iNavTool

User Manual

Revision History

Version Number	Modification Record	date
V1.0.0	Heat	2022.5.24
V1.1.0	Updated the operation instructions according to the modification of iNavTool;	2022.10.24
V1.1.1	Added posture view; Added GNSSCN0 tool; Added RTC frequency statistics; Ui interface update;	2022.11.17
V1.1.2	Added PPS tool; Added residual view; Ui interface update;	2022.12.16
V1.1.3	Added description of UC6228	2022.12.22
V1.1.4	compatibility. NMEA view supports RTCM file injection; The TTFF tool supports RTCM file injection; Optimize the display method of discrete point view; UI display optimization to support different resolutions and scaling Compare;	2023.5.5

Document Status Description

Primary: preview version, the document content is for design goals, and it is not officially released.

Alpha release: preview version for key customers, document content is initially tested and verified, indicators may be available later

Fine-tuning;

Beta release: The document content has passed the complete product test and the content indicators have been confirmed;

Production release: The document content is complete and final.

Disclaimer

This document provides information about the products of Core and Object (Shanghai) Technology Co., Ltd.
transfer, by implication, estoppel or otherwise, of any patent, trademark, copyright or proprietary right of the Company or any third party;
any rights or licenses thereunder.

Except for the responsibilities stated in the sales terms and conditions of its products, the company does not assume any
In addition, Xinyuwu makes no warranty, express or implied, regarding the sale and/or use of its products.
including any warranty of fitness for a particular purpose, merchantability or infringement of any patent, copyright or other intellectual property right.
The company is not responsible for any problems caused by connection or operation not in accordance with the manual.
Specifications and product descriptions may be modified at any time without notice.

Our products may contain certain design defects or errors, which will be included in the errata once discovered.
This may cause the product to deviate from published specifications. Current errata sheets are available upon request.

Before ordering products, please contact us or your local distributor to obtain the latest specifications.

*Core and Object, ICOE and its logo have been applied for trademark registration by Core and Object (Shanghai) Technology Co., Ltd.
Names and brands are property of their respective owners.

Preface

This User Manual provides you with an introduction to the functions of the iNavTool visual GNSS evaluation software.

Instructions, operating instructions and UI instructions are applicable to readers.

This User Manual is applicable to users or manufacturers who use core and object modules and chips.

1 iNavTool Introduction

1.1 Overview

iNavTool is a graphical satellite display control software for GNSS receivers developed by Core and Objects. It is designed to help Core and Objects users to easily perform visual operations on the company's modules or chips. Through iNavTool, users can view basic information/satellite reception status/positioning status of modules and chips, and support function settings, TTFF testing, output protocol configuration, etc.

1.2 Preparation before use

To ensure that you can fully experience the functions of iNavTool software, it is recommended that you use it with the Core and Object board. As shown in Figure 1-1, correctly connect the board, antenna and PC.

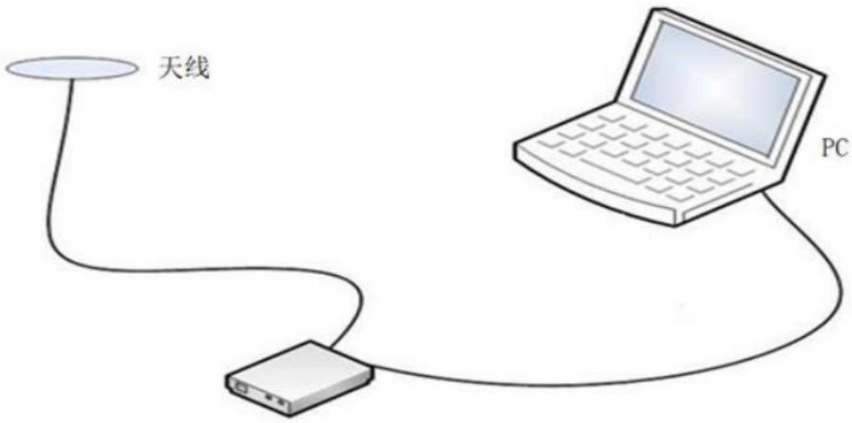

Figure 1-1 Connection example

Software version: R5.0.1

Software size: compressed package about 90MB

Software language support: Chinese, English Software

system support: Windows 7, Windows 8, Windows 10

2 Functional Description

2.1 Language Selection

iNavTool evaluation software supports Chinese and English display interfaces. When the software is started for the first time, a language selection box will pop up (as shown in Figure 2-1). When the language setting is selected, the software will automatically save the setting and automatically enable the setting after the next startup. If you want to switch the language, click "Language Switch" in the "Settings" option (as shown in Figure 2-2).

(Note: Some functions are not currently available in Chinese)

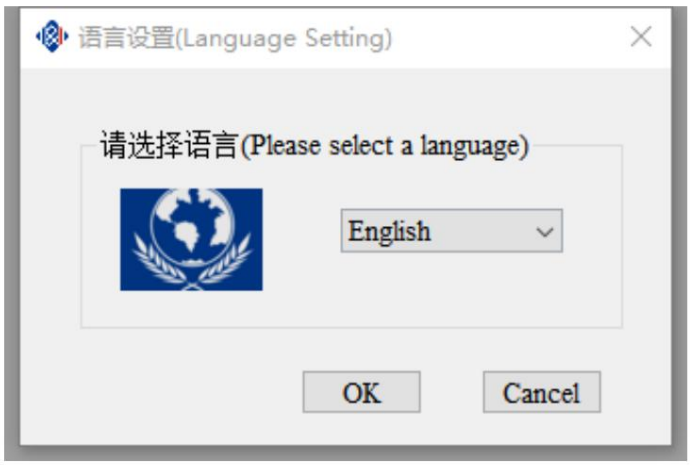

Figure 2-1 Language selection pop-up window

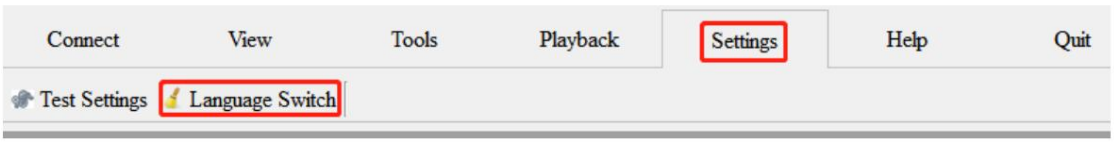

Figure 2-2 Switching between Chinese and English

2.2 Tool Settings

Before using iNavTool, it is recommended to click "Test Settings" in "Settings" (as shown in the figure 2-3) to make relevant settings so that the corresponding functions can be realized as expected.

Figure 2-3 Tool settings

2.2.1 General Settings

Selecting "General Settings" in the Settings interface will enter the general settings interface (as shown in Figure 2-4), including the setting of the statement indicating the start of Nmea, the statement to be parsed (not yet implemented, all selected by default), checking the Nmea check code, and leap second setting.

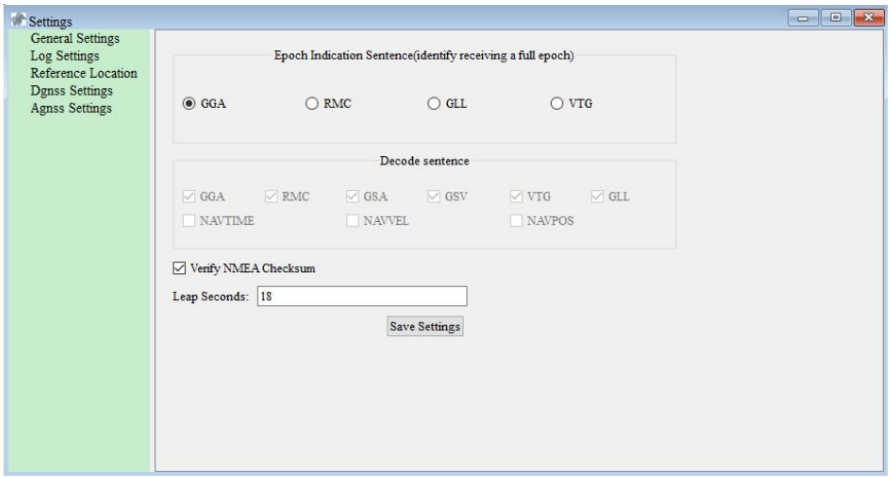

Figure 2-4 General Settings

2.2.2 Log Settings

Select "Log Settings" in the Settings interface to enter the log settings interface (as shown in Figure 2-5). By default, the prefix of the log name starts with ICOE and is continuously saved in the directory where the tool is located. The log name is in the form of ICOE_COMx_DataTime.log. You can modify it as needed, and click Save to make it effective.

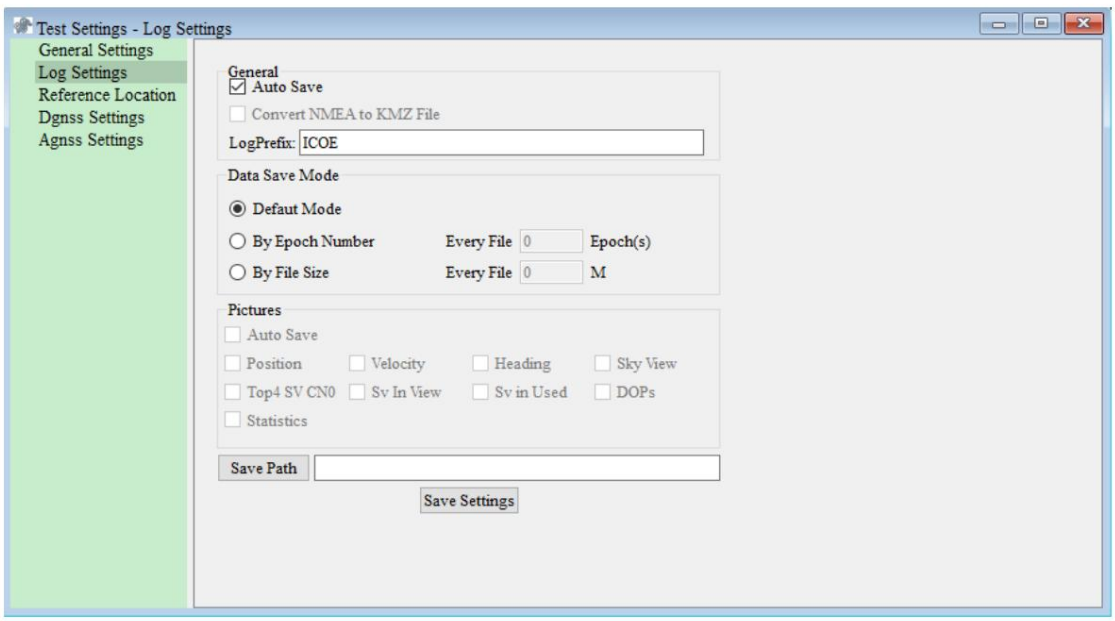

Figure 2-5 Log settings

2.2.3 Reference position setting

Select “Reference Location” in the Settings interface to enter the reference settings interface (as shown in Figure 2-6).

By default, the average positioning value of the previous 60 seconds is selected as the reference position.

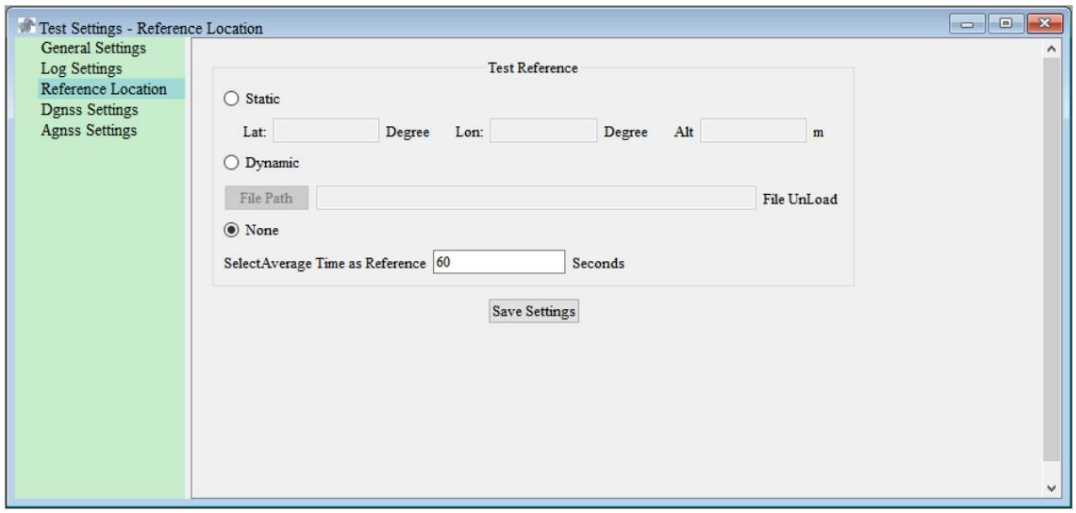

Figure 2-6 Reference position setting

2.2.4 DGNSS settings

Select “Dgnss Settings” in the Settings interface to enter the DGNSS account settings interface (as shown in Figure 2-7).

In this interface, you can add and delete accounts used for differential positioning.

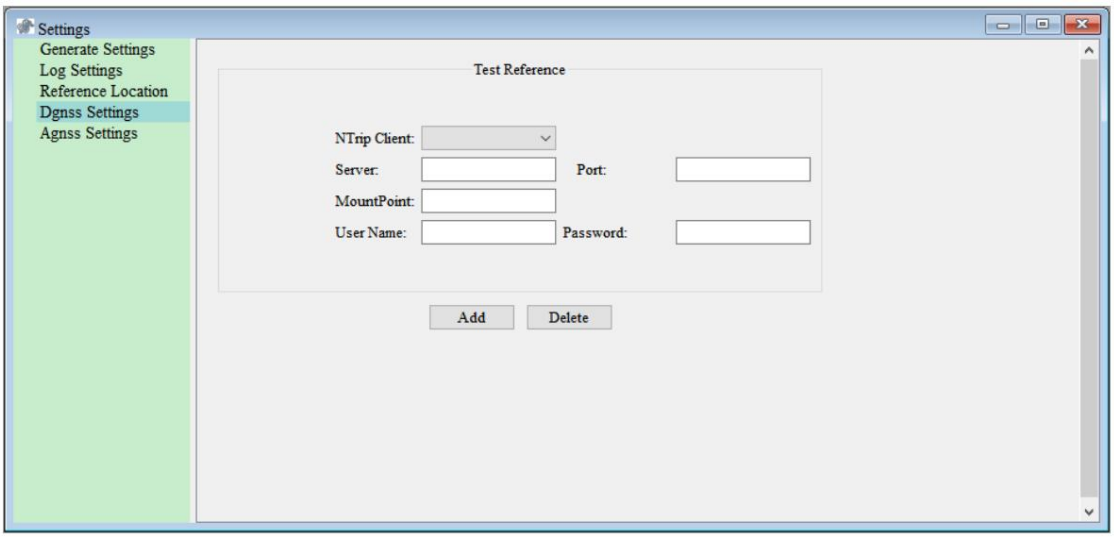

Figure 2-7 DGNSS settings

2.2.5 AGNSS settings

Selecting "Agnss Settings" in the Settings interface will enter the AGNSS settings interface (as shown in Figure 2-8). In this interface, you can configure the required auxiliary ephemeris system, real-time ephemeris account and offline ephemeris configuration. For offline ephemeris configuration, the default selection is MSLConfig.txt in the RXN directory of the tool.

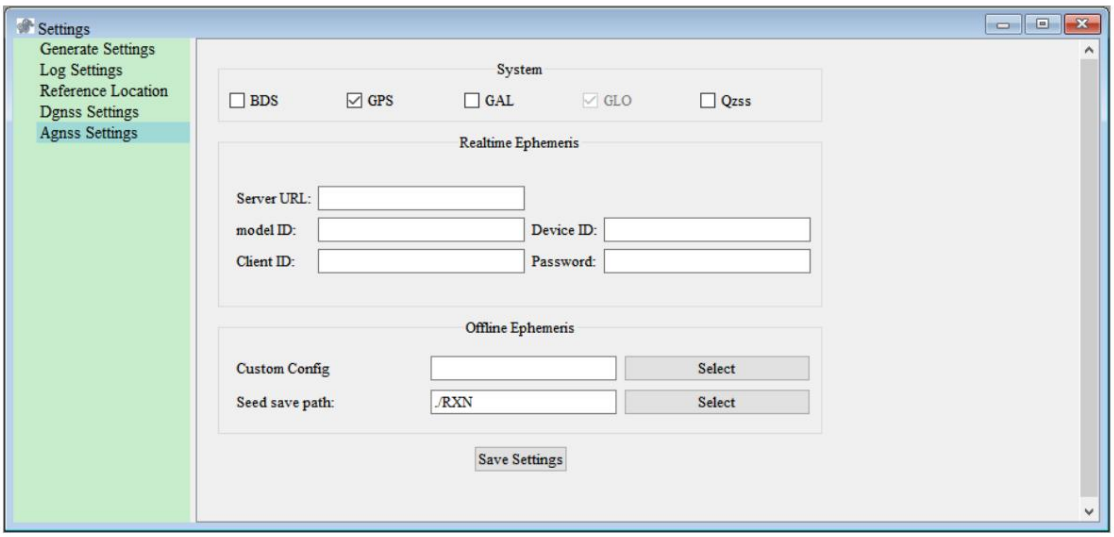

Figure 2-8 AGNSS settings

2.3 Serial port connection

The main interface of iNavTool only supports one serial port to connect to the receiver and check the receiver information. Click "Connect Device" in "Connect" in the menu bar of the main interface (as shown in Figure 2-9), and the software will pop up a serial port selection pop-up window (as shown in Figure 2-10). The serial port pop-up window supports serial port selection, baud rate selection, etc.

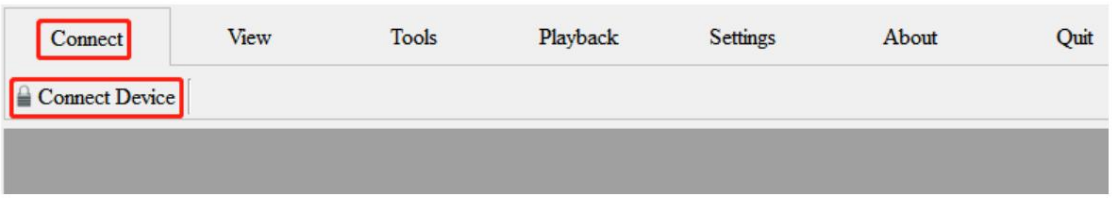

Figure 2-9 Serial port connection button

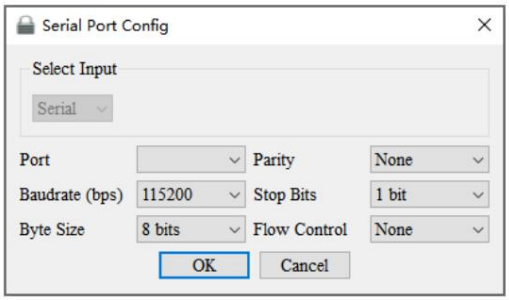

Figure 2-10 Serial port configuration pop-up window

2.4 Satellite distribution view

When the iNavTool software is connected to the receiver normally, the iNavTool evaluation software will analyze the receiver data and display the satellites that the receiver has resolved in the satellite distribution view (as shown in Figure 2-11). Users can click the "Satellite" option in the "View" option bar of the menu bar to display the view in the view area of the software (as shown in Figure 2-12). The satellite distribution view supports four navigation systems: GPS, BDS, GLO and GAL. For easy viewing, a check box is provided in the view to select the system. If you only want to view the distribution status of GPS, just check GPS. QZSS and SBAS satellites are both displayed as GPS, distinguished by PRN number.

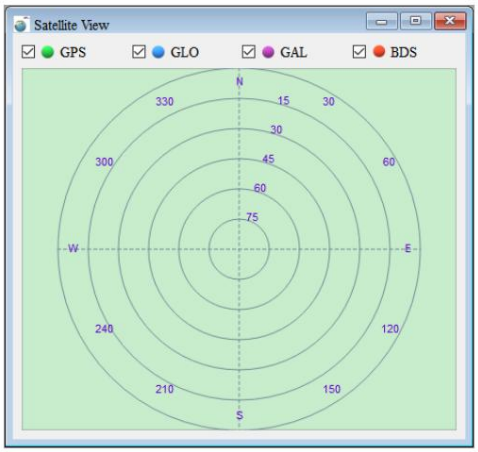

Figure 2-11 Satellite distribution view

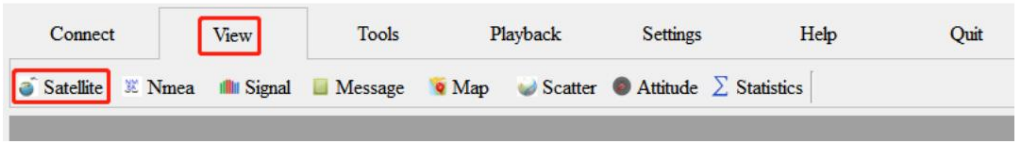

Figure 2-12 Satellite distribution view selection

2.5 NMEA View

After the iNavTool evaluation software is connected to the receiver normally, the receiver data can be displayed in the NMEA view (as shown in Figure 2-13 (1)). Users can click the "Nmea" option in the "View" option bar of the menu bar to display this view in the software view area (as shown in Figure 2-14). The NMEA view will filter the information output by the serial port and only display the protocol output of Nmea and ICOE; users can choose to send content as ASCII code or hexadecimal information by clicking "ascii" in the lower right corner.

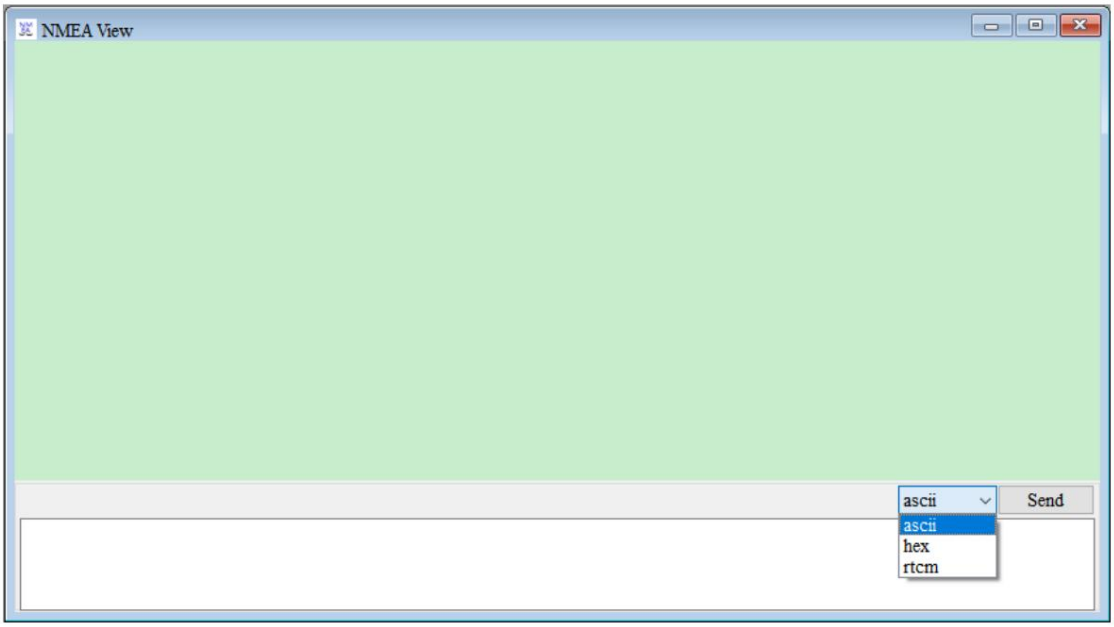

Figure 2-13(1) NMEA view

Added the function of manually selecting RTCM file injection: when "rtcm" is selected in the option box in the lower right corner, a text box and selection button will be displayed in the lower left corner. Click "Select" to select the file to be injected, and then click the "Inject" button in the lower right corner. When the prompt box "RTCM Inject Succeed" appears, the injection is successful. If it is an ephemeris file in Rinex format, you need to check the box and specify the UTC time. The time format is hh:mm, 24-hour format.

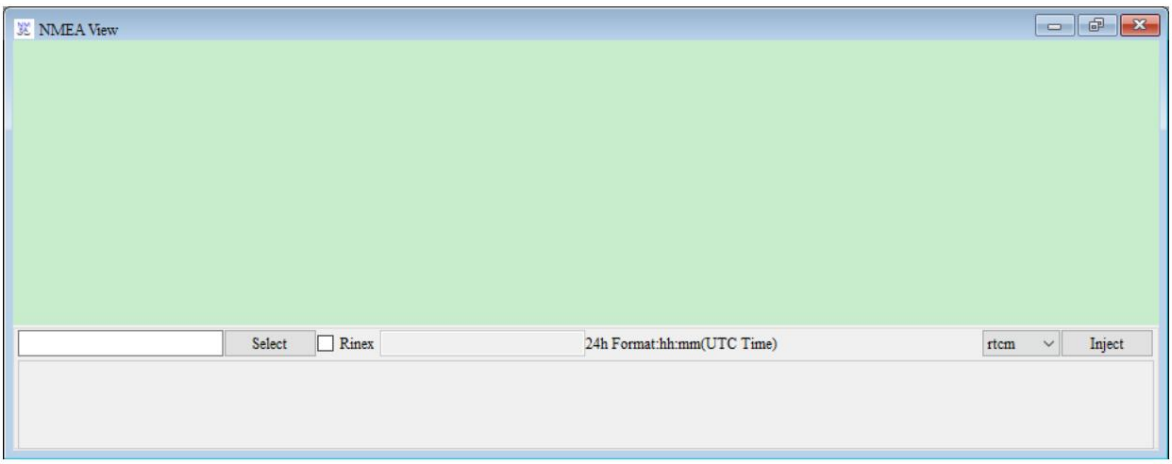

Figure 2-13 (2) NMEA view - injecting RTCM file

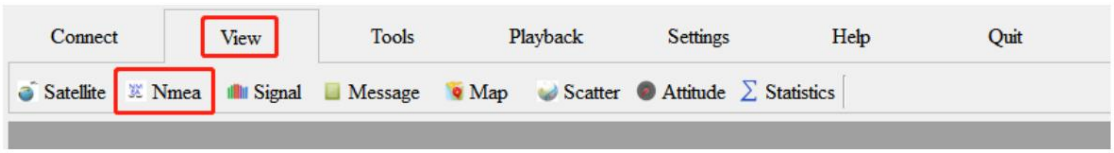

Figure 2-14 NMEA view selection

2.6 CN0 view

After the iNavTool evaluation software is properly connected to the receiver, it can analyze the data of the receiver and display the satellite

CN0 is in the satellite CN0 view (as shown in Figure 2-15). Users can click on the “View” option bar in the menu bar to “Signal” option to display the view in the software’s view area (as shown in Figure 2-16). Satellite CN0 view supports There are 4 systems displayed: GPS, BDS, GLO and GAL. (Note: QZSS and SBAS are both displayed in GPS)

The displayed content depends on the data output by the receiver. The strength of satellite CN0 is displayed in a bar graph, and the satellite number can be displayed. A solid bar graph indicates that the azimuth and elevation have been solved, while a hollow bar graph indicates the opposite. Satellites of different systems are distinguished by color. If a satellite participates in positioning, it is indicated by a fan-shaped icon.

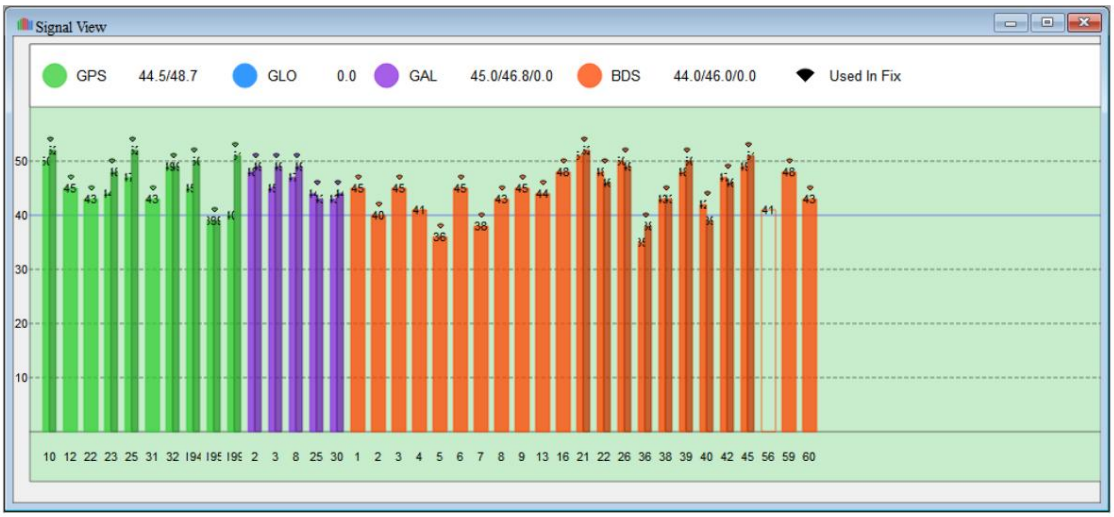

Figure 2-15 CN0 view

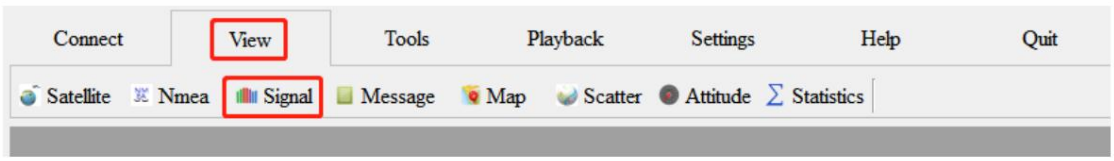

Figure 2-16 CN0 view selection

2.7 Message View

After the iNavTool evaluation software is connected to the receiver normally, it can parse the data of the receiver and display all the parsing results of the parsable statements in the statement parsing view (as shown in Figure 2-17). The user can click the "Message" option in the "View" option bar of the menu bar to display the view in the view area of the software (as shown in Figure 2-18).

Because iNavTool is a self-developed product of Xinyuwu, it only supports ICOE protocol and NMEA universal protocol.

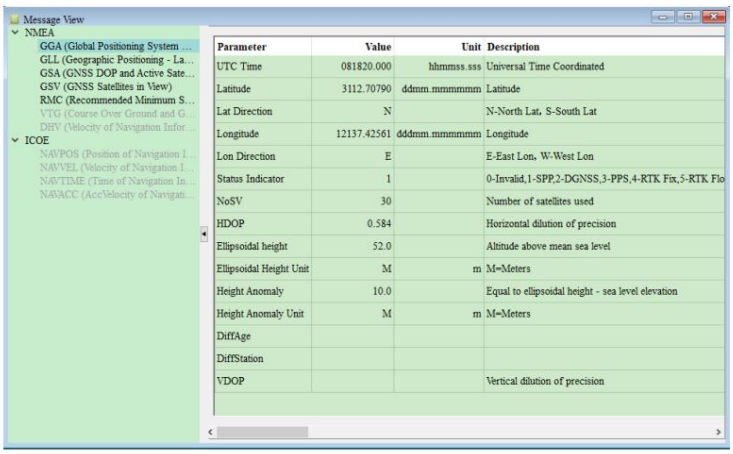

Figure 2-17 Message view

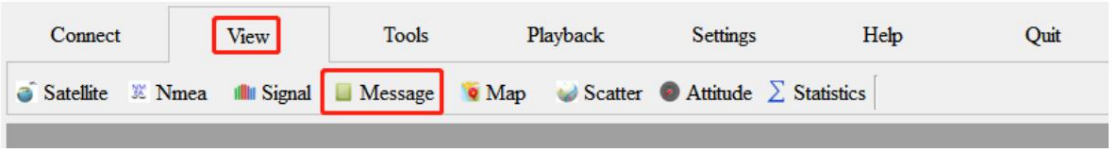

Figure 2-18 Message view selection

2.8 Map View

After the iNavTool evaluation software is properly connected to the receiver, it can parse the data of the receiver and display the parsed location information in real time in the map tracking view (as shown in Figure 2-19). Users can click the "Map" option in the "View" option bar of the menu bar to display the view in the software's view area (as shown in Figure 2-20).

In the map tracking view, iNavTool will display the parsed UTC time, longitude, latitude, elevation, speed, heading, number of satellites involved in positioning, HDOP, VDOP and positioning mode, and display the real-time location on the Baidu map. Users can set and check in the view to ensure that the location display is always in the center of the map. Users can also choose the map type, which can be either map or mixed.

Figure 2-19 Map view

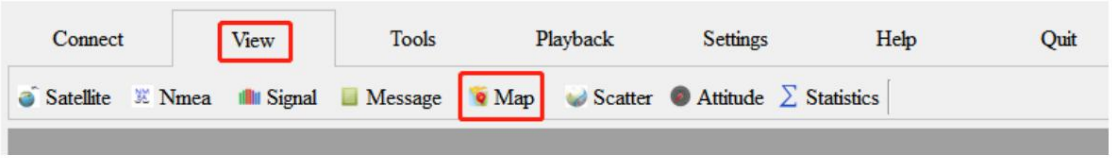

Figure 2-20 Map view selection

2.9 Discrete Point View

After the iNavTool evaluation software is connected to the receiver normally, it can parse the data of the receiver and convert it into The position information of the discrete trace view is displayed in real time (as shown in Figure 2-21).

Click the “Scatter” option in the “View” option bar to display the view in the view area of the software (as shown in Figure 2-22).

In the discrete point view, "CenterToCurrent" is selected by default, and the current point is used as the center position; you can select "MouseClick" and then click anywhere in the graph with the mouse, and the mouse click position will be used as the center position; you can also select "SpecifiedCenter" and then manually enter the longitude and latitude in the input box below and click the "Apply" button below to enter the position as the center position.

The view displays the current point in green, the history track in blue, and the center point in red.

Provide "Clear" and "Save" buttons to save and clear the track.

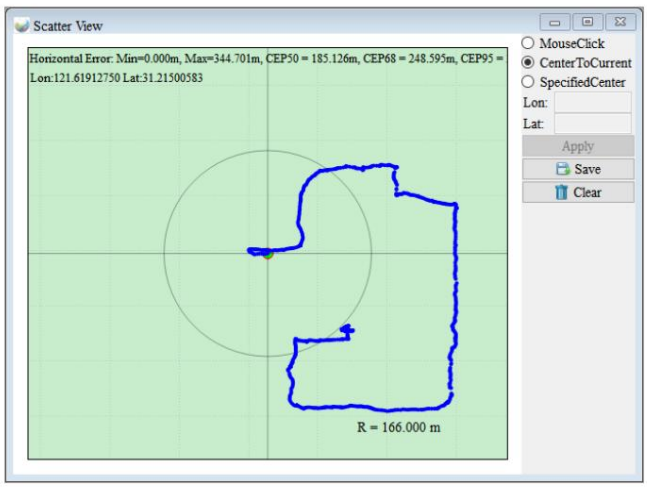

Figure 2-21 Tracking view

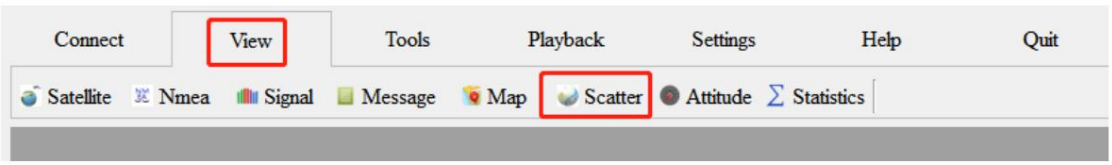

Figure 2-22 Tracking view selection

2.10 Posture View

After the iNavTool evaluation software is connected to the receiver normally, it can parse the data of the receiver and convert it into

The speed information and attitude information are displayed in real time in the attitude view (as shown in Figure 2-23). Users can click the "Attitude" option in the "View" option bar of the menu bar to display this view in the view area of the software (as shown in Figure 2-24).

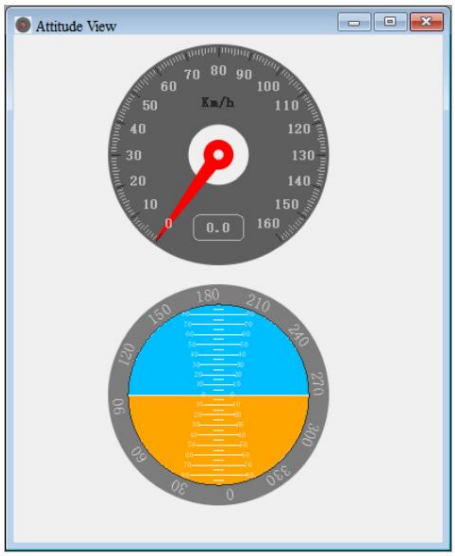

Figure 2-23 Posture view

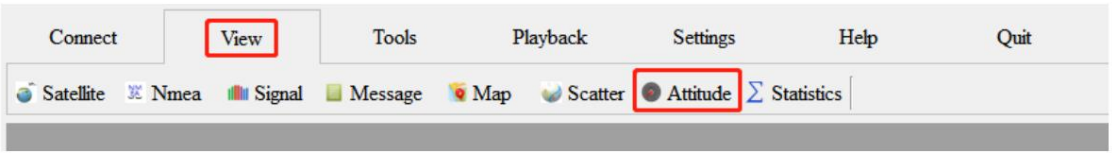

Figure 2-24 Posture view selection

2.11 Interface Reset

After iNavTool is correctly connected to the serial port, if there is no view in the view area, the software will automatically pop up and layout the satellite distribution view, NMEA view, CN0 view, message view, map view and discrete point view by default (see Figure 2-25 for detailed layout ; if there is already a view in the view area, all opened views will be rearranged. In addition, users can click the fifth "Reset visible Views" function button on the right toolbar to actively organize the views.

(As shown in Figure 2-26).

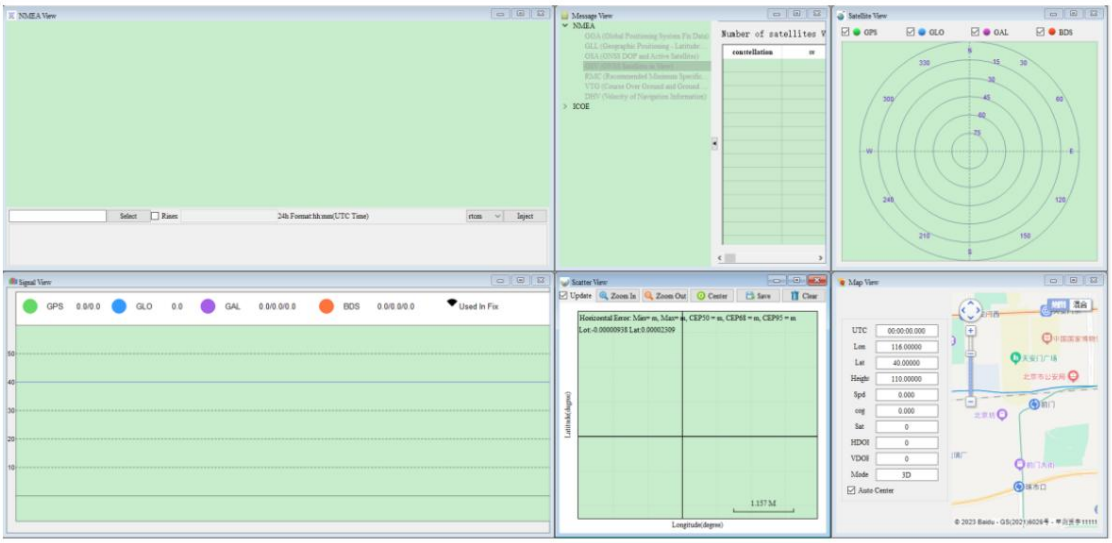

Figure 2-25 Default layout diagram

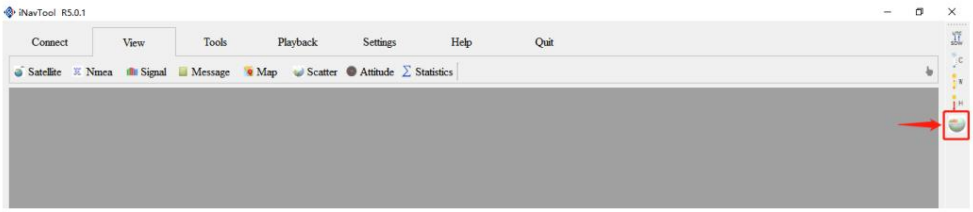

Figure 2-26 Interface reset button

2.12 Data Overview View

After the iNavTool evaluation software is connected to the receiver normally, it can parse the data of the receiver and convert it into The information is displayed in real time in the data overview view (as shown in Figure 2-27). Users can click the "Statistics" option in the "View" option bar of the menu bar to display this view in the view area of the software (as shown in Figure 2-28).

In the data overview view, users can select different buttons to display different data in the line chart, such as Top4CN0, SatInUse, etc. You can also directly obtain the required data through the table below the line chart.

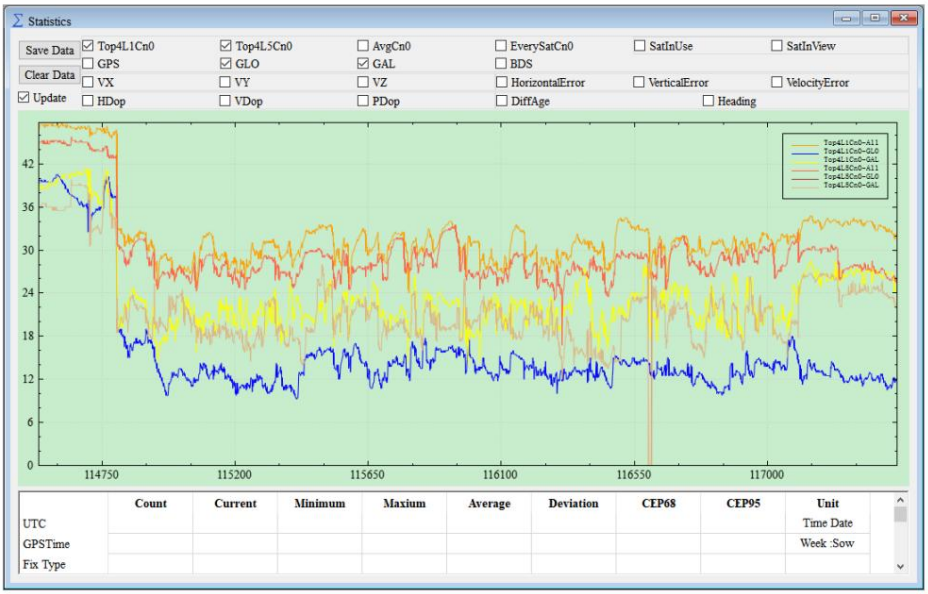

Figure 2-27 Data Overview View

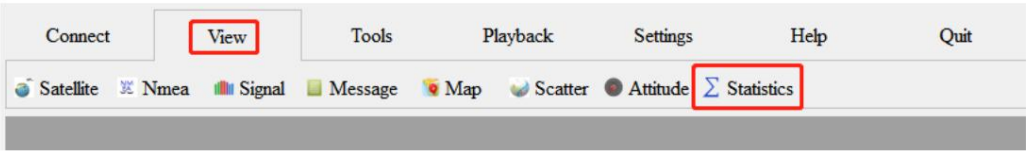

Figure 2-28 Data overview view selection

3. **Tool Description**

3.1 Message Configuration View

After the iNavTool evaluation software is connected to the receiver normally, the status of the receiver can be configured. ICOE provides users with a lot of protocol instructions to configure ICOE boards, modules and chips. For example, system switching, baud rate change, output statement change, receiving protocol support, soft reset, etc. (For details, refer to the ICOE protocol document).

There are many ICOE custom commands. To facilitate user operations, iNavTool provides users with a message configuration function (as shown in Figure 3-1). Check the required parameters in the corresponding command interface and click the "Send" button to complete the configuration. You can also query the current configuration through the "Query" button to check whether the setting is successful.

Users can click the "Config" option in the "Tools" option bar of the menu bar to display this view in the software. The viewing area of the component (as shown in Figure 3-2).

Note: When configuring the UC6228CI chip, please check the UC6228 checkbox (as shown in the red box in Figure 3-1) before proceeding.

Continue the instruction operation.

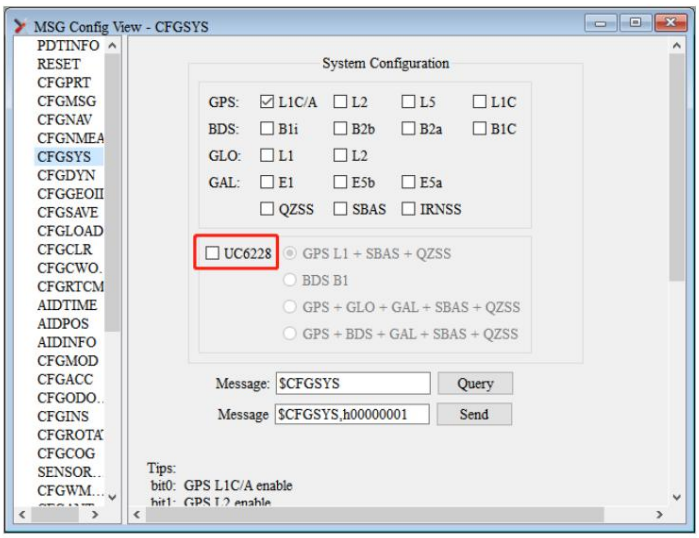

Figure 3-1 Message Configuration View (CFGSYS)

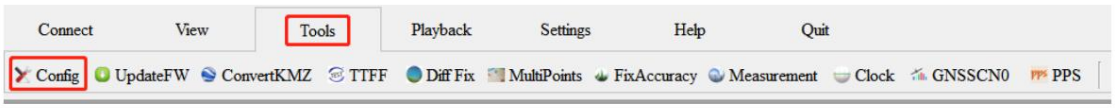

Figure 3-2 Message configuration view selection

3.2 Firmware Upgrade Tool

iNavTool evaluation software provides firmware upgrade tools for ICOE boards, modules and chips (as shown in Figure 3-3). Currently, this firmware upgrade tool only supports upgrade operations for modules and boards based on ICOE CC0058x chips. If you are using products based on ICOE's UC6580I or other chips, please contact ICOE's FAE to obtain relevant upgrade tools . Users can start this function by clicking the "Update FW" option in the "Tools" option bar of the menu bar.

(As shown in Figure 3-4).

ICOE products only support firmware upgrades on the module's COM0 port. If you use this function, make sure the serial port is

The port is normally connected to the COM0 port of the product.

The general operation process is as follows:

1. Click the "Select Path" button and select the firmware.

2. Select the correct port in the port column and make sure the port is not occupied before burning.

3. Select "FB2SEXT", which corresponds to the latest bootloader. Before burning, make sure the configuration is correct.

4. Select the transmission baud rate, currently the highest supported baud rate is 460800.

5. Because the module needs to be reset during the firmware upgrade process, the user can check "Software Reset" for soft reset or not. If it is not checked, the board needs to be hard reset.

6. Check “Erase All” to clear Flash.

7. After completing the above operations, click the "START" button to start the firmware upgrade.

8. During the firmware upgrade process, please pay attention to the upgrade status.

Important: Do not interrupt the upgrade process.

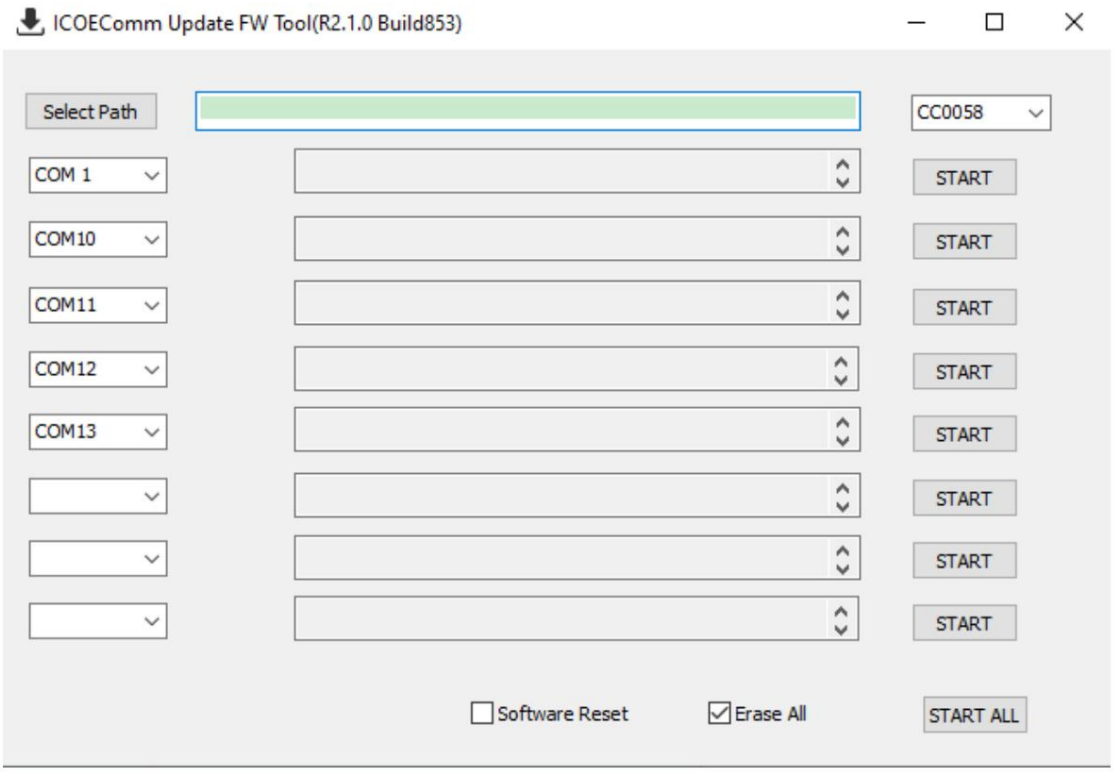

Figure 3-3 Firmware upgrade tool

Figure 3-4 Firmware upgrade tool selection

3.3 KMZ conversion tool

iNavTool evaluation software provides KMZ conversion function for ICOE product data, which can convert standard NMEA

The data is converted into a KMZ format file, which can be opened through Google Earth for easy playback of road test conditions.

After the iNavTool evaluation software starts the KMZ conversion tool, an interface as shown in Figure 3-5 will appear. In the interface, the user needs to

To choose the local location of the data, the resulting icon color and size, and the line color and width.

Users can start this function by clicking the "ConvertKMZ" option in the "Tools" option bar of the menu bar (such as

Figure 3-6 shows the process of

The general operation is as follows:

1. Click the "Open Log" button and select the product data file to be converted. Only .log files are supported.

2. Select the chart color of ICON to make it easier to distinguish when you need to view multiple KMZ data

3. Select the Line color to make it easier to distinguish when you need to view multiple KMZ data

4. Select Plot Configuration and check the boxes according to your needs.

5. When the above operations are completed, click "Process" to start data conversion

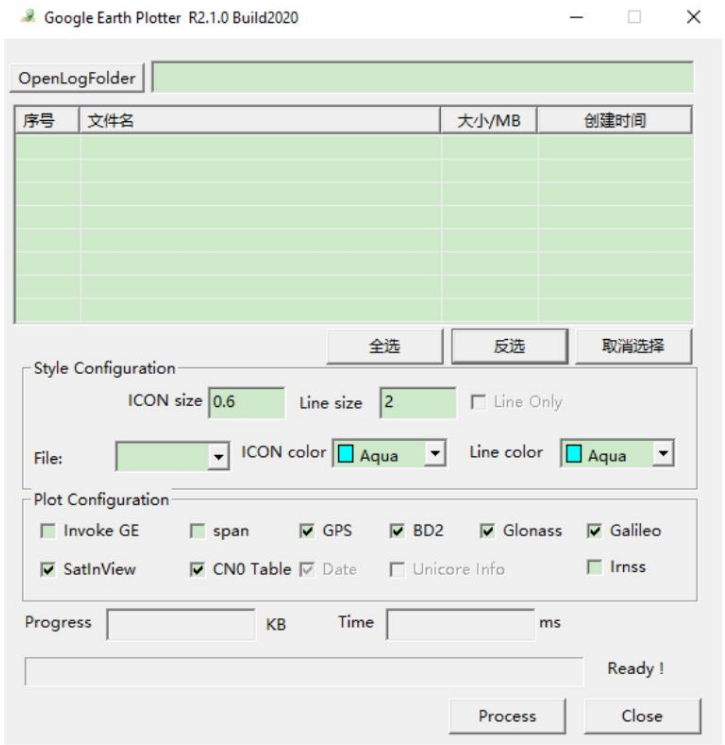

Figure 3-5 KMZ conversion tool

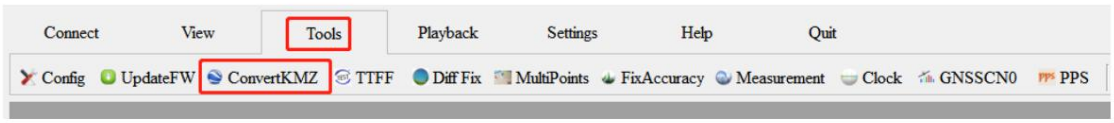

Figure 3-6 KMZ conversion tool selection

3.4 Time to First Fix Test Tool

iNavTool evaluation software provides ICOE products with a time to first fix (TTFF) test evaluation tool.
You can start this function by clicking the “TTFF” option in the “Tools” option bar on the menu bar (as shown in Figure 3-7).

In the TTFF tool (as shown in Figure 3-8), users can perform cold start TTFF test, hot start TTFF test, etc. on ICOE products. Users can set the number of tests and the time interval between each test.

For the test method, users can choose independent positioning and assisted positioning. Assisted positioning is divided into real-time ephemeris and offline ephemeris. Users need to enter the server-related information and verification-related information of the auxiliary message sending station, and check the ephemeris system to be received. Users can obtain this information by contacting ICOE's technical support engineers.

The general operation is as follows:

1. Select the reset method. iNAvTool provides cold start, hot start, warm start and custom command tests.

2. Enter the "Number of Tests", which is the total number of tests you need.

3. Enter the "Timeout" which is the maximum time for a successful first point positioning in a test.

4. Enter the "Test Interval" and set the interval between two consecutive tests. The interval is a random number between 0 and "Test Interval".

5. Check "Test Mode". iNavTool provides two test modes: "Independent Positioning" and "Assisted Positioning". Assisted positioning includes real-time ephemeris (Realtime) and offline ephemeris (Pglite).

6. When selecting "Assisted Positioning" (AGNSS), you can check "UseLocRTFCMfile" as needed, and choose to use server data or specify an RTCM file. If you use server data, you need to configure the network configuration of the auxiliary data server. If you do not have the relevant configuration information, you can consult the ICOE technical support group to obtain it.

7. Select the transmission serial port for auxiliary data. Some ICOE products provide two UART ports, so there are two options when selecting data transmission. However, it should be noted that the port for auxiliary data transmission needs to be configured to support RTCM3.3 protocol. For details, see 1.4.2.2 CFGMSG of the ICOE protocol.

8. When the above operations are completed correctly, click the "Start Test" button.

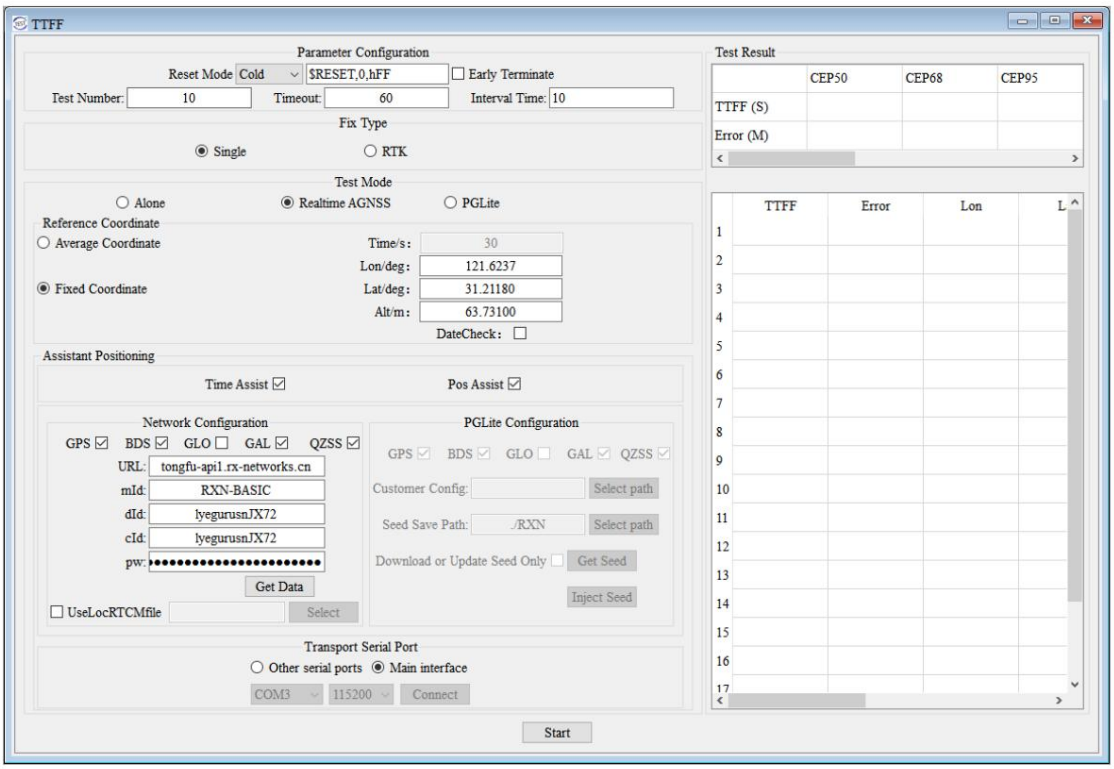

Figure 3-7 First Fix Time Test Tool

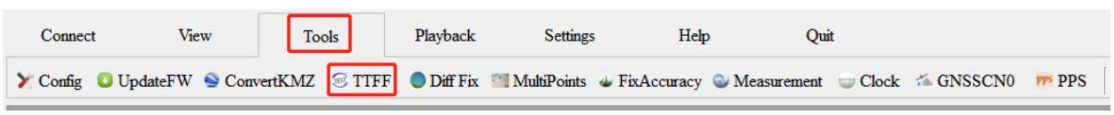

Figure 3-8 First Fix Time Test Tool Selection

3.5 DGNSS differential positioning tools

iNavTool evaluation software provides DGNSS differential positioning server connection tools for ICOE products, supporting connection to TCP servers and Ntrip servers (as shown in Figure 3-9-1). Users can start this function by clicking the "Diff Fix" option in the "Tools" option bar of the menu bar (as shown in Figure 3-10).

ICOE products provide a data source for pseudorange differentials.

The general steps are as follows:

1. Select the input stream. iNavTool provides three input methods: TCP, Ntrip and serial port. This option depends on your server type and is a required option.

2. When you select TCP client, click "Configure", you need to enter the address and port number of the TCP server; when you select Ntrip client, click "Configure", you need to enter the address and port number of the Ntrip server, as well as the mount point of your base station on the Ntrip server and the registered user name and password.

3. Select the output stream and port number. This is a required option.

4. Select data reporting, which is optional

5. Choose whether to save the file. If you choose to save the file, you need to select the location to save it, which is not a required option.

6. When all configurations are set correctly, click the "Start" button to connect to the server

Note: Commercial accounts need to report the data source (current location information) in order to match the corresponding base station for service. You can choose "serial port positioning data" or "external fixed data" to report. "External fixed data" requires manual input of the current longitude and latitude information.

Note: When the DSGNSS tool is not open, it is grayed out in the status bar below the view (as shown in Figure 3-9-2).
When the tool is on but not connected, it is red; when the tool is on and connected, it is green.

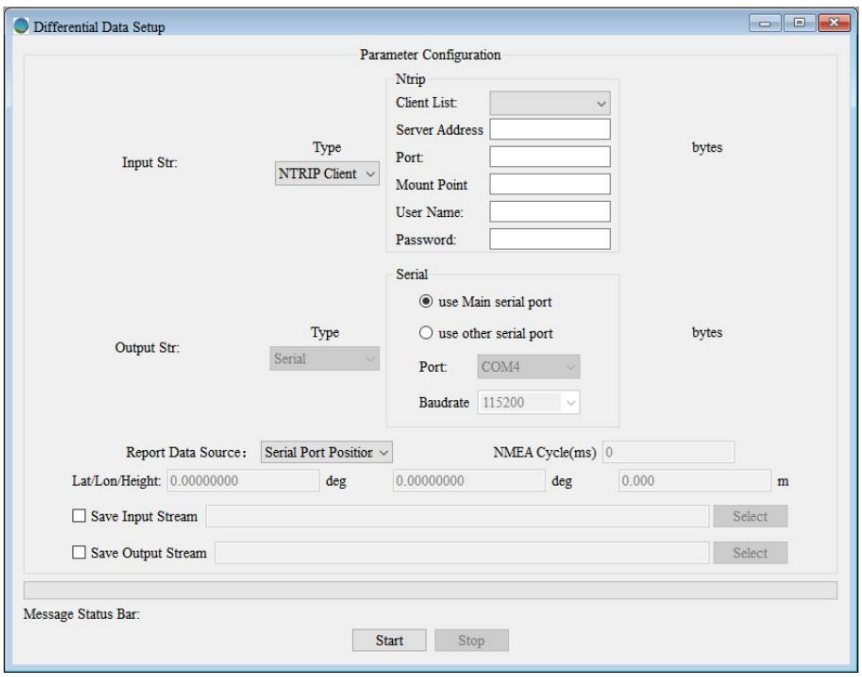

Figure 3-9-1 DGNSS tools

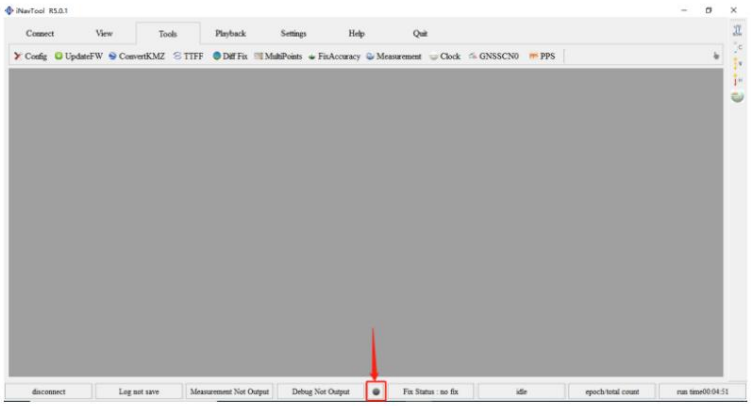

Figure 3-9-2 DGNSS connection status

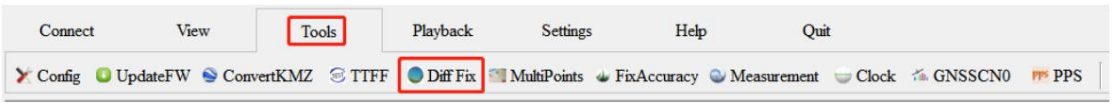

Figure 3-10 DGNSS tool selection

3.6 FixPoint Tool

The FixPoint function of the iNavTool evaluation software can simultaneously solve the positioning accuracy (pi error cep) between multiple positioning points and the corresponding standard points, which is suitable for dynamic multi-point positioning accuracy testing (as shown in Figure 3-11). Users can enable this function by clicking "MultiPoints" in the "Tools" option bar of the menu bar (as shown in Figure 3-12).

The general steps are:

1. Click "Open" to import test data.

2. Fill in the latitude and longitude, altitude and corresponding UTC time of each standard point, and click "add".

3. Click "Start" to solve. When the solution is completed, a pop-up window will appear to indicate that the test is complete.

Note: The complete test results (.csv table by default) will be automatically generated in Load Path.

To delete a standard point, just select the point in the TestPoints list and click "delete".

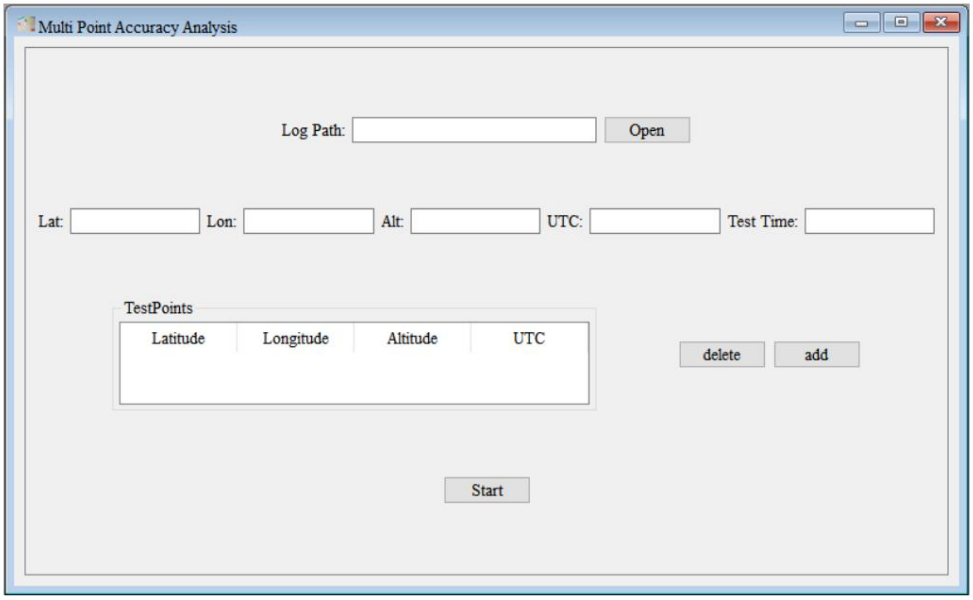

Figure 3-11 FixPoint solution

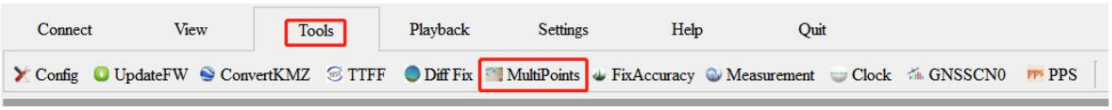

Figure 3-12 FixPoint solution function selection

3.7 Dynamic Accuracy Analysis Tools

iNavTool evaluation software dynamic accuracy analysis is divided into two functional modules: Track and TTAFF. Users can Click "FixAccuracy" in the "Tools" option bar on the menu bar to enable this function (as shown in Figure 3-13).

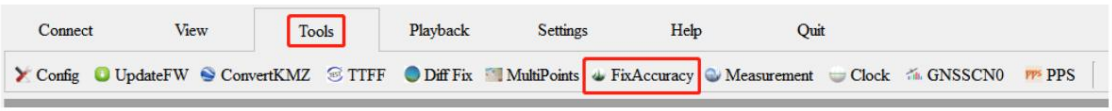

Figure 3-13 Dynamic accuracy analysis tool selection

3.7.1 Track Function

iNavTool evaluation software provides a tracking solution function, which supports the solution of the positioning accuracy (circle error cep), height error and the proportion of various positioning states between the positioning point and the standard point (or dynamic point), and displays Top4CN0, AvgCN0, number of visible satellites and number of satellites in use in the line chart on the right, which is suitable for static (or dynamic) accuracy testing. Users can select Tracking in "Test Mode" to turn on this function (as shown in Figure 3-14).

The general steps are as follows:

1. When selecting a static point, fill in the latitude, longitude and altitude of the standard point respectively; when selecting a dynamic point, click "Select Ref File" imports dynamic analysis file.

2. Click "Add" to import the test data and fill in the SOW of the start/end time.

3. After selecting the file, click "Delete" to delete the imported data.

4. Click "Start" to solve. When the solution is completed, a pop-up window will appear to indicate that the test is complete.

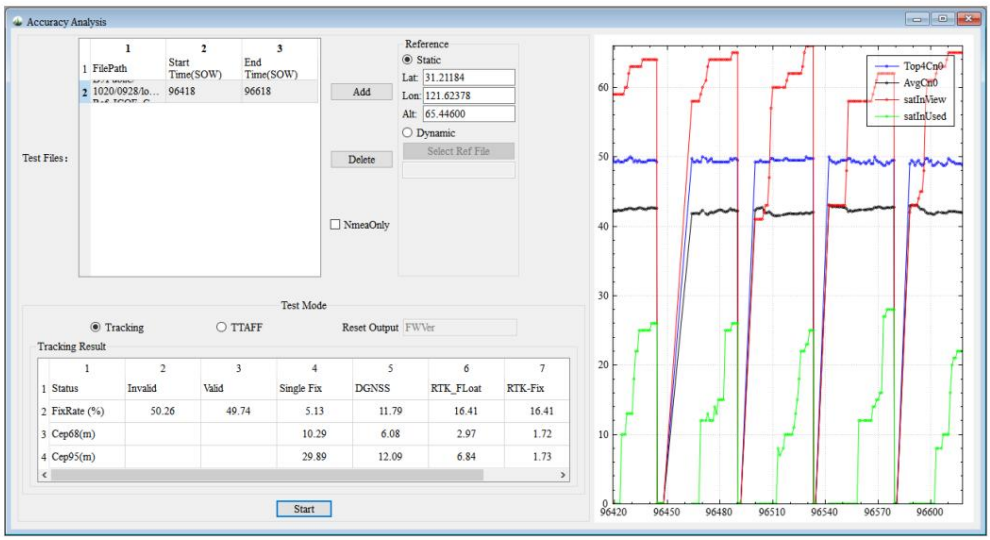

Figure 3-14 Track solution function

3.7.2 TTAFF Function

iNavTool evaluation software provides TTAFF solution function, which supports solving the positioning error between the positioning point and the standard point (or dynamic point), the time required from non-positioning to obtaining a fixed solution after restart, and the time required from obtaining a single point solution to obtaining a fixed solution after restart, and displays Time0-4, Time1-4, DGNSS and other data information in the line chart on the right, which is suitable for static (or dynamic) accuracy testing. Users can select TTAFF in "Test Mode" to turn on this function (as shown in Figure 3-15).

The general steps are as follows:

1. When selecting a static point, fill in the latitude, longitude and altitude of the standard point respectively; when selecting a dynamic point, click "Select Ref File" imports dynamic analysis file.

2. Click "Add" to import the test data and fill in the SOW of the start/end time.

3. After selecting the file, click "Delete" to delete the imported data.

4. Click "Start" to solve. When the solution is completed, a pop-up window will appear to indicate that the test is complete.

Note: You can enter different prefixes in "Reset Output" as the system restart flag characters (the default is FWVerÿÿ

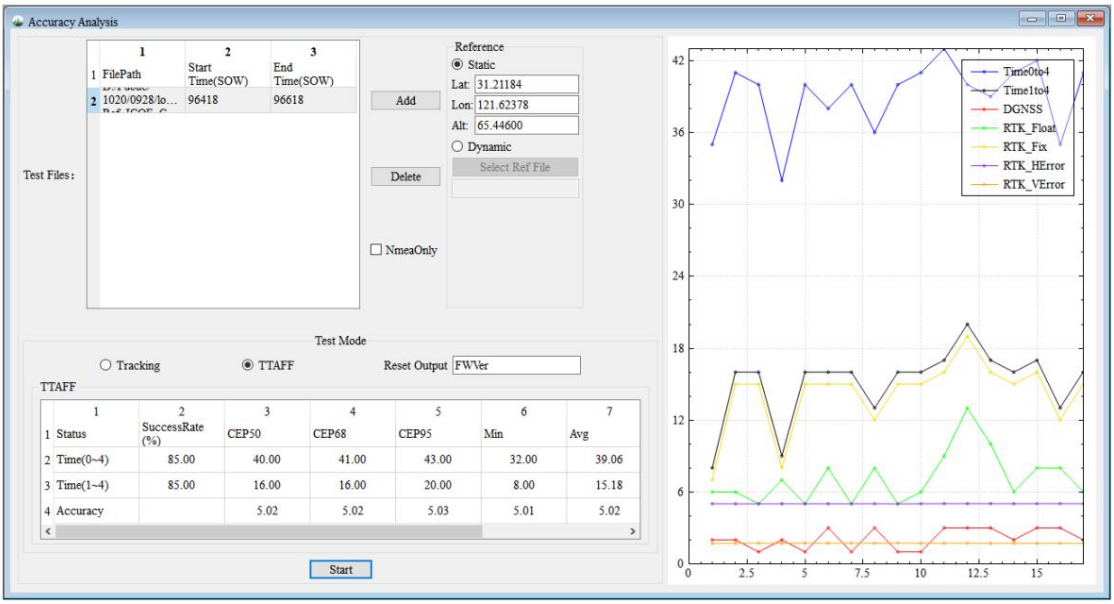

Figure 3-15 TTAFF solution function

3.8 Observational Analysis Tools

The observation analysis tool is used to evaluate the performance of the chip's pseudorange and carrier phase observations (as shown in Figure 3-16). Users can enable this function by clicking "Measurement" in the "Tools" option bar of the menu bar (as shown in Figure 3-17). Currently, only static observation evaluation is supported.

The general steps are as follows:

1. Set the reference coordinates
2. Set elevation limit
3. Set a test date
4. Select the observation log of the base station
5. Select the observation log of the mobile station
6. Click Start

During the analysis, each star will be analyzed and plotted, which is quite resource-intensive. It is recommended not to operate the software during the test. After the analysis is completed, the pseudorange and carrier observations of each star will be generated, and statistical results will be generated. The results are saved in the directory where the observation log is set by default.

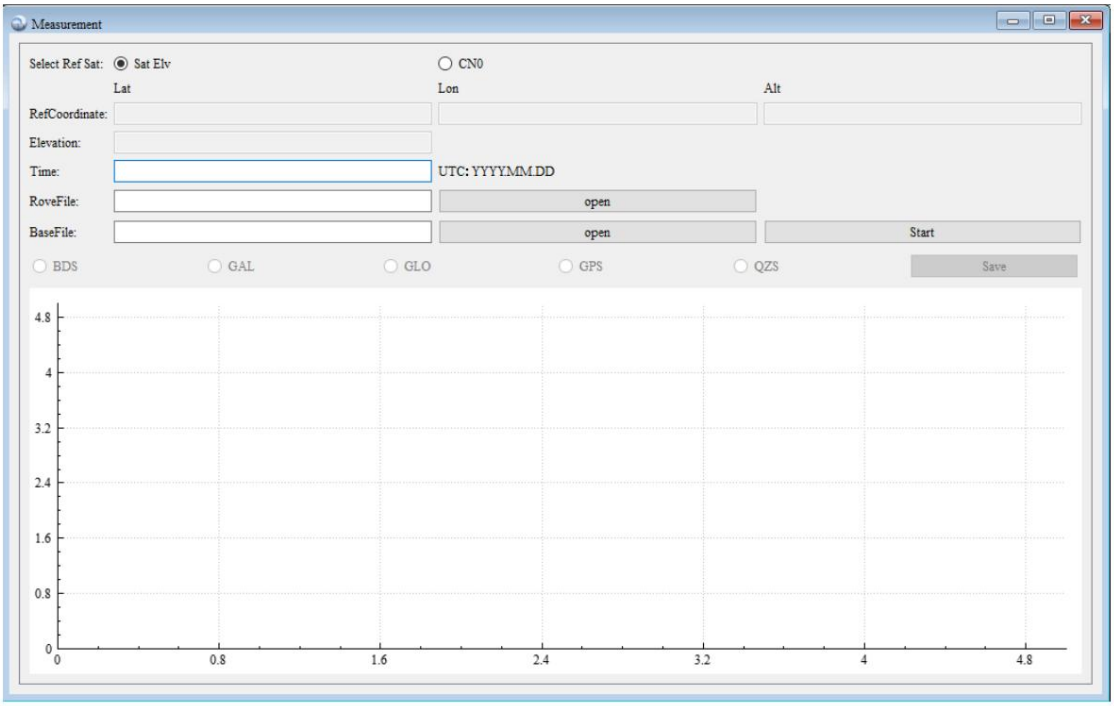

Figure 3-16 Observation analysis tool

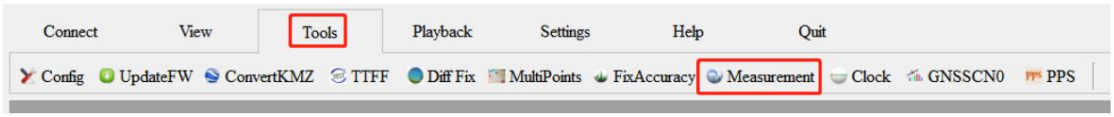

Figure 3-17 Observation analysis tool selection

3.9 Clock Drift Test Tool

The clock drift test mainly analyzes the clock drift information (NAVVEL) output by the chip and counts the results, including commonly used peak-to-peak values, CEP68, CEP95 and other statistical values, as shown in Figure 3-18. Users can enable this function by clicking "Clock" in the "Tools" option bar of the menu bar (as shown in Figure 3-19).

By default, the chip does not output NAVVEL information. You can enter $cfgmsg,1,,1,1 to enable the output. After the test is completed, you can save the test results as a picture. During the test, the offset of the first output is usually large. You can click clear to clear it.

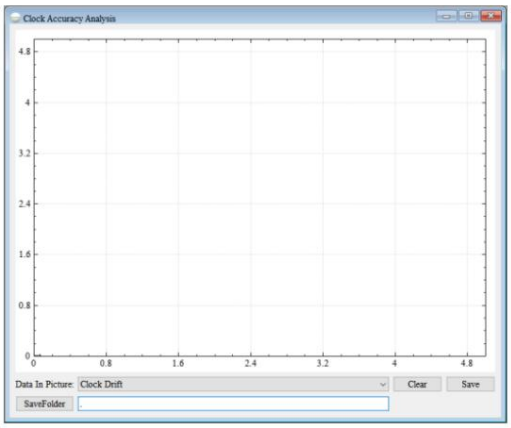

Figure 3-18 Clock drift test tool

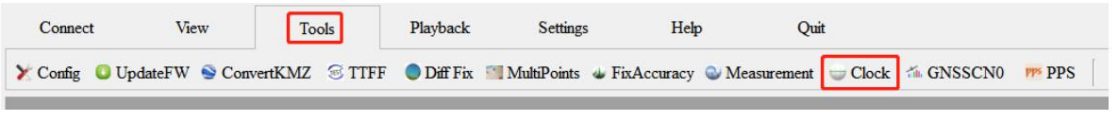

Figure 3-19 Clock drift test tool selection

3.10 CN0 tool (for debugging)

The GNSSCN0 tool of the iNavTool evaluation software can open multiple serial ports at the same time and parse the Cn0 data in them, and display them according to different systems (as shown in Figure 3-20). Users can click on the "Tools" option bar in the menu bar to open the GNSSCN0 tool. "GNSSCN0" to enable this function (as shown in Figure 3-21).

The general steps are as follows:

1. Check RuntimeProcess, select the serial port and baud rate as needed, and click "add" to add it to the list;

2. Enter the test time and select the file storage path;

3. Check "ResetBeforTest" as needed: whether to perform a cold start before testing;

4. Check "NMEA only" as needed: parse data type; if NMEA only is checked, parse the GSV CN0 information, if not checked, the CN0 information in Meas can be parsed (by default, the chip does not output Meas information, you can enter $interdebug,1 to enable it to output);

5. Click Start to switch different serial ports above the view to display CN0 data.

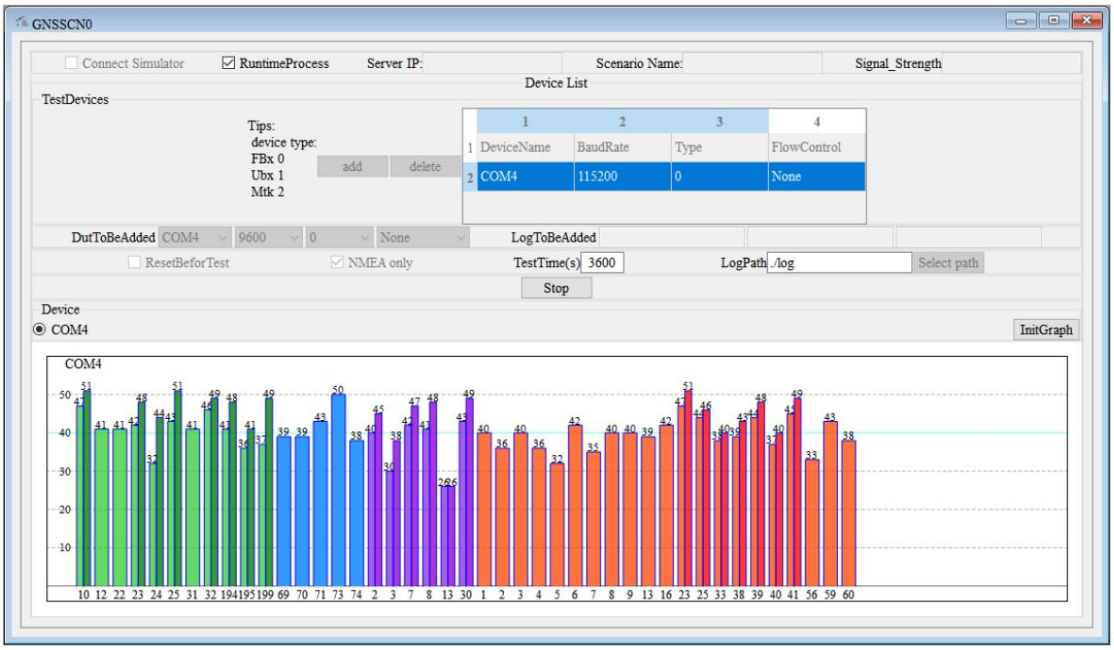

Figure 3-20 GNSSCN0 tool

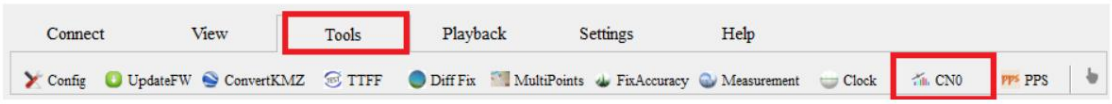

Figure 3-21 GNSSCN0 tool selection

3.11 PPS Tools

The PPS tool of the iNavTool evaluation software can read PPS-related files and present the obtained data in a graph (as shown in Figure 3-22). Users can open this function by clicking "PPS" in the "Tools" option bar of the menu bar. Yes (as shown in Figure 3-23).

The general steps are as follows:

1. Click "Open" to open the required file;

2. Click "Start" to start parsing the file. After a while, a prompt box "Analysis done" will pop up. Finish;

3. After clicking "Save", the image will be saved to the path in the settings interface.

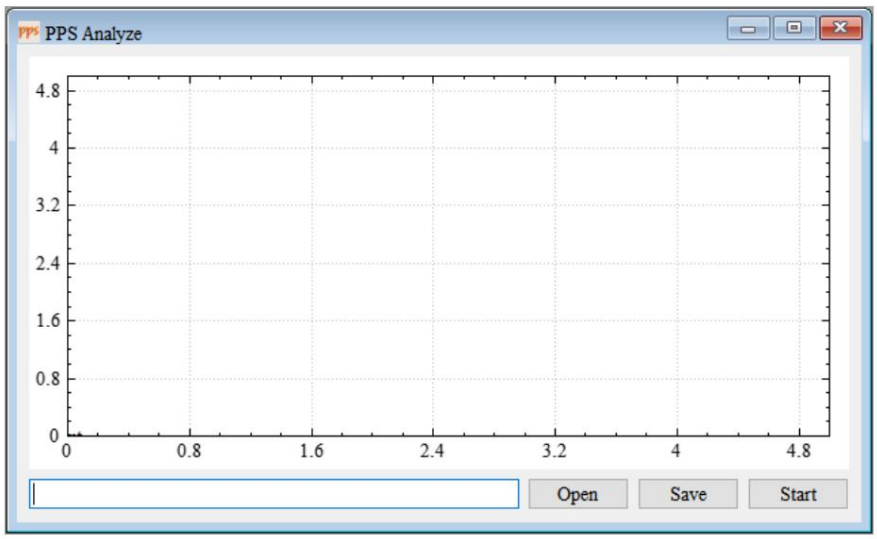

Figure 3-22 PPS tool

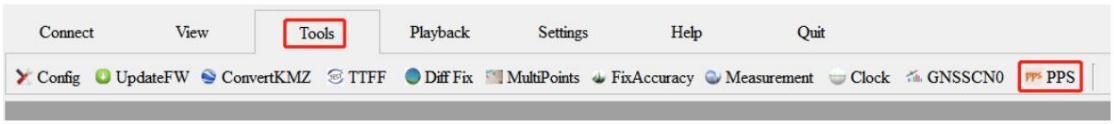

Figure 3-23 PPS tool selection

3.11 UTC to SOW Tool

The UTC to SOW tool of the iNavTool evaluation software can realize the conversion between UTC time and SOW (seconds in week) (as shown in Figure 3-24). Users can click the first icon in the shortcut toolbar on the right to open the "Utc2Sow" function. Yes (as shown in Figure 3-25).

The steps to convert UTC to SOW are as follows:

1. Enter the UTC time to be converted in "UTC Time".
2. Click “>>Convert To GPSTime”.
3. Get the week number in "GPS Week" and the seconds of the week in "Seconds Of week".

The steps to convert SOW to UTC are as follows:

1. Enter the week number in "GPS Week" and the seconds of the week in "Seconds Of week".
2. Click “<<Convert To UTC Time”.
3. Get the UTC time in "UTC Time".

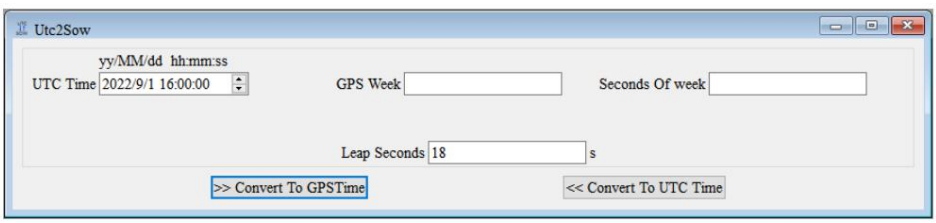

Figure 3-24 UTC to SOW tool

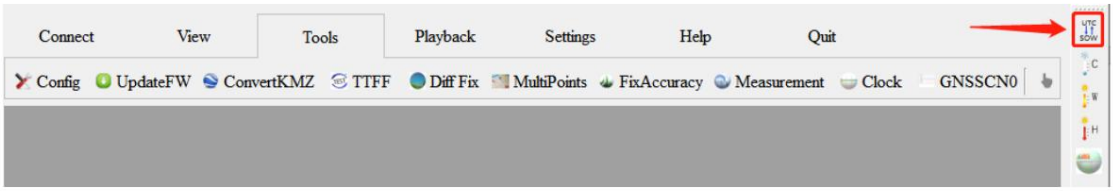

Figure 3-25 UTC to SOW tool selection

3.12 Cold Start

The user can click the second icon in the shortcut toolbar on the right to enable the cold start function of the iNavTool evaluation software (as shown in Figure 3-26).

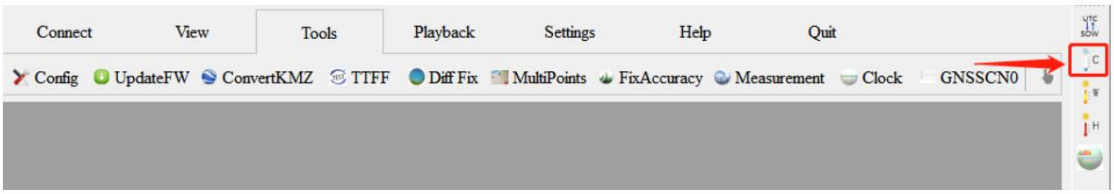

Figure 3-26 Cold start function selection

3.13 Warm Start

The user can click the third icon in the shortcut toolbar on the right to enable the warm start function of the iNavTool evaluation software (as shown in Figure 3-27).

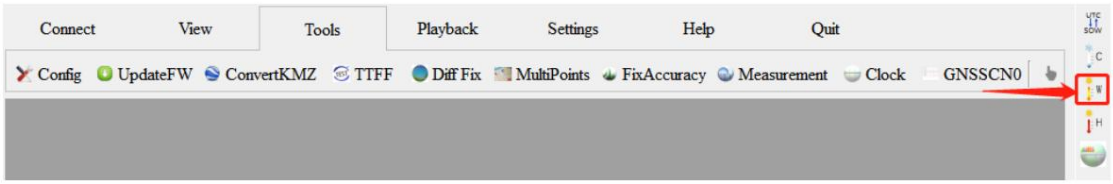

Figure 3-27 Warm start function selection

3.14 Hot Start

The user can click the fourth icon in the shortcut toolbar on the right to enable the hot start function of the iNavTool evaluation software (as shown in Figure 3-28).

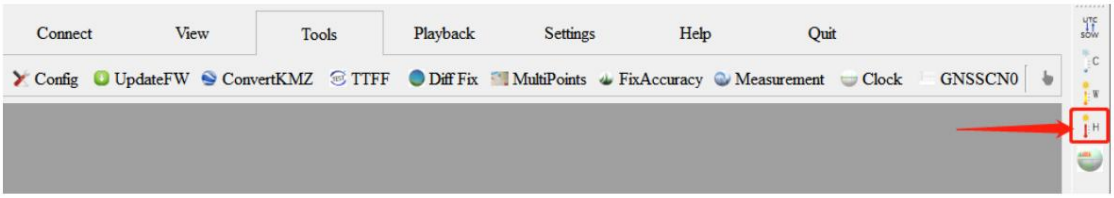

Figure 3-28 Hot start function selection

3.15 Data playback

The iNavTool evaluation software provides a data playback function for ICOE product data (as shown in Figure 3-29). Users can start this function by clicking the "Load Data" option in the "Playback" option bar of the menu bar (as shown in Figure 3-30).

When the data playback function is turned on, the color of the function area will be lit up and no longer dark gray. During the data playback process, fast forward and rewind can be supported, and the satellite status, positioning status, positioning trajectory, satellite distribution status, etc. at that time can be displayed and analyzed.

The progress bar can be dragged to achieve quick viewing. You can also jump to a specified UTC. Note that the number of milliseconds filled in should also be consistent with the actual time, otherwise the jump will fail.

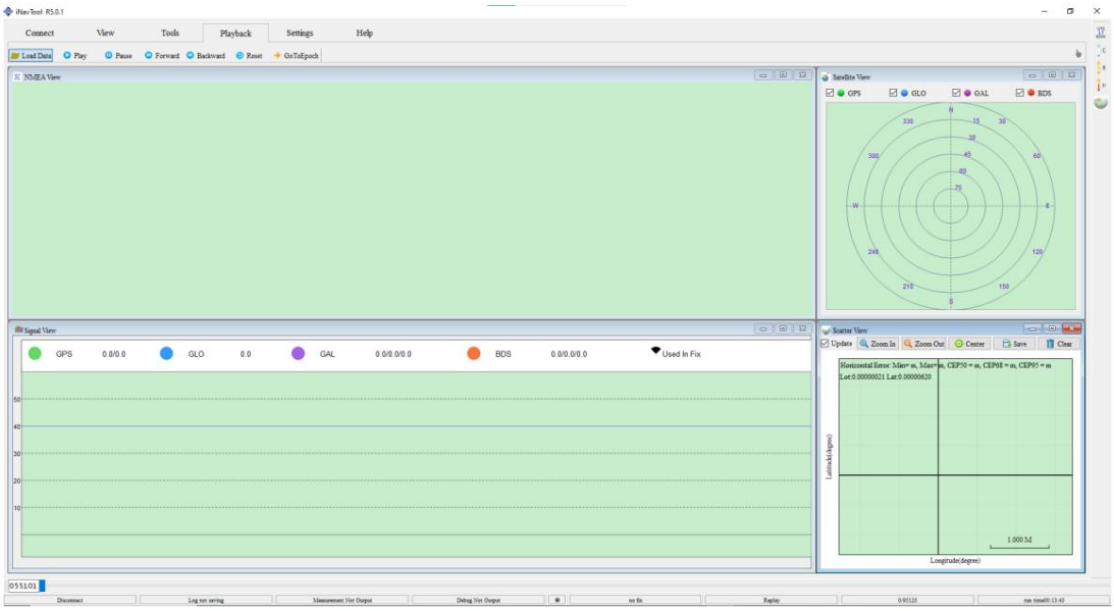

Figure 3-29 Data playback

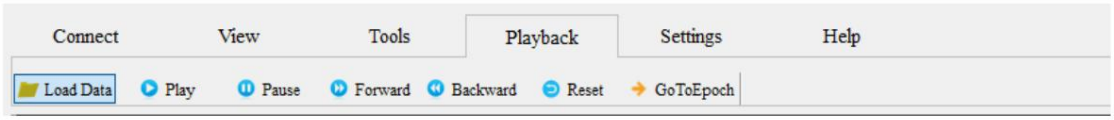

Figure 3-30 Data playback function selection

Core and Object (Shanghai) Technology Co., Ltd.

ICOE (Shanghai) Technologies Co.,Ltd

Room 301, No. 8, Lane 912, Bibo Road, Pudong New District, Shanghai

Room 301,No.8,Lane 912,Bibo Road,Pudong District,Shanghai,P.R.China