LC79D (A) EVB User Guide

GNSS Module Series

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About the Document

History

Revision	Date	Author	Description
1.0	2019-11-14	Brooke WANG	Initial

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1 Introduction

This document specifies the usage of LC79D (A) EVB which is an assistant tool for engineers to develop and test Quectel LC79D (A) module.

1.1. 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 LC79D (A) module. Manufacturers of the terminal should notify users and operating personnel of the following safety information by incorporating these guidelines into all manuals supplied with the product. If not so, Quectel assumes no liability for customers' failure to comply with these precautions.

	Ensure that the use of the product meets the national safety and environmental regulations, and is allowed in the country and in the environment required.
	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 hazards.
	The product has to be powered by a stabilized voltage source, and the wiring shall conform to security and fire prevention regulations.
	Proper ESD handling procedures must be applied throughout the mounting, handling and operation of any application that incorporates the module to avoid ESD damages.

2 General Overview

2.1. Top View of the EVB

The following figure illustrates the top view of LC79D (A) EVB.

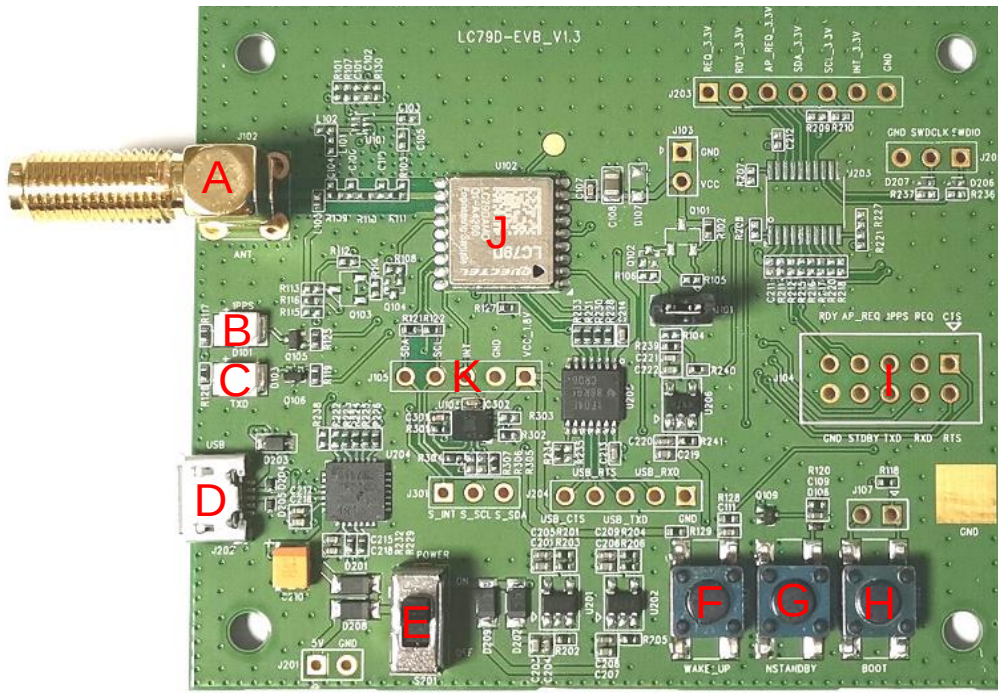

Figure 1: Top View of LC79D (A) EVB

Table 1: Interfaces of LC79D (A) EVB

SN.	Reference No.	Description
A	J102	Antenna connector
B	D101	1PPS Indication LED
C	D103	Transmit Data Indication LED

D	J202	Micro USB connector
E	S201	Power Switch
F	S103	WAKE_UP Button
G	S101	NSTANDBY Button
H	S102	BOOT Button
I	J104	Test Points
J	U102	LC79D (A) Module
K	J105	Test Points

2.2. EVB Kit Accessories

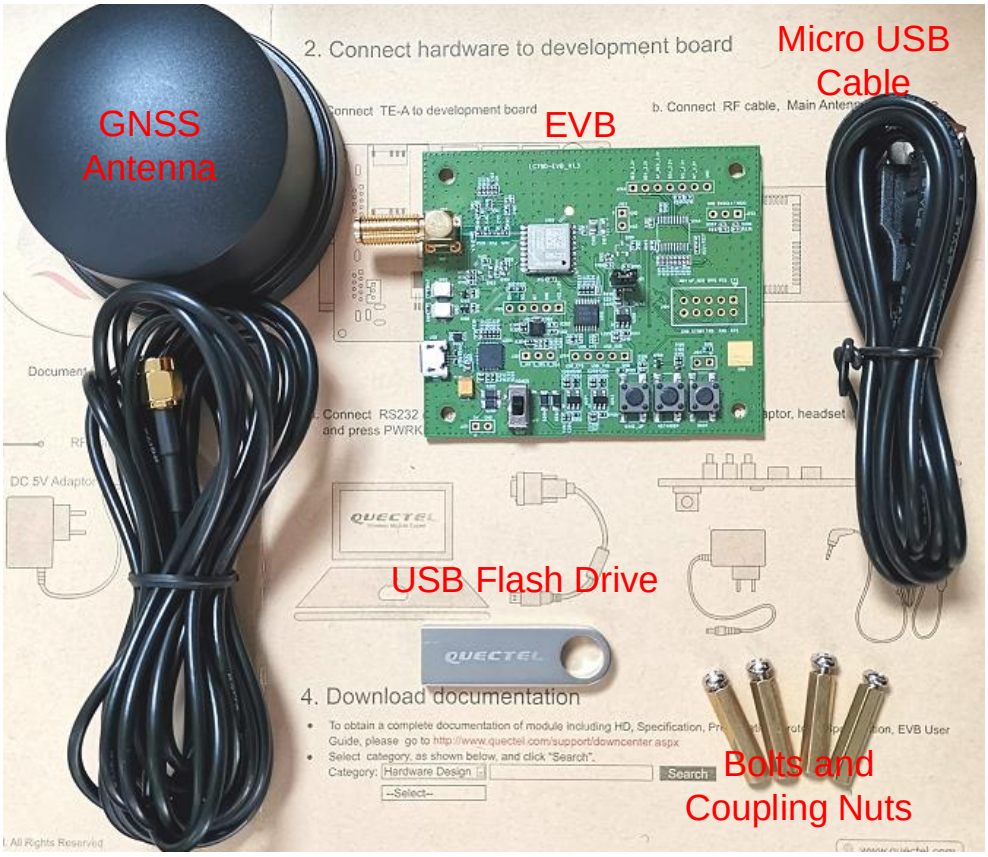

Figure 2: EVB Kit Accessories

Table 2: List of Accessories

Items	Description	Quantity
USB Cable	Micro USB Cable	1
EVB	LC79D (A) evaluation board	1
Antenna	GNSS antenna (Active)	1
USB Flash Drive	USB Flash Drive (including LC79D related documents, tools, drivers, etc.)	1
Instruction Sheet	A sheet of paper giving instructions for EVB connection, details of EVB accessories, etc.	1
Other	Bolts and coupling nuts	4 for each

2.3. EVB and Accessories Assembly

The following figure shows the assembly of LC79D (A) EVB and its accessories.

Figure 3: LC79D (A) EVB and Accessories Assembly

3 Interface Applications

3.1. Micro USB Interface

The EVB is mounted with a micro USB connector to support power supply input and data transmission.

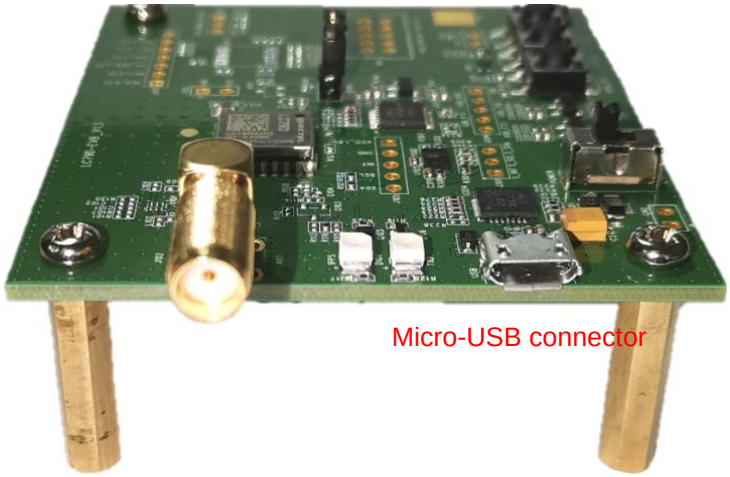

Figure 4: Micro USB Connector

NOTE

Before using the EVB, please run the USB flash drive on PC to install the USB driver.

3.2. Antenna Interface

The EVB is mounted with an antenna connector for connection of an external passive or active GNSS antenna.

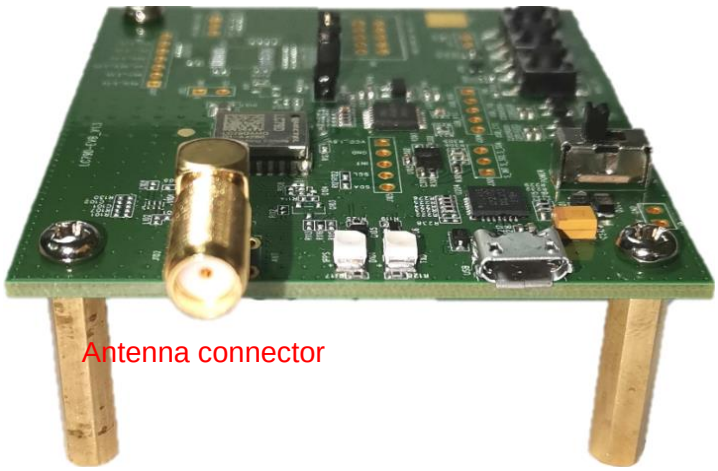

Figure 5: Antenna Connector

3.3. Switches and Buttons

The following figure illustrates the switches and buttons of the EVB.

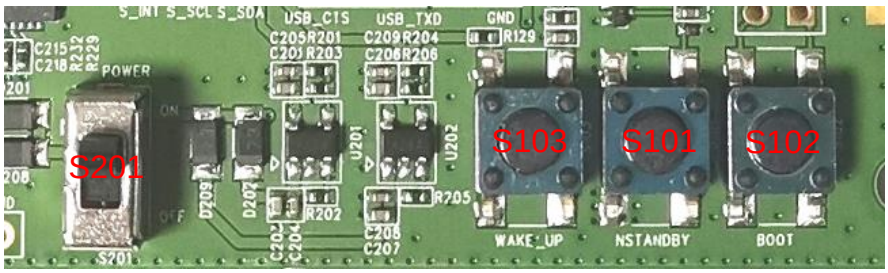

Figure 6: Switches and Buttons

Table 3: Switches and Buttons

Part No.	Name	I/O	Description
S101	NSTANDBY	DI	1. Long press (press and hold) the NSTANDBY button to enter standby mode, and release the button to exit from standby mode. 2. Short press (press and then release) the NSTANDBY button to reset the module.
S102	BOOT	DI	Press and hold the BOOT button during EVB power-on to make the module enter host mode.
S103	WAKE_UP	DI	On the EVB, the module will enter sleep mode after sending

			$PQSETSLEEP,1 command. Long press WAKE_UP button to exit from sleep mode, and then send **$PQSTARTGNSS** to start the GNSS engine.
S201	POWER	PI	EVB power on/off switch

3.4. Operation Status Indication LEDs

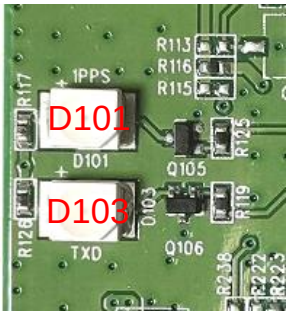

Figure 7: Operation Status Indication LEDs

Table 4: Operation Status Indication LEDs

Part No.	Name	I/O	Description
D101	1PPS	DO	Flash: successful fix. The frequency is 1Hz. Extinct: no fix.
D103	TXD	DO	Flash: the module is turned on successfully, and the micro USB port can output NMEA messages. Extinct: failed to turn on the module.

3.5. Test Points

The following figure illustrates the test points of the EVB.

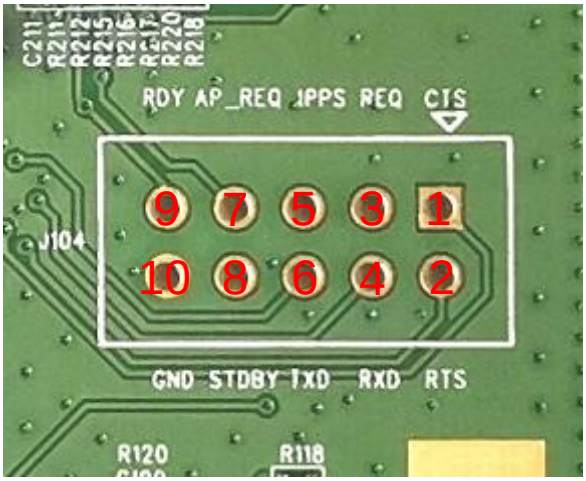

Figure 8: J104 test points

Table 5: Pin Description of J104

Pin No.	Signal	I/O	Description
1	CTS	DI	Clear to send
2	RTS	DO	Request to send
3	REQ	DO	Data availability indication, used to indicate whether there is data available for reading
4	RXD	DI	Receive data
5	1PPS	DO	One pulse per second
6	TXD	DO	Transmit data
7	AP_REQ	DI	AP request to send
8	STDBY	DI	Standby mode control
9	RDY	DO	Reserved
10	GND	-	Ground

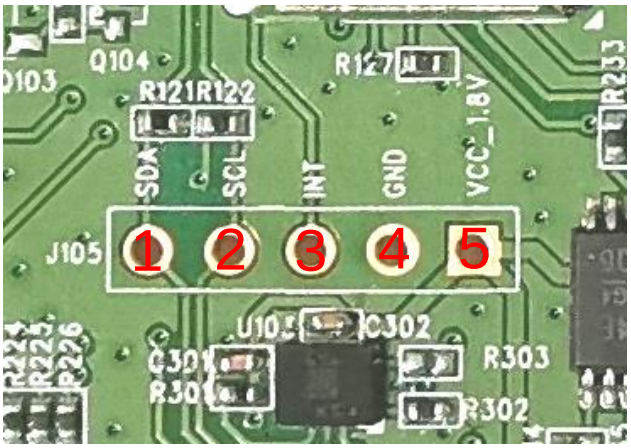

Figure 9: J105 Test Points

Table 6: Pin Description of J105

Pin No.	Signal	I/O	Description
1	SDA	OD	I2C serial clock
2	SCL	OD	I2C serial data
3	INT	DI	Interrupt
4	GND	-	Ground
5	VCC_1.8V	PO	1.8V output power supply

4 EVB Operation Procedures

This chapter mainly illustrates the operation procedures of LC79D (A) EVB.

4.1. Firmware Download

The module supports firmware download in both normal working mode and host mode.

4.1.1. Firmware Download in Normal Working Mode

Step 1: Connect the EVB to a PC with a micro USB cable.

Step 2: Turn on the POWER switch (S201) to power on the EVB.

Step 3: Run the GNSSFlashTool and then configure the tool as shown below.

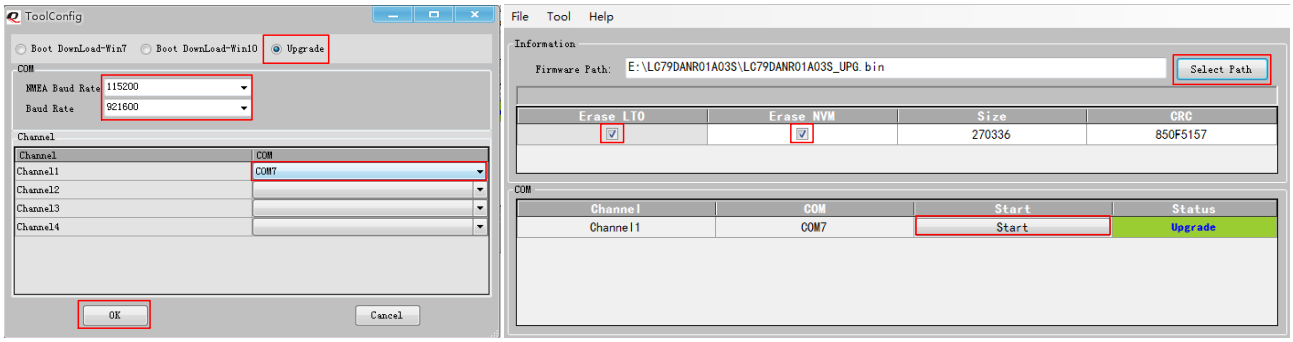

Figure 10: GNSSFlashTool Configurations for Firmware Upgrade

NOTE

Please make sure the module is in full on mode before downloading firmware in normal working mode.

4.1.2. Firmware Download in Host Mode

Step 1: Connect the EVB to a PC with a micro USB cable.

Step 2: Press and hold the BOOT button during EVB power-on to make the module enter host mode. After the module enters host mode successfully, release the BOOT button.

Step 3: Run the GNSSFlashTool and then configure the tool as shown below.

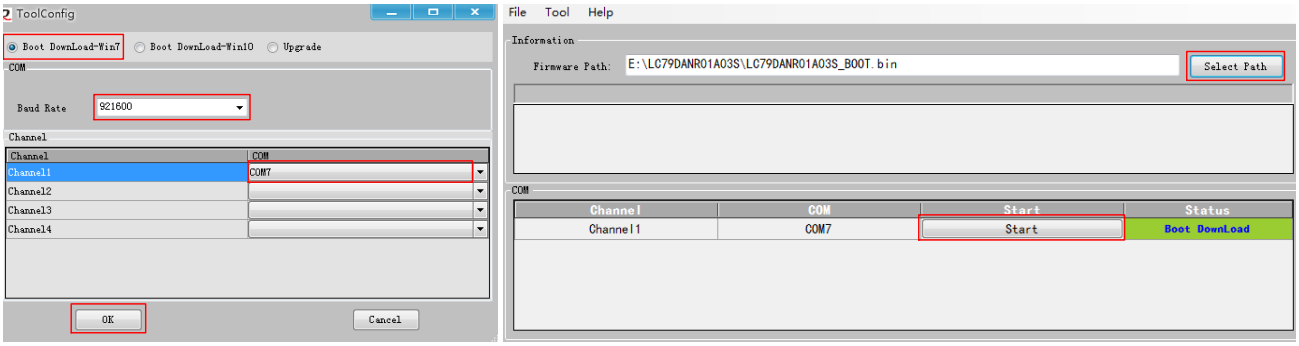

Figure 11: GNSSFlashTool Configurations for Host Mode Download

4.2. Communication via Micro USB Interface

Step 1: Connect the EVB to a PC with a micro USB cable through the micro USB interface, and then turn on the POWER switch (S201) to power on the EVB.

Step 2: Run the USB flash drive on PC to install the USB driver. The USB port numbers can be viewed through the PC Device Manager, as shown below.

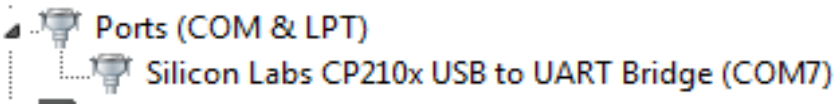

Figure 12: USB Ports

Step 3: Install and then use the QCOM tool provided by Quectel to realize the communication between the module and the PC.

The following figure shows the COM Port Setting interface of QCOM: select the correct "**COM Port**" (USB port number shown in the above figure) and set the correct "**Baudrate**" (the default value: 115200bps). For more details of the usage of QCOM, please refer to ***document [4]***.

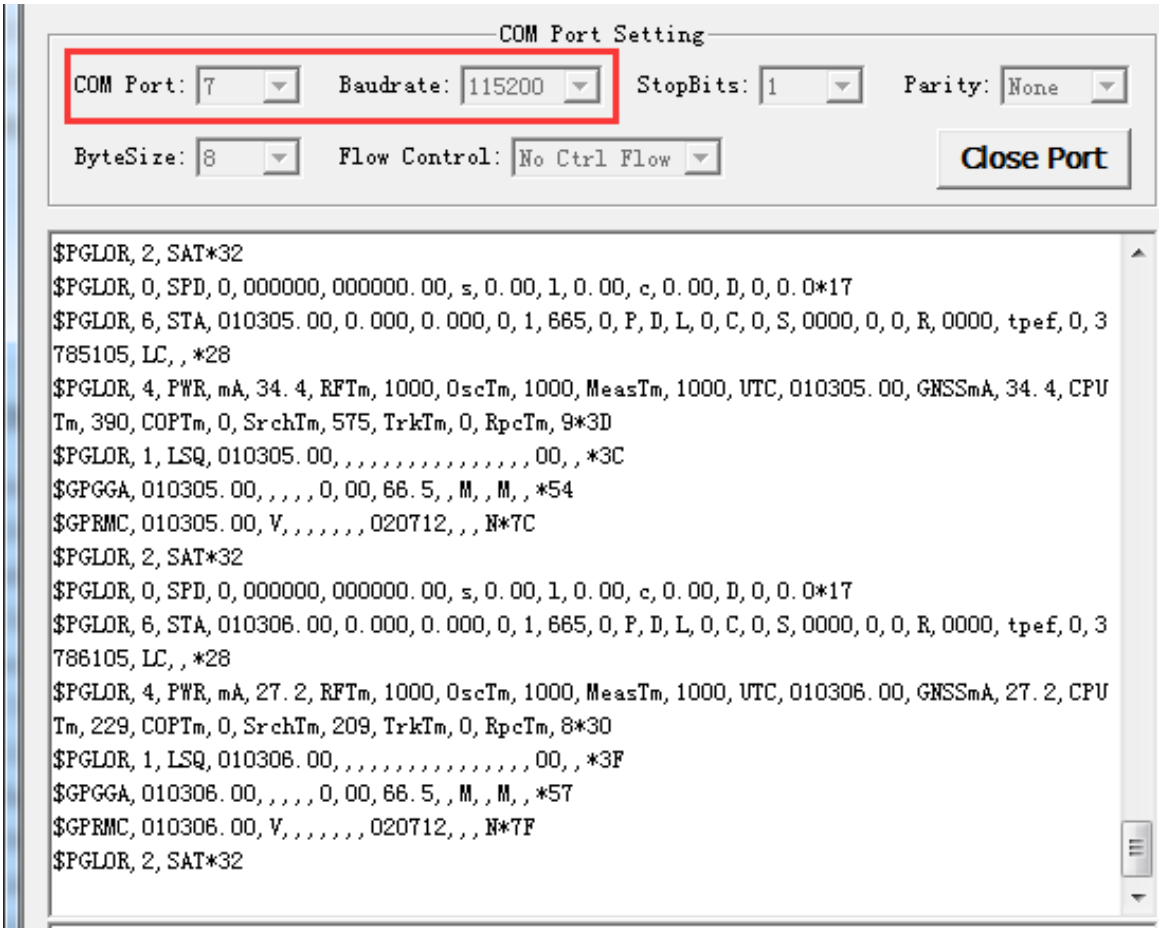

Figure 13: COM Port Setting Interface of QCOM

5 Usage of QGNSS

QGNSS tool is used to check the status of GPS, GLONASS, BeiDou, Galileo and IRNSS receivers. This chapter mainly introduces how to use the tool while operating the EVB. For more details of the usage of QGNSS, please refer to ***document [5]***.

5.1. COM and Baud Rate Setting

After successful EVB connection, turn on the module and start up the QGNSS.

Click "**Connect UART**", select correct COM port and baud rate (115200bps by default), and then click "**OK**".

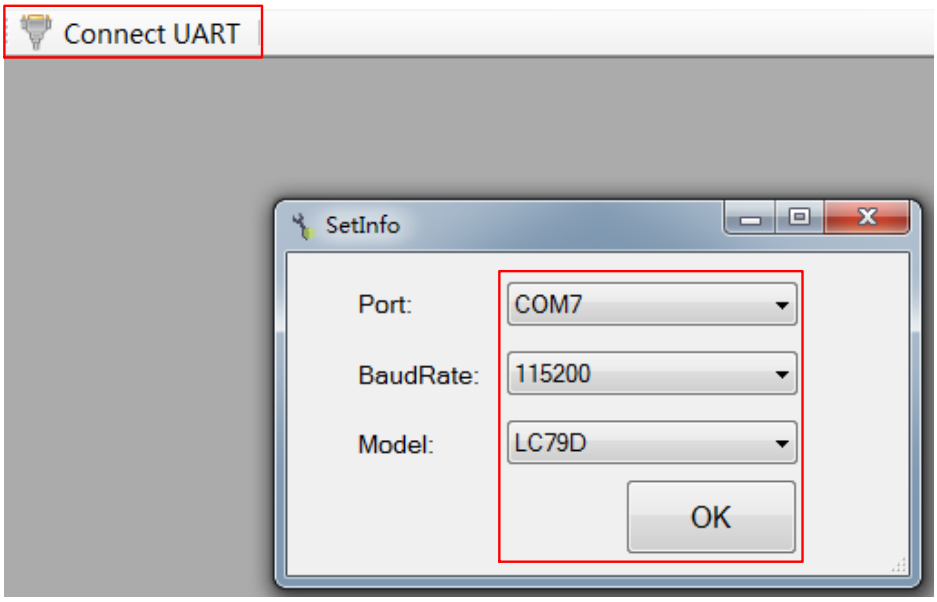

Figure 14: COM Port and Baud Rate Selection

After the tool is opened, the following interface in default layout will be shown:

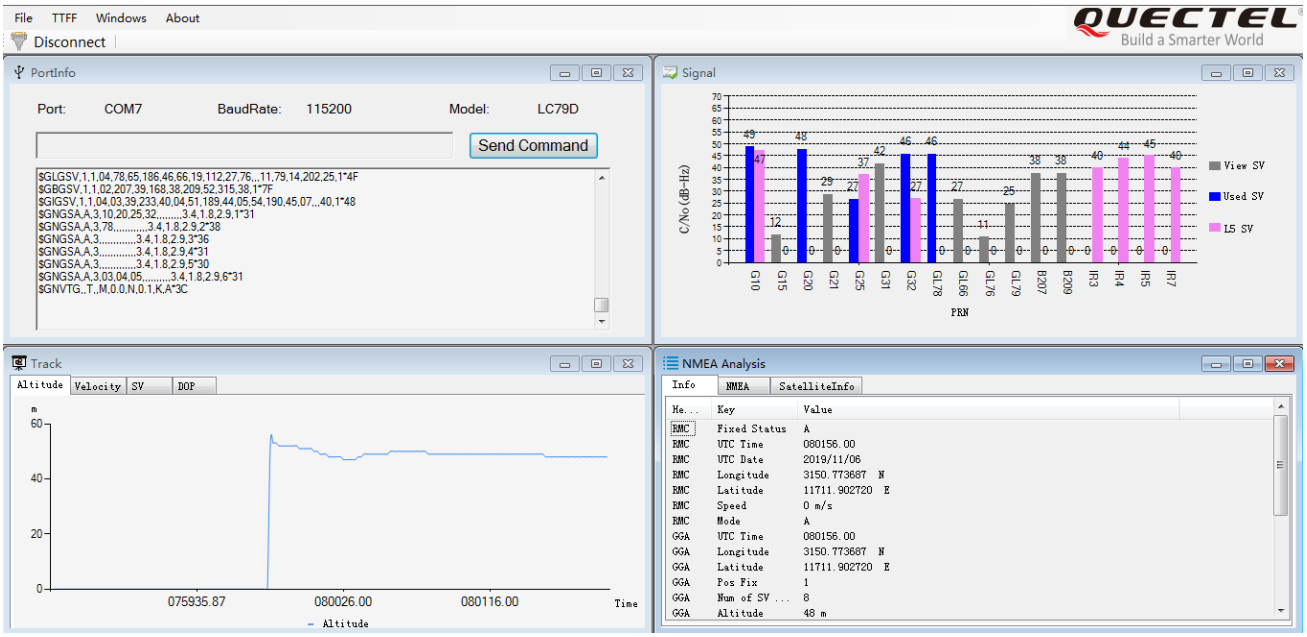

Figure 15: QGNSS Interface

Through the QGNSS interface, users will be able to check GNSS receiver information such as CNR message, time, position, satellite information, precision and so on.

5.2. PQ Command Sending

PQ commands can be sent through QGNSS. For more details about PQ commands, please refer to ***document [2]***.

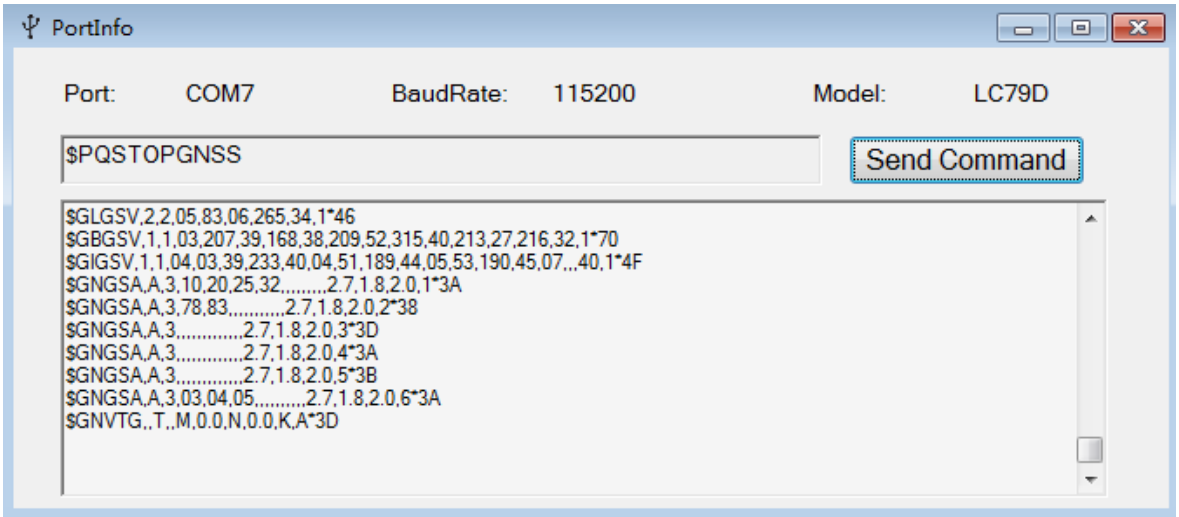

Figure 16: PQ Command Sending via QGNSS

5.3. Automatic TTFF Testing

TTFF under cold, warm and hot start conditions can be tested through QGNSS, and the number of tests can be selected from 10, 20, 50, 100 and 1000 to meet individual demands.

After selecting the "**ReStart Type**" and "**Times**", click the "**Start**" button to start the test and it can be stopped by clicking the "**Stop**" button.

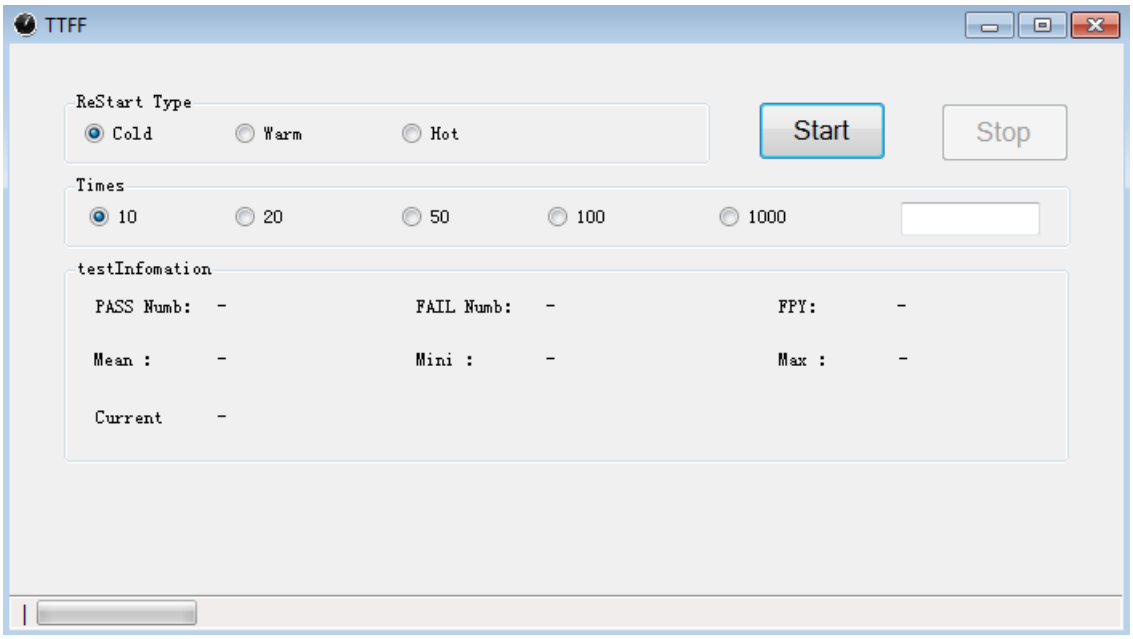

Figure 17: Static TTFF Testing via QGNSS

6 Appendix A References

Table 7: Related Documents

SN	Document name	Remark
[1]	Quectel_LC79D_Hardware_Design	LC79D Hardware Design
[2]	Quectel_LC79D_GNSS_Protocol_Specification	LC79D GNSS Protocol Specification
[3]	Quectel_LC79D_Reference Design	LC79D Reference Design
[4]	Quectel_QCOM_User_Guide	QCOM User Guide
[5]	Quectel_QGNSS_User_Guide	QGNSS User Guide

Table 8: Terms and Abbreviations

Abbreviation	Description
CNR	Carrier-to-Noise Ratio
DI	Digital Input
DO	Digital Output
EVB	Evaluation Board
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
LED	Light Emitting Diode
LNA	Low Noise Amplifier
OD	Open Drain
PI	Power Input
PO	Power Output

PPS	Pulse Per Second
PRN	Pseudorandom Noise
SV	Satellite Vehicle
TTFF	Time To First Fix
UTC	Universal Time Coordinated