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K series OEM Card Quick Tour

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Content

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Chapter 1 evaluation package list

1.1 Evaluation package list

Thanks for choosing ComNav K series, after you receive the goods, please check the package list as following.

Raw.	Name	No.	Index
1	K series OEM Card	2	
2	K series Interface board	2	
3	A/C adapter	2	
4	USB cable	2	Using USB cable can supply power to the OEM Card
5	RS232 Cross line	2	Female RS232 to Female RS232 cable
6	GNSS antenna	2	GPS+Beidou+Glonass
7	GNSS antenna cable	2	

1.2 k series Interface board introduction

K series Interface board is the hardware test platform for k series OEM Card, which has 3 serial ports and 2 power supply ports.

❶ External DC power supply, 12v-4.0A
❷ USB power supply, 5V
❸ 3 series ports
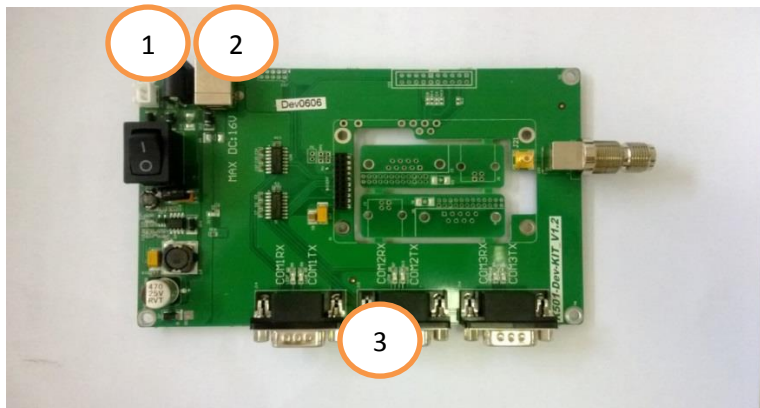
Chapter 2 System installation

The figure shows the whole installation

2.1 K Series OEM Card Installation

The following figure shows the installation (K501 as an example). Fix the 20 PIN of OEM Card to the Interface board; at same time in another direction , fix the RF connection to Interface board and press down, after installing the OEM Card, please make sure all the connector is 100% fitting.

Tips; when uninstalling the OEM Card, use the right way to avoid the damage to the OEM Card, unplug the OEM Card by using the right top way.

![ComNav logo]
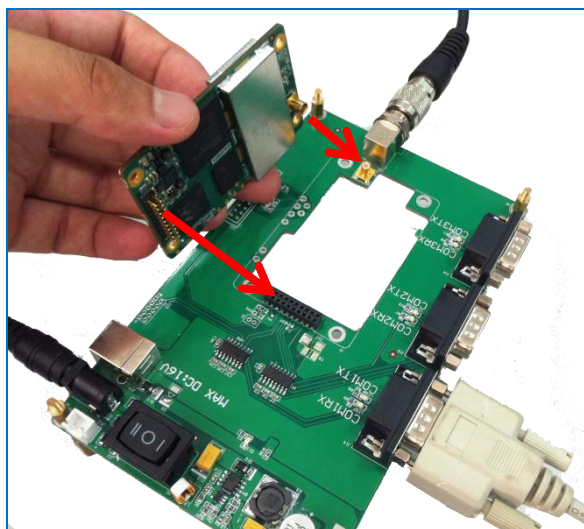
2.2 others

2.2.1 GNSS antenna installation

The Installation of GNSS antenna is a very important factor to effect the preference(performance) of OEM Card, it will have big influence on visible satellite and SNR, be sure to fix antenna in open area and far from big power electromagnetic radiation device.

2.2.2 Power supply

Use ComNav standard 12 Voltage adapter to supply power to the OEM Card, also you can use USB to supply power.

2.3 K series OEM power on and test preparations

2.3.1 Test Preparations

Before you do the test, please pay attention to all the LED indicators.
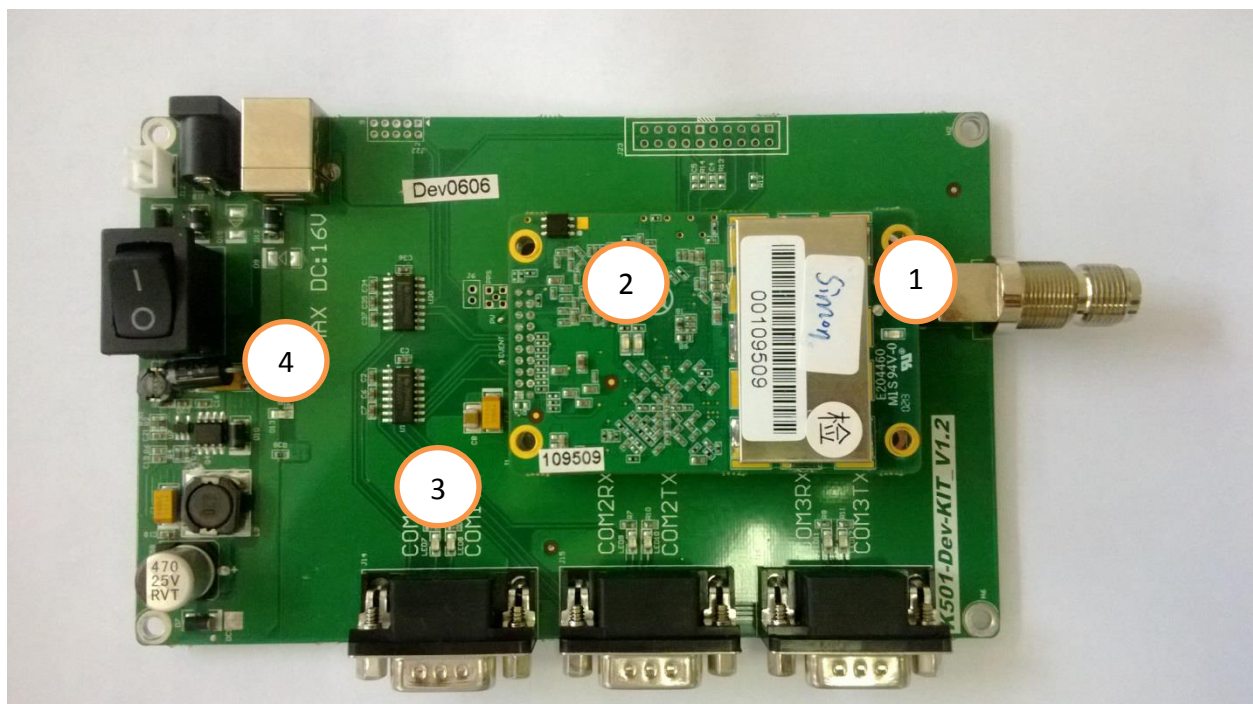
Ref. # Description
❶ OEM Card Power indicator, this LED will light in yellow colour after power on.
❷Two LED, Satellites indicator and correction message indicator.

a: satellites indicator, it will flash several times every 5 seconds, which means how many satellites have been locked by receiver.

b: correction message. As base station, if flash 1/s means sending correction message 1/s; as Rover means receiving correction message.
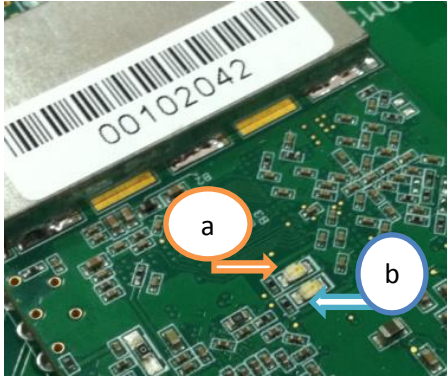
❸Serial port data commutation indicator

The right LED flash: Data output from OEM board
The left LED flash: Data incoming from external device, such as correction message, command send by PC.

❹Interface board power indictor; indictor of the Interface board power on

2.3.2 Power on the device

After connecting all the parts, Press the power button on the Interface board.

Press the button to power on receiver

After power on the receiver, the Interface board power LED (LED 4), and the OEM Card LED (led 1), 3 serial ports LED will flash together, then you can enter the test mode.

Open the COM debug software, set the serial port band rate as 115200bps, use PC link with device, and send the command to receiver. For detailed command please refer to the **ComNav OEM CARD REFERENCE MANUAL.**

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Chapter 3 K series OEM CARD Frequently Used Command

Tips;
1. Send all the commands to receiver, do not distinguish between letter case; Such as; Log version=LOG VERSION.
2. After inputting every command, press Enter button to change line and input another command.
3. For More detailed command information, please refer to ComNav OEM CARD REFERENCE MANUAL.

3.1 Base station configuration

Send command to Com1/Com2/Com3, RTCMV3 as the broad cast, the default band rate is 115200bps.

Command	Description
Unlog all	remove all log information currently in used
fix auto	Fix the current coordinates as base coordinates
log com2 rtcm1004 ontime 1	com 2 output EXTENDED GPS RTK L1/L2
log com2 rtcm1104b ontime 1	com 2 output EXTENDED Beidou RTK B1/B2/B3
log com2 rtcm1012b ontime 1	Com2 output Extended GLONASS RTK L1/L2
Log com2 rtcm1005b ontime 5	Base station coordinates
com com2 9600	change the com 2 band rate to 9600bps
saveconfig	Change the band rate to 9600, then send the command, save the current setting to the receiver, next time when receiver is power on those setting will activate

Tips; There are 3 types of GNSS RTK observations according to constellation system, GPS(RTCM1004), Beidou(RTCM1104) and Glonass(RTCM1012), send different commands according to module.

For example; use com1 to connect with PC, use com3 to output RTCM V3, send the following command (request GPS and Beidou RTK observations);

unlogall
fix auto
log com3 rtcm1004b ontime 1
log com3 rtcm1005b ontime 5
log com3 rtcm1012b ontime 1
log com3 rtcm1104b ontime 1
com com3 9600
saveconfig
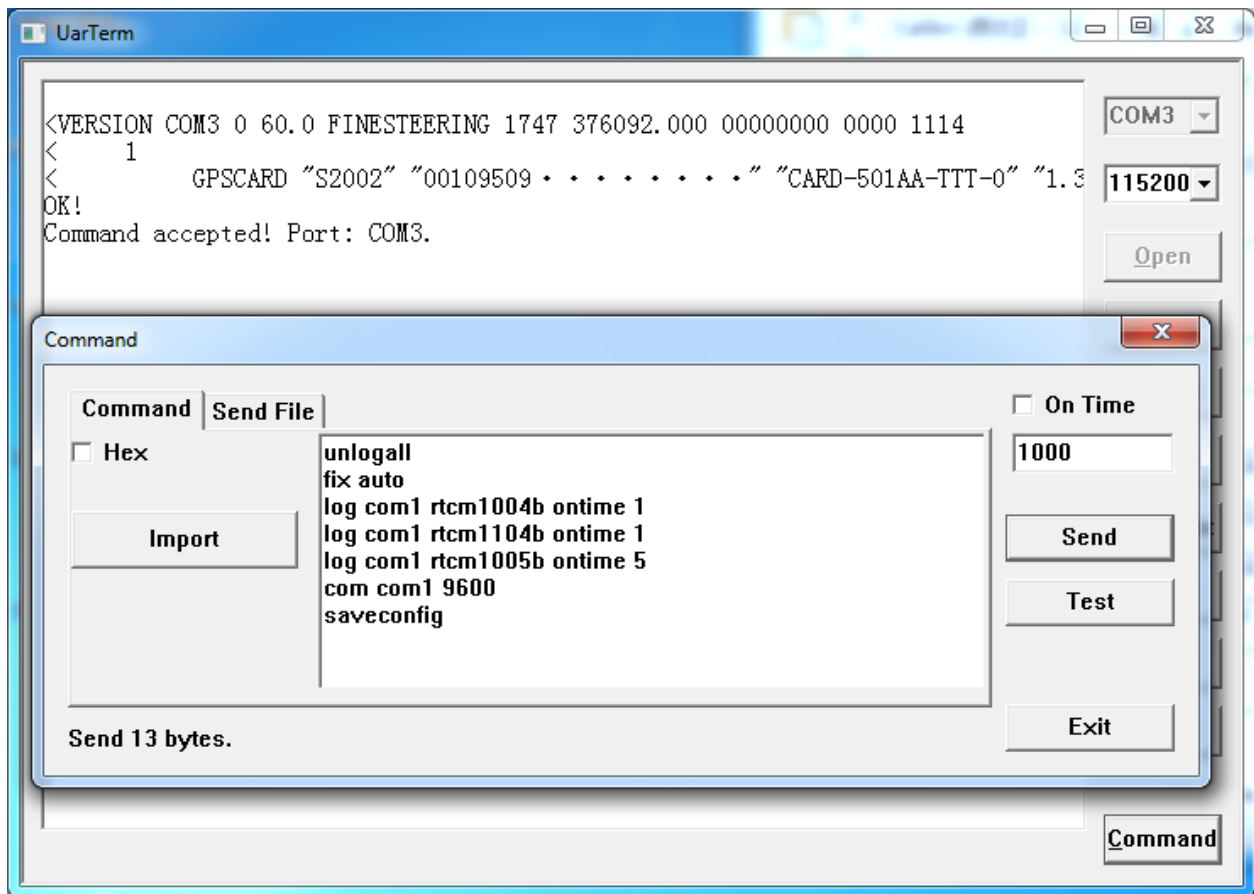
Tips; if you want to start the base station on known points, such as (31.123 N degree, 123.456E, 45 Height), please fix the base station coordinates by using the command **Fix Position 31.123 121.456 45**.

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3.2 Rover configuration

3.2.1 Set Rover to differential mode

INTERFACEMODE <port> <input-message> <output-message> ON

For example; use Com2 to receiver correction message, send the following command;

Command	Description
Com com2 9600	Match the correction message band rate as same as Base station
interfacemode com2 auto auto on	Auto detect the correction message type
Saveconfig	Save the setting to the receiver

3.2.2 Check the solution type

Send command to output GPGGA information to check the solution type;
Log <port> GPGGA ONTIME <Frequency>

Frequency description; 1(HZ), 2(2 seconds), 0.2(5HZ)

For example;

$GPGGA,<1>,<2>,<3>,<4>,<5>,<6>,<7>,<8>,<9>,M,<10>,M,<11>,<12>*hh<CR><LF>
$GPGGA,012827.00,3110.484867,N,12123.913553,E,4,05,1.4,39.4,M,8.012,M, 2.0,0031,*6E

<6> GNSS solution type：0=Fix not available，1=GPS FIX，2=RTD， 4=RTK FIXED，5=RTK floating, 6= Dead Reckong mode, 7= Manual input mode, 8= Super wide-lane mode,9= WASS MODE

3.3 Change the serial port band rate

Com <port> <band rate>
For example; com com1 9600   /change com1 band rate to 9600bps/

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3.4 satellites constellation system configuration

Command	Description
lockout bd2	Lock out Beidou system
lockout gps	Lock out GPS system
Lockout GLONASS	Lock out Glonass
Unlockoutall	Unlock all GNSS system

3.5 log raw data of GNSS observations

Raw data request command;

The ephemeris requests two different formats, you can use either of them;

ComNav Raw data Request command (ephemeris in ComNav format)	ComNav Raw data Request command (ephemeris compiler with Novatel format)
log com1 rangecmpb ontime 1	log com1 rangecmpb ontime 1
log com1 rawephemb onchanged	log com1 gpsephemb onchanged
Log com1 glorawephemb onchanged	Log com1 gloephemerisb onchanged
log com1 bd2rawephemb onchanged	log com1 bd2ephemb onchanged

Command   **explain**

Ecutoff 13   \se the mask angle as 13 degree\
log com1 rangecmpb ontime 1   \set com 1 output **cmp**[1] in binary data format, the frequency is **1**[2] HZ\
log com1 rawephemb onchanged   \if gps ephemeris changed, output 1 time \
log com1 bd2rawephemb onchanged   \if beidou ephemeris changed, output 1 time \
Log com1 gloephemerisb onchanged   \ Output glonass ephemeris\
saveconfig   \save the setting to receiver, next power on it will auto output\

1. CMP channel measurements for the currently tracked satellites.

2. The MAX out frequency is 20 Hz, if using 20HZ, please send the command
SET CPUFREQ 624   \change CPU frequency more faster to support 20HZ\
Normally we use **10HZ, 5HZ, 2HZ and 1HZ**, the relative command is **0.1/0.2/0.5/1**

After sending those commands, the raw data will output by receiver, save the data in your PC. Use ComNav Rinex convert tools to covert the data to Rinex, then you can analyse the data in any software.

3.6 Position Frequency command

The default output frequency;
 20HZ   Raw data output
 10HZ   SPP(single point position)
 5HZ   DGPS(RTK mode or RTD mode)
You can use the following command to activate 10Hz RTK output, 20Hz SPP output, send those following commands to receiver;

SET CPUFREQ 624
SET PVTFREQ 10
SET RTKFREQ 10
Saveconfig

3.7 Time service

The receiver can output a 1 pulse-per-second (1PPS) time strobe and an associated time tag message. The time tags are output though the 18th Pin of OEM Card.

The precision of PPS is 20ns, the receiver PPS out is a 1.8 V TTL level with a maximum source/sink current of 4 mA
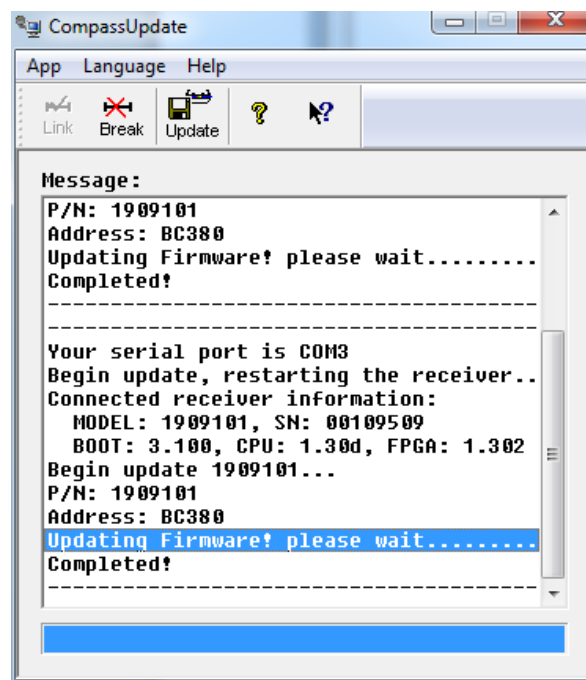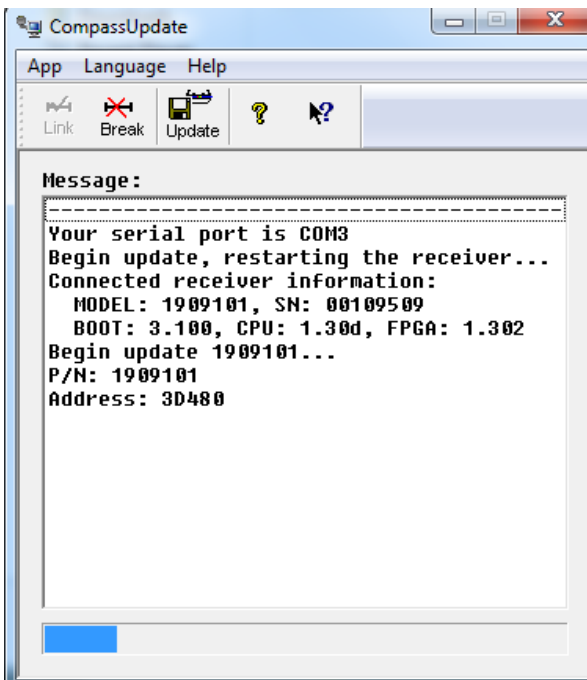
3.8 update the OEM Card

You must use the serial port to do update, connect your PC with Interface board (there are three ports, you can use either of them).
Open the update file***.exe, go to App->Link Setup, select the right serial port of your PC, then click ok, click link.
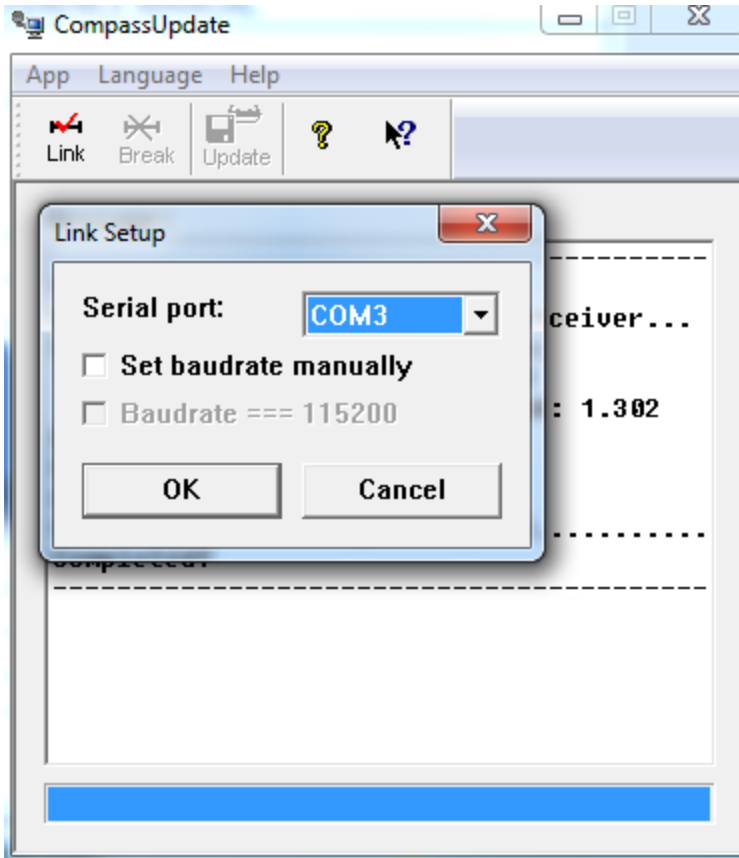
Click update, the programme bar will make progress, this will take a few seconds.

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Chapter 4 Configuration OEM Card by CRU software

Introduction

Compass Receiver Utility is a windows-based GUI that allows you to access your receiver's many features without the need to use a terminal emulator or to write special software. CRU lets you easily communicate and configure your receiver via serial port, Ethernet connection use a PC to run the Windows XP or Windows 7 operating system.

Note; please go to ComNav website
http://www.comnavtech.com/download.asp?bigclassid=28, download the software and installation in PC.

4.1 connected with GNSS receiver

You can use serial port of PC or TCP directly to connect with receiver; if using serial port communication, the default band rate is 115200(OEM Card band rate); if using TCP connect, directly key in IP address and port.

Go to Set port-> after setting up the connections, click OK
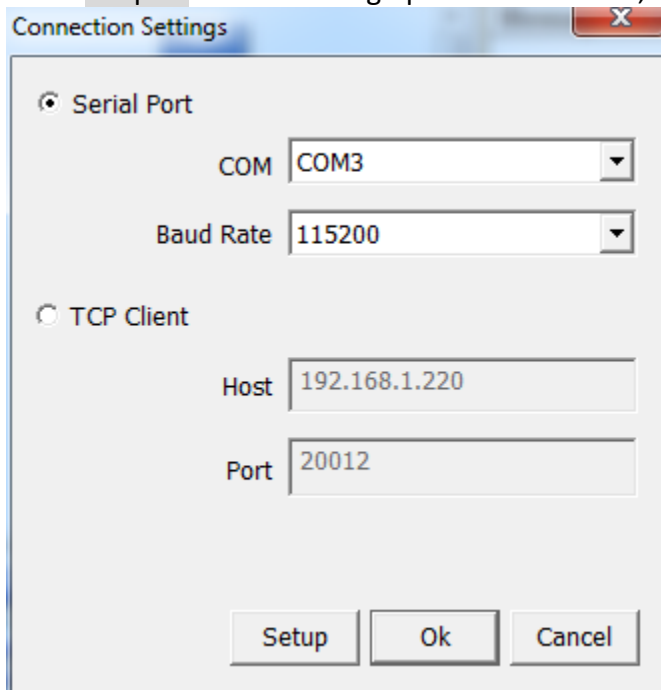
If connected successfully, you will see that the SN number of receiver will show on the left top of software operation window; if not, please check the power and connection of all parts.
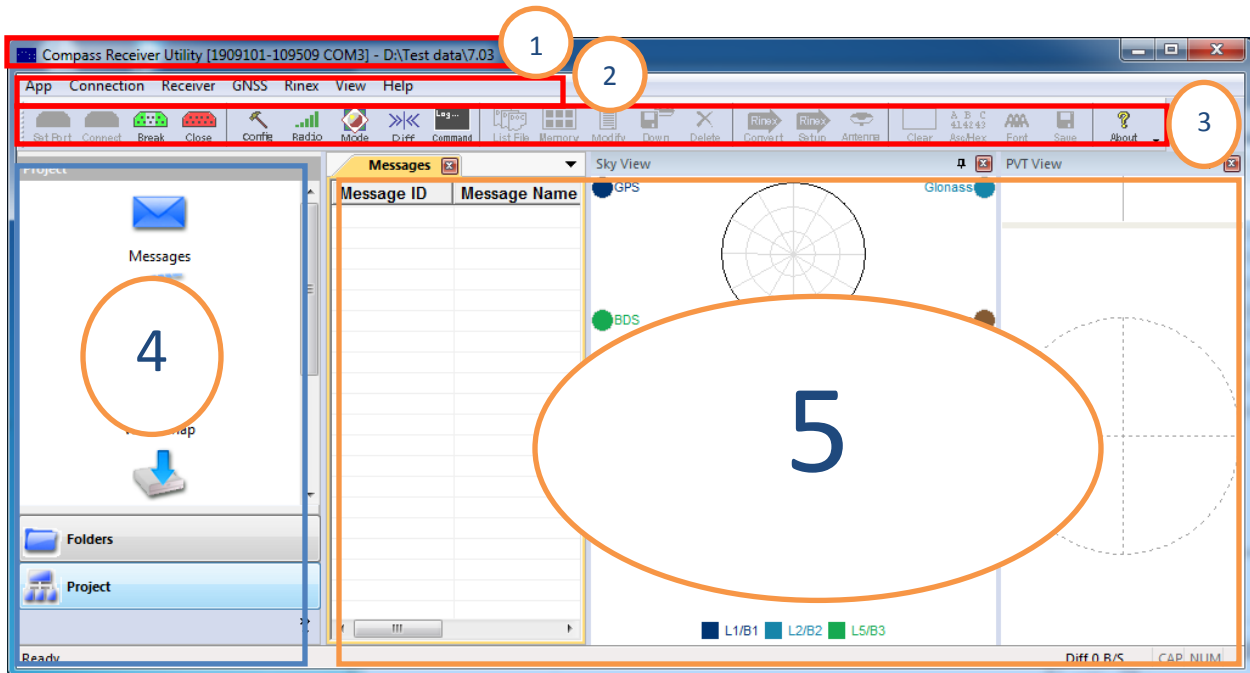
❶Connection status; SN No. of receiver, the data download path. You can select the data download path from the left function bar-> Folders, select the folder path.

❷Main menu; all the operation of software menu can be found here

❸Shortcut bar; make you easy to access some frequently operation

❹Function bar; select the function, such as data download, convert to Rinex data.

❺Main window; show the information such as PVT view, SV sky plot view, hyper terminal.

4.2 Receiver configuration

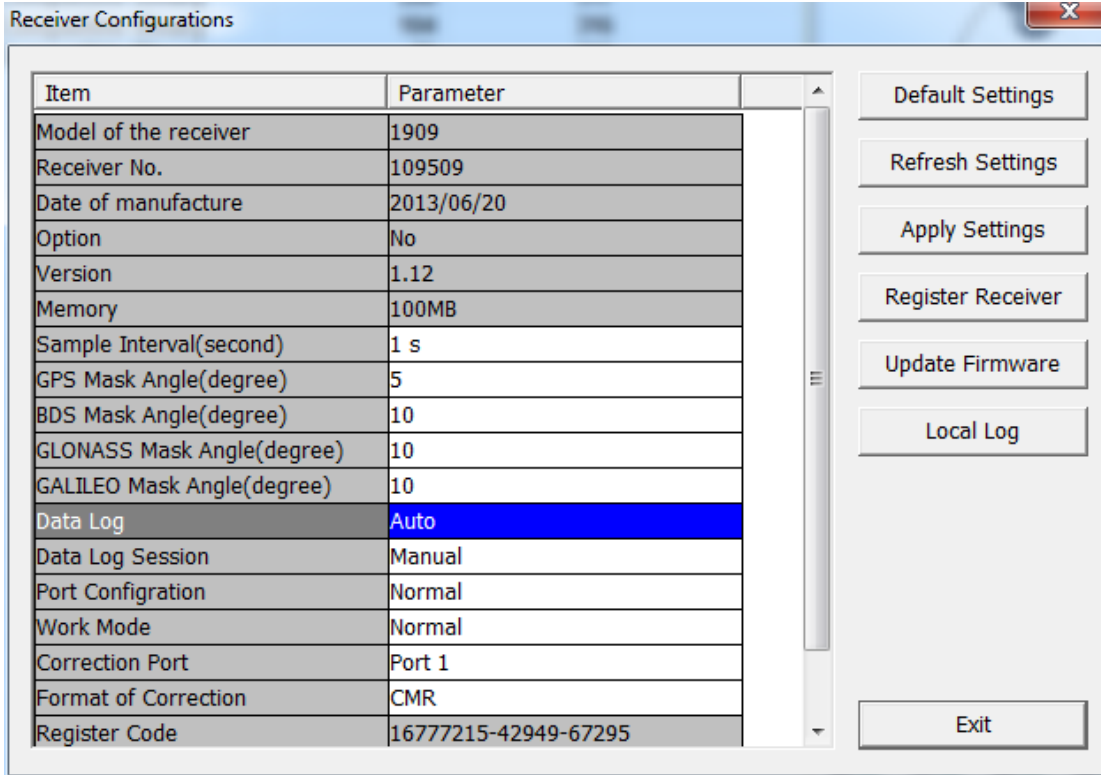### 4.2.1 Satellites configuration and raw data recording set up.

Go to the shortcut bar, click Config,
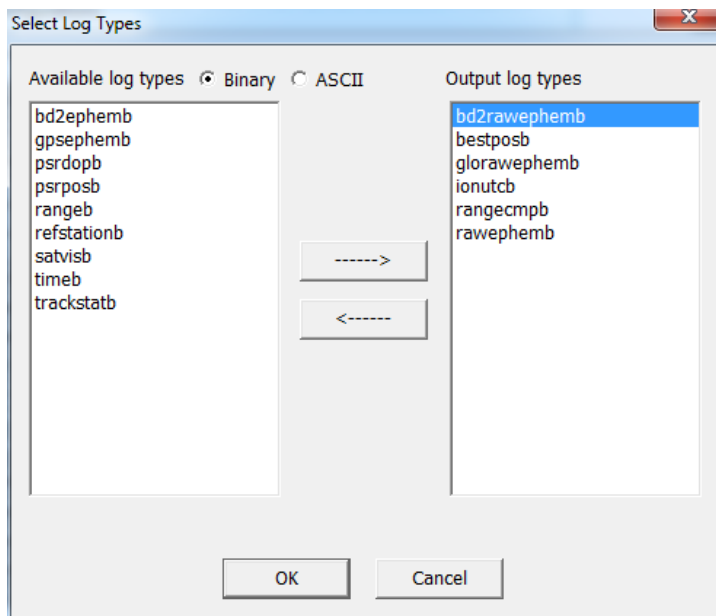
Satellites configuration;
Mask angle, GPS/Beidou/Glonass
Raw data sample interval, 1/2/5.
Data log; auto mode—save the raw data in the memory of OEM card (100MB memory card)

Local log; log the raw data to local PC, the file name will be auto named in the current folder path, in this mode; you can define the raw data message type.
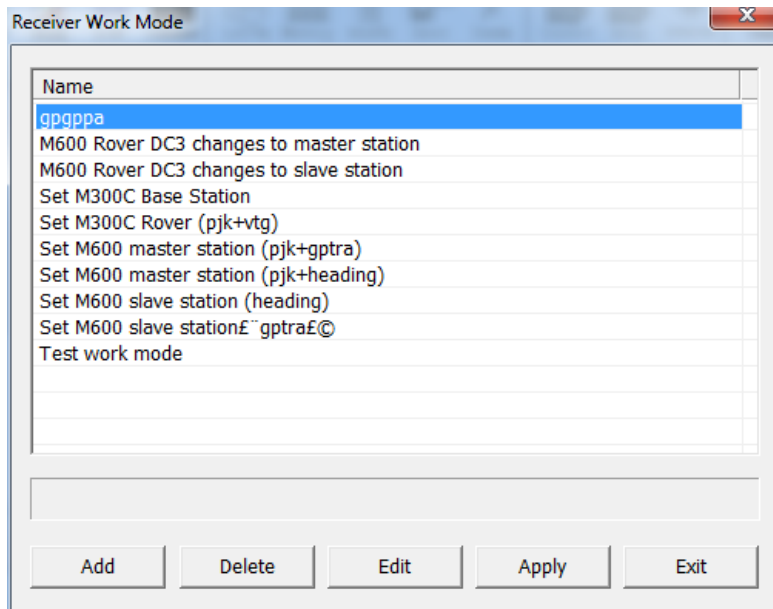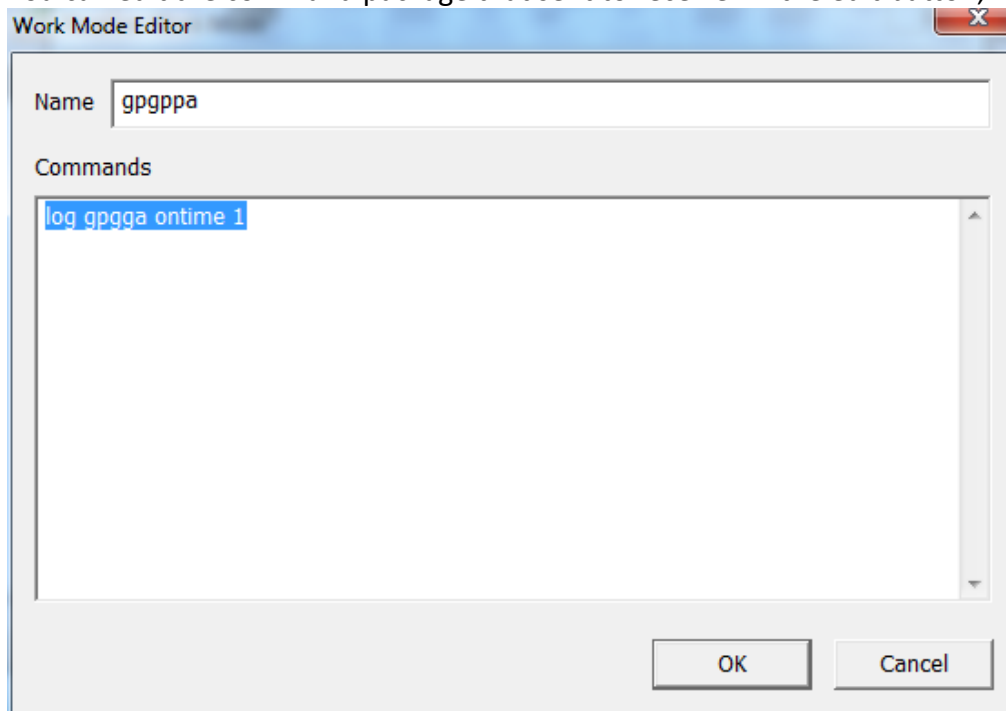
4.2.2 Get correction message.

4.2.2.1 Mode configuration

Change the work mode, edit the command package that sent to OEM card.

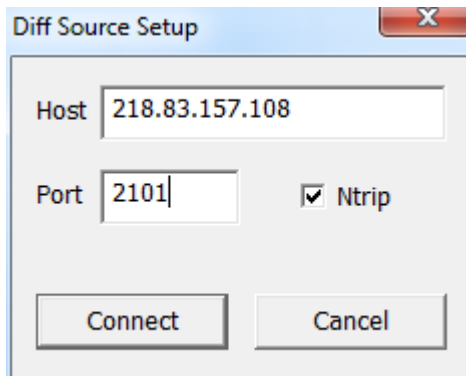Such as if you want to request gpgga information, just click the gpgga and apply.

You can edit the command package that sent to receiver in the edit button;

4.2.2.2 Get correction message from Ntrip

Go to [»|« Diff], there allows two protocols to get the correction data by internet-TCP direct and Ntrip mode; If the protocol is TCP direct mode, input the IP address and port and click connect; If using the Ntrip mode, select the Ntrip mode then click Connect.

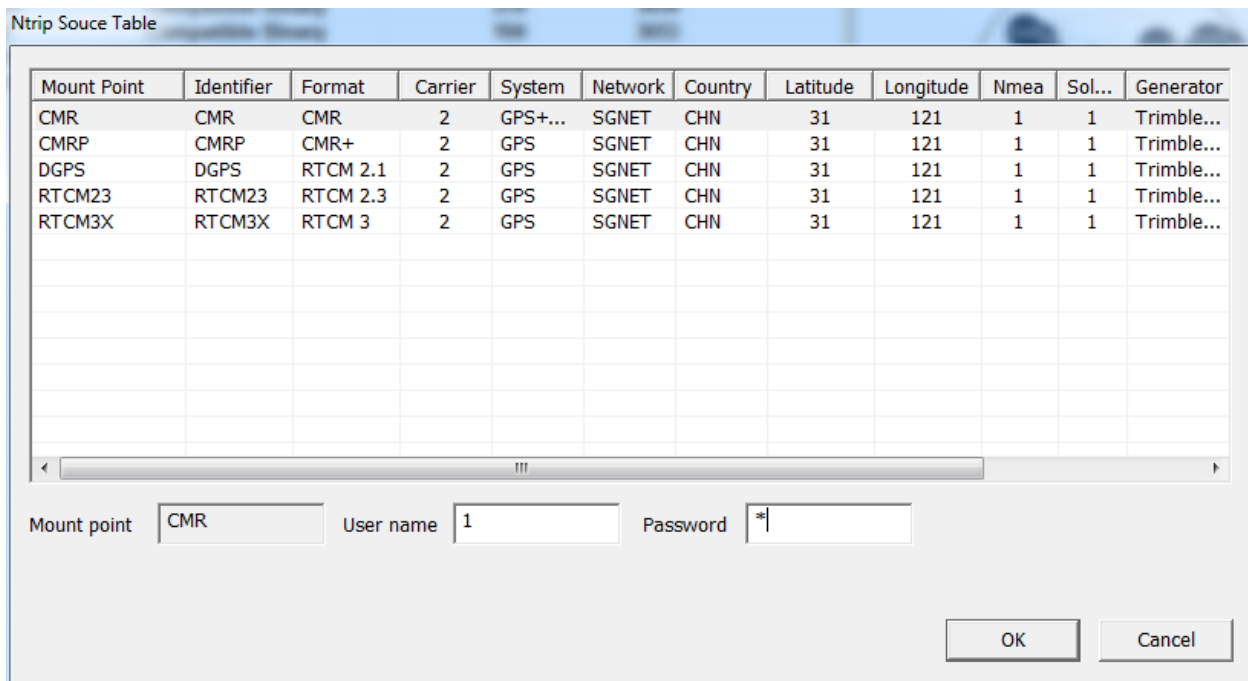| Diff Source Setup		
Host	218.83.157.108	
Port	2101	☑ Ntrip
	Connect	Cancel

In this page, show the Ntrip mount point, select the right mount point and input the User name and password, at last click ok.

Ntrip Souce Table

Mount Point	Identifier	Format	Carrier	System	Network	Country	Latitude	Longitude	Nmea	Sol...	Generator
CMR	CMR	CMR	2	GPS+...	SGNET	CHN	31	121	1	1	Trimble...
CMRP	CMRP	CMR+	2	GPS	SGNET	CHN	31	121	1	1	Trimble...
DGPS	DGPS	RTCM 2.1	2	GPS	SGNET	CHN	31	121	1	1	Trimble...
RTCM23	RTCM23	RTCM 2.3	2	GPS	SGNET	CHN	31	121	1	1	Trimble...
RTCM3X	RTCM3X	RTCM 3	2	GPS	SGNET	CHN	31	121	1	1	Trimble...

Mount point	CMR	User name	1	Password	*

OK   Cancel

4.3 main information check

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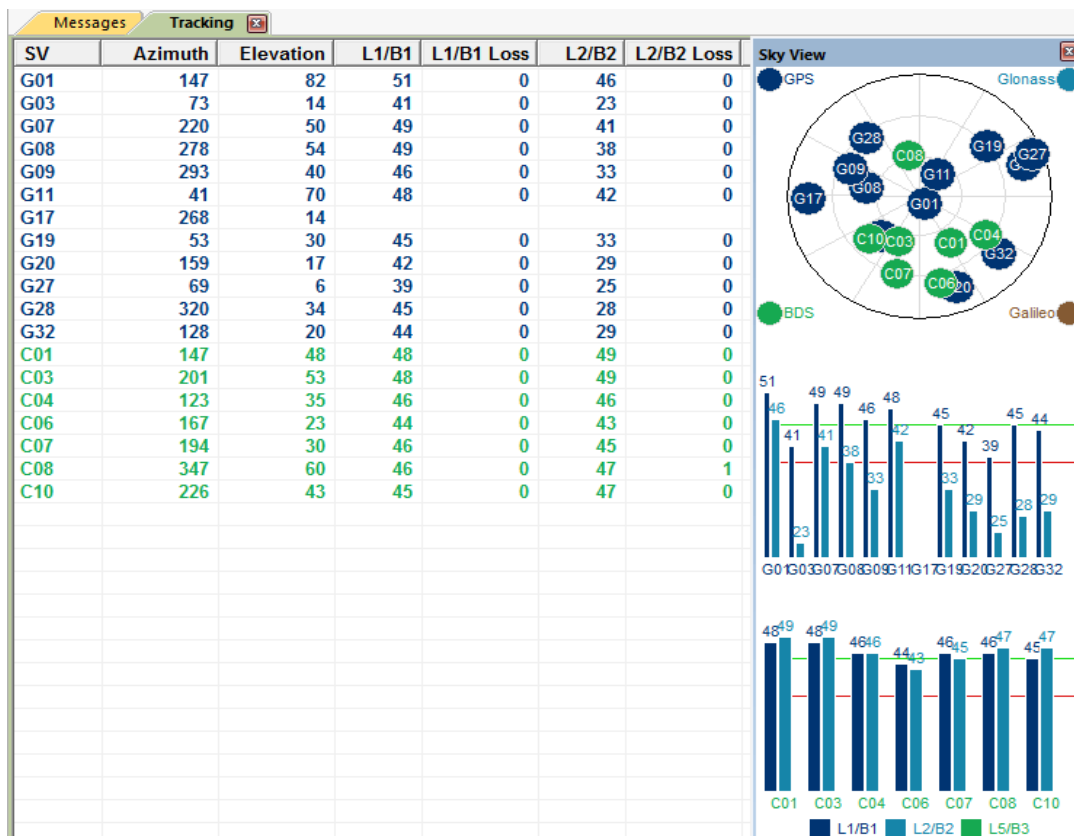## 4.3.1 Satellites information and global map view

 Messages : The output message by receiver, such as binary or GPGGA information

 Tracking satellite information such as SNR and elevation; you can go to main menu, View-> Sky view.

SV	Azimuth	Elevation	L1/B1	L1/B1 Loss	L2/B2	L2/B2 Loss
G01	147	82	51	0	46	0
G03	73	14	41	0	23	0
G07	220	50	49	0	41	0
G08	278	54	49	0	38	0
G09	293	40	46	0	33	0
G11	41	70	48	0	42	0
G17	268	14				
G19	53	30	45	0	33	0
G20	159	17	42	0	29	0
G27	69	6	39	0	25	0
G28	320	34	45	0	28	0
G32	128	20	44	0	29	0
C01	147	48	48	0	49	0
C03	201	53	48	0	49	0
C04	123	35	46	0	46	0
C06	167	23	44	0	43	0
C07	194	30	46	0	45	0
C08	347	60	46	0	47	1
C10	226	43	45	0	47	0

 World Map Make sure your PC logs on to the internet; this will show the current position on global map.

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4.3.2 RTK status indication

After receiver receives correction message, the receiver will calculate the ambiguity and turn to differential mode.

❶Position mode;   SINGLE->Narrow Float ->NARROW INT (autonomous mode-> RTK Float->RTK fixed)
❷Differential age; 99 (No correction message), 1 (received correction message).
❸Diff; Correction message data flow.
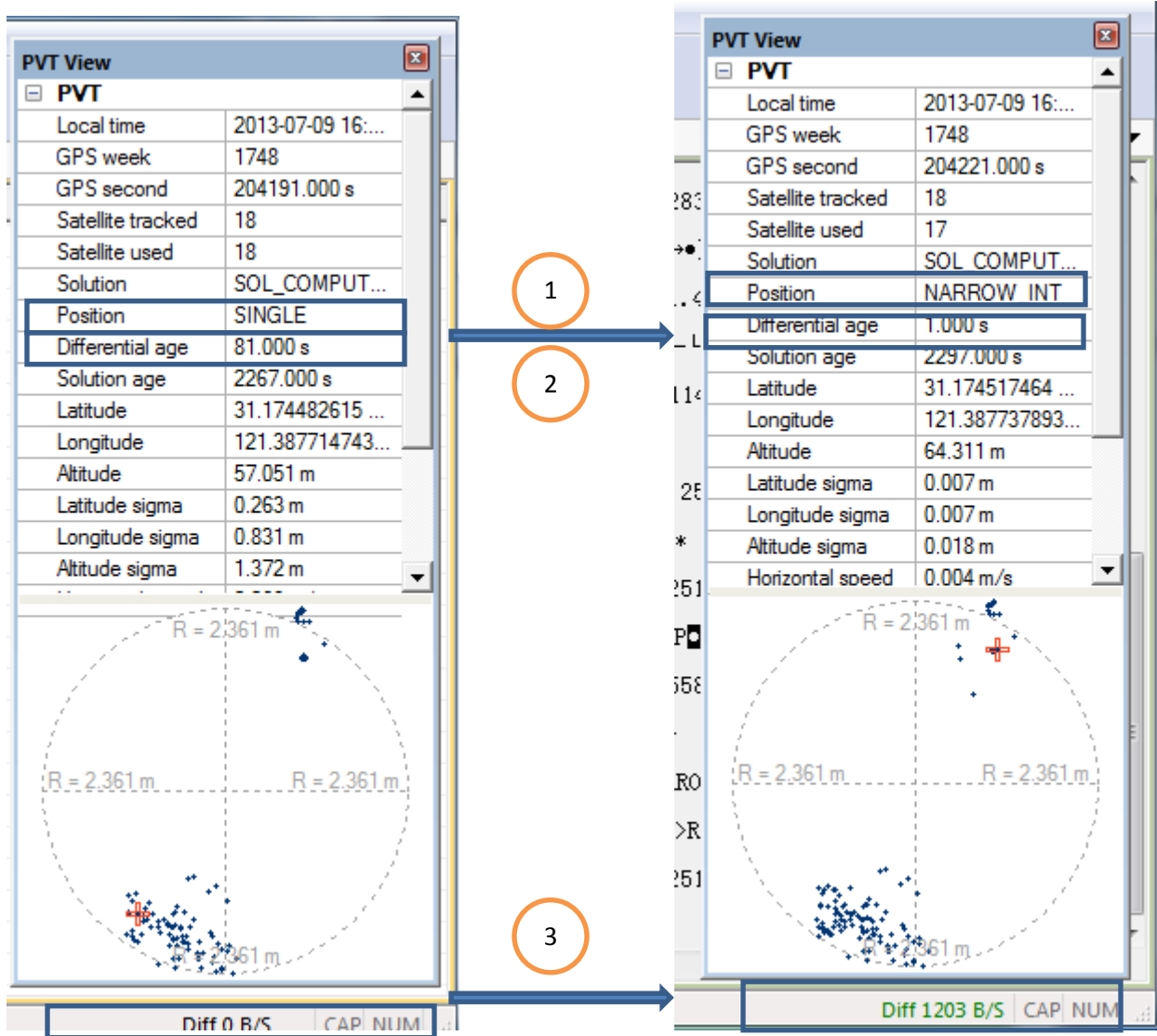
4.4 Raw data management

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4.4.1 Raw data download

Raw data can be recorded in the memory of receiver or PC.

Download the data from memory of receiver; go to File Download , the files list will appear in the Main window, you can modify the raw data, such as station name, antenna height. After selecting the file and right click, download to the current folder.

4.4.2 Memory management

Go to the Shortcut Bar, go to Memory , you can format the memory or Clear the files that you delete to the recycle bin.

4.4.3 Rinex convert

After downloading to the project folder, then you can covert the Raw data to Rinex format, Go

to the function bar, click Rinex Convert , you will see the raw data in current project.
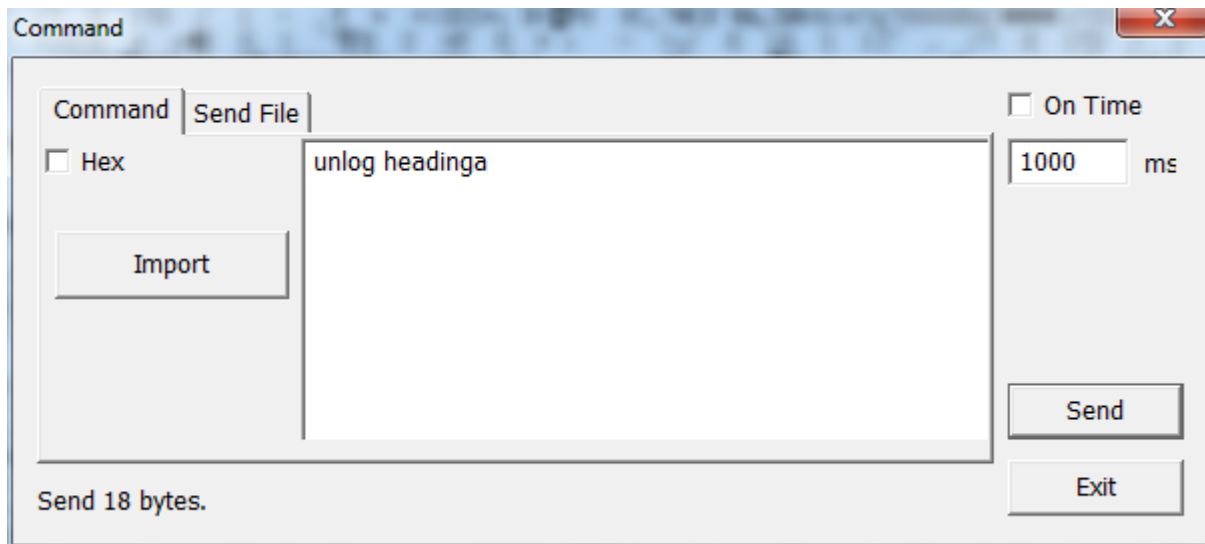
Go to the shortcut bar- , define the Rinex version and export observation information; then go to the main window, select the file and right click, convert to Rinex format. Go to the raw data files to check the Rinx format data.
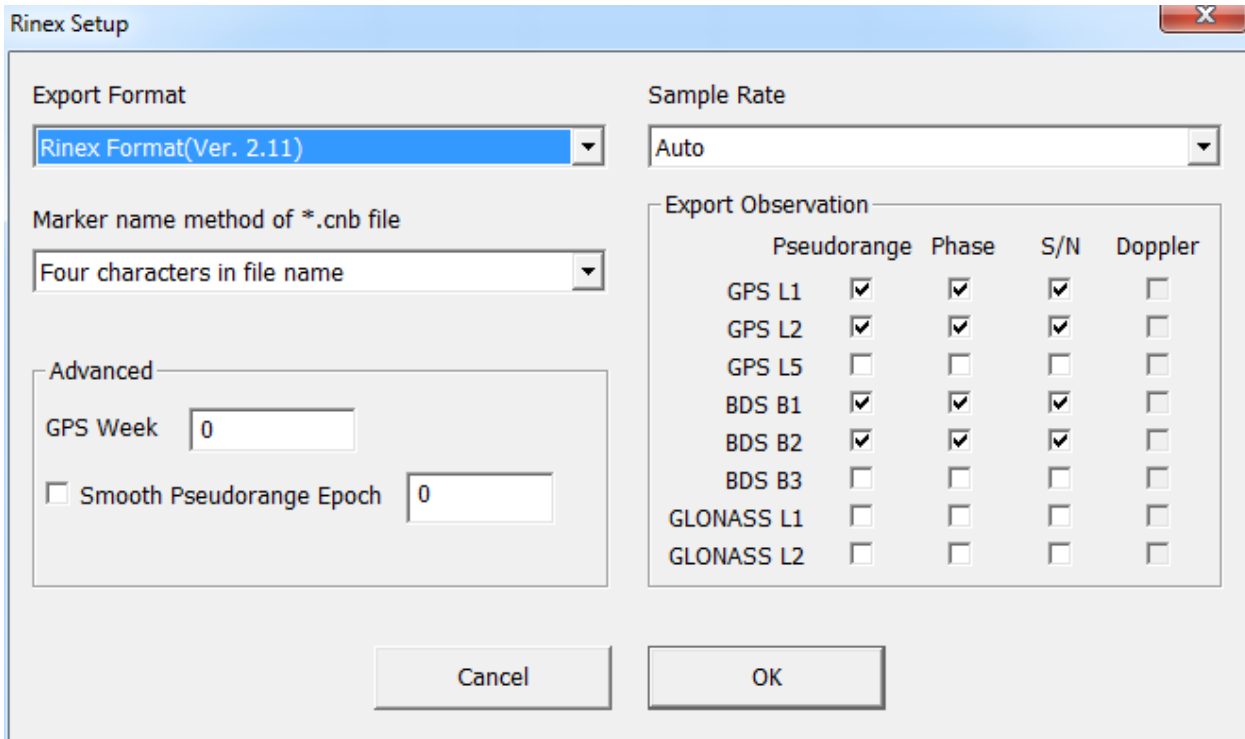
4.5 Sending command to Receiver

In the shortcut men, go to , in this page you can send ASIC command to receiver.

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Operation tips;

After receiver receives correction message, the receiver will not respond to lots of commands.

Please send the command?

Interfacemode compass compass on

Then receiver will turn to autonomous mode, you can send any command to receiver; after that send the command

Interfacemode auto auto on, the receiver will turn back to differential mode.

Last review by Simon 2013.12.30

Any feedback please sends email to Support@comnavtech.com