

LC79H (BA)

EVB User Guide

GNSS Module Series

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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 LC79H (BA) 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

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1 Introduction

This document provides information on the steps needed to evaluate the Quectel LC79H (BA) module using the Evaluation Board (EVB). The EVB is a convenient tool that allows you to become familiar with the LC79H (BA) module.

Specifically, the document is divided into several sections:

- Chapter 2 provides the general overview of EVB Kit.
- Chapter 3 describes the EVB user interfaces.
- Chapter 4 describes how to communicate with the module via QCOM tool.
- Chapter 5 describes how to test the module via QGNSS tool.
- Chapter 6 describes how to upgrade module firmware via QGPSFlashTool.
- Chapter 7 is an appendix, which summarizes the 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

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

The EVB Kit contents are shown in the figure below. Check **Table 1** for details.

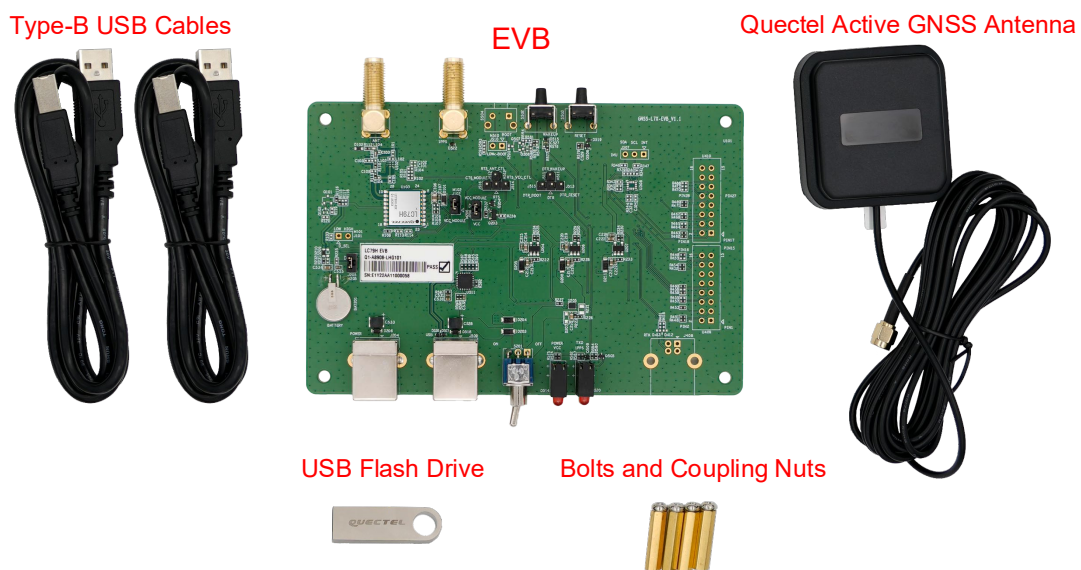


Figure 1: EVB and Components

Table 1: List of Kit Components

Items	Description	Quantity
EVB	Evaluation Board Size: 80 mm × 120 mm	1
USB Cable	Type-B USB Cable	2
USB Flash Drive	8 GB USB Flash Drive (including the module-related documents, tools, and drivers)	1
GNSS Antenna	Active GNSS Antenna: YB0017AA Request the Antenna Datasheet from Quectel Technical Support.	1
Instruction Sheet	Sheet providing instructions on how to connect the EVB and its components, detailed information on EVB contents, etc.	1
Others	Bolts and Coupling Nuts	4 pairs

2.2. Connect Cable and Antenna to EVB

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

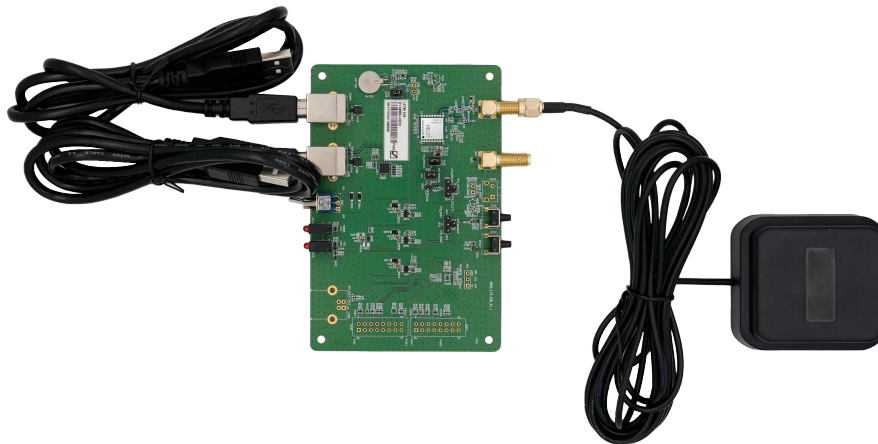


Figure 2: EVB and Components Assembly

NOTE

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

3 EVB User Interfaces

3.1. EVB Top View

EVB top view is shown in the figure below.

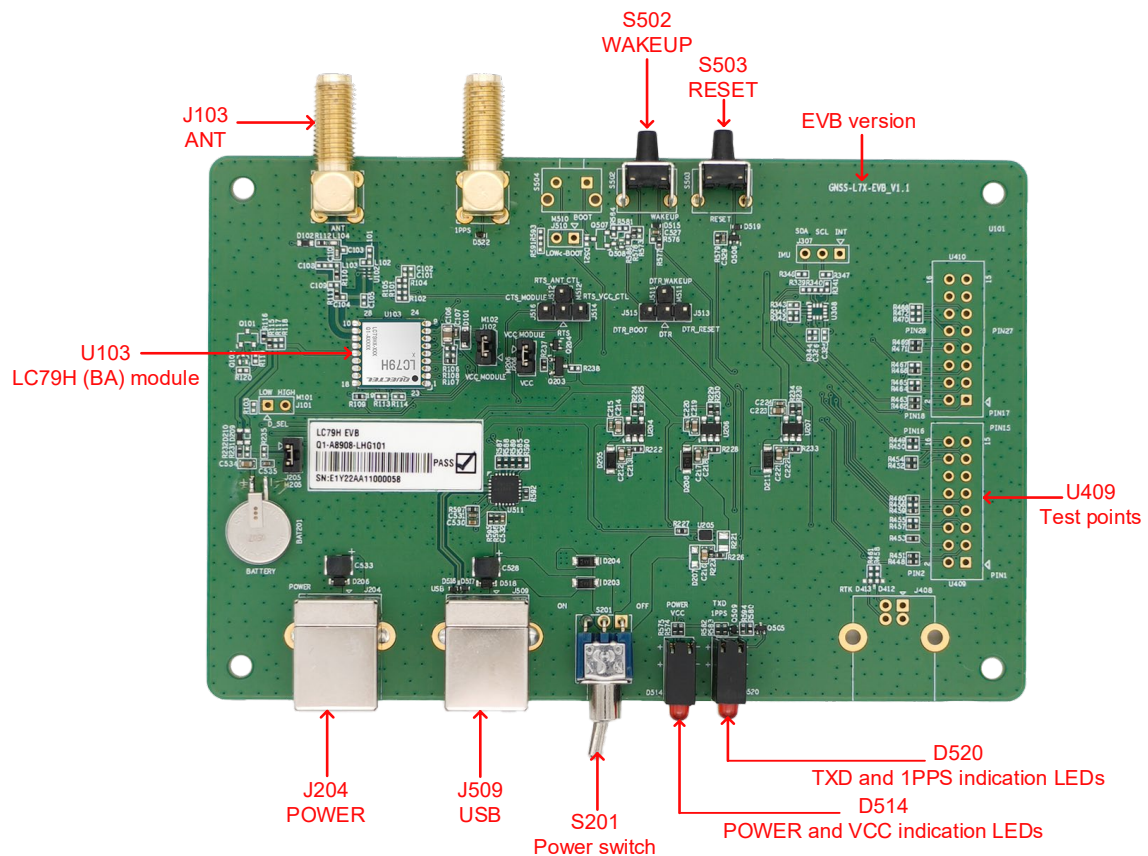


Figure 3: EVB Top View

3.2. EVB Interfaces

The EVB interfaces are detailed in the table below.

Table 2: Detailed EVB Interfaces

Function		Interfaces	Description
Power Supply		J204 POWER	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 > 100 mA
Communication Interface		J509 USB	Standard NMEA messages output, PAIR/PQTM commands input and output, and firmware upgrade.
RF Input		J103 ANT	The antenna in the Kit supports: <ul style="list-style-type: none"> ● GPS L1 C/A ● GLONASS L1 ● Galileo E1 ● BDS B1I ● QZSS L1 C/A ● SBAS L1
Signal Indication	D514 Indication LEDs	POWER (Green)	Bright: The EVB board is powered well. Extinct: The EVB board is not powered.
		VCC (Red)	Bright: The EVB board is powered well. Extinct: The EVB board is not powered.
	D520 Indication LEDs	TXD (Red)	Flashing: Data outputs from UART TXD pin. Extinct or Bright: Data does not output from UART TXD pin.
		1PPS (Green)	Flashing: Successful position fix. Frequency: 1 Hz. Extinct: No position fix.
Switches and Buttons		S201 Power Switch	Powers the EVB on/off.
		S503 RESET	Short press on the button to reset the module.
		S502 WAKEUP	Short press on the button to wake up the module from Backup mode.
Test Points		U409 Test Points	Pins are detailed in Table 3 and Table 4 below.

Test point distribution is shown below:

Table 3: U409 Pin Assignment

SDA	RESERVED
VCC_RF	LNA_EN
GND	NC
GND	RESET
VCC	RESERVED
V_BCKP	RESERVED
1PPS	RXD
TXD	GND

Table 4: U409 Pin Detailed Description

Pin Name	I/O	Description
SDA	DI	I2C serial data
VCC_RF	PO	Power supply for external RF components
GND	-	Ground
GND	-	Ground
VCC	PI	Main power supply
V_BCKP	PI	Backup power supply for backup domain of module
1PPS	DO	1 pulse per second
TXD	DO	Transmits data
RESERVED	-	Reserved
LNA_EN	DO	Power control for active antenna
NC	-	Not connected
RESET	DI	Reset the module
RESERVED	-	Reserved
RESERVED	-	Reserved
RXD	DI	Receives data
GND	-	Ground

4 Communication via QCOM Tool

This chapter explains how to use the QCOM tool to communicate with the module via the Type-B USB interface. For more information about QCOM use, see **document [1]**.

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

4.1. Communication via the Type-B USB Interface

Step 1: Connect the EVB and the PC with a Type-B USB cable via the Type-B 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 number in the Device Manager, as shown in the figure below.

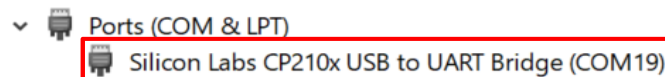


Figure 4: USB Port

Step 5: Install the QCOM tool provided by Quectel. The COM Port Setting interface of QCOM is shown in the figure below (default baud rate: 9600 bps ¹).

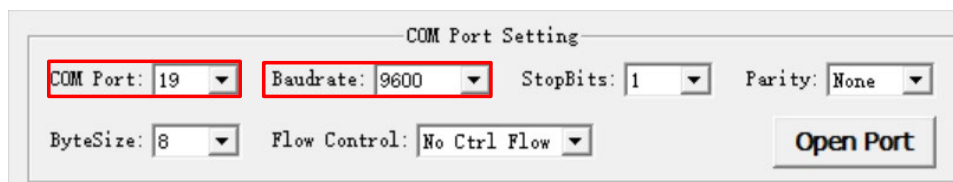


Figure 5: COM Port Setting Interface of QCOM

¹ UART interface default settings vary depending on software versions.

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

Step 7: Click “**Open Port**” to establish communication with the EVB. The NMEA sentences output by the LC79H (BA) module will be displayed in the receiving bar of the QCOM tool, as shown in the figure below.

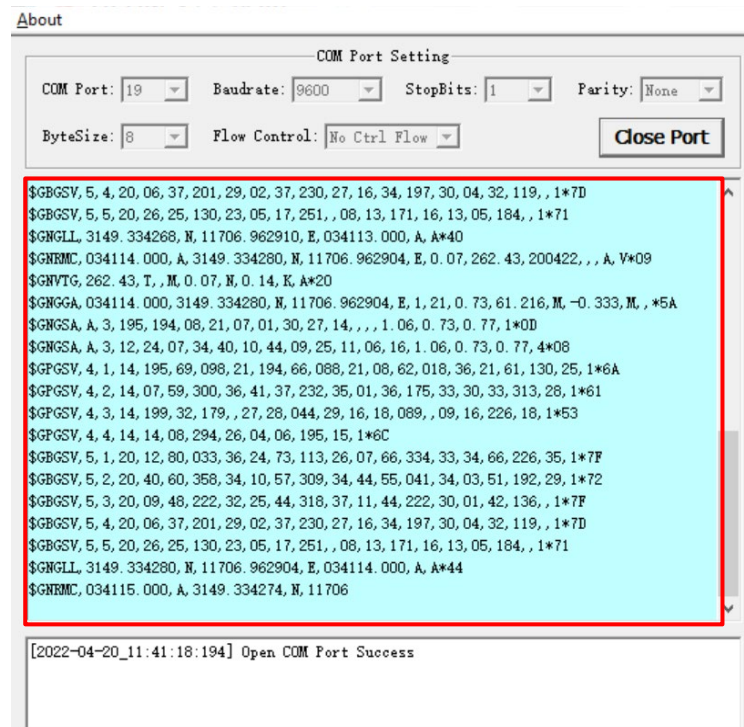


Figure 6: NMEA Sentences Output – Displayed on QCOM Tool Interface

5 Test via QGNSS Tool

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

Request the QGNSS from Quectel Technical Support.

5.1. QGNSS Setting

Step 1: Assemble the EVB components.

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 baud rate: 9600 bps ²).

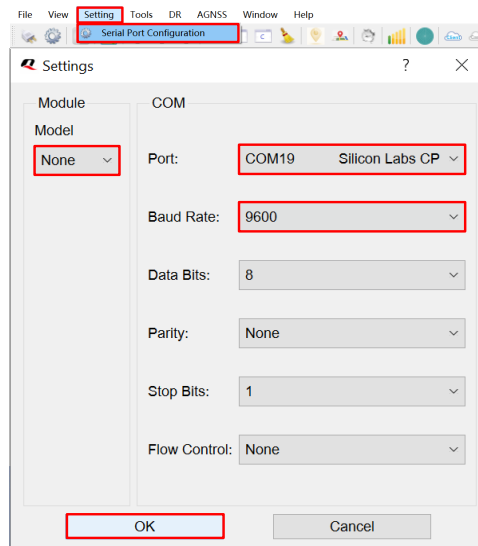



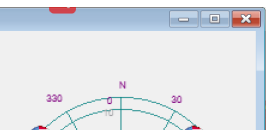
Figure 7: COM Port and Rate Setting

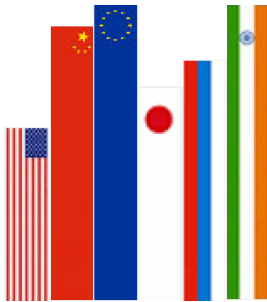
Step 4: Click the  “**Connect or disconnect**” button. The interface shown in the figure below appears once the module is connected.





² UART interface default settings vary depending on software versions.

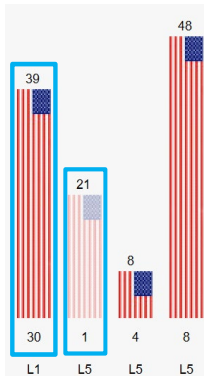


You can view GNSS information, such as C/N₀ message, time, position, speed, and precision in the QGNSS interface. See the following table to find out more about these parameters.

Icon	Explanation
 <p>The screenshot shows a 'Sky View' window. On the left, a list of satellite systems and their counts: BDS: 4, GLO: 0, GPS: 11, GAL: 0, QZSS: 0, NAVIC: 0, SBAS: 0. Each entry has a corresponding icon. On the right, a polar projection grid map shows the positions of the satellites in the sky, with labels like G18, G29, G15, G30, G2, G26, G19, G3, G1, G5, G6, G7, G8, G9, G10, G11, G12, G13, G14, G16, G17, G18, G19, G20, G21, G22, G23, G24, G25, G26, G27, G28, G29, G30, G31, G32, G33, G34, G35, G36, G37, G38, G39, G40, G41, G42, G43, G44, G45, G46, G47, G48, G49, G50, G51, G52, G53, G54, G55, G56, G57, G58, G59, G60, G61, G62, G63, G64, G65, G66, G67, G68, G69, G70, G71, G72, G73, G74, G75, G76, G77, G78, G79, G80, G81, G82, G83, G84, G85, G86, G87, G88, G89, G90, G91, G92, G93, G94, G95, G96, G97, G98, G99, G100.</p>	<p>This sky view interface shows the position of the satellites in use.</p> <ol style="list-style-type: none"> The left column icons show the satellites in use and their number. <ul style="list-style-type: none"> BDS: 4 GLO (GLONASS): 0 GPS: 11 GAL (Galileo): 0 QZSS: 0 NAVIC (IRNSS): 0 SBAS: 0 The grid map on the right shows the position of the satellites in use.



-  GPS satellite
-  BDS satellite
-  GLONASS satellite
-  Galileo satellite
-  QZSS satellite
-  NavIC (IRNSS) 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 the satellites are not in use.

Data View	
Longitude	117.11575333
Latitude	31.82233133
Altitude(MSL)	85.30
Altitude(EPH)	
Speed(km/h)	0.00
HDOP	1.05
PDOP	2.0
Fix Mode	3D
Quality Indicator	GPS SPS Mode
Time	2022-3-9 01:06:30
TOD(s)	3990
AGE	0
TTFF(s)	4.040

- 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
- Fix Mode: 2D, 3D
- Quality Indicator: DGNSS, DGPS, GPS SPS mode
- UTC date and time
- Time of day³ (unit: second)
- Age of differential GPS data
- Last TTFF (unit: second)

Analysis	
Total Times	31
Fixed Points	31
RTK Float	0
RTK Fixed	0



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

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

6 Firmware Upgrade via QGPSFlashTool

Quectel LC79H (BA) module upgrades firmware via the UART interface using QGPSFlashTool. For more information about QGPSFlashTool, see [document \[3\]](#).

Request the QGPSFlashTool from Quectel Technical Support.

6.1. Firmware Upgrade

Before you start the firmware upgrade process:

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

Second: Flip the Power switch (S201) to **ON** position before powering on the EVB.

Firmware upgrade steps:

Step 1: Open QGPSFlashTool. Click the “**Config**” and select “**Options**” as shown in the figure below.

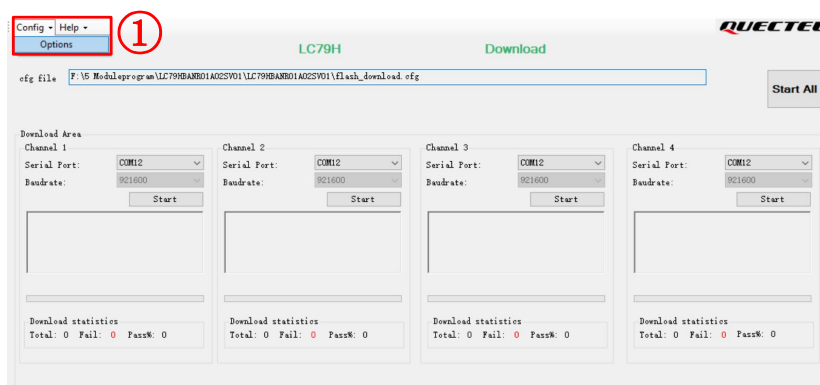


Figure 9: Firmware Upgrade – Step 1

Step 2: In the Options popup, set the number of channels to be used. In the “**Tool Options**” drop-down box, select “**LC79H**” and then click “**OK**”, as shown in the figure below.

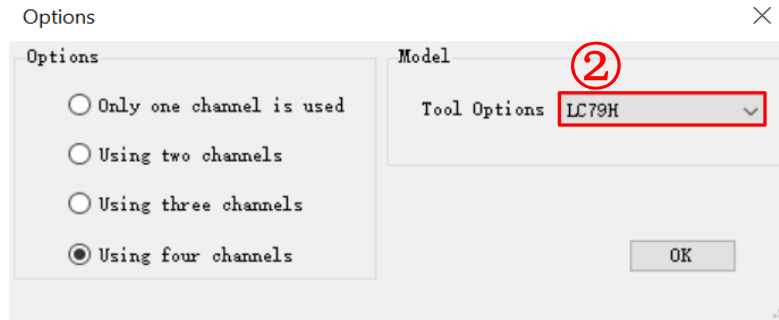


Figure 10: Firmware Upgrade – Step 2

Step 3: Double click “cfg file” to select cfg file, e.g., “flash_download.cfg” as shown in the figure below.

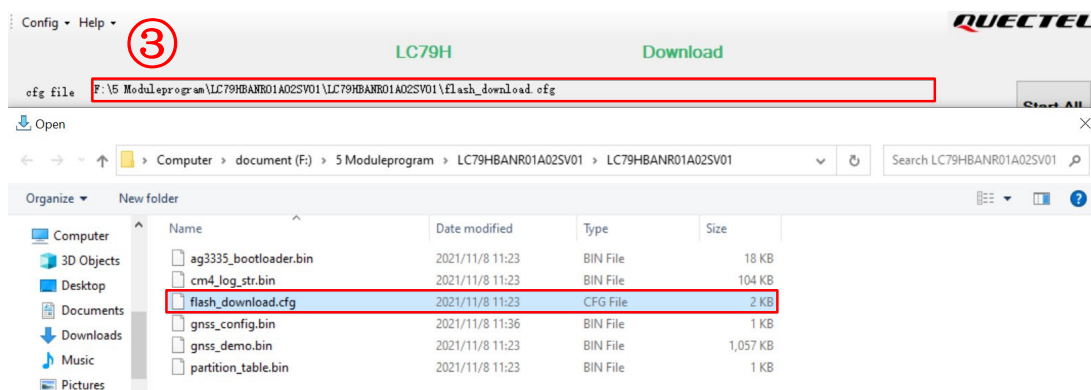


Figure 11: Firmware Upgrade – Step 3

Step 4: Select the “Serial Port” of the COM Port that will be used. Click “Start” button and then press the RESET button at least 100 ms to start downloading the firmware, as shown in the figure below.

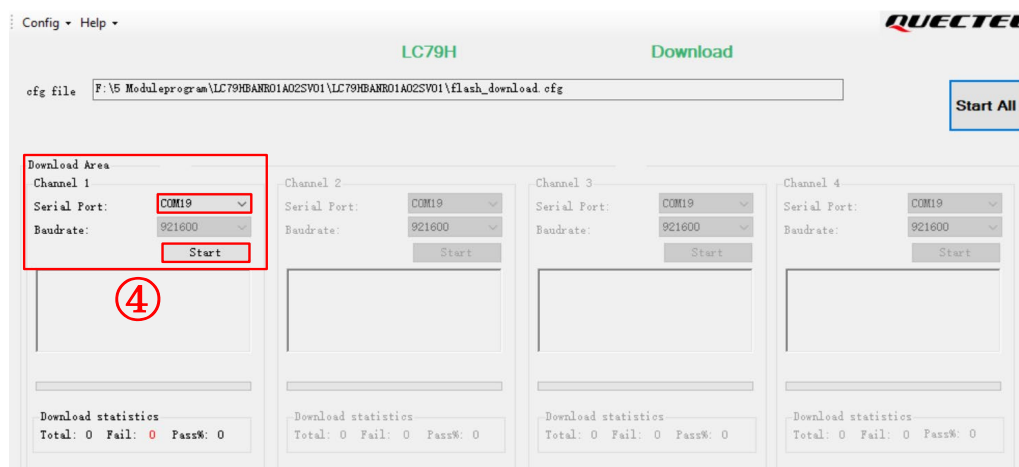


Figure 12: Firmware Upgrade – Step 4

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



Figure 13: Successful Firmware Upgrade

NOTE

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

7 Appendix References

Table 6: Related Document

Document Name
[1] Quectel QCOM User Guide
[2] Quectel_QGNSS_User_Guide
[3] Quectel_QGPSFlashTool_User_Guide

Table 7: Terms and Abbreviations

Abbreviation	Description
2D	2 Dimension
3D	3 Dimension
BDS	BeiDou Navigation Satellite System
C/N ₀	Carrier-to-Noise Ratio
CEP	Circular Error Probable
COM Port	Communication Port
DC	Direct Current
DI	Digital Input
DO	Digital Output
EPH	Ellipsoidal Height
ESD	Electrostatic Discharge
EVB	Evaluation Board
Galileo	Galileo Satellite Navigation System (EU)

Abbreviation	Description
GLONASS	Global Navigation Satellite System (Russia)
GND	Ground
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
I2C	Inter-Integrated Circuit
I/O	Input/Output
NAVIC (IRNSS)	Indian Regional Navigation Satellite System
LED	Light Emitting Diode
MSL	Mean Sea Level
NMEA	NMEA (National Marine Electronics Association) 0183 Interface Standard
PC	Personal Computer
PCB	Printed Circuit Board
PI	Power Input
PO	Power Output
1PPS	One Pulse Per Second
PRN	Pseudo Random Noise
QZSS	Quasi-Zenith Satellite System
RF	Radio Frequency
RTK	Real Time Kinematic
RXD	Receive Data (Pin)
SBAS	Satellite-Based Augmentation System
SDA	I2C Serial Data
SPS	Standard Positioning Service
TTF	Time to First Fix

Abbreviation	Description
TXD	Transmit Data (Pin)
UART	Universal Asynchronous Receiver/Transmitter
USB	Universal Serial Bus
UTC	Coordinated Universal Time