





Global Positioning System











User's Technical Manual of Leadtek GPS EVK

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1. Introduction

Leadtek GPS LR9500 is an evaluation kit designed to demonstrate the performance of Leadtek GPS modules. It supports Leadtek 9540, 9543, 9547, 9548(s), 9805(st), 9101 modules. GPS LR9500 EVK not only helps customers to evaluate our GPS modules performance but also can be used to update new firmware for the GPS modules.

2. Product Features

- Easy Installation and operation of GPS modules
- Testing and programming the GPS modules.
- Support Leadtek 9540, 9543, 9547, 9548(s), 9805(st), 9101 modules.

3. Technical Specifications

Power Input	DC 3.3V
PC Interface	TTL transform to USB
Size (L x W x H) (mm)	87.9 x 53.3 x 11.05 (mm)
Weight	16 (g)

4. Mechanical dimensions



5. Outline and Descriptions



6. Functional Description

Functional kit	Description
Power ON	Power ON by USB connector for GPS 9500 EVK. To
	inset USB port of PC will turn on power.
GPS Antenna	Connect GPS active antenna with SMA connector.
Power & Status LED	Two colors by LED, which show power and data
	transmitting status. The green is for power status and
	the red is for GPS data output status.
Reset Button	Reset GPS module and force a cold start.
Boot Select Button	Please refer to details on technical manual of CD-ROM
	for download instructions. To download firmware,
	push reset button once while hold down this button.
	The GPS module will enter into forced download
	mode. Perform reset to leave download mode.

7. The operation of EVK

This chapter will show you how to operate an EVK, let's take LR9101 for example.

7.1. Step 1: Check devices

1. Module: LR9101 (example)



2. LR9101F1 (G)PCB REV:03



3. LR9500 EVK Board



7.2. Step 2: Start to connect

Then connect the LR9101F1 board to LR9500 EVK board



8. Operation of G-Monitor software with GPS EVK

8.1. Normal operation

In GPS monitor main screen, click **data source setup** button indicated in the figure below.

90 093 Monitor Rev 2.2		_ # ×
Setup Yerv Action Merigation foll Mindows Help		
O D D → P → P → P → P → P → P → P → P → P		GPS Monitor
Data Source and	Wessmood Nevigetion View	- OX
Ň	X Y Z	
	Position(m): 0 0 0	
	Velocity(m/s): 0 0 0	
	Lat: 0 Lon: 0 Alt: 0	
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SU St Az El CHo -6 -5 -4 -3 -2 -1 0	Development Data	
SU St Az EL CHo -6 -5 -4 -3 -2 -1 0	Eventoposed Data	

<Note>Go to view menu to choose desirable information windows you like to observe.

Next, please choose Com Port and Baud Rate correctly.

		Alonia (D)
	X Y Z Positizer(m): 0 0 0 Velocity(m/s): 0 0 0 Lat: 0 Lon: 0 Alt: Velocity(m/s): 0 0 0 0 Lat: 0 Lon: 0 Alt: 0 Part Postor X Y Z Difference: 0 Part Postor Postor Postor X Difference: 0 Get do: 000000 0 Data Bis: 8 * * ASCB * Sep Bits: 1 * * BINAFDY * Sep Bits: 1 * * Sep Bits: * * Sep Bits: * * Sep Bits: *	
U St Az El CNo -6 -5 -4 -3	Port Lan Marine Description COM OWN COM	اللم
	Cancel	

Next, please click on Auto detect protocol and baud rate button. The GPS software will go on detecting protocol for GPS module.

2073 Monitor Rev 2.2		
Setup Yers Action Hevigation foll Mindows Help		Contractor
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Y Inching Yerv - G Auto Detect Protocol	Westman Havigston View	
	X Y Z Position(m): 0 0 0 Velocity(m/s): 0 0 0 Lat: 0 Lon: 0 Alt: 0 Mode: Mode GPS Week: 0 HDOP: Fit: Inveid GPS Time: 0 0 5 Vs Used in Fite: Local Time: 0000:00000 0	
SU St Az El CHo -6 -5 -4 -3 -2 -1 0	S Development Data	<u>-0×</u>
C0044 30400 00:00:25		

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8.2. Cold/Warm/Hot start time measurements

You can use the GPS EVK device and GPS Monitor software to measure hot, warm and cold start time of the GPS module. Please click on **Initialize Data Source** button.



This example shows how to measure hot start time.

Please choose Hot Start item and click on OK button.

Action	Same -		×
Initialize NMEA SiR	F Main Port DG	PS Port Operating Mode	Power Manager 🚺 🕨
×: 768	m	Load From Default	Сок
Y: 1107296256 Z: 1358954240	m	Save To Default	X Cancel
Clock: 0	Hz	Load	Periodic Reset(sec)
Week Number 0 Time of Week: 0 Channels 12	s	Save	ju 💽
Reset Mode Hot Start Warm Start(No Init Warm Start(Init) Cold Start Factory)	Messages Enable Rai	w Track Data velopment Data

Finally, please wait a moment and you will get time of hot start. The hot start time will show on the left side below.



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Please repeat above the steps and you will get time of warm and cold start.

<Warm Start>

initialize Position a	nd Time		-
X: 0	m	Load From Default	K
Y: 0	m		dize
Z: 0	m	Save To Default	
Clock: 0	Hz	Load Periodic Reset(se	c)
Week Number:	0		
Time of Week:	0	s Save	
Time of Week: Channels: 12 Reset Mode:		sSave	
Time of Week: Channels: 12 Reset Mode: Hot Start		s Save	
Time of Week: Channels: Reset Mode: Hot Start Warm Start(No Warm Start(Init		s Save	

COM4 4000 00.04.72 SIX Yallalea 1100.00.24.142	쨄	COM4	4800	00:04:32	Ex Validated in 00:00:24.142
--	---	------	------	----------	------------------------------

<Cold Start>

Initialize NMEA S	iRF Main Port	DGPS Port Operating Mode	Power Manager
Initialize Position and	d Time	1	\frown
X: 0	m	Load From Default	СОК
Y: 0	m		Y Canad
Z: 0	m	Save To Default	
Clock: 0	Hz	Load	Periodic Reset(sec)
Week Number: 0			0 🔹
Time of Week: 0		Save	
Channala 12			
Channels. 12			
C Hot Start		Messages:	
C Warm Start(No Ir	nit)	💉 Enable Ra	w Track Data
C Warm Start(Init)		C Fachla Da	
C Eactor		M Enable De	velopment Data
Initialize	Data Source		

2M	COM4	4800	00:00:55	Fix Validated in 00:00:38.815
and the second se			-	

9. Download the firmware to GPS module

Step 1>Double click the GMonitor desktop icon to run software in order to download firmware.



<Step 2> Choose the Setup→GPS Flash→Star II/III option from of main menu.

Setup	View	Action	Nav:	igation	Pol
<u>D</u> at Pret	a Source ferences				٥
GPS	5 <u>F</u> lash	•	Star II	/ III	
Exi	ŕ				

The following screen shows the download options.

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🛿 Flash	
Source File	elect FW
D:\Documents a	and Settings\1475\点面\V24.s Browser
Control Paramete	ers BaudRate Chip Select Chip Offset
COM4	• 115200 • CSN0 • 0
Progress	
Xfer	100%
Prog	100%
Total: 31.1 Source File Infor File Type S-MOTOROL	Erase: 1.8 Burn: 2.9 mation Lowest Address Highest Address A 0x0 0x52597
Hash Information	EON Model EN29LV4008 Chips 1

<Note>

If the module is type of **single chip** (ex. 9805ST), please install GMonitor2.102. The file path is in the <u>E:\GPSMonitor\GM2.102.exe.</u> (If E:\ is your CD-ROM)

<u>QLEADTEK</u>

<Download Options>

Erase All	Uncheck this box and program will only clear the portion of the flash memory that the new firmware will occupy.
	Check this box will clear the entire flash memory space before firmware burn-in
Force download (for GMonitor2.102)	Uncheck this box and GMonitor will use only software command in GPS module to download the update firmware. This is called software download method.
	Check this box and holding the boot select button in EVK while press and release reset button will force GPS module into Force Download mode, which can only break by press reset button again. This is the preferred download method and should be use whenever possible.

To use EVK to download new firmware, perform the following steps.

- 1. Check "Erase All" and "Force Download" (GMonitor2.102 for single chip) options.
- 2. Click "Browse" button to locate the new firmware you want to upgrade.
- 3. Click "Execute button to start download.
- 4. After download finish, click "Close" to close the download screen.

<Note>

- To use Software Download method, uncheck "Force Download" box and follow the reset of the download operations. For some Leadtek products that do not have boot select and reset switches, software download is the only way to upgrade firmware.
- 2. When you cannot finish updating firmware by software download, we suggest that you use the force download. This method can only be performed when GPS hardware support the boot select and reset switch. Before executing software to update firmware you have to push reset button once while hold down boot select button and make GPS module enter into download mode.

10. Install the USB Driver

<Note>Please do not plug in USB serial cable before installation of USB Driver!

■Step 1.

Insert the software CD in your CD-ROM drive. The Autorun program (LEADTEK.exe) will display a setup screen as the figure to the right.

Note: You can also start the setup program by running LEADTEK.exe in the main directory of the CD.



■Step 2.

Please click on the **USB Driver** button for installation. You will see the following picture on your screen. Click one of the items you want to operate.

InstallShield Wiza	×
Welcome Modify, repa	ir, or remove the program.
Welcome to Setup Main	the Silicon Laboratories CP210x Evaluation Kit Tools Release 3.31 ienance program. This program lets you modify the current installation. Click one of
	Select new program components to add or select currently installed components to remove.
C Repair	Reinstall all program components installed by the previous setup.
C <u>R</u> emove	Remove all installed components.
merenentiela	< <u>B</u> eck. <u>N</u> ext > Cancel

■Step 3.

You can begin installing the USB driver by click on the Install button. Then you can also see the following picture on your screen. Click Finish then you complete the installation.



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■Step 5.

Perform a reboot of PC and then insert the USB serial cable. GMonitor should now be able to detect a new serial port for the USB serial cable.

Appendix A GPS EVK schematic



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