

L10 Quectel GPS Engine

EVB User Guide

L10_EVB_UGD_V1.00



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0. Revision history

Revision	Date	Author	Description of change
1.00	2009-7-20	Tracy ZHANG	Initial

1. Introduction

This document defines and specifies the usage of L10 EVB (Evaluation Board). Customer can get useful information about L10 EVB and GPS demo tool from this document.

1.1. Reference

Table 1: Reference

SN	Document name	Remark
[1]	L10_HD	Hardware Design

1.2. Abbreviations

Table 2: Abbreviations

Abbreviation	Description
CNR	Carrier-to-Noise Ratio
GPS	Global Positioning System
PRN	Pseudorandom Noise
SPS	Standard Positioning Service
SV	Satellite Vehicle
UART	Universal Asynchronous Receiver & Transmitter
USB	Universal Serial Bus
UTC	Universal Time Coordinated
WGS84	World Geodetic System 1984

2. EVB Kit Introduction

2.1. EVB Top and Bottom View



Figure 1: EVB top view



Figure 2: EVB bottom view

A: UART port
B: Antenna interface
C: Adapter interface
D: Test points
E: L10 Module
F: POWER switch
G: USB interface
H: STANDBY button
I: RESET button
J: Indication LEDs

2.2. EVB Accessories



Figure 3: EVB accessories

A: GPS active antenna (3.3V) B: DC5V/2A power adapter C: Serial port cable (USB 2.0) D: USB cable

3. Interface Application

3.1. Power Interface



Figure 4: Power interface

3.2. UART Interface

Figure 5: UART interface

Table 3: Pins of UART port

Pin	Signal	I/O	Description
2	TXD	0	Transmit data
3	RXD	Ι	Receive data
5	GND		GND

3.3. USB Interface

Figure 6: USB interface

Pin	Signal	I/O	Description
1	USB_5V	Ι	Power supply from USB
2	GND		GND
3	USB_DP	I/O	USB data positive
4	USB_DM	I/O	USB data negative

Table 4: Pins of USB port

3.4. Antenna Interface

Figure 7: Antenna interface

3.5. Switches and Buttons

Figure 8: Switches and buttons

Table 5: Switches and buttons

Part	Name	I/O	Description
S 1	POWER I		Control power supply from adapter
K1	STANDBY	Ι	The module will enter into standby mode when pressing this button, and exit standby mode when releasing this button.
K2	RESET_N	Ι	Press and release this button. Then the module will reset.

3.6. Operating Status LEDs

Figure 9: Operating status LEDs

Table 6: Operating status LEDs

Part	Name	I/O	Description
T 1	1000	0	Flash: fix successfully, the frequency is 1Hz
LI	IPPS	0	Extinct: no fix
L2 F	DOWED	0	Bright: Power on
	FUWER		Extinct: Power off
			Bright: Active antenna is short-circuit or not
L3	AOK	Ο	assembled
			Extinct: Active antenna operates normally

3.7. Test Points

Figure 10: Test points X101

Table	7:	Pins	of	X101	L
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Pin	Signal	I/O	Description
1	GND		Ground
2	GND		
3	NC		Not connected
4	NC		
5	NC		
6	RESERVE		
7	RESERVE		
8	NC		
9	EXTINT0	Ι	Enter or exit standby mode
10	NC		
11	TIMEPULSE	0	Time pulse
12	USB_DP	I/O	USB data positive
13	USB_DM	I/O	USB data negative
14	VDDUSB	Ι	Voltage supply for USB port

15	RESERVE		
16	AADET_N	Ι	Active antenna open-circuit detection
17	V_ANT	Ι	Antenna bias voltage
18	VCC_RF	0	Output voltage for RF section
19	GND		
20	GND		

Figure 11: Test points X102

Pin	Signal	I/O	Description
1	GND		Ground
2	GND		
3	AOK	0	Antenna status report
4	V_BCKP	Ι	Backup voltage supply
5	RESET_N	Ι	System reset, low level active.
6	VCC_OUT	0	Output voltage. VCC_OUT pin is
			directly connected to VCC pin within

			the module.
7	VCC	Ι	Supply voltage
8	RESERVE		
9	TXD1	0	Transmit data
10	SDA2	I/O	I2C interface
11	SCL2	I/O	I2C interface
12	RXD1	Ι	Receive data
13	NC		Not connected
14	GND		
15	RESERVE		
16	NC		
17	NC		
18	NC		
19	GND		
20	GND		

4. EVB and Accessories

When USB to RS232 cable is used, the EVB and its accessories are equipped as shown in Figure 12.

Figure 12: EVB and accessory equipments with serial cable

When USB cable is used, the EVB and its accessories are equipped as shown in Figure 13.

Figure 13: EVB and accessory equipments with USB cable

5. Installing Device Driver

Customer can get NMEA message through UART port or USB port.

Before using UART port, please install the driver of USB 2.0 to RS232 cable from the attached CD.

Before using USB port, please install the USB driver included in Quectel L10 CD. Installation steps are as follows:

Step 1: Connect L10-EVB to PC with USB cable. Then PC will request installing the virtual COM port driver.

Found New Hardware Wizard				
	Welcome to the Found New Hardware Wizard			
	Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission). <u>Read our privacy policy</u>			
	Can Windows connect to Windows Update to search for software? Yes, this time only Yes, now and every time I connect a device No, not this time			
	Click Next to continue.			
	<back next=""> Cancel</back>			

Step 2: Choose "Install from a list or specific location".

Step 3: Choose the right folder according to PC's OS.

Found New Hardware Wizard		
Please choose your search and installation options.		
 Search for the best driver in these locations. Use the check boxes below to limit or expand the default search, w paths and removable media. The best driver found will be installed. Search removable media (floppy, CD-ROM) Include this location in the search: H:\Documents and Settings\jean\Desktop\L10\L10 	rhich includes local	
Don't search. I will choose the driver to install. Choose this option to select the device driver from a list. Windows the driver you choose will be the best match for your hardware.	Browse For Folder Select the folder that contains drivers for yo	ur hardware.
< Back Nex	DOWINGA PIC DOWINGA PIC	
	To view any subfolders, click a plus sign abo	ve. Cancel

Step 4: Click button "Continue Anyway" in the pop-up dialog box.

Step 5: GPS USB driver installation finishes.

Found New Hardware Wizard			
	Completing the Found New Hardware Wizard The wizard has finished installing the software for: OPS USB Serial Interface Driver		
	< Back Finish Cancel		

User will find a new virtual COM port in the Device Manager of PC as shown below:

🖃 Computer Management 📃 🗖 🔁				
🔜 File Action View Window Hi	elp	_8×		
← → 🖻 🖬 🖨 😫 🚨				
Computer Management (Local) System Tools Event Viewer Shared Folders Performance Logs and Alerts Device Manager Storage Removable Storage Disk Defragmenter Disk Management Services and Applications	Batteries Gomputer Gomputer Disk drives Display adapters Display adapters Display adapters DVD/CD-ROM drives DVD/CD-R			
< >	Gerrollers			

6. Starting MiniGPS

The MiniGPS tool can help user to view the status of GPS receiver conveniently. The operation window is shown below:

When USB to RS232 cable is used, power must be supplied through DC adapter, and the default baud rate is 9600bps. When USB cable is used, external DC adapter is unnecessary. In this case, power can be supplied through USB port from PC. The baud rate of the USB port is auto-adaptive. After assembling EVB accessories, start up the MiniGPS. Select a correct COM port and baud rate, click the button "Open".

When PC gets any message from the COM port, a yellow dot will be flashing at the upper right corner of the Sky Chart.

From the MiniGPS window, user can view CNR message, time, position, speed, precision and so on. Explanations are listed in Table 8.

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Table 9: Explanations of MiniGPS window

Icon	Explanation
	SV with PRN 30. If the position of SV is near to the centre of the Sky
30	View, the elevation angle of SV is close to 90°. Dark blue means this
	satellite is in tracking, i.e., the CNR of the satellite is greater than 0.
	Light blue means this satellite is not in tracking, i.e., its CNR is less
- 32	than 0.
Date : 2009/7/23 Time : 3:39:46.000	UTC time
Lat : N 31.17192°	Latitude and longitude degree
Lon : E 121.38710°	Altitude based on WGS84 Datum
Alt : 24.7m Fix Tune : 3D SPS	Fix type: NoFix, 3D or 2D SPS
Spd (km/hr): 0.0	Speed of receiver
Track : 0.0•	Track degree of receiver
PDOP: 1.2	Position Dilution of Precision
HDOP: 0.9	Horizontal Dilution of Precision
VDOP: 0.8	Vertical Dilution of Precision
26	The CNR of PRN 26 is 37dB/Hz. Blue column means the navigation data of this satellite is in use.
21	The CNR of PRN 19 is 21dB/Hz. White column means the navigation data of this satellite is not in use.

User can drive L10 to implement Hot Start, Warm Start or Cold Start via Start Command buttons. Fix time will be indicated in the Message Bar as shown in the 2 screenshots below:

🐨 Mini GPS (f/w: AXW_1.30 🔲 🗖 🗙	🐨 Lini GPS 📃 🗖 🔀
Status About	Status About
N Date : 2009/7/20 Time : 12:16:13:000 Lat : N 31.17172* Lon : E 121.38720* Alt : 52.7m Alt : 52.7m Fix Type : 3D SPS Spd (km/hr): 0.0 Track : 0.0* PDOP: 1.4 HDOP: 1.1 VDOP: 0.9 0.9	N Date : 2009/7/20 Time : 12:16:55.000 Lat : N 31.17165• Lon : E 121.38720• Alt : 69.3m Alt : 69.3m Fix Type : 3D SPS S S PDOP: 3.3 HDOP: 1.3 VDOP: 3.1 VDOP: 3.1
CNR	CNR
Hot Start Warm Start Cold Start	Hot Start Warm Start Cold Start
COM6 38400 Close Auto Detect	COM6 J38400 Close Auto Detect
Cold Start 36.1 sec(s)	Hot Start 0.4 sec(s)

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