V100 GNSS RTK
System Getting Started

Manual Revision

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Preface

Introduction

Welcome to use Hi-target V100 receiver, this introduction is applicable to Hi-Target V100 products. The introduction describes how to install, set and use V100 products.

Experience Requirement

In order to help you use Hi-Target series products better, Hi-Target suggests you carefully reading the instruction. If you are unfamiliar with V100 products, please refer to www.hi-target.com.cn

Tips for safe use

Notice: The contents here generally are special operations, needing your special attention. Please read the contents carefully.

Warning: The contents here generally are very important. Such wrong operation may make the machine damaged, make the data lost, even breaks down the system and endangers personal safety.

Exclusions

Before using the products, please carefully read the operating instruction, and it will help you better use the product. Hi-Target Surveying Instrument Co., Ltd will not assume the responsibilities if you fail to operate the product according to the requirements in operating instruction, or operate the product wrongly because of failing to understand the operating instruction.

Hi-Target is committed to constantly perfect product functions and performance, improve service quality and reserve the rights to change the contents in operating instruction without separate notice.

We have checked the consistency between contents in instruction and software & hardware, without eliminating the possibility of deviation. The pictures in operating instruction are only used for reference. In case of inconformity with products, the products shall prevail.

Technology and Service

If you have any technical issues, you can call Hi-Target technology department for help, we will answer your question in time.

Relevant Information

You can get this introduction in the following ways:

1. After purchasing hi-target V100 receiver, there will be “V100 GNSS RTK System User Manual” in the instrument container to guide you how to operate instrument.

2. Log in hi-target official website, download the electronic version introduction in “Download Center” → “Manual” → “Surveying Products”

Advice

If you have any advice or suggestion on V100, please call us or Dial the national hotline: +86 400-678-6690. Your feedback information will improve the production quality.

Content

Preface ..... **III**

Content ..... **VI**

Product Introduction **1**

1.1. **Hardware structure** 2
1.2. **Power supply system** 4
1.3. **Button operation** 8
1.4. **LED** 9
1.5. **Handheld controller iHand20** 11

Technical parameters **19**

Work Modes Introduction **24**

3.1. Static Mode 25
3.1.1. Static data collection 25
3.1.2. Static data storage and download 27
3.2. Network Rover Mode 29
3.2.1. Project setting 29
3.2.2. Data collection 43
3.2.3. Stake out 48
3.2.4. Data Export 53
3.2.5. Auto-backup and quickly recover 54
3.3. Base Mode with External Radio 56

Trouble Shooting **58**

4.1. Registration procedure 59
4.2. Firmware upgrade 61
4.3. Reset operation 62

Schedule1 factory default parameters **63**

Schedule2 Key accessories information **64**

CHAPTER

1

Product Introduction

This chapter describes:

- Hardware structure
- Power supply system
- Button operation
- LED
- Handheld controller iHand20

1.1. Hardware structure

The product appearance is divided into three parts, upper cover, bottom cover and control panel.

Figure 1-1-1

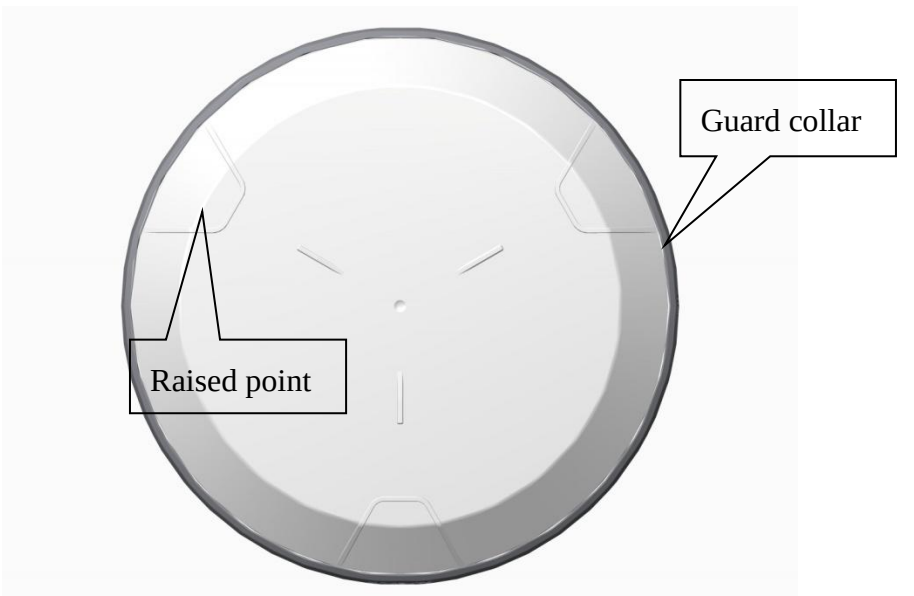


Figure 1-1-2

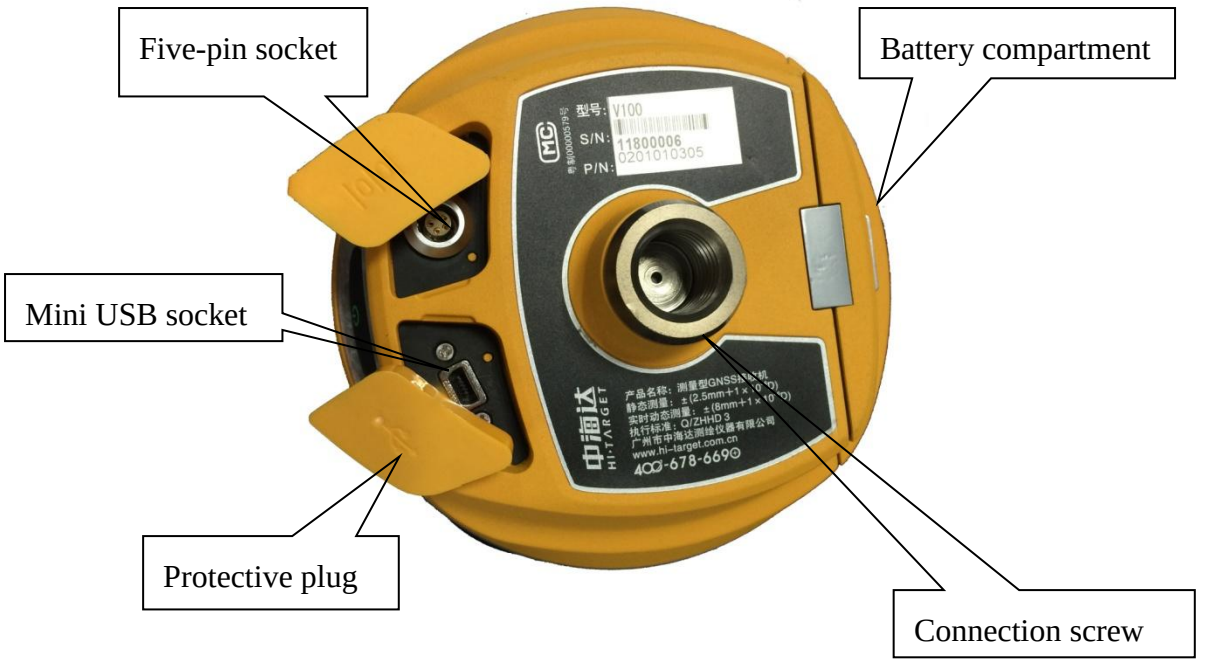


Figure 1-1-3

- Connection screw: for the instrument fixed to the base or the pole.
- Battery compartment: for housing lithium battery.
- Five-pin socket: for external data linking and external power supply.
- Mini USB socket: for connection to the host and external devices, upgrade firmware and download the static data, can also charge or supply electricity to the host.
- Protective plug: for dustproof and waterproof.

Notice: If it is unnecessary to use five-pin socket, and USB interface, please cover the rubber plug to prevent dust.

1.2. Power supply system

Battery, adapter type

Name	type
lithium battery	BLP-6300S
Power adapter	PSAI10R-050Q

Lithium battery

Figure 1-2-1

Adapter

Figure 1-2-2

Recharge

V100 lithium battery should be charged by PSAI10R-050Q adapter, about 7 hours of charging time.

Warning:

1. Only the battery and charger configured by the manufacturer can be used; the battery must not be thrown into fire or used in metal short circuit electrode.

2. Stop using when the battery is heating, deformation, liquid leakage, smelling or other abnormal reactions, please exchange new battery.

3. Stop using when the battery's working time has been Significantly reduced, the battery is aged, please exchange new battery.

Battery installation and removal

(1) Push up the battery cover button, open battery cover.

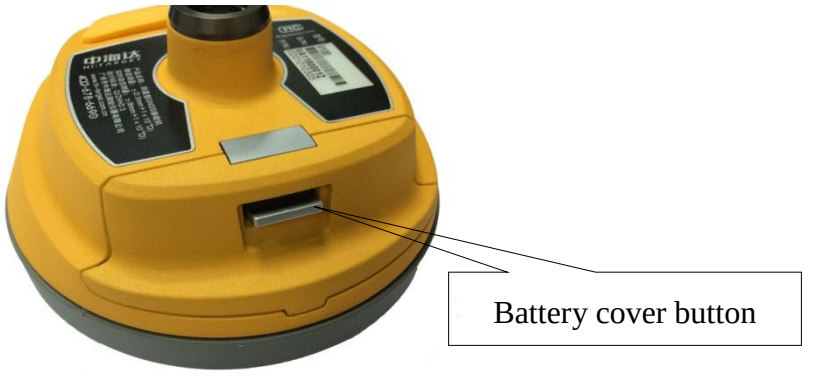


Figure 1-2-3

(2) Align battery pole with battery compartment pole, push the battery to the end and the mental button will upspring.

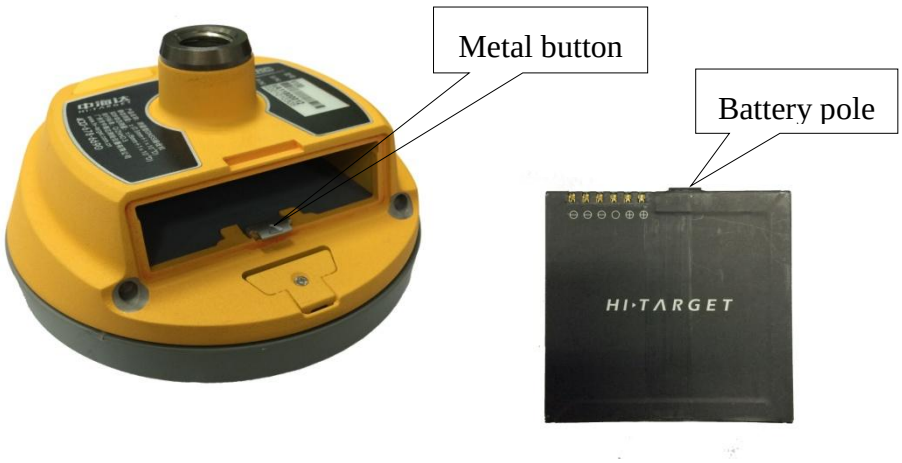


Figure 1-2-4

Figure 1-2-5

(3) Close the battery cover.

Removal

Push up the battery cover button to open it, then press the metal button and remove battery.

Power supply

Power supply mode

Power supply	Power supply mode	Internal：lithium battery External：USB, Five-pin socket
	External power supply request	USB socket：DC power 4.2-5.5V/1.5A Five-pin socket：DC power 6-28V/1A

When external power supply, the host will automatically detect the voltage of lithium battery and external power supply, and choose the higher voltage power. As for external power supply, it shall use the special power specified by Hi-Target.

Notice:

1. The service time of lithium battery will decrease along with the decrease in temperature and charging-discharging times increasing. A new 6300mAh lithium battery can be used for 7 hours of static data collection or rove work.
2. Please charge the battery within 24 hours after using up, to extend the service life of battery, or the battery performance will be damaged.
3. If the battery won't be used for long times, please charge once every month to extend the service life of battery.

1.3. Button operation

Most settings and operations of receiver are completed using a button on control panel.

Figure 1-3-1

Description of power button operation

Operation name	Description
On	Shutdown status, long press the button one second to boot, all lights are on
Off	Boot status, long press the button three seconds, all lights double fast flash, release the button
Automatic setting station	Shutdown status, long press the button six seconds, all lights double fast flash, release the button, the instrument will automatically set the base station
Operating mode switching	Double-click the button to switch working mode, double-click each time to switch between static and RTK mode
Status inquiry	Click power button, power LED flashing times displays power
Reset motherboard	Boot status, long press the button more than 6 seconds, all lights flash at the same time, release the button, it will reset motherboard

1.4. LED

In different setting mode, it displays the different LED status.

Figure 1-4-1

LED Function Description

LED	Meaning	
Power LED (Green)	Long-term lighting	Full battery
Power LED (Yellow)	Long-term lighting	Full battery voltage: internal battery≥3.9V（100% power）
Power LED (Red)	Long-term lighting	Normal voltage: 6% <internal battery power ≤99%
	Slow flash	Low voltage: internal battery≤5%
	Fast flash	Power indication: 1-4 flash per minute under the direction of electricity 1：0%~25% 2：25%~50% 3：50%~75% 4：75%~100%
Network LED (Green)	Off	Static mode
	Long-term lighting	RTK mode

Network LED (Red)	Slow flash	1. RTK mode: flash as difference data interval 2. Static mode: flash as sampling interval
	Fast flash	Static mode, storage space<10MB
Satellite LED (Green)	Long-term lighting	Satellite lock
	Slow flash	satellites are lost
Three LEDs	Fast flash	Satellite LED, Network LED, Power LED all fast flash at the same time, when release power button, the motherboard will be reset.

1.5. Handheld controller iHand20

Front of handheld controller

The front of iHand20 handheld controller includes touch screen, keyboard and microphone

Figure 1-5-1

- Touch screen: Multipoint capacitive touch screen with touch pen, which supports Chinese and English input.
- Keyboard: Photograph, direction control, switch between Chinese and English, data collection, volume control, power on, power off and other functions.

- Microphone: Internal microphone can be used for field collection of voice message.

Reverse side of handheld controller

There are camera, battery cover, belt, trumpet, etc. on the reverse side of iHand20 handheld controller.

Figure 1-5-2

- Camera: Used for field collection of image information.
- Battery cover: Internal removable lithium battery

- Belt: Connect the belt to prevent sliding down.
- Speaker: Conduct real-time voice broadcast for the instrument operation and status.

Side of handheld controller

Figure 1-5-3

- Mini USB: Used for connecting USB data line and iHand20 handheld controller.
- Audio port: Used for connecting headphone cable and iHand20 handheld controller.

Warnings:	In case of not using audio port or Mini USB, please close the rubber cover so as to be waterproof and dustproof.

Handheld controller accessories

Charger

Figure 1-5-4

Battery (Lithium battery: 3.7V /6300mAh)

Figure 1-5-5

Data line

Figure 1-5-6

Connect to the USB port of computer, and used for download of data Connect to the USB port of charger and used for charging

handheld controller

Touch pen

Figure 1-5-7

In case of using touch pen to operate the handheld controller, it is required to start the function of "handwriting pen", and open the handheld controller's [system setting] → [auxiliary function] → check [handwriting pen]

Operation of handheld controller

Keyboard

Most settings and operations of Hi-Target iHand20 handheld controller can be completed by the touch pen, and commonly used operations can be completed by Keyboard. Appearance and functions of Keyboard are introduced briefly as follows.

Figure 1-5-8

Keyboard include: Back, OK, Power, APP, Fn, Collect, Camera, etc. on button board of iHand20.

Back: Delete or exit the operation of current window.

OK: Confirmation.

Power: Press it for above 3s for power on/ power off. Under the power on status, press power button for 1s to turn off / turn on the screen backlight.

APP: Quick start of Hi-Survey software, press button APP for a long time for the Road popup, then select "Hi-Survey Road" and click [Ok]. And the software selected this time can be started quickly only by pressing button APP next time.

Cautions: When installing Hi-Survey Road for the first time, it is necessary to press button APP for 3s for software quick start selection settings. Otherwise, corresponding software cannot be started quickly by only pressing button APP.

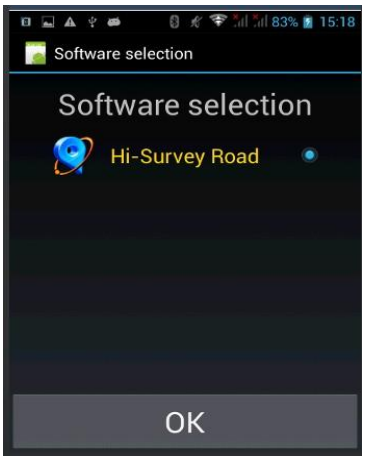


Figure 1-5-9

Fn button: Press Fn button for 3s and popup interface of software switching so as to achieve fast switch of input method. In case of [physical button input method], only press Fn button to switch over input methods of Chinese Pinyin ,strokes, digitals and letters under input status.

Collect button: Collect data by manual operation.

Camera button: Press it for a short time to enter into photograph interface; Press it for 3s on the non-camera interface to start up/shut down flashlight function.

Screenshot: Press "VOL-" and power button simultaneously for 3s, screen capture will be kept in the file of "Mobile phone storage→ Pictures→ Screenshots".

Cautions: 1. When the iHand20 handheld controller is not used in the work, please turn off the backlight for saving electric quantity and prolonging the working time.

2. Only the image collection interface supports the shortcuts operation. In order to avoid the input conflict of input box, the

text interface does not support shortcuts operation.

(1) Average collection shortcut is Button "7";

(2) Indirect measurement shortcut is Button "8".

Data download

1. Connect handheld controller to computer by USB data line, and pull down the notice column and click USB computer connection [open USB storage].

2. If it is required to synchronously operate handheld controller or install and use third-party software to debug data on the computer, "USB debugging" function shall be ticked. Turn on the handheld controller, and click [System Settings] → [Developer options] → [USB debugging] on the desktop menu.

3. In the popup debugging window, click [OK] to complete the connection between handheld controller and computer.

4. In the computer, file operations between handheld controller and computer can be conducted by [Portable Devices].

CHAPTER

2

Technical parameters

GNSS configuration

Table 1 GNSS configuration

System core	International first-class PCC new efficient intelligent real-time core
Channel	220
BDS	B1, B2
GPS	L1 C/A, L2E, L2C, L5
GLONASS	L1 C/A, L1 P, L2 C/A（Limited GLONASS M and L2P）
GALILEO	Upgrade reserve
Output format	ASCⅡ： NMEA-0183 and binary : Trimble GSOF
Difference support	sCMRx, CMR, CMR+, RTCM2.1/2.2/2.3/3.0/3.2
RTK positioning accuracy	Plane： ±(8mm＋1×10^{-6}D) Height： ±(15 mm＋1×10^{-6}D)
Static, rapid static accuracy	Plane： ±(2.5 mm＋1×10-6D) Height： ±(5 mm＋1×10-6D) Code difference：0.4m SBAS difference：1.2m
Initialization time	Typical 8s
Initialization reliability	>99.9%
Data update rate	<20Hz

System configuration

- Operation system：intelligent real-time system
- Boot time: 1s
- Data storage：built-in 8GB storage

Built-in communication

- NFC near field communication
- Dual mode Bluetooth communication

Control panel

- Panel: one button
- Indicator：three bi-color LED lights

External interface

- 1 USB socket
- 1 five-pin socket

Electric characteristics

- Battery: high capacity lithium 6300mAh/3.7V, removable, continuously operating time reaches above 7 hours
- Voltage: USB interface: DC 4.2-5.5V/1.5A; five-pin interface: DC6-28V/1A
- Power consumption: 3.2W

Physical characteristics

- Core control chip CotexA8, built-in 16GB Flash memory
- Size: 127.5mm×57mm
- Weight: ≤700g (including battery)
- Material: magnesium alloy

Environment characteristics

- Protection class： IP67; protect 2m temporary soaking underwater, completely prevent dust
- Shock-proof: Anti 2 m natural fall
- Working temperature: -40 ℃ ~ 65℃
- Storage temperature: -40℃～75℃
- Relative humidity: 100%, anti-condensation

Private cloud service

The cloud service supports for 24 hours, realizes integrated technique of indoor work and field work, remote manage serve and support equipment. It manages team project, shares parameters and control points, post backs real-time verify and note track of result data by cloud background. After the user's authorization, terminal servers can remotely provide customers with technical support, including system version upgrading, system registration, remote debugging and other services.

Environmental Requirements

The receiver shall operate in dry working environment regardless

of waterproof materials. In order to advance the stability and service cycle of receiver, the receiver shall be prevented from extreme environment, such as:

- Moisture
- Temperatures above 65 degrees centigrade
- Below - 40 degrees centigrade
- Corrosive liquids or gases

Electronic Jamming

The receiver shall not be installed in the place near to strong electric power and interference signal, such as:

- Oil duct (spark plugs)
- Television and computer display
- Generator
- Battery-operated motor cycle
- DC-AC power supply changeover equipment
- Fluorescent lamp
- Power supple

CHAPTER

3

Work Modes Introduction

This chapter describes:

- Static Mode
- Network Rover Mode
- Base Mode with External Radio

3.1. Static Mode

3.1.1. Static data collection

V100 GNSS Receiver can collect static data. Relative operations are as below.

1. Set up receiver on a control point, centering and leveling strictly.

2. Measure the height of receiver for three times, on condition that the difference of each measuring is less than 3mm and the final height of the receiver should be the average height. Below is the schematic.

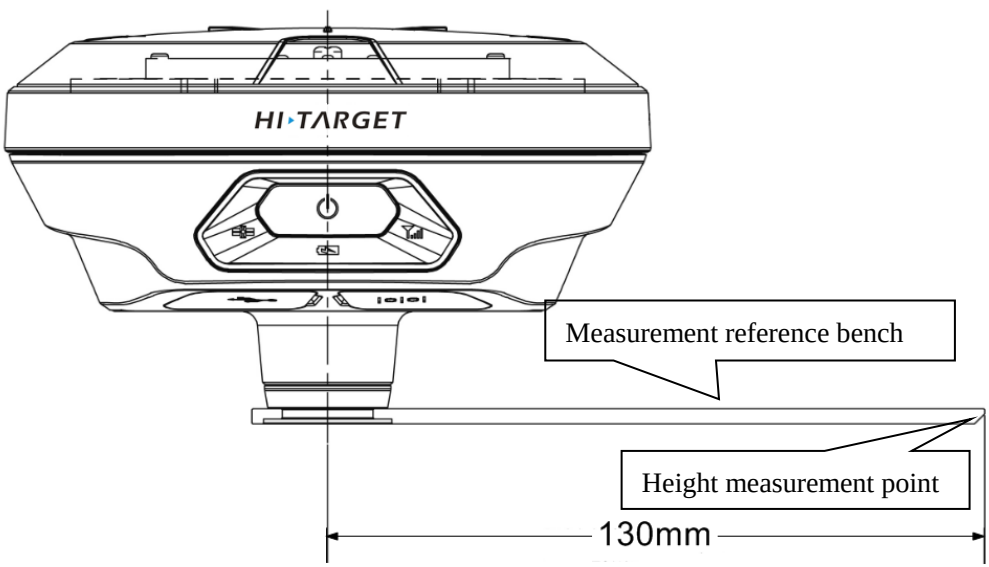


Figure 3-1

Notice:
1). Instrument height should be measured from control point to the height measurement point of the measurement reference bench.
2). The measurement reference bench radius is 0.130 meter.

3. Record point name, receiver S/N, receiver height, beginning time.

4. Press power button to power on and double click power button to set static collecting mode.

Notice:
The satellite LED flashing means the receiver is searching the satellites. The satellites are fixed once the satellite LED stays light on. Network LED flashes due to your collection interval set, which means an epoch will be collected every flash.

5. Turn off the receiver after static data collected and record the turn off time.

6. Download and post-process static data.

Caution：
1) Don't move the tri-branch or change the collecting set while the receiver is collecting data.
2) V100 GNSS receiver doesn't support recording Rinex format data.

3.1.2. Static data storage and download

Collected GNSS static data is stored in "static" disk that 8GB internal storage of V100 receiver, effective storage space is 6.6GB, includes two folders: log and gnss, log folder stores log information, the data format storage in gnss folder is * .gns. You can connect the receiver to computer through USB data cable, copy static data to your computer like using a U disk.

Figure 3-2

Notice:

When the receiver storage space is less than 10MB, data light (red) fast flash, and it stop recording data, the existing data files will not be overwritten.

The receiver can download data like U disk , it need Mini USB data cable, one end of Mini USB data cable is connected to computer USB port and the other end is connected to Mini USB port of receiver. It will appear “static” disk after being connected, then

open the disk, copy the collected static files to computer's hard disk.

Figure 3-3

The steps of modify point name and antenna height of downloaded static file are:

1. Choose *. GNS files and double click the mouse.

2. Modify point name and input antenna height in the popping up dialogue of "file edit", and then click "OK".

Figure 3-4

Caution:

It only supports copy procedure when connected to computer. Deleting static files and formatting disk can be only operated by handheld software.

3.2. Network Rover Mode

Pair with the powerful surveying software ***Hi-Survey***, the intelligent V100 GNSS receiver will turn into a portable network rover.

The main operating procedures in brief:

- Project setting
- Data collecting
- Staking out
- Data exporting

3.2.1. Project setting

- ✧ New project
- ✧ Project settings
- ✧ Device connecting
- ✧ Rove setting

1. New project

After new project is built before the measurement, the collected data

will be saved in the project. When building new project, relevant setting needs to be conducted, for example, setting of project information, and coordinate system, etc...

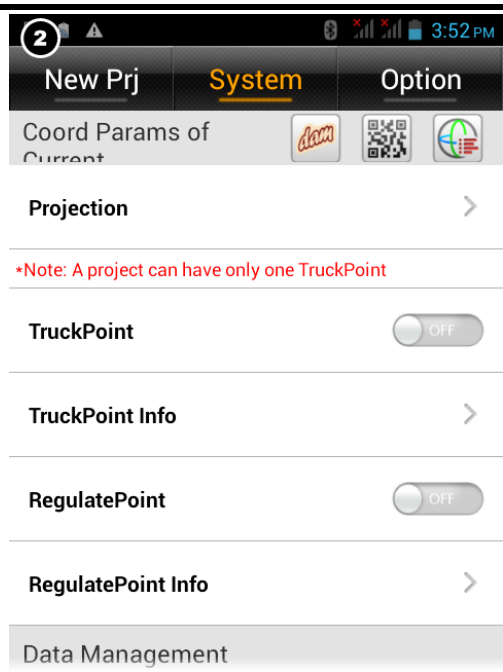
	
1. New project can be built and the existing project can be opened or deleted.	2.Input project name (Note: The name of new project shall not be the same as the name of old projects)

2. Project settings

Project settings include coordinate system and other parameters settings.

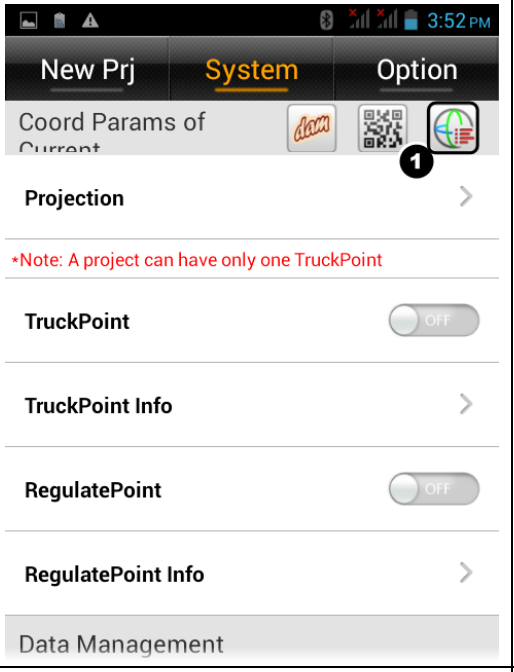
For measurement, coordinate system must be configured, because it is related to the accuracy of coordinate. There are two methods to set the coordinate system.

1. Click Project Settings： Including settings of project and coordinate system information.

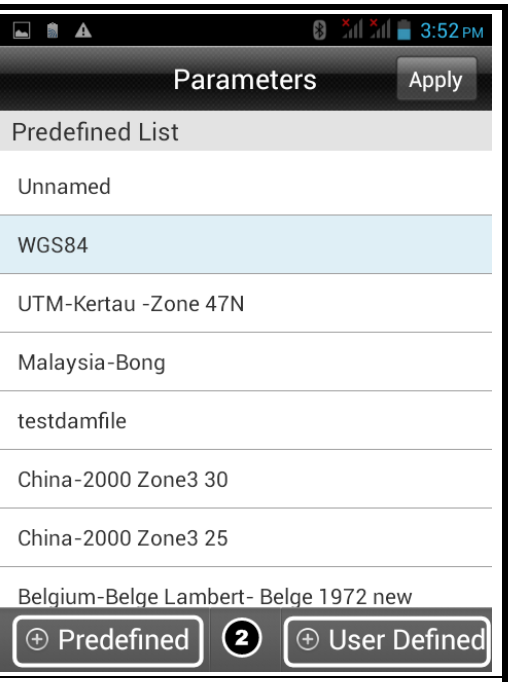


2. Settings interface.

(1) Build a coordinate system



1. Click ① to enter into the setting interface.

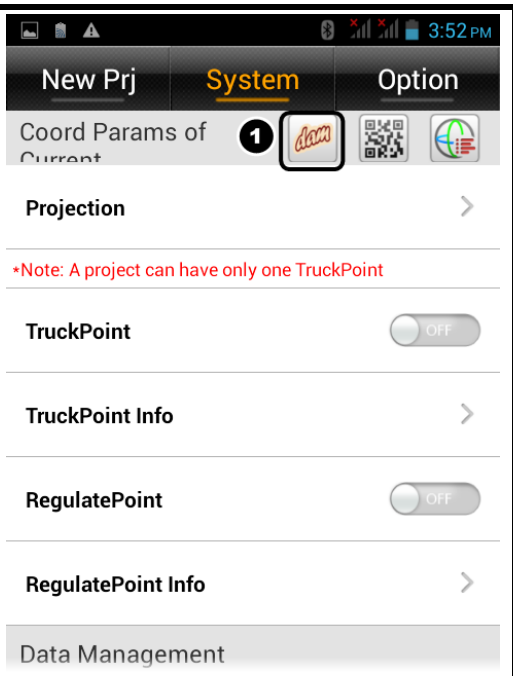


2. Select a coordinate system from "*Predefined*" or build by *User Defined*

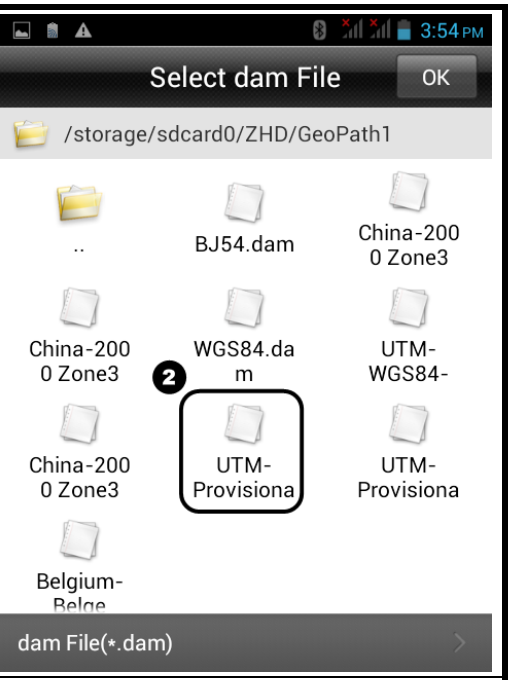
Notice:

Any question about "User Defined" pleases contact technical support

(2) Add existing coordinate system files



1. Click ① to add an existing datum system file.



2. Select a datum system file be imported before

Notice:

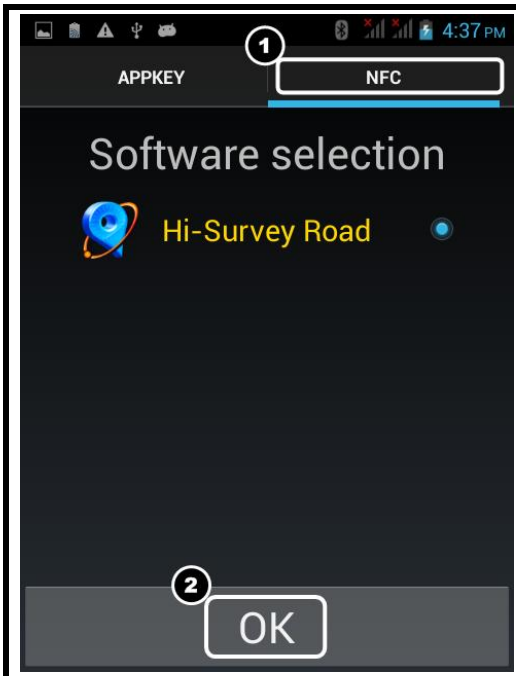
The .dam file can be built with *HGO post processing software* or be output by *User Defined*. Copy it to the "Geopath" folder, then it can be loaded by software.

3. Device connecting

NFC (Near Field Communication)*

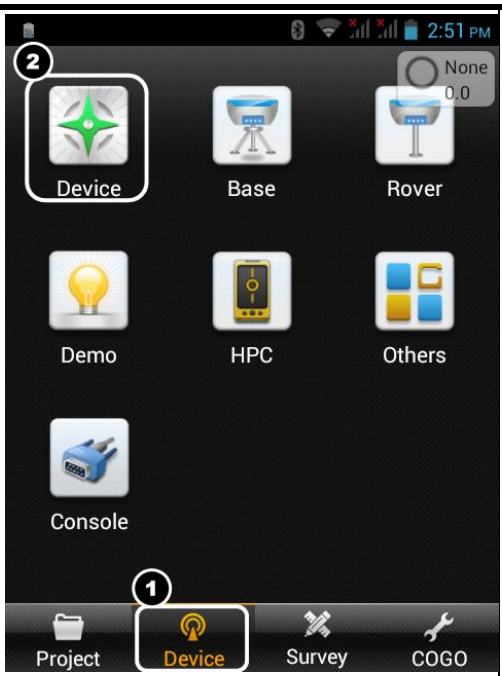
NFC is used to quickly establish Bluetooth connection. On condition that the handheld controller or smart phone supports NFC function.

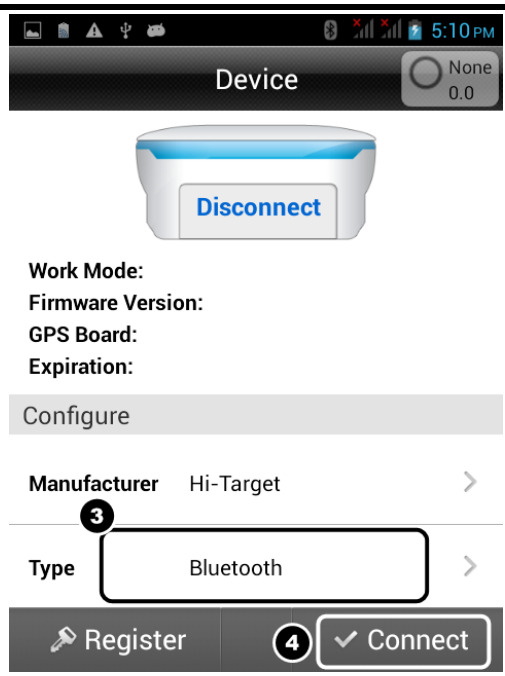
The application of NFC, combined with new intelligent handheld, a light touch will realize automatically connecting to receiver and run the software through Bluetooth. Compared to the past complicated connection process, V100 GNSS receiver is more convenient and efficient.

	
1. Long press "APP" button on keyboard. Press NFC; select "*Hi-Survey Road*". 2. Press "OK".	3. Take ihand20 NFC response area close to receiver's NFC response area.

Bluetooth connection

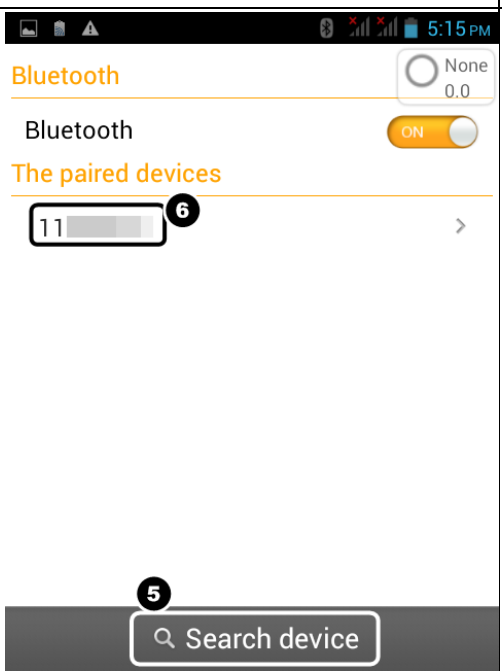
The receiver can also be connected by Bluetooth manually.

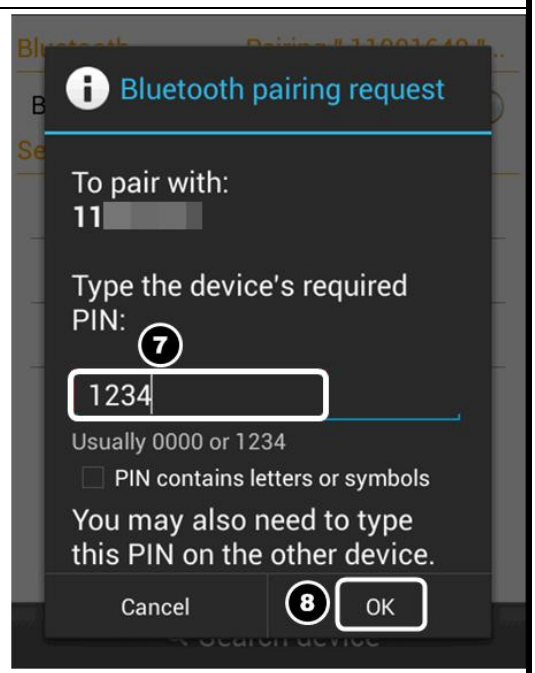




1. Slip to *Device* tab.
2. Press *Device*

3. Select *Bluetooth*.
4. Press *Connect*

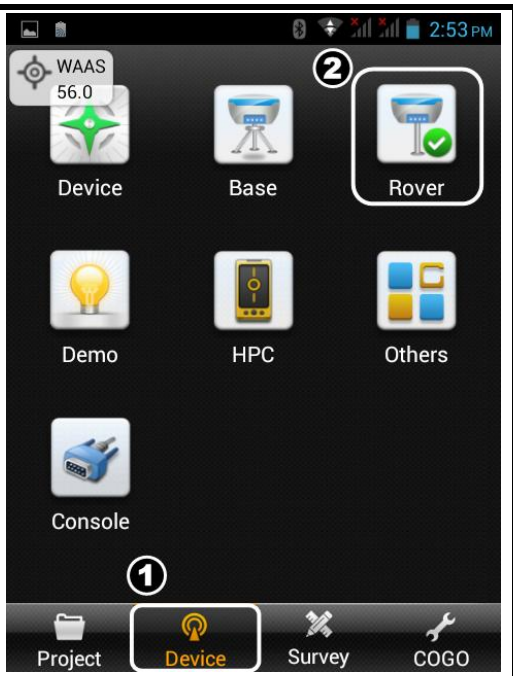




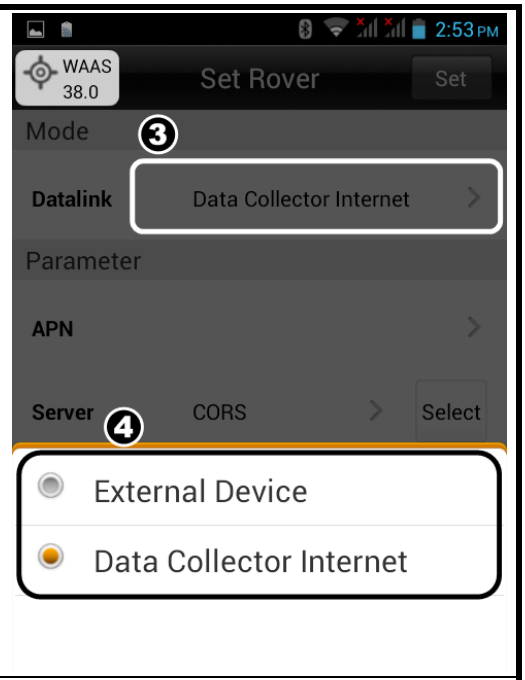
5. Search device.
6. Or select the receiver from the list directly

7. When connect to a new receiver, PIN is needed.
8. Enter 1234,press *OK*

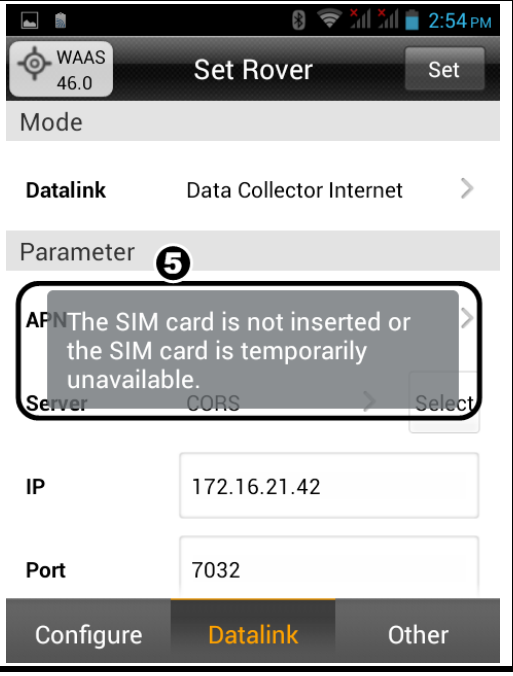
4. Rover setting

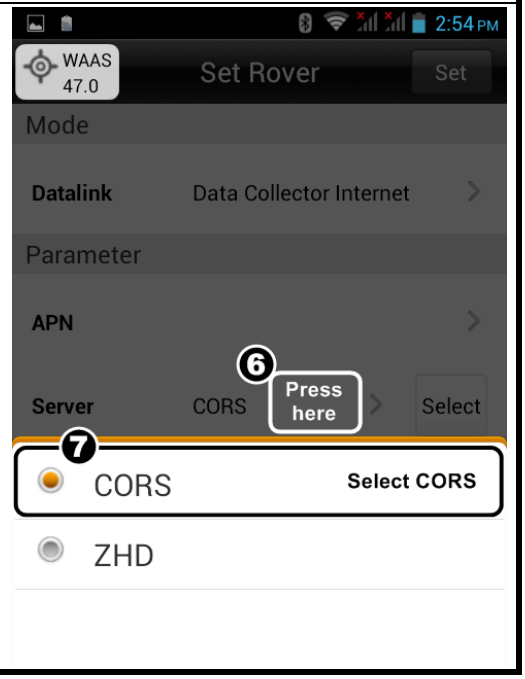


1. Slip to *Device* tab.
2. Press *Rover*.

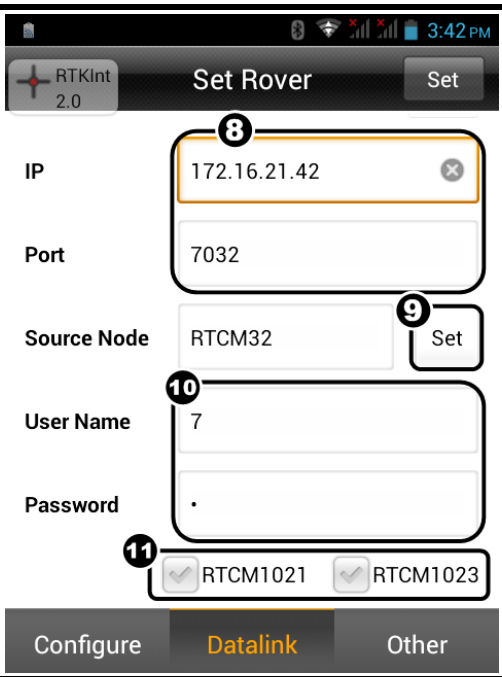


3. Press ③ to set *Data-link.*
4. Select *Data Collector Internet* mode.





5. Make sure your controller has SIM cards installed. Select the right APN option.	6. Press ⑥ to select communication mode. 7. Select *CORS.*



8. Enter the IP &Port value got from the CORS operator. 9. Press *Set* to get and select mount-points (nodes). 10. Enter the username & password. 11. Tick *RTCM1021/RTCM1023* if your CORS service operator provides this type of message.	12. Select the Message Type same as the node you selected. 13. Set the needed Elevation. Press *Set* to finish setting.

5. Floating box

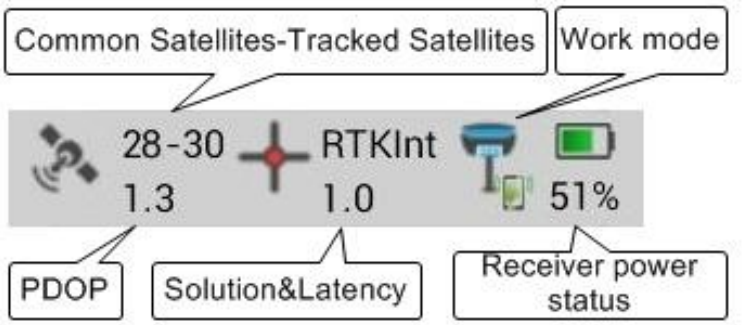


Figure 3-5

"Solution state":

It is mainly divided into the following several modes (except for fixed coordinate, precision is arranged from high level to low level):The given point refers to fixed coordinate (Base) → RTK fixed solution → RTK float solution → RTD solution → single point positioning →no solution type(indicates: no GNSS data)

"Correction latency":

Refers to calculating time after Rover receives the signal from Base.

"PDOP value":

Intensity factor of space geometry where the satellite is distributed. Generally, the better the satellite distribution is, the smaller the PDOP value is. Generally, the value is less than 3 as the more ideal state.

"Number of visible satellites":

Number of satellite received by receiver, at least 5 satellites required by RTK work.

"Number of public satellites":

Base hasn't it and only Rover has it after receiving the difference data. It refers to the satellite used for calculation when the Base and Rover participate in the searching of ambiguity of whole cycles at

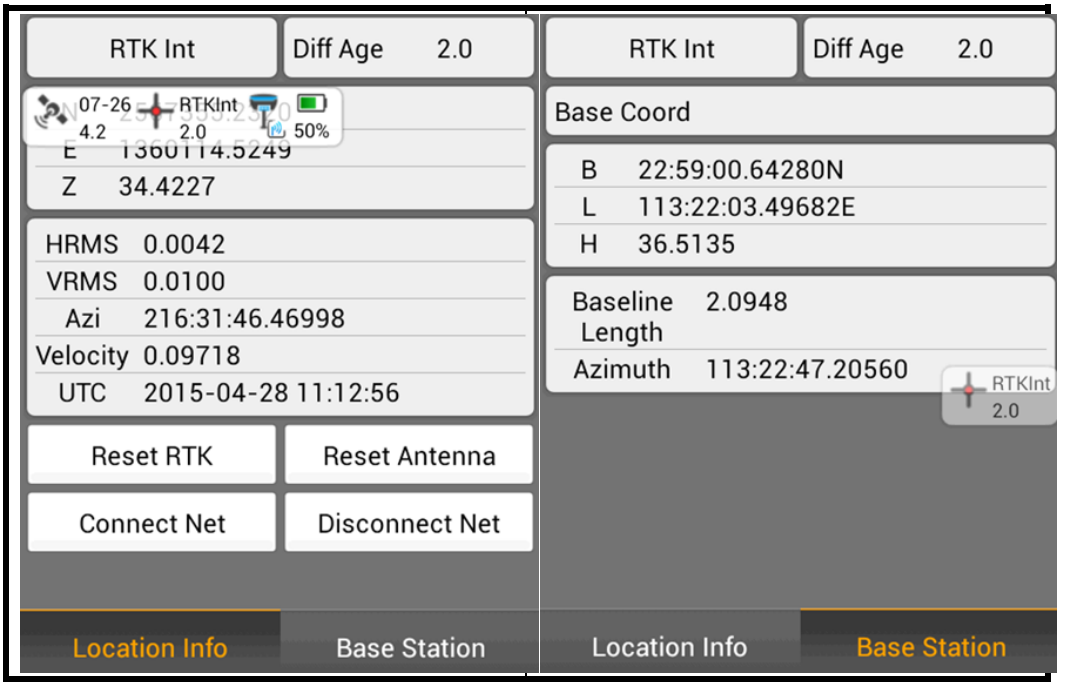
the same time, which are generally more than 5 so as to ensure normal work.

Click the satellite icon in the floating window to rapidly check detailed information of current connected receiver satellite.

(1) Position information

Figure 3-6

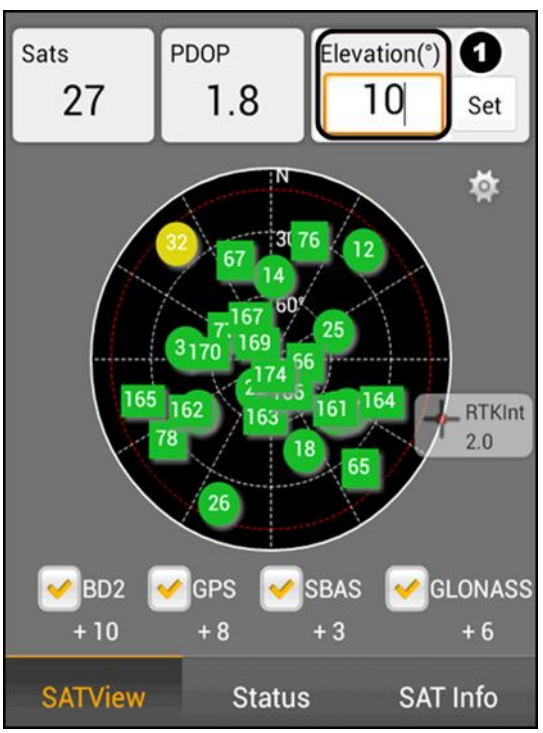
Press here to display position information of current point, including position, speed, solution state and time, etc...

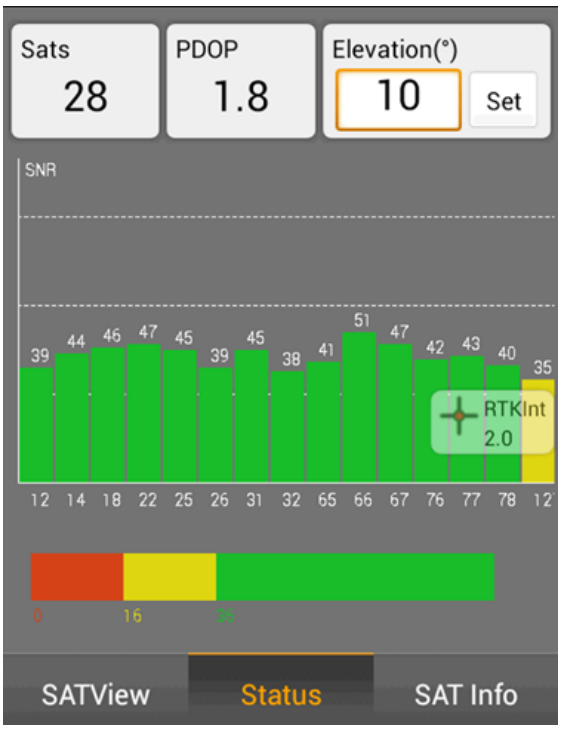


(2) Stellar map

Figure 3-7

◇ Distribution situation of projection position of satellite can be viewed by pressing here. Roundness refers to GPS satellite and SBAS satellite, square refers to GLONASS and BDS satellite. GPS: Prn value is 1-32; GLONASS: Prn value is 65-96; BDS: Prn value is 161-197.

	◇View elevation cut-off angle of GNSS satellite and click "Set" to set the elevation cutoff angle of receiving satellite.



◇Click "Status", and give the color according to L1 carrier signal to noise ratio of satellite: Orange<=15, yellow<=35, green>35As shown in the following figure.

(3) Signal-to-noise ratio figure of satellite:

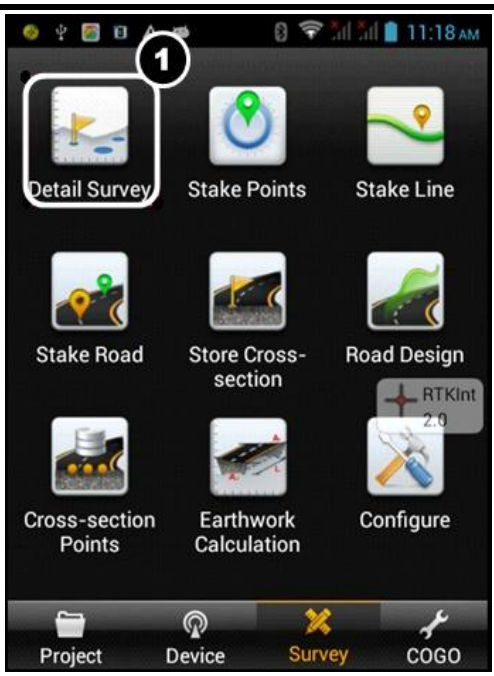
Prn refers to number of satellite; Azi refers to azimuth angle of satellite; Ele refers to satellite elevation, L1 refers to signal to noise ratio of L1, and L2 refers to signal to noise ratio of L2.

◇Click "SAT Info", and Prn refers to number of satellite, L1 refers to signal to noise ratio of L1, L2 refers to signal to noise ratio of L2

3.2.2. Data collection

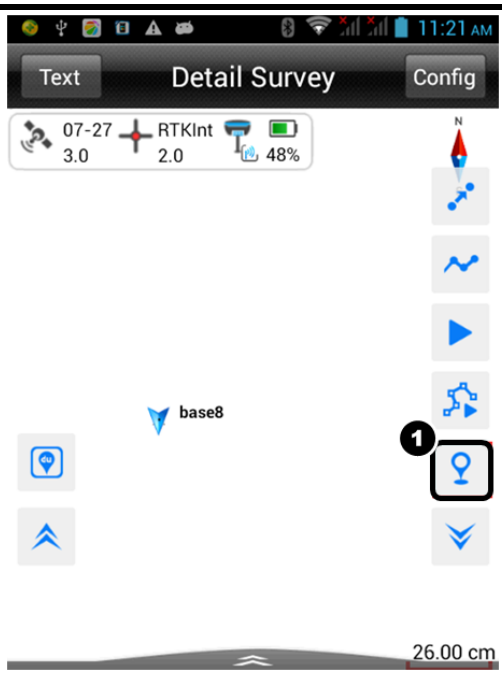
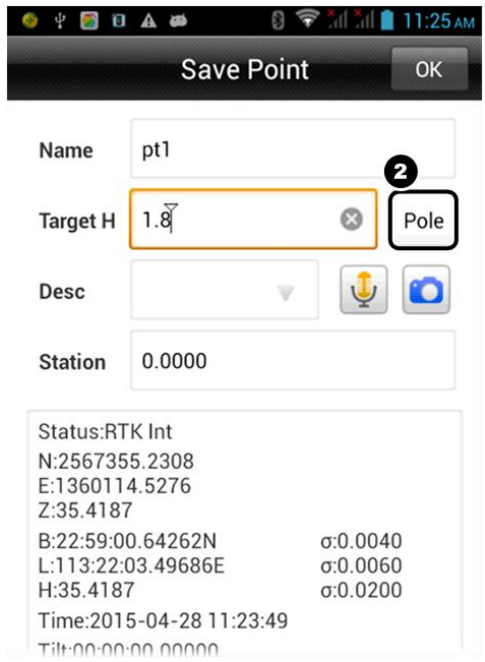
- ✧ Single-point mode
- ✧ Average mode
- ✧ Automatic mode

After the settings for the above project and Base as well as Rover being completed successfully, enter into data collection interface for collection. Corresponding collection methods can be selected according to different demands.

	
1. Slip to *Survey* tab. Press *Detail Survey*.	2. Press ② to expand the list

1. Single-point collection

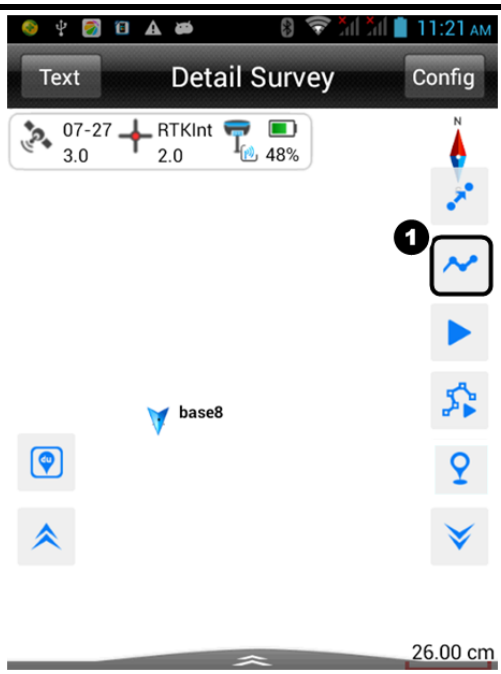
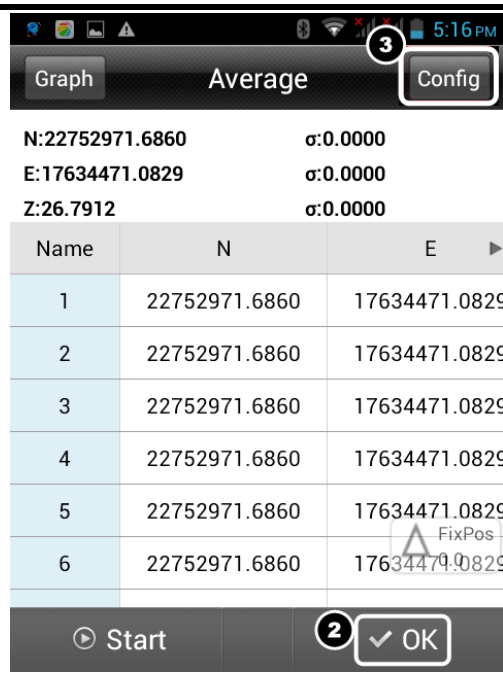
Single-point collection means collecting the data of each point by manual operation.

<table>
<tr>
<td> 
</td>
<td> 
</td>
</tr>
<tr>
<td>1. Press ① (or the same button on physical keyboard) to collect.</td>
<td>2. Press ② to select the height type then input the value</td>
</tr>
</table>

The information of point, including point name, target height (the first point needs to be measured and this value will be set as the default to the next points) and point position description (non-input optional).Click "OK" to complete the collection of the point.

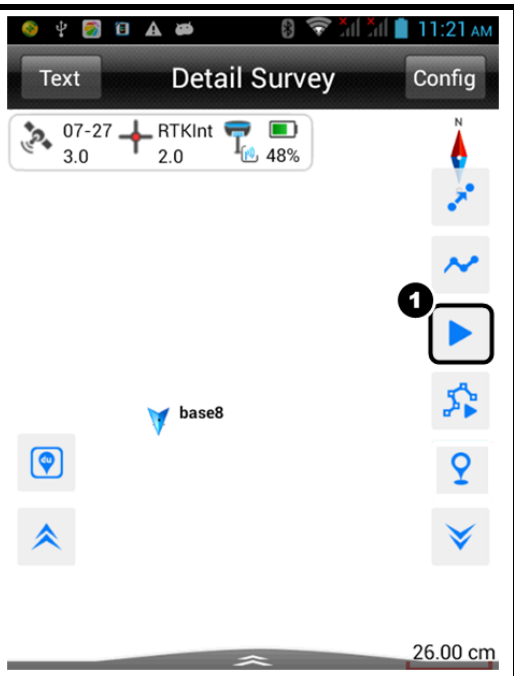
2. Average collection

That is averaging for the multi-measurement value of coordinate for each point.

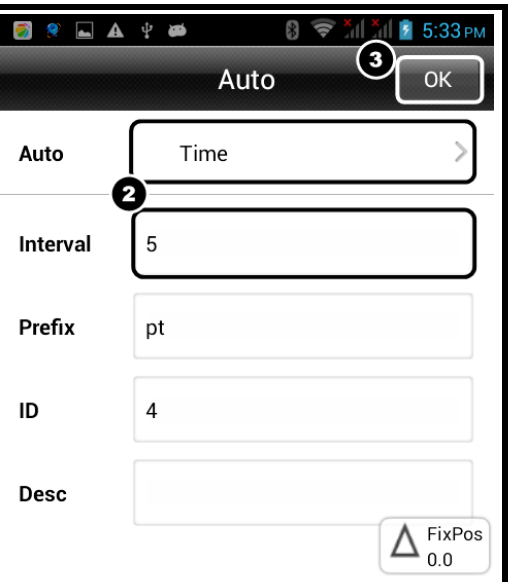
<table>
<tr>
<td> 
</td>
<td> 
</td>
</tr>
<tr>
<td>1. Press ① to collect</td>
<td>2. Press OK to save the point
3. Press here to change the configuration</td>
</tr>
</table>

3. Automatic collection

Point measurement will be recorded automatically according to the configured record condition.



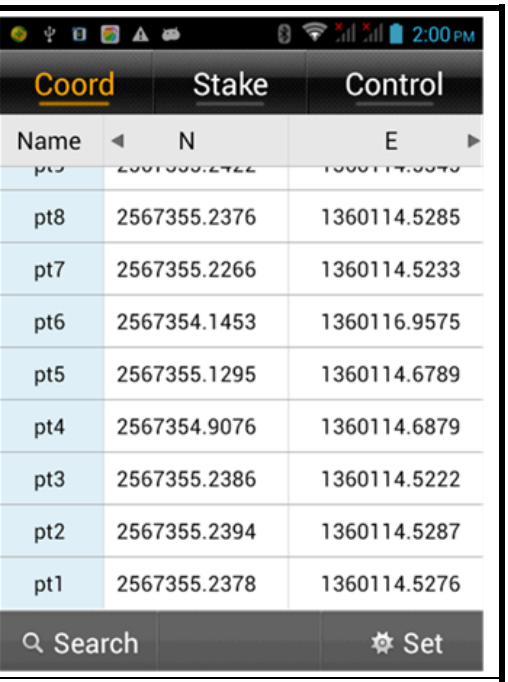
1. Press ① to start automatic collection.



2. Select the mode and enter the interval
3. Press *OK* to start collecting

4. All the points will be auto saved. Press here to end collecting.

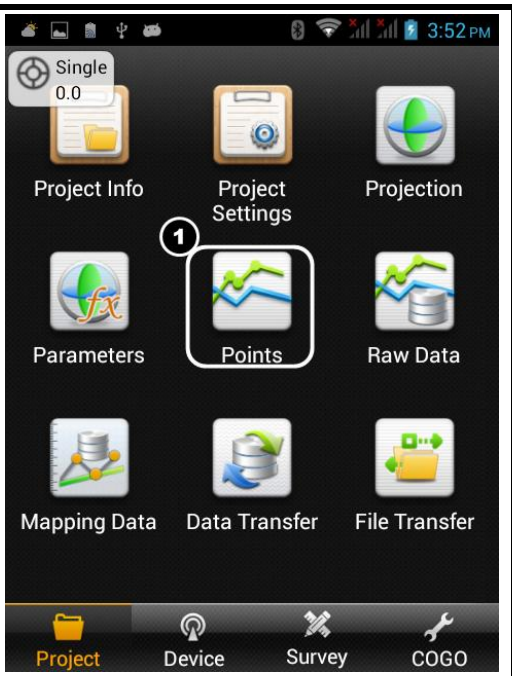
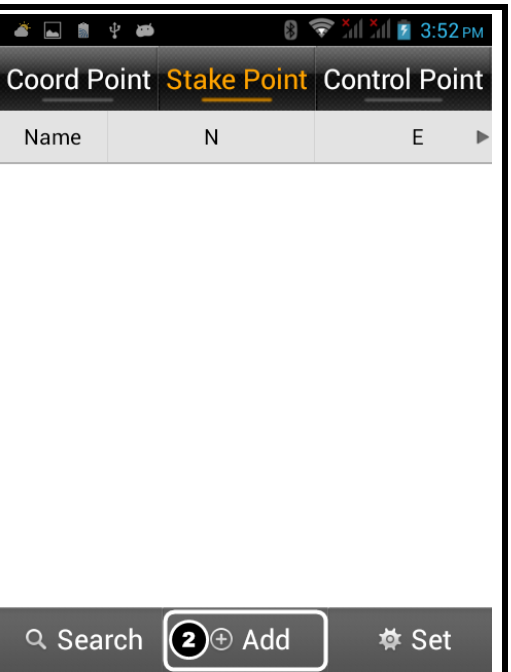
4. View all collected points

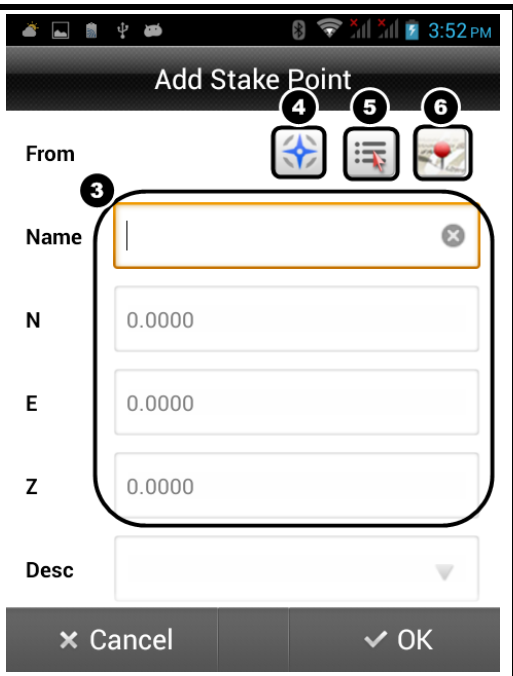
<table>
<tr>
<td> 
</td>
<td> 
</td>
</tr>
<tr>
<td>1. Press ① to view all collected points.
Press ② to manage the raw data</td>
<td>All the collected points will be displayed in this interface.</td>
</tr>
</table>

3.2.3. Stake out

1. Import the stake point

1) Add the point manually

	
1. Press ① to add the point manually.	2. Press ② to add point to the list.



You can add stake point by:

③Enter manually

④Get from receiver

⑤Select from list

⑥Map picking

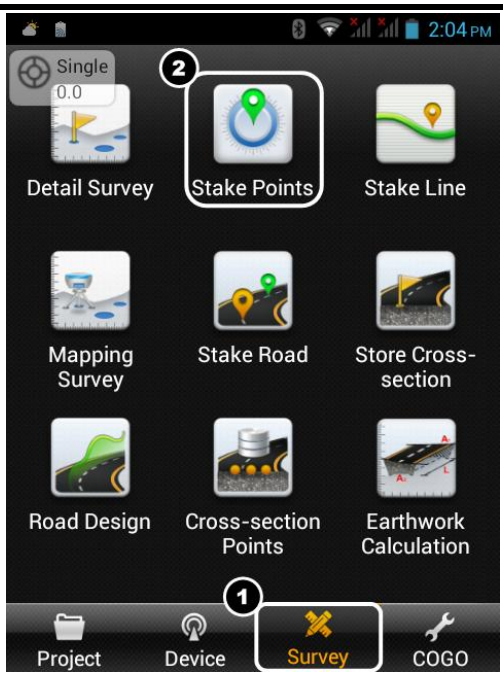
Press *OK* to confirm

2) Import the points/lines from file（Support Dxf file to be staked）

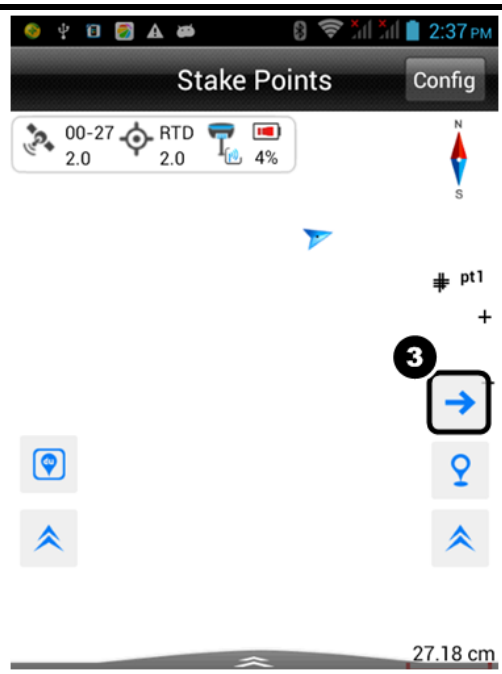
1. Press ① to import the points from file.

2. Slip to *Stake Point.*
3. Select *Import.*
4. Choose the file you uploaded

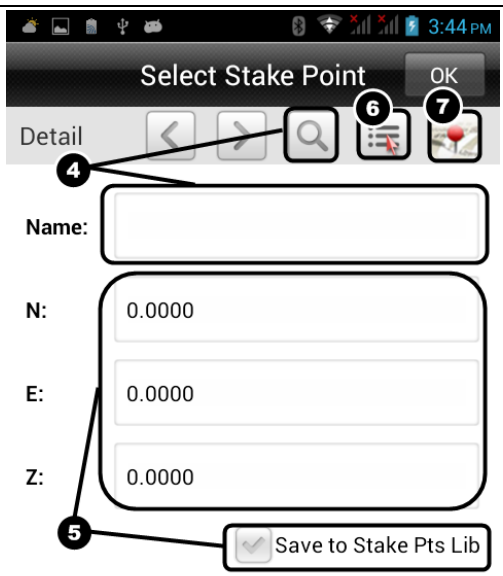
2. Point Staking



1. Slip to *Survey* tab.
2. Press *Stake Points*



3. Click here to enter into points selection interface



You can add stake point by:

④Enter the point name then search it from list

⑤Input the coordinates manually and save the point to the list by ticking the option.

⑥Select from list

⑦Map picking

Press *OK* to confirm and start staking-out

Stake interface

Backward: Southward

Towards the Right: Eastward

Delta H: Altitude difference between stake coordinate and actual position

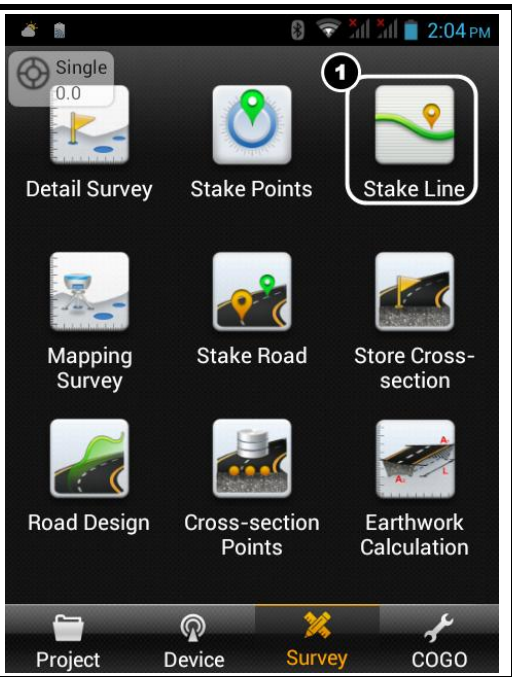
Name : Name of stake point

σ: Relative precision

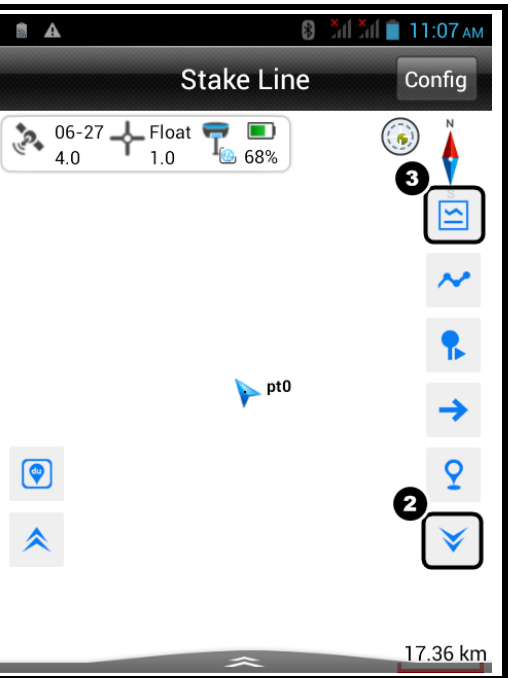
HD: Horizontal Distance

3. Line staking

1. Stake line from line library.



1. Press *Stake Line*



2. Press ② to expand the list.
3. Press ③ to add the line from library

Notice:

You can define the line to be staked-out manually or import it from files. Please refer to the manual of *Hi-Survey* software to get the procedures.

3.2.4. Data Export

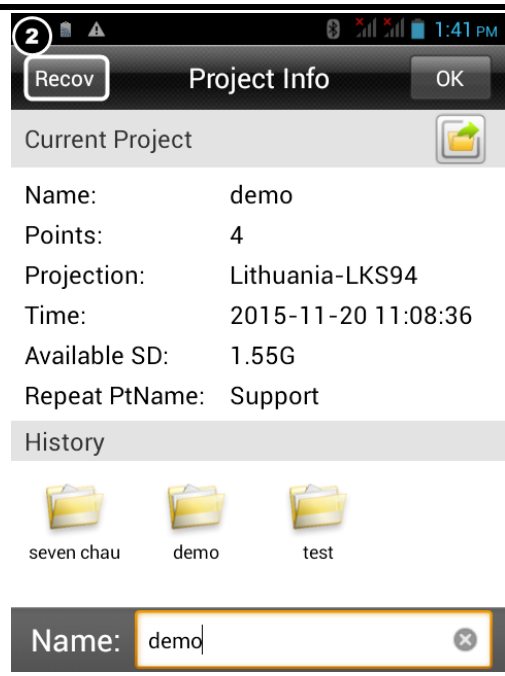
Data achievement export supports the following format: *.txt, *.CSV, *.dxf, (shp File)*.shp and (Excel File)*.csv.

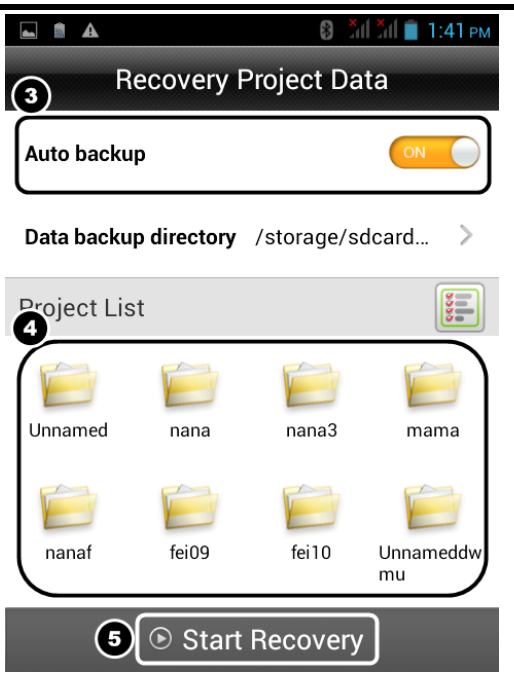
<table>
<tr>
<td> 
</td>
<td> 
</td>
</tr>
<tr>
<td>1. Press Data Transfer.</td>
<td>2. Press ② to select data type.
3. Press ③ to select exchange type.
4. Choose the path to output.
5. Name the file.
6. Select the format.

Press OK to confirm</td>
</tr>
</table>

3.2.5. Auto-backup and quickly recover

Project is auto restored in Hi-Survey. External SD card is used for important data backup (Including: Raw data, project file, coordinate system or encryption code file).

	
1. Press *Data Transfer.*	2. Press ② to enter into project recovery configuration interface.



3. Turn on the *Auto backup* option

4. Select the project to be recovered from the list.

5. Press *Start Recovery.*

Notice：

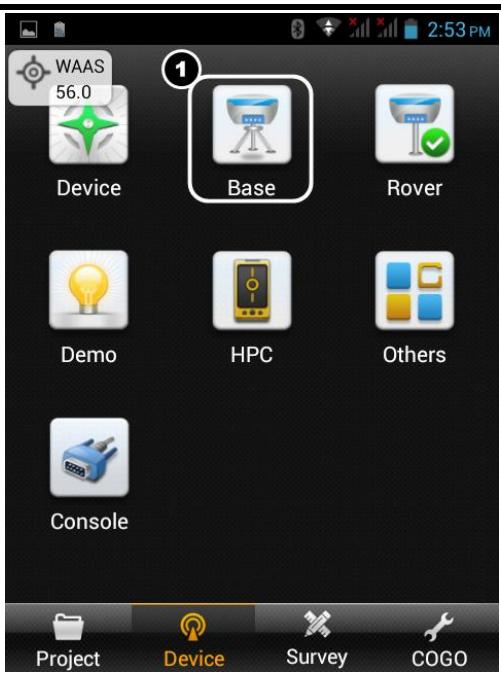
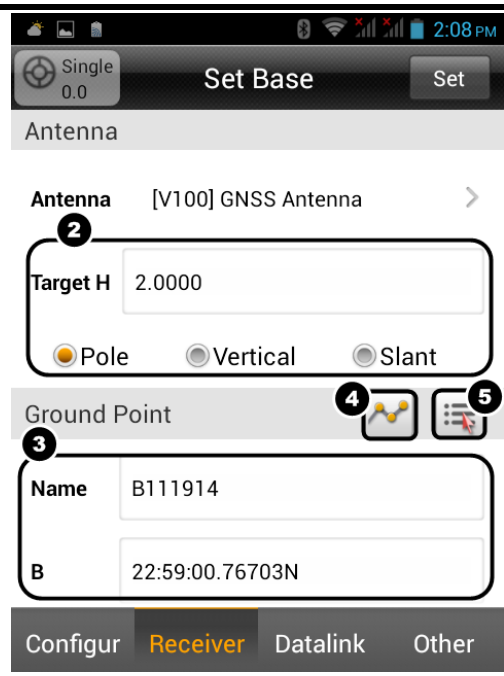
The path of backup file: External SD card /ZHD-Bak/Project/Road.

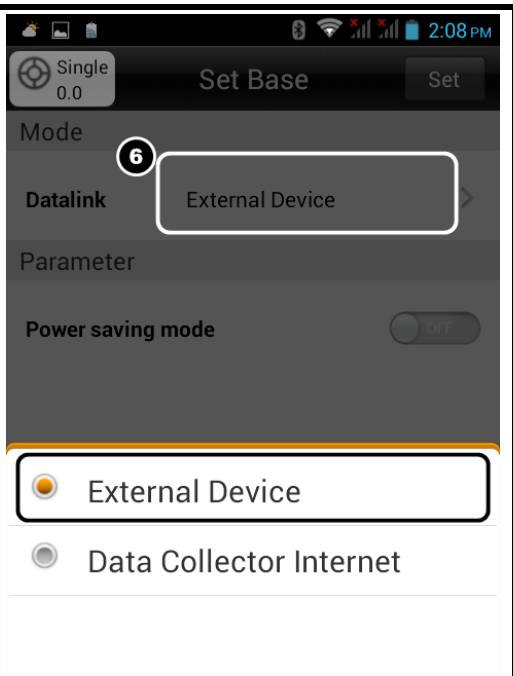
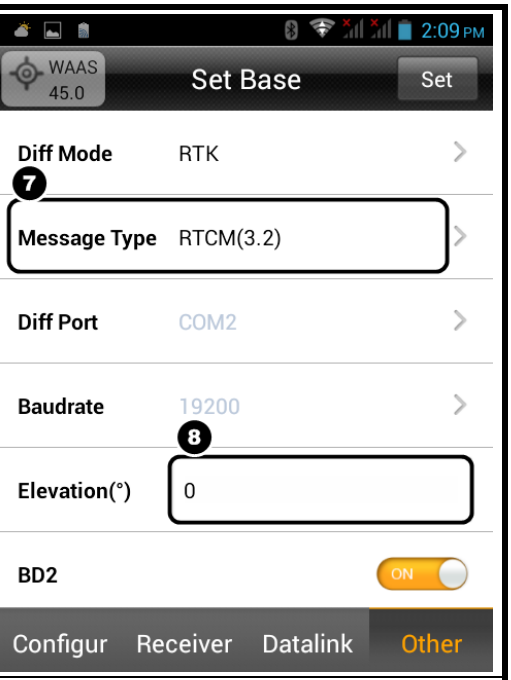
Notice：

1. External SD card is necessary before users backup project file.
2. All the backup operations are over version 1.0.2.

3.3. Base Mode with External Radio

When connected with an external radio，V100 GNSS receiver can also work as a GNSS base.

<table>
<tr>
<td> 
</td>
<td> 
</td>
</tr>
<tr>
<td>1. Connect to V100 GNSS receiver then press Base.</td>
<td>2. Select the height type and input the Target Height.
3. Set the coordinates of base by
③Input manually
④Smooth from receiver
⑤Select from point library</td>
</tr>
</table>

<table>
<tr>
<td> 
</td>
<td> 
</td>
</tr>
<tr>
<td>6. Set Datalink.
Select External Device.</td>
<td>7. Select the correction message type.
8. Set the Elevation angle.
Press Set to confirm</td>
</tr>
</table>

Notice：

For the details of Radio which is supported and how to configure the connection, please refer to the related documents on Hi-Target website：

www.hi-target.com.cn

CHAPTER

4

Trouble Shooting

This chapter describes:

- Registration procedure
- Firmware upgrade
- Reset operation

4.1. Registration procedure

Register ihand20

Step 1: Run the *Auth Code* App which icon is like a lock. (You can find it on the desktop or the Apps Listing.)

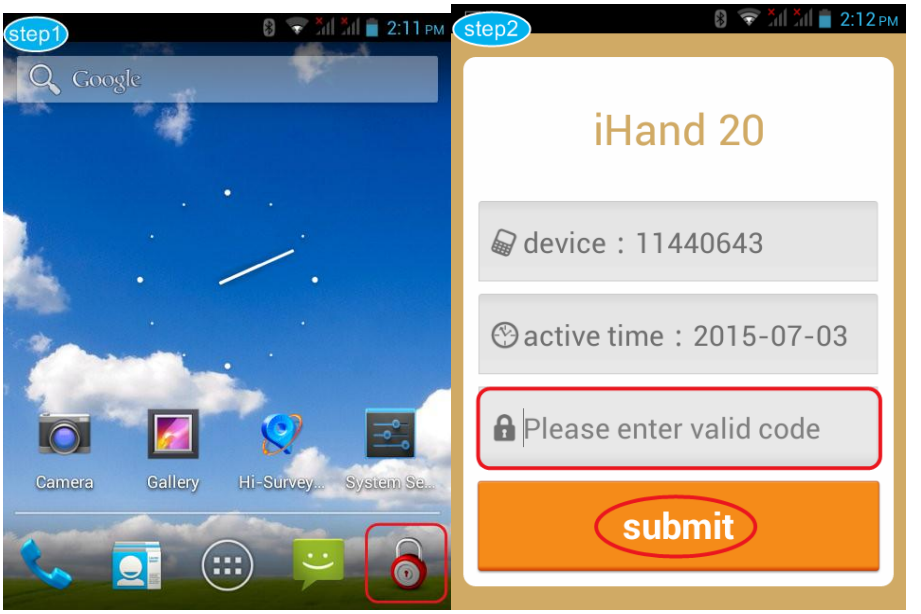


Figure 4-1-1

Step 2: Enter the registration code in the input box, then click *submit.*

Step 3: Registration should be successful. If failed, please check the code and try more times.

Register GNSS receiver via Hi-Survey App

Step 1: Power on your GNSS receiver then run the *Hi-Survey* App and click the *Device* icon

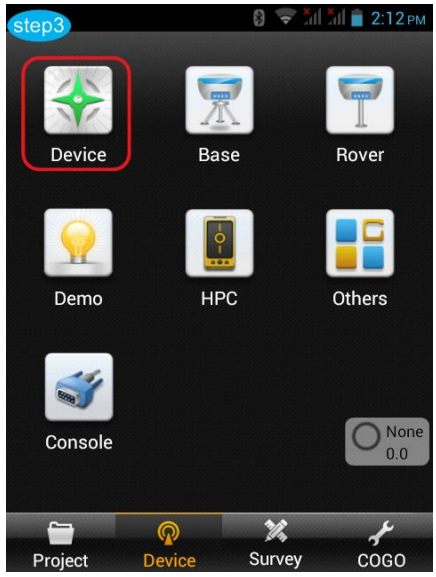


Figure 4-1-3

Step 2: Connect your GNSS receiver first, and then click the *Register* icon. Input the 24 bit registration code, press *OK*.

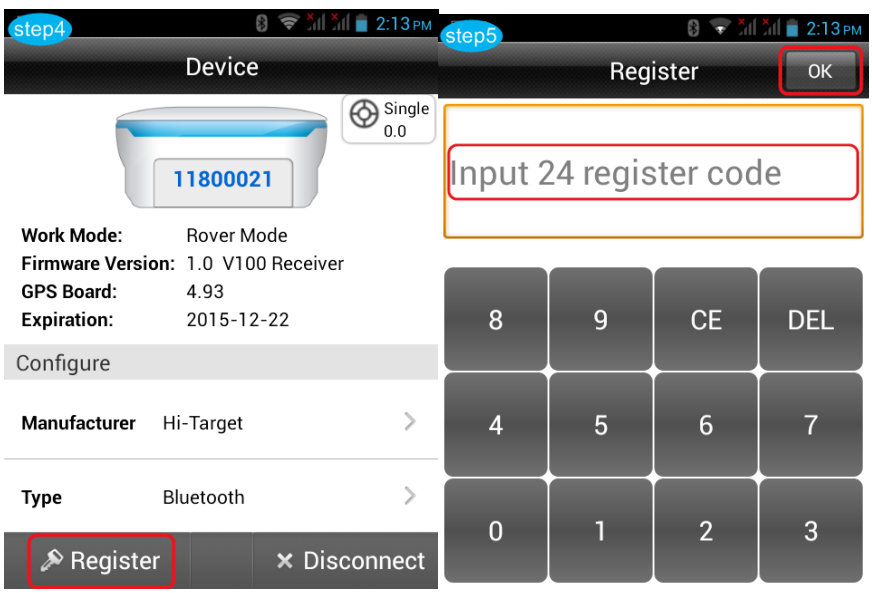


Figure 4-1-4

Step 3: Registration should be successful. If failed, please check the code and try more times.

4.2. Firmware upgrade

The receiver can upload data like U disk , it need Mini USB data cable, one end of Mini USB data cable is connected to computer USB port and the other end is connected to Mini USB port of receiver. It will appear “UPDATE” disk after being connected, then open the disk, copy the firmware files to it. Remove it and disconnect USB cable, restart GNSS receiver. The receiver will upgrade the firmware automatically.

The new firmware can be downloaded from: *www.hi-target.com.cn*

Figure 4-2-1

4.3. Reset operation

When the Bluetooth is not connected, satellite searching fails and network connection fails, the operation can be conducted in case that instrument restarting does not work.

Reset receiver: In power on status, long press power button (>6s) when LED begins flashing, release power button to reset, and then restart the receiver.

Schedule1 factory default parameters

Table 2 Factory default parameters

Options content		**The factory default parameters**
System parameters	Working mode	Rover
	Data link	Data collector internet
	Differential mode	RTK
	Correction format	RTCM(3.2)
	Elevation angle	10°
	GPS	Enable
	BDS	Enable
	GLONASS	Enable
	Static collection interval	5s
	Static elevation angle	10
Others	none	

Schedule2 key accessories information

Table 3 key accessories information

name	**version**	**manufacturer**	**Main performance index**
Motherboard	BD970	Trimble	220channels
Antenna	Small measuring zero phase antenna	Hi-Target Surveying Instrument Co., Ltd.	51dB
Databoard	ZHD20150010B [PCBA]	Hi-Target Surveying Instrument Co., Ltd.	_