

# **L26-T EVB User Guide**

### **GNSS Module Series**

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# **About the document**

# History

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# **1** Introduction

This user guide describes detailed information about the usage of Quectel L26-T EVB (Evaluation Board), the auxiliary for engineers to develop and test Quectel L26-T 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 L26-T 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 any failure to comply with these precautions.

	Be assure the use of the product conforms to the national safety and environmental regulations, and is allowed in the country and in the environment required.
Since a	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 L26-T EVB

The following figure illustrates the top view of L26-T EVB.



Figure 1: Top View of L26-T EVB

#### Table 1: Interfaces of L26-T EVB

SN.	Designator	Description
А	D102	Indication LEDs



В	J303	Micro-USB connector
С	S201	Power switch
D	S102	Boot button
E	S101	Reset button
F	J103	Antenna connector
G	U102	L26-T module
Н	J104	Test points

### 2.2. L26-T EVB & Kit Accessories



Figure 2: L26-T EVB & Kit Accessories



#### Table 2: List of Accessories

Items	Description	Quantity
USB Cable	USB cable	1
EVB	Evaluation board	1
Antenna	GNSS antenna (active)	1
USB Flash Drive	USB flash drive (including L26-T related documents, tools, drivers, etc.)	1
Instruction Sheet	A sheet of paper giving instructions for EVB connection, details of EVB accessories, etc.	1
Others	Bolts and coupling nuts	4 pairs

# 2.3. EVB and Accessories Assembly

The following figure shows the assembly of L26-T EVB and its accessories.



Figure 3: L26-T EVB and Accessories Assembly



# **3** Interface Applications

## 3.1. Micro-USB Interface

Micro-USB connector is used for EVB power supply as well as data transmission.



Figure 4: Micro-USB Connector

## 3.2. Antenna Interface

The antenna connector is used to connect 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	RESET	DI	The module will be reset through pressing and then releasing the button.
S102	BOOT	DI	Please refer to Chapter 4.2.2 for details.
S201	POWER	PI	Power switch



# 3.4. Operation Status Indication LEDs



Figure 7: Operation Status Indication LEDs

#### Table 4: Operation Status Indication LEDs

Part	Name	I/O	Description
L1	1PPS	DO	Flash: 1PPS signal indicator. The frequency is 1Hz (configurable).
L2	PWR	DO	Power indicator

### 3.5. Test Points

The following figure illustrates the test points of the EVB.



Figure 8: Test Points - J104



#### Table 5: Pin Description

Pin No.	Signal	I/O	Description
1	WI	/	/
2	UART_RX	DI	Receive data
3	TIMEPULSE	DO	One pulse per second
4	UART_TX	DO	Transmit data
5	PIN5	PI	Reserved
6	ANT1	AI	Antenna detection 1
7	BOOT	DI	Force the module to enter boot download
8	ANT2	AI	Antenna detection 2
9	3.3V	PO	3.3V output
10	GND	/	Ground



# **4** EVB Operation Procedures

This chapter mainly illustrates the operation procedures of L26-T EVB.

#### 4.1. Communication via Micro-USB Interface

- **Step 1:** Connect the EVB and the PC with a Micro-USB cable through Micro-USB interface, and then switch POWER to ON state 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 in Device Manager of the PC after the USB driver is installed, as shown below.

Ports (COM & LPT)



**Step 3:** Install and then use the tool QCOM provided by Quectel to realize the communication between L26-T module and the PC.

The following figure shows the COM Port Setting of QCOM: select the correct "**COM Port**" (USB Port shown in the above figure) and set the correct "**Baudrate**" (the default value: 9600bps). For more details about the usage of QCOM, please refer to *document [4]*.

COM Port Setting					
COM Port: 7 - Baudrate: 9600 - StopBits: 1 - Parity: None -	-				
ByteSize: 8 - Flow Control: No Ctrl Flow - Close Port					
\$GPVTG, , T, , M, , N, , K, N*2C	*				
\$GNGSA, A, 1, , , , , , , , , , , , 99. 0, 99. 0, 99. 0*1E					
\$GNGSA, A, 1, , , , , , , , , , , , 99. 0, 99. 0, 99. 0*1E					
\$GNGSA, A, 1, , , , , , , , , , , , 99. 0, 99. 0, 99. 0*1E					
\$GPGLL, 0000. 00000, N, 00000. 00000, E, 000259. 000, V, N*4F					
\$PSTMANTENNASTATUS, 1, 0, 0, 0*50					
\$GPRMC, 000300.000, V, 0000.00000, N, 00000.00000, E, , , 030917, , , N*79					
\$GPGGA, 000300.000, 0000.00000, N, 00000.00000, E, 0, 00, 99.0, 100.00, M, 0.0, M, .*6F					

#### Figure 10: COM Port Setting of QCOM



### 4.2. Firmware Download

L26-T module supports the firmware download in both normal working mode and boot download mode, respectively using the tools STA808x/9x Firmware Upgrade and TeseoIII XLoader.

#### 4.2.1. Firmware Download in Normal Working Mode

Firmware upgrade in normal working mode should be performed as the following steps:

**Step 1:** Connect the EVB to a PC through the USB cable.

**Step 2:** Switch POWER to ON state to power on the EVB.

**Step 3:** Run the tool STA808x/9x Firmware Upgrade and configure the tool as shown below.

🞲 STA808x/9x Firmware Upgrade 3.3	
Port settings VART mode USB mode Output port COM7	NMEA baud rate 9600 - Baud rate 460800 -
Firmware options Program only Erase NVM 1024 KB Dump Recovery DTR RTS	Size: 781.132 CRC: 74E4494B
E:\L26TNR01A03V03\L26TNR01A03V03_UPC	G26. bin
Start Site	About
Idle	



Step 4: Click Start button and then reset the module to upgrade the firmware.

NOTE	
Please mal	ke sure the module is in full on mode before downloading firmware by this method.

#### 4.2.2. Firmware Download in Boot Download Mode

Firmware download in boot download mode should be performed as the following steps:

- **Step 1:** Connect the EVB to a PC through the USB cable.
- **Step 2:** Press and hold the BOOT button, and switch POWER to ON state to power on the EVB. Once the high voltage level of BOOT pin has been detected during power-up, the module will enter into boot download mode.
- **Step 3:** Release BOOT button to make BOOT pin of L26-T return to normal floating.
- **Step 4:** Run the tool TeseoIII XLoader and configure the tool as shown below.

	binary image settings		
O SRAM	Destination address 0000000	Size	846.684
◎ SQI flash	Entry point off 00000000	CRC32	1DA48481
🔘 NOR flash	Load E: \126TNR01A03V03\126TNR01A03V0	03_BOOT26. bin	
Loading settings	Options		
Output COM7	Erase NVM 1024 KE	STA809	OFG only
Baud rate 460800	Erase only Program or	nly 📃 Use 4K	B sector si
Debug options 🔲 Enable			
🔘 Dump 💿 Set	Address 10000000 Size 52	4288 Data	00000000
Security options			
🔲 RSA authenticatio	r Generate RSA		
Private key			Load
Public signed key			Load

Figure 12: TeseoIII XLoader Tool Configurations for Firmware Upgrade

**Step 5:** Click Send button to upgrade the firmware.



# **5** Usage of Teseo-Suite Pro

After the EVB accessories are assembled, please turn on the module and start the tool Teseo-Suite Pro. The tool helps users to view the status of GNSS receiver. The following chapter only briefly describes the use of Teseo-Suite Pro, for more details about the tool, please click "**Help**" and select "**User Manual**" in the tool.

## 5.1. View the GNSS Receiver Status

#### 5.1.1. COM Port and Baud Rate Setting

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



Figure 13: Teseo-Suite Pro Tool Interface



UART port can be automatically identified by Teseo-Suite Pro when it is opened. If not, the steps from "a" to "d" illustrated in the following figure should be performed.

Please click the corresponding buttons. After **Add Device** button is clicked, the "Rover Configuration" box will be popped up, then please check the "**Add Control Port**" box.

🚽 Teseo-Suite Pro	Rover configuration	
<u>File View Map Iools DR Windows Help</u>	Configuration	
<mark> @</mark> Q   🗠   ¶ @ 1 🔛 @ 1 🖉   🖉   🖉   🖉   🖉	Binary Image Vers. 4 2 5 1 1 2	
Configuration Session	Hardware type: TESE03_STA8090 -	
Configuration Session Action	GNSS Device Name	
Auto	STA8090_v4.5.1_01	
	Add Control Fort Add Debug Fort	
Connect Connect Record Record	Control Port Debug Port Assi ( )	
GPS Device name Ctrl Dbg Ctrl Dbg Connect Protocol Contro port port data data	I Protocol (c) PTCH 3.5	
	WIEA 3.x	
	XMEA 4.10	
	Debug	
	Port Name CONT	
	Rend Rote Com	
	Jata Bits 8 V	
	Parity None -	
	Stop Bits None -	
J.	Read Timeout 1000	
	DIR control	
	Action	
	Ok Cancel	
Connect Connect Record Record		
GPS Device name Ctrl Dbg Ctrl Dbg ( port port data data	Connect Protocol Control Port Debug Port	Delete device Settings
STA8090 v4.5.1 I		

Figure 14: Manual Configuration the COM Port



#### 5.1.2. Explanations of Views and Windows

The following interface will be shown by clicking **button**. The digit shown above each flag is the CN value. Below are displayed information such as the PRN, the frequency band used by the satellite ("BAND"), the azimuth ("AZI") and the elevation of the satellite ("ELE"). The clear flag indicates that the navigation data of this satellite is in use, while the faded flag indicates not used.



Figure 15: Signal Level

By clicking 🚱 button, "Sky View" will be opened, which shows the current azimuth and elevation of satellites used for the fix.



Figure 16: Sky View



Through clicking **?** button, "View Positioning" form that shows information about GPS positioning of devices will be opened.

🛃 Teseo-Suite	Pro							×
File View	Map Tools 🔏 🍷 📊 🄇	DR Windows Help	(					
PVT						STA8090_v4	4.5.1_D1	8
Label Latitude North/South Longitude East/West Altitude Geoid Fix Mode TTFF Filter Mode Nb sats	STA8090_V4.5 31° 50.7749 N 117° 11 E 72.80 m 0 m 3D 11		E	Reference Position Ant Latitude 4055.04798N Ant Longitude 01416.55162 E Height Ant 88.4330700090124 Set Reference Position Save Reference Position	Ш	Latitude Longitude Altitude Fix Mode Sats used PDOP HDOP 2D Acc. 3D Acc.	31.8462 117.198 72.80 a 3D/DGPS 11 1.63 0.72 8716528.23 8716528.23	
GPSQual Speed	DGPS 0 km/h			Coordinates Format MinDec				
Heading	70.61°			🔘 Decimal degrees				
UTC Time	13:40:03							
Day								
Month					Ŧ			

Figure 17: Module Positioning Form

### 5.2. Send PSTM Commands

PSTM Commands can be sent by Teseo-Suite Pro. By clicking **a** button, the command input box will be popped up, which is shown in the figure below.

🛃 Teseo-Suite Pro							- • ×
File View Map Too	ols DR Windows Help						
📝 🔍 🔏 🧐 📍 🕌	🐼 🔊 🕑 🔼 📟 📾 🔛 🛃 🛃 🚦 🕴 🥸 🖄 📚	20				_	
Configuration Session						STA8090_v4	I.5.1_D1 ≅
Configuration Session	lation					Latitude	31.8461 🔶
Session Name	Add Device Melete All					Longitude	117.198
Nmea Decoding - STA80	90 v4 5.1 D1					Altitude	46.30 n
The boot of the bo			Decodin	g		Fix Mode	3D
Message Filter	NMLA Message \$PSTMSFTCONSTMASK1	SEND	\$BDDTM	-	🗸 Follow last frame	Sats used	15 =
SBDGGA =	\$GPGSV 4 4 14 193 35 32 18 0*55		Lahe	1	Value	PDOP	1.37
SBDGLL ADDONG	\$GLGSV, 3, 1, 10, 75, 46, 022, 34, 85, 44, 085, 20, 76, 37	,320,44,6	Local	datum code		HDOP	0.72
SBDGNS SBDGSA	\$GLGSV, 3, 2, 10, 63, 29, 223, 44, 86, 26, 135, 47, 84, 14, \$GLGSV, 3, 3, 10, 72, 03, 188, , 67, 01, 338, , 1*76	,031,22,74	Local	datum co		2D Acc.	8716509.94
SBDGST	<pre>\$GNGLL,3150.7712,N,11711.8993,E,015803.000,A,# \$GPTXT.01.01.02.ANTSTATUS=0K*3B</pre>	A*40	Latit	ude offset		ob Acc.	8110309.94
SBDGSV SBDRMC	\$GNRMC,015804.000,A,3150.7712,N,11711.8993,E,0	0.00,302.:	N/S				
\$BDTXT	\$GPGGA,015804.000,3150.7712,N,11711.8993,E,1,1	15,0.72,4	Longi	tude offset			
SBDVTG	\$GNGSA,A,3,16,26,27,08,03,09,193,14,23,,,,1.37 \$GNGSA,A,3,84,76,65,86,75,66,1,37,0,72,1	7,0.72,1.1	E/V				
SGADTM	\$GPGSV, 4, 1, 13, 16, 67, 327, 40, 26, 53, 030, 29, 27, 51	181,43,2	Altit	ude offset			
SGAGGA	\$GPGSV,4,2,13,31,30,095,18,08,20,200,31,14,17 \$GPGSV,4,3,13,40,14,254,37,193,13,172,35,21,1	3,080,19,0	Refer	ence datu			
SGAGLL SCACNS	\$GPGSV, 4, 4, 13, 22, 05, 223, 28, 0*5B \$GLGSV, 3, 1, 10, 75, 46, 022, 34, 85, 44, 085, 20, 76, 37	320 45 6					
SGAGSA	\$GLGSV, 3, 2, 10, 65, 29, 223, 45, 86, 26, 155, 47, 84, 14	,031,21,74					
SGAGST -	\$GLGSV,3,3,10,72,03,188,,67,01,338,,1*76 \$GNGLL,3150.7712,N,11711.8993,E,015804.000,A,4	<b>A*</b> 47					
: 2 2 45	\$GPTXT,01,01,02,ANTSTATUS=0K*3B						
	<	F					
	Control						
	🕨 🛚 🖉 🔚 🛛 Patte						

Figure 18: Command Sending via Teseo-Suite Pro



# **6** Appendix A Reference

#### **Table 6: Related Documents**

SN	Document name	Remark
[1]	Quectel_L26-T&L26-P_Hardware_Design	L26-T&L26-P hardware design
[2]	Quectel_L26-T&L26-P_GNSS_Protocol_Specification	L26-T&L26-P GNSS protocol specification document
[3]	Quectel_L26-T&L26-P_Reference Design	L26-T&L26-P reference design
[4]	Quectel_QCOM_User_Guide	QCOM User Guide

#### **Table 7: Terms and Abbreviations**

Abbreviation	Description
API	Application Programming Interface
CAN	Controller Area Network
CNR	Carrier-to-Noise Ratio
DI	Digital Input
DO	Digital Output
EVB	Evaluation Board
GNSS	Global Navigation Satellite System
Ю	Bidirectional
LED	Light Emitting Diode
NVM	Non-volatile Memory
OBD	On Board Diagnostics
PI	Power Input



PPS	Pulse Per Second
PRN	Pseudorandom Noise
SV	Satellite Vehicle
UART	Universal Asynchronous Receiver & Transmitter
UTC	Coordinated Universal Time