



# RTK Solution based on Android platform

## LandStar 7

September 2016

# Agenda

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- Software introduction
- Feature and Benefits
- RTK operation

# Software introduction

- LandStar 7 is our newest field-proven software solution for Android
- Designed for high precision surveying and mapping tasks for your everyday work
- LandStar7 supports various GNSS instruments, and features seamless work mode management, easy-to-use and easy-to-learn graphical user interface with simple operation
- Extensive data import/export formats and multiple types of measurement and stakeout methods ensure instant productivity

# Agenda

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- Software introduction
- Feature and Benefits
- RTK operation

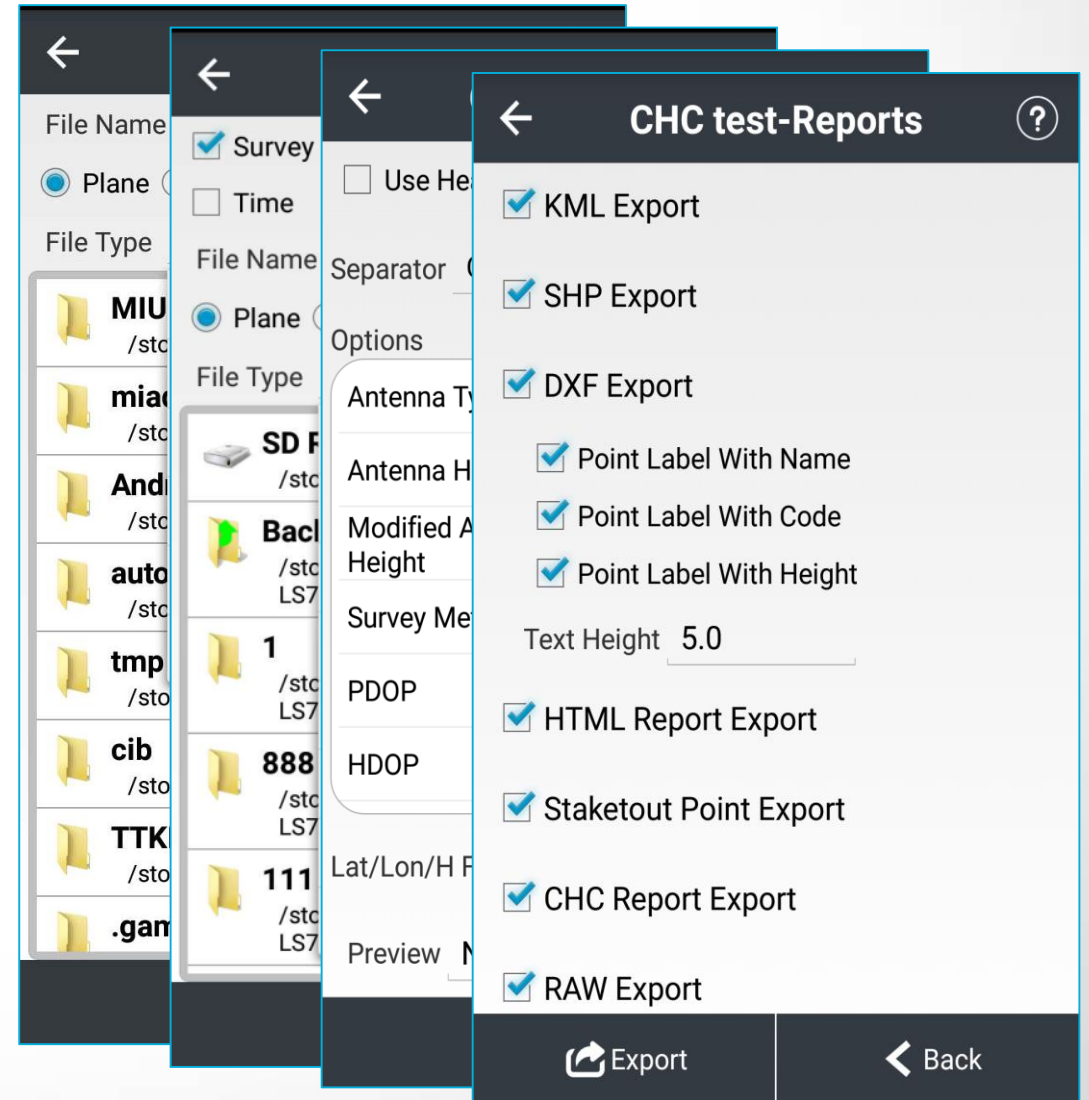
# Feature and Benefits

- Powerful graphical surveying
  - Support both OSM online map and offline map (DXF and ESRI SHP file formats) as the base map while surveying
  - Selected points in a DXF or SHP file can be automatically added to the point's manager for staking out
  - Multiple features are allowed to measure simultaneously



# Feature and Benefits

- Extensive data import and export formats
  - Support CSV, DAT, TXT, DXF, SHP and NCN as the import format
  - Support CSV, DAT, TXT, KML, DXF, SHP, RAW, HTML as the export format
  - Support customize the import and export contents while choosing CSV, DAT, TXT format



# Feature and Benefits

- Multiple localization methods
  - Support 3 parameters
  - Support 7 parameters
  - Support 4 parameters
- Support Geoid undulation file and Grid shift file(GGF, BIN, GRD, GSF, GRI, ASC)
- Support RTCM transformation messages (1021-1027)

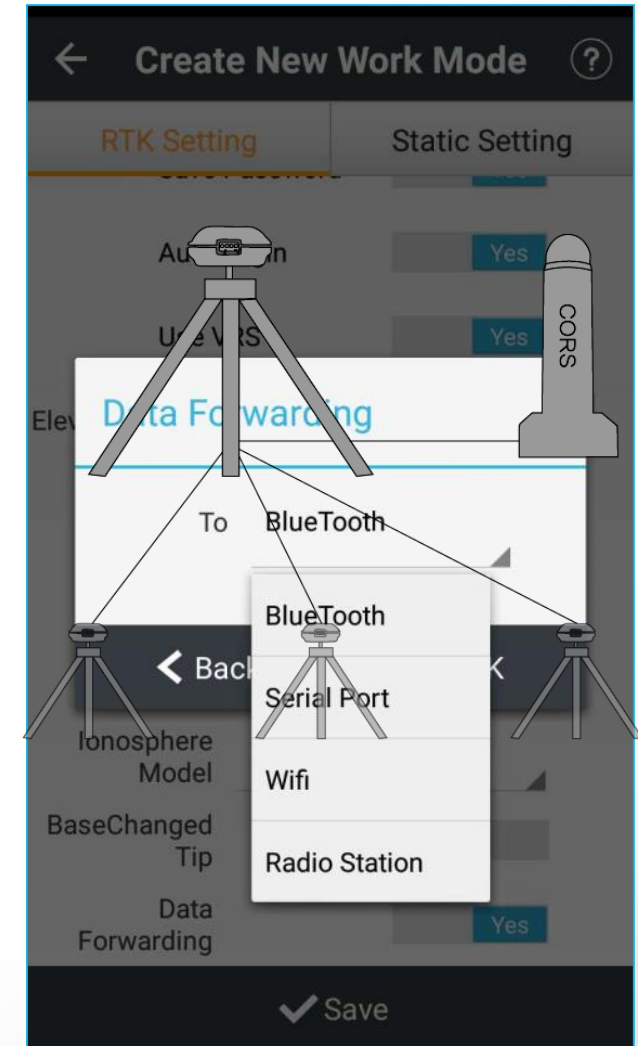
The screenshot displays the 'CHC test-Edit Work Mode' interface. It features two tabs: 'RTK Setting' (selected) and 'Static Setting'. The 'RTK Setting' tab contains a list of RTCM messages (1021-1022, 1023-1024, 1025-1027) with 'Yes' or 'No' toggle buttons. Below this are settings for 'Save Password' (Yes), 'Auto Login' (Yes), and 'Use VRS' (Yes). The 'Static Setting' tab is currently inactive. At the bottom, there are input fields for 'Elevation Mask' (10), 'PDOP Limit' (6), and 'RTK FREQ' (5HZ). A 'Save' button with a checkmark is at the bottom right. The background shows a partially visible 'CHC test-Edit Work Mode' screen with a 'Logou' button.

| RTK Setting   | Static Setting |
|---------------|----------------|
| 1021-1022     | Yes            |
| 1023-1024     | Yes            |
| 1025-1027     | No             |
| Save Password | Yes            |
| Auto Login    | Yes            |
| Use VRS       | Yes            |

Elevation Mask 10  
PDOP Limit 6  
RTK FREQ 5HZ  
Save

# Feature and Benefits

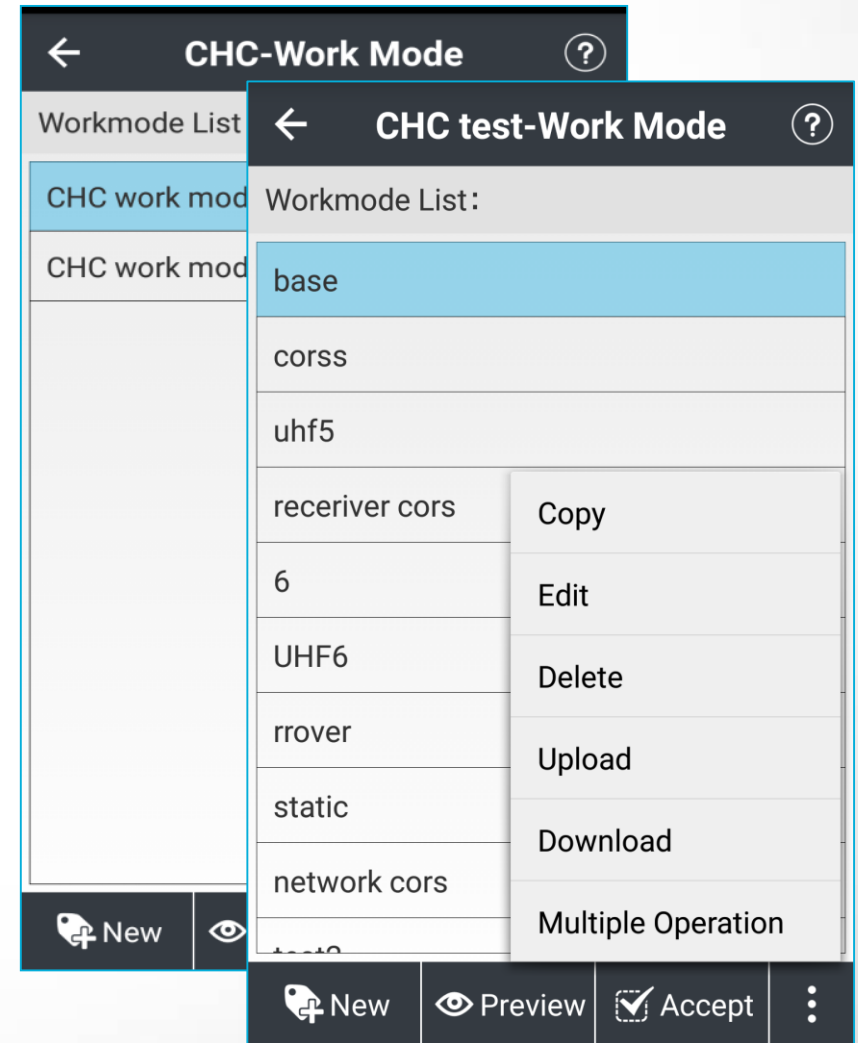
- Correction repeater function
  - Support repeating correction data from RTK network to other rovers via the internal radio modem





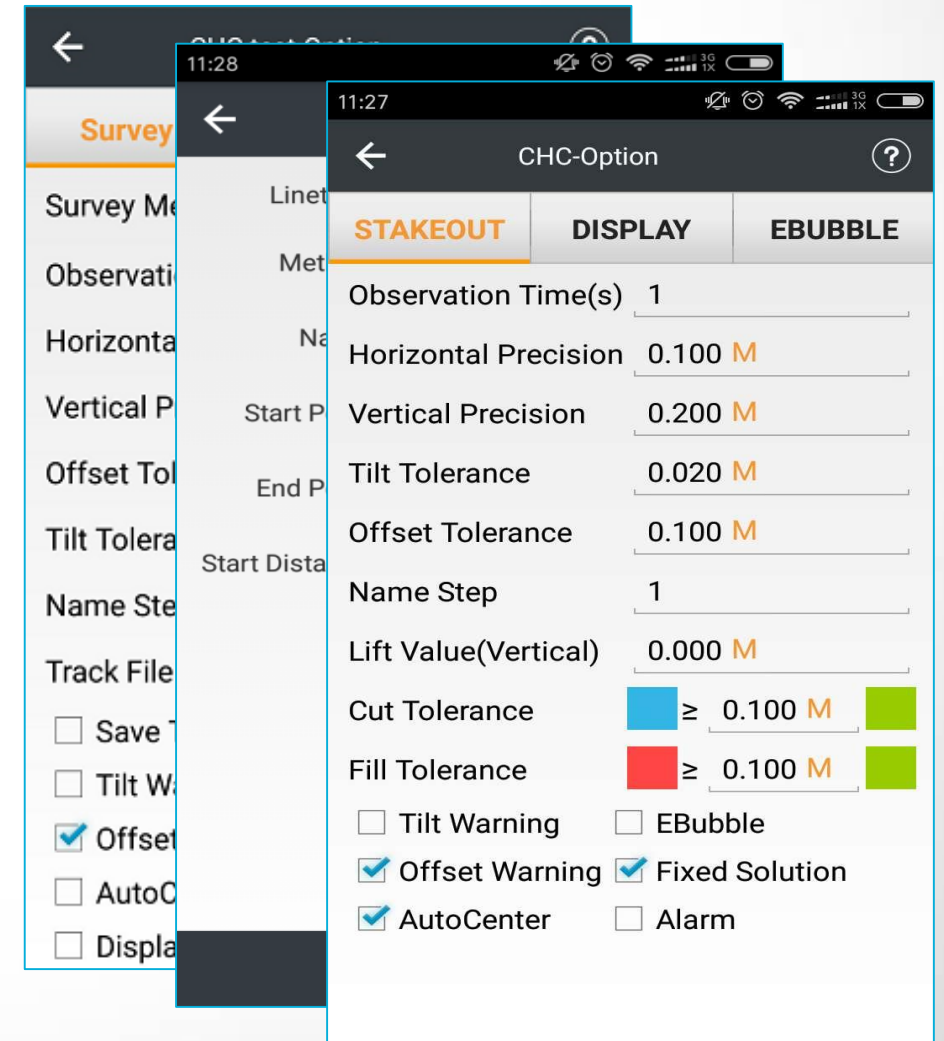
# Feature and Benefits

- Convenient work mode management
  - Support presetting of common work modes
  - Support selecting or switching work modes by one button push



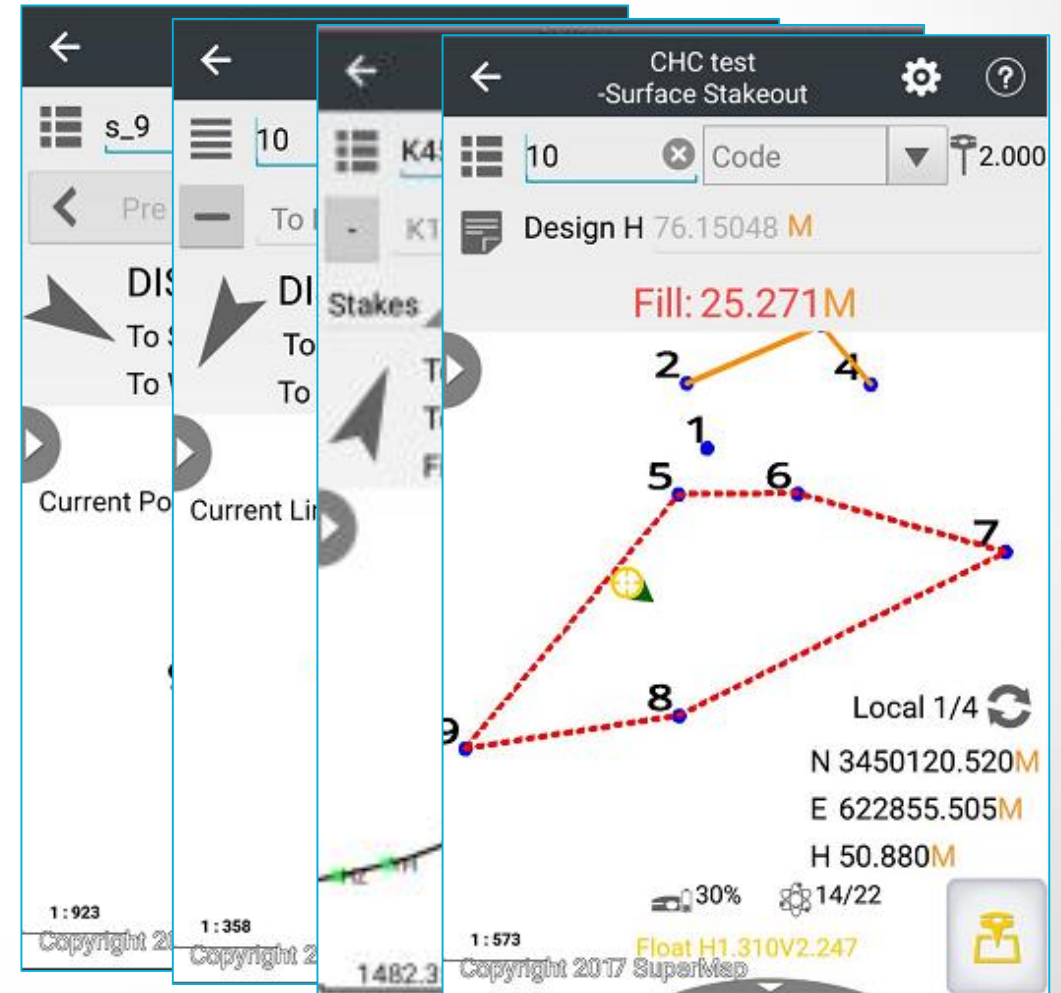
# Feature and Benefits

- Various types of measurement
  - Support points measurement (include topographic point, control point, quick point, continuous point, offset point and compensation point)
  - Support lines measurement
  - Support features measurement
  - Support PPK(Postprocessed Kinematic) measurement



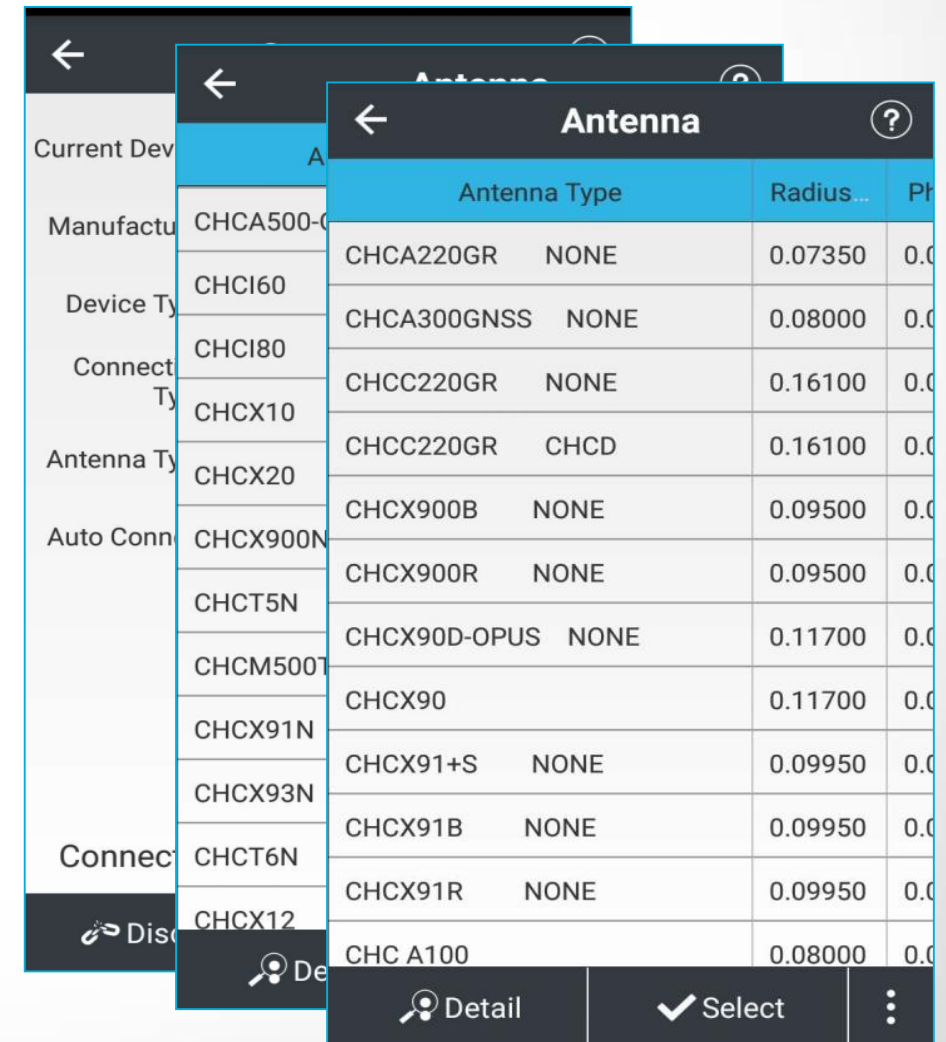
# Feature and Benefits

- Multiple types of stakeout
  - Support point stakeout
  - Support line stakeout
  - Support surface stakeout
  - Support road stakeout



# Feature and Benefits

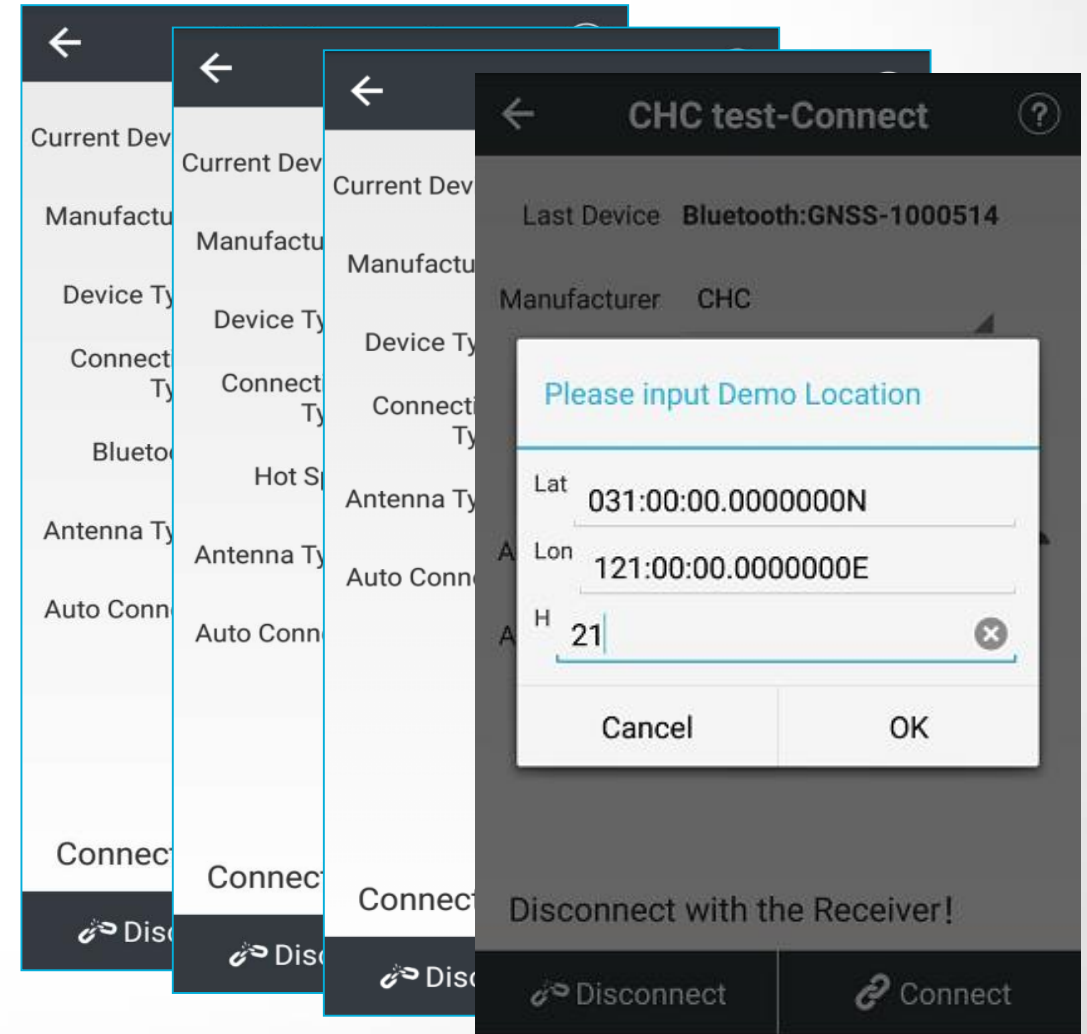
- Various GNSS instruments
  - Support all CHC GNSS receivers
  - Support internal GPS receiver in Android smartphone and handheld controller
  - Support many types of peripheral instruments such as generic NMEA0183 receivers



| Antenna Type | Radius... | Power   |
|--------------|-----------|---------|
| CHCA220GR    | NONE      | 0.07350 |
| CHCA300GNSS  | NONE      | 0.08000 |
| CHCC220GR    | NONE      | 0.16100 |
| CHCC220GR    | CHCD      | 0.16100 |
| CHCX900B     | NONE      | 0.09500 |
| CHCX900R     | NONE      | 0.09500 |
| CHCX90D-OPUS | NONE      | 0.11700 |
| CHCX90       |           | 0.11700 |
| CHCX91+S     | NONE      | 0.09950 |
| CHCX91B      | NONE      | 0.09950 |
| CHCX91R      | NONE      | 0.09950 |
| CHC A100     | 0.08000   | 0.0     |

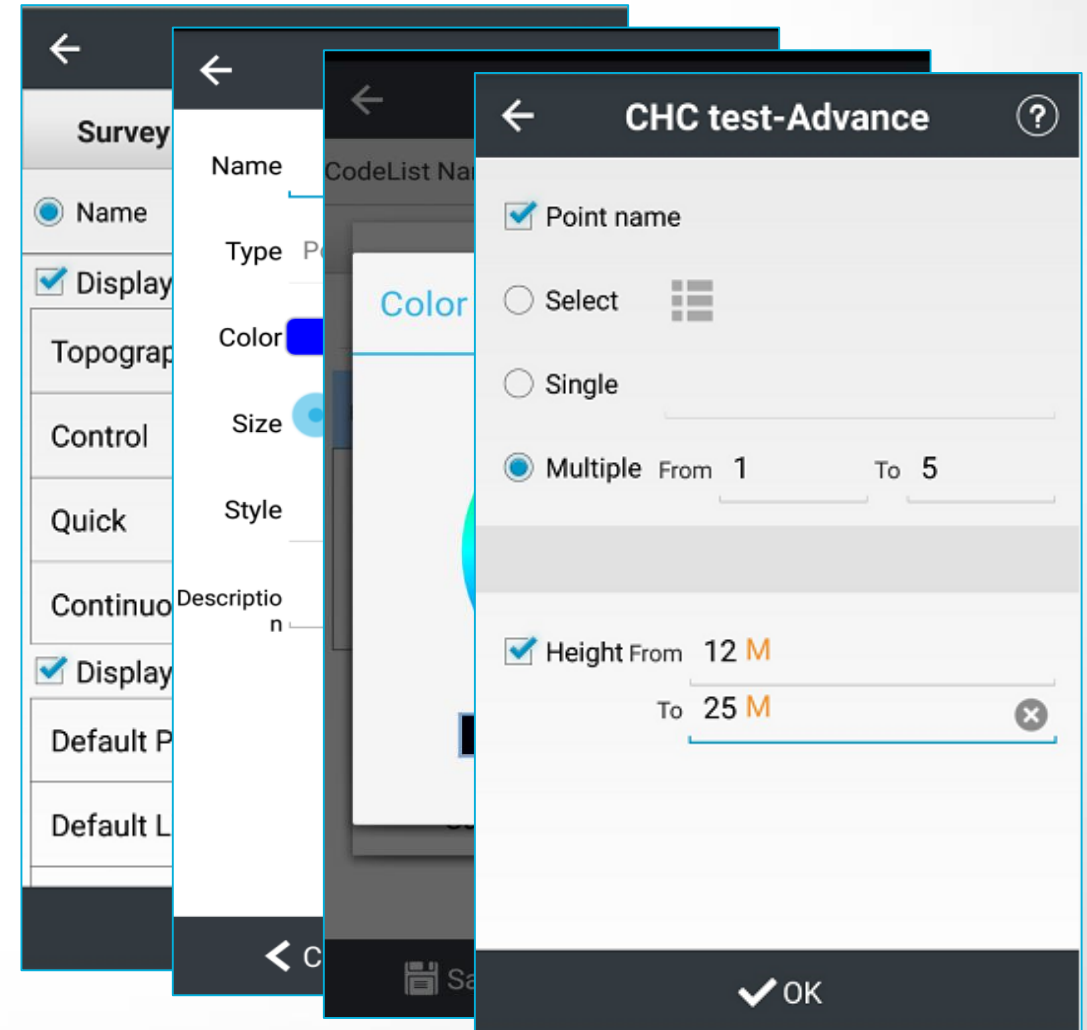
# Feature and Benefits

- Three connection types
  - Support Bluetooth, WIFI and demonstration connection
  - The WiFi connection features fast connection speed, stable performance and longer distance
  - Demonstration module allows user to input the coordinates and simulate it as the current position



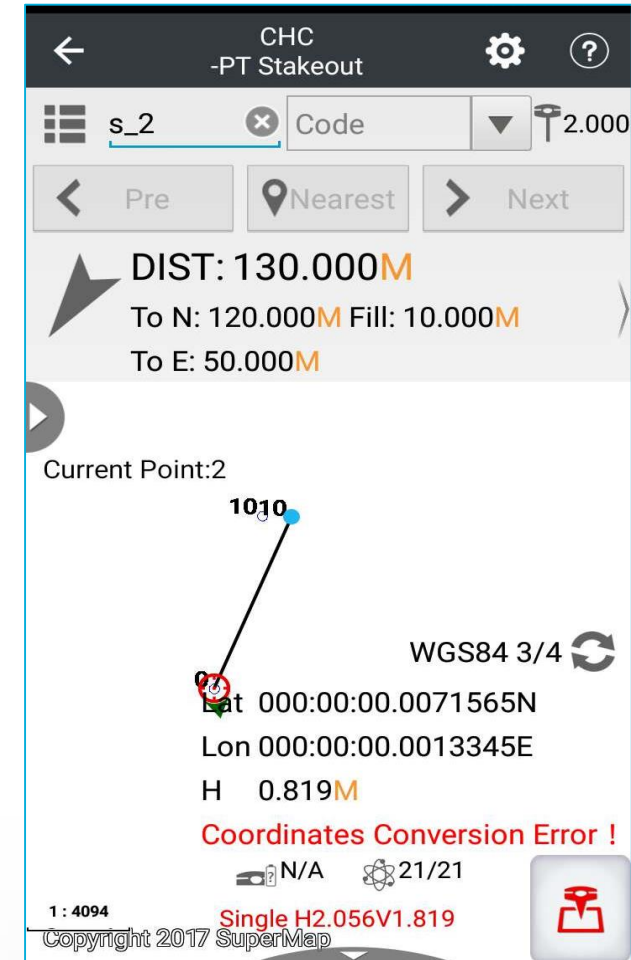
# Feature and Benefits

- Customizable layer display
  - Support separate display of points name, code and height
  - Customize color, size and types of points, lines and polygons
  - Configuration of single or multiple points with height



# Feature and Benefits

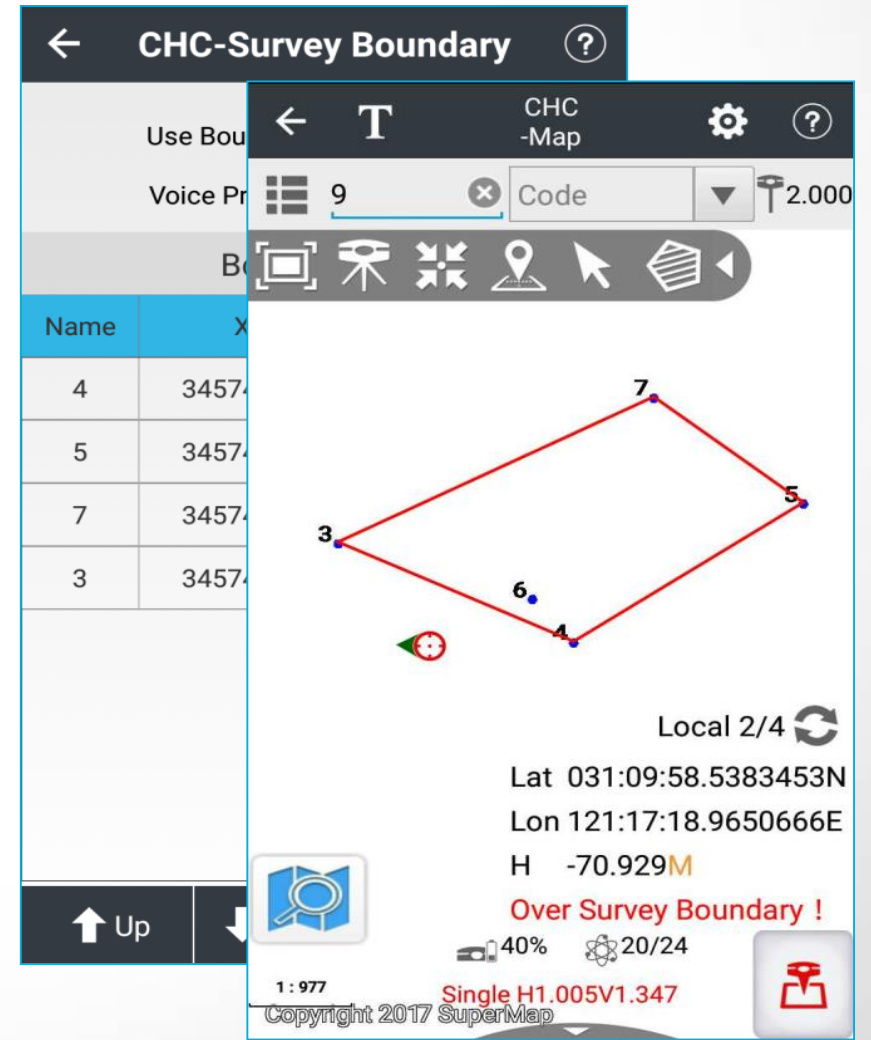
- Navigation stakeout
  - Support real-time display of direction, distance and elevation difference
  - An arrow pointing to the target in real time





# Features and Benefits

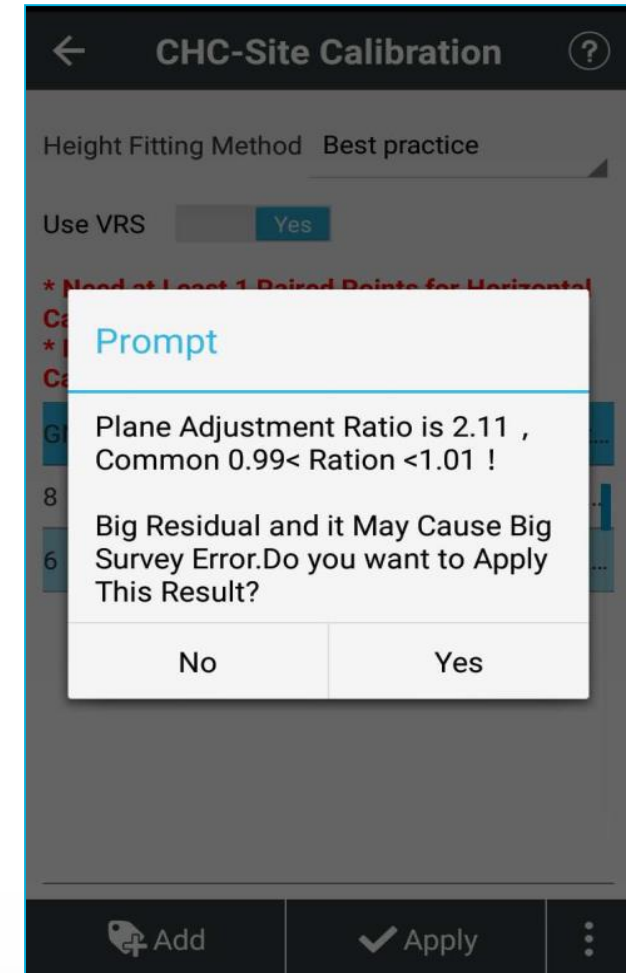
- Measurement geofencing
  - Support series of points as the measurement geofencing
  - It will remind you once your position goes out of the geofencing





# Feature and Benefits

- Site calibration Quality Control
  - Support automatic reminders when the error of site calibration results is too large



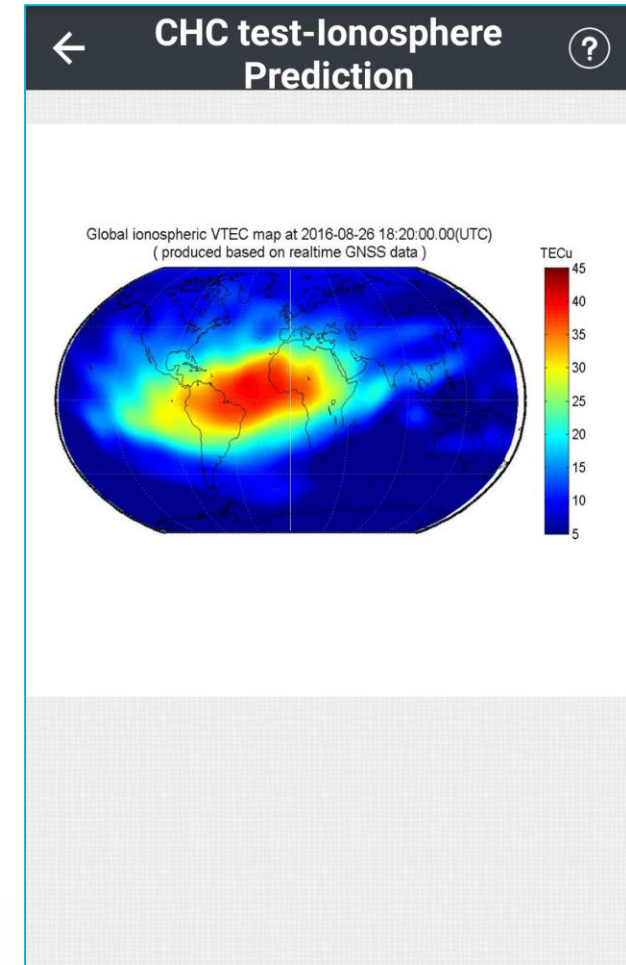
# Feature and Benefits

- Powerful COGO tools
  - Support calculation of perimeters, areas, transformation parameters, etc
  - Support conversion from different units of angle
  - It also has a build-in RPN calculator so that you can do common calculations conveniently in the field

| 2222-Calculator |     |     |     |    |
|-----------------|-----|-----|-----|----|
| 0               |     |     |     |    |
| MEM : 0         |     |     | DEG |    |
| MC              | DRG |     | C   |    |
| sin             | cos | tan | ←   |    |
| log             | ln  | √   | ^   | n! |
| 7               | 8   | 9   | (   | )  |
| 4               | 5   | 6   | ×   | ÷  |
| 1               | 2   | 3   | -   | +  |
| 0               | .   | =   |     |    |

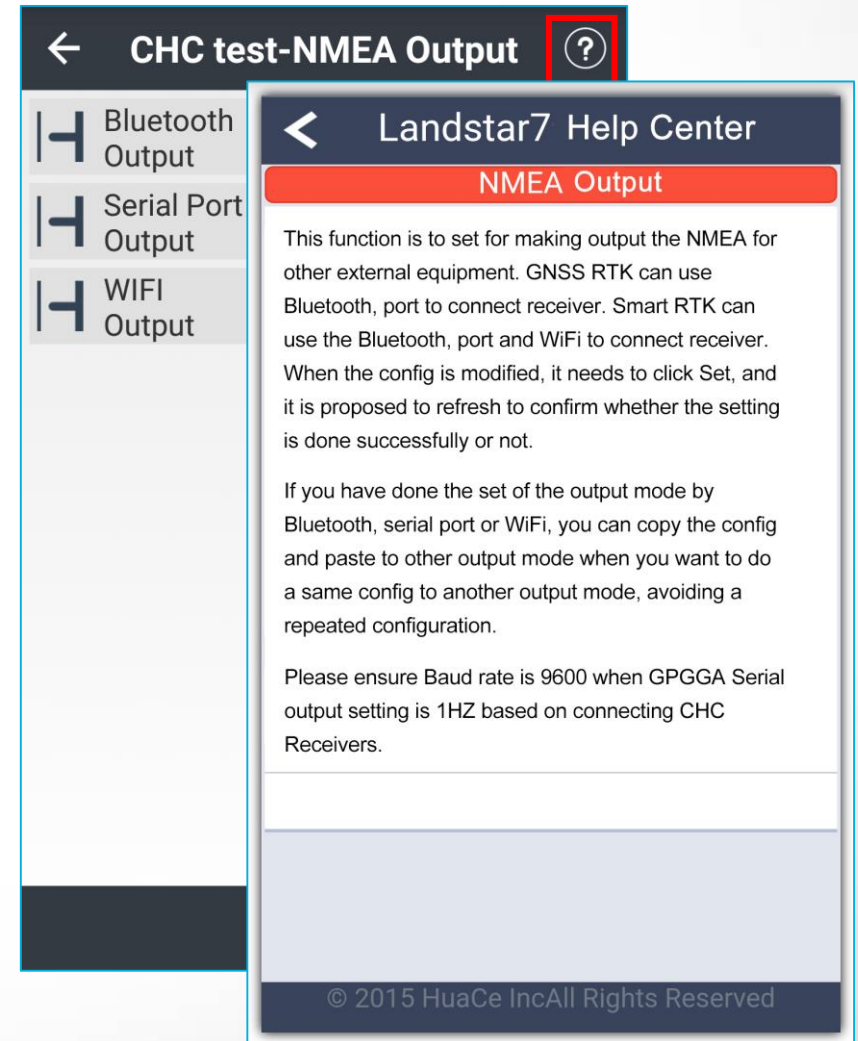
# Feature and Benefits

- Real-time global TEC map
  - Support a built-in global TEC map with updating every 10 minutes



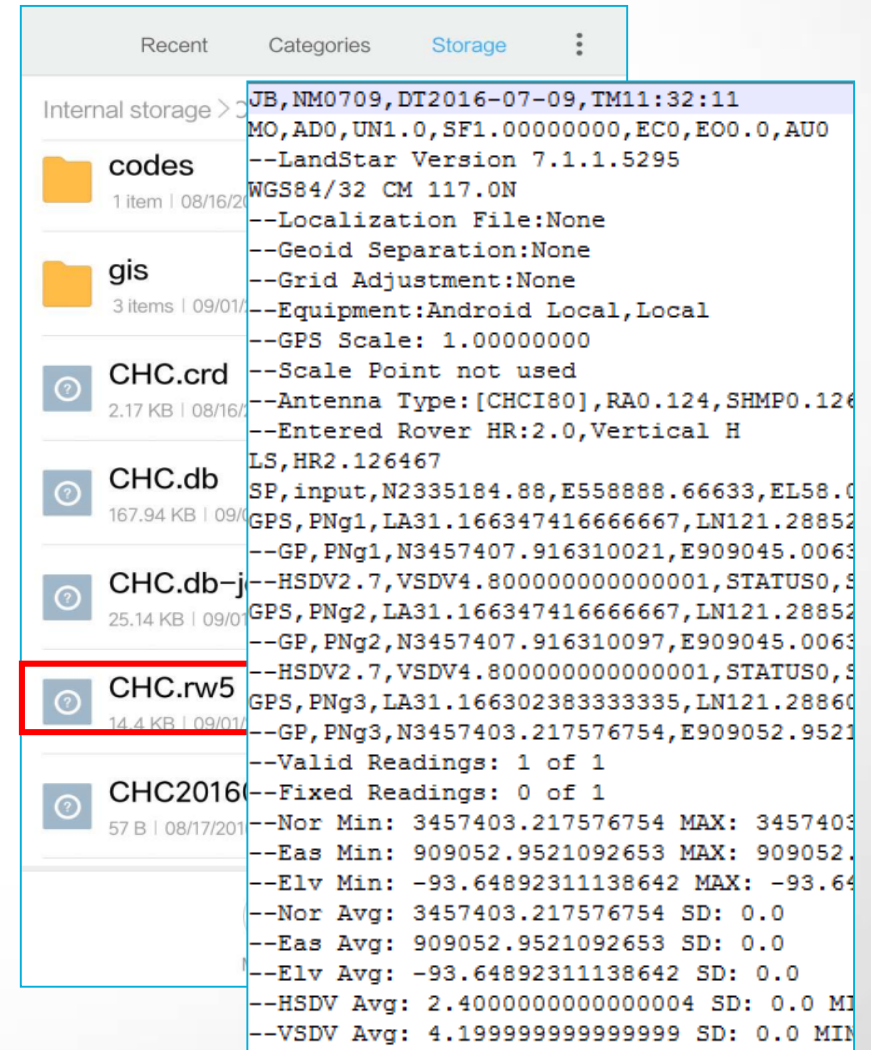
# Feature and Benefits

- Smart e-manual
  - Embedded e-manual is available on the field
  - You can check the help documentation in the top right corner of the software



# Feature and Benefits

- RAW file recording
  - Support raw data
  - You can review the operation procedures, configuration parameters and measurement results
  - Path: CHCNAV/LS7\_Projects/project name.rw5



# Feature and Benefits

Download link( From Google play store)

- LandStar7:<https://play.google.com/store/apps/details?id=com.huace.landstar&hl=zh-CN>
- LandStar7help:<https://play.google.com/store/apps/details?id=com.huace.landstarhelp&hl=zh-CN>



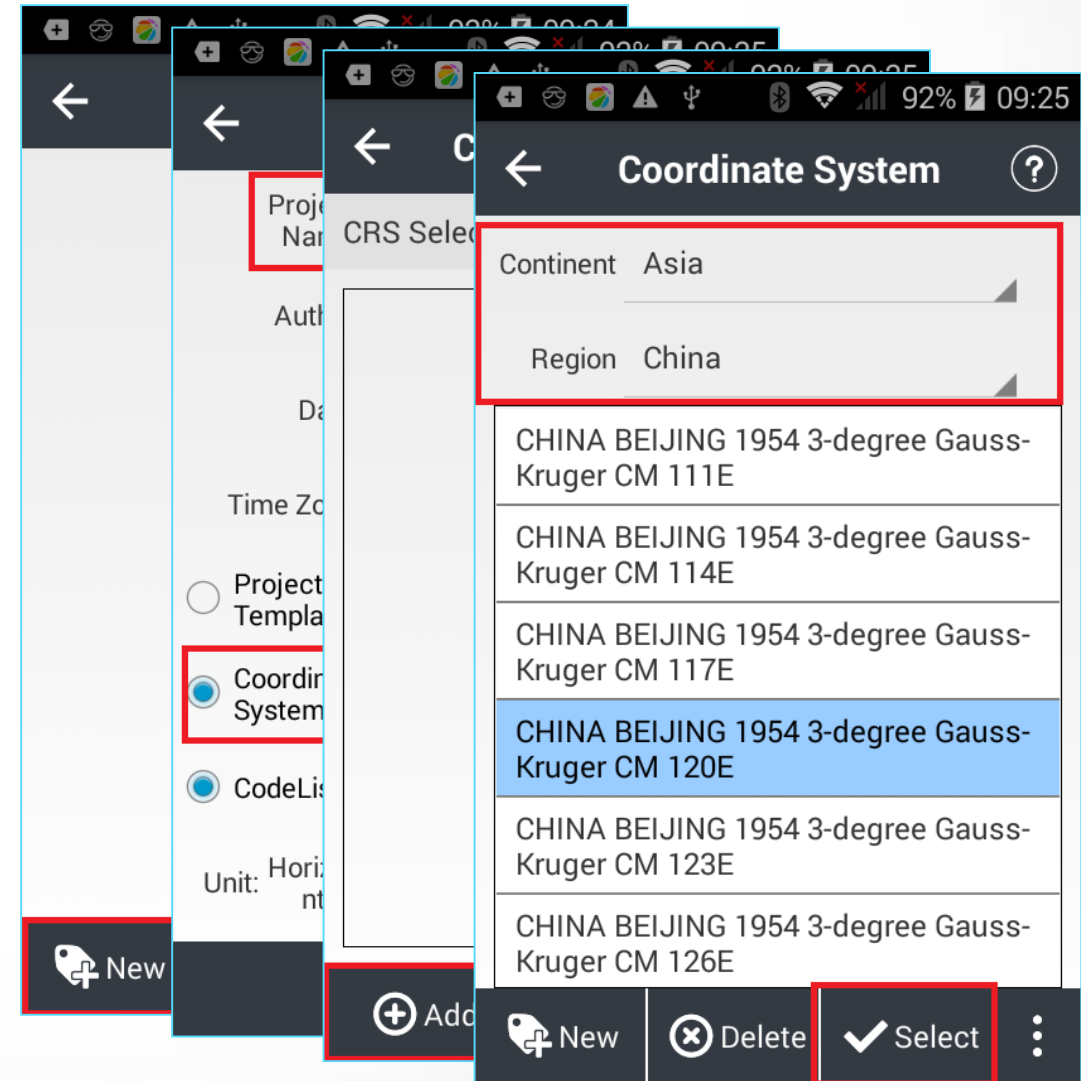
# RTK operation

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- DCI Mode
- Internal GSM Rover
- UHF Rover
- Internal UHF Base
- External Radio Base
- Check RTK status and map

# DCI Mode

- Create new project





# DCI Mode

- Create new project

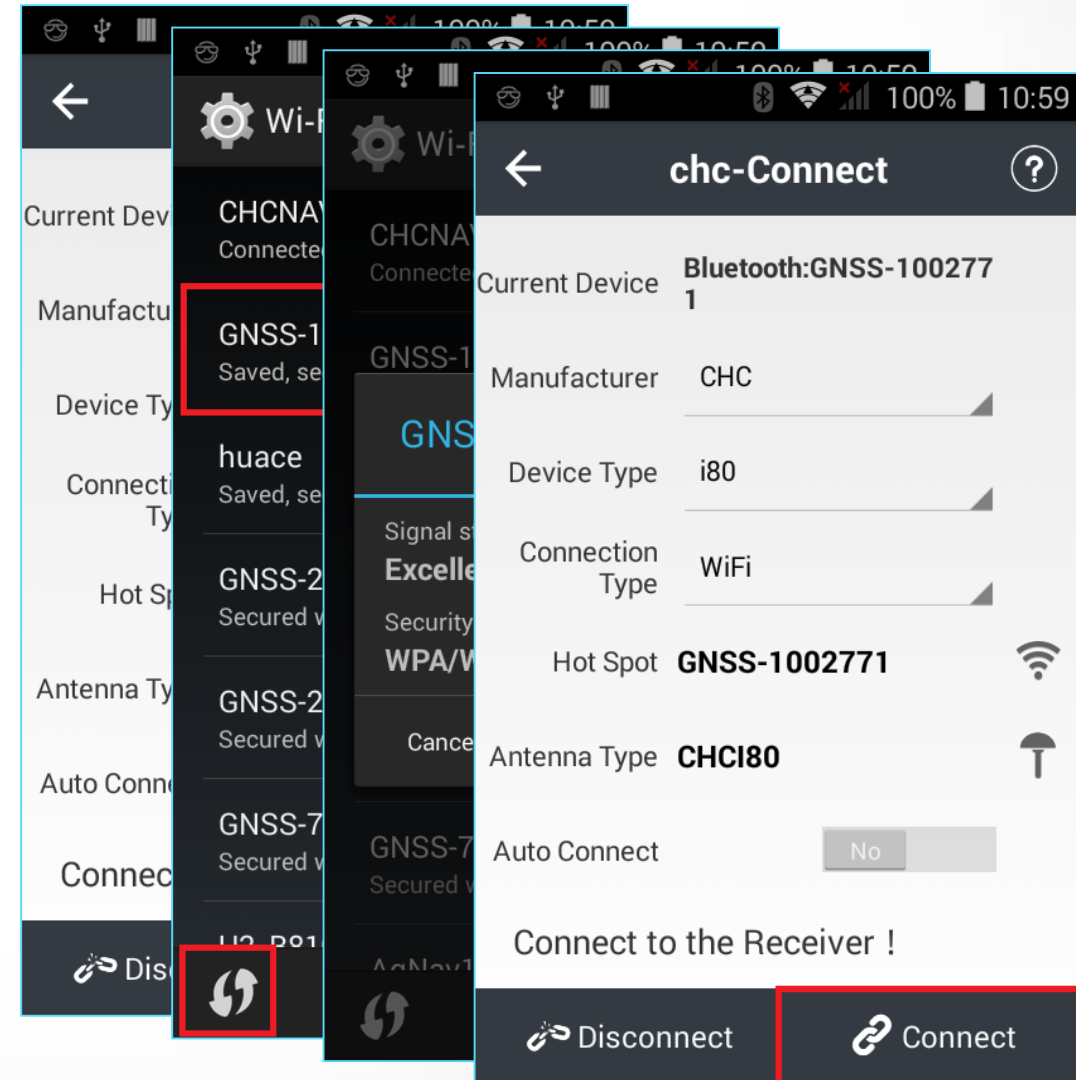
The screenshot shows the 'LandStar' application interface for creating a new project. The dialog box is titled 'LandStar' and contains the following fields and options:

- Project Name:** chc
- Author:** support
- Date:** 2016-07-27
- Time Zone:** UTC+08:00
- Project Template:** ...
- Coordinate System:** CHINA BEIJING 1954 3-degree
- CodeList:** TEMPLATE
- Unit:** Horizontal M, Vertical M

An 'OK' button is located at the bottom right of the dialog.

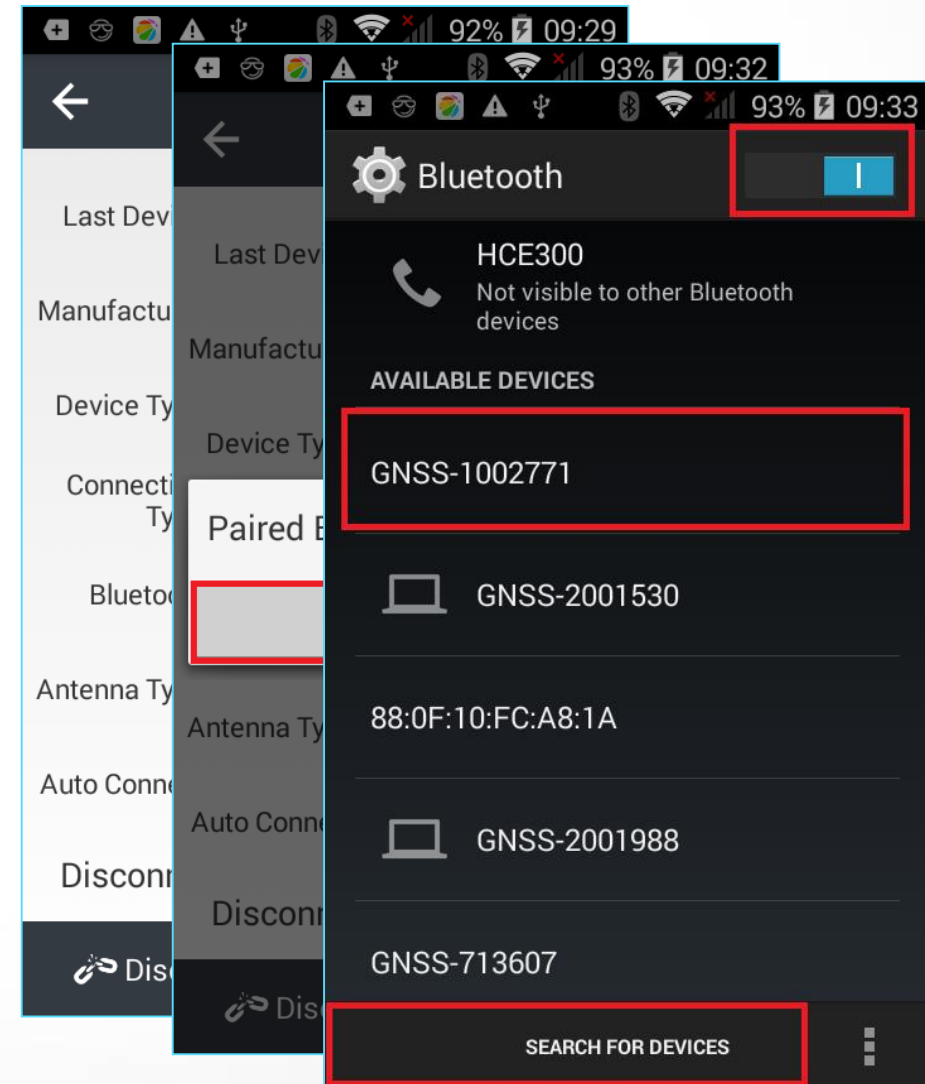
# DCI Mode

- Connect Data collector via Wifi



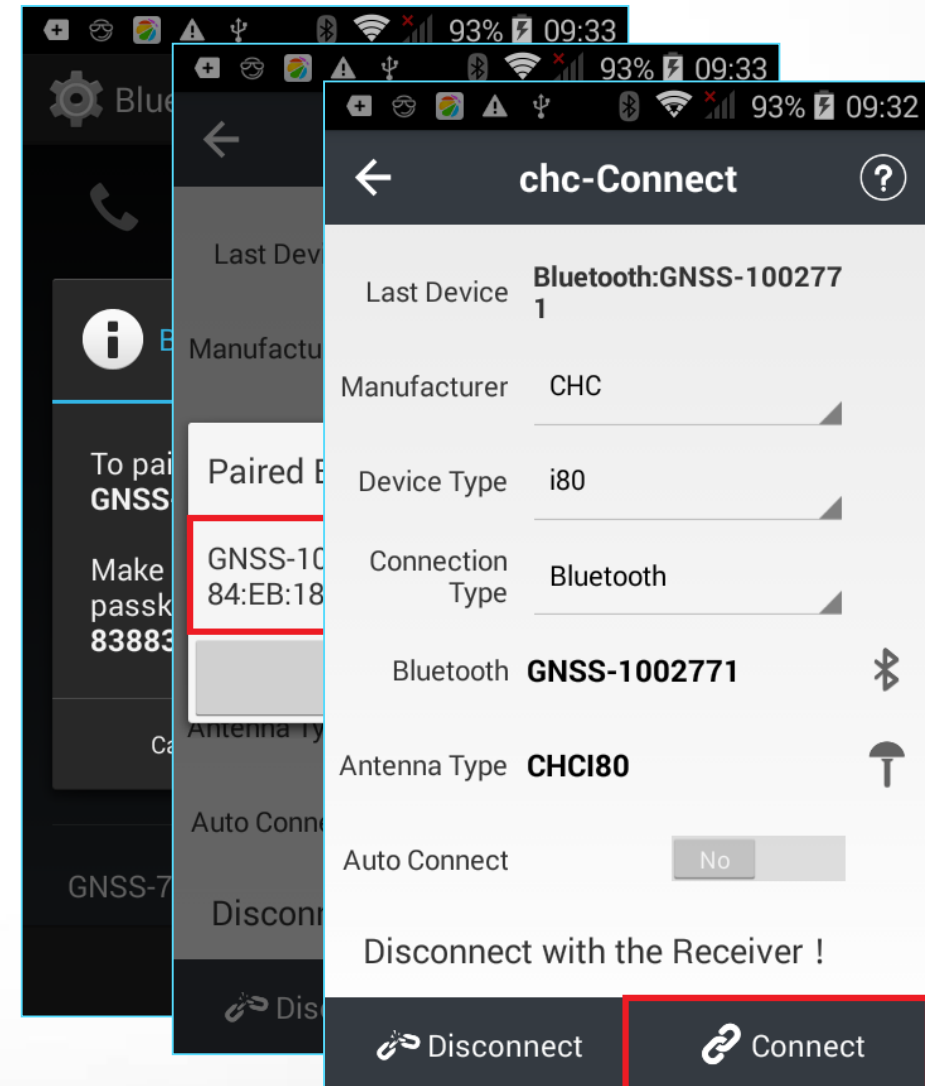
# DCI Mode

- Connect Data collector via Bluetooth



# DCI Mode

- Connect Data collector via Bluetooth



# DCI Mode

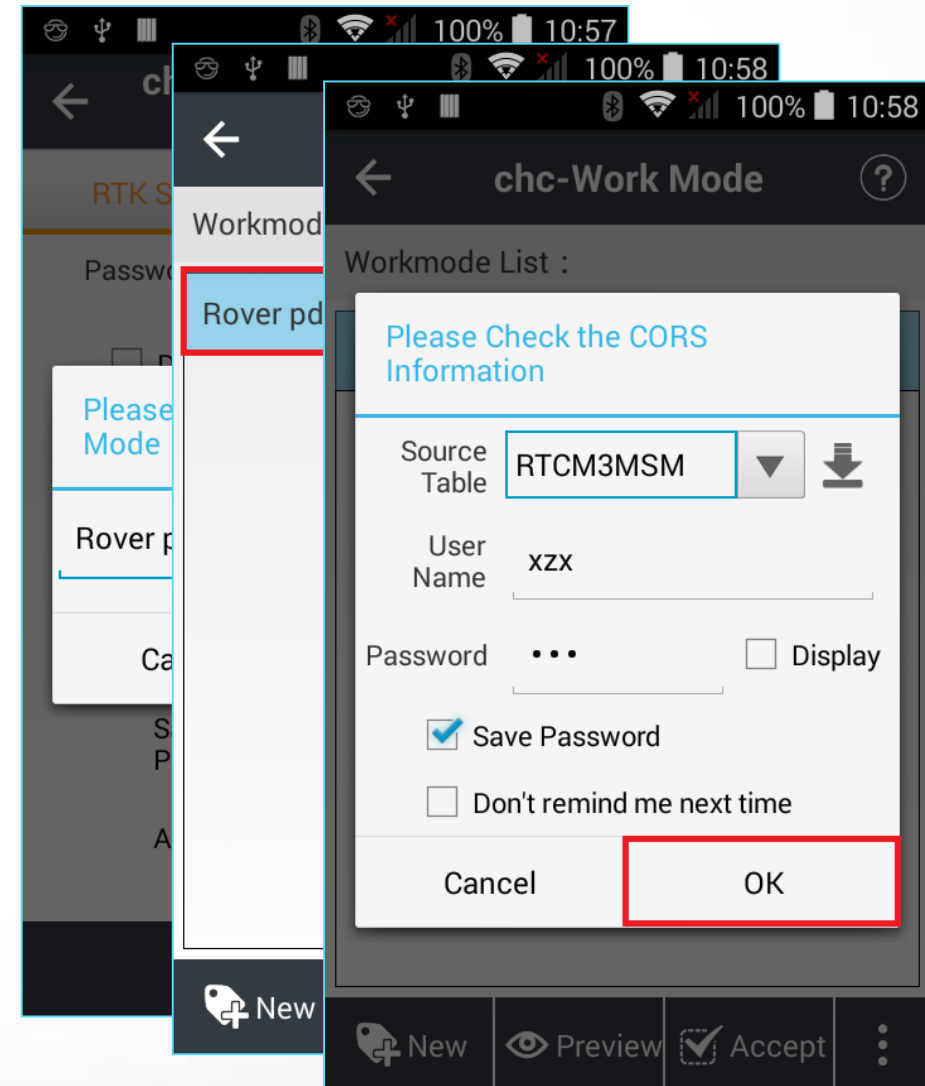
- Configure RTK PDA Network (DCI) mode

The screenshot displays the 'chc-Create New Work Mode' interface. The 'RTK Setting' tab is active, showing various configuration options. A red box highlights the 'Save' button at the bottom right of the screen.

| Setting          | Value       |
|------------------|-------------|
| Auto Login       | Yes         |
| Use VRS          | Yes         |
| Elevation Mask   | 10          |
| PDOP Limit       | 6           |
| RTK FREQ         | 1HZ         |
| Safe Mode        | Normal Mode |
| Ionosphere Model | No Disturb  |

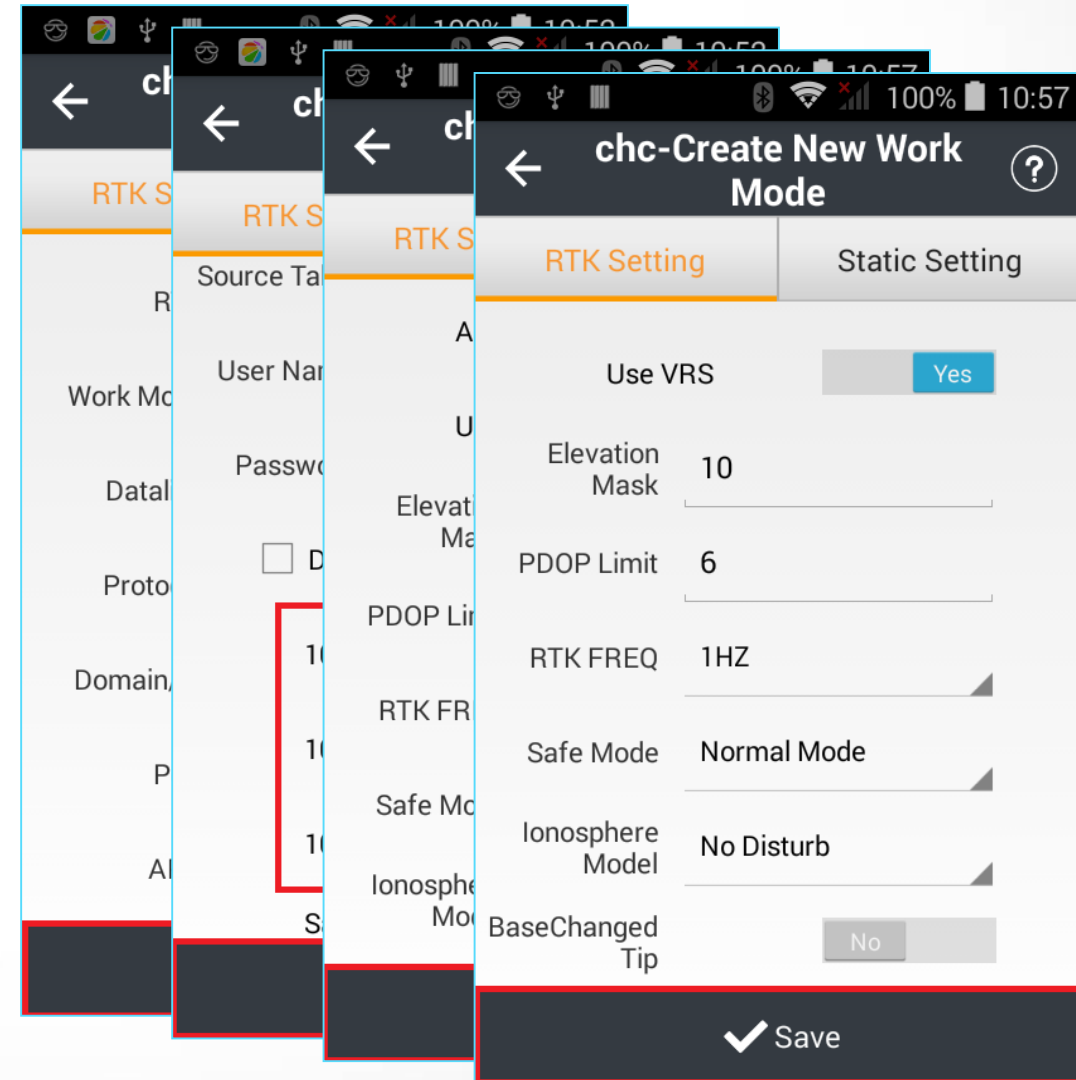
# DCI Mode

- Configure RTK PDA Network (DCI) mode



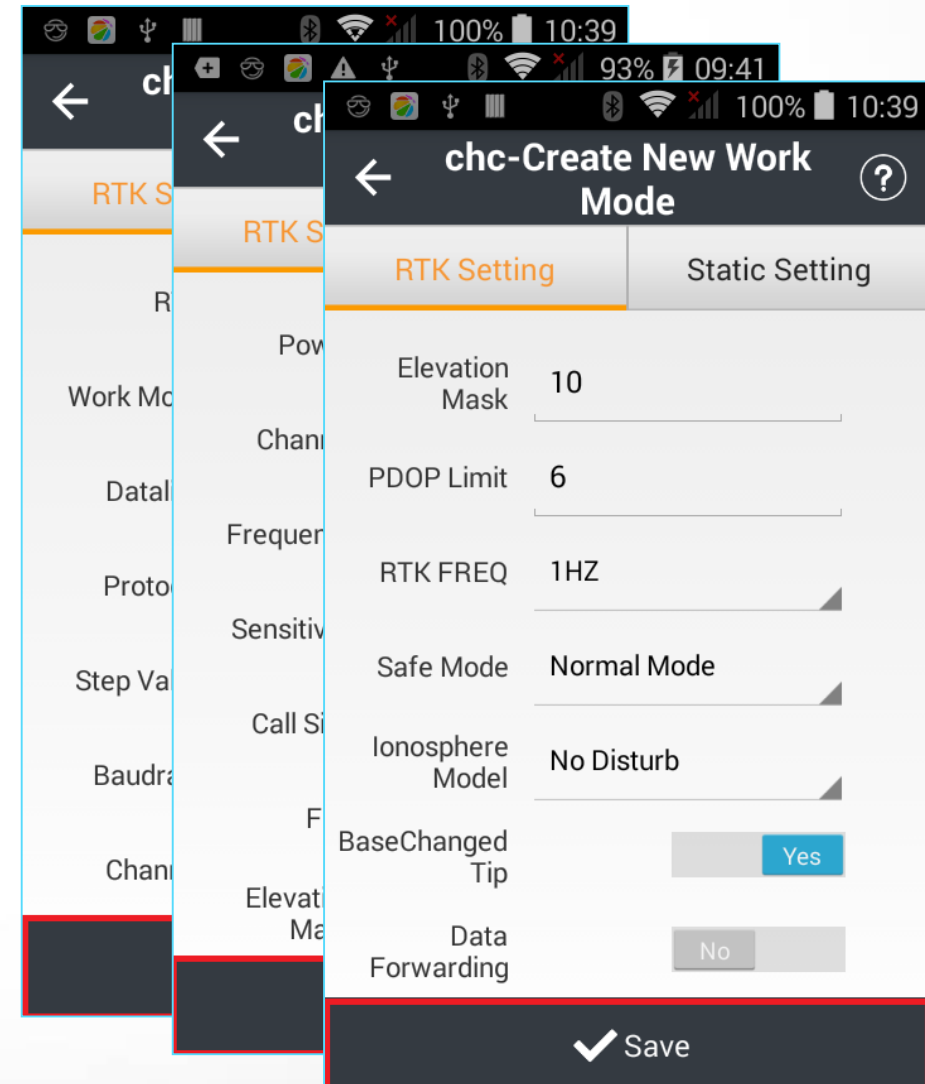
# Internal GSM Rover

- Create new project
- Bluetooth/WIFI connection
- Configure RTK Receiver Network (Internal GSM Rover) mode



# UHF Rover

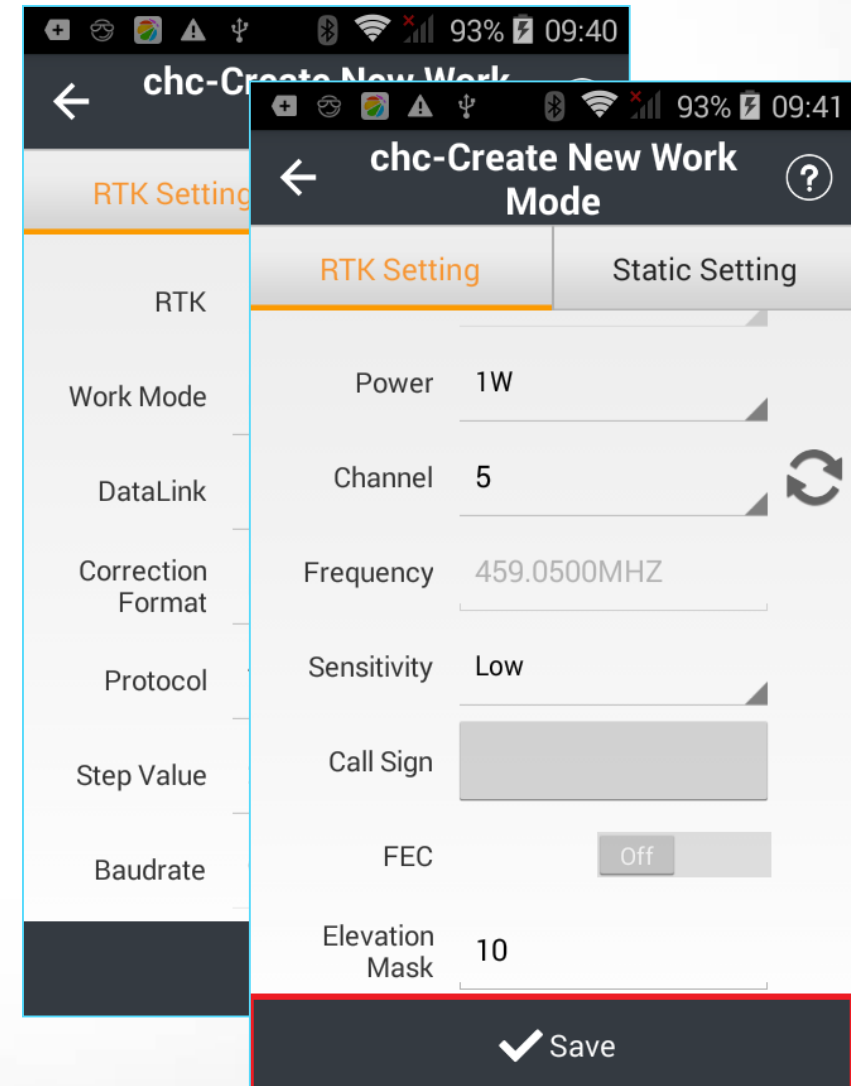
- Create new project
- Bluetooth/WIFI connection
- Configure RTK SATEL Radio (UHF Rover) mode





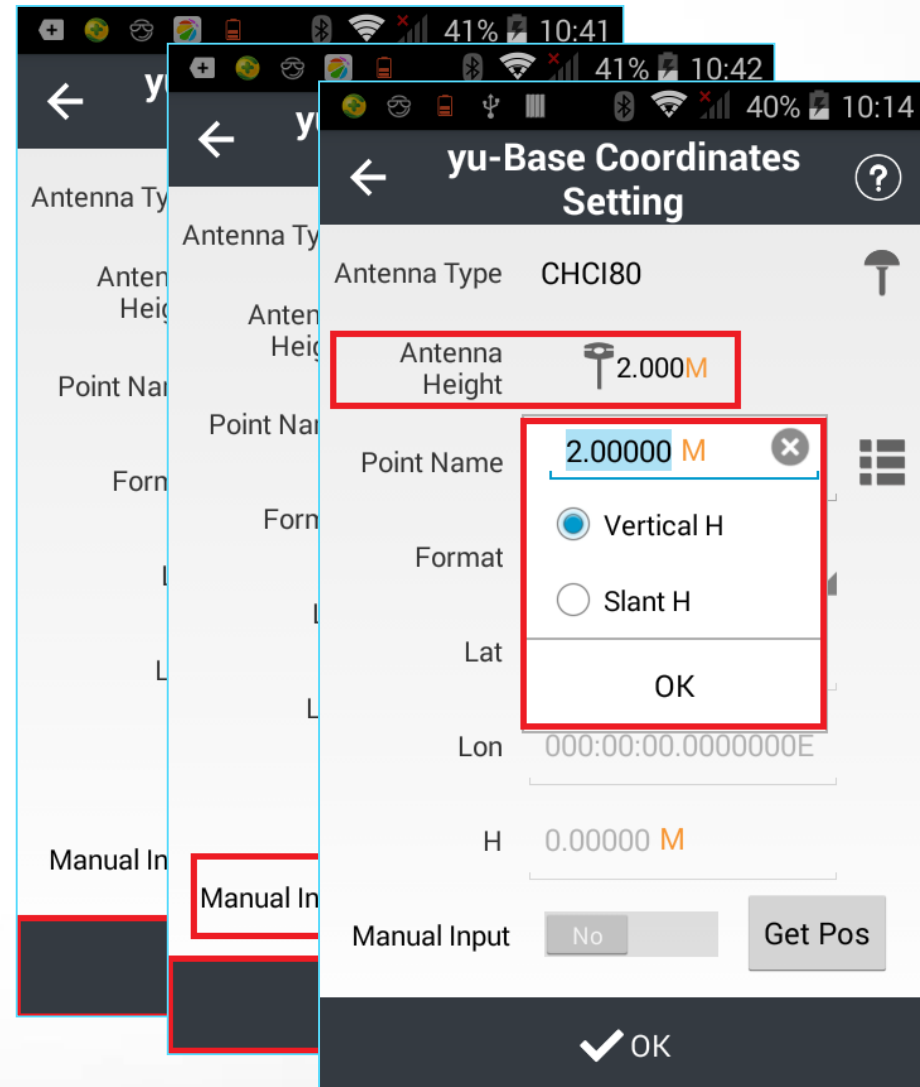
# Internal UHF Base

- Create new project
- Bluetooth/WIFI connection
- Configure RTK Internal SATEL Radio (Internal UHF Base) mode



# Internal UHF Base

- Create new project
- Bluetooth/WIFI connection
- Configure RTK Internal SATEL Radio (Internal UHF Base) mode
- Configure base coordinates



# External Radio Base

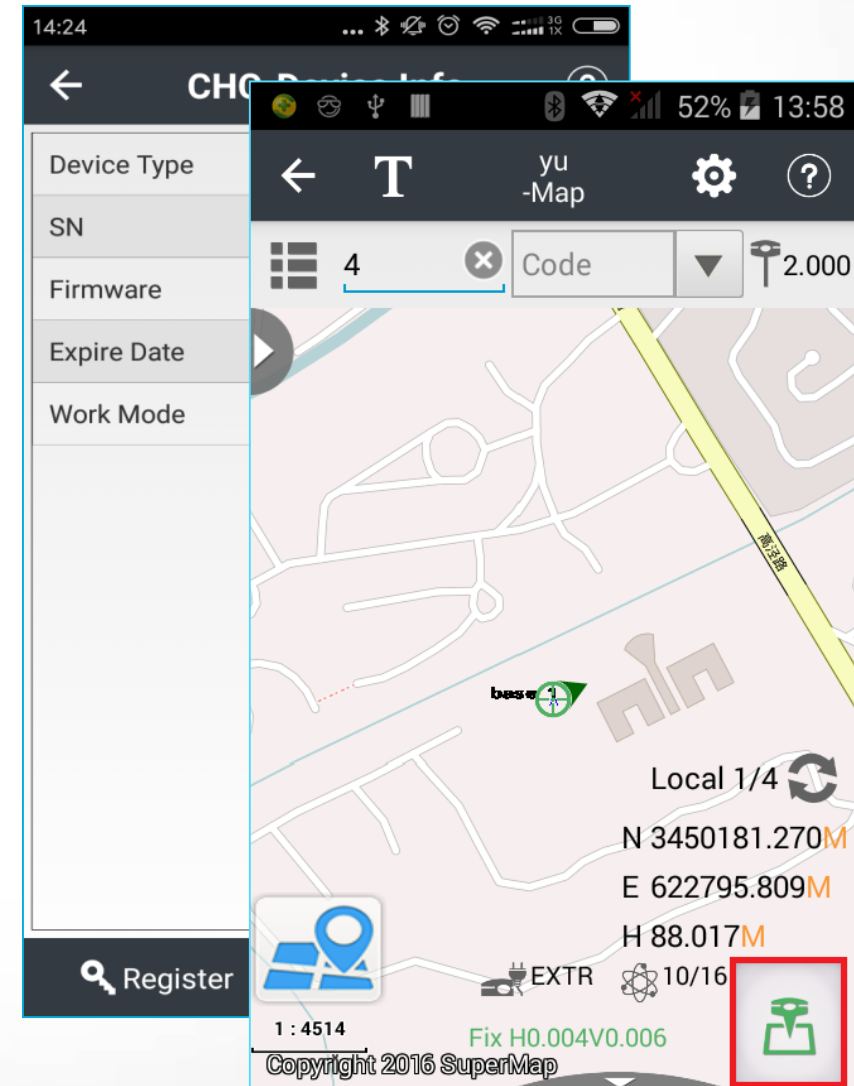
- Create new project
- Bluetooth/WIFI connection
- **Configure RTK External Radio (External Radio Base) mode**
- Configure base coordinates

The screenshot shows a mobile application interface for configuring a new work mode. The title bar at the top reads 'chc-Create New Work Mode' with a back arrow on the left and a help icon on the right. Below the title bar are two tabs: 'RTK Setting' (highlighted in orange) and 'Static Setting'. The 'RTK' toggle switch is turned on, with a 'Yes' button next to it. Below this, there are five settings, each with a label and a dropdown menu: 'Work Mode' is set to 'Manual Base', 'DataLink' is set to 'External Radio', 'Correction Format' is set to 'RTCM3.2', 'Baudrate' is set to '9600', and 'Elevation Mask' is set to '10'. At the bottom of the screen is a dark grey bar with a white checkmark icon and the text 'Save'.

| Setting           | Value          |
|-------------------|----------------|
| RTK               | Yes            |
| Work Mode         | Manual Base    |
| DataLink          | External Radio |
| Correction Format | RTCM3.2        |
| Baudrate          | 9600           |
| Elevation Mask    | 10             |

# Check RTK status and map

- Create new project
- Bluetooth connection
- Configure RTK mode
- Configure base coordinates
- Check RTK status and map





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