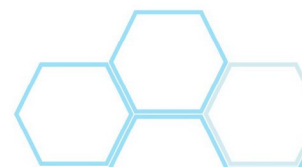
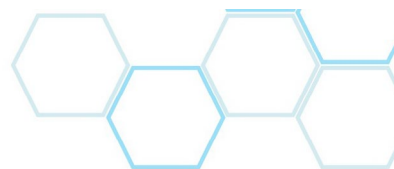


# Quick Start for TSP Scanner



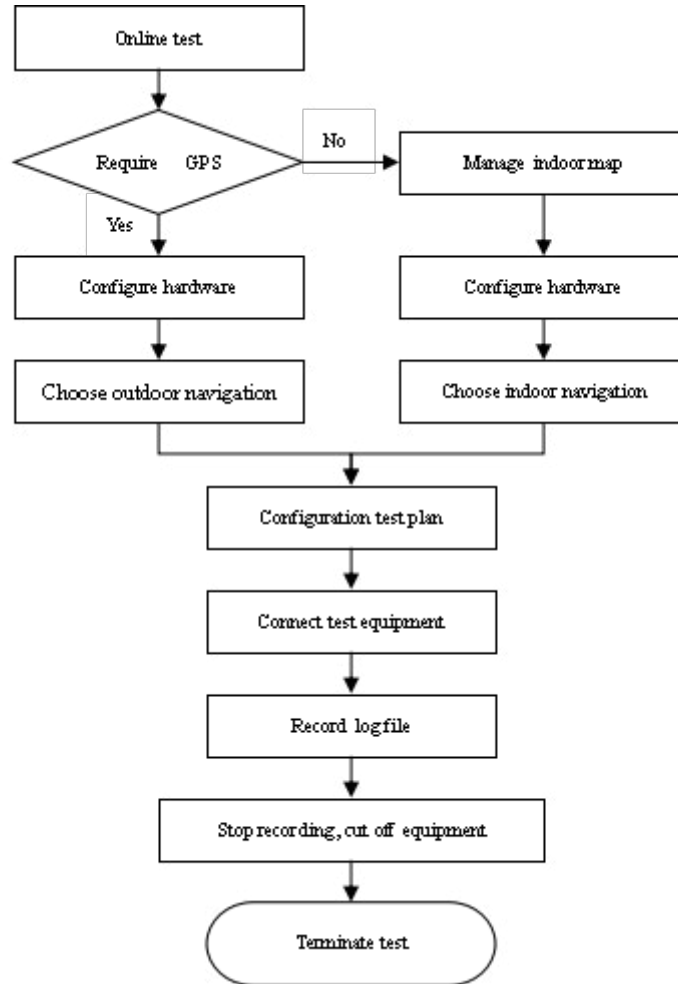
TRANSCOM  
INSTRUMENTS

# Quick Start for TSP Scanner

## 1. Online Test

### 1.1 Test Principle

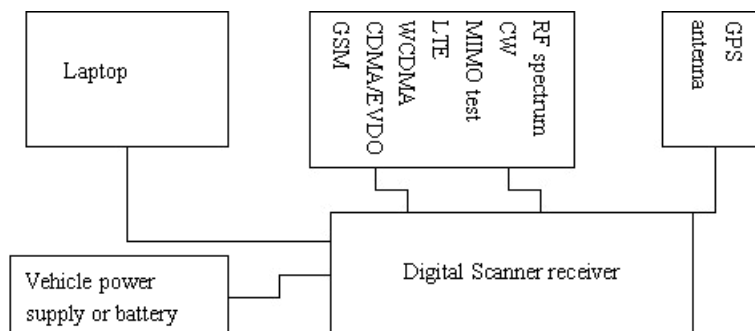
Eagle Digital Receiver sweep-frequency system enables real-time air interface data collection, the flow of which is as follows:



### 1.2 Test Preparation

#### 1.2.1 Hardware Connection

Before test, finish hardware connection of digital scanner setup, which should be connected to RF antenna, GPS antenna, 12VDC power and PC Ethernet connection, as shown in the figure below: (note: number of antenna connected depend on your measurement, more than one antenna may be require)



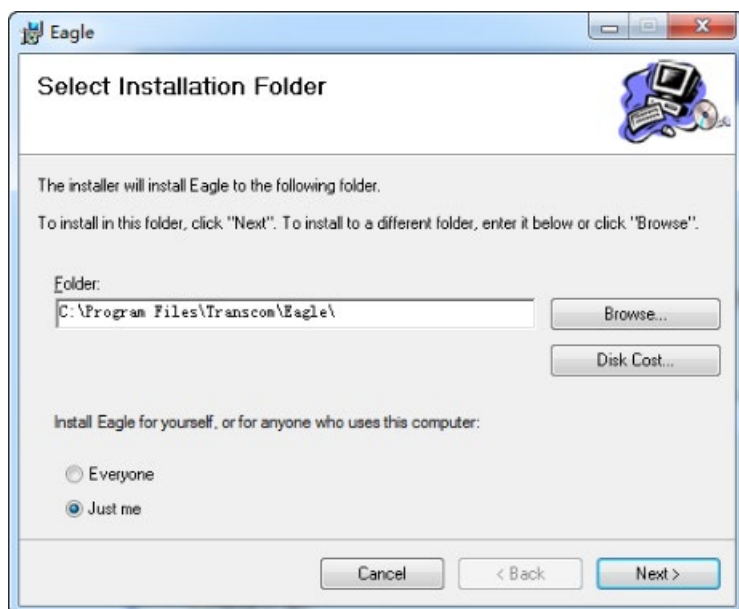
Switch ON the digital receiver after confirming that all connections are properly connected, the red power light will flash. Wait until the power light turn green, it will take few minutes.

### 1.2.2 Software Installation

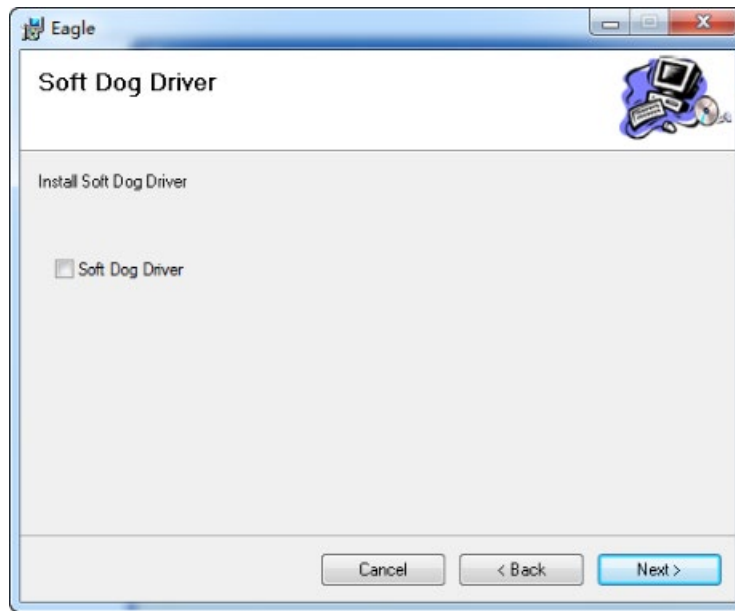
After finishing hardware connection of digital scanner, insert installation disc of “Eagle wireless environmental assessment and analysis system” into CD driver. Browse files in the CD driver, open the folder to find application file of Eagle.msi, double click the application file to run installation program to install the software: (software installation environment supports XP, WIN7 32-bit/64-bit system; system software higher than netformwork3.5 version should be installed for XP system before installation of Eagle wireless environmental assessment and analysis system platform)



Click “Next” to set installation path and permission, which is shown in the figure below:



Click “Next” to set installation path and permission, which is shown in the figure below:

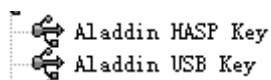


After confirming that installation settings are correct, click “Next” to install the software.

Click “Close” to close installation program after Installation Complete interface pops up. Shortcut of “Eagle wireless environmental assessment and analysis system” will be generated on the desktop, as shown in the figure below:



Dongle driver can also find in PC device manager after installation:

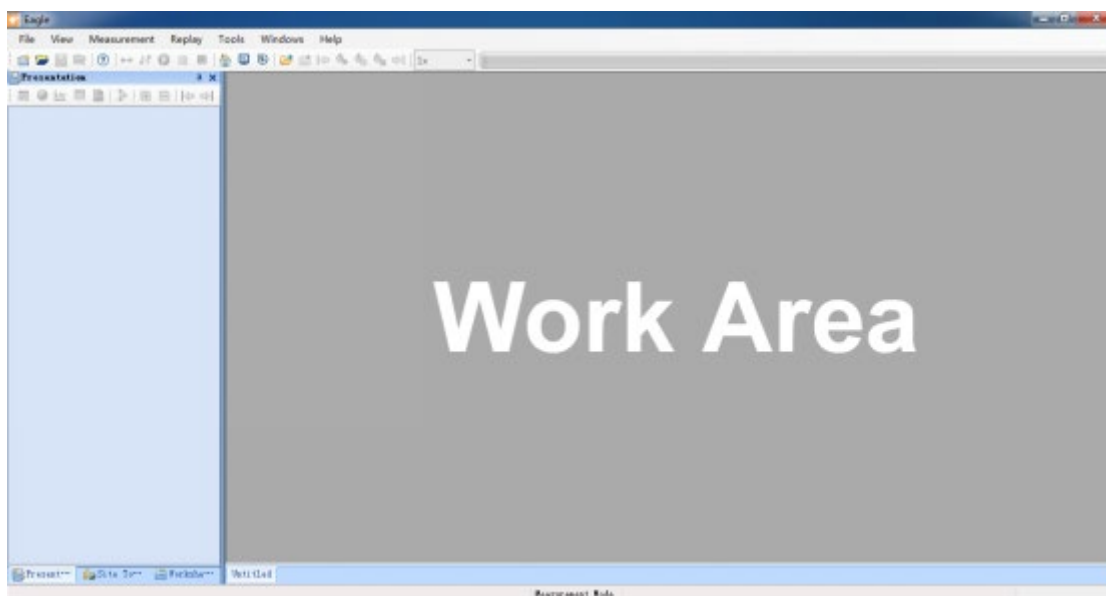


### 1.2.3 Run Software


Click Eagle icon on the desktop after hardware is connected properly and software is installed:

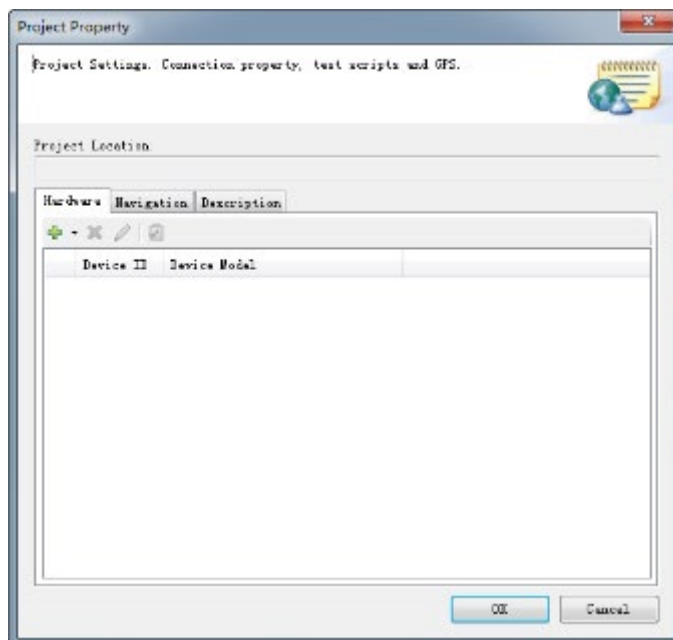


Or open Eagle wireless environmental assessment and analysis system under “Start” ,  
Eagle software shown in the figure below:

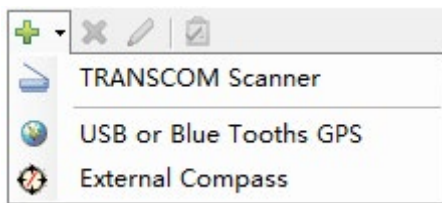


### 1.3 Configuration Test Plan

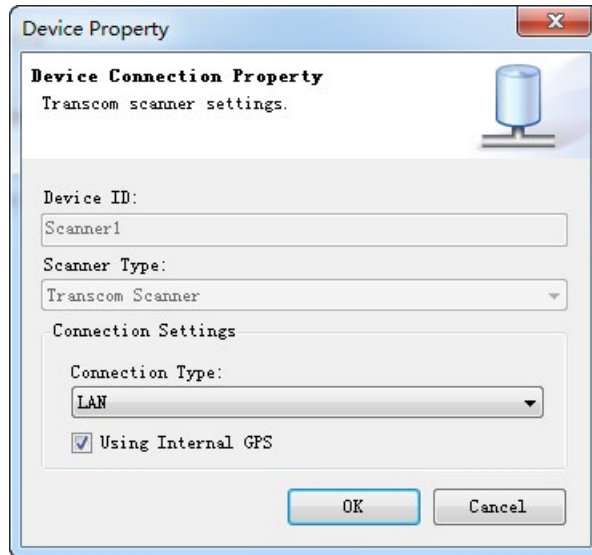
Click “New Project” in drop-down menu of “File” or directly click icon  in toolbar to create a new test project, Project Properties dialog box will pop up, as shown in the figure below:



Click “Add Equipment” (  ), select “TRANSCOM Scanner” from the drop-down menu:



For connection type: please select “LAN”

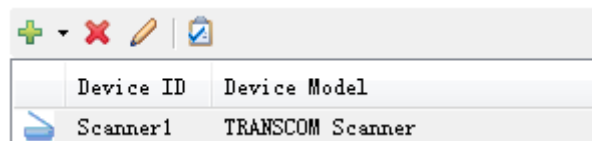



Default IP address of digital scanner receiver: 192.168.1.30/20/100.

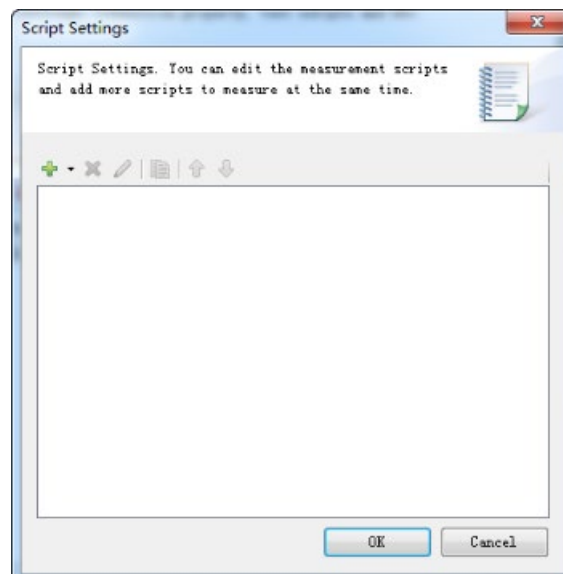
Please note that local IP address of PC shall not be the same as the address of digital scanner receiver, otherwise the equipment can not be connected due to IP address conflict. In case of conflict, please promptly change local IP address. Other IP addresses that do not conflict with the default address are advised, such as 192.168.1.111. Subnet mask is 255.255.255.0 by default.

Unless external GPS is needed under special circumstances, generally we use built-in GPS by default.

Click OK to finish the dialog box, and the equipment we connect has been in the equipment list:

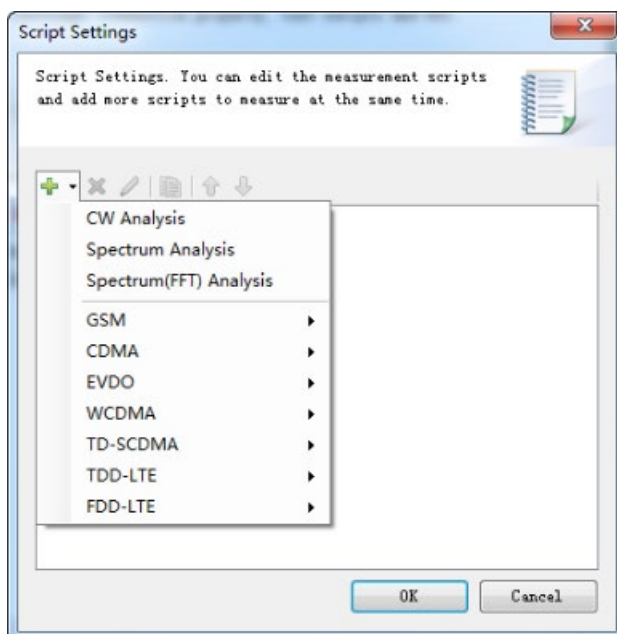


Double click the selected equipment or click “Configuration Setting” (icon ), Script Configuration dialog box will pop up, as shown in the figure below:



Click “Add Script” (icon  ) to add testing functions, drop-down menu will pop up.

Select testing function from the drop-down manual:



Eagle support all-standard communication standard including:

[CW Analysis](#)

[Spectrum Analysis](#)

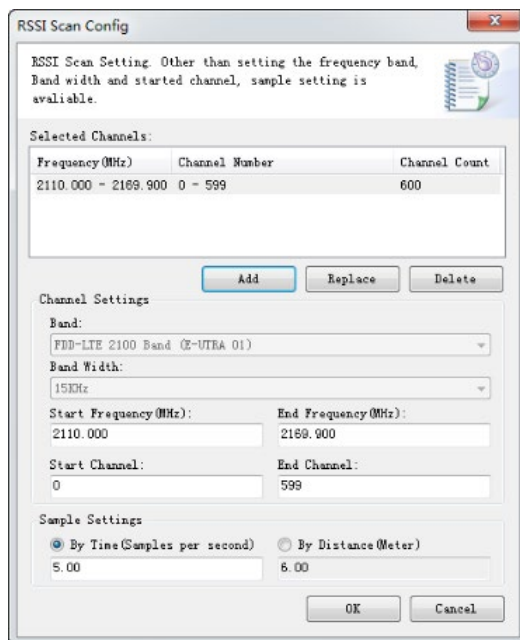
[Full-frequency Scan of Pilot](#)

[Cell Coverage Scan](#)

Let’ s have a look at the configuration of these test scripts in turn:

### 1.3.1 CW Analysis

CW Analysis is also known as “Frequency Cleaning test” . Dialog box will pop up after choosing this measurement script, as shown in the figure below:



Channel selected: select frequency band to be tested as required (add, replace, delete)

Frequency band: network type and frequency band under test;

Bandwidth: frequency space between frequency points within frequency band tested;

Starting frequency: starting frequency of defined frequency band, which can be modified as required;

End frequency: end frequency of defined frequency band, which can be modified as required;

Starting channel: defined starting channel number;

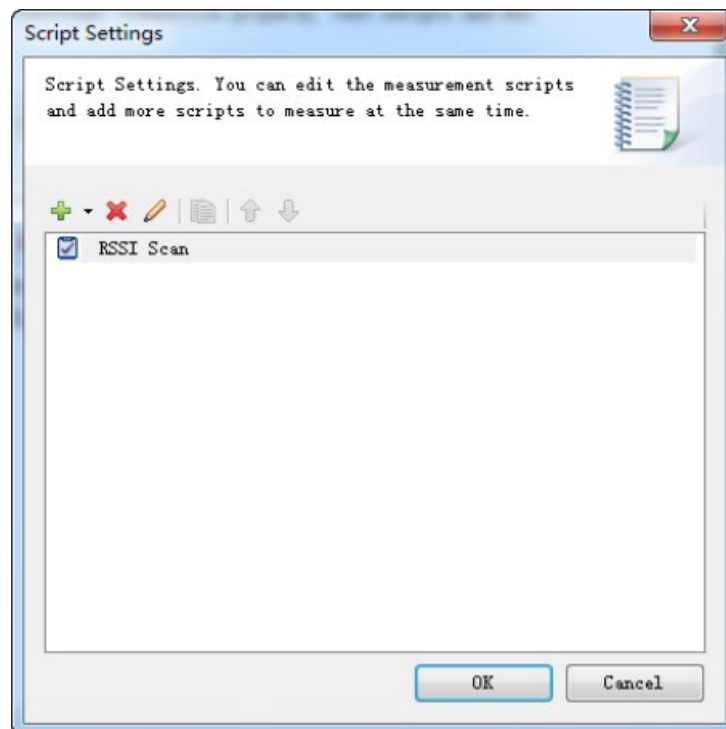
End channel: defined end channel number;


There are two sample modes:

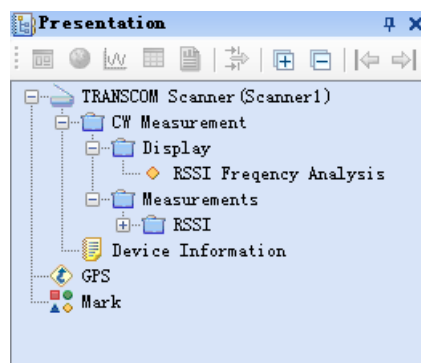
Input sampling points per second (PPS) in case of sampling by time, 5 points/second by default;

Input unit sampling distance in case of sampling by distance, 6m by default (GPS support is needed).

Click OK after finishing setting. You can find that the test script has been in Script Configuration dialog box, as shown in the figure below:

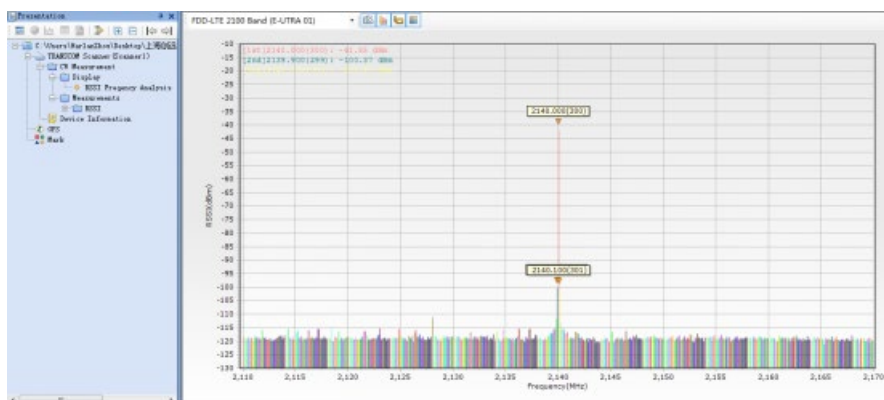


In test interface, when clicking button “Connect” , the navigation tree on the left side of software interface will list the current test items, as shown in the figure below:



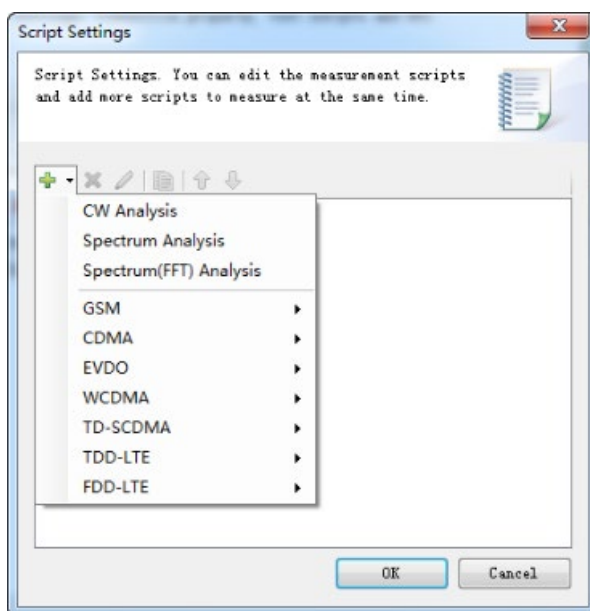


View will pop up in the work area after double clicking “RSSI Frequency Analysis”, displaying the data information of this test item in a real-time way, as shown in the figure below:

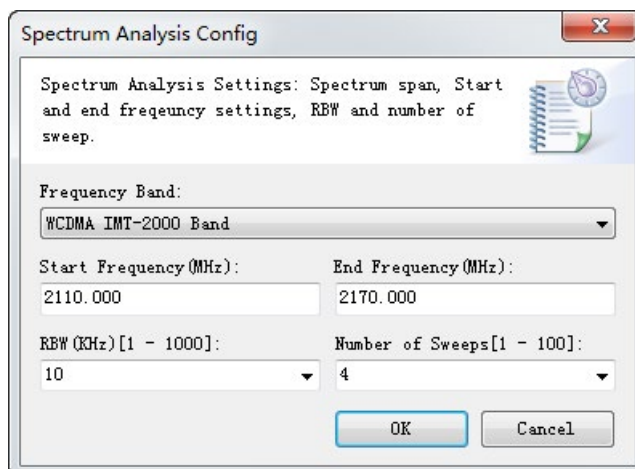


### 1.3.2 Spectrum Analysis

Please confirm that antenna is connected to digital scanner receiver RF3 antenna interface before spectrum measurement, and then choose the option of Spectrum analysis. According to different frequency bands of frequency spectrum, the dialog box below appears after choosing script:



The dialog box below appears after choosing Spectrum Analysis:



Frequency band: choose corresponding frequency band

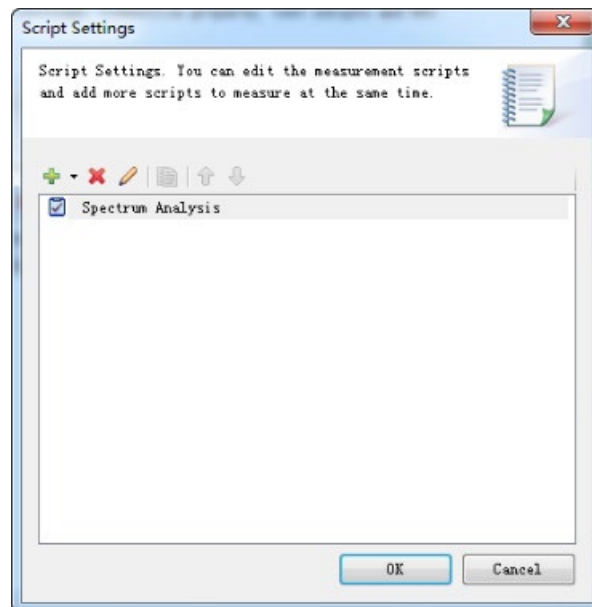
Starting frequency: set starting frequency of frequency spectrum




End frequency: set end frequency of frequency spectrum


RBW: choose different RBW for measurement

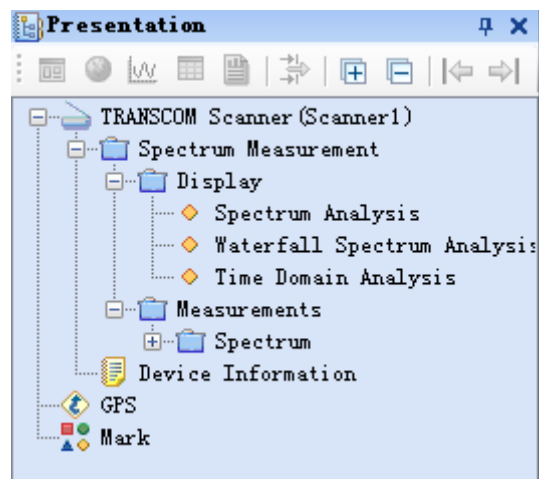
Number of Sweeps: Number of sweep per second

Click OK after finishing setting. You can find that the test script has been in Script Configuration dialog box, as shown in the figure below:

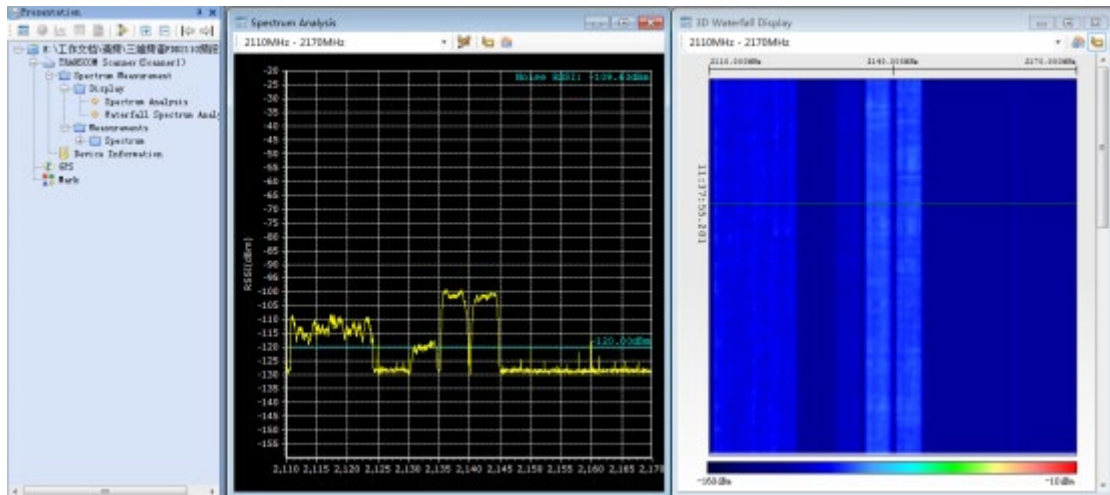


Click icon  to add test script (only script “Spectrum Analysis” can be added, but different frequency bands, starting and end frequency and RBW can be chosen); click icon  to edit and modify the test script; click icon  to delete the selected test script. Click “OK” after finishing setting to finish script configuration and enter the next step.

In test interface page, when clicking button “Connect” , the navigation tree on the left side will list down the current test items, as shown in the figure below:



View will pop up in the work area after double clicking test item, displaying the data information of this test item in a real-time and simultaneously displaying multiple test views, as shown in the figure below:



“Spectrum Analysis” window is equivalent to the function of ordinary two-dimensional spectrum analyzer.

“Waterfall Spectrum Analysis” window can display characteristics of frequency spectrum in time domain or 3-D.

“Span0 time domain analysis” window can display time domain characteristics at designated frequency point.

Peak RSSI: Peak RSSI level will show on report

Noise RSSI: average RSSI level will reported

Spectrum Interference Factor: signal above ground noise upper limit of frequency spectrum (preference can be set) is deemed to be interference signal, the total energy of interference signal strength above background noise upper limit in a SPAN measurement. The measurement bandwidth is greatly affected by RBW and other parameters. Therefore, this analysis result can be used to measure the severity of interference when script of conventional test rarely changes.

Spectrum Interference Factor Percentage: signal above background noise upper limit of frequency spectrum (preference can be set) is deemed to be interference signal, percentage of area of closed interval of interference signal strength above background noise upper limit in area of background noise and interference upper limits of frequency spectrum (preference can be set) in a SPAN measurement. This analysis result basically is not affected by completely different interference analysis result caused by different RBW.

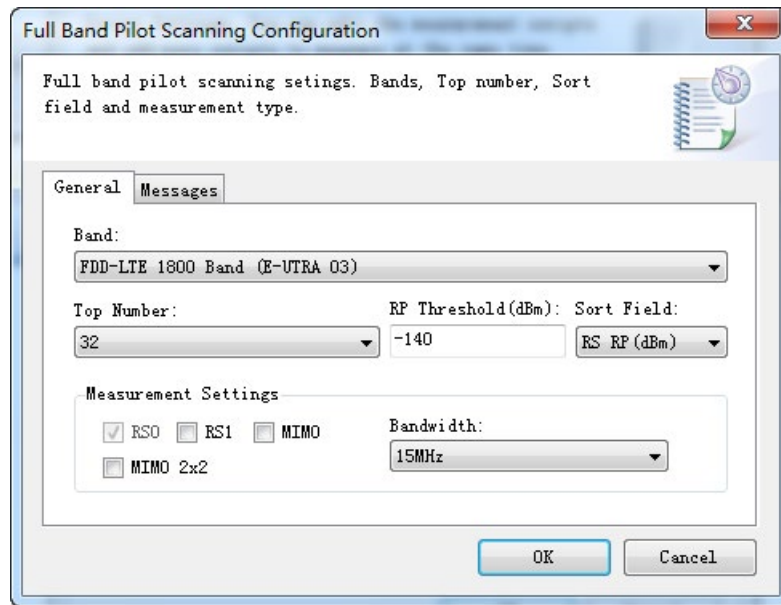
User-defined frequency: user can select frequency point

User-defined frequency range: user can select frequency band

### 1.3.3 Full-frequency Pilot Scan

#### 1.3.3.1 FDD-LTE

The dialog box below appears after choosing the script:



Band: select testing frequency type and band;

Top Number: maximum number of pilot frequencies displayed (from high to low);

RP threshold (dBm): Minimum cell RP decoding level;

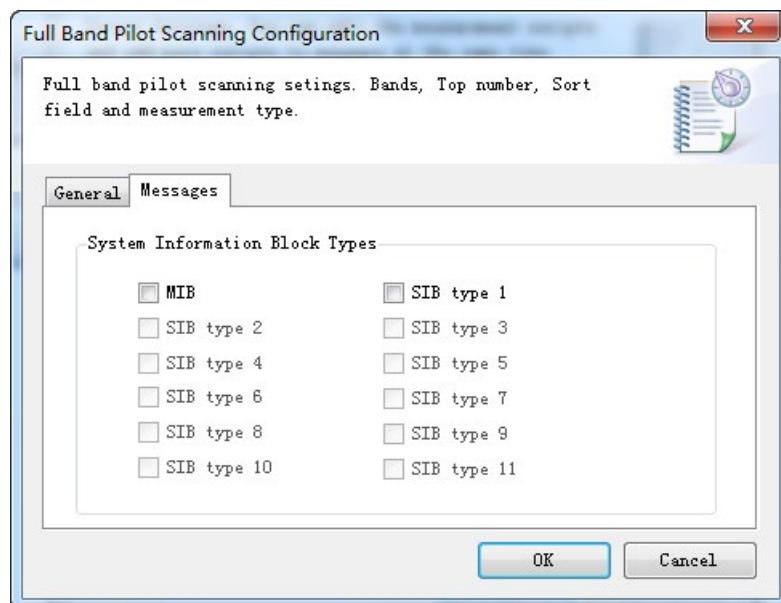
Sort Field: sequencing method of Pilot;

Measurement Settings: Select which item(s) you want to measurement

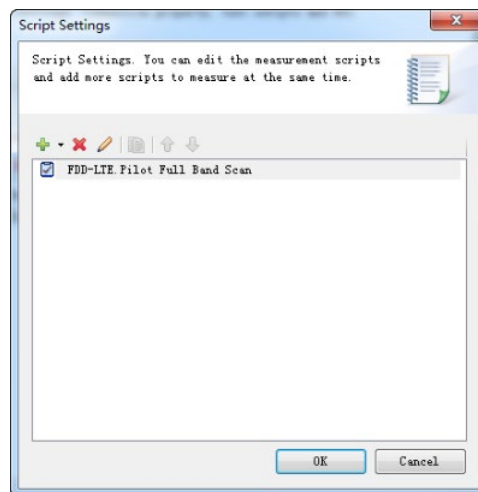
RS0 is always required and the test function is activated after checking RS4, MIMO and MIMO 2 x 2 for four antennas.

Bandwidth: Select decoding measurement bandwidths (selectable on 20,15,10,5 and 3) , Default is 20MHz.

Click “Message” page to choose the function of layer 3 decoding, which supports SIB1~SIB11. Users can choose as needed, as shown in the figure below:

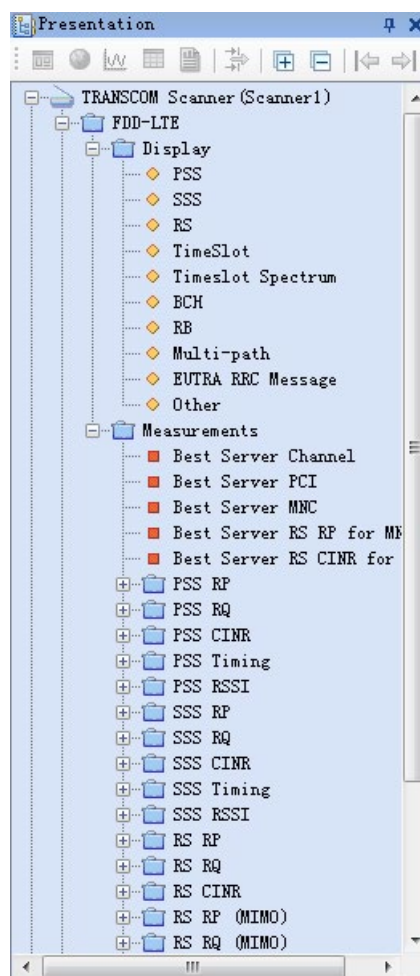


Click OK after finishing setting. You can find that the test script has been in Script Configuration dialog box, as shown in the figure below:

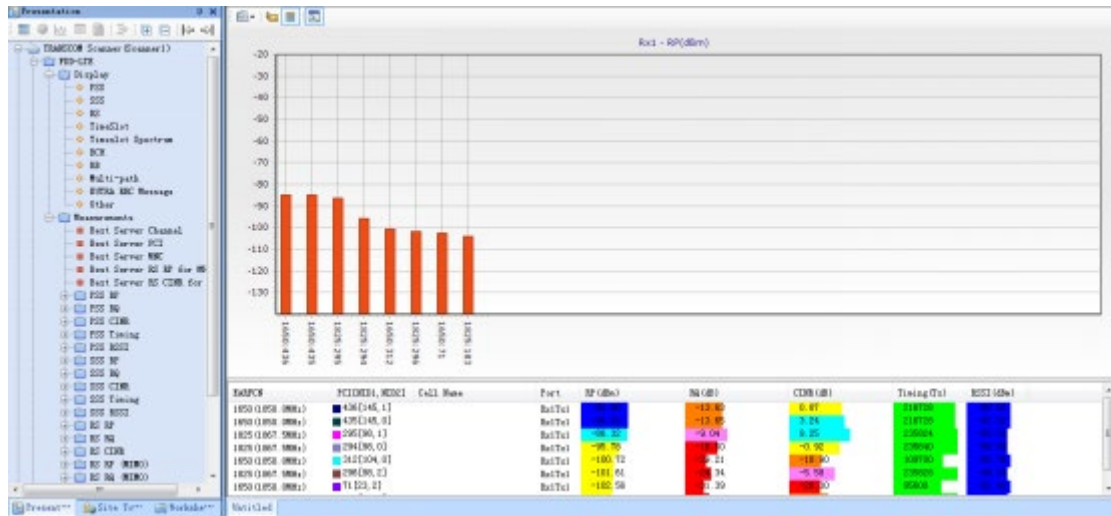


Click icon to add test script (only script “Full-frequency Pilot Scan” can be added, but different frequency bands can be chosen); click icon to edit and modify the test script; click icon to delete the selected test script. Click “OK” after finishing setting to finish script configuration and enter the next step.

In test interface, when clicking button “Connect” , the navigation tree on the left side of software interface will list the current test items, as shown in the figure below:

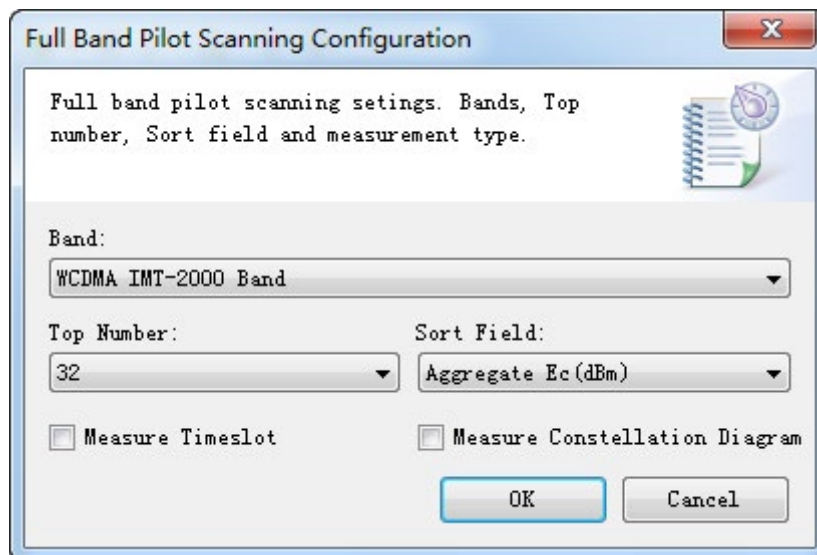


View will pop up in the work area after double clicking “RS” , displaying the data information of this test item in a real-time, as shown in the figure below:



### 1.3.3.2 WCDMA

The dialog box below appears after choosing the script:



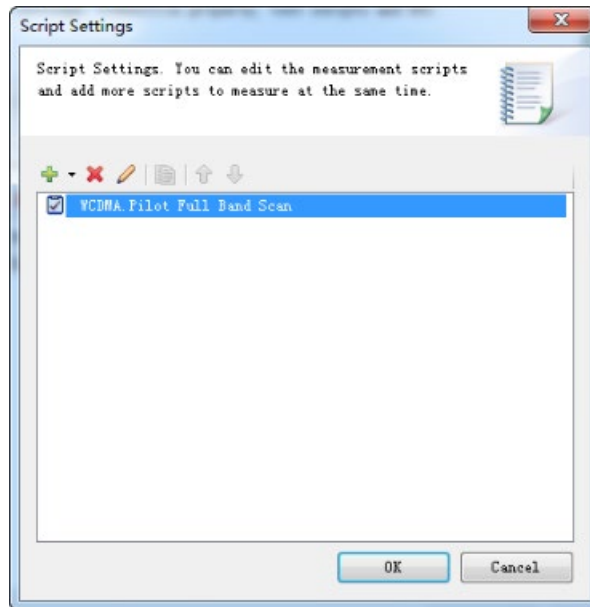
Frequency band: select network type and frequency band under test;

TOP Number: Maximum number of pilot channels displayed( from high to low);

Sort Field: sequencing of Pilot;

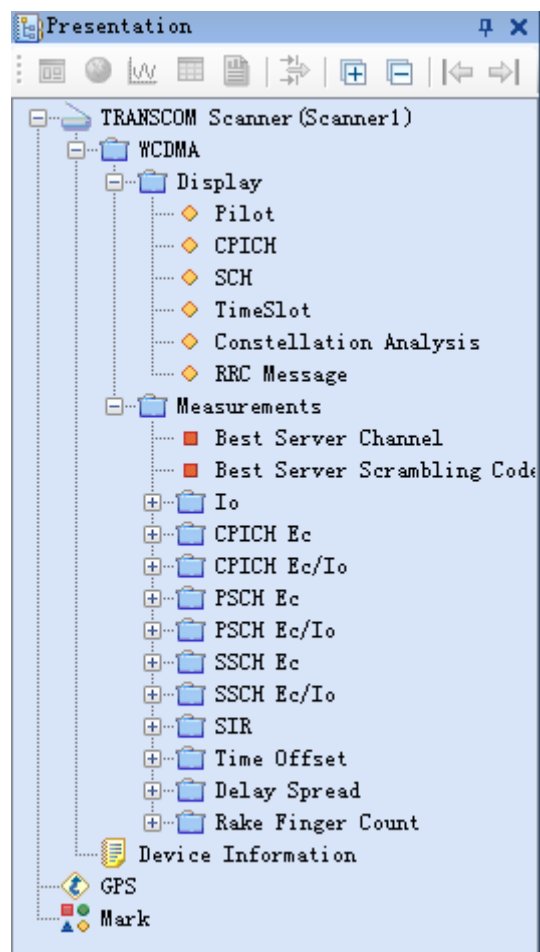
Measure Timeslot: constellation measurement;

Click OK after finishing setting. You can find that the test script has been in Script Configuration dialog box, as shown in the figure below:

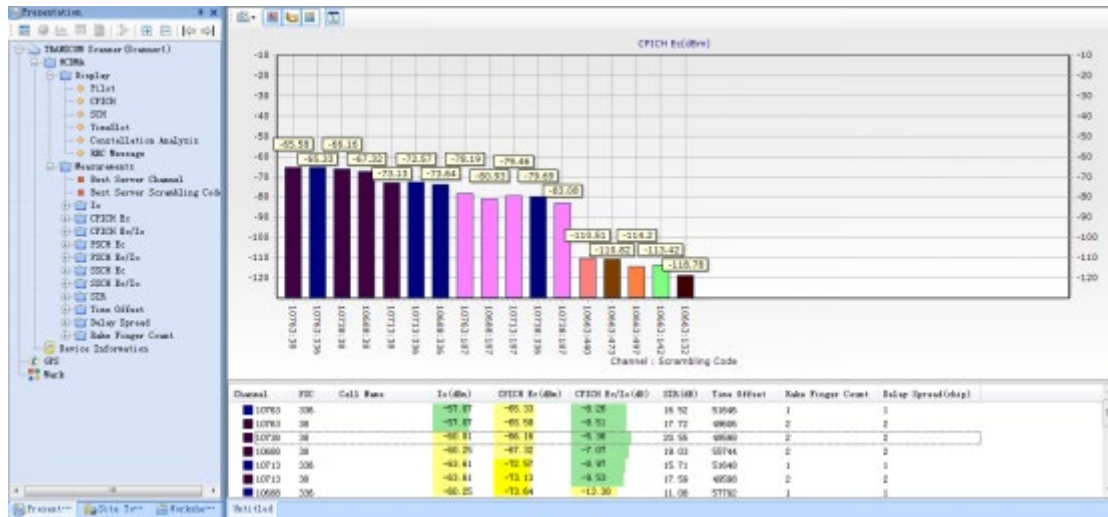


Click icon to add test script (only script “Full-frequency Scan of Pilot” can be added, but different frequency bands can be chosen); click icon to edit and modify the test script; click icon to delete the selected test script. Click “OK” after finishing setting to finish script configuration and enter the next step.

In test interface, when clicking button “Connect” , the navigation tree on the left side will list the current test items, as shown in the figure below:



View will pop up in the work area after double clicking “CPICH”, displaying the data information of this test item in a real-time way, as shown in the figure below:



### 1.3.4 Cell Coverage Scan

This is the most common measurement script. The dialog box below appears after choosing cell coverage scan:

The screenshot shows the "Cell Coverage Scan Config" dialog box. It contains the following settings:

- General** tab is selected.
- Band:** FDD-LTE 1800 Band (E-UTRA 03)
- Top Number:** 32
- Report Time:** 500
- RP Threshold (dBm):** -140
- Sort Field:** RS RP (dBm)
- Measurement Settings:**
  - Bandwidth:** 15MHz
  - RSO  RS1  MIMO
  - MIMO 2x2
  - Sub-band/Timeslot Spectrum...
- Channel (Right click to setting PCI):** Manual Input...
- Channel List:**

1200	1201	1202	1203	1204	1205	1206	1207
1208	1209	1210	1211	1212	1213	1214	1215
1216	1217	1218	1219	1220	1221	1222	1223
1224	1225	1226	1227	1228	1229	1230	1231
1232	1233	1234	1235	1236	1237	1238	1239
1240	1241	1242	1243	1244	1245	1246	1247
1248	1249	1250	1251	1252	1253	1254	1255
1256	1257	1258	1259	1260	1261	1262	1263
1264	1265	1266	1267	1268	1269	1270	1271
1272	1273	1274	1275	1276	1277	1278	1279
- Buttons:** OK, Cancel



## General

**Band:** You can select which network type and frequency band;

**Top Number:** Maximum number of pilot frequencies displayed (from high to low);

**Report Time:** sweeping time in ms

**RP Threshold:** The minimum decoding receiving signal level

**Sort field:** Pilot sequencing method;

**Measurement Setting:** including test bandwidth setting and MIMO measurement setting and spectrum setting of sub-band and timeslot;

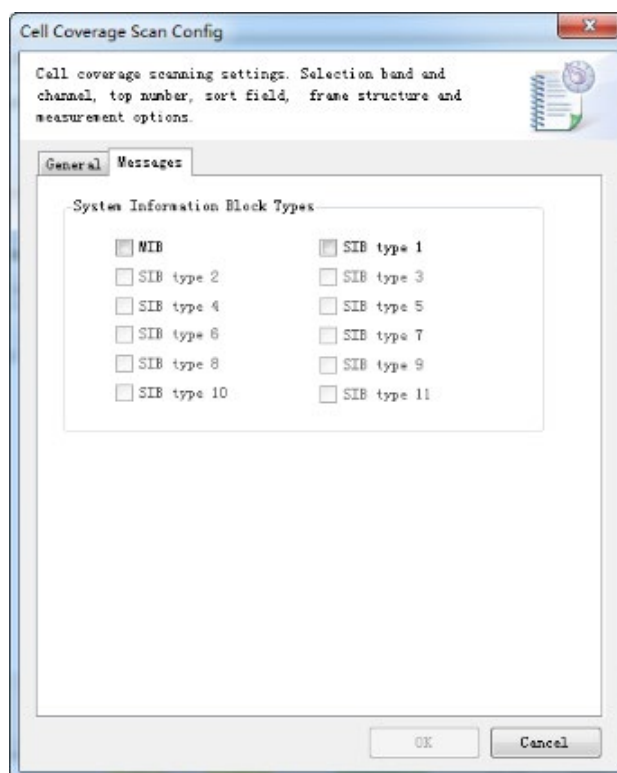
**Bandwidth:** multiple measurement bandwidths are available (20, 15, 10, 5 and 3) , 20MHz by default.

**Measurement option:** PSS, SSS and RS0 are required, and the test function is activated after checking RS1, MIMO and measurement of MIMO 2 x 2.

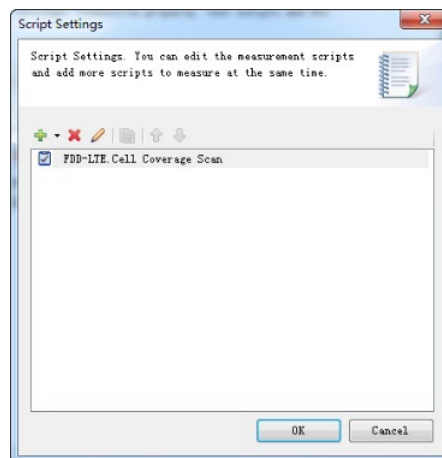
**Sub-band/timeslot frequency spectrum:** check sub-band measurement and designate RB measurement mode after clicking it; check timeslot spectrum measurement, up-and-down configuration and special sub-frame configuration appear. The scope of up-and-down configuration is 0-6, and that of special subframe configuration is 0-8; timeslot measurement, RBW, measurement period and measurement window can be as required;

**Channel:** choose the channel to be measured. Manual input of channel number and frequency is supported;

Click “Message” page to choose the function of layer 3 decoding, which supports SIB1~SIB11. Users can choose as needed, as shown in the figure below:

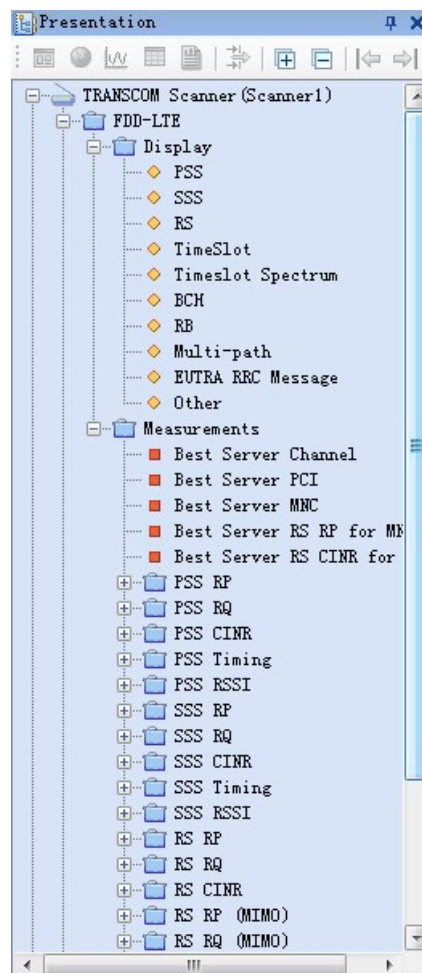


Click OK after finishing setting. You can find that the test script has been in Script Configuration dialog box, as shown in the figure below:

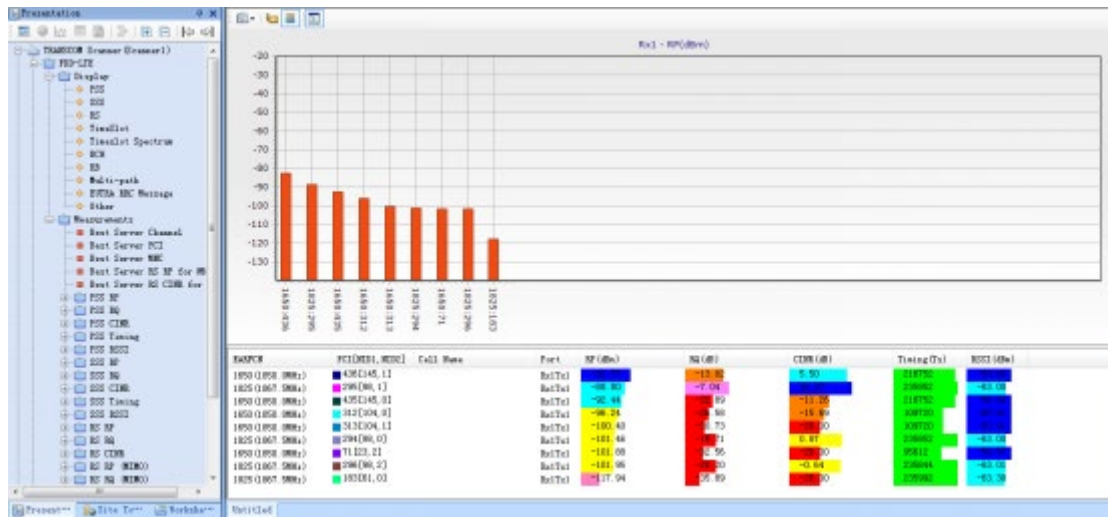


Click icon to add test script (only script “Cell Coverage Scan” can be added, but different frequency bands and points can be chosen); click icon to edit and modify the test script; click icon to delete the selected test script. Click “OK” after finishing setting to finish script configuration and enter the next step.

In test interface, when clicking button “Connect” , the navigation tree on the left side of software interface will list the current test items, as shown in the figure below:

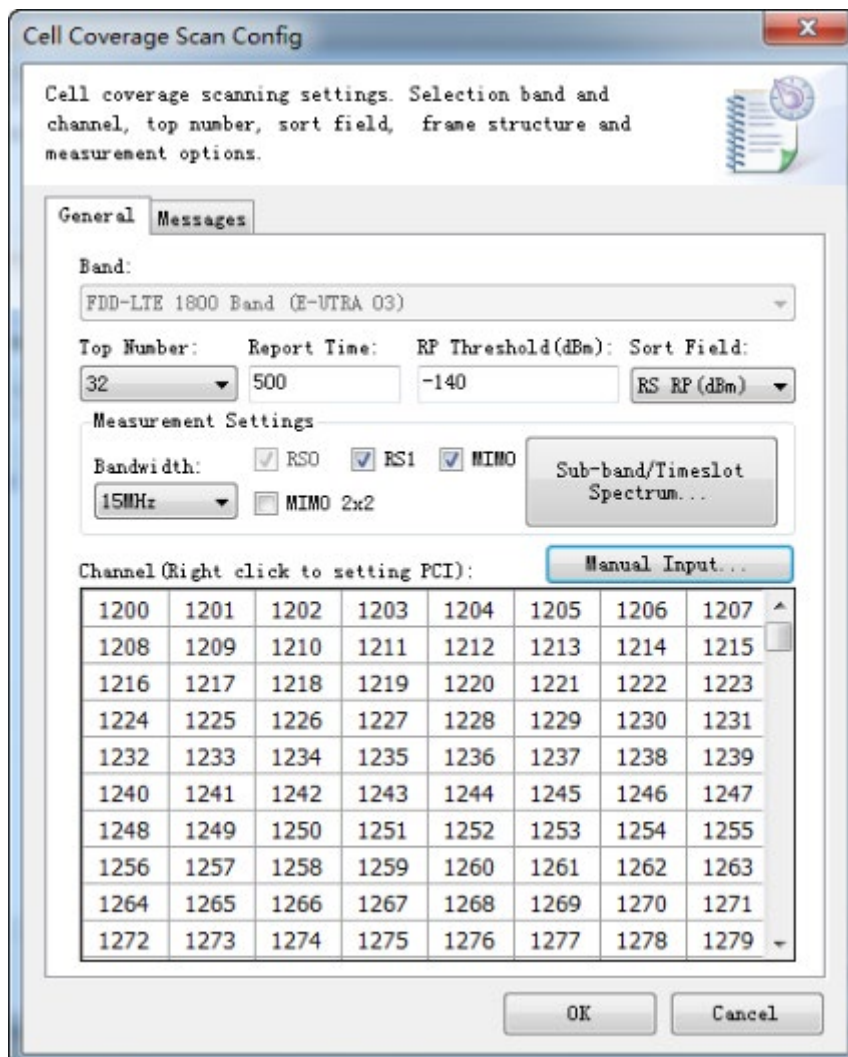


View will pop up in the work area after double clicking “RS” , displaying the data information of this test item in a real-time, as shown in the figure below:

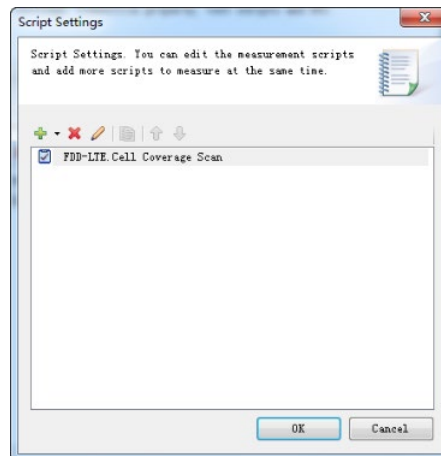


### 1.3.4.1 MIMO Measurement

Check RS1 and MIMO measurement for MIMO measurement, the dialog box below will appear:

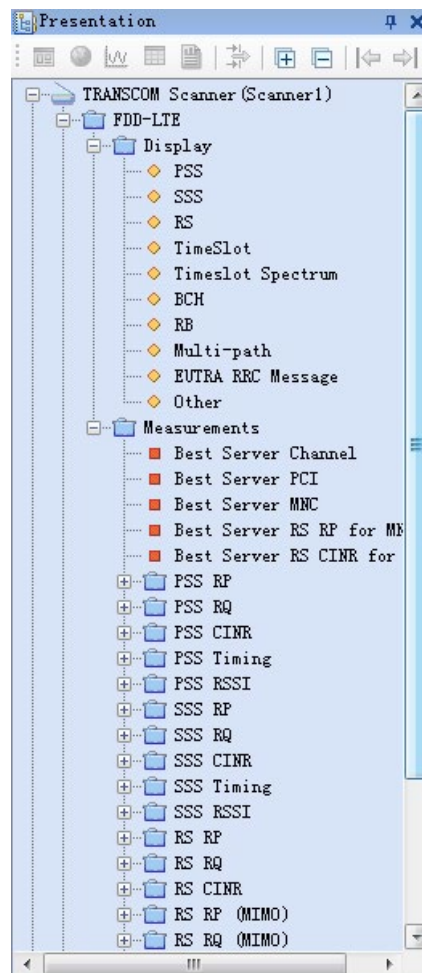


Click OK after finishing setting. You can find that the test script has been in Script Configuration dialog box, as shown in the figure below:



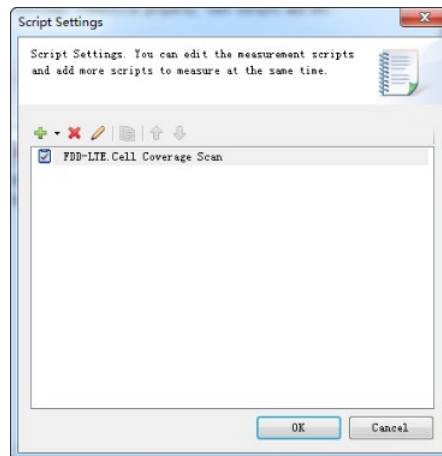
Click icon to add test script (only script “Cell Coverage Scan” can be added, but different frequency bands and points can be chosen); click icon to edit and modify the test script; click icon to delete the selected test script. Click “OK” after finishing setting to finish script configuration and enter the next step.




In test interface, when clicking button “Connect” , the navigation tree on the left side of software interface will list the current test items, as shown in the figure below:




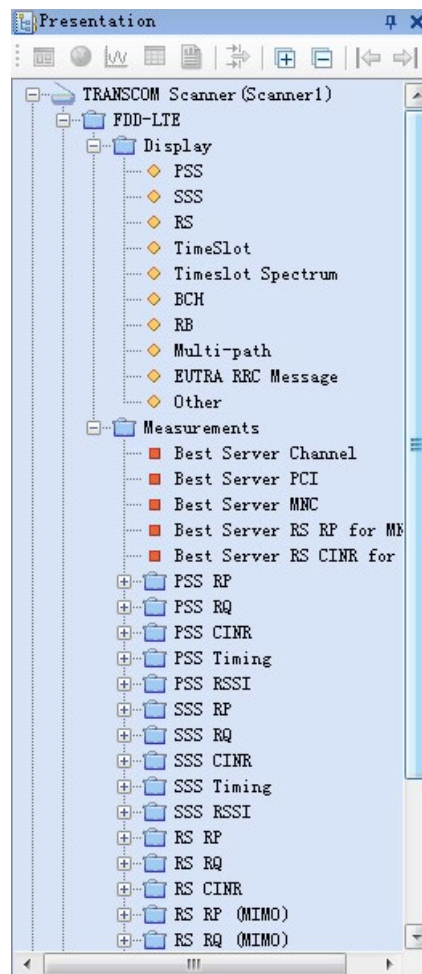


Click OK after finishing setting. You can find that the test script has been in Script Configuration dialog box, as shown in the figure below:

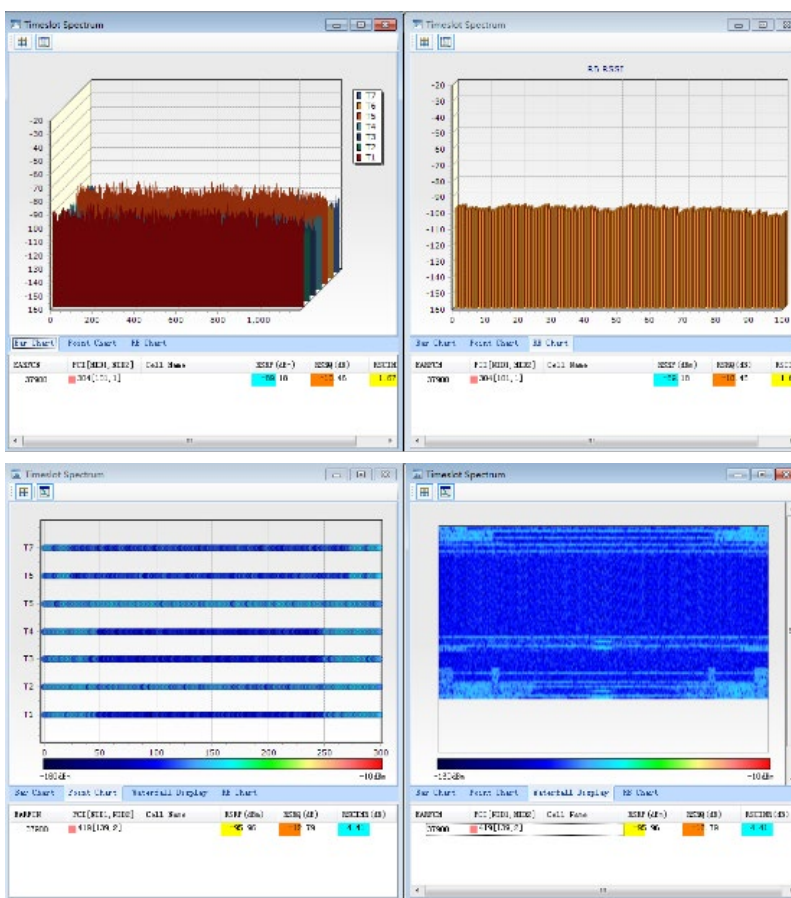


Click icon  to add test script (only script “Cell Coverage Scan” can be added, but different frequency bands and points can be chosen); click icon  to edit and modify the test script; click icon  to delete the selected test script. Click “OK” after finishing setting to finish script configuration and enter the next step.

In test interface, when clicking button “Connect” , the navigation tree on the left side of software interface will list the current test items, as shown in the figure below:

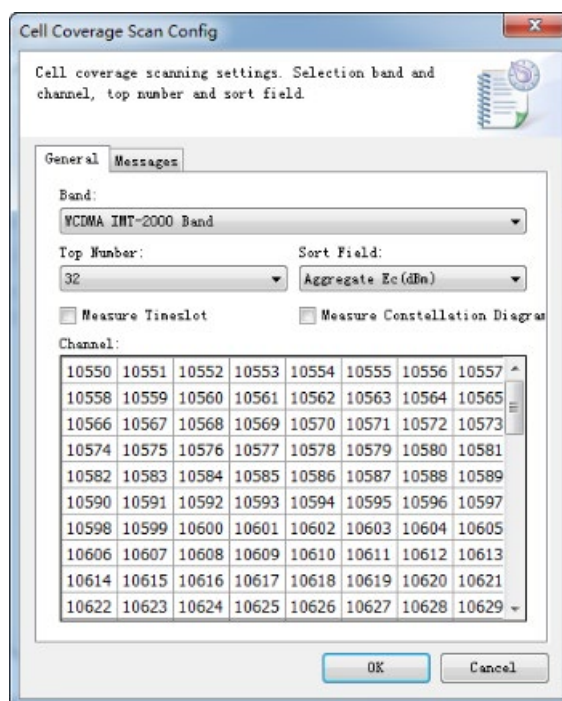


View will pop up in the work area after double clicking “Timeslot Frequency Spectrum”, displaying the data information of this test item in a real-time, as shown in the figure below:



### 1.3.4.3 WCDMA Cell Coverage Scan

This is the most common measurement script. The dialog box below appears after choosing the script:



Band: Select network type and frequency band under test;

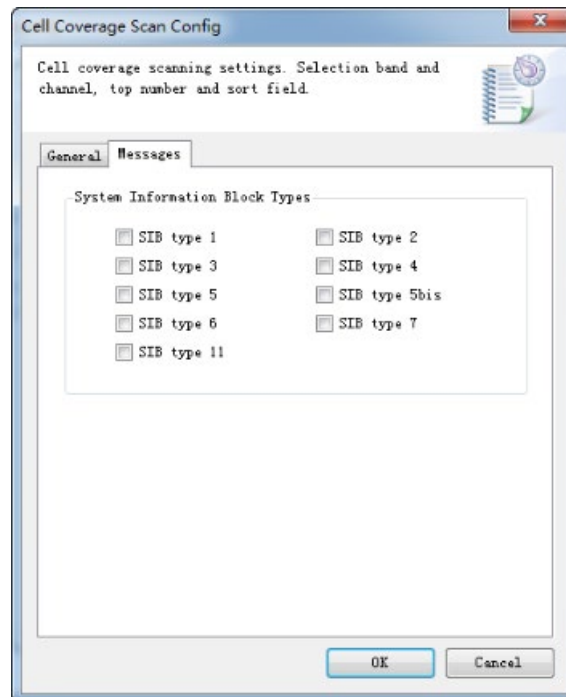
Top Number: Maximum number of pilot frequencies displayed (from high to low);

Sort field: Pilot sequencing method;

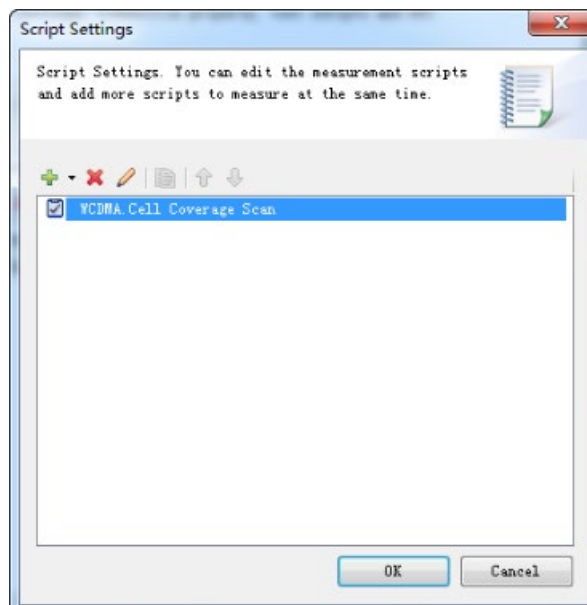
Measure Timeslot: constellation measurement, choose as required;

Channels: choose channel number(s) to be measure;

Click “Message” page to choose the function of layer 3 decoding, which supports SIB1~SIB11. Users can choose as needed, as shown in the figure below:



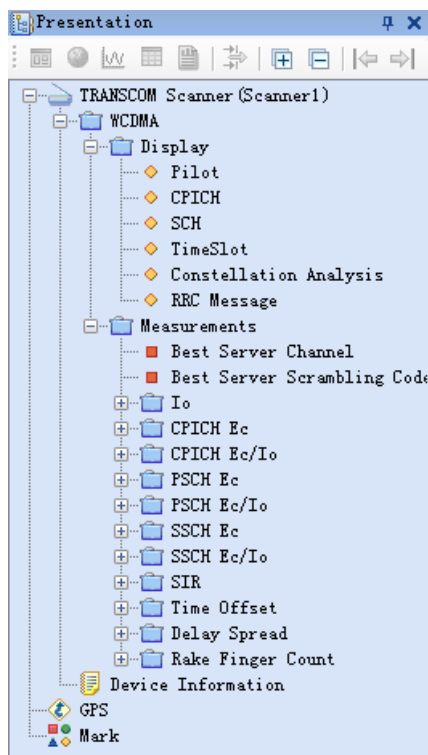
Click OK after finishing setting. You can find that the test script has been in Script Configuration dialog box, as shown in the figure below:





Click icon to add test script (only script “Cell Coverage Scan” can be added, but different frequency bands and points can be chosen); click icon to edit and modify the test script; click icon to delete the selected test script. Click “OK” after finishing setting to finish script configuration and enter the next step.

In test interface, when clicking button “Connect” , the navigation tree on the left side of software interface will list the current test items, as shown in the figure below:

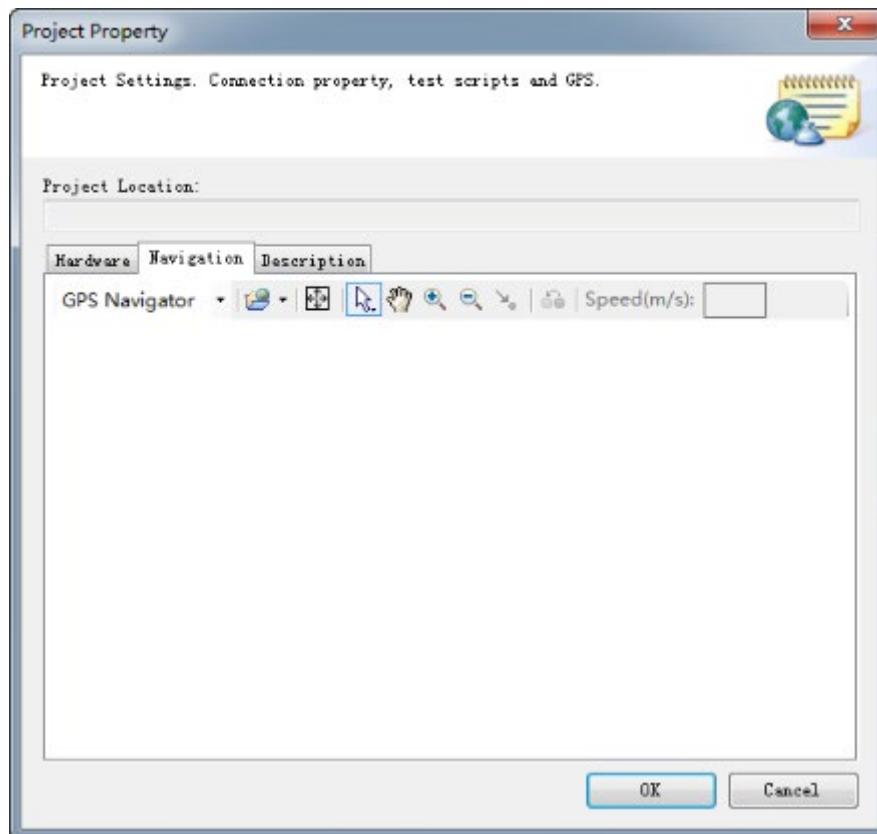


View will pop up in the work area after double clicking “CPICH”, displaying the data information of this test item in a real-time way, as shown in the figure below:

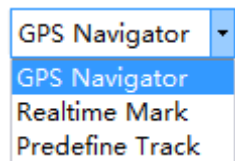


## 1.4 Navigation Configuration

After finishing script configuration, return to the last dialog box, i.e. “Project Properties” dialog box, and click “Navigation” page, as shown in the figure below:



Click drop-down button of navigation mode, drop-down menu appears:



There are 3 optional navigation modes:

GPS navigation: use built-in or external GPS for navigation, mainly for drive test;

Real-time mark: operators manually set locating points during test, mainly for indoor dotting test;

Preset track: preset test route, and test according to preset route, which is used for indoor dotting test.

Generally we choose GPS navigation in drive test, mainly choose real-time mark and also use preset track in indoor dotting test.


Click drop-down button of background image, drop-down menu pops up, as shown in the figure below:






Import GST file in outdoor drive test, and grid map file in indoor dotting test. Please refer to [1.7 Outdoor Drive Test Configuration](#); [1.8 Indoor Dotting Test Configuration](#).



Click “OK” after finishing navigation configuration to finish the whole project properties configuration.

### 1.5 Save and Call Project

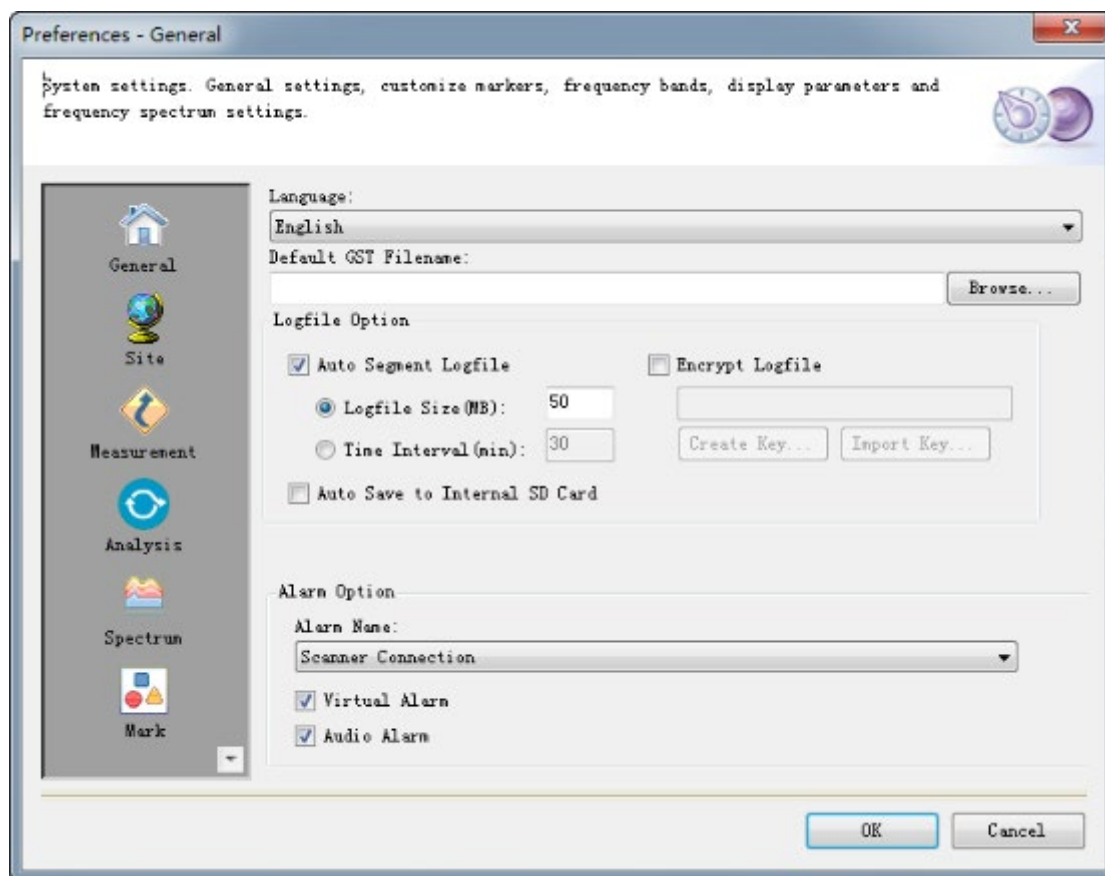
Click “Save Project” in drop-down menu of “File” or directly click icon  in the toolbar to save the current project to path designated by users. The format of file is Eagle Workspace File (.ewf file).

Click “Open Project” in drop-down menu of “File” or directly click icon  in the toolbar to recall the project files previously saved.

In case of saving per file size, please check “Automatically Segment Log” in “Log Record Selection” in option  of preference  of software before recording, and input file size segmented before log record. The data will be automatically segmented according to the log size input by customers.


In case of saving by time interval, please check “Automatically Segment Log” and choose “Segment by Measurement Time” in “Log Record Selection” under option  of preference  of software before recording log, the data will be automatically segmented according to the time set by customer.

Log encryption function and autosave to SD card (custom-made) are also provided.



## 1.6 Start Test


Start test after finishing project properties configuration.

Click “Connect” in drop-down menu of “Measurement” or directly click icon  in the toolbar to receive data from the digital scanner receiver.


### 1.6.1 Display Data


After test is started, users can view the current wireless environment in real time. The navigation bar on the left side listed views available to the current test plan. Users can double click the view name in navigation bar and get relevant view window on working page.

### 1.6.2 Record Log


Click “Start Recording” in drop-down menu of “Measurement” , or directly click icon  in the toolbar to start log record of test data.


Set name and save path of log file when recording log. The suffix of log file is .bin.

Click “Pause Recording” in drop-down menu of “Measurement” , or directly click icon  in the toolbar to pause log record of test data.

Click “Stop Recording” in drop-down menu of “Measurement” , or directly click icon  in the toolbar to pause log record of test data.

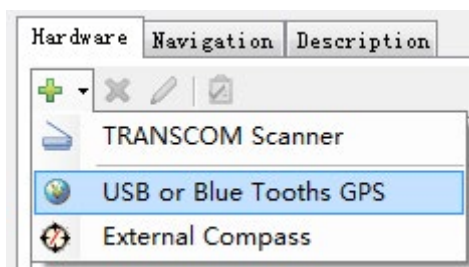
### 1.6.3 Stop Test

Stop log record before stopping test. Click “Stop Recording” in drop-down menu of “Measurement” , or directly click icon  in the toolbar to pause log record of test data.

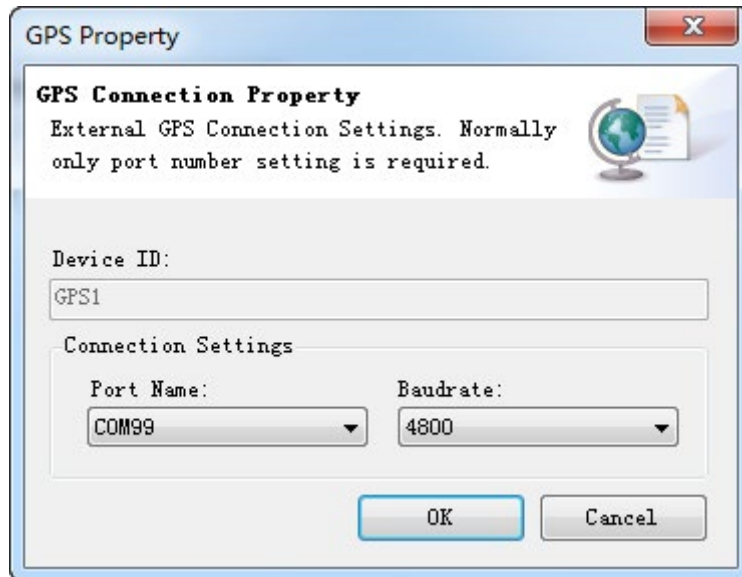
Click “Disconnect” in drop-down menu of “Measurement” or directly click icon  in the toolbar to stop data transmission of digital scanner receiver. Turn off the power and disconnect data line of the digital scanner receiver.

## 1.7 Outdoor Drive Test Configuration

Eagle digital scanner receiver is equipped with built-in GPS module, generally sparing external GPS. If external GPS is needed under special circumstances, please click drop-down button “Add Equipment” , the drop-down menu will pop up:

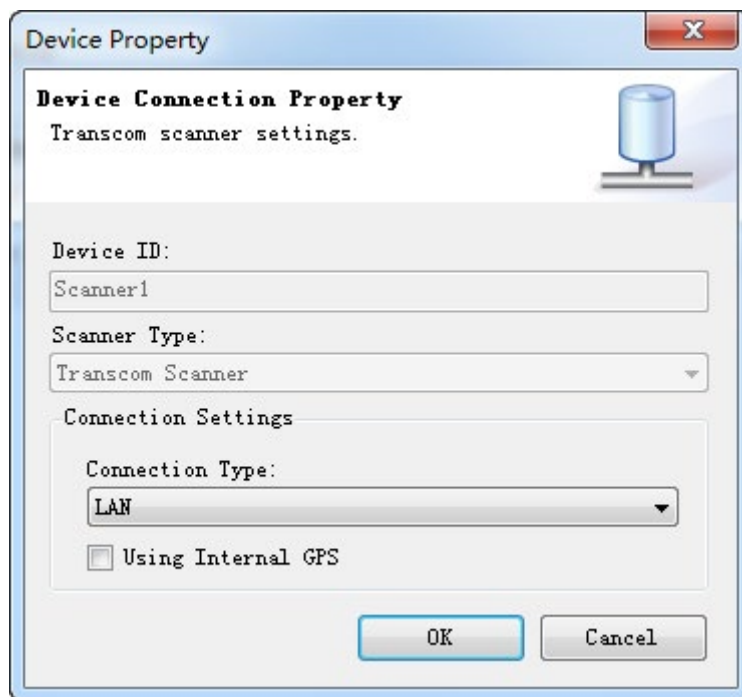


Add “USB or Bluetooth GPS” , the dialog box below will pop up:

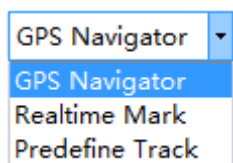


Choose PC port number (inquire in device manager of PC) used by external GPS; choose external GPS Baud rate, 4800 by default.

And then uncheck “Use Built-in GPS Module” :



Click “Navigation” page in “Project Properties” dialog box after finishing equipment configuration, and drop-down button of navigation mode, drop-down menu will pop up:

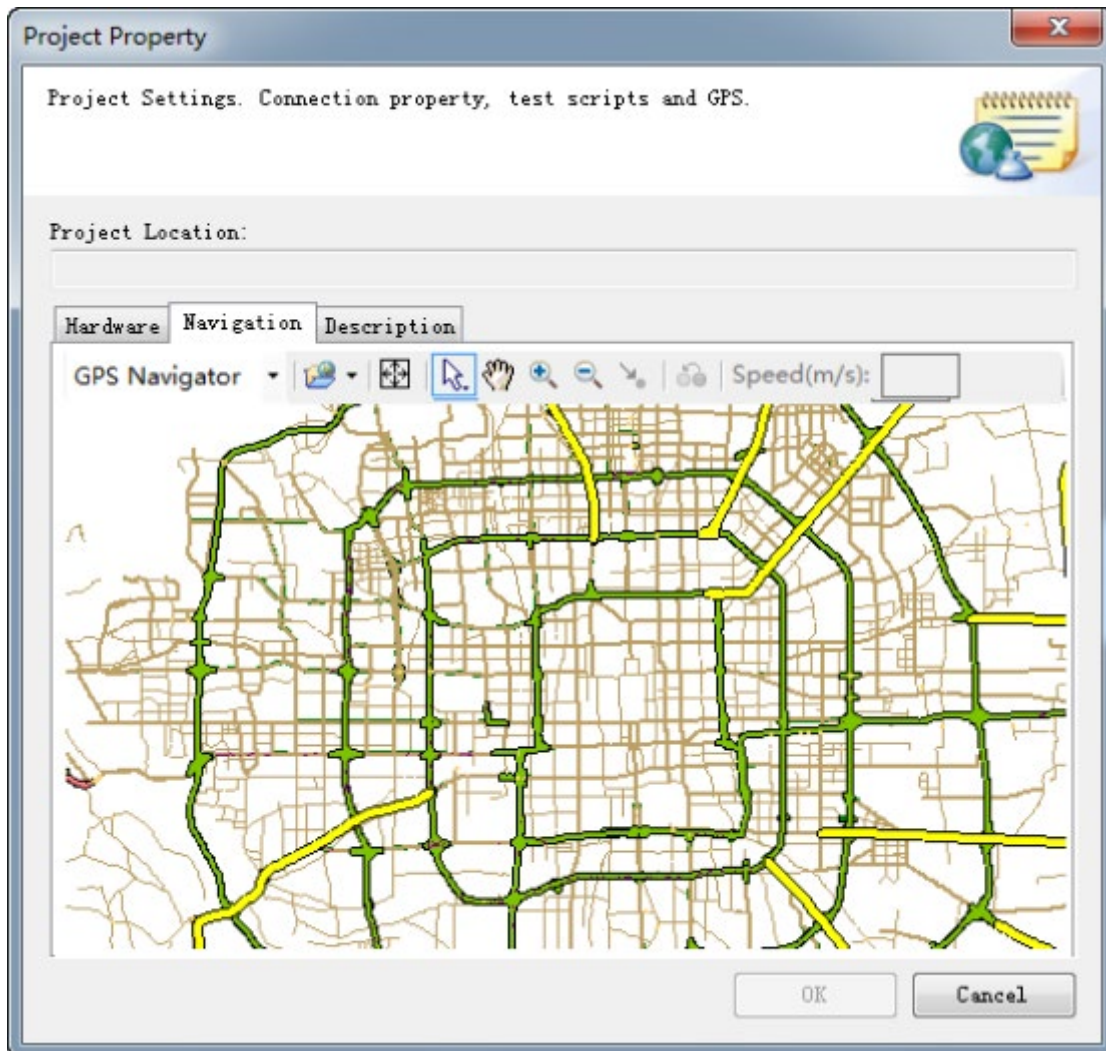


Choose GPS navigation, and then click drop-down button of background image, drop-down menu will pop up:



Choose “Open GST File” to open map index file, the suffix of which is .GST.

The map window will display the view after map is imported, as shown in the figure below:

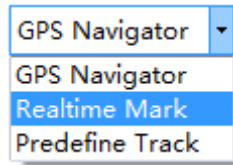


Click OK to finish configuration of project properties after finishing equipment and navigation configuration, and then click “Connect” for drive test.

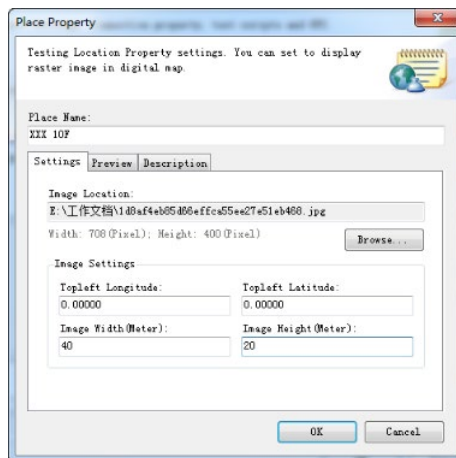
Please refer to [1.6.2 Record Log](#) to save test data during test.

## 1.8 Indoor Dotting Test Configuration

GPS is not required for indoor dotting test. Click drop-down button of “Navigation Mode” on “Navigation” page, and choose “Real-time Mark” in pop-up menu, as shown in the figure below:

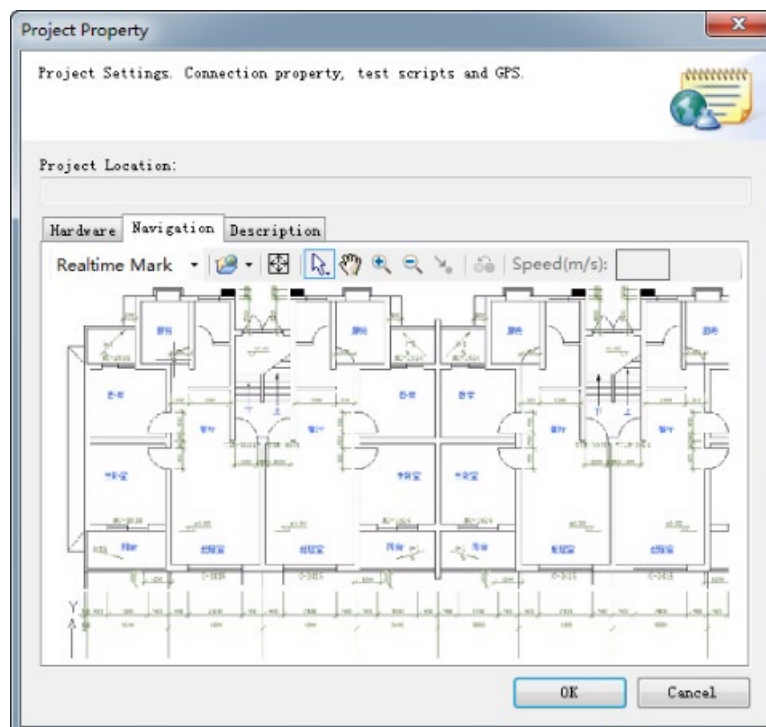


Click drop-down button of “Open Background Image”, drop-down menu will pop up. Click “Open Grid Map File”, the dialog box will pop up, as shown in the figure below:



Input name of test site, longitude and latitude at the top left corner of grid map, and length and width of test site; the grid map file imported supports .bmp and .jpg formats.

Preview of the imported grid map can be seen on “Preview” page, as shown in the figure below:



Click OK to finish equipment and navigation configuration, and then click “Connect” for measurement.

Unlike outdoor drive test, indoor dotting test does not support GPS, so manual dotting is needed during test.

Open navigation tree, and click subdirectories in order:

TRANSCOM Scanner(Scanner1)->

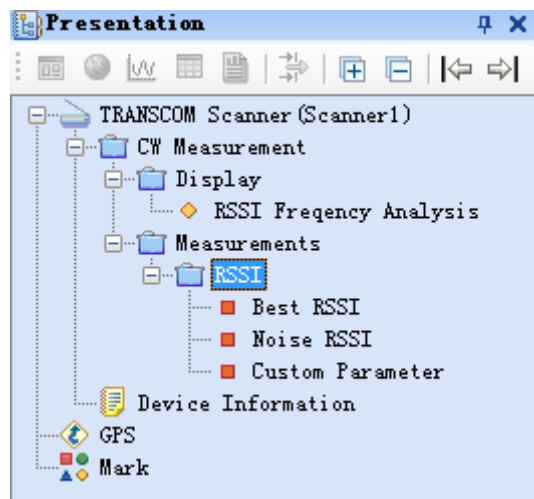
LTE Band->

Parameter->

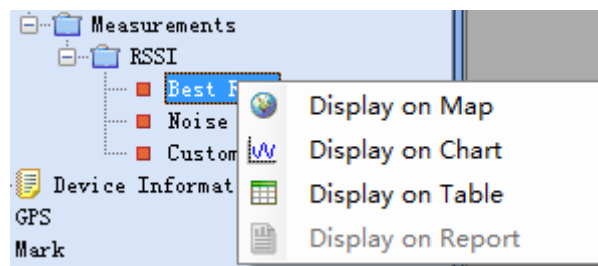
RSSI->


Best RSSI

The specific path is shown in the figure below:



Double click or right-click “Best RSSI”, and choose “Display in Map” in pop-up menu, as shown in the figure below:

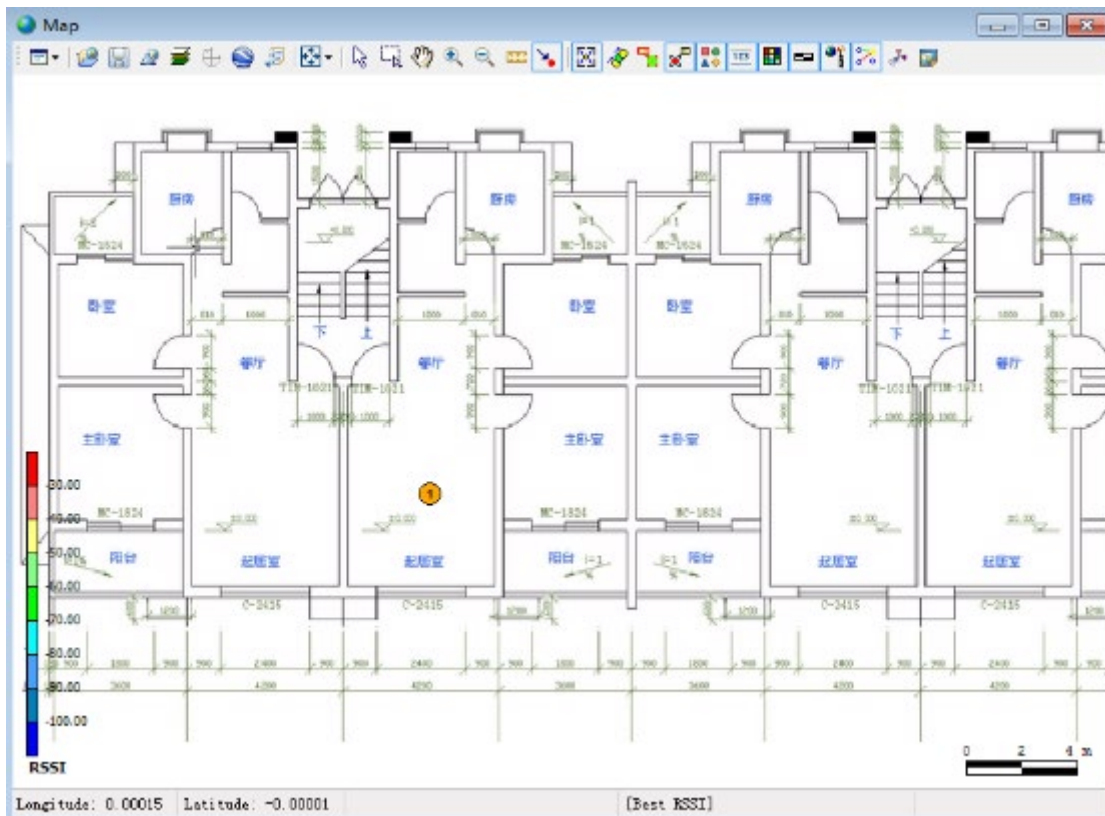


The grid map imported will pop up in the work area. Click , icon of “Drive Test Mark” in the toolbar on the top of grid map to open manual dotting. See the figure below for specific position:

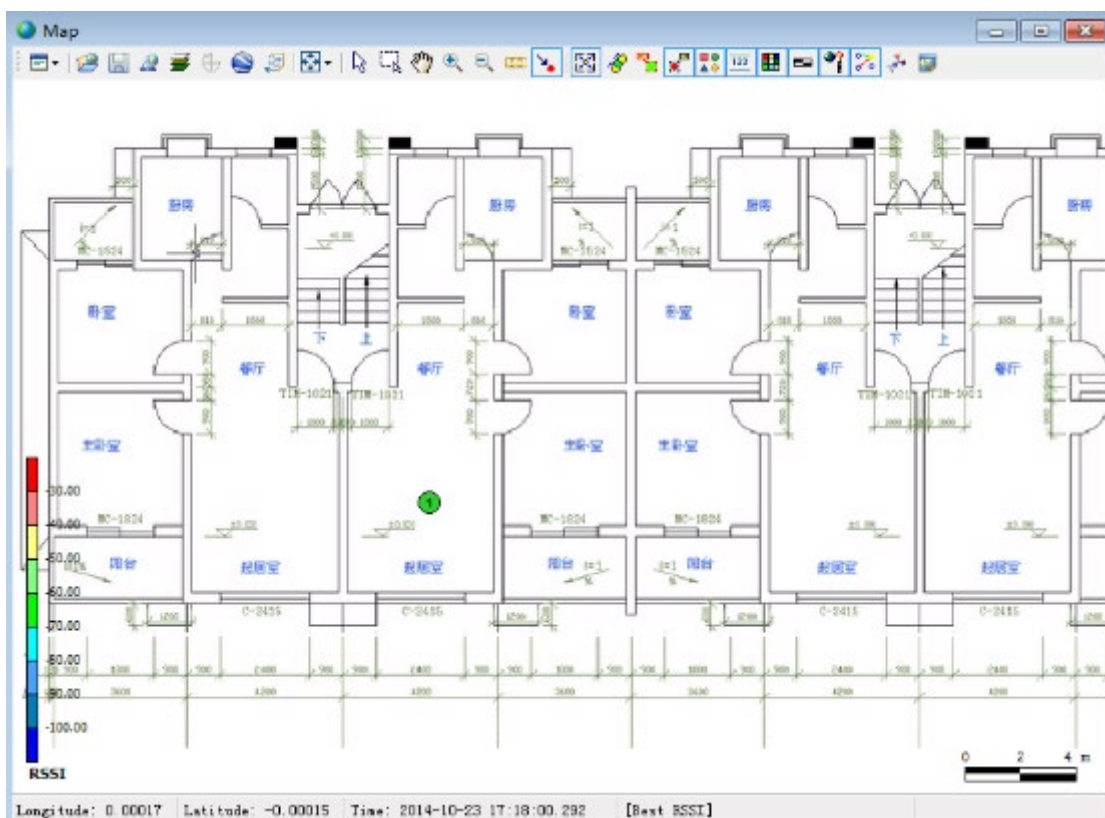




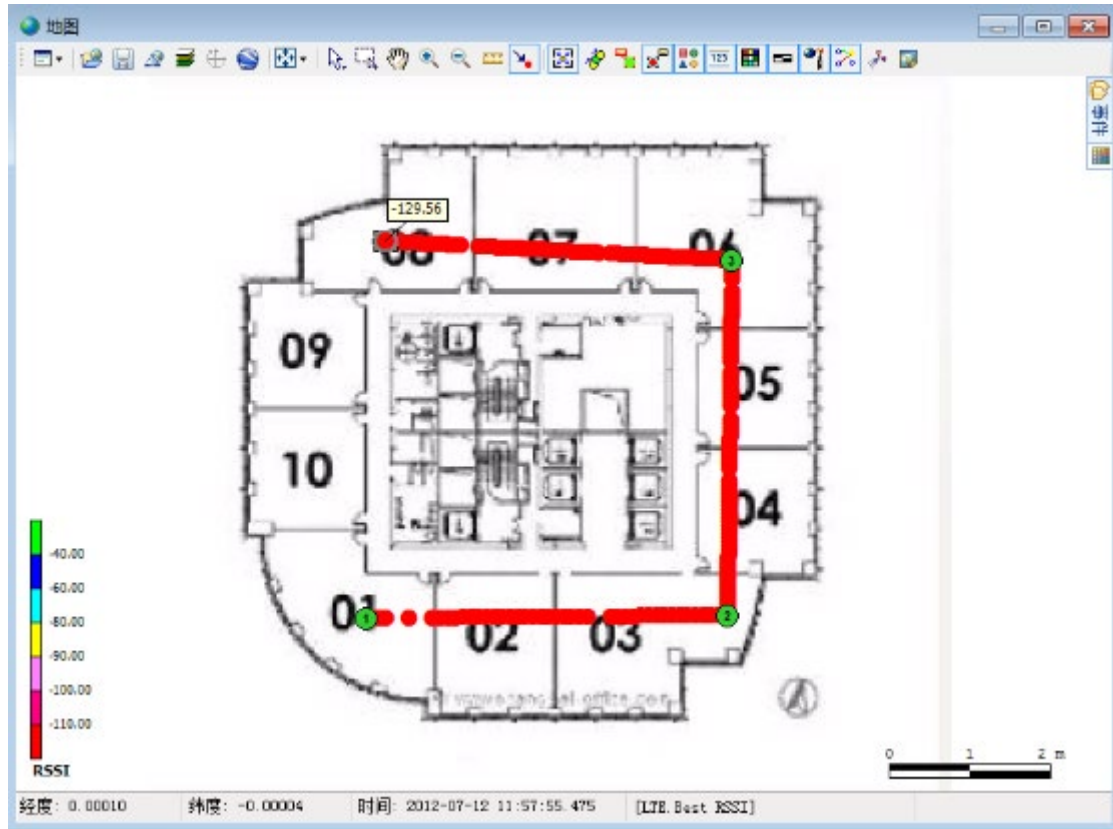
Click left mouse button in the grid map for manual dotting. Click the left mouse button once for pre-positioning, when locating points can be changed, as shown in the figure below:



Double click the left mouse button again at the locating point after confirming that dotting position is correct to finish marking of locating point, when the locating point turns green, as shown in the figure below:




According to actual indoor test path, make locating points at corresponding positions in the grid map when the path is changed. The software automatically evenly distributes positions of locating points on the path, as shown in the figure below:




Please refer to 1.6.2 Record Log to save test data during test.

## 2. Off-line Playback

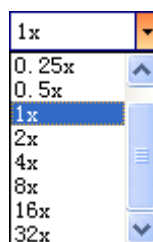
### 2.1 Open Log File



Click “Open Log” in drop-down menu “Playback” or directly click icon  in the toolbar, dialog box will pop up. Choose the path and file name (.bin file) of the log file to be opened to open the log file.

### 2.2 Start Playback

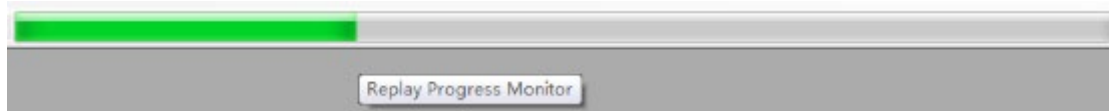
Click “Start Playback” in drop-down menu “Playback” or directly click icon  in the toolbar to start playback of the log file opened.

Click “Playback Acceleration” and “Playback Deceleration” in drop-down menu “Playback” to adjust the speed of playback from 0.125x to 32x, or directly click “Playback Speed Regulator” in the toolbar to adjust the speed in the drop-down menu, as shown in the figure below:




Click “Playback of Last Step” or “Playback of Next Step” in drop-down menu “Playback” to directly display the data of last/next sampling point. Users can also directly click icon  /  in the toolbar to realize this function.

The rightmost “Playback Progress Monitor” in the toolbar displays the current playback progress percentage of log file. Users can directly click the left mouse button on the progress bar to make the log playback skip to corresponding progress, as shown in the figure below:




### 2.3 Pause Playback


Click “Pause Playback” in drop-down menu “Playback” or directly click icon  in the toolbar to pause automatic playback of the log file.

Use “Playback of Last Step/Next Step” or directly click the left mouse button on “Playback Progress Monitor” during pause of playback to directly adjust to corresponding playback progress.

### 2.4 Stop Playback

Click “Stop Playback” in drop-down menu “Playback” or directly click icon  in the toolbar to stop automatic playback of the log file.

### 2.5 Close Log

After stopping automatic playback of the log, click “Close Log” in drop-down menu “Playback” or directly click icon  in the toolbar to close the log opened.

*Keep innovating for excellence!*

#### About Transcom

Shanghai Transcom Instrument Co., Ltd. (NEEQ: 831961), established in 2005, independently research and develop high-end radio frequency communication testing instruments and is a professional provider of overall testing solutions. Starting from 2009, Transcom, titled as National High-Tech Enterprise and the fostered enterprise by Shanghai Little Giant Project, has undertaken the tasks of development for National "New-Generation Broadband Wireless Mobile Communication Network" and the construction of Shanghai Engineering Research Center for Wireless Communication Testing Instruments.

In 2015, Transcom officially announced its new five-year development strategy "1+3". In detail, Transcom will continue to enhance its potential to be the national team for domestic wireless communication instruments, and develop security software for mobile communication network (network communication/data mining), wireless signal (spectrum monitoring/situation analysis) and Beidou navigation (signal monitoring for satellite navigation/mobile anti-jam verification platform). The strategy has now been implemented systematically with progressive achievements in Shanghai, Guangdong and other cities.

Keep innovating for excellence!



ISO9001



ISO14001

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