

HUAWEI MU736 HSPA+ M.2 Module

GPS Application Guide

lssue 01 Date 2013-03-22 Huawei Technologies Co., Ltd. provides customers with comprehensive technical support and service. For any assistance, please contact our local office or company headquarters.

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About This Document

Revision History

Document Version	Date	Chapter	Descriptions
01	2013-03-22		Creation



Contents

Introduction	5
2 GPS Test Procedure	6
2.1 Enabling or Disabling GPS	6
2.2 GPS Test	6
2.3 A-GPS Test	0
2.4 GPS Positioning in Windows 81	0
2.4.1 Using the Sensor Diagnostic Tool1	0
2.4.2 Using the Maps Application1	4
GPS Tool User Guide1	7
3.1 Overview	7
3.2 Test Procedure	7
3.2.1 Setting the Debug Mode1	7
3.2.2 Configuring the Dialog Windows1	9
3.3 Checking Window Display	6
3.3.1 Checking Signal Quality Window	6
3.3.2 Checking Location Data Window24	8
3.3.3 Checking A-GPS Location Window	8
3.4 Calculating CEP	9
3.4.1 Averaging TTFF	9
3.4.2 Calculating CEP	1
3.5 Exiting the GPS Tool	3
Acronyms and Abbreviations	5





The MU736 module incorporates a Global Positioning System (GPS) chipset capable of GPS and network assisted GPS (A-GPS). The standalone GPS depends on GPS satellites to provide location information, while the A-GPS functions in conjunction with base stations as well as GPS satellites to improve the time to first fix (TTFF).

The purpose of this document is to guide how to do the GPS test.



2 GPS Test Procedure

2.1 Enabling or Disabling GPS

The MU736 GPS module can have its GPS function enabled or disabled.

- To disable GPS: Before the MU736 is powered on, pull down the GPS_DISABLE_N (PIN 25) pin. Then after the MU736 is powered on, GPS is disabled and cannot be enabled by using AT commands.
- To enable GPS: Before the MU736 is powered on, pull up the GPS_DISABLE_N (PIN 25) pin. Then after the MU736 is powered on, GPS is enabled and can be disabled by using AT commands.

2.2 GPS Test

Ensure that the GPS antenna is located in an open sky environment.

In Windows 7 or Windows XP

On a computer running Windows 7 or Windows XP, use HyperTerminal to test the GPS.

Step 1 Right-click **My Computer**, and choose **Manage** from the shortcut menu. In the displayed **Computer Management** window, click **Device Manager** in the left pane, and check for **HUAWEI Mobile Connect-3G GPS Interface (COM 25)** under **Ports** in the right pane.





Step 2 Open the HyperTerminal and select the GPS port.

- 1) Click the icon \Im .
- 2) Select COM25 in the Connect using list, and then click OK.
- 3) Select 115200 in the Bits per second list, and then click OK.

gps - HyperTerminal	allow making
File Edit View Call Transfer Help	
다 🗃 🍘 📓 💷 🎦	
1	
	Connect To
	gps
	Enter details for the phone number that you want to dial:
	Country/region: China (86)
	Area code: 0755
	Phone number:
	Connect using: COM25 2
	3 OK Cancel



gps - HyperTerminal	to Maline Maline
File Edit View Call Transfer Help	
다 🗃 🍘 💲 🗈 🎦	
COM25 Pro	perties ? X
Port Settin	gs
Br	ts per second: 115200
	Data bits: 8
	Parity: None
	Stop bits: 1
	Flow control: Hardware
	Restore Defaults
	b OK Cancel Apply

Step 3 The module starts to search the current location, and reports NMEA data.

gps - HyperTerminal
File Edit View Call Transfer Help
\$GPRMC,,V,,,,,,,,N*53
\$GPGSA,A,1,,,,,,,,,,,,,*1E
\$GPVTG,,T,,M,,N,,K,N×2C
\$GPGGA,,,,,,0,,,,M,,,M,,,*66
\$GPGSV,1,1,03,14,00,000,42,29,00,000,45,31,00,000,50,,,,*44
\$GPRMC,,V,,,,,,,,N*53
\$GPGSA,A,1,,,,,,,,,,,,,,*1E
\$GPVTG,,T,,M,,N,,K,N*2C



If the NMEA data contains latitude and longitude values (for example, 2231.8378,N,11356.6409E), it means that the module obtains the current location information.

Ľ	gps - HyperTerminal
Fi	ile Edit View Call Transfer Help
С) 🖆 🍘 🐉 🗈 🎦 📸
	\$GPRMC,094221.88,A,2231.8738,N,11356.6409,E,0.01,0.00,210313,,,A*5C
	\$GPG\$0 0 3 6 1/ 29 31 2 50 2 25 0 75*38
	\$010011,11,0,0,14,29,01,,,,,,,,,,,,2.00,2.20,0.70*00
	\$GPVIG,0.00,I,,M,0.01,N,0.02,K,A*3E
	latitude longitude
	\$GPGGA,094222.88,2231.8738,N,11356.6409,E,1,04,2.25,53.86,M,M,*49
	 ¢CDC&U 1 1 0/ 06 33 177 35 1/ 37 120 /2 20 18 052 /7 31 // 020 /0±73
	401 034,1,1,04,00,00,177,00,14,07,127,42,27,10,002,47,01,44,027,47^70
	\$GPRMC,094222.88,A,2231.8738,N,11356.6409,E,0.03,302.70,210313,,,A*5
	\$GPG\$A,A,3,6,14,29,31,,2,50,2,25,0,75*38
	¢ΩΩUTC 302 70 T Ν 0 03 N 0 06 K 0∞3E
	[#0F¥10,302.70,1,,11,0.03,11,0.00,N,Π*3L

Step 4 Disconnect the GPS port on HyperTerminal to stop GPS location and NMEA data reporting.

1 9	gps - HyperTerminal
File	e Edit View Call Transfer Help
D	
_	Disconnect
\$	GPRMC,094221.88,A,2231.8738,N,11356.6409,E,0.01,0.00,210313,,,A*5C
\$	GPGSA,A,3,6,14,29,31,,,,,,,,,,,2.50,2.25,0.75×38
\$	\$GPVTG,0.00,T,,M,0.01,N,0].02,K,A×3E
\$	GPGGA,094222.88,2231.8738,N,11356.6409,E,1,04,2.25,53.86,M,,M,,*49
\$	GPGSV,1,1,04,06,33,177,35,14,37,129,42,29,18,052,47,31,44,029,49*73
\$	GPRMC,094222.88,A,2231.8738,N,11356.6409,E,0.03,302.70,210313,,,A*5
\$	GPGSA,A,3,6,14,29,31,,,,,,,,,,,2.50,2.25,0.75*38
\$	©PVTG,302.70,T,,M,0.03,N,0.06,K,A×3E



In Windows 8

On a computer running Windows 8, open a GPS-enabled map application to start GPS location.

2.3 A-GPS Test

Step 1 Load the Secure User Plane Location (SUPL) server and certificate information onto the nonvolatile storage of the MU736 module.

The MU736 module has integrated the server and certificate information, and no additional configuration is required. If an original equipment manufacturer (OEM) needs to load the certificate other than the integrated one, the OEM can contact Huawei to integrate the certificate into the PC Vendor tool. Once the certificate is integrated into the PC Vendor, one-click is required to load the certificate and relevant server information into the MU736 module.

Step 2 Insert a SIM card that has subscribed to network services into the MU736 module. Then set up a dial-up connection.

The MU736 starts the A-GPS positioning.

2.4 GPS Positioning in Windows 8

2.4.1 Using the Sensor Diagnostic Tool

To use the Sensor Diagnostic Tool provided in the Windows driver program installation kit:

- Step 1 Connect the MU736 module to one of the USB ports on a PC.
- Step 2 Right-click **My Computer**, and choose **Manage** from the shortcut menu. In the displayed **Computer Management** window, click **Device Manager** in the left pane, and check for **HUAWEI GNSS Sensor** under **Sensors** in the right pane.





Step 3 Close the window. Perform either of the following:

- If you are using A-GPS positioning, go to Step 4.
- If you are using GPS positioning, go to Step 5.
- Step 4 Set up a dial-up connection.

After the dial-up connection is set up, you can use the A-GPS positioning.



- Step 5 While the GPS antenna is located in an open sky environment, open the Sensor Diagnostic Tool. The Sensor Diagnostic Tool user interface is displayed, and GPS positioning starts.
- Step 6 In the left pane, select HUAWEI GNSS Sensor under Sensors.

Initializing is displayed in State, indicating that the GPS positioning is in progress.



HUAWEI MU736 HSPA+ M.2 Module GPS Application Guide

2	Sensor Diagnostic Tool 0.7.2	- 🗆 🗙
File Events Sensors		
Sensors Location		
Sensors	SB% Refresh Data Change Sensitivity A Execute Change 0	Automatic Data Request Report Interval
· · · · · · · · · · · · · · · · · · ·	Datafield SENSOR VALUES	Events Per Second State
	Properties WPD_OBJECT_ID	HUAWEI GNSS
	WPD_OBJECT_PERSISTENT_UNIQUE_ID	HUAWEI GNSS
	WPD_OBJECT_PARENT_ID	DEVICE
	WPD_OBJECT_NAME	HUAWEI GNSS
	WPD_OBJECT_FORMAT	UNSPECIFIED
	WPD_OBJECT_CONTENT_TYPE	FUNCTIONAL OBJECT
	WPD_OBJECT_CAN_DELETE	False
	SENSOR_DATA_TYPE_TIMESTAMP	2013-02-28T10:09:00.9740000+08:00
	SENSOR_DATA_TYPE_LATITUDE_DEGREES	0
	SENSOR_DATA_TYPE_LONGITUDE_DEGREES	0
	SENSOR_DATA_TYPE_ALTITUDE_SEALEVEL_M	0
	SENSOR DATA TYPE ALTITUDE ELLIPSOID M	0 ~
	Events	

Under **Properties**, the HUAWEI GNSS port information is displayed. Under **Data**, the latitude, longitude, system time, and moving speed of the MU736 are displayed. If the GPS positioning does not complete, only the system time of the MU736 is displayed.

When the content of **State** turns from **Initializing** to **Ready**, the MU736 has obtained its current position information. Under **Data**, you can view the GPS location information, including the latitude, longitude, altitude, and system time of the MU736.



	Sensor Di	agnostic Tool 0.7.2	2				х
File Events Sensors							
Sensors Location							
	SB% Refresh Data	Change Sensitivity	Automatic Da	sta Request	Report	Interval	
HUAWEI GNSS Sensor	Execute	Change	0	Execute	0	Execu	ute
✓ SUBSCRIBED	Datafield			Events Per S	Second	State	
	SENSOR VALUES		~	0	F	Ready	
	Properties						
	WPD_OBJECT_ID		HUAWEI	GNSS			^
	WPD_OBJECT_PERSIST	ENT_UNIQUE_ID	HUAWEI	GNSS			
	WPD_OBJECT_PARENT	ID	DEVICE				
	WPD_OBJECT_NAME		HUAWEI	GNSS			
	WPD_OBJECT_FORMAT		UNSPECI	FIED			
	WPD_OBJECT_CONTEN	T_TYPE	FUNCTION	NAL OBJECT			
	WPD_OBJECT_CAN_DEL	.ETE	False				
	CENCOR PROPERTY TO	VDF	CENCOR	TYPE LOCAT			~
	Data		_				
	SENSOR_DATA_TYPE_T	IMESTAMP	2013-01-1	8T22:37:20.80	80000+08:00	⁾ Time	^
	SENSOR_DATA_TYPE_L	ATITUDE_DEGREES	22.530988	13333333 La	atitude		
	SENSOR_DATA_TYPE_L	ONGITUDE_DEGREES	113.94432	3333333	ongituc	e	
	SENSOR_DATA_TYPE_A	LTITUDE_SEALEVEL_N	M 121.67	Al	titude		
	SENSOR DATA TYPE A	LTITUDE ELLIPSOID	M 121.67				~
	Events						
	2013-01-18T22:36:20.8527 2013-01-18T22:36:20.8684 2013-01-18T22:36:23.0873 2013-01-18T22:36:26.0874	7938+08:00 State Chang (210+08:00 State Chang (022+08:00 State Chang (247+08:00 State Chang)	ed event for sen ed event for sen ed event for sen ed event for sen	sor HUAWEI G sor HUAWEI G sor HUAWEI G sor HUAWEI G	NSS Sensor NSS Sensor NSS Sensor NSS Sensor	to state Ready to state Ready to state Initializi to state Ready	ng

2.4.2 Using the Maps Application

To use the Maps application for GPS positioning:

Step 1 Open Maps.





Your current location is displayed on the map within 1 minute. In this example, the location of the Huawei Device building is displayed.



Step 2 To have a better view of the current location, click **Map style** at the bottom and select **Aerial view**.

The current location is updated per second. To check the NMEA sentences, access the Bus Hound.



HUAWEI MU736 HSPA+ M.2 Module GPS Application Guide

GPS Test Procedure







3.1 Overview

The MU736 GPS Tool is used to test the GPS functions.

Prepare Tools:

NO.	Name	Comment
1	GPS Tool 1.6.0.0	Run the GPS test

3.2 Test Procedure

3.2.1 Setting the Debug Mode

The purpose of this step is to expose the GPS Interface and PC UI Interface in the **Windows 8** system. So if your computer system is Windows 7/Windows XP, please skip this step and run the next step (chapter 3.2.2) directly.

The GPS Tool 1.6.0.0 will enable debug mode **automatically** once you open the GPS Tool; and it will exit debug mode when you close the GPS Tool.

However the driver has the bug that cannot display the interface friendly name. We will resolve it as soon as possible.

Now the contingency scheme is to distinguish the interface by the following steps.

Step 1 Open the GPS Tool.



M Intel Mobile Communications - GPS Tool Ver. 1.6.0.0	×
AGRESS AT Terminal Configuration IMMEA Interval (0-300): 1 Interval (0-300): 1 Connect Stand Alone Hot Start Signal to Noise Ratio (capped at 50) 00	CEP Truth Latitude: 0.0 (* North C South Truth Longitude: 0.0 (* East C West Input Log file Calculate CEP

Step 2 Get the interface friendly name.

- 1) Open the Ports list, and choose HUAWEI Mobile Connect Serial Port(COM22)
- 2) Select the Properties
- 3) Select the **Details**
- 4) Select the Compatible Ids in Property list
- 5) Check the interface friendly name in Value (It is means that COM22 USB/MS_COMP_HWJGNSS is the GPS interface exactly)





HUAWEI Mobile Connect - Serial Port (COM22) Propert ×
General Port Settings Driver Details Events Power Management HUAWEI Mobile Connect - Serial Port (COM22)
Property 4 Compatible Ids
Value 5 USB\MS_COMP_HWJGNSS USB\Class_ff&SubClass_02&Prot_05 USB\Class_ff&SubClass_02 USB\Class_ff
OK Cancel

3.2.2 Configuring the Dialog Windows

Create a New Result Log File

- Step 1 Create a new **Result Log file** to store the **locate process log** (named gps_log) in **Configuration > NMEA**.
 - 1) Press **Result Log file** button
 - 2) Write down a **File name** (gps_log)
 - 3) Press Save button



4	Intel M	lobile Commur	ications - GPS Tool Ver. 1.3.0).0	-
AGNSS AT Terminal		-	Court	A -	×
Configuration	Testing	with.	Save	As	
NMEA C AT port O NMEA port	Test Type Stand Alone Cold Star	Save in:	GPSTool	• E 🛉 💷 •	
Port: COM8 (HUAWEI Mobile -	C Stand Alone Warm Sta	C.	Name	Date modified	Туре
Baud: 115200 - RTS	C Stand Alone Hot Start	Recent places) photo	1/5/2013 2:36 PM	File folder
Interval (0-30s): 1 V DTR	C Stand Alone Tracking		gps_at	1/5/2013 11:03 AM 1/5/2013 2:12 PM	Text Docu
Result Log file 1	C SUPL MS based	Desktop	gps_result	1/5/2013 10:59 AM	Text Docu
recourt bog nic	Signal to Noise Ratio (cap		gps_result1	1/5/2013 11:14 AM	Text Docu
Disconnect Start Logging	00 00 00 00 00	in the second se	gps_track	1/5/2013 2:28 PM	Text Docu
SUPL Server			gps_track_result	1/5/2015 2:20 PM	Text Docu
Server Config file Set					
PDP Context		Network			
			<		>
APN Config file Set			File name: gps_log 2	_ 3	Save
			Save as type: Log files (*.log)	_	Cancel
Profile	00 00 00 00 00	0 00 00 00	00 00 00		
Save Load		00 00 00			

- Step 2 Create a new **Result Log file** to store the **position data output** (named gps_result) in **Testing**.
 - 1) Press Result Log file button
 - 2) Write down a File name (gps_result)
 - 3) Press **Save** button



4	Intel Mobile Communications - GPS Tool Ver. 1.3.0.0					
AGNSS AT Terminal						
Configuration NMEA C AT port	t	Sensitivity level: -130dbm t No of Iterations: 100	•			
Baud: 115200 V F Interval (0-30s): 1 V C C:\Users\test\Desk Result Lo	RTS C Stand Alone Hot Start DTR C Stand Alone Tracking g file C SUPL MS based	Fix Time Out: 300 Start	g file			
Disconnect Start Lo	4	Save As	×			
SUPL Server	Save in: 🔒 GPSTool	•	← 🗈 📸 🎟 -			
	Name	*	Date modified Type			
Server Config file Se	Recent places gps_at		1/5/2013 2:38 PM File folde 1/5/2013 11:03 AM Text Doc			
PDP Context	Desktop gps_at1 gps_result gps_result1		1/5/2013 2:12 PM Text Doc 1/5/2013 10:59 AM Text Doc 1/5/2013 11:14 AM Text Doc			
APN Config file Se	Libraries gps_track_resu	ult	1/5/2013 2:28 PM Text Doc 1/5/2013 2:20 PM Text Doc			
Profile	i 🔍					
Loa	Computer Computer Network					
	<		3 >			
	File name:	gps_result 2	▼ Save			
	Save as type:	Log files (*.log)	- Cancel			

Step 3 Press Start Logging button.



蝴	Intel Mobile Communications - G	PS Tool Ver. 1.3.0.0
AGNSS AT Terminal		
Configuration	Testing	
NMEA-	Test Type Sensitivity level: -130dbm	-
C AT port	Stand Alone Cold Start No of Iterations: 100	-
Port: COM8 (HUAWEI Mobile 🗸	C Stand Alone Warm Start	
Baud: 115200 👻 🔽 RTS	C Stand Alone Hot Start	
Interval (0-30s): 1	C Stand Alone Tracking	
C:\Users\test\Desk Result Log file	C SUPL MS based Fix Time Out: 300 Start Te	est
Disconnect Start Logging	Signal to Noise Ratio (capped at 50)	ок
SUPL Server		
		^MODE: 5,9
Server Config file Set		+XLSRSTOP: OK
PDP Context		^MODE: 5,4
		^MODE: 5,7
APN Config file Set		^MODE: 5,9
Profile		
Save Load	00 00 00 00 00 00 00 00 00 00 00 00 00	^MODE: 5,7

Configure the Fix Settings

- Step 1 Set the NMEA output **Interval**, by which you can set the NMEA sentences output interval. (The default value is 1s.)
- Step 2 Set the **NO. of Iterations**, by which you can decide how many GPS sessions you want to try (It depends on yourself, if you have enough time, the more is the better.)
- Step 3 Set the **Fix Time Out**, by which you can set a GPS session duration. (The default value is 300s.)
- Step 4 Set the **Tracking Interval**, by which you can set a GPS Tracking session interval (only for Stand Alone Tracking test, in which the NMEA output Interval must be the multiple times of Tracking Interval).



蝴	Intel Mobile Communications - GF	S Tool Ver. 1.3.0.0
AGNSS AT Terminal		
Configuration	Testing	Π
NMEA C AT port	Test Type Sensitivity level: -130dbm Image: Stand Alone Cold Start No of Iterations: 10 2 Image: Stand Alone Warm Start Tracking Interval: 10 2 Image: Stand Alone Hot Start Tracking Interval: 10 2 Image: Stand Alone Hot Start Image: Stand Alone Tracking Image: Stand Alone Tracking Result Log from Start Terval: Image: Stand Alone Tracking Image: Start Terval: Image: Start Terval: Start Terval: Image: Start Type Start Terval: Image: Start Terval: Start Terval:	▼ I 4 st
Disconnect Stop Logging SUPL Server Server Config file	Signal to Noise Ratio (capped at 50) 42 44 41 N.A	\$GPGSV, 1, 1,03,09,00,0 \$GPRMC,,V,,,,,,N*5 \$GPGSA,A, 1,,,,,,,,
PDP Context APN Config file Set Profile		\$GPVTG,,T,,M,,N,,K,N*. AT+XLSRSTOP OK
Save Load	9 15 24 N.A	+XLSRSTOP: OK

Configure the AT Port

- Step 1 Select the **AT port**.
- Step 2 Select the PC UI Interface in Port list.
- Step 3 Set the **Baud** rate to **115200**.
- Step 4 Mark the checkboxes (RTS and DTR).
- Step 5 **Connect** the PC UI Interface as AT port.



4	Intel Mobile Communications - GPS Tool Ver. 1.3.0.
AGNSS AT Terminal	
Configuration	Testing
NMEA 1	Test Type Sensitivity level: -130dbm 🗸
AT port O NMEA port	Stand Alone Cold Start No of Iterations: 100
Port: hnect - PC UI Interface) - 2	O Stand Alone Warm Start
3Baud: 115200	O Stand Alone Hot Start
Interval (0-30s): 1 V DTR	C Stand Alone Tracking Result Log file
Result Log file	C SUPL MS based Fix Time Out: 300 Start Test
5 Connect Start Longing	Signal to Noise Ratio (capped at 50)
	00 00 00 00 00 00 00 00 00 00 00 00
SUPL Server	
Server Config file Set	
PDP Context	
APN Config file Set	
Profile	
Save Load	

Start the GPS Test

- Step 1 Select **Test Type**, such as **Stand Alone Cold Start**. Note that if you want to select the **SUPL MS based**, you should dial-up and surf on internet at first.
- Step 2 Press Start Test button to start the GPS session.



4						h	ntel	Mol	oile	Con	nmu	inica	atior	ns - G	PS Tool Ver. 1.3.0.0
AGNSS															
Configuration	7 6	T	estino												
NMEA			Tes	: Тур	e				Se	ensitiv	vity le	vel:	-130	Odbm	•
C AT port NMEA port			•	Stand	d Alor	ne Co	ld Sta	rt	No	oofI	terati	ons:	100		_
Port: COM8 (HUAWEI Mobile 💌		1	0	Stand	d Alor	ne Wa	arm St	tart	Te	acking	a Tota	evale	Ē		
Baud: 115200 🗸 🔽 RTS			0	Stand	d Alor	ne Ho	t Star	t		archair ing	g 11100	a ven.			
Interval (0-30s): 1 DTR			0	Stand	d Alor	ne Tra	acking			:\Use	ers\te	st\D	Res	ult Log	file
C:\Users\test\Desk Result Log file			0	SUPL	MS b	ased			Fib	c Time	e Out	: 300		Start To	est 2
Disconnect Stop Longing		[Sign	al to	Noise	e Rati	o (cap	oped	at 50)—					
			00	00	00	00	00	00	00	00	00	00	00	00	+XLSRSTOP: OK
SUPL Server															
															HODE. 3,4
Server Config file Set															^MODE: 5,7
PDP Context															^MODE: 5,9
															^MODE: 5,7
APN Config file Set															
Profile															HODE: 3,5
Save Load			00	00	00	00	00	00	00	00	00	00	00	00	^MODE: 5,7
		_													,

Configure the NMEA Port

Make sure you have pressed Start Test before this step.

- Step 1 Select the **NMEA port**.
- Step 2 Select the **GPS Interface** in **Port** list.
- Step 3 Set the **Baud** rate to **115200**.
- Step 4 Mark the checkboxes (**RTS** and **DTR**).
- Step 5 **Connect** the GPS Interface as NMEA port.



- Tua		-
	Intel Mobile Communications - GPS Tool Ver. 1.3.0.	0
AGNSS AT Terminal		
Configuration	Testing	
NMEA	Test Type Sensitivity level: -130dbm 💌	
○ AT port	Stand Alone Cold Start No of Iterations	
Port: COM12 (HUAWEI Mobile - 2	C Stand Alone Warm Start	
3 Baud: 115200 - RTS	C Stand Alone Hot Start	
	C Stand Alone Tracking C:\Users\test\D Result Log file	
Interval (0-30s): 1		
C:\Users\test\Desk Result Log file	Fix Time Out: 300 Stop Test	
E Connect Stop Logging	Signal to Noise Ratio (capped at 50)	-
S Connect Stop Logging	00 00 00 00 00 00 00 00 00 00 00 00	
SUPL Server		
Server Config file Set		
PDP Context		
APN Config file Set		
Profile		
Saus Lord	00 00 00 00 00 00 00 00 00 00 00 00	
Save		

3.3 Checking Window Display

3.3.1 Checking Signal Quality Window

You can get the following data from NMEA sentences:

NO.	Item	Description
1	SNR	Raw SNR value is displayed at the top of each bar which is capped at 50.
2	Satellite ID	They are shown at the bottom of each bar.
3	Green bars	The color of bars changes to green during acquisition.
4	Blue bars	The color of bars changes to blue after position is acquired.



GPS Tool User Guide

11	Intel Mobile Communications - G	PS Tool Ver. 1.3.0.0
AGNSS AT Terminal Configuration	Testing Test Type Stand Alone Cold Start C Stand Alone Warm Start	 ✓ 22.531800 N, 113.5 86.00000,0.12,-0 22.531049 N, 113.5 E, 17.000000,0.13, 22.530062 N, 113.5
Baud: 115200	C Stand Alone Hot Start C Stand Alone Tracking C SUPL MS based Fix Time Out: 300 Signal to Noise Ratio (capped at 50)	E, 157.000000,0.14
Superior Stop Logging	1 40 44 35 43 39 N.A N.A N.A N.A N.A N.A N.A A	\$GPGGA,,,,,0,,,,M,,M,, \$GPGSV,2,1,05,05,00,00
PDP Context APN Config file Set		\$GPRMC,,V,,,,,,,N*5:
Save Load	2 5 9 15 24 26 N.A N.A N.A N.A N.A N.A N.A N.A	\$GPVTG,,T,,M,,N,,K,N*2



3.3.2 Checking Location Data Window

Once the position is acquired, the following data will be shown in the window and logged in the result log file.

NO.	Item	Description
1	Specific Location Data	Contains all data you can get from NMEA sentences.
2	AT Command	Starts the next time location.
3	Summary Location Data	Contains summary location data which are: • Latitude and Longitude, Directions • Altitude • Speed (Horizontal & Vertical) • TTFF



3.3.3 Checking A-GPS Location Window

Because there is no need to get the TTFF in A-GPS mode, and our specification is track fix.

NO.	Item	Description			
1	Test Type	SUPL MS based			
2	SNR bars	Doesn't change color in A-GPS.			



NO.	Item	Description
3	Location data	When the Latitude, Longitude and Directions displayed, it means that we have acquired the position.



3.4 Calculating CEP

3.4.1 Averaging TTFF

After all tests (**NO. of iterations**) have finished or you artificially press the **Stop Test**, you should **Stop Logging** subsequently.



Then the Average TTFF will be calculated.

You can see the detailed position result in the **position data** output document (named gps_result.txt).



HUAWEI MU736 HSPA+ M.2 Module GPS Application Guide

Take the example of **22.531349 N,113.943328 E, 38.000000,0.21,0.02,42**, the specific meaning of these data:

22.531349	Latitude
Ν	Directions
113.943328	Longitude
Ε	Directions
38.000000	Altitude(m)
0.21	Horizontal Speed(km/h)
0.02	Vertical Speed(km/h)
42	TTFF(s)

3.4.2 Calculating CEP

- Step 1 Input **Truth Latitude** value with direction.
- Step 2 Input Truth Longitude value with direction.
- Step 3 Input **log file** (the same as the **position data** output document (named gps_result.txt) as substep 3-5 in the following figure.
- Step 4 Press Calculate CEP button as substep 6.



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ting est Type Stand Alone Colo Stand Alone War Stand Alone Hot Stand Alone Trac	I Start m Start Start Start king	vity level: -130dbm • terations: 100 g Interval: ers\test\D Result Log file	22.531 86.000 22.531 E,17.0 E,157. 22.530 E,157. 22.530 75.000 22.531	800 N, 113.942041 E,- 000,0. 12,-0.01,42 049 N, 113.943436 0000,0. 13,-0.01,42 062 N, 113.945732 000000,0.14,-0.03,37 598 N, 113.945731 E,- 000,0.27,-0.00,79 317 N, 113.943521	1 Truth 22.5 2 Truth 113.1	Latitude: 31250 • North C South Longitude: • East C West 3 Input Log file 6 Calculate CEP
Look in: Recent places Desktop Libraries Libraries Computer Computer	GPSTool Name photo gps_at gps_lag gps_lag gps_result gps_result gps_track gps_track_re	4 esult	•	← È È ⊡ ← ⊡ Date modified 1/5/2013 3:01 PM 1/5/2013 11:03 AM 1/5/2013 2:12 PM 1/5/2013 2:26 PM 1/5/2013 11:14 AM 1/5/2013 2:28 PM 1/5/2013 2:20 PM	Type File folder Text Docu Text Docu Text Docu Text Docu Text Docu Text Docu Text Docu	
	File name: Files of type:	gps_result Log files (*Jog)		- 5 - [> Open Cancel	T) ions Port (COM1) ions Port (COM2) ile Connect - ADBG Inte

The **HCPE** result will be saved in the <Result Log File>_CEP.txt (named gps_result_CEP.txt here), and you can see it in the window too.



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Cold Start Warm Start Hot Start Tracking ed	Sensitivity level: -130dbm No of Iterations: 100 Tracking Interval: C:\Users\test\D Result Log Fix Time Out: 300 Start T	Image: Product of the state of th			
atio (capped a	at 50) N.A N.A N.A N.A N.A N.A	^MODE: 5,9 ^MODE: 5,7			
		^MODE: 5,9			
		^MODE: 5,9			
I.A N.A N.A	N.A N.A N.A N.A N.A N.A	^MODE: 5,7 ^MODE: 5,9			

3.5 Exiting the GPS Tool

The module will exit the debug mode once you close the GPS Tool.

Then you cannot see the GPS interface and PC UI interface in the **Device Manager**. But the **HUAWEI GNSS Sensor** is still shown in the **Sensors** list.



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	 Print (COM & CPT) Communications Port (COM1) Communications Port (COM2) Print queues Processors Security devices Sensors HUAWEI GNSS Sensor Windows Location Provider Software devices Software devices Sound, video and game controllers System devices Universal Serial Bus controllers Universal Serial Bus controllers



4 Acronyms and Abbreviations

Acronym or Abbreviation	Expansion
A-GPS/AGPS	Assisted GPS
CEP/CPE	Circular Error Probable
GPS	Global Position System
HCPE	Horizontal Circular Probable Error
NMEA	National Marine Electronics Association
NVM	Non-Volatile Memory
SUPL	Secure User Plane Location
TTFF	Time To First Fix