

GGB-1916 EVB User's Manual



Document history

Version	Date	Updates
1.0	August 31, 2016	Creation.
1.1	November 29, 2016	Added "We do not provide the source code or library of Arduino™ to control GGB-1916" in section 5.6.

Contents

1. OVERVIEW	3
2. CONTENT OF THE KIT	3
3. GGB-1916 EVB HARDWARE OVERVIEW	4
4. GETTING STARTED	5
5. GGB-1916 EVB HARDWARE DESCRIPTION.....	6
5.1 POWER SUPPLY	6
5.2 USB INTERFACE	6
5.3 INPUT/OUTPUT HEADER	7
5.4 LEDs	8
5.5 MEASUREMENT OF POWER CONSUMPTION.....	9
5.6 ARDUINO COMPATIBILITY.....	10
5.7 RASPBERRY PI COMPATIBILITY	11

1. Overview

The GGB-1916 EVB is a set of software and hardware tools for evaluation and development. It is ideal for rapid prototyping of GNSS, GSM and Bluetooth based application.

GGB-1916 EVB can be used to not only evaluate RF performance and power consumption but also be familiar with AT commands. It features a GGB-1916 module, GNSS antenna, GSM 4-band antenna, Bluetooth antenna, micro SIM socket, microphone, speaker and international wall adapter. Besides, it can work as a Arduino™ or Raspberry Pi shield. All functions of GNSS, GSM/GPRS and Bluetooth are software controlled via single UART port.

2. Content of the kit



- ① International wall adapter
- ② USB cable
- ③ GGB-1916 EVB board
- ④ GSM 4-band antenna
- ⑤ Bluetooth antenna
- ⑥ GNSS antenna (GPS+GLONASS)

3. GGB-1916 EVB Hardware overview

The block diagram of GGB-1916 EVB is shown in Figure 1. The primary components and their placement on the hardware assembly are pointed out in Figure 2.

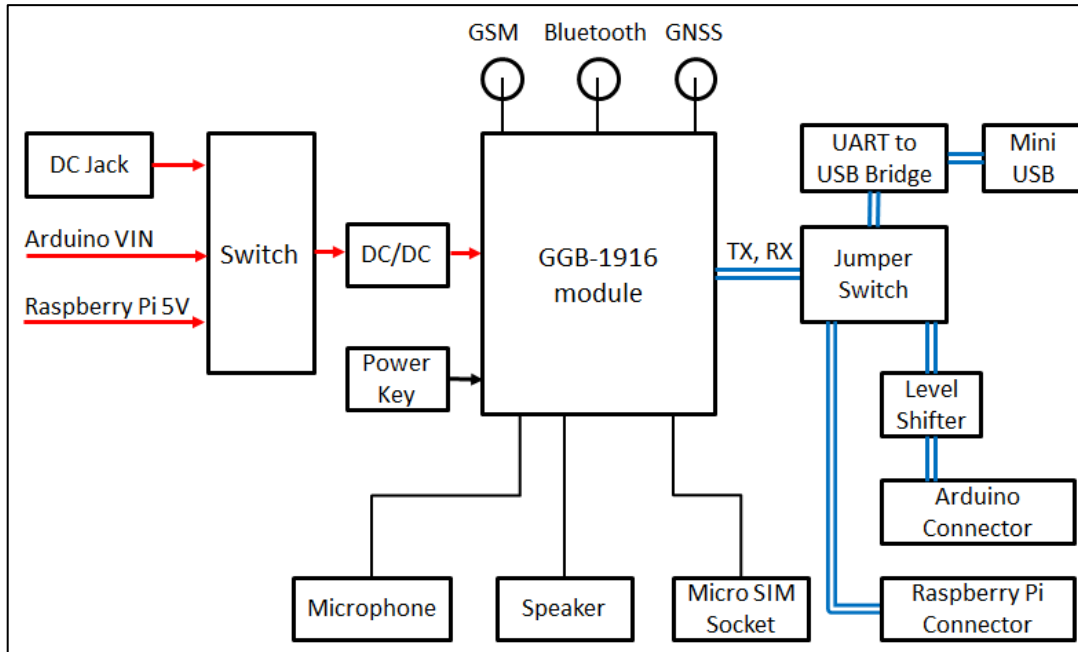


Figure 1: GGB-1916 EVB block diagram

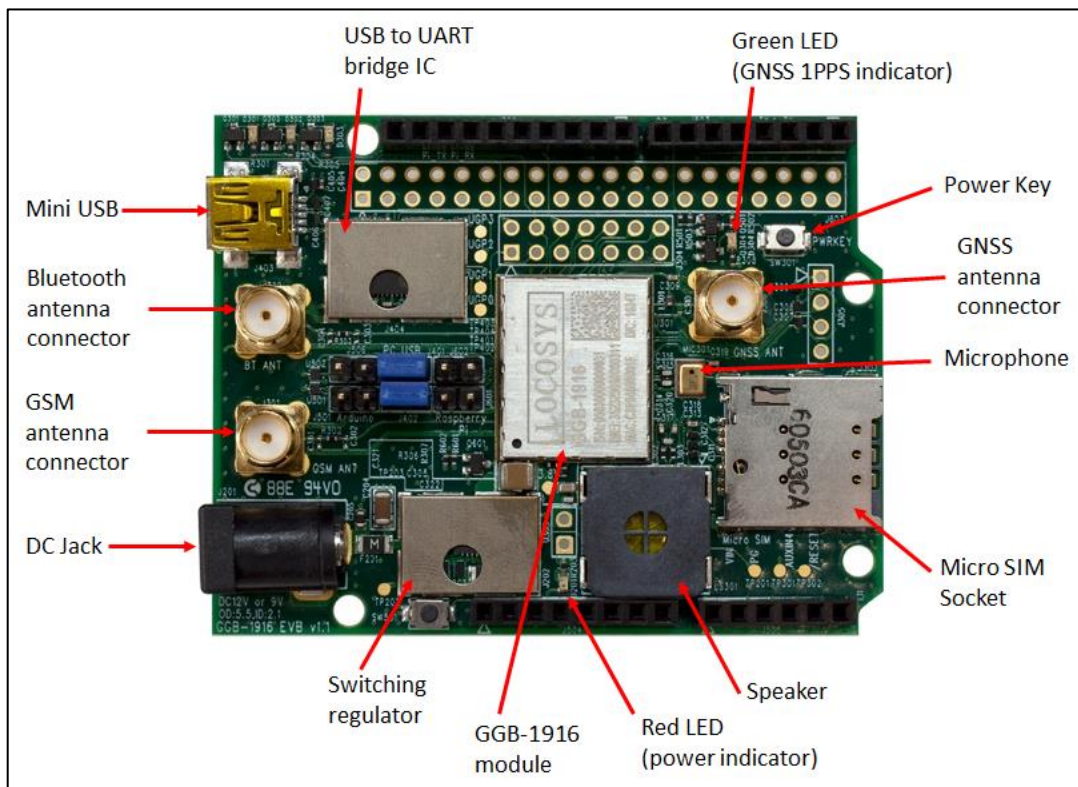
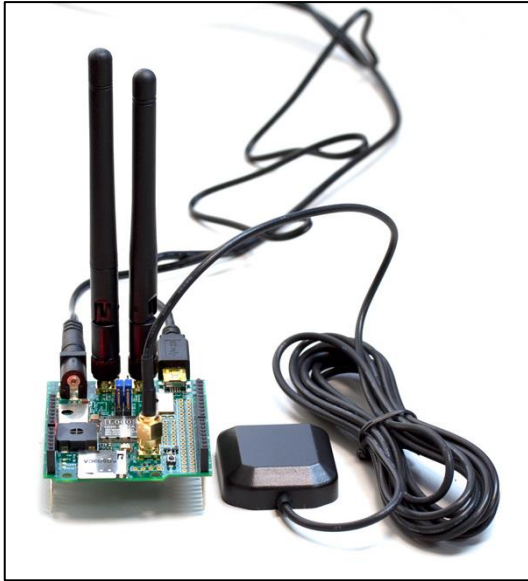
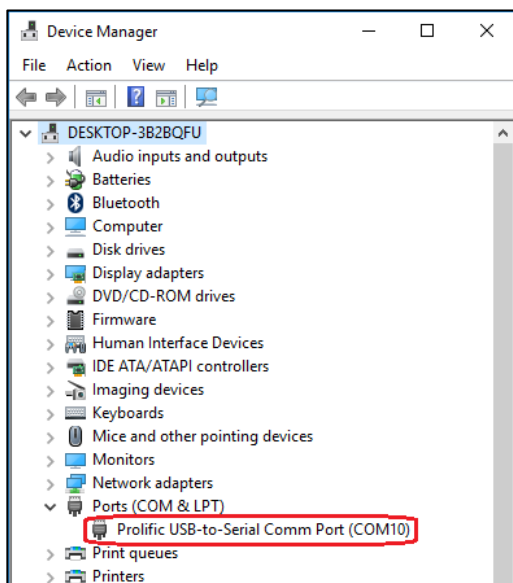


Figure 2: GGB-1916 EVB feature call-outs

4. Getting started



- 4.1 Install USB driver for MS Windows. It can be downloaded at http://www.prolific.com.tw/UserFiles/files/PL2303_Prolific_DriverInstaller_v1_14_0.zip.
- 4.2 Attach antennas of GNSS, GSM and Bluetooth.
- 4.3 Insert a micro SIM card with no PIN lock.
- 4.4 Plug the wall adaptor. The red LED on GGB-1916 EVB will be turned on.
- 4.5 Connect USB cable to GGB-1916 EVB and PC. A COM port will be enumerated in the Device Manager of MS Windows.



- 4.6 Press power key close to GNSS antenna connector for about 3 seconds to power on GGB-1916 module.
- 4.7 Now you can use the software tool of GGB-Trio to evaluate GGB-1916 module.

5. GGB-1916 EVB Hardware description

5.1 Power supply

There are 4 power supply options on GGB-1916 EVB. It can be powered from either of the wall adaptor, the V_{IN} pin of Arduino I/O header, 5V pin of Arduino I/O header or 5V pin of Raspberry Pi I/O header. The power supplies are regulated on-board using a step-down switching regulator to produce the 3.8V main power for GGB-1916 module. If the user does not use the wall adaptor, but use the other supplies instead. It has to be capable to supply maximum 2A current that GGB-1916 module requires for full functionality.

Figure 3 shows the schematic drawing for the power supply inputs and the on-board step-down switching regulator.

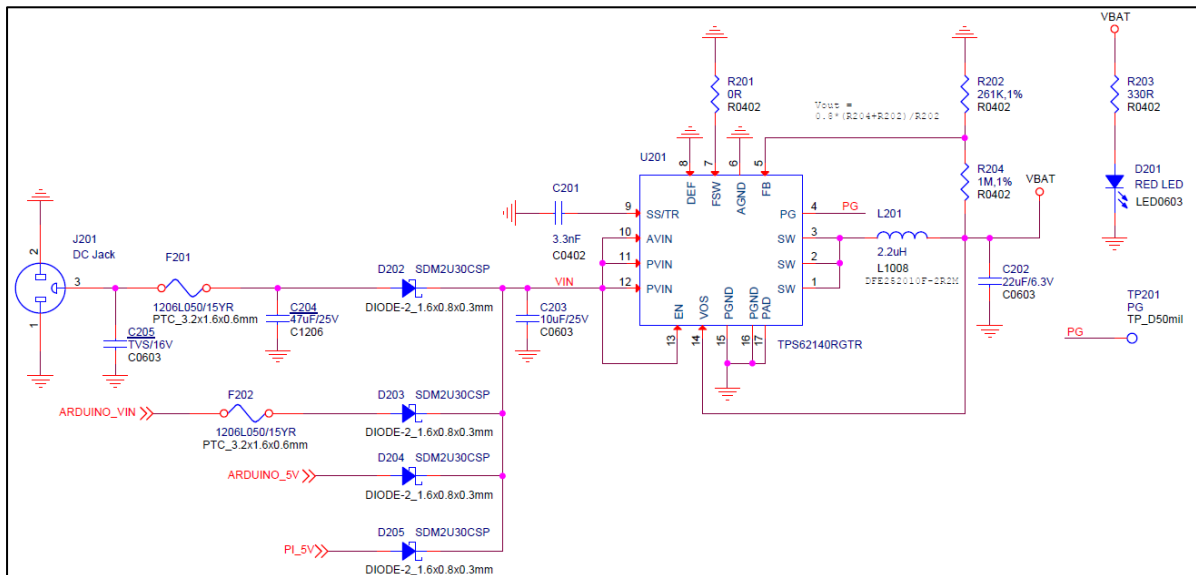
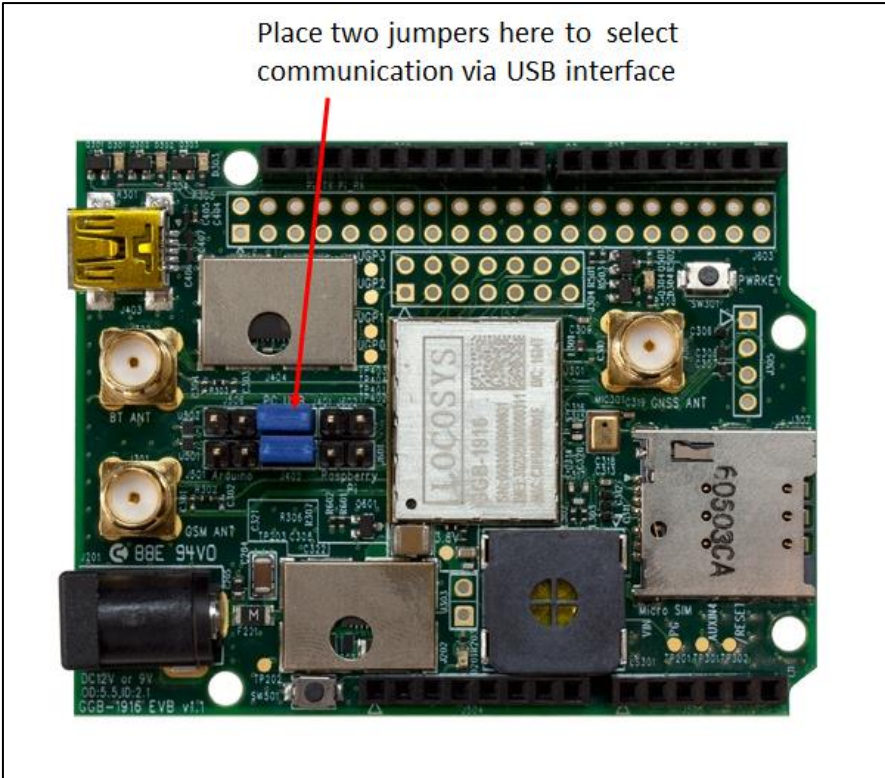


Figure 3: Power supply schematic

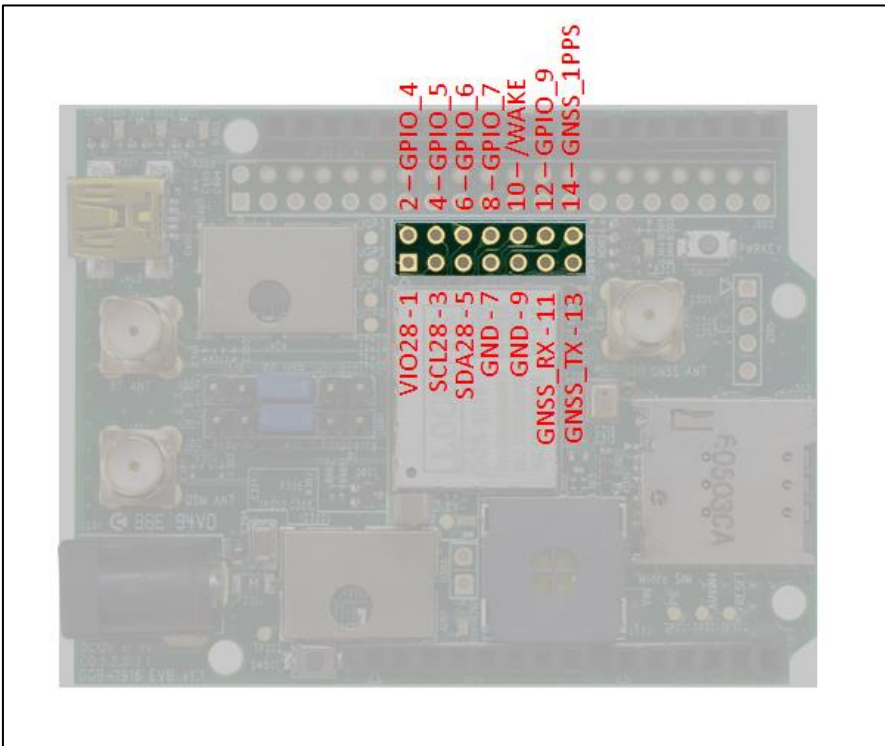
5.2 USB interface

There is a USB-to-UART bridge IC on GGB-1916 EVB. It transfers data from GGB-1916 module's pins of UTXD1 and URXD1 to PC through USB interface. The user therefore can use the software tool running on MS Windows to control GGB-1916 module. Because pins of UTXD1 and URXD1 are also connected to I/O headers of Arduino™ and Raspberry Pi, six 2-pin headers are adopted to manually select which device GGB-1916 will communicate with.



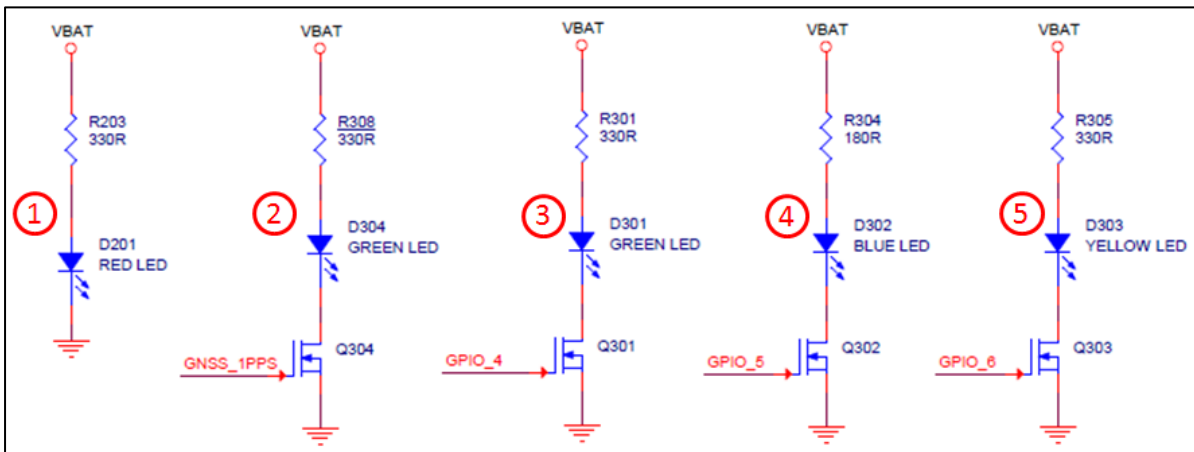
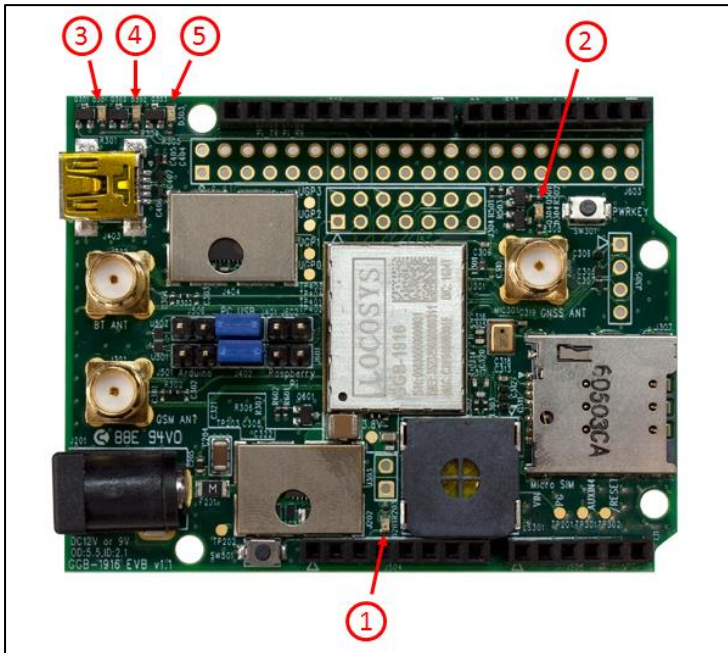
5.3 Input/output header

Some pins of GGB-1916 module are routed to a header. The pinout of the header is shown in the following picture.



5.4 LEDs

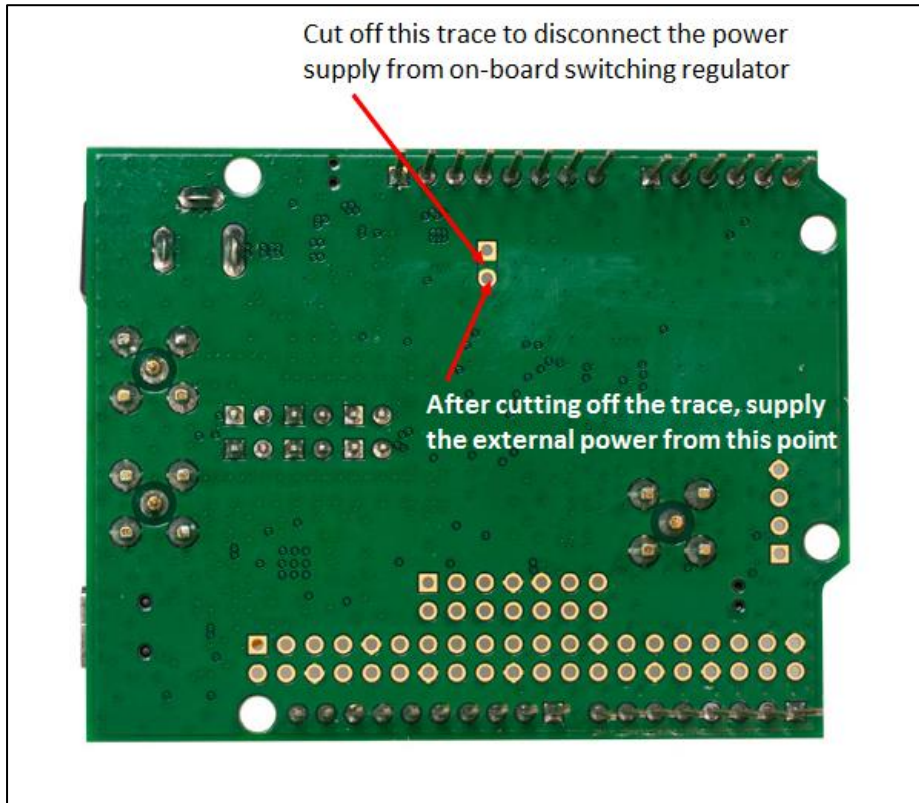
There are 5 LEDs on GGB-1916 EVB. The color and signal connection are described in below table.



Number	Color	Description
1	Red	Indicator of GGB-1916 module's power supply.
2	Green	Controlled by GNSS_1PPS signal. It will be on for 100ms every second if GNSS position is 3D fixed.
3	Green	Controlled by GPIO_4 signal. On if GPIO_4 outputs high level; off if GPIO_4 outputs low level.
4	Blue	Controlled by GPIO_5 signal. On if GPIO_5 outputs high level; off if GPIO_5 outputs low level.
5	Yellow	Controlled by GPIO_6 signal. On if GPIO_6 outputs high level; off if GPIO_6 outputs low level.

5.5 Measurement of power consumption

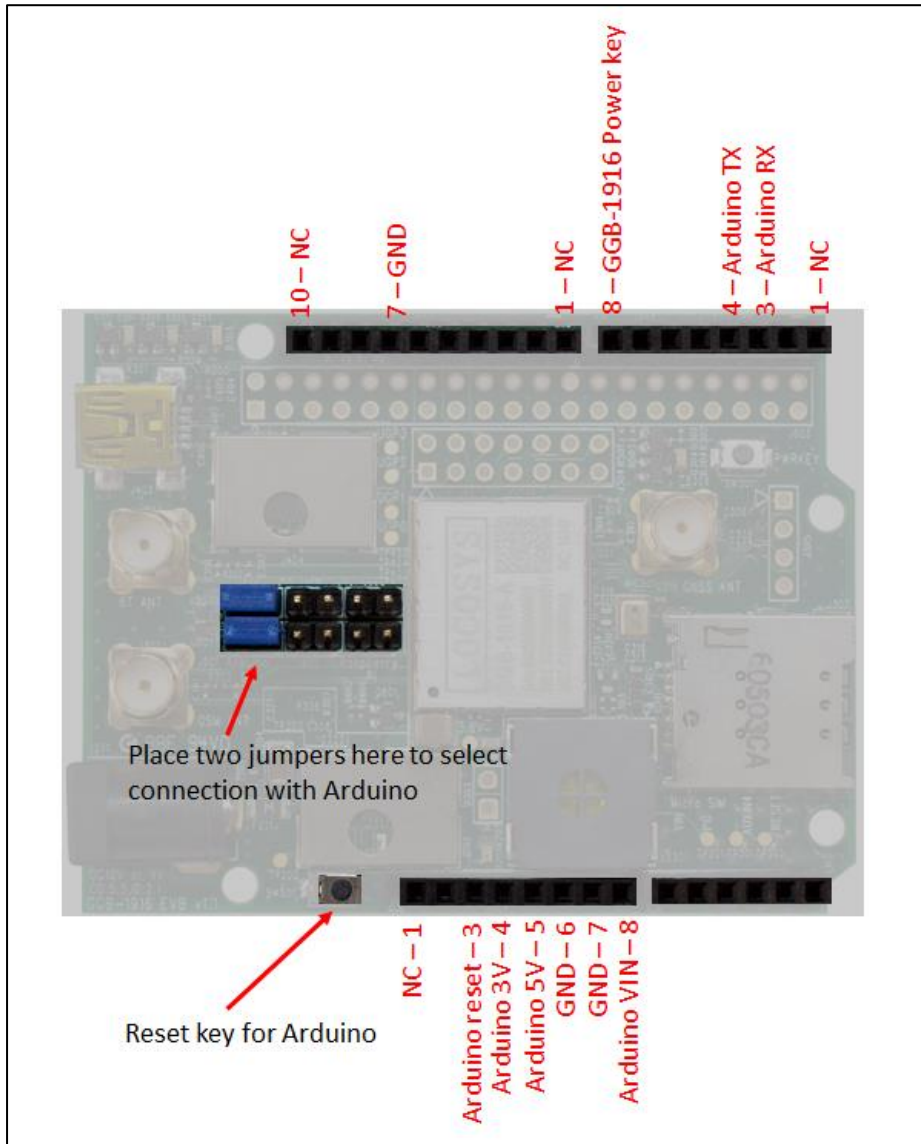
The user can cut off a trace on the bottom side of GGB-1916 EVB board to disconnect the power supply from the on-board step-down switching regulator. Because of the highly dynamic current range of GGB-1916 module, it is not applicable to use a DC current meter in series to measure the current consumption of GGB-1916. We suggest to use a DC power supply with the current measurement function to supply power to GGB-1916 module. For example, KEYSIGHT E3631A, KEITHLEY 2303 or GWINSTEK PPH-1503D. Then the current consumption of GGB-1916 can be read directly from the power supply.



5.6 Arduino compatibility

The I/O headers on GGB-1916 EVB are arranged to allow to connect to Arduino™ and Arduino-compatible microcontroller boards. When connected properly, GGB-1916 EVB will work as the Arduino™ shield with the functions of GNSS, GSM, GPRS and Bluetooth. We do not provide the source code or library of Arduino™ to control GGB-1916.

Please note that two jumpers have to be changed to the position as below picture. If the 5V or VIN power from Arduino™ board could not supply up to 2A current, please plug in the wall adaptor of GGB-1916 EVB.



5.7 Raspberry Pi compatibility

The I/O header on GGB-1916 EVB is arranged to allow to connect with Raspberry Pi™. When connected properly, GGB-1916 EVB will work as a shield with the functions of GNSS, GSM, GPRS and Bluetooth.

Please note that two jumpers have to be changed to the position as below picture. If the 5V power from Raspberry Pi could not supply up to 2A current, please plug in the wall adaptor of GGB-1916 EVB.

