However since this is the first edition, there are still many things need to improve, if you have any suggestions or findings, you are most welcome to submit the amended version as our contributor or give us suggestions in the survey below, Please don't forget to leave your email address so that we can reply.

Happy hacking