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Version History

Data	Version	Description of change	Author
2012-12-11	1.00	Origin	Honggang. Ma
2014-5-20	1.00	Modify the document for SIMcom GNSS modules	Chengbing.wu



1. Introduction

This document introduces the usage of SIM68 EVB kit, it applies to most of SIMCom GNSS Modules. User can get useful information about the SIM68 EVB quickly through this document.

This document is subject to change without notice at any time.

2. SIM68_EVB Overview

2.1 Detailed description of SIM68-EVB

The chapter introduces the functions of each component.



Figure 1: SIM68-EVB components function

A: USB interface, support USB communication with SIMcom GNSS module, and also power the SIM68-EVB.

B: S301, Power switch, push up to power the EVB and module, push down to power off.

C: S202, NMEA output select. Push up to choose USB port. Push down to close.

D: UART to RS232 transceiver

E, F: Select for receiving NMEA data from A or K. Jump the left and middle needle is select A



port, jump the middle and right needle is select K port.

- G: UART to USB transceiver.
- H: 60 PIN connect to TE board of the navigation SIMcom GNSS module

I: J302, the jumper of VANT which is the source of active of antenna.(Internal to the antenna power supply module doesn't need)

- J: Test point area. (Customer should contact SIMCom if the test point is needed).
- K: Main UART port for the NMEA output.
- L: Debug UART port, reserved.
- M: Reset button (for Parts of module).

2.2 USB Interface

There is one Mini-USB interface on SIM68-EVB, which is transferred to UART by a USB to UART chip CP2103 on the EVB board. User need to install CP2103 driver in their PC first, then connect the EVB board to the PC by a USB cable, and push S301 up to power the SIM68-EVB.

Please download the latest CP2103 driver according to the PC's OS from the following link: *http://www.silabs.com/products/mcu/pages/usbtouartbridgevcpdrivers.aspx* or contact SIMCom for support.



Figure 2: USB interface

Table 1: USB pin definition

-			
PIN Number	Signal	I/O	Description
1	VBUS	Ι	5V input
2	D-	I/O	Data minus
3	D+	I/O	Data plus
4,5	GND		GND

3. Illustration of testing

User need to install CP2103 driver in their PC first before using SIM68-EVB. Please download the latest CP2103 driver according to the PC's OS from the following link: <u>http://www.silabs.com/products/mcu/pages/usbtouartbridgevcpdrivers.aspx</u> or contact SIMCom for support.

3.1 An example of USB driver installation

Step1.exectue Setup file (CP210x_VCP_Win_XP_S2K3_Vista_7)

Silicon Laboratories CP210x VCP Drivers for Vindo 🔳 🗖 🔀
Existing Installed Instances Detected Select the appropriate application instance to maintain or update.
Setup has detected one or more instances of this application already installed on your system. You can maintain or update an existing instance or install a completely new instance. Install a new instance of this application Maintain or update the instance of this application selected below:
Display Name Silicon Laboratories CP210x VCP Drivers for Windows XP/2003 Server/Vista/7 Silicon Laboratories CP210x VCP Drivers for Windows XP/2003 Server/Vista/7_2 (c:\SiL
InstallShield

Figure 3: USB driver installation step1



Step2.select "next" button then "next"

Silicon Laboratories	CP210x VCP Drivers for Windows XP/ 🗙
N	Welcome to the InstallShield Wizard for Silicon Laboratories CP210x VCP Drivers for Windows XP/2003 Server/Vista/7 v6.00
	The InstallShield Wizard will copy Silicon Laboratories CP210x VCP Drivers for Windows XP/2003 Server/Vista/7 v6.00 onto your computer. To continue, click Next.
< <u>B</u> ack Next> Cancel	

Figure 4: USB driver installition step2

Step3. Accept the license agreement and "next"

Silicon Laboratories CP210x VCP Drivers for Windows XP/	- 🗙
License Agreement Please read the following license agreement carefully.	1
	_
END-USER LICENSE AGREEMENT IMPORTANT: READ CAREFULLY BEFORE AGREEING TO TERMS	
SILICON LABORATORIES INC., SILICON LABORATORIES INTERNATIONAL PTE. LTD., AND THEIR AFFILIATES (COLLECTIVELY, "SILICON LABS") HAVE DEVELOPED CERTAIN MATERIALS (E.G., DEVELOPMENT TOOLS, EXAMPLE CODE, EMBEDDABLE CODE, DLLS, SOFTWARE/COMPUTER PROGRAMS AND OTHER THIRD PARTY PROPRIETARY MATERIAL) ("LICENSED MATERIALS") THAT YOU MAY USE IN CONJUNCTION WITH SILICON LABS' MCU PRODUCTS. ANY USE OF THE LICENSED MATERIALS IS SUBJECT TO THIS END-USER LICENSE ADDEDUCTION WITH SILICON TO THIS END-USER LICENSE	>
I do not accept the terms of the license agreement	_
InstallShield	
< <u>B</u> ack <u>N</u> ext > Cance	!

Figure 5: USB driver installation step3

Step4. Choose Driver Destination Location



Silicon Laboratories CP210x VCP Drivers for Windows XP/ 🔀
Choose Destination Location Select folder where setup will install files.
Setup will install Silicon Laboratories CP210x VCP Drivers for Windows XP/2003 Server/Vista/7 v6.00 in the following folder.
To install to this folder, click Next. To install to a different folder, click Browse and select another folder.
Destination Folder c:\\MCU\CP210x\Windows_XP_S2K3_Vista_7_3
InstallShield
< <u>B</u> ack <u>Next></u> Cancel

Figure 6: USB driver installation step4

Step5. Confirm Installation, select "Install" button



Figure 7: USB driver installition step5

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Step6. Launch the CP210x VCP Driver Installer



Silicon Laboratories CP210x VCP Drivers for Vindows XP/200		
	InstallShield Wizard Complete The InstallShield Wizard has successfully copied the Silicon Laboratories CP210x VCP Drivers for Windows XP/2003 Server/Vista/7 v6.00 to your hard drive. The driver installer listed below should be executed in order to install drivers or update an existing driver. ✓ Launch the CP210x VCP Driver Installer. Click Finish to complete the Silicon Laboratories CP210x VCP Drivers for Windows XP/2003 Server/Vista/7 v6.00 setup.	
< <u>B</u> ack Finish Cancel		

Figure 8: USB driver installition step6

Step7. Select "Install" button

// Sili	icon Laboratories CP2	10x USB to UART Bridge 🔀
%	Silicon Laboratories Silicon Laboratories CP210	x USB to UART Bridge
Insta	allation	Driver Version 6.0
C:\Program Files\Silabs\MCU\CP210x\		
nan	ge Install Location.	Install Cancel

Figure 9: USB driver installation step7

Step8. Installation completed.



Figure 10: USB driver installation step8

Step9. After completing CP2103 driver installation, connect SIM68-EVB to PC by the bus cable, and set S301 switch to VBUS, then "Silicon Labs CP210x USB to UART Bridge (COMX)" will appear in the device manager:





Figure 11: USB driver installation step9

3.2 Connecting and run

To test the SIM68V/R module, the following operations are needed:

- 1. Install CP2103 driver.
- 2. Install GPS test tool.
- 3. Connect the active antenna to the RF connector, and insert SIM68V/R-TE to module connector.
- 4. Connect the SIM68-EVB to PC with USB cable.
- 5. Push up the power switch of S301.
- 6. Push up the switch of S202 to select UART signal.
- 7. Open GPS test tool to test.

4. SIMCom GPS Testing Tool

This chapter gives a detailed introduction of testing tool "SIMCom GPS Demo". Please contact SIMCom to get the newest version of GPS Testing tool.

4.1 Port setting

In the testing tool interface, open the "setting" window according to the following path: Module-->Properties.



M SIMCom GPS DEMO V1.04 Module: SIM68R&V	
Module Windows Tools Help	
Properties	
Connect × Signal	x Position x
GPS [1-32][33-6	(+8/)] GLURASS [05-90]
BJ Time	
Latitud	
Longitude	
Altitude	
Speed	90 60 30
GPS average power	
GLONASS average power	
	RestartType CycleTimes(T) UnfixTimeOut(S) FixedTimeOut(S)
	HOT 20 60 6 UR
	A
	2
	INFO: Stop Start
	Send
Log IsSave Pause Clear	Command Result Without CheckSum + -
Setting Comport	数字

Figure 12: Testing tool interface

Module	SIM68R&V	· -	→ Cor	nfigura ty	tion mod 7pe	lule
RF Type	BMC4751:Th	names, Ext.	Ant.	2.2		
ComPort	Confirm th	ne port nui	mber in d	evice mar	ager	
NMEA COM	COM3	➡ B	audRate	115200	•	
Pair COM		¥	11520) or 9600,	check on t	he la
Main COM		- B	audRate	115200	-	

Figure 13: Setting Window

In the "NMEA COM" drop down list choose the corresponding commentioned before. The baudrate is 115200 or 9600. Then click OK.

4.2 Click to RUN

Click the button "Run Comport" to run the module.



Comport With a second	GPS [1-32][33-64(+87)]	G	LONASS [65-96]	×
PDOP HDOP VDOP GPS sverage power GLOMASS average power			RestartType	CycleTim



The module will run as the following figure:



Figure 15: The Module is running

After position has been fixed, the GPS information can be viewed in the "General info" window. In the "Signal" window, satellite signal has been tracked as showing, GPS on the left side and GLONASS on the right side. The NEMA message can be accessed on the bottom window, and it will be saved as txt file in the GPS testing tool directory, with start time as its name.



4.3 TTFF Test

The test configure should be set before each TTFF test. It is in the right bottom of the tool interface.

The restart type (hot, warm or cold) could be selected in the drop down list of "Restart type". Fill in the next three blank ("Cycletimes" for the testing times, "Unfixtimeout" for the max time limit of each test and "Fixedtimeout" for the time waiting before next TTFF test) and press the start button.



Figure 16: Setting TTFF testing configuration

The result of each TTFF will be shown in the window, each TTFF shorter than the "UnfixTimeOut" is labeled as Pass.





Figure 17: TTFF Test Result

4.4 PMTK command input

SIMcom GNSS module supports some kinds of modes that must be enabled by PMTK commands as mentioned in the HD document, GPS Demo provides an access to send PMTK command to module, as the following figure shows, customer can refer to *SIM28@SIM68R@SIM68V_NMEA Messages Specification_V1.01* to get the detailed information of PMTK list.

RestartType		CycleTimes(T)	UnfixTimeOut(S)	FixedTim	eOut (S)
HOT	•	20	60	5	UR
					~
[INF0] TIFF	Test end				Stop Start
[INFO] TTFF Command \$PM	Test end TK161,0				Stop Start
[INFO] TIFF Command \$PM [PASS] comm	Test end TK161,0 and send s	success.		With Chec	Stop Start Send kSum + +
[INFO] TIFF Command \$PM [PASS] Comm	Test end TK161,0 and send s	success.		With Chec	Stop Start Send kSum +



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5. Firmware update

To update the SIMcom GNSS module software, the following operations are needed:

- 1. Install the tool of "Power Flash".
- 2. Connect the SIM68-EVB to PC with USB cable.
- 3. Setting the jumper "N" and "O" as figure 1 shows.
- 4. Switch on S202 to select UART signal.
- 5. Switch on the power switch S301.

Step1. Customer should open the tool Power Flash, the following figure shows the interface of power flash.

M IIIK Pow	erflash for	[Simcom]					
<u>F</u> ile <u>A</u> ction	<u>T</u> est <u>C</u> omPort	<u>W</u> indow <u>O</u> ption	A <u>b</u> out				
Download Ager	t ROM	Connect	🔁 Test	Ø Stop	⊡ Clean	M About	
DA				ROM	E:\Project\SIM68V\	\DVT阶段软件\20120	918_SIMCOM_Modui

Figure 19: power flash main UI



Step 2.Using the combination key "CTRL+ALT+T" to set the port, the password is "123456".

M HIK Powerf	lash for [S	incon]						
<u>F</u> ile <u>Action M</u> i	ndow A <u>b</u> out							
Download Agent	21 ВОМ	Connect	C Test	Stop		Clean	M Ahout	
			Password Modiy	OK	[Cancel]			
DA				ROM	E:\Project	\SIM68V\DVT的	股软件\20120918_	SIMCOM_Modui

Figure 20: enter code

Step 3.The window UI has changed.

M II	M TIK Powerflash for [Sincon]											
File	Action Tes	t <u>C</u> omPort	Mindow Option	A <u>b</u> out								
Downle	🗃 bad Agent	2 ROM	Connect	😨 Test	0 Stop		D Clean	M About				
DA	E:\Project\S	SIM68V\DVTβ))段软件\MTK_AllI	nOne_DA_MT3333_M	ROM	E:\Projec	t\SIM68V\DV	T阶段软件\201209	18_SIMCOM_Modui			

Figure 21: the main UI

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Step 4.Setting the number of comport as following figure shows, here is the comport 3.

M TIK Powerflash for [Simcom]	
<u>F</u> ile <u>A</u> ction <u>T</u> est <u>ComPort</u> <u>W</u> indow <u>O</u> ption About	
Eile Acton Test Lonkort Eindow Uption Agout Download Agent f Under Baudrate CQB 3 UNEA Baudrate CQB 3 Select All Cancel All	Stop Clean About
DA DA_File	RDM E:\Project\SIM68V\DVT阶段软件\20120918_SIMCOM_Modui

Figure 22: setting port

Step 5.Setting the update baudrate as 460800.

M HIK Powerflash for [Sincom]					
<u>F</u> ile <u>A</u> ction <u>T</u> est <u>ComPort</u> <u>M</u> indow <u>Opti</u>	ion A <u>b</u> out				
COM Download Agent F Update Baudrate	921600	0 Stop	D Clean	M About	
MEA Baudrate	✓ <u>46000</u> 230400 115200 57600 38400 19200 14400 9600 4800				
DA		ROM E:\P	roject\SIM68V\DV	T阶段软件\201209	18_SIMCOM_Modui

Figure 23: setting baudrate



Step 6.Load files to the power flash.



Figure 24: detailed settings



Step 7.The DA file is in downloading proceeding.

M II	IK Powe	rflash fo	r [Sime	m]					
File	Action	Test ComPo	rt <u>W</u> indow	Option	A <u>b</u> out				
Downl	oad Agent	nom 🔁	Co	▶ nnect	C Test	0 Stop	Clean	M' About	
M C	0∎ 20	Ready	Fail (Co	mPort)	Fail (Do	vnload)			
Sock	ket	Serial No. :							
Seria	al Number	:							
BTN	/lac Addr :								
						Fail!! Op [Finish] Take(0) :	en ComPort Fa secs to test.	úl!!	4
						[Finish] Take(13)	i secs to test.		
						[Flash Dow	nload]		=
						<			
					c	INR			
						0			
					3:	3%			
DA	E:\Proj	ect\SIM68V\DV	T阶段软件	MTK_AllI	nOne_DA_MT3333_M	ROM E:\P	roject\SIM68V\D	/T阶段软件\20120	918_SIMCOM_Modui

Figure 25: DA file in downloading proceeding

Step 8. The ROM is in downloading proceeding.

M D	IK Powe	rflash for	[Sinco	•]					
File	Action	Test ComPort	<u>W</u> indow	Option	A <u>b</u> out	0	-	M	
Downl	oad Agent	ROM	Con	nect	Test	Stop	Clean	About	
M C	OII 20 F	leady F	ail(Co	Port)	Fail(Do	mload)			
Sock	ket	Serial No. :							
Seria	al Number :								
BTN	/lac Addr :								
					с	[Flash Dow Pass!! Flash Ty [Finish] Take(23) [Flash Dow	nload] pe:[AMD] AM29 i secs to test. nload]	9DL640D/G, AM	41DL6408G, S2
					23	0			
DA	E:\Proje	ct\SIM68V\DVT₿	∩段软件\₩	ITK_ALLI	nOne_DA_MT3333_M	ROM E:\Pa	roject\SIM68V\D	VT阶段软件\20120	918_SIMCOM_Modui

Figure 26: ROM file in downloading proceeding



Step 9.Firmware update succeeds.

м пт	K Pow	erflash for	[Sinco	a]					
File	Action	Test ComPort	Tindow	Option	A <u>b</u> out	0			
Downlo	ad Agen	ROM	Con	nect	⊊ ⊋ Test	Stop	Clean	About	
M C	O ≣ 20	Ready F	ail(Co	Port)	Fail(D	ovnload)			
Sock	.et	Serial No. :							
Seria	l Number	:							
						Take(23 [Flash Dov Pass!! Flash T [Finish] Take(23	i) secs to test. vnload] ype:[AMD] AM29 i) secs to test.	3DL640D/G, AM	41DL6408G, S2
						CNR			
						0			
					1	00%			
DA	E:\Proj	ect\SIM68V\DVTØ	↑段软件\#	TK_ALLIT	0ne_DA_MT3333_	M ROM E: \J	roject\SIM68V\D\	/T阶段软件\20120	918_SIMCOM_Modui

Figure 27: Firmware update succeeds



6 Acronyms and abbreviation

Abbreviation	Description
DC	Direct Current
I/O	Input/Output
LED	Light Emitting Diode
SPI	Serial Peripheral Interface
USB	Universal Serial Bus
UART	Universal Asynchronous Receiver & Transmitter

Table 2: Acronyms and abbreviations



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