



ComNav Technology

User Guide

K-series OEM Board

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ComNav Technology OEM boards comply with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference;
- (2) It must accept any interference received, including interference that may cause undesired operation.

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Technical Assistance

If you have any question and can't find the answer in this manual, please contact your local dealer from which you purchased K-series OEM board. Alternatively, request technical support from ComNav Website: www.comnavtech.com or technical support email:

support@comnavtech.com or oem.support@comnavtech.com. Your feedback about this Guide will help us to improve it with future revisions. Please email your comments to: support@comnavtech.com or oem.support@comnavtech.com.

Warranty Notice

ComNav Technology warrants K-series OEM board for one (1) year from date of purchase unless otherwise specified.

ComNav Technology only guarantees products that are properly and correctly installed, configured, and operated in accordance with ComNav Technology's K-series OEM board User Guide and Specifications.

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1. Introduction

This User Guide provides a brief introduction of K-series OEM board installation, configuration and operation. We recommend that you read this manual carefully even if you have used GNSS products from other brands.

1.1 Overview of K-series OEM board

ComNav Technology K-series OEM boards support existing and future constellations, which are widely used in high-accuracy positioning and navigation applications. With QUANTUMTM technology, it remarkably improves the stability and reliability of positioning accuracy in standalone and RTK modes. Following table shows specifications of K-series OEM board.

Model	Signal tracked	Size(W×H×D)	Weight	Position accuracy	Orientation accuracy	Position fix update rate	Port types	Power consumption	Internal memory
K708	- GPS: L1 C/A, L2C, L2P, L5 - BeiDou: B1, B2, B3 - GLONASS: L1 C/A, L1P, L2 C/A, L2P - Galileo: E1, E5a, E5b - QZSS - SBAS: WAAS, EGNOS, MSAS, GAGAN	100 mm × 60 mm × 9 mm	45 g	autonomous <1.5m SBAS <1m DGPS 0.25m+1ppm RTK 10mm+1ppm Post processed 2.5mm+1ppm (All values in Horiz/RMS)	+	50Hz PVT 100Hz Raw data	4×RS232 1 USB 1 LAN Port	1.70 W	8 GB
K728	- GPS: L1 C/A, L2C, L2P - BeiDou: B1, B2 - GLONASS: L1 C/A, L1P, L2 C/A, L2P - SBAS: WAAS, EGNOS, MSAS, GAGAN	100 mm × 60 mm × 9 mm	44.2 g	autonomous <1.5m SBAS <1m DGPS 0.25m+1ppm RTK 10mm+1ppm Post processed 2.5mm+1ppm (All values in Horiz/RMS)	Hdg: (0.2/R)* R/P: (0.4/R)* R (meter) is the baseline length of two GNSS Antennas	20Hz PVT 20Hz Raw data	4×RS232 1 USB 1 LAN Port	2.10 W	32GB
K706	- GPS: L1 C/A, L2C, L2P - BeiDou: B1, B2 - GLONASS: L1 C/A, L1P, L2 C/A, L2P - Galileo, QZSS2 - SBAS: WAAS, EGNOS, MSAS, GAGAN	71 mm × 46 mm × 9 mm	26.6 g	autonomous <1.5m SBAS <1m DGPS 0.25m+1ppm RTK 10mm+1ppm Post processed 2.5mm+1ppm (All values in Horiz/RMS)	+	50Hz PVT 50Hz Raw data	3×RS232 1 USB 1 LAN Port	1.68 W	8 GB
K726	- GPS: L1 C/A, L2C, L2P - BeiDou: B1, B2 - GLONASS: L1 C/A, L1P, L2 C/A, L2P - SBAS: WAAS, EGNOS, MSAS, GAGAN	71 mm × 46 mm × 9 mm	27.2 g	autonomous <1.5m SBAS <1m DGPS 0.25m+1ppm RTK 10mm+1ppm Post processed 2.5mm+1ppm (All values in Horiz/RMS)	Hdg: (0.2/R)* R/P: (0.4/R)* R (meter) is the baseline length of two GNSS Antennas	20Hz PVT 20Hz Raw data	3×RS232 1 USB	1.96 W	32GB
K700	- GPS: L1 - BeiDou: B1 - GLONASS: L1 - SBAS: WAAS, EGNOS, MSAS and GAGAN	71 mm × 41 mm × 11 mm	18 g	autonomous <1.5m SBAS <1m DGPS 0.25m+1ppm RTK 10mm+1ppm Post processed 2.5mm+1ppm (All values in Horiz/RMS)	+	50Hz PVT 100Hz Raw data	3×RS232	0.6 W	32GB
K501G	- GPS: L1 C/A, L2C, L2P - GLONASS: L1 C/A, L1P, L2 C/A, L2P - SBAS: WAAS, EGNOS, MSAS, GAGAN	71 mm × 46 mm × 10 mm	24 g	autonomous <1.5m SBAS <1m DGPS 0.25m+1ppm RTK 10mm+1ppm Post processed 2.5mm+1ppm (All values in Horiz/RMS)	+	10Hz PVT 20Hz Raw data	3×RS232	1.35 W	100 MB

For detailed information about K-family products, refer to the product brochures at <http://www.comnavtech.com/products.asp>.

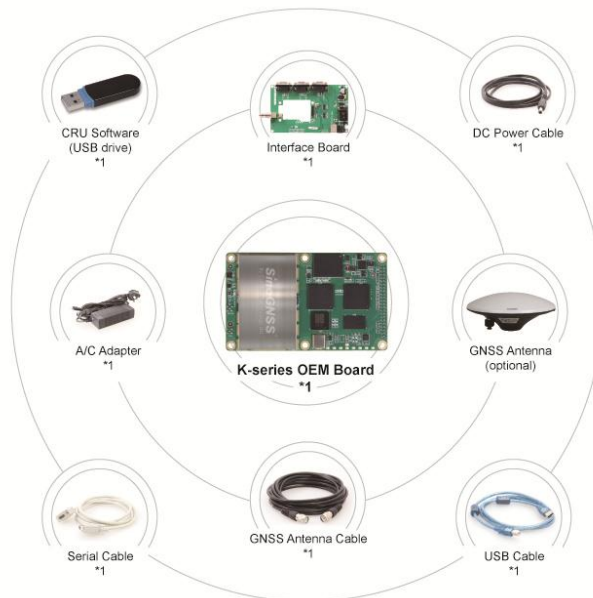
1.2 Related documents

This document only cover frequently used commands, find further information about command and log information in *ComNav OEM Board Reference Manual_V1.5*, also for technical specifications of every OEM board model

Please download at: <http://www.comnavtech.com/download.asp?bigclassid=27>.

1.3 Evaluation kit

If you order ComNav Technology OEM board evaluation kit, please check carefully when you receive shipping box as the following figure:

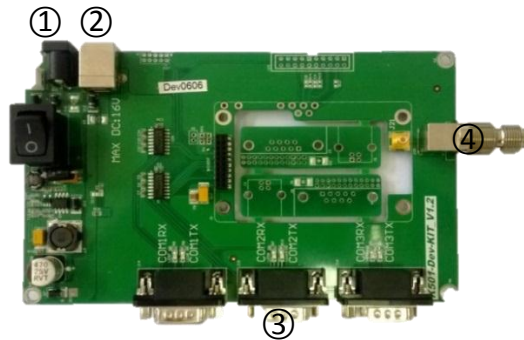


2. Installation of K-series OEM board

This chapter introduces guidelines to install your OEM boards, and check status of K-series OEM board.

2.1 ComNav Technology interface board

ComNav Technology interface board is a mother board for K-series OEM board, and two types interface board are available depending on the size of your OEM board. The following figure shows interface board for small-sized OEM board:



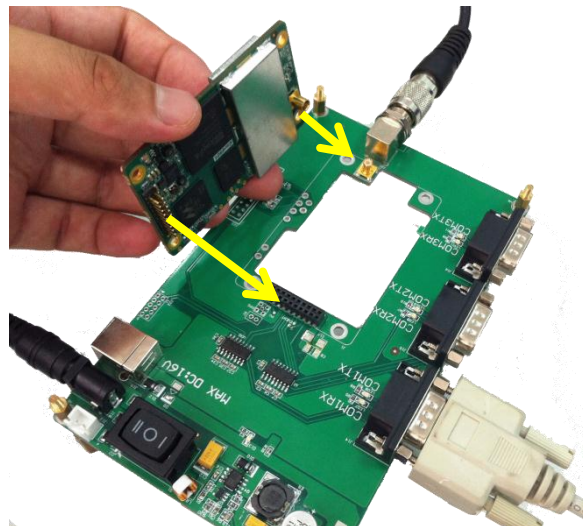
- ① External DC power supply, 12V-16V
- ② USB power supply, 5V
- ③ 3*serial ports
- ④ Antenna connector

The following sector describes installation guidelines with ComNav Technology interface board. Making self-developing integrated system, please refer to OEM board specification at <http://www.comnavtech.com/download.asp?bigclassid=27>.

2.2 Guidelines for installation

1. Install the K-series OEM board with ComNav interface board.

- Fix the PIN and RF connection to the interface board properly
- Ensure 100% fitting for all connections
- Firstly unplug the PIN out when uninstalling the OEM cards (the K501 installation shown in the following figure).



2. Connect the GNSS antenna through a coaxial cable.

When mounting the antenna:

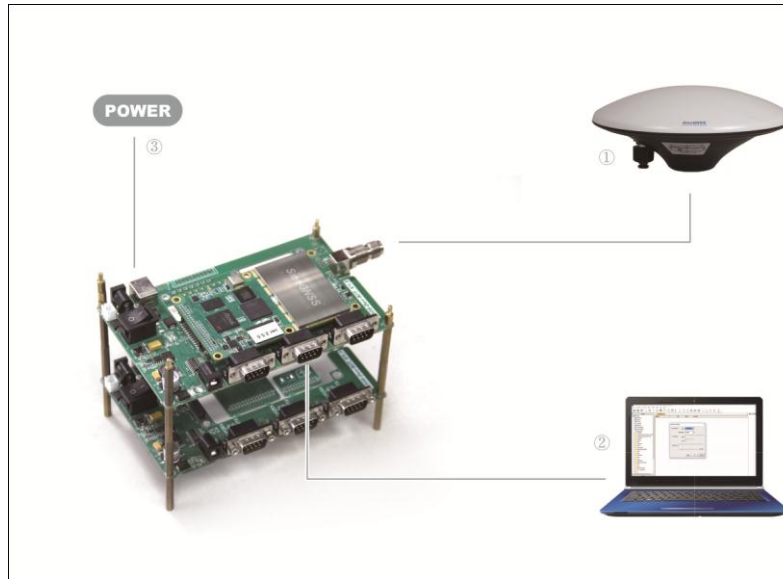
- In the area with a clear view of the sky
- Far from big power electromagnetic radiation devices
- On a secure and stable environment

3. Power supply.

- Power on your OEM board through ComNav standard 12 voltage adapter or USB

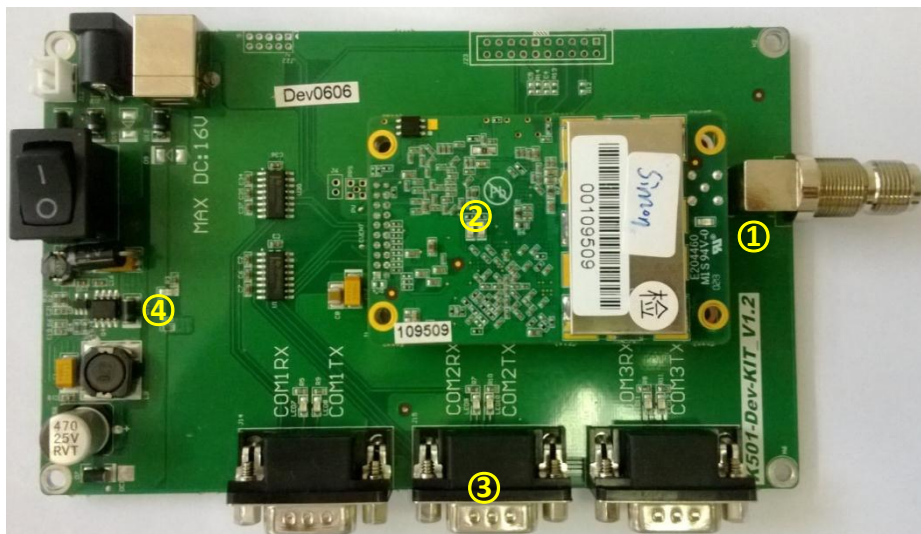
- After all components connected, press the power button on the interface board

4. Connect to your PC or data communications equipment as the picture below:



2.3 LED behavior

There are LED indicators helping you to check status of K-series OEM board.



① Power indicator of OEM board

② LED indicators of satellites and correction data

Satellite indicator (R): Flashing N times/5s (N=the number of satellites tracked)

Correction data indicator (L): Flashing 1/s to send or receive correction data.

③ LED indicators of serial ports

TX(R): Flashing when outputting data from OEM board

RX(L): Flashing when OEM board receiving correction data or commands

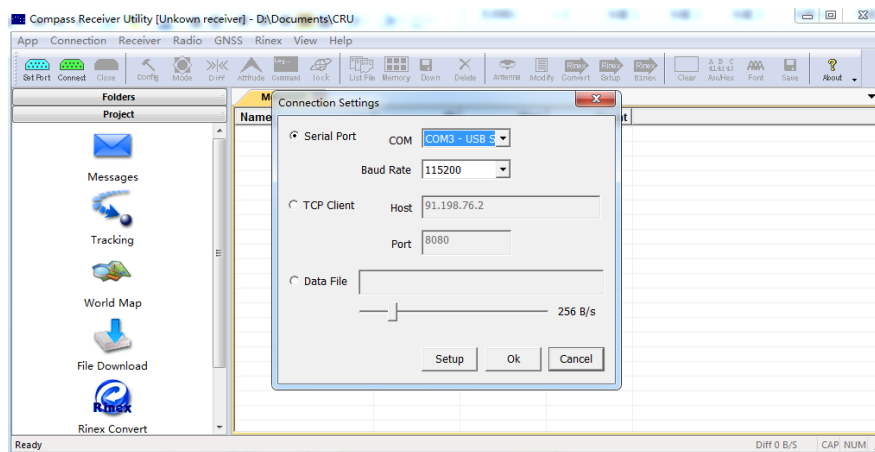
④ Power indicator of Interface board

3. OEM board configuration with CRU software

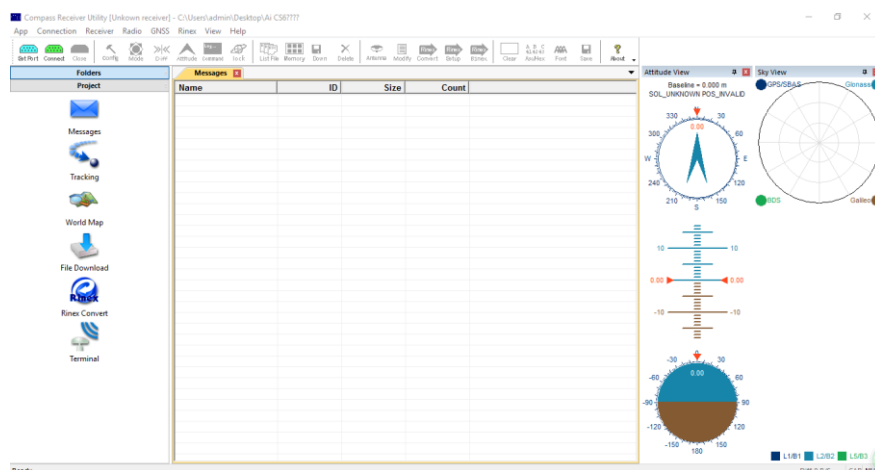
This chapter describes OEM board configuration with ComNav Compass Receiver Utility (CRU) software. With CRU software, you are able to communicate and configure your OEM boards via serial port or Ethernet connection. Download at: <http://www.comnavtech.com/download.asp?bigclassid=28>.

3.1 Connect with OEM boards

For serial port communication, Click **Set Port** -> select COM port -> OK to connect (the default baud rate of OEM board is 115200).



The series number of OEM board will be shown on the title bar if connected successfully, otherwise please check power supply and connections of every components.

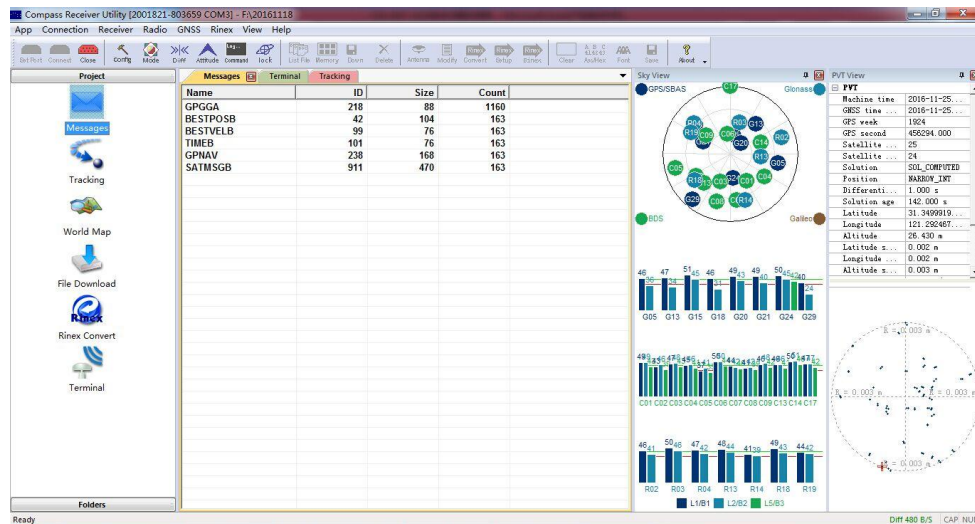


3.2 Status checking

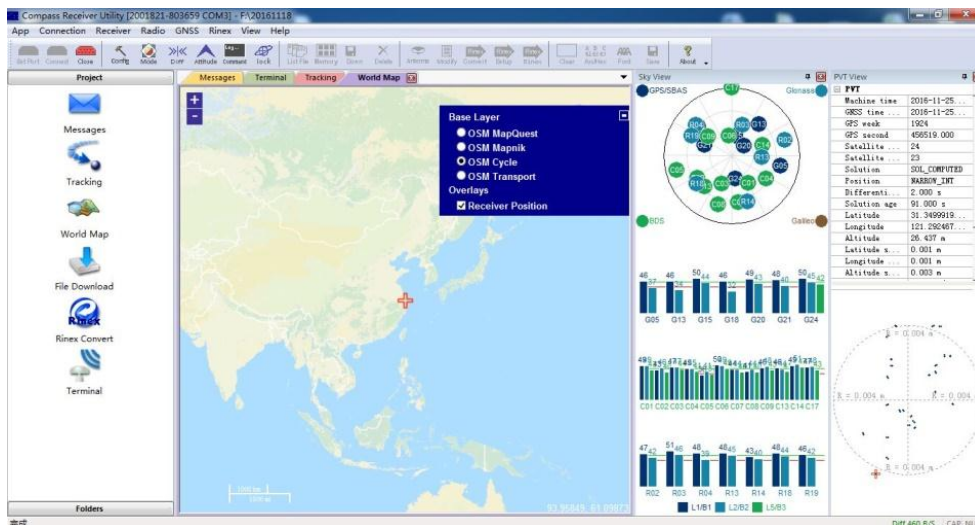
Go to **Tracking** to check satellite information such as SNR and elevation, and click **view** to display the sky view shown below. Normally the SNR should reach the following values:

- GPS(G): max value for L1: 48-50; max value for L2: 40-42
- Glonass(R): max value for L1: 48-50; max value for L2: 45-48
- Beidou(C): max value for B1: 45-47; max value for B2: 45-47

Go to **Message** to check the output message of receiver.



Ensure your pc internet connected, and go to **World Map** -> select proper base layer to check the current position on global map.



*Tip: After you click on **Tracking**, terminal interface will output binary data that used for request sky view, PTV view. To stop output, please enter command "Unlogall" in*

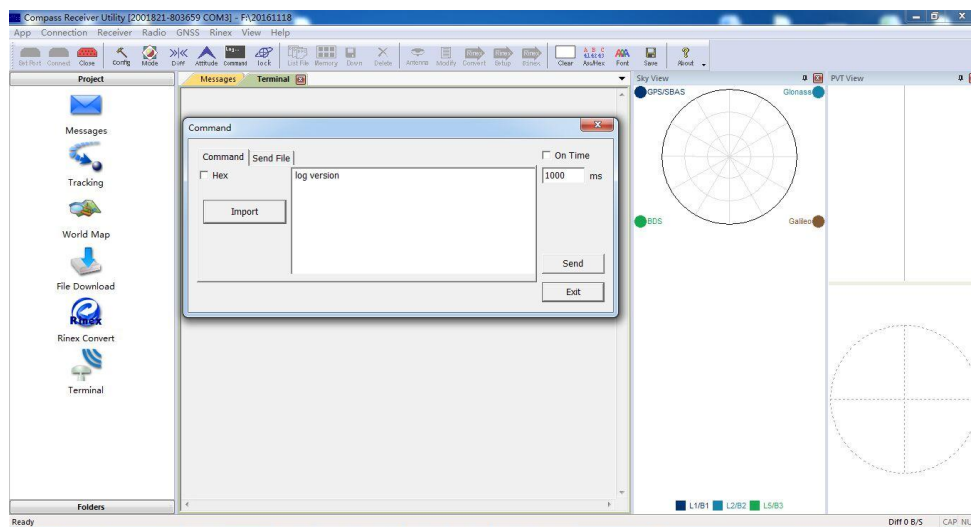
command interface, then enter ASCII commands you need.

3.3 Command Interface

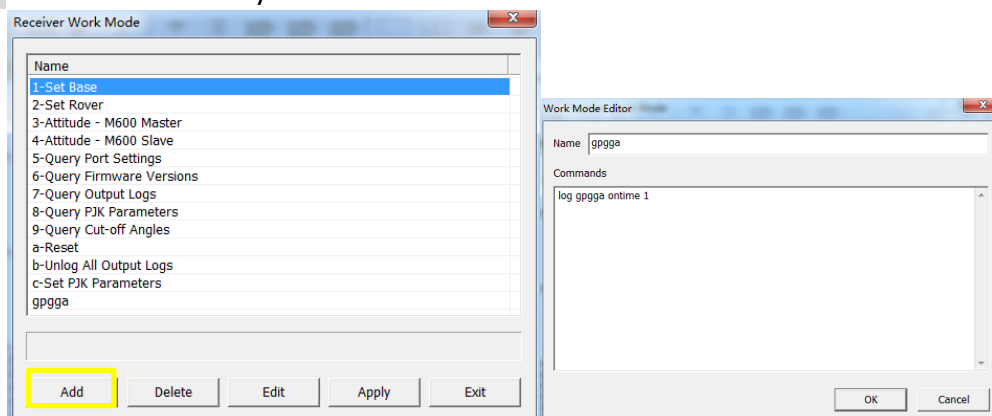
Go to **Command** to send ASCII commands to receiver.

When inputting commands:

- Select and send proper commands, all commands are case insensitive: Log version=LOG VERSION
- Press **Enter** button at the end of every command to check receivers' feedback information or input another command
- For all programmatic commands, please refer to **ComNav OEM Board Reference Manual_V1.5**



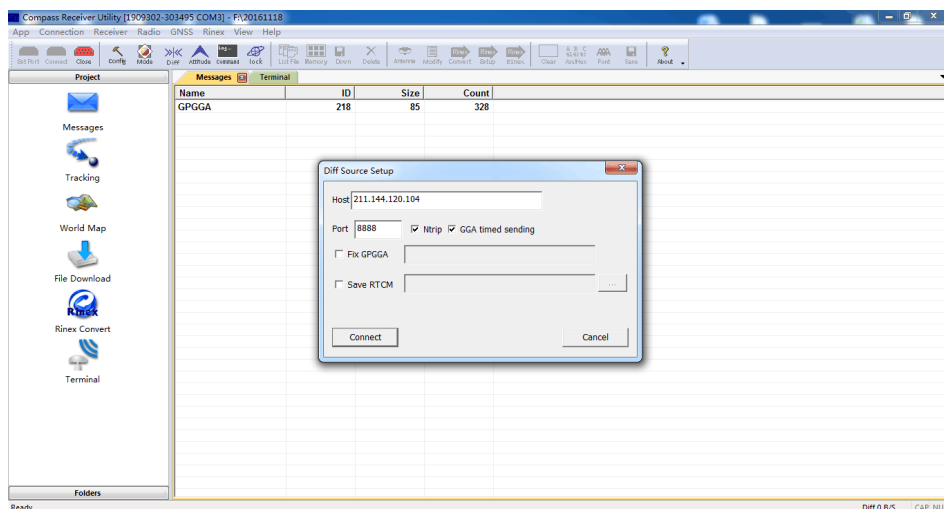
Go to **Mode** to check frequently used commands package, and it also supports click **Add** to add commands you need.



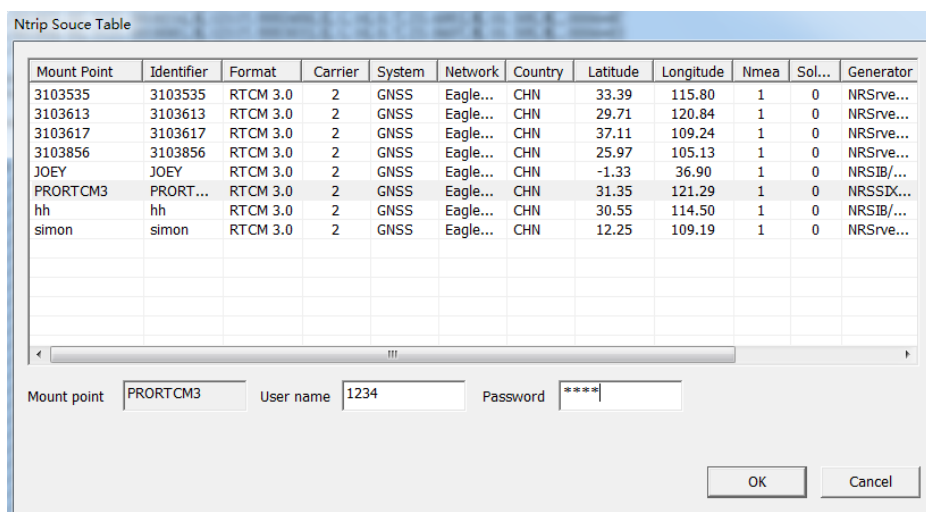
3.4 NTRIP configuration

To easily test RTK function through NTRIP protocol, firstly ensure your PC internet connected, then go to **Diff** -> enter IP and port -> click Ntrip -> OK to go to NTRIP

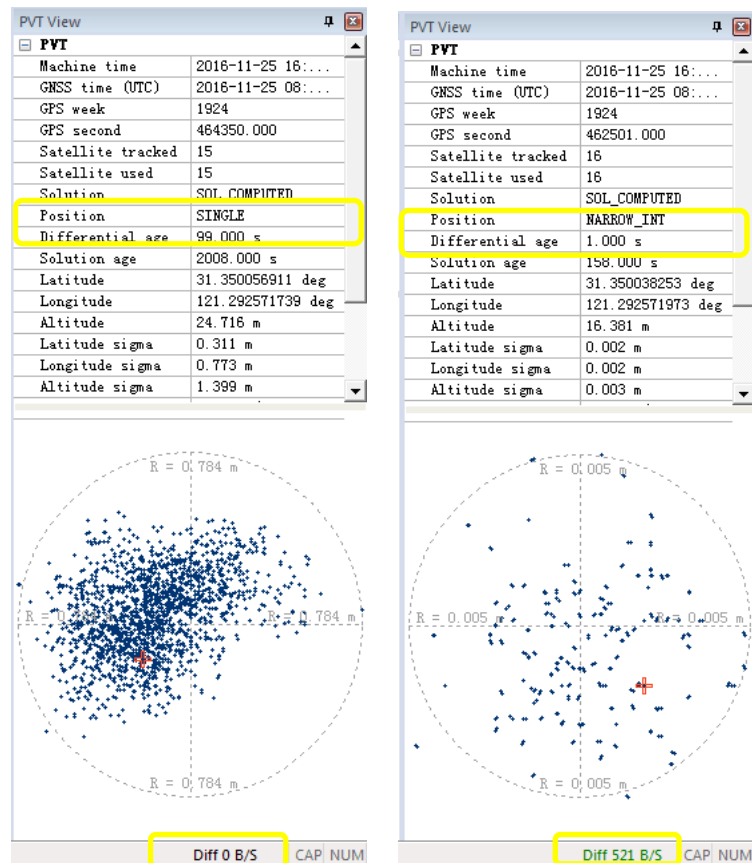
source table.



Then select Ntrip **mount point** -> enter **User name** and **password** (Anonymous Types) -> OK.



After receiver received correction data, the receiver will calculate the ambiguity and turn to differential mode. Go to **View** -> **PVT View** to check RTK status: 1) Position mode; 2) Differential age: from 1(correction data received) to 99(No correction data received); 3) Diff: Correction data flow.



Be careful that the OEM board is unable to respond to any command when set as the differential mode, it's better to switch to the normal mode by:

- 1) Go to **Diff** – click disconnect
 - 2) Or send command: *Interfacemode compass compass on*
- Then you can send commands to OEM board.

3.5 Data recording configuration

For data recording, it provides two methods to save the raw observation data:

- 1) To save the raw data in the onboard memory,

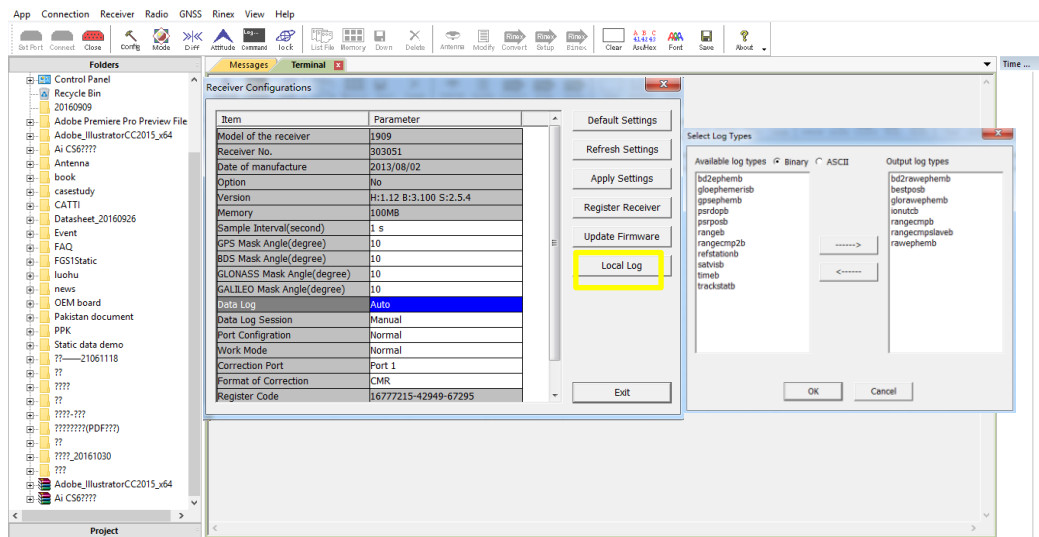
- For K5-series: go to **Config** -> select **Auto** Data log -> **Apply Settings** -> restart your OEM board to activate this setting.
- For K7-series OEM board, it needs to send the following command:

Set EMMC on

Saveconfig

Then go to **Config** -> select **Auto** Data log -> **Apply Settings** -> restart your OEM board to activate this setting.

- 2) To save the raw data in your PC, select the folder path -> go to **Config** -> click **Local Log** -> select **log types** -> **OK**, the raw data file will be saved in the folder you select.



There are other settings for onboard memory you can change based on your requirements:

- **Sample Interval:** change the sample interval of observations, the maximum data rate is 20Hz, the minimum is one observation per minute.
- **Mask angle:** disable the receiver to track satellites that below the mask angle. You can set mask angle values for different constellations, which can reduce serious multipath influence or low SNR.
- **Data Log Session:** 1) Manual means that the receiver keeps recording data in one file until the receiver is turned off or its memory runs out; 2) if set to 1/2/3/4/12 hours, the data recorded will be saved in to a file every 1/2/3/4/12 hours.
- **Data log:** the default setting is manual mode. To log data in manual mode, send the following commands.

For K5-series:

Set static on
Saveconfig

For K7-series:

Set emmc on
Saveconfig
Restart your OEM board
Set static on
Send set static off, if you finish recording

3.6 Data management

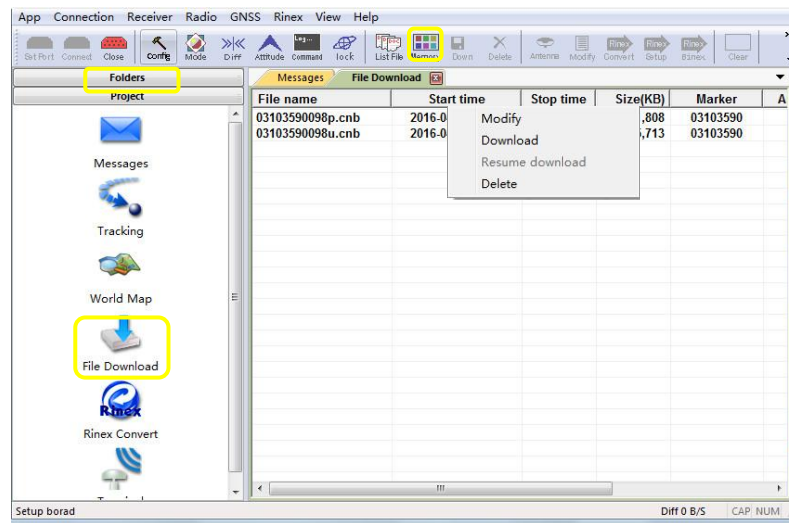
3.6.1 Raw Data Download

For K5-series OEM board, download data only from receiver to your PC through serial port in CRU software.

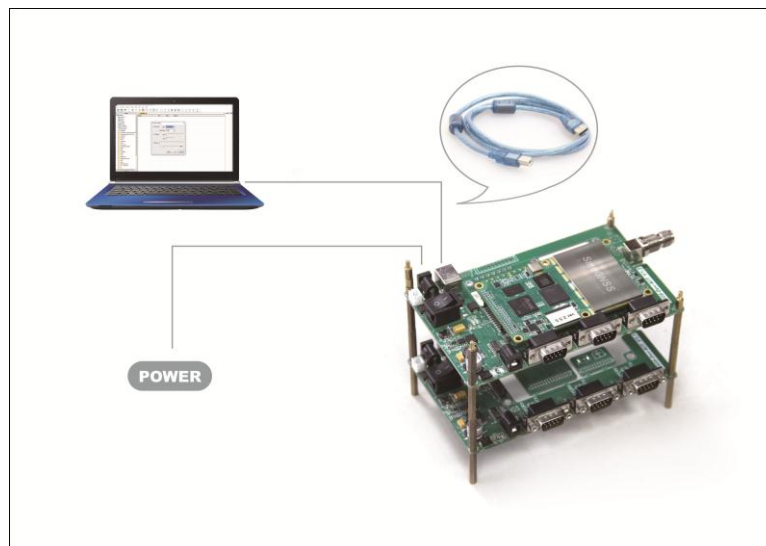
1. Connect the OEM board to your PC as described before (see [Chapter 3.1](#)).
2. Click **Folders** to select download path
3. Click **File Download** in project menu to check all raw data on main window, or

click **List File** to refresh raw data list.


4. Right-click on the file name to modify, download or delete the raw observation data.





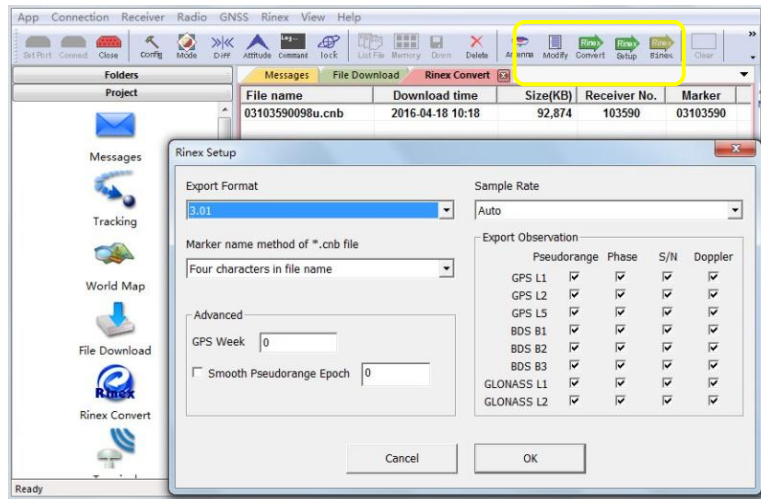
For K7-series OEM board, you only can download raw data through USB cable and raw data will be saved in the file named after its date.



3.6.2 Convert to RINEX

After downloading raw observation data to your PC, click  to convert from ComNav binary format (*.cnb) to RINEX.

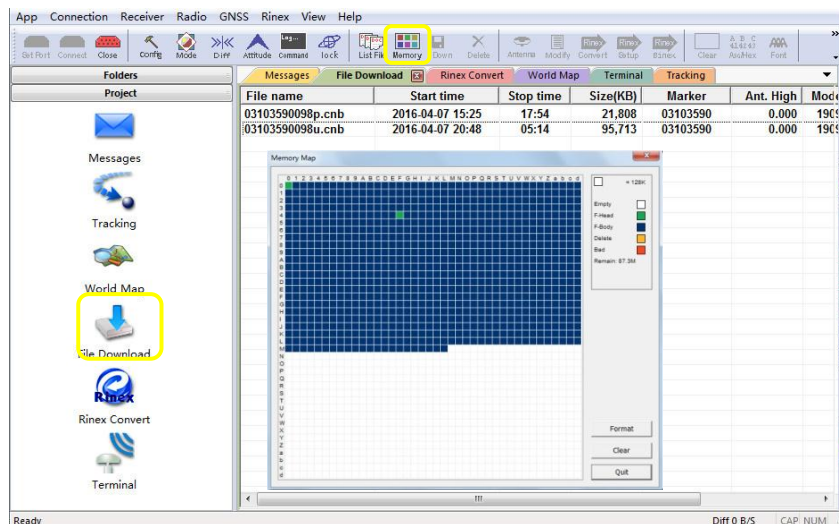
Click  in standard toolbar to change Convert Settings, mainly export format and export observation information. Then go to  to convert to RINEX, the RINEX data will be saved in the same path as raw observation data.



Tip: In some Post Processing software, the Beidou observations cannot be processed, you can uncheck the Beidou B1, B2, B3 observations.

3.6.3 Memory Management

Go to **Memory** to format or clear the files.



4 Work mode configuration

This chapter describes the commands for frequently used work mode, which can help you to quick start to use ComNav Technology OEM board.

ComNav Technology OEM board set single point positioning as default work mode. However, it also supports various work modes that meet your requirements, including smooth mode, SBAS mode, RTK mode, RTD mode and Moving baseline mode.

Note: comX shown in the following commands, X is the serial port number

4.1. Smooth mode

In single-point positioning, ComNav Technology have adopted an advanced smoothing filter to enhance pass-to-pass accuracy, which need register code (see [chapter 5.10](#)) before send following commands. With the 20cm pass-to-pass accuracy, positioning with smooth mode is ideal solution for precision agriculture, fleet management and more.

Send commands:

```
Rtkobsmode 4 //set smooth mode of rover receiver
log gpgga ontime 1 //output GPGGA message
saveconfig // save configuration
```

Output GPGGA message to check if OEM board in smooth mode, differential age value should be 99 shown below.

```
$GPGGA,000359.00,3125.4999742,N,12136.9969461,E,1,07,2.5,10.4541,M,11.371,
M,99,0000*4C
```

4.2. SBAS mode

For ComNav Technology OEM boards, the default setting for SBAS is disabled. You can enable this mode to improve positioning accuracy if receivers in the area covered by certain SBAS satellites. Make sure GNSS antenna is able to track satellites, and send following commands to activate this mode:

```
sbascontrol enable msas //activate the SBAS satellite, take MSAS as an example
rtkobsmode 3 //Set the observation mode of rover receiver
saveconfig // Save configuration
```

To disable SBAS, send “*sbascontrol disable*”.

Output GPGGA message to check if OEM board in SBAS mode, solution status should be “E, 2” (SBAS mode) and base ID is SBAS satellite’s PRN.

```
$GPGGA,015101.00,3121.0000551,N,12117.5483125,E,2,23,1.1,37.2598,M,0.000,M,
02,0129*58
```

4.3. RTK mode

Generally, RTK mode is commonly used work mode, which can provide centimeter

real-time positioning accuracy. We recommend you use RTCM3.0/3.2 as correction data, please refer to following configuration to start RTK mode.

For the Base:

RTCM3.0

```
unlogall //clear previous settings
Fix position 31.1744880 121.3878091 44.1287 //fix the coordinate
(Fix auto) //fix auto
Log comX rtc1004b ontime 1 //Extended L1&L2 GPS RTK Observables
Log comX rtc1104b ontime 1 //Extended B1, B2, B3 BD2 RTK Observables
Log comX rtc1012b ontime 1 //Extended L1&L2 GLONASS Observables
Log comX rtc1005b ontime 5 // Base station coordinate
Log comX rtc1033b ontime 10 / Base station type
Saveconfig //Save configuration
```

Tip: RTCM1104b message is defined by ComNav Technology, which may be incompatible with rover receiver of other brand.

With 9600 baud rate for air link, the limited number of data can be sent out per second in radio mode. Therefore, it's better to set latency time for different constellations if you start base station in radio mode. The following commands show RTCM3.0 as an example, which may be incompatible with rover receiver of other brands.

RTCM3.0

```
unlogall //clear previous settings
Fix position 31.1744880 121.3878091 44.1287 //fix the coordinate
(Fix auto) //fix auto
Log comX rtc1004b ontime 3 //Extended L1&L2 GPS RTK Observables
Log comX rtc1104b ontime 3 1 //Extended B1, B2, B3 BD2 RTK Observables
Log comX rtc1012b ontime 3 2 //Extended L1&L2 GLONASS Observables
Log comX rtc1005b ontime 5 // Base station coordinate
Log comX rtc1033b ontime 10 // Base station type
Saveconfig //Save configuration
```

RTCM3.2 (MSM4)

```
unlogall //clear previous settings
fix position 31.1744880 121.3878091 44.1287 //fix the coordinate
(Fix auto) //fix auto
Log comX rtc1074b ontime 1 //GPS Full PRs and Phase Ranges plus CNR
Log comX rtc1084b ontime 1 //GLONASS Full PRs and Phase Ranges plus CNR
Log comX rtc1124b ontime 1 //Beidou Full PRs and Phase Ranges plus CNR
Log comX rtc1005b ontime 5 //Base station coordinate
Log comX rtc1033b ontime 10 //Base station type
```

Saveconfig *//Save configuration*

RTCM3.2 (MSM5)

```

unlogall //clear previous settings
fix position 31.1744880 121.3878091 44.1287 //fix the coordinate
(Fix auto) //fix auto
Log comX rtcm1075b ontime 1 //GPS Full PRs and Phase Ranges plus CNR
Log comX rtcm1085b ontime 1 //GLONASS Full PRs and Phase Ranges plus CNR
Log comX rtcm1125b ontime 1 //Beidou Full PRs and Phase Ranges plus CNR
Log comX rtcm1005b ontime 5 //Base station coordinate
Log comX rtcm1033b ontime 10 //Base station type
Saveconfig //save configuration

```

For the Rover:

```

log comX gpgga ontime 1 //ComX output GPGLGA data
rtkobsmode 0 //Set the observation mode of rover receiver
Interfacemode comX auto auto on //Config comX to detect RTCM corrections
saveconfig //Save configuration

```

Output GPGLGA message to check if OEM board in RTK mode, solution status is “E, 4”.
 \$GPGLGA,015101.00,3121.0000551,N,12117.5483125,E,4,23,1.1,37.2598,M,0.000,M,
 02,0004*58

Moreover, the default setting is foot mode, and you also can adjust different dynamic mode in the RTK mode based on your requirements including foot, land, air and auto. In different mode, RTK engine treats the observation data in different style to promote the performance of RTK engine. The command is *rtkdynamics <mode>*.

Mode	Description
LAND	Board is in a stable land vehicle with velocity less than 110 km/h
FOOT	Board is being carried by a person with velocity less than 11km/h
AIR	Board is in a stable land vehicle or an aircraft with velocity more than 110km/h
Auto	Board is in an automatic mode

4.4. RTD mode

For decimeter-level positioning application, our board can provide DGPS mode. The configuration is as below:

For the Base:

```

Fix position 31.1744880 121.3878091 44.1287 //fix the coordinate

```

```

Log rtcm1b ontime 1           //Differential GPS Corrections
Log rtcm31b ontime 1         //Differential GLONASS Corrections
Log rtcm59bdsprcb ontime 1   //Differential Beidou Corrections
Saveconfig                   //save configuration

```

Tip: RTCM59bdsprcb message is defined by ComNav Technology, which may be incompatible with rover receiver of other brand.

For the Rover:

```

rtkobsmode 3                 //Set the observation mode of rover receiver
Log comX gpgga ontime 1      //comX output GPGGA data
Interfacemode comX auto auto on //config comX to detect RTCM corrections
Saveconfig                   //save configuration

```

Output GPGGA message to check if OEM board in RTD mode, solution status is “E, 2”.

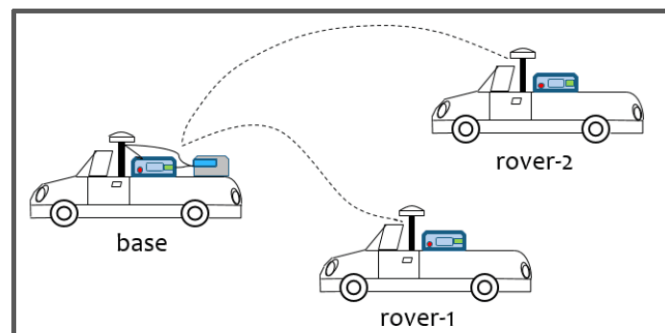
```
$GPGGA,015101.00,3121.0000551,N,12117.5483125,E,2,23,1.1,37.2598,M,0.000,M,02,0004*58
```

4.5. Moving base mode

Different from the stationary base station, the moving base station transmits corrections to the rover when it’s moving. Therefore, it should set without a fixed position through the “Fix none” command. There are mainly two types of moving base mode shown below:

4.5.1 Moving base station

The moving base function allows you to obtain a centimeter-level xyz baseline estimate when the base station and rover are moving, which means the rover can only get accurate relative position based on the base. In this mode, the rover should be set as synchronous mode due to the latency of the reference station position message. Moreover, the moving base can accept the external high accuracy NMEA input, for example from another GNSS station with absolute high precision; then transmit to the rover, refer to chapter 6.4 in **ComNav OEM Board Reference Manual_V1.5** for detailed information.



The configuration is shown below:

For Moving Base Station:

```
Fix none //Undo fix position mode
Log comX rtccompassb ontime 1 //Differential GPS/GLONASS/Beidou corrections
Saveconfig //Save configuration
```

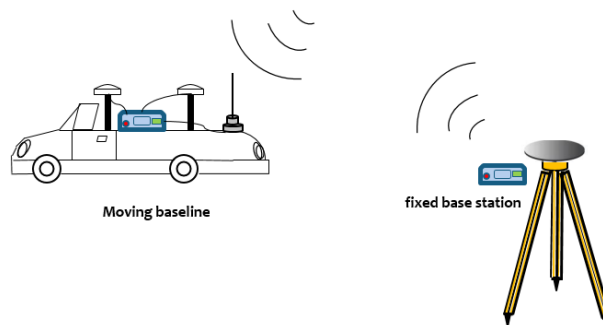
For the Rover:

```
Interfacemode comx auto auto on //Set comx in differential mode
Set diffmatchmode synch //Set RTK in synchronous mode
Rtkrefmode 1 //Set moving base RTK mode
Log comx headinga ontime 1 //Output heading message
Saveconfig //Save configuration
```

4.5.2 Moving baseline

In this application case, two OEM boards with two antennae are used and one of the OEM boards is used for the dynamic base station (Master) and the other one is applied as a rover station (Slave). The settings are used to enable or disable a receiver from working with a dynamic base station. In this case, both of the Master and Slave are fixed on the vehicle where the Slave station is static with respect to the Master station.

Moving baseline mode allows the base to do the RTK positioning with the fixed station and also display the attitude information to the user. The rover station is used for attitude determination computation and send the results back to the dynamic base station.



The configuration is shown below:

For dynamic base:

```
Fix none //Undo fix position mode
Interfacemode com2 auto auto on //Set com2 in differential mode
```

```
Interfacemode com3 auto auto on //Set com3 in differential mode
log com3 rtmcompassb ontime 1 //Differential GPS/GLONASS/Beidou corrections
log com1 gpgga ontime 1 //Output GPGGA message
log com1 headingt ontime 1 //Output heading message
saveconfig //Save configuration
```

For the rover:

```
interfacemode com3 auto auto on //Set com3 in differential mode
Log com3 headingp ontime 1 //Transmit heading message to the dynamic base
Set diffmatchmode synch //Set RTK in synchronous mode
rtkrefmode 1 //Set moving base RTK mode
Saveconfig //Save configuration
```

4.6. Heading mode

If you use K726 or K728 board and two antennas' position always fixed, you can use the following configuration to restrain the baseline length, it will get better azimuth result.

For example, the baseline length is 1900 mm

```
Set vectorlength 1900 // Restrain the baseline length
Saveconfig //Save configuration
```

The unit of this value is mm. You can get the length between two antenna through the heading message by command "log headinga ontime 1" when heading get the fixed solution.

5. Frequently Used Commands

This section describes some frequently used commands for K-series OEM boards, such as version, raw data and NMEA data output. For more programmatic commands, please refer to **ComNav OEM Board Reference Manual_V1.5**.

5.1 Check Version Information

```
Log version //Version information about the board
```

```
<VERSION COM1 0 60.0 UNKNOWN 1869 200404.500 00000000 0000 1114
< 1< GPSCARD "S32030K708" "02801074" "CRDK-708AA-TTT-0" "2.20R-
2.032-1" "5.000" "2015/Aug/25" "17:27:16"
OK!
Command accepted! Port: COM1.
```

5.2 Check Port Information

Log comconfig

//Log Information of the port

Port	Baud	Parity	Databits	Stopbits	Handshake	Echo	Breaks	RxType	TxType
Response									
COM1	115200	0	8	1	0	0	1	1	1
COM2	921600	0	8	1	0	0	1	1	1
COM3	115200	0	8	1	0	0	1	1	1
COM4	115200	0	8	1	0	0	1	1	1

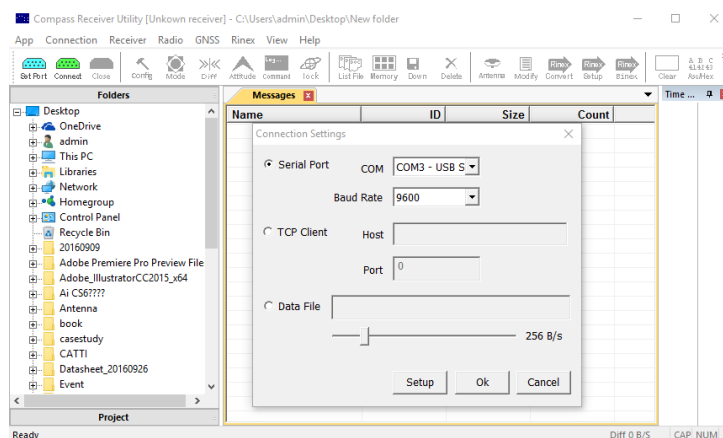
OK!
Command accepted! Port: COM1.

5.3 Change the serial port baud rate

Com comX 9600

//Change the baud rate of comX to 9600

Tip: after changing baud rate of current serial port, you need to reconnect your OEM board.



5.4 Check System Information

Log sysconfiga

//log all configuration information

5.5 Check the Output data Information

Log loglista

//List all output Logs

5.6 Lockout/unlockout satellite system

Command	Description
<code>(un)lockout bd2</code>	(un)lockout Beidou system
<code>(un)lockout gps</code>	(un)lockout GPS system
<code>(un)lockout GLONASS</code>	(un)lockout Glonass
<code>Unlockoutall</code>	Unlock all GNSS system

5.7 NMEA data output

`Log comX gpgga ontime 1` //Output GPGLGA
`Log comX gpgsv ontime 1` //Output GPGLSV

5.8 Raw data output

Please create file to save the raw data before sending the following commands:

`Log comX rawephemb onchanged` //Output GPS ephemeris
`Log comX glorawephemb onchanged` //Output Glonass ephemeris
`Log comX bd2rawephemb onchanged` //Output Beidou ephemeris
`Log comX rangecmpb ontime 1` //Set comX output 1Hz **observation** data

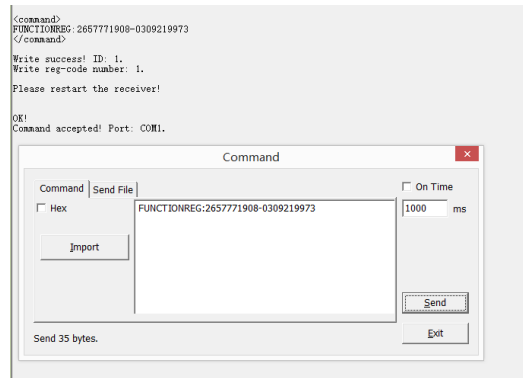
5.9 High-frequency data output

`Set pvtfreq 10` //set PVT frequency; take 10Hz as an example
`Set rtkfreq 10` //set PVT frequency; take 10Hz as an example
`Log gpgga ontime 0.1` //output GPGLGA; take 10Hz as an example
`saveconfig` //Save the configuration
Tip: the default setting supports up to 5Hz, you need to send the above commands if requiring more than 5Hz.

5.10 Activate register code

The format of register code we send you: `FUNCTIONREG: xxxxxxxx`

1. Copy this code to any serial communication software and click **send** as shown below:



2. Send command **Log regista** to check the registration status. It will show the number and list of activated functions (**ZONEGLOBAL** function as an example in the following figure)



5.11 Event Marker

Markcontrol

MARKCONTROL signal switch [polarity] [timebias [timeguard]]

Description

The signal only supports the key words “mark1”; switch supports the key words “enable” and “disable”; polarity supports the key words “positive” and “negative”, which separately represent “positive pulse” and “negative pulse”; timebias and timeguard parameters cannot be set by now.

The settings can be saved by saveconfig command and the markcontrol status can be checked by log sysconfig command.

Example

markcontrol mark1 enable negative 0 0

Log marktimea onnew

//Time of mark input event

Log markposa onnew

// Position at time of mark input event

5.12 PPS

Format:

PPSCONTROL <switch><polarity><period><pulse-width>

Description:

This command can be used to set the polarity, period and pulse-width of PPS output.

The PPS can't be disabled and the update rate can be up to 10 Hz.

Parameters:

switch 'enable' or 'disable', the switch should be set to 'enable', and 'disable' is not allowed.

polarity 'positive' and 'negative', if 'positive', it should be a high level pulse, a low level pulse correspond to a 'negative' mode.

Period in seconds, 'period' can't be configured, it is constantly 1 second temporary.

Pulse-width in microseconds, pulse-width should be less than half of period.

Example:

PPSCONTROL ENABLE POSITIVE 1 1000

5.13 Freset

This command clears data which is stored in non-volatile memory, and set the baud rate to 115200. No data log is outputted.

Freset

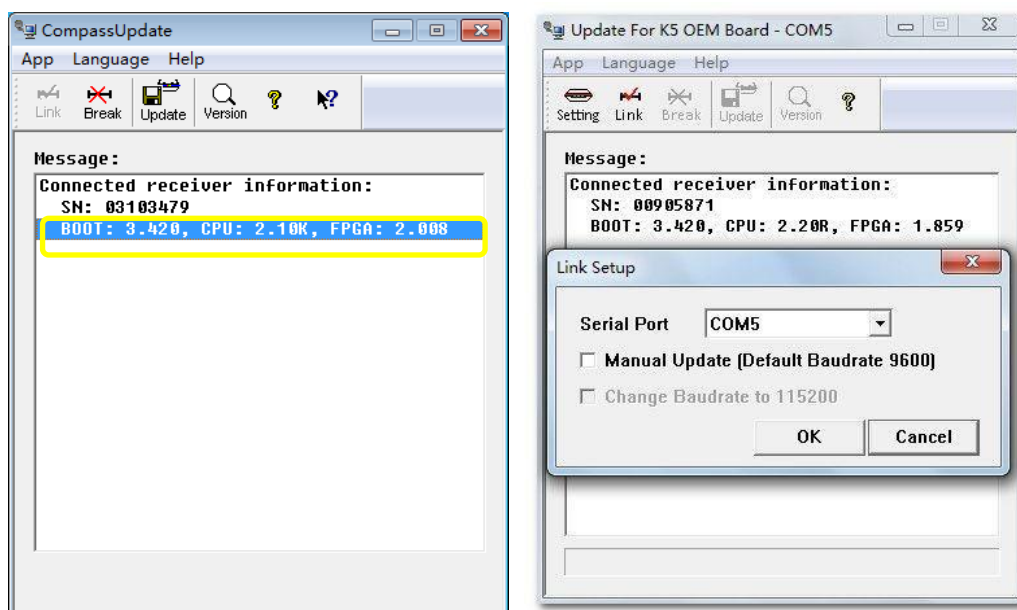
//Reset to the factory default

6. Firmware update

6.1 Auto Update

To update firmware of GNSS OEM board, you should follow:

1. Connect your OEM board with your PC.
2. Change the baud rate to 115200 in CRU software, enter commands:
com com1 115200
3. Open firmware upgrade software, click **Break** -> **Setting** -> select serial port and click OK. If Boot message output as below, it means the OEM board is successfully connected; otherwise try FORCE UPDATE.
4. If parameters are incompatible after upgrading, please send command **Freset** to clean all previous settings. Download the latest firmware at <http://www.comnavtech.com/download.asp?bigclassid=28>.

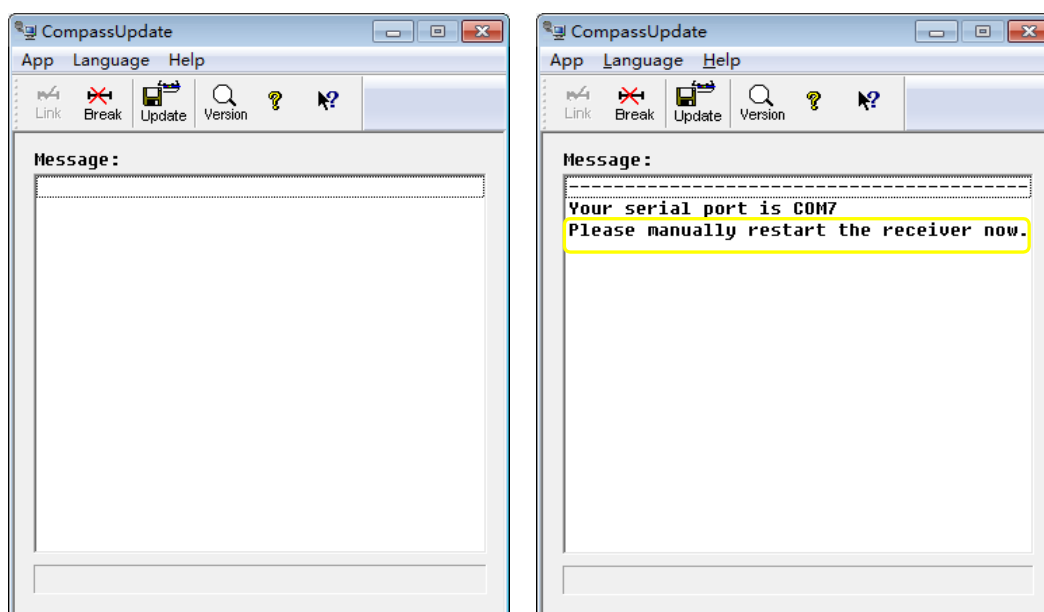
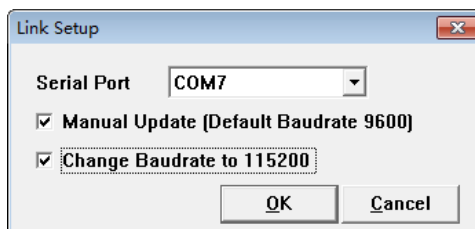


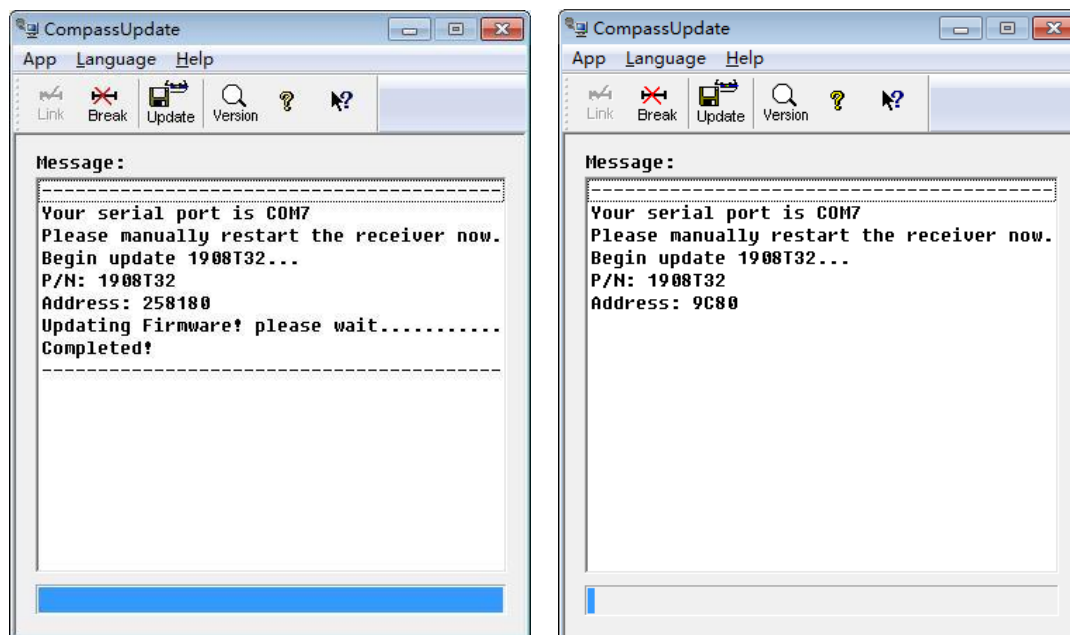
4. Click **Link** and **Update** to upgrade OEM board

Note: please don't move your mouse or run other software when updating firmware (5-6 minutes).

6.2 Force Update

Check the following two options in link setup and update again





Tip: it's better to use USB to ComNav provided Serial convertor, otherwise it may result a fail identify of serial port.