LC29H Core Board Specification and User's Manual

1、Overview

1.1、LC29H Core Board Kit

The kit includes: core board board, GNSS dual-frequency active antenna.

Figure 1 Core Board Kit Diagram

（The above picture is for reference only, please refer to the actual appearance of the real object）

1.2、EVB kit connection diagram

Figure 2 Core Board Test Connection Diagram

The GNSS active antenna needs to be placed in an open outdoor area where satellites can be detected.

2、Connector

2.1、Interface Distribution

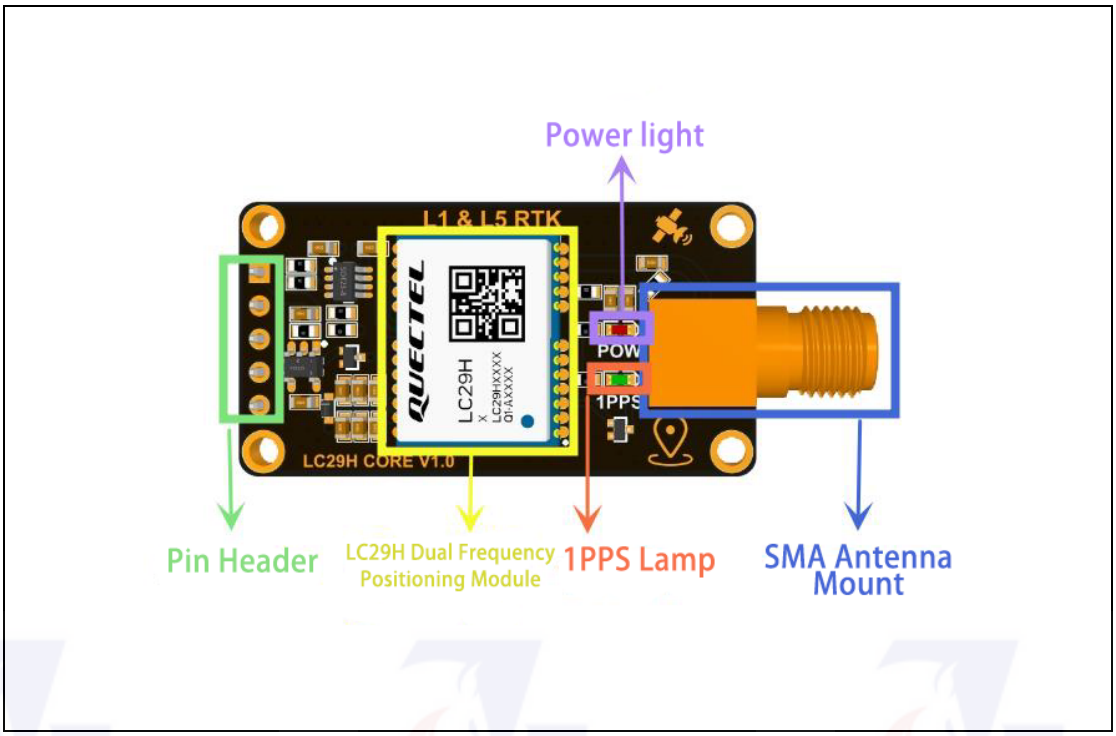


Figure 3 Distribution of core board interfaces

2.2、interface definition

functionality	connector	descriptive
electricity supply	External Power Supply	Pin power supply, DC 4.5V-6V (100mA)
communications interface	Pin Serial Interface	Serial Port, Level 3.3V
RF input	GNSS Antenna SMA Interface	The GNSS antenna in the accessory supports the following galaxies and frequency bands: ● GPS L1 C/A and L5 ● GLONASS L1 ● Galileo E1 and E5a ● BDS B1I and B2a ● QZSS L1 C/A and L5 ● SBAS L1

signal indication	Power Light 1PPS Indicator	Power-up long on flashing: positioning successful at 1 Hz. not lit: not positioned.

2.3、Pin Definitions

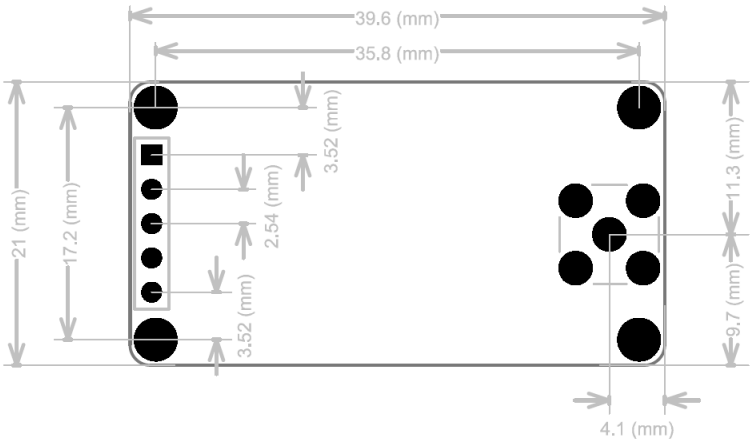
J2 Line Pin Definitions, top to bottom.

NO	define	descriptive
1	VCC	DC 4.5V-6V(100mA)
2	GND	GND
3	TXD	LC29H Serial Transmit, 3.3V level
4	RXD	LC29H Serial Receiver, 3.3V level
5	RST	LC29H Reset pin, released after 100ms pull-up, can reset the module, if not used, it will be suspended.

The core board provides one UART interface with the following features:

- Supports NMEA standard statement output, binary data input/output, PAIR/PQTM command input/output, and firmware upgrades.
- Supported baud rates: 9600, 14400, 19200, 38400, 57600, 115200, 230400, 460800, 921600 and 3000000 bps.
- Hardware flow control and synchronization operations are not supported.

3、Mechanical dimensions



4、Instructions for using the software

4.1、QCOM Get NEMA Statement

procedure

Step 1:

The antenna was connected to the serial port of the core board via the USB to TTL tool, as shown in Figure 4, and the antenna was placed outdoors in an open area, towards the sky.

Figure 4 USB to TTL tool connection diagram

Step 2: Install the provided USB serial port driver to your computer, and you can see the USB port number in the “Device Manager” interface of your computer, as shown in the figure below.

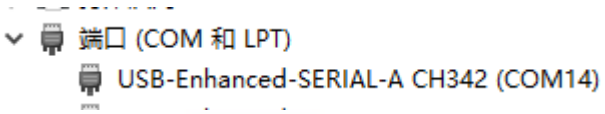


Figure 5 USB Port

Step 3: Install the QCOM tool provided by Mobile Communications to realize the communication between the computer and the module. The QCOM communication port settings are shown below (default baud rate 115200 bps 1).

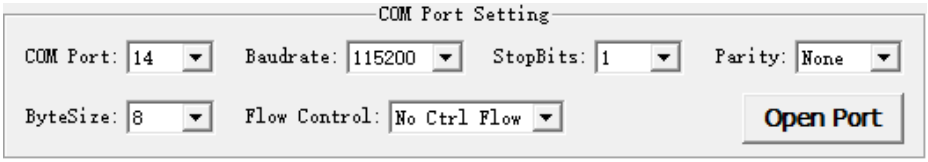


Figure 6 QCOM Communication Port Setting Screen

Step 4: Select the correct “COM Port” (port number as shown in Figure 6) and “Baudrate”.
Step 5: Click “Open Port” (open the port, as shown in Figure 7). After successfully establishing communication with the core board, the default baud rate setting for the UART interface output from the module may vary depending on the software version.
The NMEA statement will be displayed through the QCOM utility as shown in Figure 7.

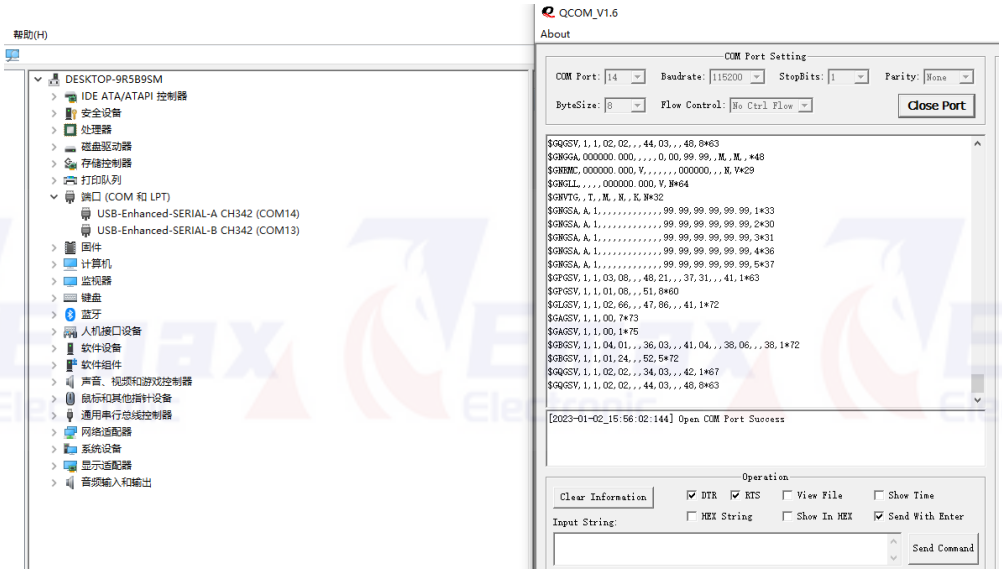


Figure 7 QCOM Interface NMEA Statement Output

4.2、Testing with the QGNSS Tool

This section describes how to verify the status of a module using the software tool QGNSS. For more information on using the QGNSS tool, please refer to the documentation [2].

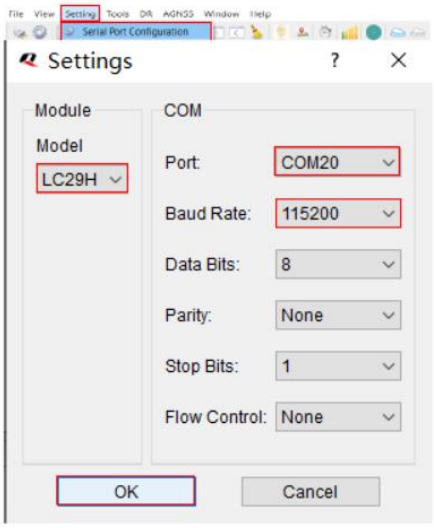
The software tool QGNSS is available for download from the official website of Mobile Telecom (Download Area) or from Mobile Telecom Technical Support.

4.2.1. QGNSS Settings

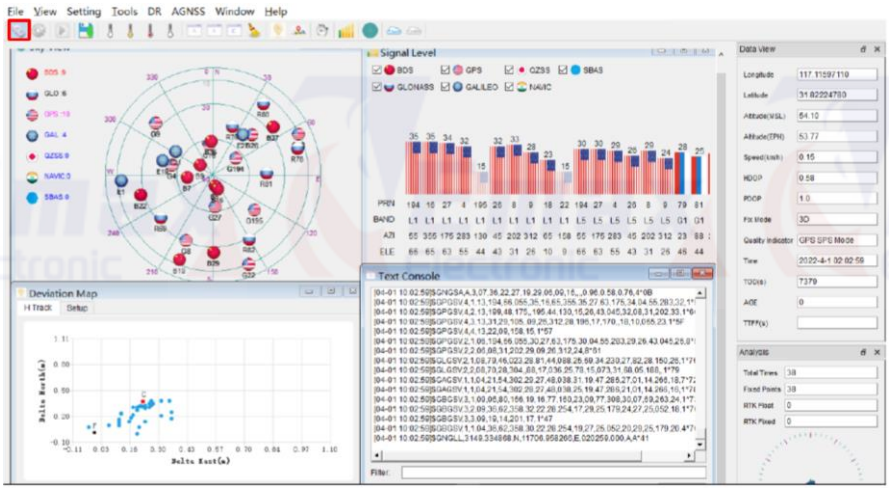
Step 1: Connect the accessory to the core board. As shown in Figure 4.

Step 2: Plug the USB tool into the computer.

Step 3: Open the QGNSS utility provided by Mobile Communications. Click on “Setting” and “Serial Port Configuration” (default baud rate 115200 bps).



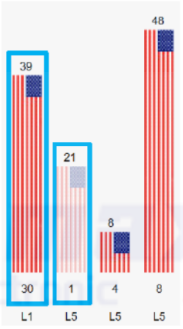
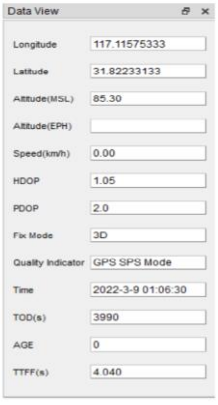
Step 4: Click  “Connect or disconnect” button. After successfully connecting the module, the QGNSS interface is shown below.



4.2.2. Window Interface Description

GNSS information such as C/N0 information, time, position, velocity, and accuracy can be viewed in the QGNSS interface. For more information on these parameters, refer to the following table.

Table 5: Description of the QGNSS Window Interface

图标	说明
	此天空视图界面显示正在被追踪的卫星信息。 1) 左侧图标显示正在被追踪的卫星及其数量。 ● BDS：4 ● GLO（GLONASS）：0 ● GPS：11 ● GAL（Galileo）：0 ● QZSS：0 ● NavIC：0 ● SBAS：0
	2) 右侧的栅格地图显示了正在被追踪中的卫星方位。
	● GPS 卫星 ● BDS 卫星 ● GLONASS 卫星 ● Galileo 卫星 ● QZSS 卫星 ● IRNSS（NavIC）卫星
	● PRN 30 的 C/N_0 值是 39 dB-Hz。 ● 亮红色柱表示卫星的导航数据正在使用中。 ● PRN 1 的 C/N_0 值是 21 dB-Hz。 ● 浅红色柱表示该卫星的导航数据未被使用。
	● 经度（单位：度） ● 纬度（单位：度） ● 平均海拔高度（MSL，单位：m） ● 椭球面高度（EPH，单位：m） ● 接收机速度（单位：km/h） ● 水平精度因子（HDOP） ● 位置精度因子（PDOP） ● 定位模式 ● 质量指标：包含 DGNSS、DGPS 和 GPS SPS 模式 ● UTC 日期和时间 ● TOD 时间[3]（单位：秒） ● GPS 差分数据时间 ● TTFF（单位：秒）

5、Upgrading the firmware using the QGPSFlashTool utility

The LC29H series modules support the use of the software tool QGPSFlashTool, which can be used to upgrade the firmware via the UART interface. For more information about using the QGPSFlashTool, please refer to the document [3].

The software tool QGPSFlashTool can be downloaded from the official website (Download Area), or obtained from Mobile Communications technical support.

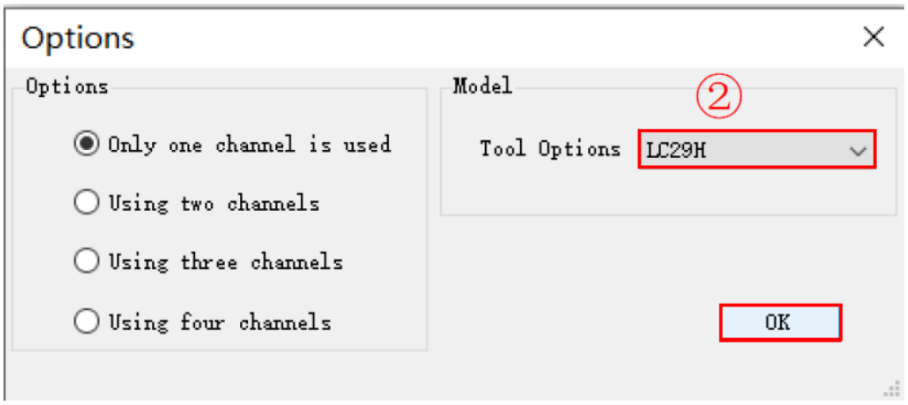
5.1. Firmware Upgrade

Before proceeding with the firmware upgrade, you first need to connect the core board to your computer via a USB to TTL utility. The detailed steps for firmware download are listed below:

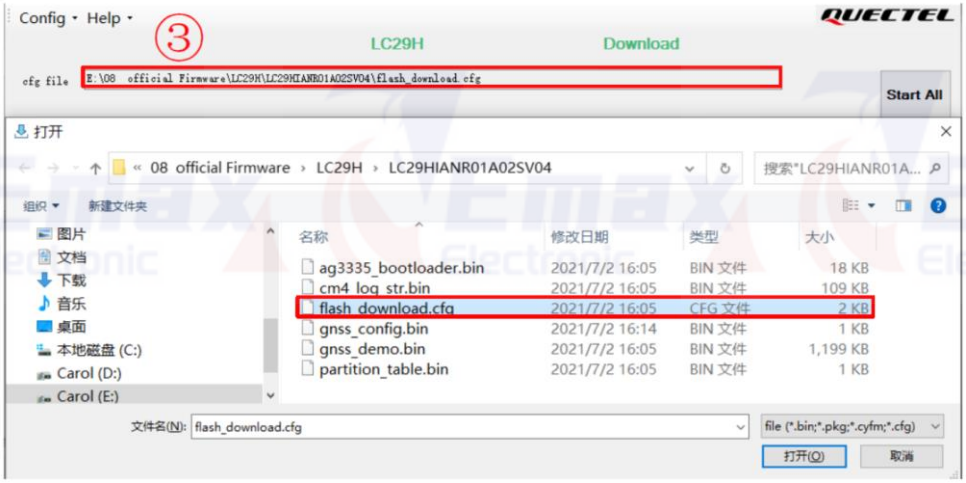
Step 1: Open the QGPSFlashTool provided by Mobile Telecom, click “Config” and select “Options” as shown below.

Figure 9: Firmware Upgrade Step 1

Step 2: In the “Options” pop-up box, set the number of channels to be used. Select “LC29H” in the “Tool Options” drop-down list, and then click “OK” as shown below.



Step 3: Double click the “cfg file” selection box to select the corresponding CFG file, such as “flash_download.cfg”, as shown in the figure below.



Step 4: Select the COM port corresponding to “Serial Port”, click the “Start” button, and then re-power on the core board to start the download, as shown in the following figure.

Step 5: When the firmware upgrade is successful, a green rectangular progress bar with 100 % progress will be displayed on the interface as shown below.

6、caveat

1、Pin power supply needs to be at least 5V 100mA

2、In order to maintain a high level of accuracy, it is necessary to ensure an open sky environment and the availability of visible satellites.