seeed studio Grove-GPS-Air530 Module Owner’s Manual

Contents

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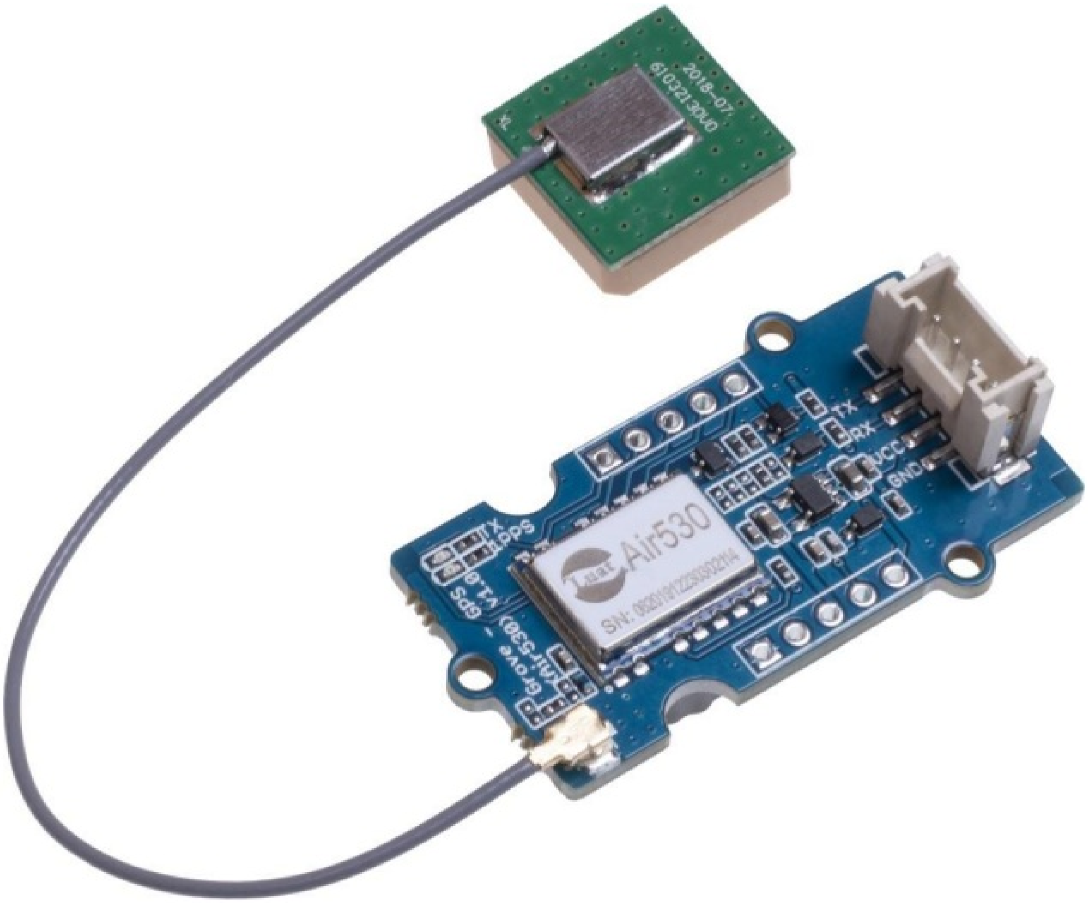


Product Information

The Grove – GPS (Air530) is a high-performance, highly integrated multi-mode satellite positioning and navigation module.
It supports GPS / Beidou / Glonass / Galileo / QZSS / SBAS, making it suitable for GNSS positioning applications such as car navigation, smart wear, and drones.

Features

- Cost-effective
- Highly integrated
- Multi-mode satellite positioning and navigation
- Compact size for easy deployment
- Tiny volume and low power consumption

Specifications

Parameter	Value
Supply voltage	3.3V/5V
Working current	up to 60mA
Time of warm start	4s
Time of cold boot	30s
Platforms Supported	Arduino, Raspberry Pi

Product Usage Instructions

Getting Started

If this is the first time you work with Arduino, we recommend you to see the Getting Started with Arduino guide before starting.

Play With Arduino

1. Prepare the following items:
   - Seeeduino V4.2
   - Base Shield
   - Grove – GPS (Air530)
2. Connect Grove – GPS to port D2 of Grove-Base Shield.
3. Plug Grove – Base Shield into Seeeduino.
4. Connect Seeeduino to PC via a USB cable.

Software Installation

Note that the u-center software is for Windows only.

1. Install u-center software.
2. Copy the provided code into Arduino IDE and upload it.

```
#include <SoftwareSerial.h>
SoftwareSerial SoftSerial(2, 3);
unsigned char buffer[64];
int count=0;

void setup() {
  SoftSerial.begin(9600);
  Serial.begin(9600);
}

void loop() {
  if (SoftSerial.available()) {
    while(SoftSerial.available()) {
      buffer[count++] = SoftSerial.read();
    }
  }
}
```

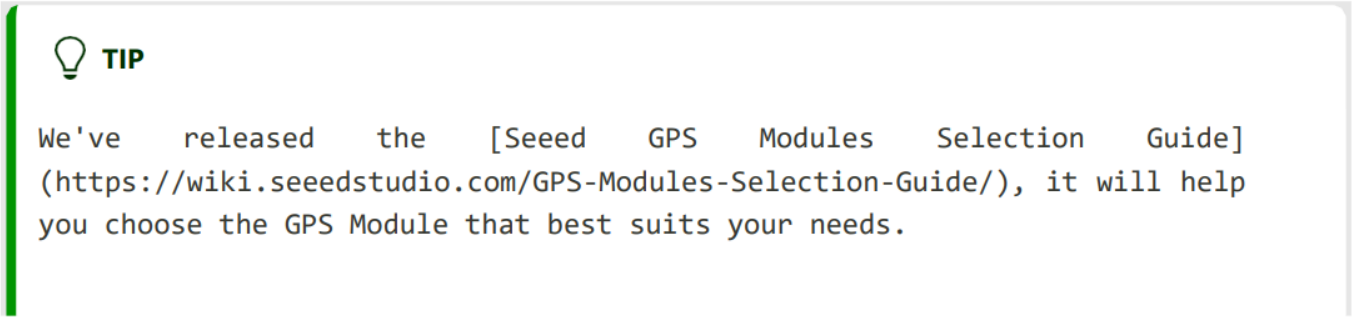
FAQ

- **Q: Where can I find more information about Grove modules?**
  - **A**: You can refer to the [Grove System](https://wiki.seeedstudio.com/Grove_System/) for more details about Grove modules.

- **Q: Can I connect the Grove – GPS directly to Seeeduino without the Base Shield?**
    - **A**: Yes, you can connect the Grove – GPS directly to Seeeduino following the provided instructions.

Confused of your GPS not working well in urbans or outsides under only one or few satellite modules? Then you should not miss our new Grove-GPS (Air530). It's a high-performance, highly integrated multi-mode satellite positioning and navigation module. It supports GPS / Beidou / Glonass / Galileo / QZSS / SBAS, which makes it suitable for GNSS positioning applications such as car navigation, smart wear and drones.

TIP

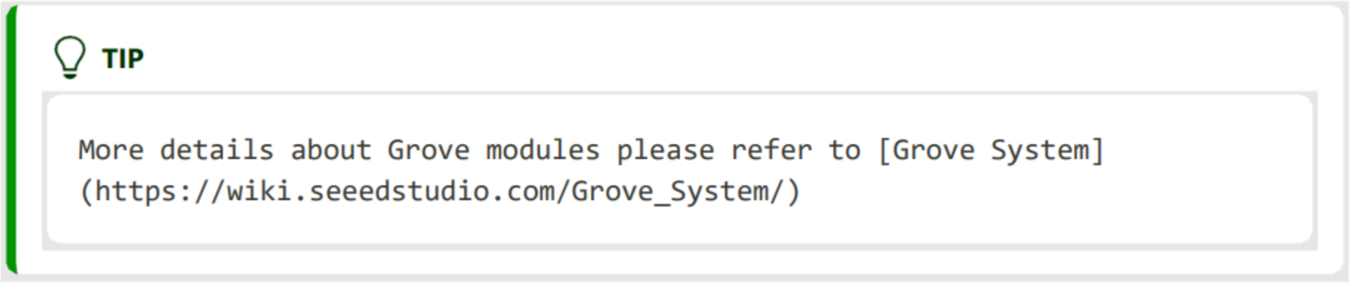


TIP

We've released the [Seeed GPS Modules Selection Guide](https://wiki.seeedstudio.com/GPS-Modules-Selection-Guide/), it will help you choose the GPS Module that best suits your needs.

Features

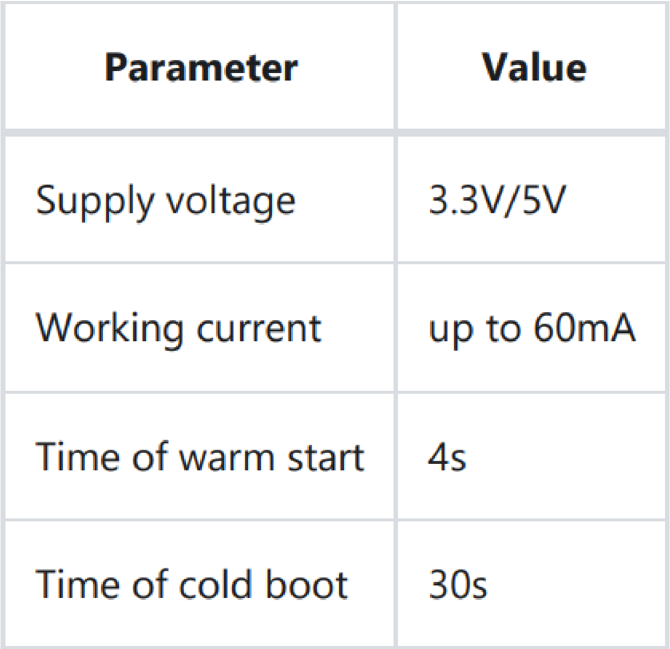
- Cost-effective
- Highly integrated Multi-mode satellite positioning and navigation
- Compact size for easy deployment
- Tiny volume and low power consumption



TIP

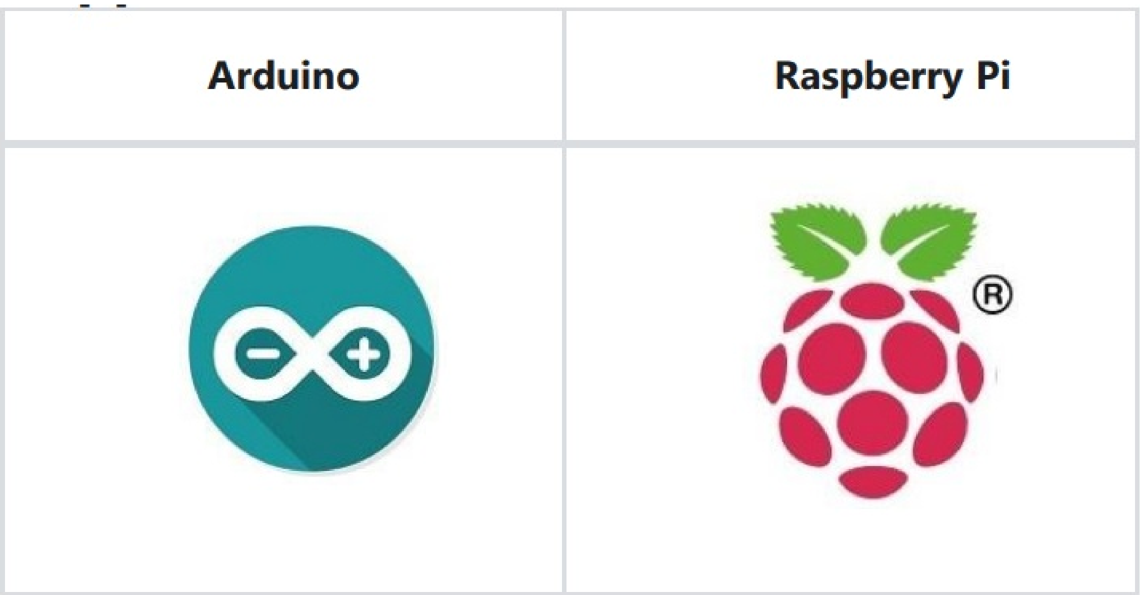
```
More details about Grove modules please refer to [Grove System]
(https://wiki.seeedstudio.com/Grove_System/)
```

Specifications

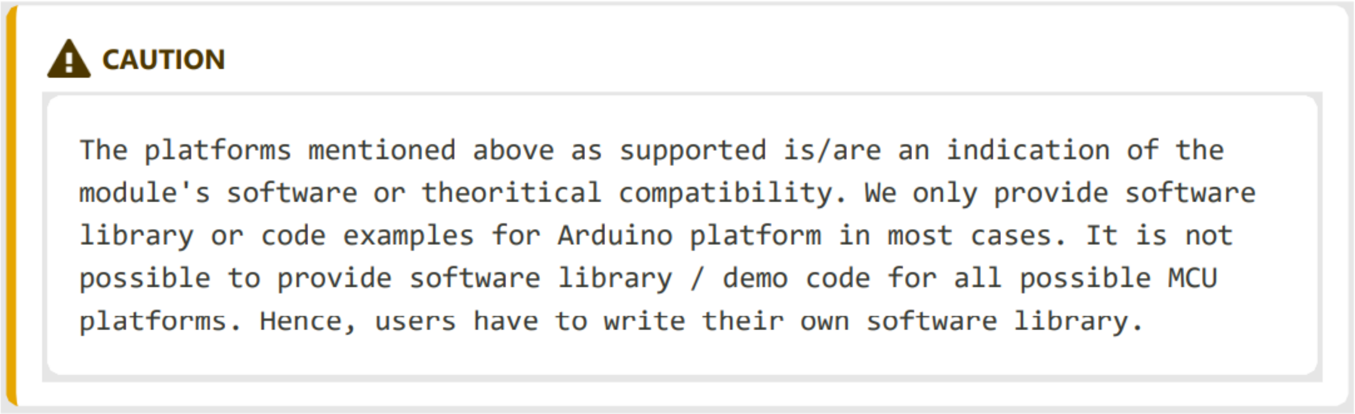


Parameter	Value
Supply voltage	3.3V/5V
Working current	up to 60mA
Time of warm start	4s
Time of cold boot	30s

Platforms Supported



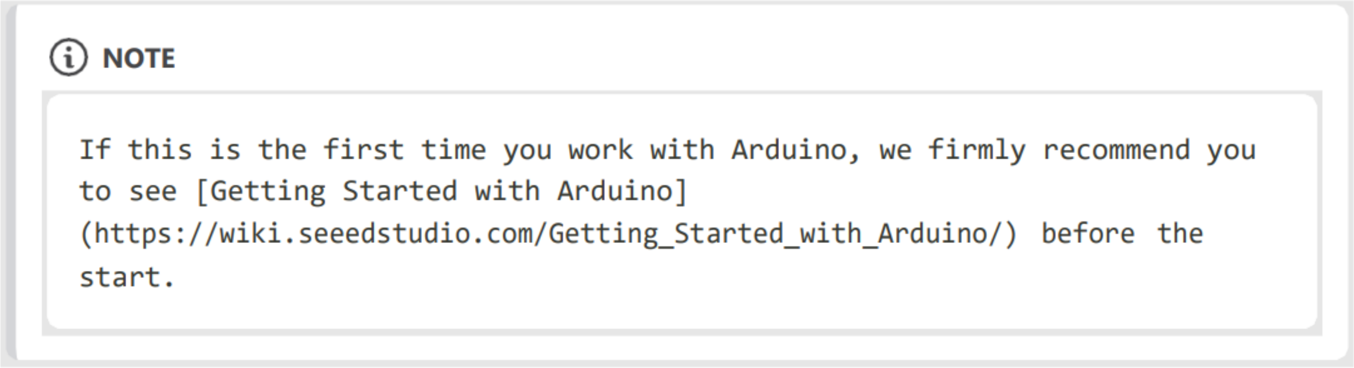
Arduino	Raspberry Pi



CAUTION

```
The platforms mentioned above as supported is/are an indication of the
module's software or theoritical compatibility. We only provide software
library or code examples for Arduino platform in most cases. It is not
possible to provide software library / demo code for all possible MCU
platforms. Hence, users have to write their own software library.
```

Getting Started



NOTE

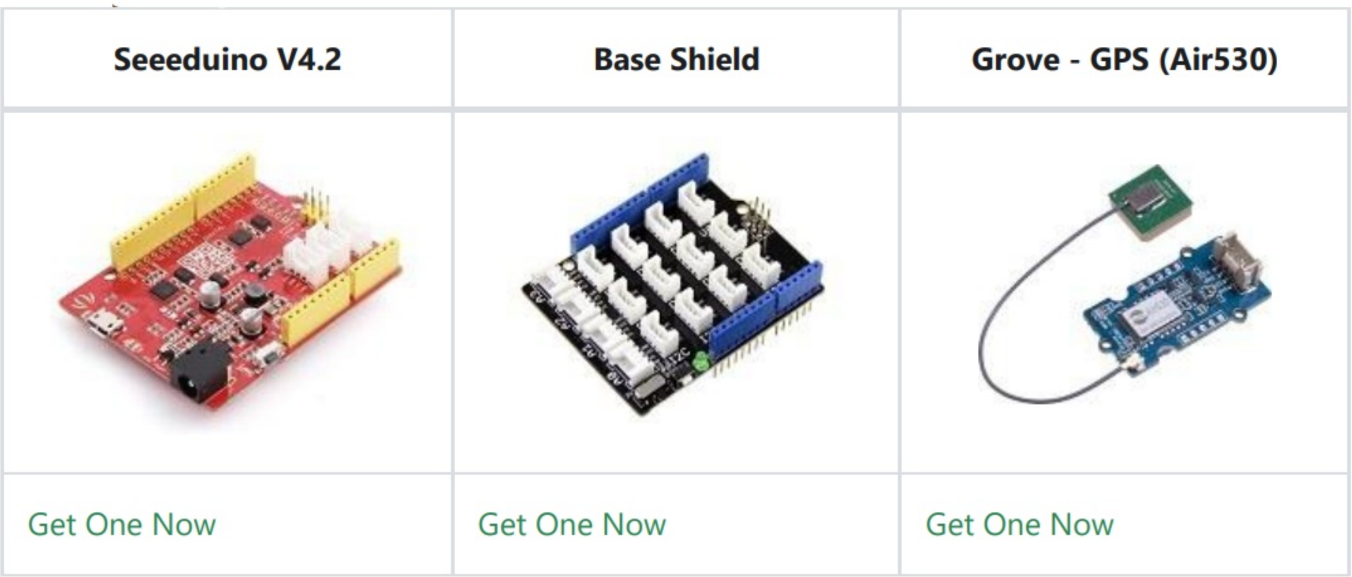
If this is the first time you work with Arduino, we firmly recommend you to see [Getting Started with Arduino](https://wiki.seeedstudio.com/Getting_Started_with_Arduino/) before the start.

Play With Arduino

This sample simply reads from the GPS by using software serial and sends it back to the serial port.

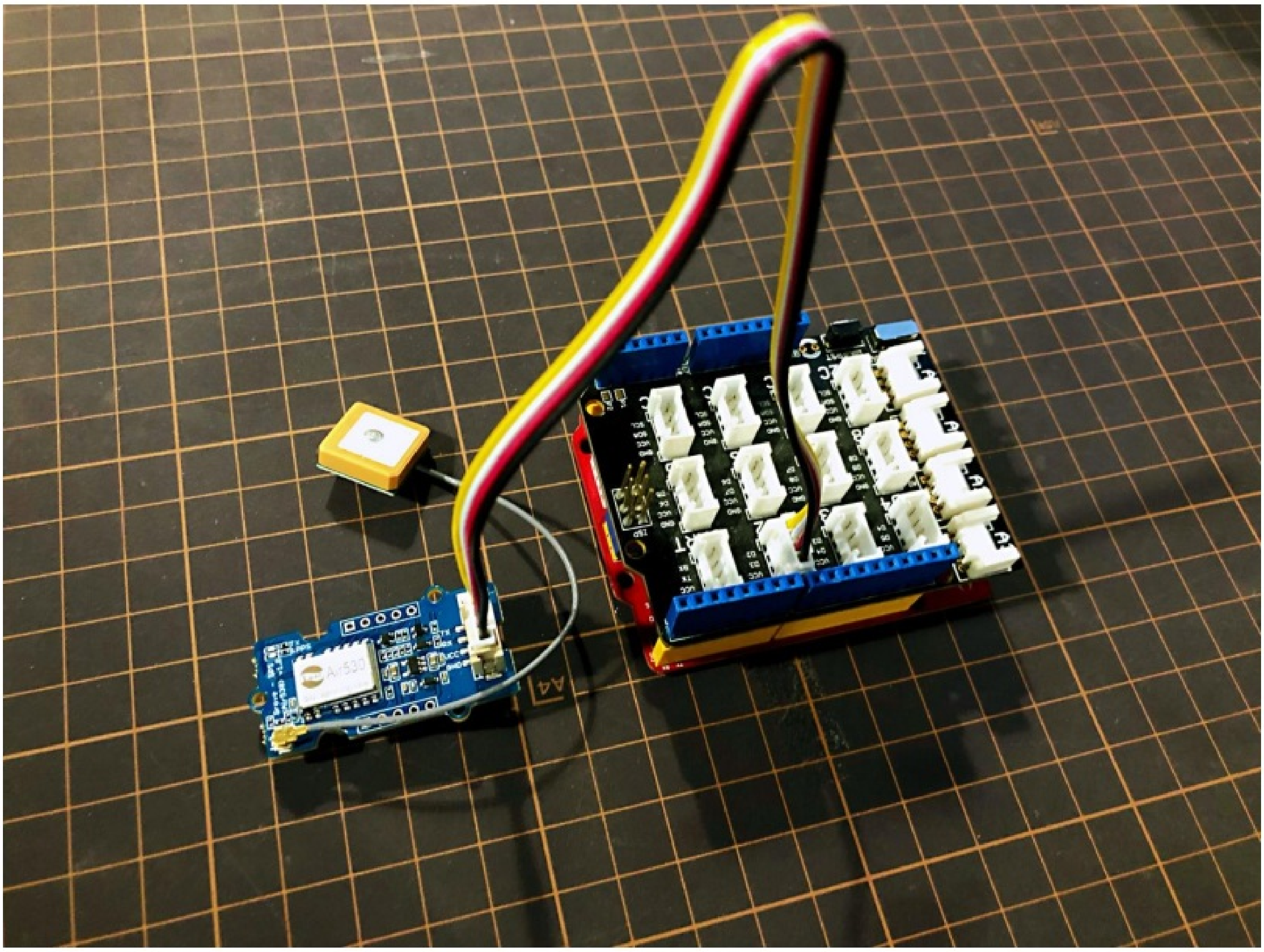
Hardware

- **Step 1**. Prepare the below stuff:



Seeeduino V4.2	Base Shield	Grove - GPS (Air530)
Get One Now	Get One Now	Get One Now

- **Step 2**. Connect Grove – GPS to port D2 of Grove-Base Shield.
- **Step 3**. Plug Grove – Base Shield into Seeeduino.
- **Step 4**. Connect Seeeduino to PC via a USB cable.
  [Grab your reader’s attention with a great quote from the document or use this space to emphasize a key point. To place this text box anywhere on the page, just drag it.]



ⓘ **NOTE**

If we don't have Grove Base Shield, We also can directly connect Grove - GPS to Seeeduinoas below.

Seeeduino	Grove - GPS
5V	Red
GND	Black
D3	White
D2	Yellow

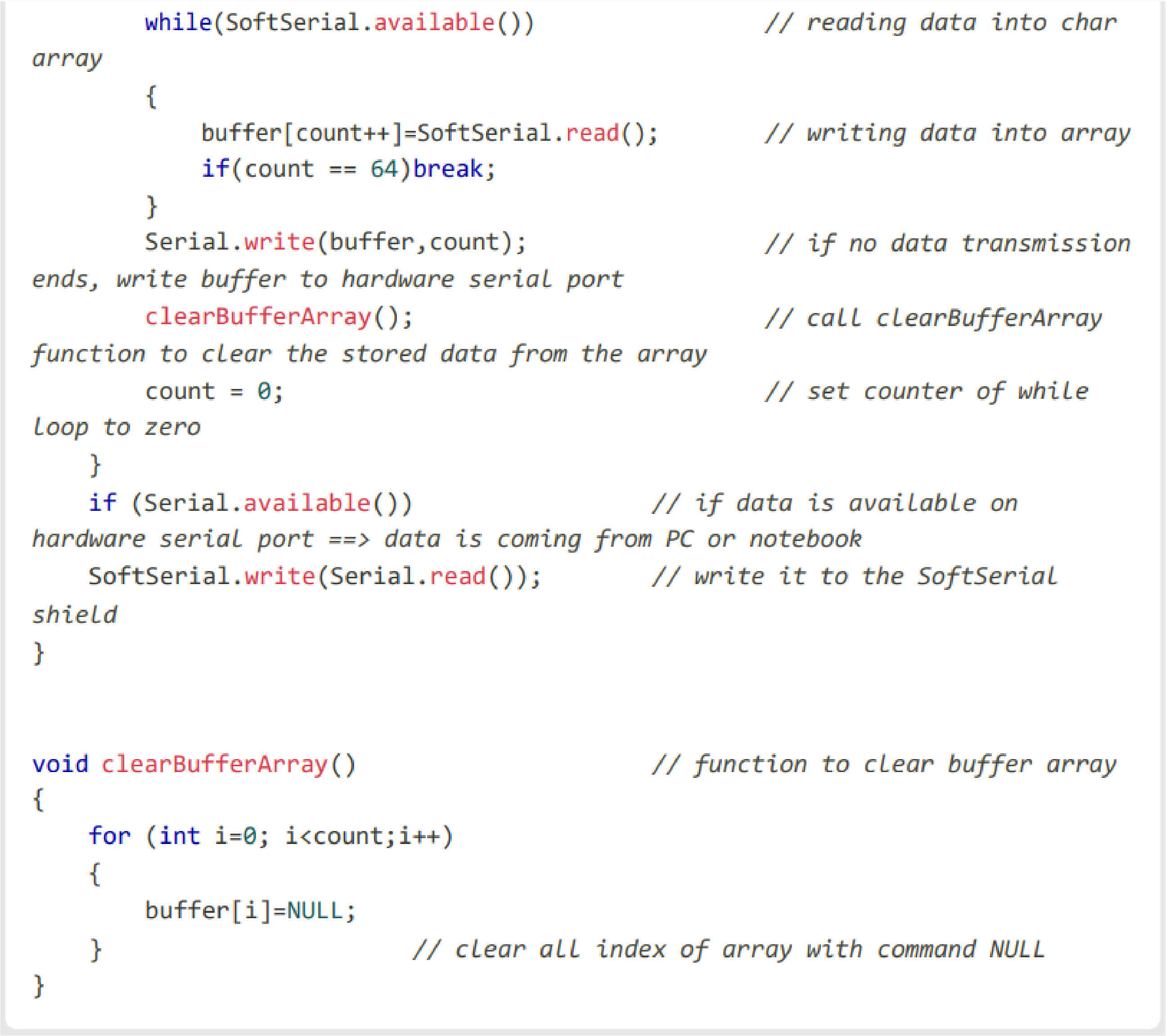
Software

NOTE

```
Please note that the u-center software is for windows only.
```

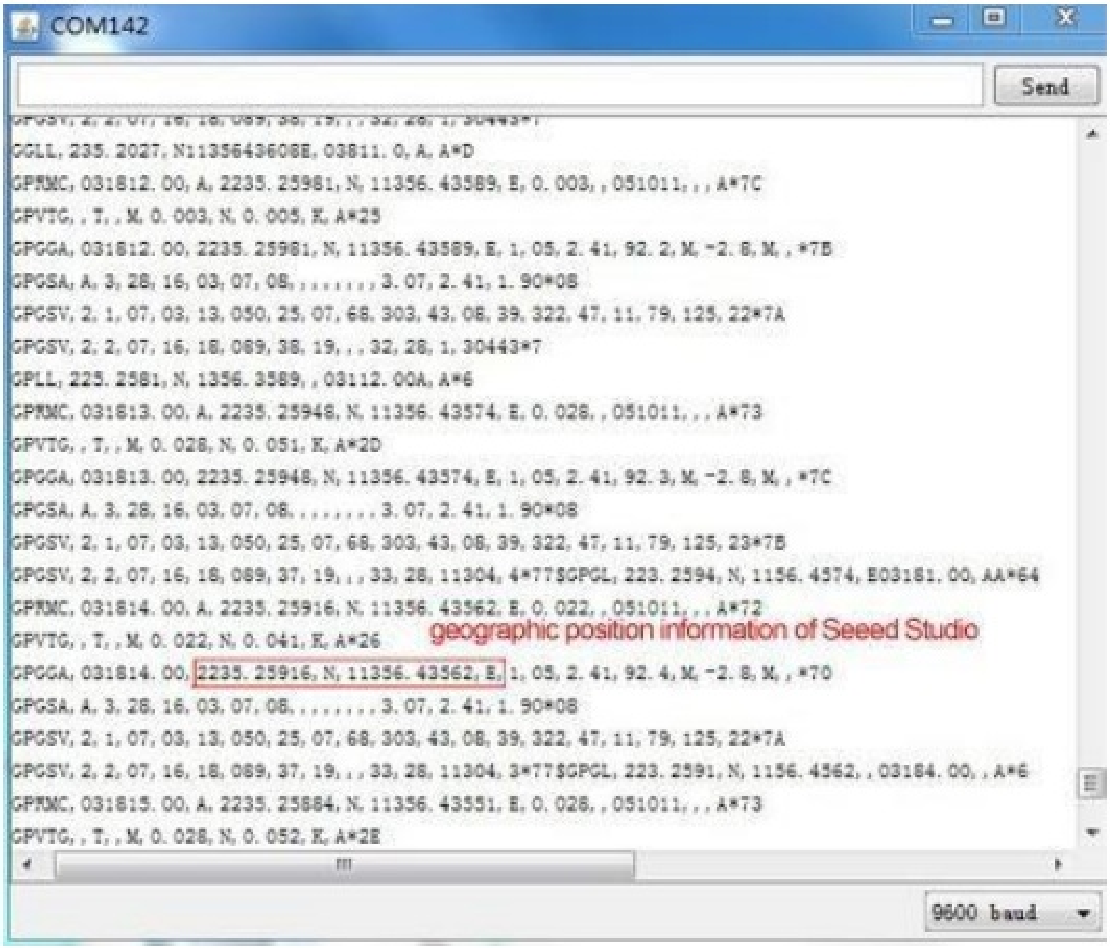
- **Step 1**. Install u-center software.
- **Step 2**. Copy the code into Arduino IDE and upload. If you do not know how to upload the code, please check how to upload code.

```
#include <SoftwareSerial.h>
SoftwareSerial SoftSerial(2, 3);
unsigned char buffer[64];                    // buffer array for data receive
over serial port
int count=0;                                 // counter for buffer array
void setup()
{
    SoftSerial.begin(9600);                  // the SoftSerial baud rate
    Serial.begin(9600);                      // the Serial port of Arduino baud
rate.
}

void loop()
{
    if (SoftSerial.available())                      // if date is coming from
software serial port ==> data is coming from SoftSerial shield
    {
```



```
        while(SoftSerial.available())                // reading data into char
array
        {
            buffer[count++]=SoftSerial.read();       // writing data into array
            if(count == 64)break;
        }
        Serial.write(buffer,count);                  // if no data transmission
ends, write buffer to hardware serial port
        clearBufferArray();                          // call clearBufferArray
function to clear the stored data from the array
        count = 0;                                   // set counter of while
loop to zero
    }
    if (Serial.available())                  // if data is available on
hardware serial port ==> data is coming from PC or notebook
    SoftSerial.write(Serial.read());         // write it to the SoftSerial
shield
}


void clearBufferArray()                      // function to clear buffer array
{
    for (int i=0; i<count;i++)
    {
        buffer[i]=NULL;
    }                        // clear all index of array with command NULL
}
```

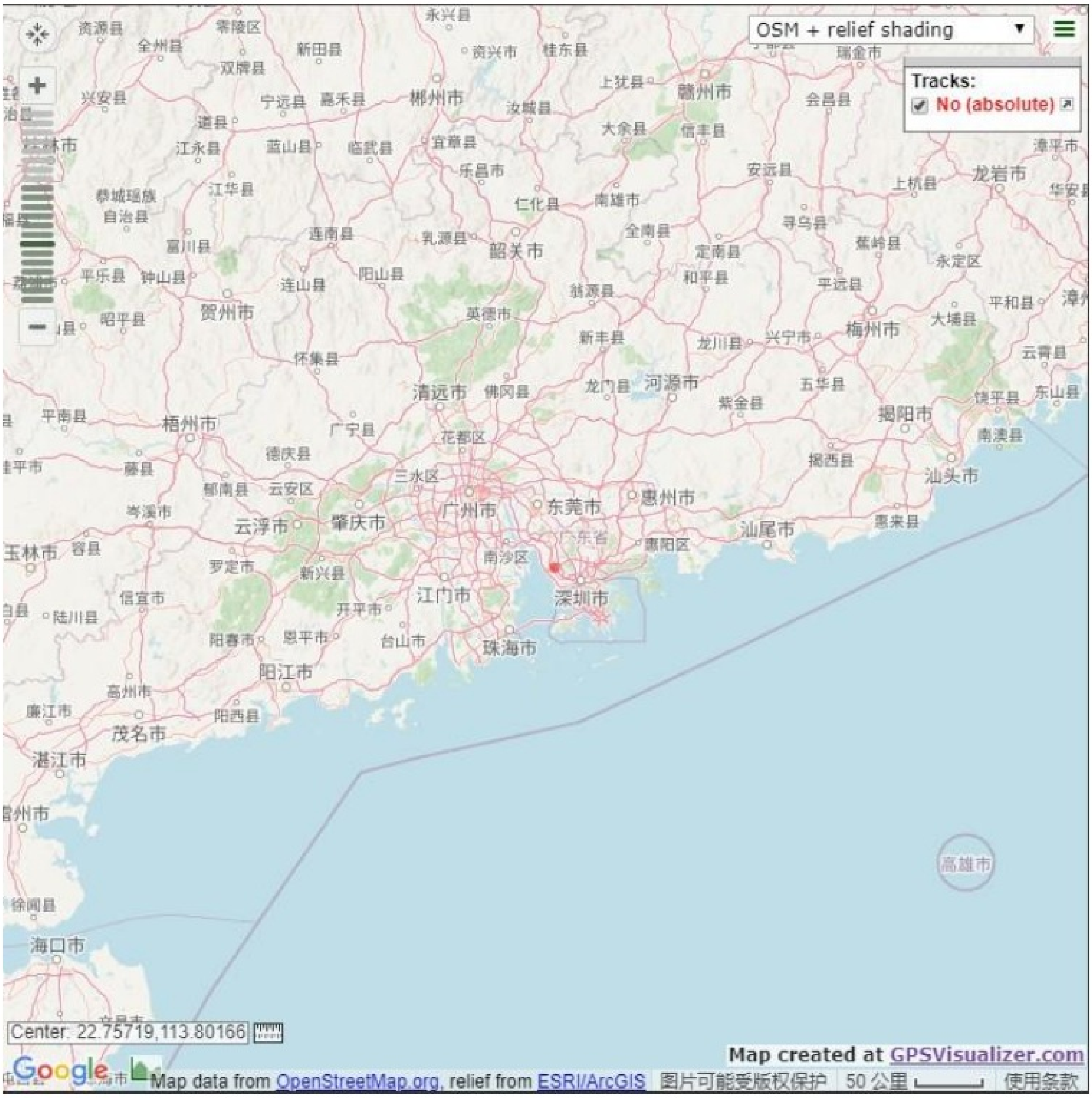
- **Step 3**. Open U-center.
- **Step 4**. Click Receiver -> Port and select the COM port that the Arduino is using.
- **Step 5**. Click Receiver -> Baudrate and make sure 9600 is selected.
- **Step 6**. Click View -> Text Console and you should get a window that will stream NMEA data.
- **Step 7**. Open the serial monitor, You can see as shown below:



```
GGLL, 235. 2027, N11356436088, 03811. 0, A, A*D
GPRMC, 031812. 00, A, 2235. 25981, N, 11356. 43589, E, 0. 003, , 051011, , , A*7C
GPVTG, , T, , M, 0. 003, N, 0. 005, K, A*25
GPGGA, 031812. 00, 2235. 25981, N, 11356. 43589, E, 1, 05, 2. 41, 92. 2, M, -2. 8, M, , *7B
GPGSA, A, 3, 28, 16, 03, 07, 08, , , , , , , , 3. 07, 2. 41, 1. 90*08
GPGSV, 2, 1, 07, 03, 13, 050, 25, 07, 68, 303, 43, 08, 39, 322, 47, 11, 79, 125, 22*7A
GPGSV, 2, 2, 07, 16, 18, 089, 38, 19, , , 32, 28, 1, 30443*7
GPLL, 225. 2581, N, 1356. 3589, , 03112. 00A, A*6
GPRMC, 031813. 00, A, 2235. 25948, N, 11356. 43574, E, 0. 028, , 051011, , , A*73
GPVTG, , T, , M, 0. 028, N, 0. 051, K, A*2D
GPGGA, 031813. 00, 2235. 25948, N, 11356. 43574, E, 1, 05, 2. 41, 92. 3, M, -2. 8, M, , *7C
GPGSA, A, 3, 28, 16, 03, 07, 08, , , , , , , , 3. 07, 2. 41, 1. 90*08
GPGSV, 2, 1, 07, 03, 13, 050, 25, 07, 68, 303, 43, 08, 39, 322, 47, 11, 79, 125, 23*7B
GPGSV, 2, 2, 07, 16, 18, 089, 37, 19, , , 33, 28, 11304, 4*77$GPGL, 223. 2594, N, 1156. 4574, E03181. 00, AA*64
GPRMC, 031814. 00, A, 2235. 25916, N, 11356. 43562, E, 0. 022, , 051011, , , A*72
GPVTG, , T, , M, 0. 022, N, 0. 041, K, A*26
GPGGA, 031814. 00, 2235. 25916, N, 11356. 43562, E, 1, 05, 2. 41, 92. 4, M, -2. 8, M, , *70
GPGSA, A, 3, 28, 16, 03, 07, 08, , , , , , , , 3. 07, 2. 41, 1. 90*08
GPGSV, 2, 1, 07, 03, 13, 050, 25, 07, 68, 303, 43, 08, 39, 322, 47, 11, 79, 125, 22*7A
GPGSV, 2, 2, 07, 16, 18, 089, 37, 19, , , 33, 28, 11304, 3*77$GPGL, 223. 2591, N, 1156. 4562, , 03184. 00, , A*6
GPRMC, 031815. 00, A, 2235. 25884, N, 11356. 43551, E, 0. 028, , 051011, , , A*73
GPVTG, , T, , M, 0. 028, N, 0. 052, K, A*2E
```

We also can view data in Google Earth:

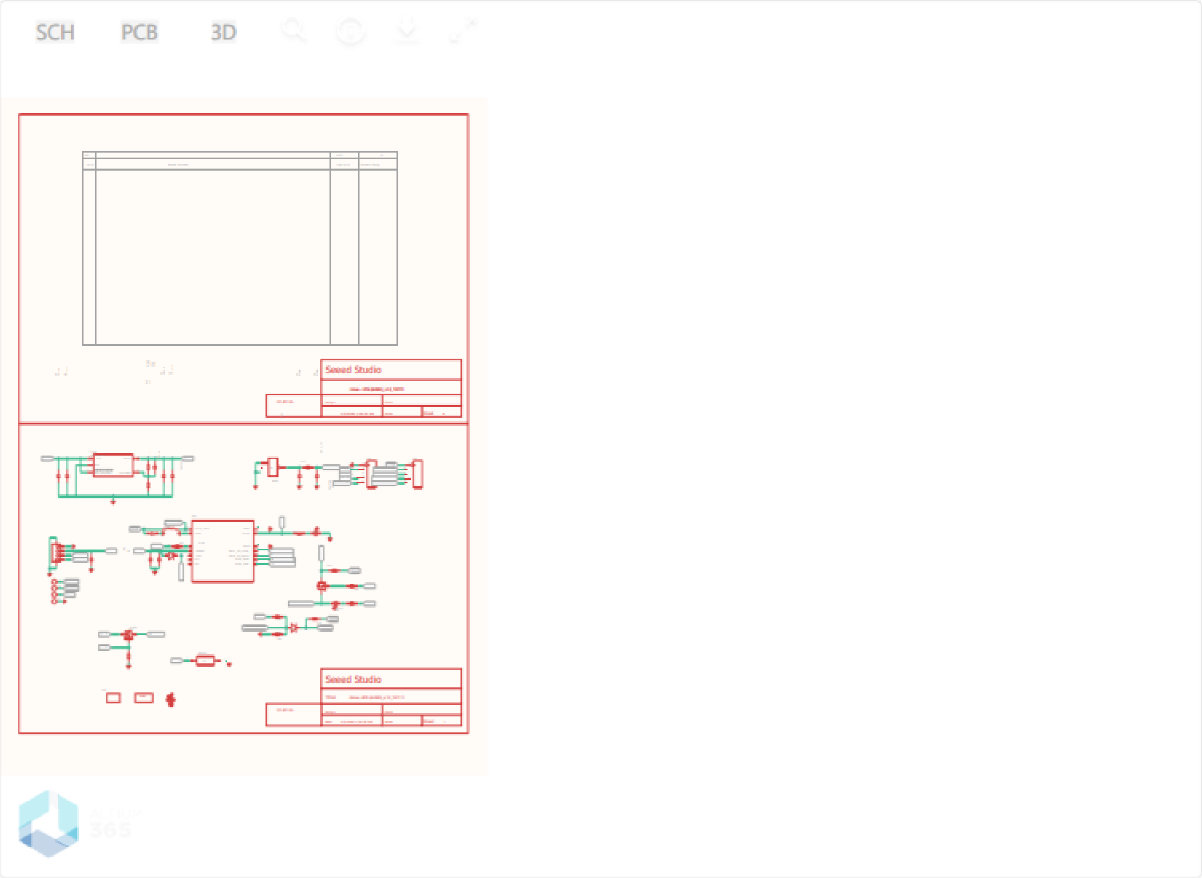
- **Step 1**. Click File -> Database Export -> Google Earth KML
- **Step 2**. This should launch Google Earth with the history that was captured by u-center.
- **Step 3**. Alternatively, data can be recorded by pressing the red circle on the toolbar which will then ask where you want to save the record.
- **Step 4**. When we have captured enough data, click the black square to stop recording.
- **Step 5.** We can then convert the .ubx file generated to KML by using uploading the ubx file to GPSVisualizer, and the location (Red spot) would be shown on the map as following:



ⓘ **NOTE**

```
    Tests would rather be taken outdoors to avoid location inaccuracy
caused by bad signal transmission.
```

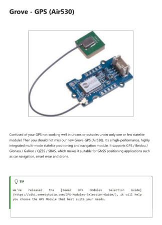
Schematic Online Viewer



Resources

- [ZIP] GPS Schematic(PDF)
- [PDF] Air 530 User Booklet

Documents / Resources

 Grove - GPS (Air530) Confused of your GPS not working well in urbans or outsides under only one or few statelite module? Then you should not miss our new Grove-GPS (Air530). It's a high-performance, highly integrated multi-mode statelite positioning and navigation module. It supports GPS / Beidou / Glonass / Galileo / QZSS / SBAS, which makes it suitable for GNSS positioning applications such as car navigation, smart wear and drone. TIP We've released the [Seeed GPS Modules Selection Guide](https://wiki.seeedstudio.com/GPS-Modules-Selection-Guide/), it will help you choose the GPS Module that best suits your needs.	**seeed studio Grove-GPS-Air530 Module** [pdf] Owner's Manual Grove-GPS-Air530, Grove-GPS-Air530 Module, Module

References

- GPS Visualizer
- Get Started with Arduino \| Seeed Studio Wiki
- GPS Modules Selection Guide \| Seeed Studio Wiki
- Grove Ecosystem Introduction \| Seeed Studio Wiki
- Upload Code \| Seeed Studio Wiki

- Grove Base Shield V2.0 for Arduino - Seeed Studio
- Grove - GPS (Air530) - Seeed Studio
- Seeeduino V4.2(ATMega328P) - Seeed Studio
- u-center | u-blox
- User Manual

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