

Standard Precision GNSS-SAA-KIT EVB Kit User Guide

GNSS Products

Version: 1.0

Date: 2025-09-09

Status: Released



At Quectel, our aim is to provide timely and comprehensive services to our customers. If you require any assistance, please contact our headquarters:

Quectel Wireless Solutions Co., Ltd.

Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai 200233, China

Tel: +86 21 5108 6236

Email: info@quectel.com

Or our local offices. For more information, please visit:

<http://www.quectel.com/support/sales.htm>.

For technical support, or to report documentation errors, please visit:

<http://www.quectel.com/support/technical.htm>.

Or email us at: support@quectel.com.

Legal Notices

We offer information as a service to you. The provided information is based on your requirements and we make every effort to ensure its quality. You agree that you are responsible for using independent analysis and evaluation in designing intended products, and we provide reference designs for illustrative purposes only. Before using any hardware, software or service guided by this document, please read this notice carefully. Even though we employ commercially reasonable efforts to provide the best possible experience, you hereby acknowledge and agree that this document and related services hereunder are provided to you on an “as available” basis. We may revise or restate this document from time to time at our sole discretion without any prior notice to you.

Use and Disclosure Restrictions

License Agreements

Documents and information provided by us shall be kept confidential, unless specific permission is granted. They shall not be accessed or used for any purpose except as expressly provided herein.

Copyright

Our and third-party products hereunder may contain copyrighted material. Such copyrighted material shall not be copied, reproduced, distributed, merged, published, translated, or modified without prior written consent. We and the third party have exclusive rights over copyrighted material. No license shall be granted or conveyed under any patents, copyrights, trademarks, or service mark rights. To avoid ambiguities, purchasing in any form cannot be deemed as granting a license other than the normal non-exclusive, royalty-free license to use the material. We reserve the right to take legal action for noncompliance with abovementioned requirements, unauthorized use, or other illegal or malicious use of the material.

Trademarks

Except as otherwise set forth herein, nothing in this document shall be construed as conferring any rights to use any trademark, trade name or name, abbreviation, or counterfeit product thereof owned by Quectel or any third party in advertising, publicity, or other aspects.

Third-Party Rights

This document may refer to hardware, software and/or documentation owned by one or more third parties ("third-party materials"). Use of such third-party materials shall be governed by all restrictions and obligations applicable thereto.

We make no warranty or representation, either express or implied, regarding the third-party materials, including but not limited to any implied or statutory, warranties of merchantability or fitness for a particular purpose, quiet enjoyment, system integration, information accuracy, and non-infringement of any third-party intellectual property rights with regard to the licensed technology or use thereof. Nothing herein constitutes a representation or warranty by us to either develop, enhance, modify, distribute, market, sell, offer for sale, or otherwise maintain production of any our products or any other hardware, software, device, tool, information, or product. We moreover disclaim any and all warranties arising from the course of dealing or usage of trade.

Privacy Policy

To implement module functionality, certain device data are uploaded to Quectel's or third-party's servers, including carriers, chipset suppliers or customer-designated servers. Quectel, strictly abiding by the relevant laws and regulations, shall retain, use, disclose or otherwise process relevant data for the purpose of performing the service only or as permitted by applicable laws. Before data interaction with third parties, please be informed of their privacy and data security policy.

Disclaimer

- a) We acknowledge no liability for any injury or damage arising from the reliance upon the information.
- b) We shall bear no liability resulting from any inaccuracies or omissions, or from the use of the information contained herein.
- c) While we have made every effort to ensure that the functions and features under development are free from errors, it is possible that they could contain errors, inaccuracies, and omissions. Unless otherwise provided by valid agreement, we make no warranties of any kind, either implied or express, and exclude all liability for any loss or damage suffered in connection with the use of features and functions under development, to the maximum extent permitted by law, regardless of whether such loss or damage may have been foreseeable.
- d) We are not responsible for the accessibility, safety, accuracy, availability, legality, or completeness of information, advertising, commercial offers, products, services, and materials on third-party websites and third-party resources.

Copyright © Quectel Wireless Solutions Co., Ltd. 2025. All rights reserved.

Safety Information

The following safety precautions must be observed during all phases of operation, such as usage, service, or repair of any terminal or mobile incorporating the module. Manufacturers of the terminal should notify users and operating personnel of the following safety precautions by incorporating them into all product manuals. 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	Standard Precision GNSS-SAA-KIT EVB Kit User Guide
Subtitle	GNSS Products
Document Type	EVB Kit User Guide
Document Status	Released

Revision History

Version	Date	Description
-	2025-06-26	Creation of the document
1.0	2025-09-09	First official release

Contents

Safety Information.....	3
About the Document.....	4
Contents.....	5
Table Index.....	6
Figure Index.....	7
1 Introduction	8
1.1. Applicable Modules.....	8
2 General Overview.....	9
2.1. EVB Kit.....	9
2.2. Connect Kit Components and Module TE-A to EVB	10
3 Quick Start.....	12
3.1. Set up Test Environment	12
3.2. Operation Steps	14
4 EVB Block Diagram	18
5 EVB Interfaces.....	19
5.1. EVB Top and Bottom Views.....	19
5.2. EVB Interfaces	20
5.2.1. J0504 (ODO Interface) Description	22
6 EVB and Antenna Installation.....	23
6.1. GNSS Antenna Installation	23
6.2. EVB Installation.....	24
7 Common Issues and Troubleshooting	25
8 Cautions	26
9 Appendix References	27

Table Index

Table 1: Applicable Modules	8
Table 2: List of Kit Components	10
Table 3: EVB Interface Descriptions	20
Table 4: J0504 Pin Description	22
Table 5: Related Documents.....	27
Table 6: Terms and Abbreviations	27

Figure Index

Figure 1: EVB Kit Components	9
Figure 2: GNSS Module TE-A and Kit Components Mounted on EVB	10
Figure 3: EVB Interfaces	13
Figure 4: Indication LEDs on EVB	14
Figure 5: COM Ports in Device Manager	14
Figure 6: Device Information Window	15
Figure 7: QGNSS Tool Displaying GNSS Module Data	16
Figure 8: Access Log Data in QGNSS Tool.....	16
Figure 9: EVB Block Diagram	18
Figure 10: EVB Top View	19
Figure 11: EVB Bottom View.....	20
Figure 12: GNSS Antenna Installation	23

1 Introduction

This document provides information on the steps needed to evaluate Quectel GNSS modules using the Evaluation Board (GNSS-MODULE EVB). GNSS-SAA-KIT is an evaluation board kit designed for standard precision GNSS modules.

1.1. Applicable Modules

Table 1: Applicable Modules

Module Family	Module
-	L26-DR Series
-	L89 R2.0
-	LC26G-T (AA)
-	LC260Z (00)
-	LC76G Series
LC76xZ	LC760Z (00)
	LC762Z (00)
-	LC79H (AL)
-	LC86G Series
-	LG69T (AA)

NOTE

The above applicable modules are for reference only. For details, see [document \[1\] list of EVB applicable modules](#).

2 General Overview

2.1. EVB Kit

The EVB kit includes:

- GNSS-MODULE EVB
- USB Type-C cable
- Dual-band active GNSS antenna
- Bolts and coupling nuts

MCU (GD32F470ZIT6), which is shipped with pre-burned firmware, is embedded in the GNSS-MODULE EVB. You can directly test and evaluate Quectel GNSS modules after acquiring the EVB kit and the corresponding module TE-A(s) (Please note that the module TE-A must be purchased separately).

The EVB kit components are shown in the figure below. For details, see [Table 2: List of Kit Components](#).

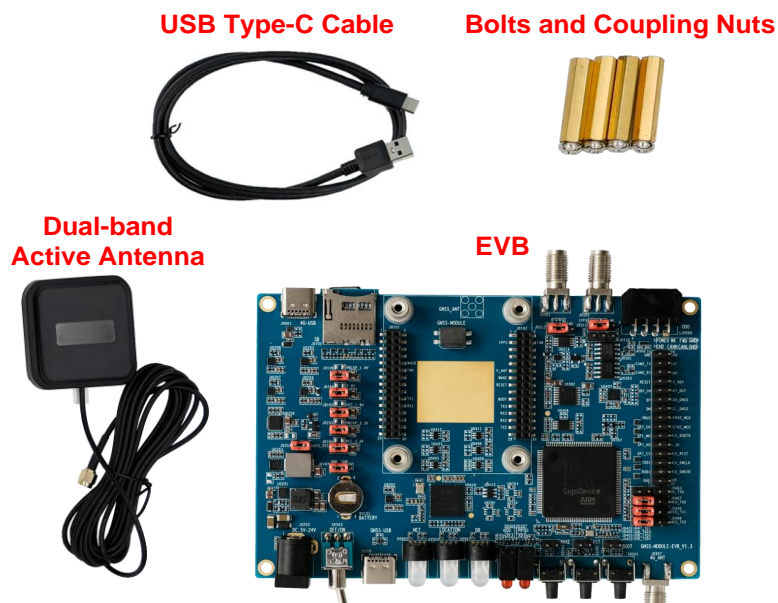


Figure 1: EVB Kit Components

Table 2: List of Kit Components

Item	Description	Quantity
EVB	GNSS-MODULE EVB Size: 120 mm x 80 mm	1
USB Cable	USB Type-C Cable	1
GNSS Antenna	Dual-band Active Antenna: YB0017AA or YEGB000Q1A	1
Other	Bolts and Coupling Nuts	4 pairs

NOTE

1. The GNSS module TE-A is not included in GNSS-SAA-KIT and must be ordered separately according to your requirements.
2. For details about Quectel active GNSS antenna and EVB schematics, contact Quectel Technical Support (support@quectel.com).

2.2. Connect Kit Components and Module TE-A to EVB

To test a GNSS module with the EVB you must order the corresponding GNSS module TE-A. Before using the EVB, ensure that the (red) jumper caps are connected correctly as shown in the figure below.

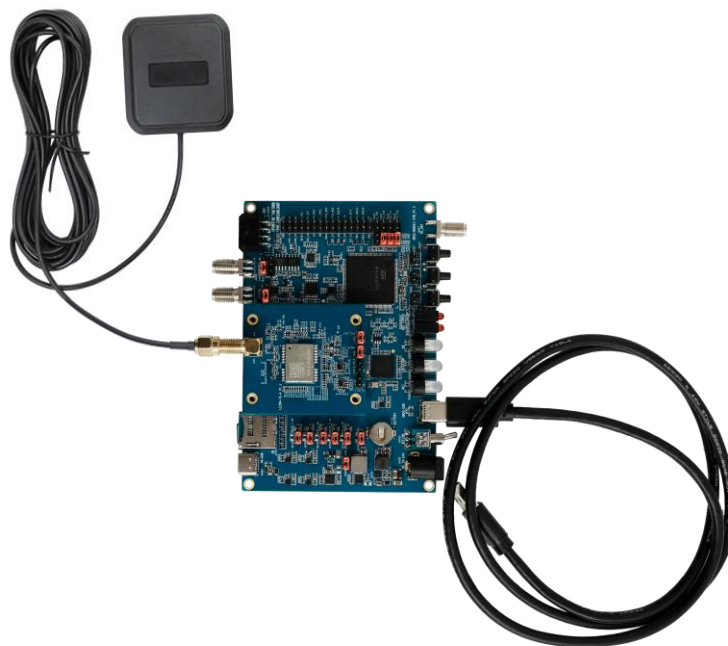


Figure 2: GNSS Module TE-A and Kit Components Mounted on EVB

NOTE

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

3 Quick Start

This chapter provides a step-by-step guide for setting up and testing standard precision GNSS positioning modules using the GNSS-MODULE EVB. The LC76G (AB) module is used as an example.

3.1. Set up Test Environment

Before testing the standard precision GNSS positioning modules, set up the test environment as follows:

Step 1: Install the required software to your PC. The software includes:

- **USB-to-serial port driver for EVB.**

For Windows 10 and Windows 11 systems, the PC automatically recognizes and installs the USB-to-serial port driver.

If the PC does not automatically install the driver, you should manually install the USB-to-serial port driver of the USB-to-UART bridge chip (FT4232HAQ) ([click to download](#)).

- **QGNSS tool (V2.1 or higher).**

Download the QGNSS tool .zip file ([click to download](#)) to your PC, extract the contents, and run the executable file to start the tool.

Step 2: Set up the GNSS-MODULE EVB connections. Make sure that connections to related interfaces (as shown in [Figure 3: EVB Interfaces](#)) are properly configured.

- Install the GNSS module TE-A onto the EVB and connect the GNSS antenna to the GNSS antenna connector on TE-A (Note that the module TE-A must be purchased separately).
- Use USB Type-C cable to connect the GNSS-USB port (J0506) and your PC.
- Insert SD card into the SD socket (J0701) if you need to save log data.
- Place all jumper caps in the exact positions shown in the figure below.
- Power on the EVB using the power switch (S0503).

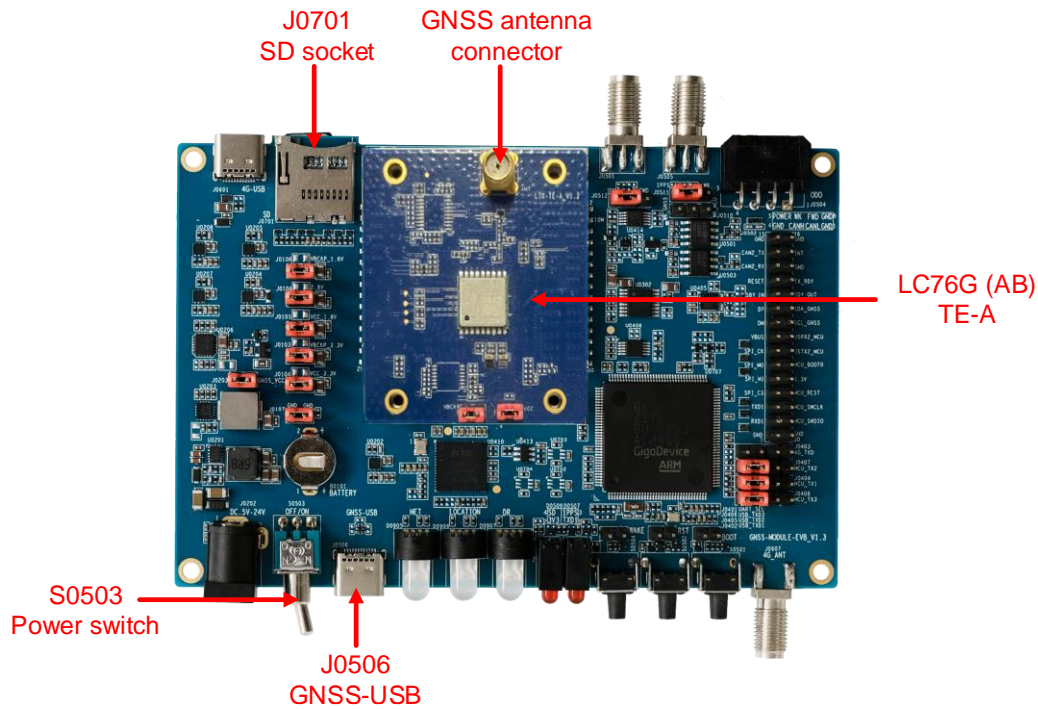


Figure 3: EVB Interfaces

Step 3: Check the module's operating status preliminarily against the EVB's LED indicators. As shown in the figure below, observe D0507 (1PPS/TXD1 indication LED) and D0509 (SD/3V3 indication LED).

- **Red D0509: SD indication LED.** Flashing means SD card is storing data and extinct means SD card is not storing data.
- **Green D0509: 3V3 indication LED.** Bright means VCC power supply for module is powered and extinct means VCC power supply for module is not powered.
- **Red D0507: 1PPS indication LED.** Flashing means 1PPS signal output and extinct means 1PPS is unavailable.
- **Green D0507: TXD1 indication LED.** Flashing means data output from UART1 TXD and bright/extinct means no data output from UART1 TXD.

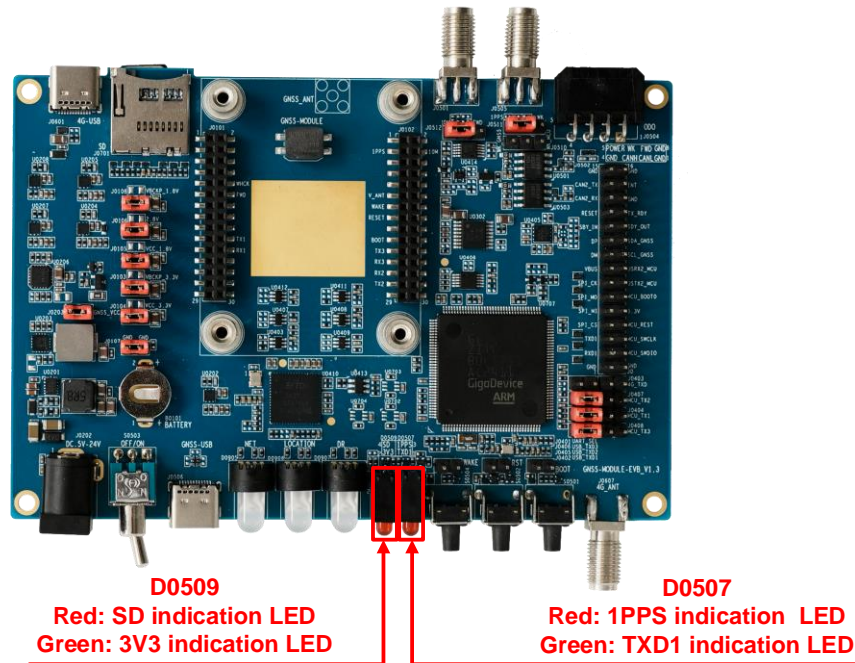


Figure 4: Indication LEDs on EVB

NOTE

1. Make sure that jumper caps are positioned as in [Figure 3: EVB Interfaces](#) before using the EVB for testing.
2. For more information about the QGNSS tool, see [document \[2\] QGNSS user guide](#).


3.2. Operation Steps

Once the test environment is set up as explained in [Chapter 3.1 Set up Test Environment](#), connect the GNSS-MODULE EVB to your PC as follows:

Step 1: After the driver is installed, the PC's Device Manager displays four consecutive COM ports with randomly assigned port numbers. The port with the smallest number (COM17) corresponds to the UART of the LC76G (AB) module. Several other serial ports are unused and reserved for future use.



Figure 5: COM Ports in Device Manager

Step 2: Double click QGNSS.exe to run the QGNSS tool. Click  to navigate to the "Device Information" window, change the module model, port, and baud rate, and then click "OK" to connect the QGNSS tool and the GNSS module on the EVB.

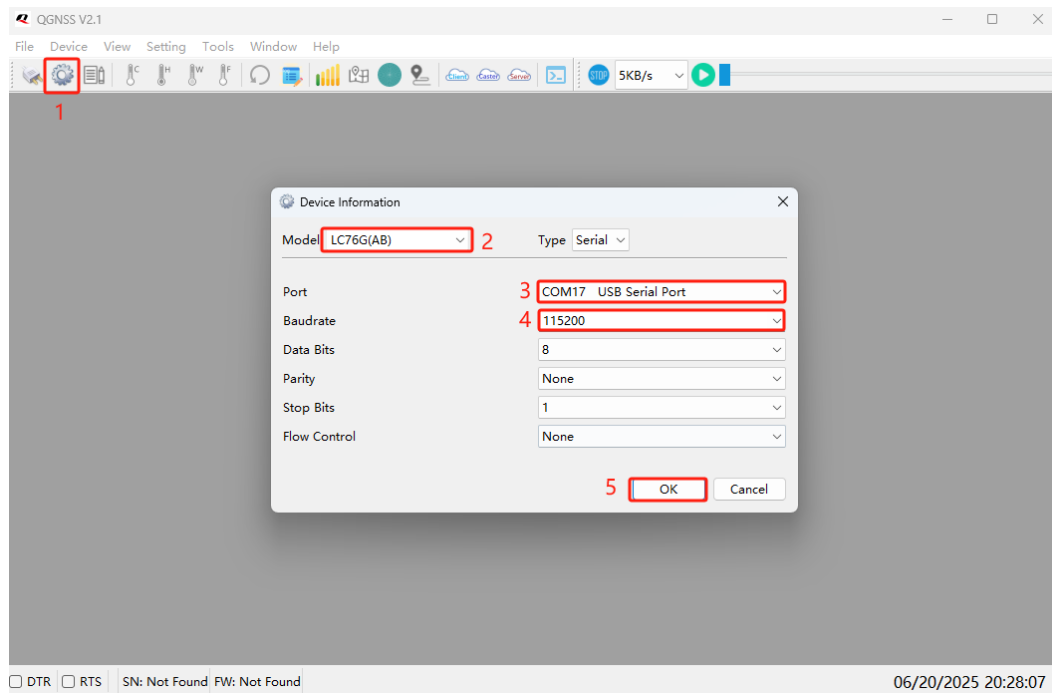


Figure 6: Device Information Window

Step 3: If the connection is successful, the QGNSS tool will display data as shown in the following figure. The QGNSS tool supports many functions, such as displaying real-time positioning results, firmware version and raw data from UART. For more details, see [document \[2\] QGNSS user guide](#).

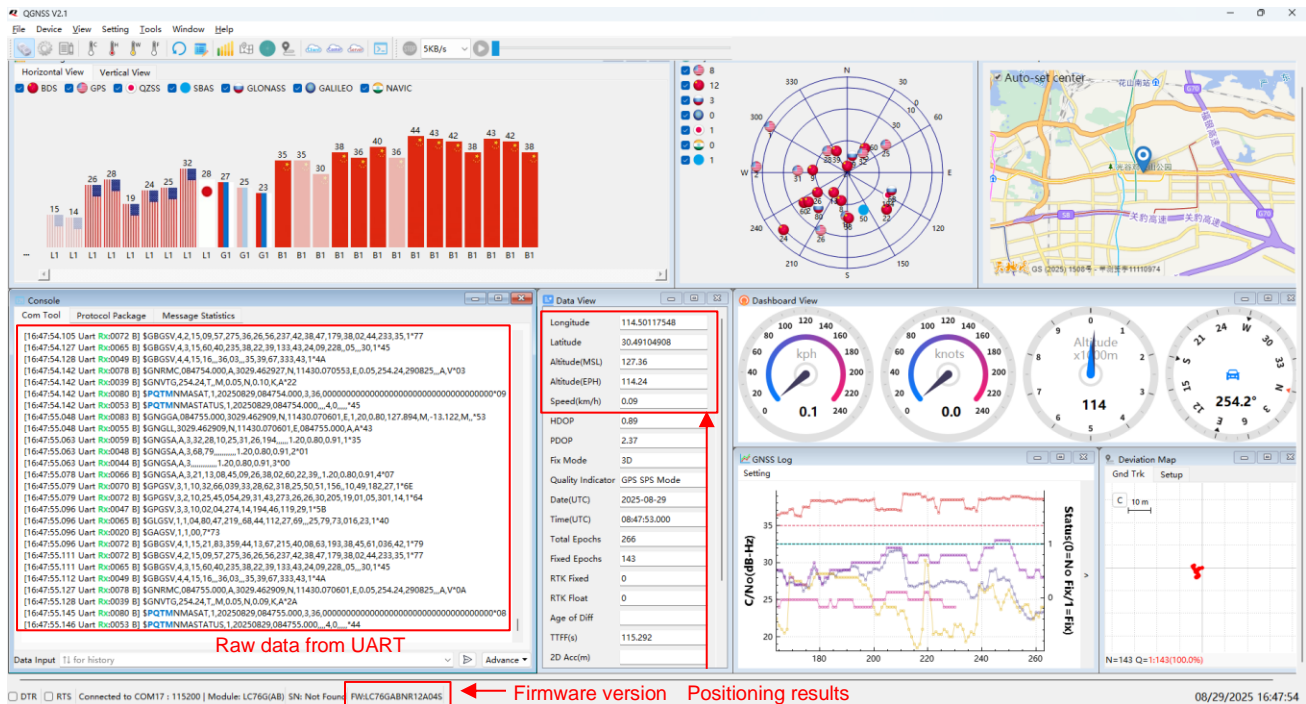



Figure 7: QGNSS Tool Displaying GNSS Module Data

Step 4: QGNSS tool supports saving log files in the <QGNSS version>\logFile\ directory (e.g., QGNSS_V2.1\logFile\) by default. To check raw data from UART while the QGNSS tool is running, you can click  in the QGNSS tool to open the folder.

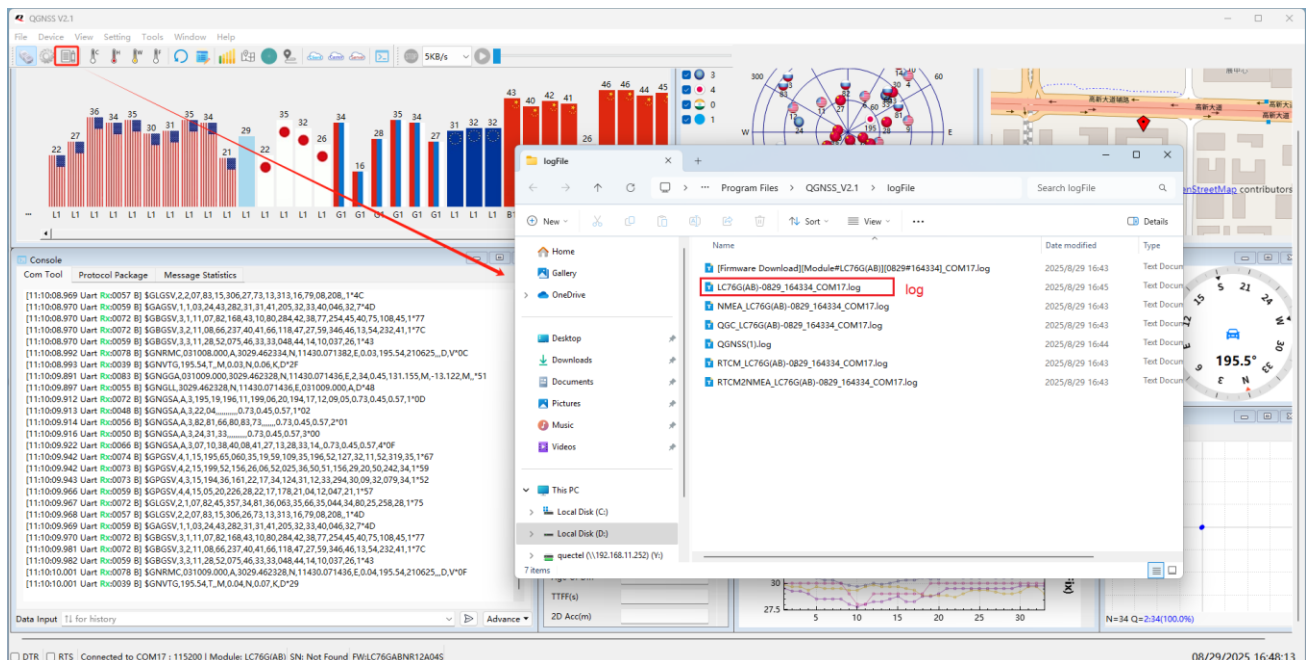


Figure 8: Access Log Data in QGNSS Tool

NOTE

During testing and verification, place the GNSS antenna in an outdoor area with an unobstructed view of the sky.

4 EVB Block Diagram

Block diagram of GNSS-MODULE EVB includes:

- USB-to-UART bridge chip (FT4232HAQ),
- GNSS module interfaces, and
- Peripheral interfaces.

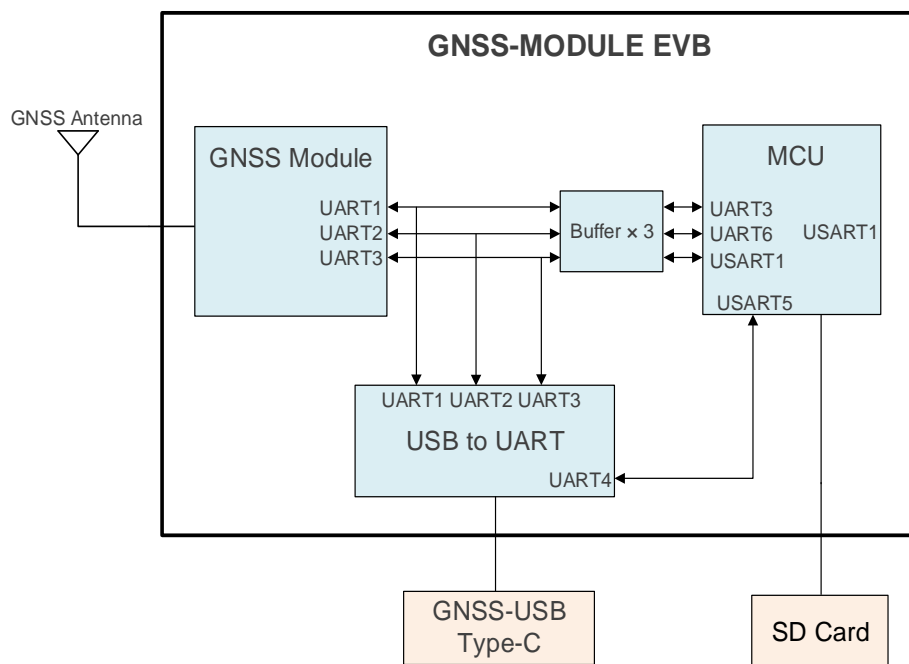
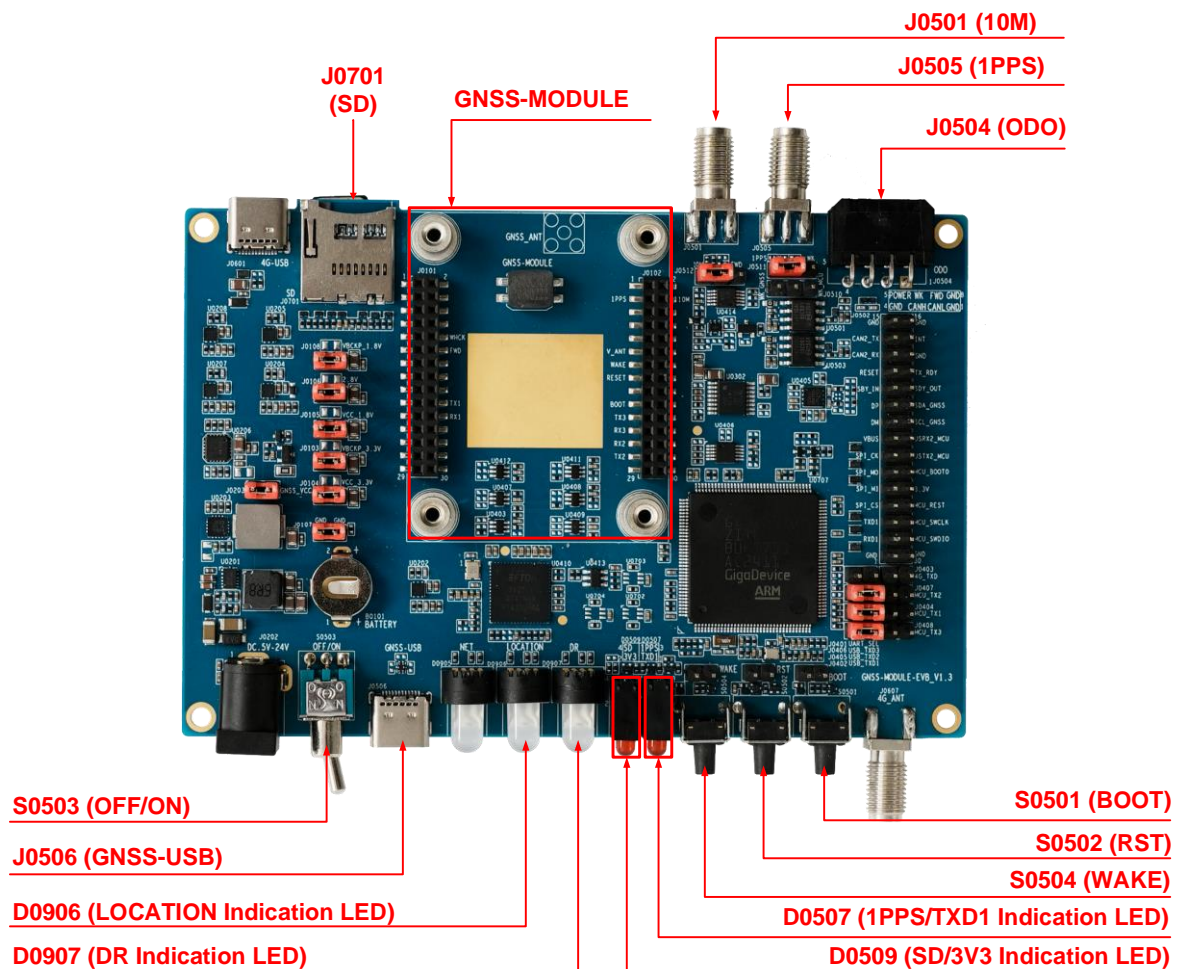


Figure 9: EVB Block Diagram

5 EVB Interfaces

5.1. EVB Top and Bottom Views

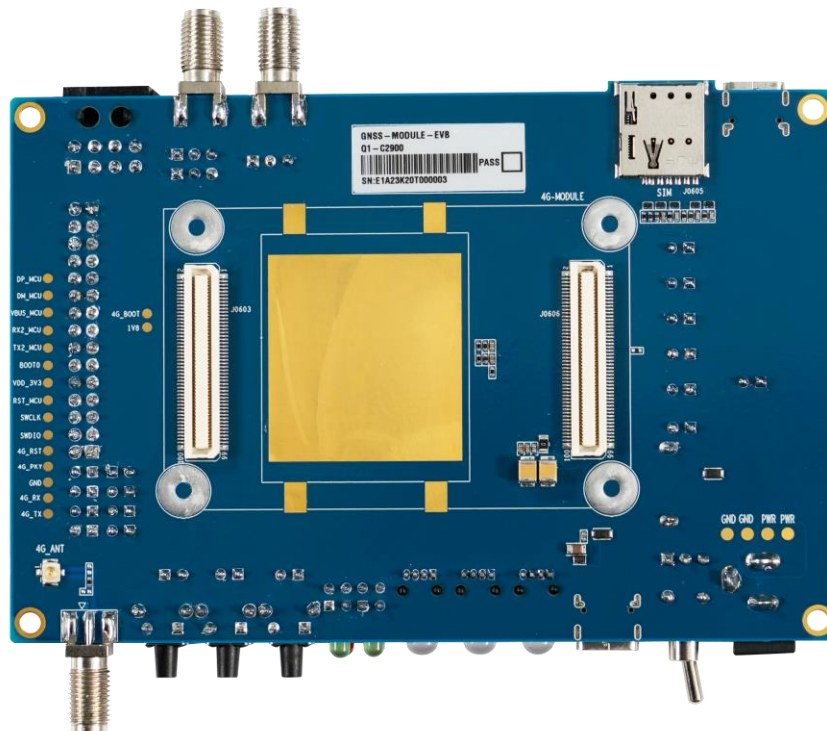
EVB top view is shown in the figure below.



Note:

Peripheral interfaces or indicators not marked in red are not applicable to GNSS-SAA-KIT.

Figure 10: EVB Top View



Note:
Peripheral interfaces or indicators not marked in red are not applicable to GNSS-SAA-KIT.

Figure 11: EVB Bottom View

5.2. EVB Interfaces

The EVB interfaces are detailed in the table below.

Table 3: EVB Interface Descriptions

Function	Interfaces	Description	Remark
Power Supply	J0506	● EVB power supply: 4.5–5.5 V, typ. 5.0 V	
	GNSS-USB	● Current capability: > 500 mA	
Communication Interface	J0506 GNSS-USB	Supports data transmission and firmware upgrade for GNSS module.	
SMA Connector	J0505 1PPS	Used for outputting 1PPS signal.	
	J0501	Used for outputting 10 MHz signal.	

Function	Interfaces	Description	Remark
Signal Indication	10M		
	D0906 LOCATION Indication LED	Red: Successful GNSS positioning.	
	D0907 DR Indication LED	<ul style="list-style-type: none"> ● Red: Not calibrated. ● Green: Calibration in progress. ● Blue: Calibrated. 	
	D0509 Indication LED	SD	Red: <ul style="list-style-type: none"> ● Flashing: SD card is storing data. ● Extinct: SD card is not storing data.
		3V3	Green: <ul style="list-style-type: none"> ● Bright: VCC power supply for module is powered. ● Extinct: VCC power supply for module is not powered.
	D0507 Indication LED	1PPS	Red: <ul style="list-style-type: none"> ● Flashing: 1PPS signal output. ● Extinct: 1PPS is unavailable.
		TXD1	Green: <ul style="list-style-type: none"> ● Flashing: Data output from UART1 TXD. ● Bright/Extinct: No data output from UART1 TXD.
	S0503 OFF/ON	Powers the EVB on/off. When the switch is turned to the right ("ON"), the EVB is turned on.	
Switch and Buttons	S0504 WAKE	Short press to wake up the GNSS module.	
	S0502 RST	Short press to reset the GNSS module.	
	S0501 BOOT	Press and hold before EVB is powered on to set the module to Boot download mode.	
Other	J0504 ODO	Used to input WHEELTICK and FWD signals, and inject vehicle speed information into GNSS module via CAN interface.	See Chapter 5.2.1 J0504 (ODO Interface) Description for details.
	J0701 SD Card Slot	SD socket for inserting an SD card used to store GNSS log data.	

5.2.1. J0504 (ODO Interface) Description

J0504 pin assignment is shown below.

POWER (5)	WK (6)	FWD (7)	GND (8)
GND (4)	CANH (3)	CANL (2)	GND (1)

J0504 interface pin description is provided below:

Table 4: J0504 Pin Description

Pin Name	I/O	Description
POWER	PI	Supply power for GNSS module
WK	DI	WHEELTICK: Odometer/Wheel-tick pulse input
FWD	DI	Forward/Backward status signal input
GND	-	Ground
GND	-	Ground
CANL	DIO	CAN transceiver low line
CANH	DIO	CAN transceiver high line
GND	-	Ground

6 EVB and Antenna Installation

6.1. GNSS Antenna Installation

GNSS antenna installation requirements:

- The installation environment affects antenna reception quality and satellite visibility, which in turn affect the positioning performance of a GNSS receiver.
- Antenna's position and direction can also impact its reception quality. Therefore, it is important to avoid obstacles and interference when installing the antenna.
For automotive applications, it is recommended to fix the antenna firmly on the roof of the car, as shown in the figure below. Place the ceramic patch antenna horizontally and make sure it radiates toward the sky.
- Ensure that the antenna cable is undamaged, as any damage to the cable may affect reception quality and test results.
- If dynamic testing is required, make sure that the antenna is firmly fixed to the device under test. No relative movement or vibration between the antenna and device is allowed.

For more information about GNSS antenna installation, see [document \[3\] GNSS antenna application note](#).

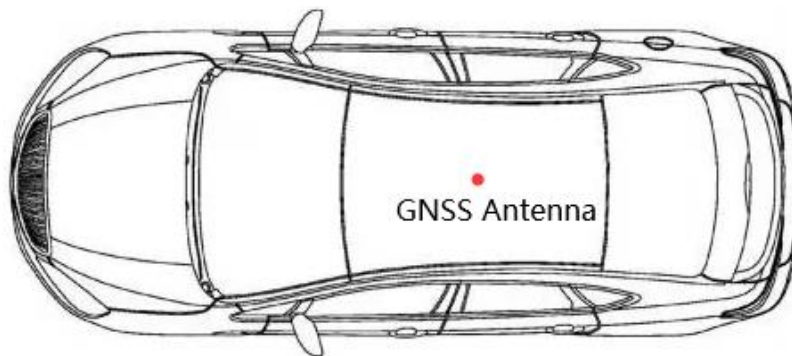


Figure 12: GNSS Antenna Installation

6.2. EVB Installation

If dynamic testing and DR performance testing are required, make sure the EVB is firmly fixed to the device under test to prevent any movement or vibration.

Keep the EVB at a sufficient distance from the GNSS antenna to prevent MCU crystal oscillator harmonics from interfering with antenna performance.

7 Common Issues and Troubleshooting

1. **COM port is not detected in the Device Manager when EVB is connected to your PC via a USB cable.**
 - Verify if the EVB communication interface is properly connected to the PC.
 - Verify if the USB-to-serial driver for FT4232HAQ has been installed successfully.
2. **Communication interface is not outputting any messages or commands.**
 - Verify if the power supply indication LED on the EVB is illuminated.
 - Verify if the (red) jumper caps are connected correctly, as shown in [Figure 2: GNSS Module TE-A and Kit Components Mounted on EVB](#).
 - Check the module power supply status via the D0509 power indicator. If the green LED is extinct, the module has not been powered up correctly.
3. **Module is unable to search for satellite signals.**
 - If there is no transponder indoors, test the module in an open-sky environment.
4. **Module is unable to enter download mode or upgrade mode.**
 - Check if the downloaded firmware is correct.
 - Check if the S0501 (BOOT) or S0502 (RST) button has been successfully pressed.
 - Verify if the correct COM port is selected.
5. **GNSS data is still output when the jumper cap on J0104 (VCC_3.3V) is removed.**
 - Check whether J0103 (VBCKP_3.3V) and J0104 (VCC_3.3V) are shorted through a jumper cap on GNSS TE-A.

NOTE

For the issues that cannot be solved, you can contact Quectel Technical Support (support@quectel.com).

8 Cautions

1. Make sure to conduct tests in the same environment when comparing different parameters of GNSS modules.
2. Ensure that the measurement method is correct. If there are significant differences between parameters tested via EVB and those provided by Quectel, contact Quectel Technical Support.
3. Note that momentary data obtained from measurement cannot always be regarded as reference data, because it may be affected by various factors, such as satellite positions at different times, environmental conditions, temperature, humidity and altitude.

9 Appendix References

Table 5: Related Documents

Document Name
[1] Quectel List of EVB Applicable Modules
[2] Quectel QGNSS User Guide
[3] Quectel GNSS Antenna Application Note

Table 6: Terms and Abbreviations

Abbreviation	Description
1PPS	One Pulse Per Second
COM Port	Communication Port
DI	Digital Input
DO	Digital Output
DR	Dead Reckoning
ESD	Electrostatic Discharge
EVb	Evaluation Board
GNSS	Global Navigation Satellite System
I/O	Input/Output
LED	Light Emitting Diode
MCU	Microcontroller Unit
ODO	Odometer
PC	Personal Computer

Abbreviation	Description
PI	Power Input
PO	Power Output
RF	Radio Frequency
RXD	Receive Data (Pin)
SD Card	Secure Digital Card
SMA	SubMiniature Version A
TXD	Transmit Data (Pin)
UART	Universal Asynchronous Receiver/Transmitter
USART	Universal Synchronous/Asynchronous Receiver/Transmitter
USB	Universal Serial Bus