

LC29H (AA,BA,CA,DA,EA) EVB User Guide

GNSS Module Series

Version: 1.0

Date: 2021-12-20

Status: Released



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Safety Information

The following safety precautions must be observed during all phases of operation, such as usage, service or repair of any terminal incorporating Quectel LC29H module. Manufacturers of the terminal should distribute the following safety precautions to users and operating personnel, and incorporate them into all manuals supplied with the product. Otherwise, Quectel assumes no liability for customers' failure to comply with these precautions.



Ensure that the product may be used in the country and the required environment, as well as that it conforms to the local safety and environmental regulations.



Keep away from explosive and flammable materials. The use of electronic products in extreme power supply conditions and locations with potentially explosive atmospheres may cause fire and explosion accidents.



The product must be powered by a stable voltage source, while the wiring must conform to security precautions and fire prevention regulations.



Proper ESD handling procedures must be followed throughout the mounting, handling and operation of any devices and equipment incorporating the module to avoid ESD damages.

About the Document

Document Information	
Title	LC29H EVB User Guide
Subtitle	GNSS Module Series
Document Type	EVB User Guide
Document Status	Released

Revision History

Version	Date	Description
-	2021-12-14	Creation of the document
1.0	2021-12-20	First official release

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1 Introduction

This document explains how to evaluate the Quectel LC29H module using the Evaluation Board (EVB). The EVB is a reference tool that allows you to become familiar with the LC29H module.

Specifically, the document is divided into several sections:

- Chapter 2 provides the general overview of EVB Kit accessories;
- Chapter 3 describes the EVB user interfaces;
- Chapter 4 describes how to communicate with the module by using the QCOM tool;
- Chapter 5 describes how to test the module by using the QGNSS tool;
- Chapter 6 describes how to upgrade the module by using the QGPSFlashTool tool;
- Chapter 7 is an appendix, which summarizes relevant documents and terms and abbreviations appearing herein.

NOTE

For EVB schematic and PCB layout design files, contact Quectel Technical Support (support@quectel.com).

2 General Overview

2.1. EVB Kit Accessories

The EVB Kit includes: Evaluation Board (EVB), Active GNSS Antenna, Micro-USB Cable, USB flash drive, Bolts and Coupling Nuts. You can download the software tools (QCOM, QGNSS, QGPSFlashTool) from our website [Download Zone](#) or request them from Quectel Technical Support.

The EVB Kit accessories are shown in the figure below, and check **Table 1** for details.

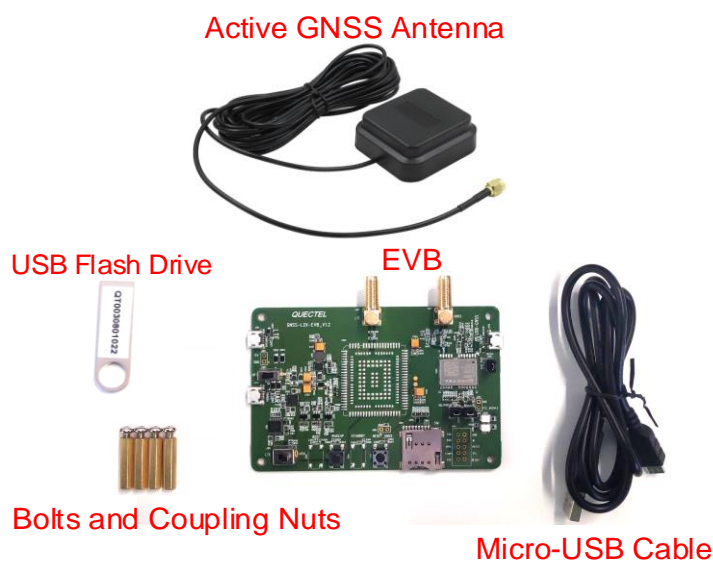


Figure 1: EVB Kit Accessories

Table 1: List of Accessories

Items	Description	Quantity
EVB	Evaluation Board Size: 100 mm x 68 mm	1

USB Cable	Micro-USB Cable	1
USB Flash Drive	8 GB USB Flash Drive (including the module-related documents, tools, and drivers)	1
GNSS Antenna	YB0017AA, Active GNSS Antenna Request the Antenna Datasheet from Quectel Technical Support.	1
Instruction Sheet	Document providing instructions on how to connect the EVB, detailed information on EVB accessories, etc.	1
Other	Bolts and Coupling Nuts	4 pairs

2.2. Connect Cables and Antenna to EVB

The connection between the EVB and its accessories is shown in the figure below. For more information on how to connect the EVB and its accessories, refer to the instruction sheet inside the EVB Kit.



Figure 2: EVB and Accessories Assembly

NOTE

Make sure that the Active GNSS Antenna is placed with a clear line of sight to the sky.

3 Board User Interfaces

3.1. EVB Top View

EVB top view is shown in the figure below.

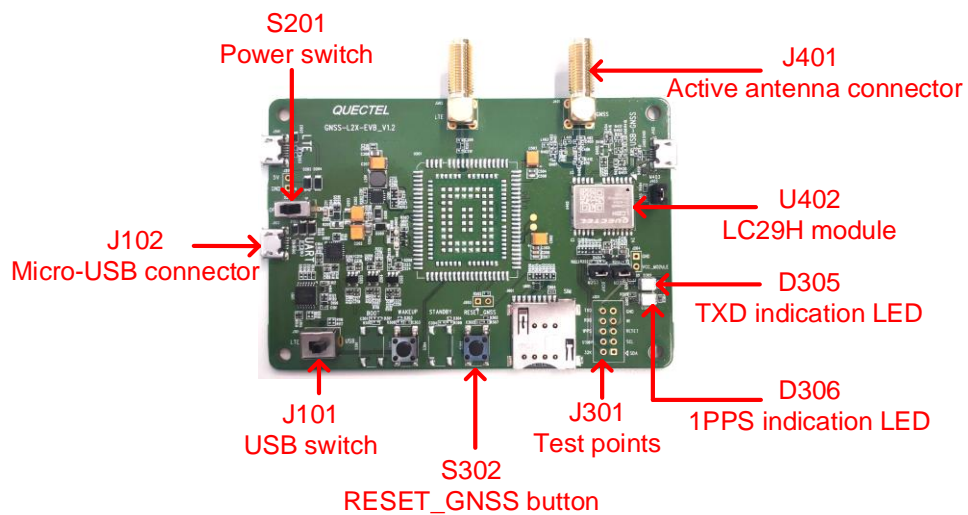


Figure 3: EVB Top View

3.2. Board User Interfaces

The EVB interfaces are detailed in the table below.

Table 2: Detailed EVB Interfaces

Function	Interfaces	Description
Power Supply	J102 Micro-USB	Power supply input: <ul style="list-style-type: none"> ● DC power supply: 4.5–5.5 V, typ. 5.0 V ● Current capability should be > 200 mA
User Interface	J102 Micro-USB	Used for standard NMEA messages output, binary data input and output, PAIR/PQTM commands input and output, and firmware upgrade.
RF input	J401 Active Antenna Connector	The antenna in the Kit supports: <ul style="list-style-type: none"> ● GPS L1 C/A and L5 ● QZSS L1 C/A and L5 ● Galileo E1 and E5a ● GLONASS L1 ● BeiDou B1I and B2a ● SBAS L1
Signal indication	D305 TXD Indication LED (Blue LED)	Flashing: The module is turned on successfully. NMEA messages are output from UART TXD pin. Extinct: Failed to turn on the module.
	D306 1PPS Indication LED (Red LED)	Flashing: Successful position fix. Frequency: 1 Hz. Extinct: No position fix.
Switches and Buttons	S201 Power Switch	Powers the EVB on/off.
	J101 USB Switch	Keep it on the USB side.
	S302 RESET_GNSS Button	Short press on the button to reset the module.
Test Points	J301 Test Points	Pins are detailed in Table 3 below.

Test point distribution is shown below:

J301 Pin Assignment:

TXD	GND
RXD	WI
1PPS	RESET
STDBY	SCL
32K	SDA

Table 3: J301 Pin Detailed Description

Pin Name	I/O	Description
TXD	DO	Transmits data
RXD	DI	Receives data
1PPS	DO	1 pulse per second
STDBY	DI	Standby mode control
32K	-	NC
GND	-	Ground
WI	DI	Odometer wheel-tick
RESET	DI	Resets the module
SCL	I/O	I2C serial clock
SDA	I/O	I2C serial data

4 Communication via QCOM Tool

This chapter explains how to use the QCOM tool to communicate with the module via the Micro-USB interface.

Download the QCOM tool from our website [Download Zone](#) or request it from Quectel Technical Support.

4.1. Communication via Micro-USB Interface

Step 1: Connect the EVB and the PC with a Micro-USB cable via the Micro-USB interface.

Step 2: Flip the power switch (S201) to ON position to power on the EVB.

Step 3: Run the provided driver installer to install the USB driver.

Step 4: View the USB port numbers in the Device Manager, as shown in the figure below.

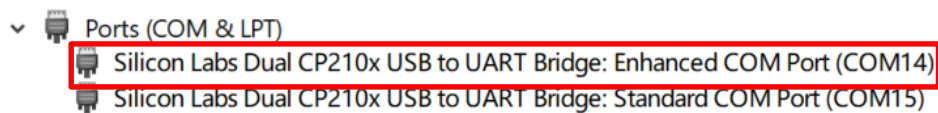


Figure 4: USB Ports

Step 5: Install the QCOM tool provided by Quectel. The COM Port Setting interface of QCOM is shown in the figure below (default baudrate: 115200 bps ¹).

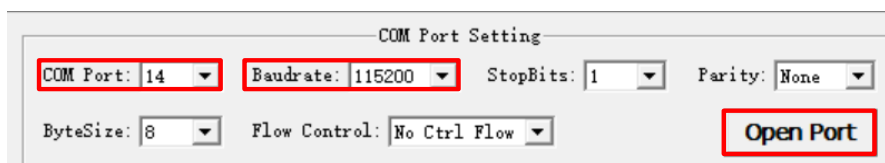


Figure 5: QCOM Tool Interface for COM Port Setting

¹ UART interface default settings vary depending on software versions. Please see specific software versions for details.

Step 6: Select the correct “COM Port” (USB Port shown in *Figure 4* above).

Step 7: Set the correct “Baudrate”.

Step 8: Click “Open Port” to establish communication with the EVB. The NMEA sentences output by the module will be displayed in the receiving bar of the QCOM tool. For more information about QCOM use, see *document [1]*.

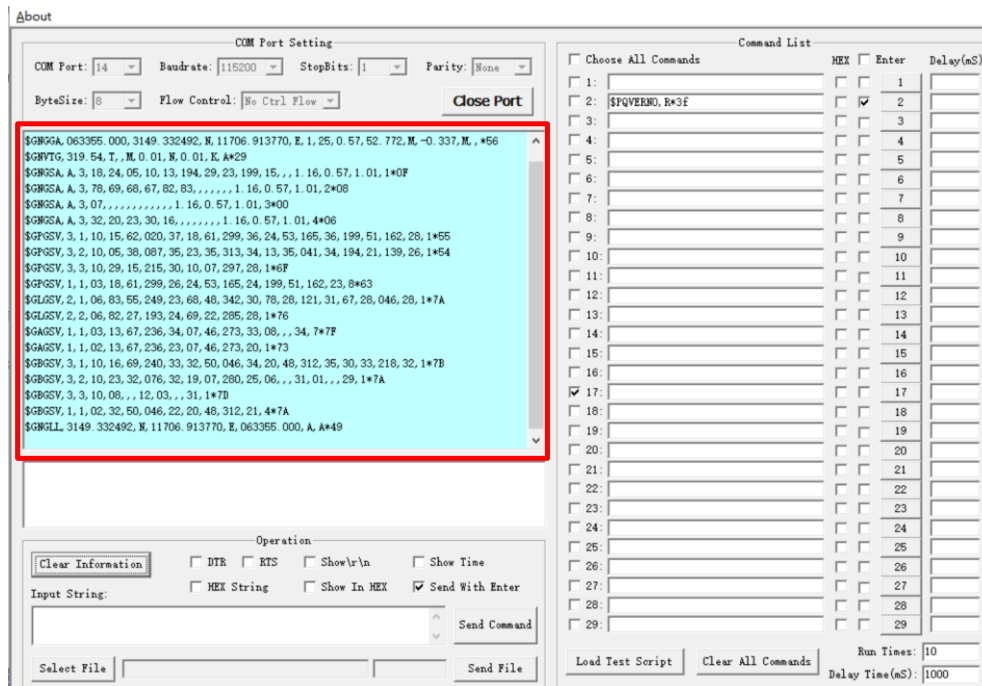


Figure 6: NMEA Sentences Output by Module – Displayed on QCOM Tool Interface

5 Test with QGNSS Tool

This chapter explains how to use the QGNSS software tool for checking the status of a GNSS receiver. For more information about QGNSS use, see **document [2]**.

Download the QGNSS tool from our website [Download Zone](#), or request it from Quectel Technical Support.

5.1. COM Port and Baud Rate Setting

Step 1: Assemble the EVB Accessories.

Step 2: Flip the Power switch (S201) to ON position to power on the EVB.

Step 3: Start the QGNSS and click **“Setting”** and **“Serial Port Configuration”** (default baudrate: 115200 bps ²).

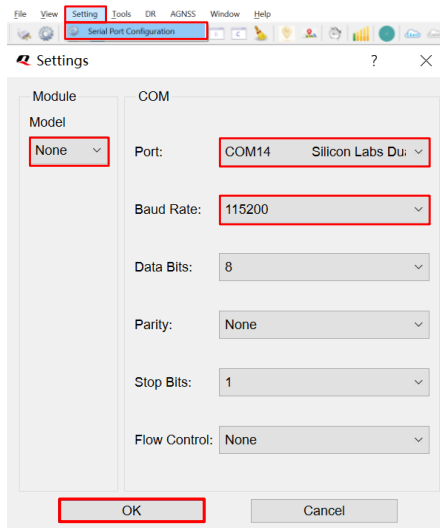


Figure 7: QGNSS Setting

Step 4: Click the  **“Connect or disconnect”** button. The interface shown in the figure below appears

² UART interface default settings vary depending on software versions. Please see specific software versions for details.

once the module is connected. For more information, see [document \[2\]](#).

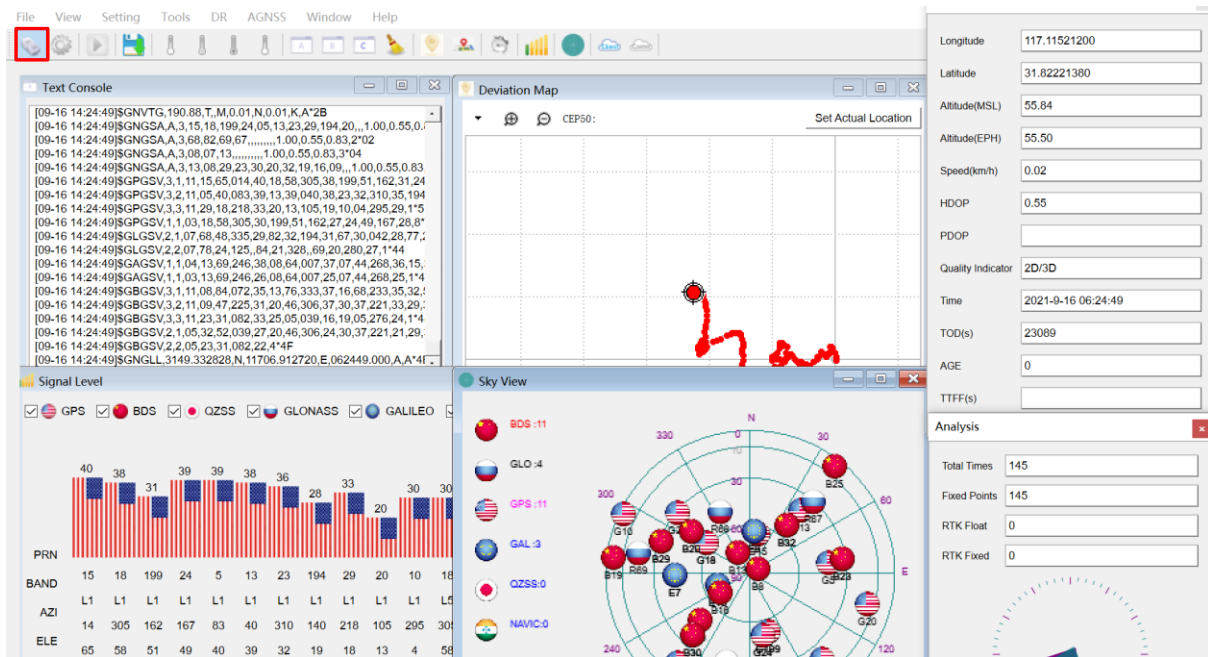


Figure 8: QGNSS Interface (Connected)

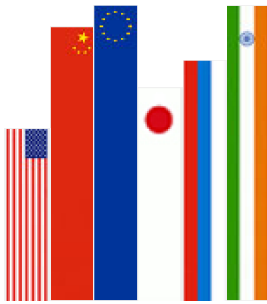
5.1.1. Interface Explanation







You can view GNSS information, such as C/N₀ message, time, position, speed, and precision in the QGNSS interface. To find out more about these parameters, see the following table.

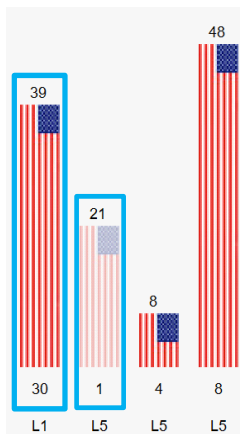
Table 4: QGNSS Interface Explanation

Icon	Explanation
	<p>This sky view interface shows the position of the satellites in use.</p> <p>1) The left column icons show the satellites in use and their numbers.</p> <ul style="list-style-type: none"> ● BDS (BeiDou): 4 ● GLO (GLONASS): 0 ● GPS: 11 ● GAL (Galileo): 0 ● QZSS: 0 ● NAVIC (IRNSS): 0 ● SBAS: 0 <p>2) The grid map on the right shows the position of the satellites</p>

in use.



-  GPS satellite
-  BeiDou satellite
-  GLONASS satellite
-  Galileo satellite
-  QZSS satellite
-  NavIC satellite

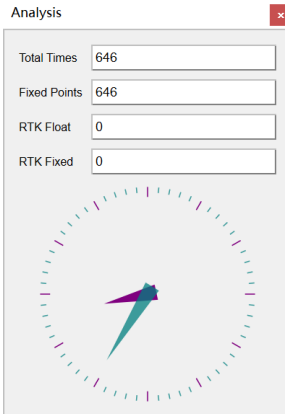


- PRN 30 C/N₀ is 39 dB-Hz.
- Column in **bright red** means that the navigation data of the satellites are in use.
- PRN 1 C/N₀ is 21 dB-Hz.
- Column in **light red** means that the navigation data of this satellite is not in use.

Data View	
Longitude	117.11524930
Latitude	31.82222100
Altitude(MSL)	58.29
Altitude(EPH)	57.95
Speed(km/h)	0.33
HDOP	0.50
PDOP	
Quality Indicator	2D/3D
Time	2021-9-15 08:33:29
TOD(s)	30809
AGE	0
TTFF(s)	

- Longitude (unit: degree)
- Latitude (unit: degree)
- Altitude (MSL) (unit: m)
- Altitude (EPH) (unit: m)
- Receiver speed (unit: km/h)
- Horizontal dilution of precision
- Position dilution of precision
- Quality Indicator: 2D/3D
- UTC date and time
- Time of day ³ (unit: second)
- Age of differential GPS data
- Last TTFF(s) (unit: second)

³ Total number of seconds elapsed since midnight of the current day.



- Total Times
- Fixed Points
- RTK Float
- RTK Fixed

6 Firmware Upgrade

Quectel LC29H module upgrades firmware via the UART interface by using QGPSFlashTool. For more information about QGPSFlashTool use, see **document [3]**.

Download the QGPSFlashTool from our website [Download Zone](#), or request it from Quectel Technical Support.

Before you start the firmware upgrade process:

First: Connect the EVB to a PC with a Micro-USB cable.

Second: Flip the power switch (S201) to ON position to power on the EVB.

Firmware upgrade steps:

Step 1: Start QGPSFlashTool. Click “**Config**”, then select “**Options**” and the interface of QGPSFlashTool will pop up as shown in the figure below.

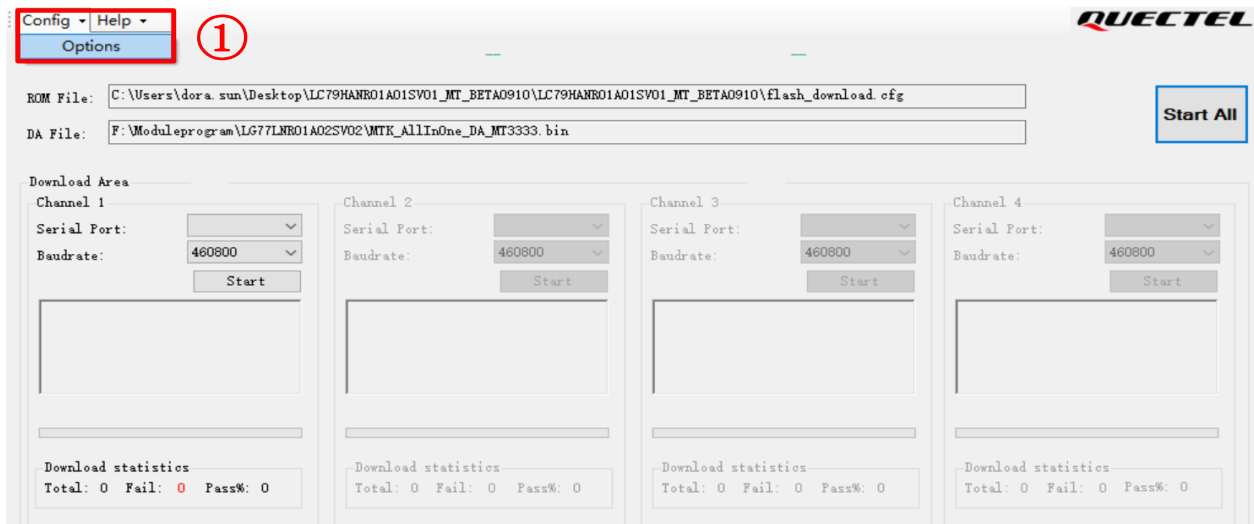


Figure 9: Firmware Upgrade – Step 1

Step 2: In the “**Options**” popup window, set the number of channels to be used. In the “**Tool Options**” drop-down box, select “**LC29H**”, and then click “**OK**” as shown in the figure below.



Figure 10: Firmware Upgrade – Step 2

Step 3: Double-click the “cfg file” selection box to select CFG file, e.g., “flash_download.cfg”.

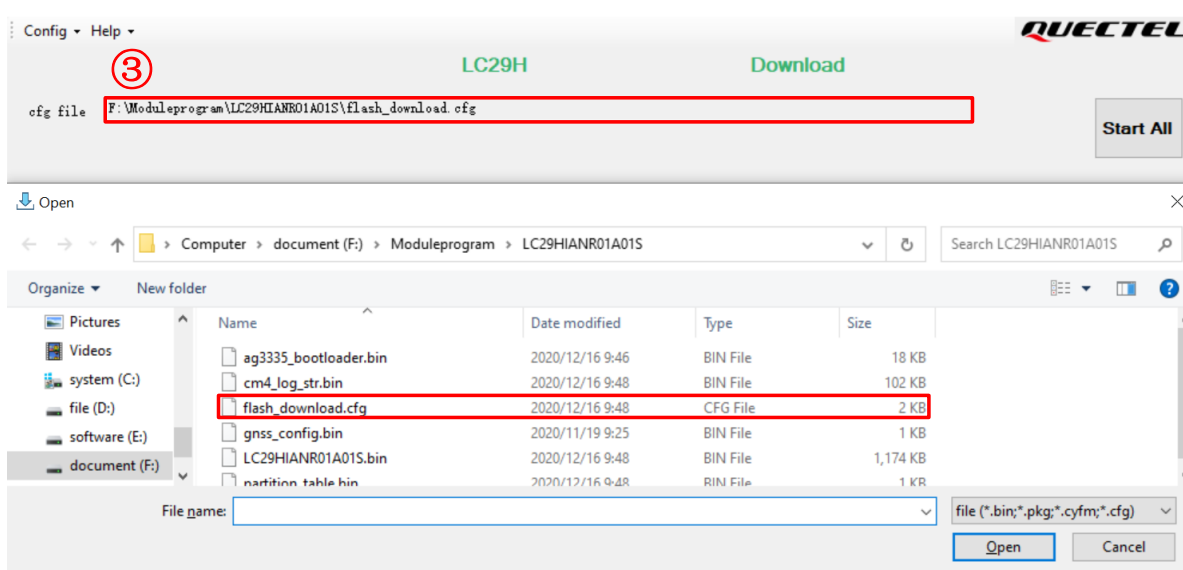


Figure 11: Firmware Upgrade – Step 3

Step 4: Select the “Serial Port” and “Baudrate” of the COM Port to be used. While the EVB board is in a power-on state, after clicking the “Start” button, press the RESET_GNSS button on the EVB (for 100 ms before releasing it) to start downloading.



Figure 12: Firmware Upgrade – Step 4

Step 5: When the firmware upgrade is successful, the QGPSFlashTool green progress bar on the screen will indicate “100%”, as shown in the figure below.



Figure 13: Successful Firmware Upgrade

7 Appendix References

Table 5: Related Documents

Document Name	
[1]	Quectel QCOM User Guide
[2]	Quectel QGNSS User Guide
[3]	Quectel QGPSFlashTool User Guide

Table 6: Terms and Abbreviations

Abbreviation	Description
2D	Two-dimensional
3D	Three-dimensional
BeiDou	BeiDou Navigation Satellite System
COM Port	Communication Port
C/N ₀	Carrier-to-noise-density Ratio
DC	Direct Current
DI	Digital Input
DO	Digital Output
ESD	Electrostatic Discharge
EVB	Evaluation Board
Galileo	Galileo Satellite Navigation System (EU)
GND	Ground

GNSS	Global Navigation Satellite System
GPS	Global Positioning System
GLONASS	Global Navigation Satellite System (Russia)
I2C	Inter-Integrated Circuit
I/O	Input/Output
LED	Light Emitting Diode
MSC	Mobile Switching Center
NMEA	NMEA (National Marine Electronics Association) 0183 Interface Standard
PC	Personal Computer
PCB	Printed Circuit Board
1PPS	One Pulse Per Second
PRN	Pseudorandom Noise
QZSS	Quasi-Zenith Satellite System
RF	Radio Frequency
RXD	Receive Data (Pin)
RTK	Real-Time Kinematic
SBAS	Satellite-Based Augmentation System
SCL	Serial Clock Line
SDA	Serial Data Line
TTFF	Time to First Fix
TXD	Transmit Data (Pin)
UART	Universal Asynchronous Receiver/Transmitter
USB	Universal Serial Bus
UTC	Coordinated Universal Time
