V60 Getting Started

HITARGET

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Introduction of hardware

- Hardware structure
- Buttons operation and screen display
- Descriptions of indicator lamp on the control panel
- Static collection and data transmission

1. Introduction of hardware

1.1 Hardware structure

Hardware Schematic Diagram



Fig.1.1-1

Control Panel

There are FN button, Power button and three indicator lamps on the control panel .Three indicator lamps are satellite lamp (single green lamp), status lamp (bi-color lamp of red and green) and power lamp (bi-color lamp of red and green) from the left to the right.

FN button (Function): Set work mode, data chain, UHF transceiver channel, satellite elevation angle, sampling interval and restoration receiver, etc.

Power button (Function): for power on and power off, Set confirmation and inquiry of the current work mode, etc.

Upper Cover



Fig.1.1-2

Anti-wear buffer: Anti-wear buffer can effective avoid the instrument from scratches.



Bottom Cover

- 1. 8-core socket and protective plug 2. 5-core socket and protective plug
- 3. Differential antenna port and protective plug: 4. Connecting screw hole
 - 5. Battery cabin 6. Spring contacts power seat

7. SIM card slot 8. SD card slot

3. Transceiver antenna port: Used to connect internal transceiver antenna for receiving and transmitting differential signal.

(!) Cautions:

1. when 8-core socket or 5-core socket is not in use, please cover them with the plug.

2. When water enters into the trumpet, it is likely that the trumpet is silent or hoarse. The voice can recover after the trumpet is dry.

5-core socket and 8-core socket



Fig.1.1-4



Fig.1.1-5

1. 5-core socket: It is also known as COM2/PW2, which is generally used to connect the receiver with external data chain or the external power supply.

2. 8-core socket: It is also known as COM1/USB/PW1, which is used to connect with computer, handheld controller and other equipment for downloading and deleting data.

Cautions: All the above are the front diagrams of sockets at the bottom of receiver when facing to the receiver. (Namely the face of weld of plug)

Battery

Outside view of 5000 m Ah lithium battery



Fig.1.1-6

Environmental requirements

V60 receiver is designed by waterproof material but please try to keep its environment dry. In order to improve the stability and service life, please avoid the receiver from being exposed to extreme environment for use, for example:

◇Humid environment

- ♦Temperature of higher than 65°C
- \Diamond Lower than -40°C
- \diamondsuit Corrosive liquid or gas

Electronic interference sources

Do not set the GNSS receiver at the place near electric power or strong interference signal, such as:

- \Diamond petroleum pipeline
- \Diamond Television and computer monitor
- \Diamond Generator
- ♦ Electric motors
- ◊DC AC power conversion equipment
- ♦Fluorescent lamp
- \Diamond Power switch

Basic Operations

Introduction of this chapter

Power supply system

Installation and dismantlement of battery cover



Fig.1.1-7

Power supply mode

	11.2	
Power Supply	Power Supply Mode	Lithium battery, 8-core socket and 5-core socket external power supply
	Scope of Power Supply	6V min. and 28V max.

Table 3.1Power supply mode of V60 signal receiver

V60 receiver can be supplied with the power by the external power supply of 8-core socket and 5-core socket at the bottom of receiver ,in which, once external power supply of 8-core socket is powered on, the receiver can power on automatically. When the external power supply of 5-core socket is powered on, the receiver can be powered on by pressing the power button on the control panel of receiver.

External voltage range for GSM operation mode and UHF rover station is DC 6-28V and the current shall be more than 1000mA. If there is external power supply, the receiver will choose the higher voltage between the lithium and external power supplies. If it is needed to use the external power supply, it is required to use the special power supply designated by Hi-Target.

Cautions:

1. Service time of lithium battery will decrease with the reduction of temperature and increase of charging and discharging times. Generally, one new 5000 m Ah lithium battery can be used for 13-15 hours for static data collection, or 10-12 hours as GPRS Rover, or 8-10 hours as internal transceiver transmitting station.

2. In case that electric quantity is used up, in order to avoid battery performance from damage, it shall be used again after continuous charging for 24 hours.

3. If the battery is not used for a long time, in order to prolong its service time, please charge the battery once per month.

BL-5000 lithium battery must be charged by CL-8410 lithium battery charger dedicated by Hi-Target. Charging time is about 7 hours.CL-4400 chargers is designed with charging lamps, which becomes red during the charging period, and becomes green after charging. Then continue charging for 1-1.5 hours until the electric quantity of battery is in full state.



Fig.1.1-8

U Warnings:

1. only use battery and charger configured by manufacturer, and do not throw them into the fire or use the metallic short-circuit electrode.

2. In case of heating, deformation, liquid leakage, smell emission or other anomaly phenomenon during the use, charging or storage period of the battery, please stop using and replace it with new one.

3. If the service time of the battery is shortened obviously, please stop using the battery. It indicates that the battery has been aged; please replace it with new one.

1.2 Buttons operation and screen display

1. Control panel

For Hi-Target V60 receiver, most settings and operations can be realized by two keys on the control panel.

2. LCD Buttons operation

V60 GNSS RTK system can open/close the liquid crystal panel display by double clicking power button. High-definition LCD panel with two buttons complete the basic work demands of receiver, which can set three work modes of base, rover station and static state flexibly. Detailed descriptions of keys operation of control panel are as follows.

Double click button power to turn on the LCD, and the initial interface will display the current work mode and relevant basic information.



Fig.1.2-1



Fig.1.2-2

Operation	Description	
Single-click	Button operation time is less than 0.5 seconds	
Double-click	Interval time for double-click is more than 0.2s but less than 1s.	
Long-time press	Button operation time is more than 3s.	
Super long-time press	Button operation time more than 6s.	
Slow flash	The lamp is flash with frequency of more than 0.5s.	
Quick flash	The lamp is flash with frequency of less than 0.3s.	

Function	Button operation	Function
Turn on/Turn off LCD	Double-click power button	
display		
Select the menu	Single-click Fn button	Single-click the function button
		then the choice box will jump into
		the next option automatically.
Set confirmation	Single-click power button	Single-click power button; confirm
		current content or move the choice
		box to the next menu.
Display/Close	Double click power button	Display the work mode of receiver,
<u> </u>		satellite information and version
🛱 Base 🖽 GSM 🖻 Linking		information.
Initial interface		
	Single-click Fn button	It displays as follows under the
		RTK mode from left to right: data
Information		chain, difference parameters, work
		mode and system information
△Fix \$200-11	Single-click Fn button to	Data chain menu includes three
聞楽等ち	move choice box,	options: UHF (Internal
DevicebUHF	single-click power button to	transceiver), External transceiver
Switch over the data	confirm setting.	and Return to previous menu.
chain		

IP 59.41.181.34	Single-click button to select,	GSM data chain: input IP address
Port▶2101 ID ▶ <u>0111019019</u>	single-click power button to	serial port; grouping No. , and
р ок	edit, and select "OK" after	group No.
Set GSM parameter	edition to confirm.	
Power Minh		UHF (Internal transceiver): Select
Channel▶10		among high, medium and low
D OK		power and channel between
Set UHF parameter		0-115.
Message CMR		Set parameter of difference
Elev 10		information of the base:
• OK		1.Difference scheme:CMR/RTCM2
E 113° 22' 35.1169"		/RTCM3/sCMRx.
U 15.08.19 08:22:03		2.Cutoff angle of satellite: 0°-30°
Set parameter of		3.Current position coordinates: B
difference information		LH
in the base		
		Set parameter of difference
Message PCMR		information in the rover station:
Elev > 10		Difference scheme: CMR/RTCM2
POSITION		/RTCM3/sCMRx.
		Cutoff angle of satellite: 0°-30°
Set parameter of rover		GGA data transmission frequency
station		0s, 1s, 2s, 5s, 10s, 30s, 60s
		It displays as follows under the
Static 200-25		static mode from left to right:
Static Set		Static setting Work mode and
		System information.

		Static setting
Message ▶ Elev ▶ 10		Cutoff angle of satellite:0 °- 30 °
Send GGAÞ 5		Sampling interval: 1s, 2s, 5s, 10s,
		15s, 30s
	Select " DBack " single-click	System information provide with
E 113° 22' 35.1169"	the power button to return to	current information of receiver,
U 15.08.19 08:22:03	the previous menu.	stellar map and system status, etc.
A11 09	In case of no Back on the	
GLON 01 GPS 08	interface, single-click power	
- Back	button to return to the	
	previous menu.	
SN ▶10104539 Henory▶ 99% Power▶ 100% Code ▶ 15,07,10		System information
System information		

Editing parameters

Take edition of elevation angle for example, edit parameter of LCD interface following the sequence from left to right and make a selection according to the popup digital choice box.

(1) Single-click Fn button to select the digit and single-click power button after confirmation, then the cursor can jump to the next digit automatically.

(2) If it is not required to edit from the first digit, after opening the choice box, select and the cursor can jump to previous step or next step.

(3) After the completion of edition, single-click Fn button, and the selected box jumps into the next edit item (such as sampling interval).Edit interface is changed as shown in the below figure:



Attentions:

1. When the LCD interface is in the mode of parameter setting, and handheld controller cannot connect with the receiver, it is required to wait for liquid-crystal operation to return to the main menu.

2. For GSM data chain interface of parameter setting, it can take effect only by setting Hi-Target server IP: 202.96.185.34; Port: 9000; Grouping number (7 bits); Group number (3 bits) on the panel. Connect by CORS; the parameter setting must be conducted by the Hi-Target handheld controller software.

The parameter setting (elevating angle, sampling interval) will be invalid during the static data collection, and the successful parameter setting will take effect when the next static collection starts.
 If button operation does not be made more than 50s under the liquid crystal display status, the LCD can be turned off automatically and the system enters into pure button mode for saving power consumption. The user can double click power button to restart the LCD.

3. Turn off the LCD only by button operation

If there is no LCD display status, work mode can be switched by two buttons and voice can be provided to assist the user to complete the operation.

Function	Button operation	Content	
Work mode	Double-click Fn button	Enter into work mode of "base", "rover station"	
	(0.2s <interval<1s)< td=""><td>and "static state" to select.</td></interval<1s)<>	and "static state" to select.	
Data chain	Press Fn button for a	Enter into data chain mode of "GSM", "UHF" and	
	long time (>3s)	"External" and single-click Fn button to select	
		the mode.	
UHF mode	Single-click Fn button	Enter into "UHF transceiver channel" setting.	
		There are 116 channels from 0 to 115 for	
		selection. And when the numbers of channel are	
		more than 15, it is recommended to use liquid	
		crystal and software setting, which make more	
		quick and convenient.	
	Single-click Fn button	Increase the channels ten by ten.	
	and long press Fn		
	button		

Set	Single-click	Voice prompts the current work mode, data	
confirmation	power button	chain mode and radio power and channel;	
		meanwhile, the power lamp indicates the battery	
		capacity.	
Automatically	Key Fn power button	Firstly press Fn button, then press power button	
set the base	for power on	for power on and do not loosen Fn button until	
		"Ding-dong" sound is heard. Voice prompts	
		confirmation and current status of receiver.	
Receiver	Super long-time press	Reset mainboard. After resetting the receiver, if	
restoration	Fn button	the handheld controller bluetooth cannot be	
		connected with the receiver, firstly adjust the	
		receiver to be in the static mode and adjust it	
		back after starting the collection.	

4. Power on and power off the receiver

Table Display State Descriptions of Indicator Lamp under the Mode of Power on and

Power off

	-		
Power on	Press power	All indictor	Power on music, voice prompt of work mode
	button for 1s	lamps are on.	and data chain mode before the last power off
Power off	Press power	All indictor	Power off voice
	button for 3s	lamps are off.	

The display state of indicator lamp is different under different setting mode. Please refer to Chapter 6.7: Descriptions of control panel indicator lights

SIM /USIM card

Receiver adopts network data chain mode to implement RTK operation. It is necessary to prepare network communication card and open corresponding data communication services. The required number of card is determined according to your RTK measurement system configuration. Each receiver and handheld controller can be equipped with one card. The receiver supports SIM card and USIM card.

Table Descriptions of SIM card/USIM card		
USIM card	GPRS(ZHD/VRS)	
	GSM	
SIM card	GPRS(ZHD/VRS)	
	GSM	

Table Descriptions of SIM card/USIM card

Installation procedure of SIM card:

(1) Demount the battery cover and remove the battery to make the SIM card slot exposed.



Fig.1.2-3

(2) Put SIM card in the card base and insert it into the slot with the front (the side with metal contact) facing downward without loosening.



Fig.1.2-4

5.Transceiver

UHF transceiver

Internal transmitter-receiver (Standard configuration)

Band of transceiver: 450-470MHz, 116 channels can be switched over flexibly. Transmitted power can be adjusted among 1W, 2W and 5W.

Transmission rate: 19.2Kbps and 9.6Kbps, which are available for adjustment.

PCC XDL transceiver module (Optional purchasing)

Transceiver frequency: 403MHz-473MHz, frequency table can be modified by yourself.

Transmitted power can be adjusted among 0.1W, 1W and 2W.

Transmission rate: 19.2Kbps and 9.6Kbps, which are available for adjustment.

Support a variety of transmission protocols.

Zautions: Once transceiver channel of the base is modified, rover also need to be modified to the corresponding channel, otherwise, the differential signal cannot be received. Normal operations made only under the same channels.

6. Power on to switch to UHF rover mode

(1) Double-click power button to power on LCD and the initial interface will display the current work mode and relevant basic information. See Fig.1.2-2.

(2) Set work mode: Single-click Fn button, it shows as follows from left to right under the RTK mode: Data chain, difference parameter, work mode and system information.

Operation steps are shown as follows:



Single-click power button for confirmation when the steps are finished.

(3) Set data chain:



Single-click power button for confirmation when the steps are finished.

1.3 Descriptions of indicator lamp on the control panel

Display state of indicator lamp under different setting mode:

1. Work mode (Double-click Fn button to enter into the work setting mode, then single-click Fn button to make mode selection and click power button for confirmation. In case of failing to press power button exceeding 10s, confirmation can be done automatically):• On;• Off

Mode	Satellite lamp	Signal lamp
	(single green lamp)	(the green lamp of the double lamps)
Base	•	0
Rover	0	•
Static state	•	•

Table 2.1 Descriptions of display state of indicator lamp under the work mode

2. Data chain (Long-time press Fn button to enter into the data chain setting mode and then single-click Fn button to make mode selection and click power button for confirmation. In case of failing to press power button exceeding 10s, confirmation can be done automatically):● On;○ Off

Туре	Satellite lamp	Signal lamp
	(single green lamp)	(the green lamp of the double lamps)
UHF	•	0
Internal GSM	0	•
External	•	•

Table 2.2 Descriptions of display state of indicator lamp under the data chain mode

1.4 Static collection and data transmission

Introduction of this chapter:

- Introduction
- Static measurement of the receiver
- U disk-type data download
- Operation of static management software

Introduction

The collecting static measurement data is stored in the receiver or the memory card. Static data file needs to be downloaded into the computer and processed by the static post-processing software. Static measurement of the receiver

1. Set up instrument at the control point and strictly keep the optical plummet centering and leveling.

2. Measure the height of instrument three times and difference among them shall not be more than 3mm, and the average value of them is the final height of instrument. Height of instrument is the distance from mark-stone center of control point to measurement marker line of receiver.

- 3. Parameter of the receiver:
- \diamondsuit Receiver radius:91mm
- \diamond Height between the bottom of receiver and antenna phase center :94.2mm
- ♦ Height between measurement line of receiver height and antenna phase center:39.3mm

*If the antenna parameter certificated by NGS is needed, please view

http://www.ngs.noaa.gov/ANTCAL/Antennas.jsp?manu=HI-Target

5-core socket and 8-core socket



Fig.1.4-1

4. Record point name, instrument No. height of instrument, time of beginning observation.

5. Power on, set the receiver to be static measurement mode according to the following button operations:

(1) Set work mode:

Single-click Fn button, it shows as follows from left to right under the RTK mode: data chain, difference parameter, work mode and system information.



Single-click power button to confirm the selection.

(2) Set static collection parameter:



Adjust cutoff angle of satellite and sampling interval. Move the choice box again, and single-click power button for confirmation.

Flashing satellite lamp indicates searching for satellite, and it indicates that the satellite has been locked if satellite lamp turns on. State lamp flashes according to sampling interval and each flashing indicates that one epoch is collected.

- 6. Power off after the completion of measurement and record the power off time.
- 7. Download and process data.

Cautions: Do not move base .Do not change collection parameter during the collection.

Data download by USB flash disk:

Receiver files are managed and stored by USB flash disk and it is not necessary to download drive program. Only download the static data of receiver but not conduct read-write operation for the receiver. The receiver can conduct U disk-type data download by using Y-type data line, of which one terminal is connected to the computer USB and the other terminal is connected to the 8-core socket on the bottom of receiver. After the connection, drive of "static" and SD card can appear in the computer. Copy the collected static file after opening the drive.

	static (I:)	Removable Disk (J:)	
Ś	791 MB free of 799 MB	7.38 GB free of 7.39 GB	

Fig.1.4-2

The procedure of modifying the point name and antenna height of the downloaded static file as follows:

1. Select *GNS static file and double-click the mouse.

2. After popup of dialog box of "File Editor", modify the point name and inputting antenna height and click [OK].

File Editor	
Marker Name: (less than 4 charactors	1234
Antenna Slant Height:	2.100 m
ОК((<u>O</u>) Cancel(<u>C</u>)



Cautions: Static files in the removable disk cannot be deleted directly but can be deleted by management software of GNSS receiver or handheld controller software.

Operation of static management software

Main functions of management software of GNSS receiver:

- \Diamond Delete original data and files.
- \bigcirc Delete and format the whole memory.
- \Diamond Read and set parameter.
- \diamondsuit Set storage path of static data.

Operation procedures:

1. Separately connect 8-core socket and serial port of the computer by using two terminals of Y-type data line.

- 2. Select the computer port and click it to connect the serial port.
- 3. Refresh the catalogue and then observed data files can display in the form.
- 4. File Name: There are eight bit characters.
- 5. Create Time: Time of file creation.

6. Data deleting. Select the data required to be deleted and click Delete to delete the selected files.

7. Set collection interval and cutoff angle of satellite: Input the value to be changed and click to set the parameter. Click read parameter and will show the originally set collection interval and cutoff angle of satellite.

8. Format data: Click "Format/Del All Files" to complete the formatting of receiver and all data are deleted, which cannot be recovered.

FileName	Size	CreateTime	^	Read All Files
ABCDEFXX.GNS	22K	8:01:00		
CALSONXX.GNS	63K	8:03:00		Format/Del All Files
AHXXXXXX.GNS	15	8:04:00	_	
789XXXXX.GNS	24	8:40:00		Del Selected
123 .GNS	8K	7:53:00		
1234 .GNS	35K	7:54:00		
47 .GNS	19K	7:55:00		
L .GNS	18K	7:56:00		Download Colorted
Q .GNS	35K	8:01:00		Download Selected
W .GNS	51K	8:03:00		Path:
7801050.GNS	11	7:07:00	~	
<			>	

Fig.1.4-4

CHAPTER 2

Handheld controller and application

- Introduction to the handheld controller
- Appearance of the handheld controller
- Handheld controller accessories
- Operation of handheld controller
- Installation of SIM card
- Power on and power off operation
- Data download

Introduction to the handheld controller

 \diamond Industrial design, IP68 design, resistance to fall from the height of 1.2 m and adaption of all kinds of complicated working environments outdoor

 \diamond 640*480 Highlighting LCD with 3.7 inches can be readable normally under strong sunlight

 \diamond Support bluetooth, Wi-Fi, Network and provide convenience for achieving a variety of wireless data transmission with receiver.

 \diamond Internal camera with 8 million pixel, which supports field collection of high-definition image information

 \diamond Internal 6300 m Ah lithium battery, which supports continuous work for above 20 hours

 \diamond 1.5GHZ of basic frequency, quad-core CPU;4GB Internal Memory +1GB RAM memory; Internal Micro SD card slot, which supports 32GB expansion card at maximum

 \diamond Dual SIM dual stand by, which support WCDMA and GSM system: Android 4.2

Attentions

Although iHand20 handheld controller adopts anti-chemical agent and impact-resistance material, precise instrument shall also be used and maintained carefully and be in dry environment as far as possible. In order to improve stability and service period of iHand20 handheld controller, please avoid it from being exposed to extreme environment for use, for example, humid, high temperature, low temperature, corrosive liquid, gas, etc...

(!) Warnings: iHand20 handheld controller shall be used and stored within the specified temperature of -20 C-55 C.

Appearance of the handheld controller

Front of handheld controller

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



Fig.2- 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

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





Fig.2- 2

Camera: Used for field collection of image information.

Battery cover: Internal removable lithium battery.

Belt: Connect the belt to prevent sliding down.

Trumpet: Conduct real-time voice broadcast for the instrument operation and status.

Side of handheld controller



Fig.2-3

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 achieving waterproof and dustproof.

Handheld controller accessories

Charger



Charger: 5V/1A

Fig.2-4

Battery



Lithium battery: 3.7V /6300mAh



Data line





USB data line:

 \diamond Connect to the USB port of computer, and used for download of data

 \diamondsuit Connect to the USB port of charger and used for charging handheld controller

Touch pen





Touch pen: 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] \rightarrow [auxiliary function] \rightarrow 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.



Fig.2-8

Handheld controller 20 keyboard include: Back, OK, Power, APP, Fn, Collect, Camera, etc. on buttonboard of iHand 20 handheld controller.

Button Back: Delete or exit the operation of current window.

Button OK: Confirmation

Button 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.

Button 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 key APP next time.





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

Fn button: Press Fn button for 3s and popup interface of input method switch 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.



Fig.2-10

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 function: Press "VOL-" and power button simultaneously for 3s, screen capture will be kept in the file of "Mobile phone storage \rightarrow Pictures \rightarrow 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 Key "7";

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

Table 6.1 Model of iHand20 handheld controller battery and charger

Name	Model
Lithium battery	BL-6300A
Charger	CL-6300A

	Charging:
	It shall be charged with special charger within a certain
	temperature range and a certain charging time. Specific
	usage methods and requirements: It shall be charged by
(1)	special charger with standard configuration of iHand20
	within the temperature range of 0 $^\circ\!\mathrm{C}$ -40 $^\circ\!\mathrm{C}$.For the first usage,
\smile	there is a certain electric quantity in the battery generally.
	Therefore, the battery shall not be charged until the electric
	quantity is used up. And it shall be charged for 12 hours for
	the first three times and later it can be charged normally.
	Warnings:
	1.Must use battery and charger configured by manufacturer,
	and do not throw them into the fire or use the metallic
	short-circuit electrode.
•	2. Each charging time shall not be more than 24 hours.
\wedge	3. In case of heat, deformation, liquid leakage, smell
/!\	emission or other anomaly during the use, charging or
	storage period of the battery, please stop using the battery
	and replace it with new one.
	4. If the service life of the battery is shortened obviously,
	please stop using the battery. It indicates that the battery
	has been aged; please replace it with new one.

Installation of SIM card

Handheld controller supports dual SIM dual stand by and is provided with two SIM card slots, of which SIM1 is defaulted to support GSM, WCDMA and SIM2 supports GSM.

Cautions: iHand20 does not support 4G network temporarily. If using 4G card on the handheld controller, it is required to open 2G service.

Installation procedures of SIM card

1. Unload the battery cover and remove the battery to make the SIM card slot expose.



Fig.2-11

2. Put SIM card in the card base and insert it into the slot without loosening with the front (the side with metal contact) facing downward.



Fig.2- 12

Installation Procedures of Micro SD card

1. Unload the battery cover and remove the battery to make the Micro SD card slot expose.

2. Push downward with the tip of the finger by resisting the sheet metal of slot to open the sheet metal.



Fig.2-13

3. Insert the Micro SD card into the card seat and the side with metal contract is placed down.



Fig.2-14

4. Push upward with the tip of the finger resisting the sheet metal of slot until it is stuck without looseness.

Power on and power off operation

Under the power off status, press the power button for 3s to power on;



Under the power on status, press the power button for 3s, and then popup the prompt box and click "Power off".


Fig.2- 15

Data download

Connect handheld controller to computer

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



Fig.2- 16

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] \rightarrow [Developer options] \rightarrow [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].



Fig.2-17



Hi-Survey

- Creat a project
- Measurement and collection
- Export of data achievement
- Stake out

3. Hi-Survey

3.1 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..

Specific procedures as follows:

(1) Open the software Hi-Survey;



Fig.3-1

(2) Click "Project Info"; (As shown in Fig. 3-2)



"Project Info": New project can be built and the existing project can be opened or deleted.



(3) Input project name in "Name" box->click "OK";



Input project name in "Name" box->click "OK"; (Note: The name of new project shall not be the same as the name of old projects)

2. Bluetooth connection

Receiver is connected with handheld controller by bluetooth, therefore, it is necessary to do this step before the operation. If conducting RTK under the mode of UHF (transceiver), two sets of receiver bluetooth shall be configured at least (one for base and one for rover).

(1) Device ->Blue Tooth->Connect->Search device;



Disconnect	
Work Mode: Firmware Version: GPS Board: Expiration:	None 0.0
Configure	
Manufacturer Hi-Target	>
Type Bluetooth	>
🔊 Register	✓ Connect
🔊 Register 💦 💊	Connect
	✓ Connect
Register	✓ Connect Click "Search device" to search t
	✓ Connect Click "Search device" to search t bluetooth device nearby.
	Connect Click "Search device" to search the bluetooth device nearby.
Register Register Successful and the second sec	Connect Click "Search device" to search t bluetooth device nearby.
Register Register Register A A C	Connect Click "Search device" to search t bluetooth device nearby.
Register Register Suetooth Bluetooth Search device zhd_3009270 11001649	Connect Click "Search device" to search t bluetooth device nearby.
	Connect Click "Search device" to search the bluetooth device nearby. None None >
Register Register Suetooth Bluetooth Search device zhd_3009270 11001649 zhd_0970322 10211158	 Connect Click "Search device" to search the bluetooth device nearby. ○N ○ >> >> >> >>
≫ Register ♥ ● □ ● ▲ ● ● ● Bluetooth Bluetooth Search device zhd_3009270 11001649 zhd_0970322 10211158	Connect Click "Search device" to search the bluetooth device nearby. None None >> >> >>

(2) Select S/N code of the device to be connected->input bluetooth PIN"1234";

Bluetooth pairing request Bluetooth pairing request To pair with: 11001649 Type the device's required PIN: 1234 Usually 0000 or 1234 PIN contains letters or symbols You may also need to type this PIN on the other device. Cancel OK	Configuration PIN of buletooth:1234
Device Device Disconnect Prompt E Getting the registration date 37% C Manufacturer Hi-Target Type Bluetooth	Click "OK" to connect (May take a few seconds)



(3) Use the same method to connect with other GPS receiver (Such as 10211158).

e ▲ ♀ ● 8 ♥ 11 11 55% ∎ 15:10 Device	Connection Process
Prompt	
F G E Getting the datalink 87% information	
Manufacturer Histarget	

IO211158 Work Mode: Rover Mode Firmware Version: 5.10 GPS Board: 4.81 Expiration: 2015-04-22 Configure Manufacturer Hi-Target Type Bluetooth Name Note: Name Note: Manufacturer Hi-Target	IO211158Work Mode:Rover ModeFirmware Version:5.10GPS Board:4.81Expiration:2015-04-22ConfigureManufacturerHi-TargetTypeBluetoothPregisterX Disconnect	ID211158 Work Mode: Rover Mode Firmware Version: 5.10 GPS Board: 4.81 Expiration: 2015-04-22 Configure Manufacturer Hi-Target Manufacturer Bluetooth ✓ Pegister × Disconnect
10211158 Work Mode: Rover Mode Firmware Version: 5.10 3PS Board: 4.81 Expiration: 2015-04-22 configure Hi-Target Manufacturer Hi-Target Fype Bluetooth Image: Segister X Disconnect	10211158 Work Mode: Rover Mode Firmware Version: 5.10 BPS Board: 4.81 Expiration: 2015-04-22 Configure Hi-Target Manufacturer Hi-Target Fype Bluetooth Image: State Stat	10211158 Work Mode: Rover Mode Firmware Version: 5.10 BPS Board: 4.81 Expiration: 2015-04-22 configure Hi-Target Manufacturer Hi-Target Fype Bluetooth IValue X Disconnect
Work Mode: Rover Mode Firmware Version: 5.10 GPS Board: 4.81 Expiration: 2015-04-22 Configure Manufacturer Hi-Target Type Bluetooth ≫ Register × Disconnect	Work Mode: Bover Mode Firmware Version: 5.10 GPS Board: 4.81 Expiration: 2015-04-22 Configure Manufacturer Hi-Target Type Bluetooth > Register X Disconnect	Work Mode: Rover Mode Firmware Version: 5.10 GPS Board: 4.81 Expiration: 2015-04-22 Configure Manufacturer Hi-Target Type Bluetooth Negister X Disconnect
GPS Board: 4.81 Expiration: 2015-04-22 Configure Manufacturer Hi-Target > Type Bluetooth >	GPS Board: 4.81 Expiration: 2015-04-22 Configure Manufacturer Hi-Target > Type Bluetooth >	GPS Board: 4.81 Expiration: 2015-04-22 Configure Manufacturer Hi-Target > Type Bluetooth >
Expiration: 2015-04-22 Configure Hi-Target Manufacturer Hi-Target Type Bluetooth > Register	Expiration: 2015-04-22 Configure Hi-Target Manufacturer Hi-Target Type Bluetooth ≫ Register × Disconnect	Expiration: 2015-04-22 Configure Hi-Target Manufacturer Hi-Target Type Bluetooth N Register X Disconnect
Configure Manufacturer Hi-Target Type Bluetooth N Register X Disconnect	Configure Manufacturer Hi-Target Type Bluetooth > Register × Disconnect	Configure Manufacturer Hi-Target > Type Bluetooth >
Manufacturer Hi-Target Type Bluetooth > Register	Manufacturer Hi-Target Type Bluetooth > Register X Disconnect	Manufacturer Hi-Target Type Bluetooth ≫ Register × Disconnect
Type Bluetooth > P Register X Disconnect	Type Bluetooth > P Register X Disconnect	Type Bluetooth > ≫ Register × Disconnect

3. Set coordinate system

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. A. build a new coordinate system, including Ellipsoid projection and Ellipsoid transformation parameters, etc. B&C. Import existing coordinate system.



A .Build a coordinate system:

Projection->Ellipsoid switchover->Elevation fitting

(1) Click "Projection"-> -> User Defined



(2) Input projection information(Input ellipsoid information according to local actual situation) Click "System" to input name of coordinate system->"Projection" to select projection mode and take "Transverse Mercator" for example.

ų 🤞 🗉 📓 🗛 🛤	8 🛜 Xil Xil 💈 3:42 рм	System: Define the name of coordinate system
Projection	Datum Plan 🕨	Projection: Optional
System		(take Transverse Mercator for example)
oyotem		C. Meridian: Center meridian
Projection	Transverse Mercator	(According to the local situation)
		False Northing: Unit: meter
C.Meridian	114:00:00.00000E	(According to the local situation)
False Northing(m)	0.0	False Easting: Unit: meter
r dise Hording(iii)		(According to the local situation)
False Easting(m)	500000.0	Lat. of False Origin: Latitude of False Origin
		(According to the local situation)
Lat.of False Origin	00:00:00.00000N	False Easting: Additive constant in the
	🖬 Save	direction of east;
		Scale Factor:(Adjustable in accordance with
		actual situation)
¥ 📀 🗊 🛃 🛤	8 🛜 Xil Xil 🛽 3:49 рм	Fill other information or not.
Projection	Datum Plan	
False Easting(m)	500000.0	
Lat.of False Origin	00:00:00.00000N	
Scale Factor	1.0	
Zone+	OFF	
X->North	ON	
Y->East	ON	
	🖬 Save	

(3) Click "Datum", set Source Ellipsoid and Local Ellipsoid,

* • • • • • • • • • • • • • • • • • • •	Click "Datum", set Source Ellipsoid and Local Ellipsoid, but the ellipsoid information is determined by local and project requirement and must be accurate.
Projection Datum Plan Source Ellipsoid WGS 1984 a(m) : 6378137.0 WGS 1984 WGS 1972 International 1924 GRS 1980 Airy 1830	Source Ellipsoid: Optional, commonly use WGS84



(4) Select switchover model: click "Model"; take Bursa-Wolf (Boolean Sally seven parameters) for example.

🕴 🚳 🖬 🖪 🔺 🕯 Proiection	в 🗇 🐨 5d 5d 🖻 4:46 рм Datum Plan ►	Click "Model" to select switchover
a(m) :	6378137.0	inde
1/f :	298.2572236	
Local Ellipsoid	Krassovsky 1940 🔍	
a(m):	6378245.0	
1/f :	298.3	
Model	None >	
	🖪 Save	



(5) Height fitting (It can be skipped over if the fitting is not required)Height->select elevation fitting mode; (complete elevation fitting)





(6) Click "Save" to complete settings and saving of coordinate system.

B. Add existing coordinate system files(user-defined)

1) Click "dam" 2->Select .dam File; Click 📃 to return the parent directory. Path: SD Card ->ZHD->Geo Path ->select .dam file (take the addition of DD. dam for example) ->click "OK".

Image: Weight of the second secon	Click "dam" <i>(</i> to add created dam system file.
Projection ddd >	
TruckPoint	
TruckPoint Info	
RegulatePoint	
RegulatePoint Info >	
Data Management	





(2) Return " -> select .dam file->click "Apply"-> select "OK";

🖞 🧶 🔁 🛃 🛦 🛤 🛛 🕄 🐨 ॅंगी ॅंगी 📓 5:46 PM	Return " 🕼 "-> select .dam file
New Prj System Option	
Coord Params of	
Projection ddd >	
TruckPoint	
TruckPoint Info >	
RegulatePoint	
RegulatePoint Info >	
Data Management	



C. Add coordinate system files(Hi-Survey software BYO)

The software adds many coordinate systems all over the world intelligently for reference and selection.

(1) Return" (1) Return (1)

🖞 🎯 🖬 🗃 🛦 🗰 🚯 🛜 ไป ไป 🗿 5:46 рм	Return" 🚳 "
New Prj System Option	
Coord Params of	
Projection ddd >	
TruckPoint	
TruckPoint Info	
RegulatePoint	
RegulatePoint Info >	
Data Management	



(2) Select the continent located, take Eastern Asia for example;

ý 📀 🗊 💽 T	▲ ø 8 좋 5:12 Projection	йі 🙆 5:51 рм
Continent	Eastern Asia	>
Country	China	>
China-2000 Z	Zone3 25	
China-2000 Z	Zone3 26	
China-2000 Z	Zone3 27	
China-2000 Z	Zone3 28	
China-2000 Z	Zone3 29	
China-2000 2	Zone3 30	
China-2000 2	Zone3 31	

(3)Add corresponding coordinate system file into "Predefined List" ->select the file->click "Apply" to apply it to current project.

4 🌖 🗊 🖉 🖌		ала 2 5:53 рм	Select corresponding coordinated
	Projection		system and add it into the list.
Continent	Eastern Asia	>	
Country	China	>	
China-2000 Z	Zone3 25		
China-2000 Z	Zone3 26		
China-2000 Z	Zone3 27		
China-2000 Z	Zone3 28		
China-2000 Z	Zone3 29		
China-2000 Z	Zone3 30		
China-2000 7	Zone3 31		
ψ 🍪 🖬 🏹 🖌	▲ ##	XII 🗿 5:55 рм	Select corresponding coordinated
	Parameters	Apply	system and add it into the list.
Predefined L	List		
UTM-Kertau -	-Zone 48N		
BJ54			
WGS84			
Russia-SK42	-Zone 13 CM 75E		
China-xian80) Zone6 21		
ddd			
China-2000 Z	Zone3 35		
China-2000 7			
011110 2000 2	Zone3 29		



4. Set the base

Set the base, setting parameter of base after bluetooth connection. Including: coordinate of base, communication mode, difference scheme, etc... Base is responsible for transmitting difference to the rover so as to conduct real-time difference. The base can be set by handheld controller only when the device bluetooth has been connected.

(1) Open software "Main interface" ->Device->confirm current connected GPS receiver



(2) For example: Set 11001649 as Base;



For example: Set 11001649 as Base;

- (3) Select "type of antenna" ->input "target height"(Target H)
- PS: Select type of antenna according to the type of receiver, V60forexample.

🍪 ହୁଁ 🗐	🖻 🛦 🛎 🛛 🗑 🗟 और्डि में 9:25 का Set Base Set	
Antenna		
Antenna	[V60] GNSS Antenna	
Target H	2.0000	
Pole Vertical Slant		
Ground Point 🛛 🛃		
В	00:00:00.00000N	
L	023:39:15.53832E	
Configur	Receiver Datalink Other	

Antenna: The system can be default to select corresponding type of antenna (but is can be selected autonomously);

Target H: Target height need to be measured actually. Slant height is normally used for the base and pole height is commonly used for the rover.

- (4) There are three methods to set "coordinate of base":
- A. Input with known point. B. Get by average. C. Select from the collection point library;

A. Input with known point.

1) Ensure accuracy of coordinate of base;

2) Select "geodetic coordinates BLH" or "local coordinates NEZ". (Take BLH for example)



Select "geodetic coordinates BLH" or "local coordinates NEZ". (Take BLH for example)

B. Get by average

1) Click" 🛃 "->Click "OK" to obtain position of base.



C. Obtain from point library

pp7 22:59:00.49689N 113:22:03.60845E

1) Click " 国

Click "				
🍥 🖞 🖬 📓 🛦 👼 🛛 🕄 🍞 วันไว้นไ 🛢 9:33 AM	Click" 🕎 "			
Set Base Set				
Target H 2.0000				
Pole Vertical Slant				
Ground Point 💦 属				
B 22:59:00.64280N				
L 113:22:03.49682E				
Н 34.4758				
Configur Receiver Datalink Other				
🥥 🖞 🖻 🛃 🛦 👼 🛛 💱 🍞 ЭН ЭН 📕 9:34 ам	In the point library, there are			
Raw Data Control Cross-	"original data" and "control point"			
Name B L 🕨	data, etc. for optional.			
pp16 22:59:00.49669N 113:22:03.60811E				
pp15 22:59:00.49679N 113:22:03.60831E				
pp14 22:59:00.49670N 113:22:03.60822E				
pp13 22:59:00.49667N 113:22:03.60794E				
pp12 22:59:00.49678N 113:22:03.60804E				
pp11 22:59:00.49687N 113:22:03.60834E				
pp10 22:59:00.49674N 113:22:03.60830E				
pp9 22:59:00.49706N 113:22:03.60850E				
pp8 22:59:00.49697N 113:22:03.60848E				

(5) Set data chain, including

A. "Internal UHF", B."Internal GSM" (Omitted), C."External Device"

🍳 🖞 🔟 🋃 🛦	∆aa 8.❤?	il îil 📕 9:37 ам	
	Set Base	Set	
Mode			
Datalink	Internal UHF	>	
Parameter			
Channel	ի	8	
Sky Buaterate	e 19200	>	
Power	High	>	
Power saving mode			
Configur F	Receiver Datalink	Other	

Click "Datalink"

There are 5 kinds of data chain, which are Internal UHF, Internal GSM, External Device and External Network (3G).



A."Internal UHF"

- 1) Data link->select "Internal UHF"
- 2) Set "Chanel", "Sky Baud rate", "Power", etc.



3) Other settings (including difference scheme and elevation cutoff angle, etc.)



Difference mode(Diff Mode): Including RTK, RTD and RT20. RTK is defaulted and RTD refers to code difference, (Base is in conformity with Rover). Message type(Message Type): Including RTCA, RTCM (2.X), RTCM (3.0), CMR, NovAtel and sCMRx (Base is in conformity with Rover). Elevation cutoff angle(Elevation): Express cutoff angle of GNSS receiving satellite, which can be adjustable within 5-20 degrees.(Base is in conformity with Rover)

4) Click "Set" to complete the setting of base



C."External Device"

1) Datalink-> select "External Device";



When base data chain selects "External Device", channel of transceiver will be determined by the

2) Other setting (including difference scheme, elevation cutoff angle) method is the same with the Internal UHF method;



3) Click "Set" to complete the setting of base.

5. Set the rover

(1) After completing setting of base, enter into "setting of rover" ->select "Yes"->click "Connect" (take 10211158 for example) to set the rover.



(2) Click "Connect" and select receiver equipped with bluetooth (take 10211158 for example)

Bluetooth	If the device has not been equipped with the bluetooth please refer to
Bluetooth	above "Bluetooth connection"
The paired devices	method for configuration.
11001649 >	
10211158 >	
O None 0.0	
9. Search device	
🌢 🖞 🔟 👩 🛦 🛤 🛛 🕄 🐨 ไล่ไ ไล่ไ 📘 10:10 ам	The connected instrument can
Device	display fuselage number (Such as:
10211158	10211158)
Work Mode: Rover Mode	
Firmware Version: 5.10 GPS Board: 4.93	
Expiration: 2015-07-23	
Expiration: 2015-07-23 Configure	
Expiration: 2015-07-23 Configure Manufacturer Hi-Target	
Expiration: 2015-07-23 Configure Manufacturer Manufacturer Hi-Target Type Blueto Single 0.0	

(3) Set rover "Datalink", including "Channel" and "Sky Baud rate", etc. and click "Set" to complete the setting of the rover.


(4) When base communicates with the rover successfully and differential lamp (middle lamp) in both base and rover flash red.

6. Floating box



"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) \rightarrow RTK fixed solution \rightarrow RTK float solution \rightarrow RTD solution \rightarrow single point positioning \rightarrow 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



Display position information of current point, including position, speed, solution state and time, etc...

RTK Int	Diff Age 2.0	RTK Int Diff Age 2.0	
07-26 H BTKInt	50%	Base Coord	
E 1360114.524 Z 34.4227	9	B 22:59:00.64280N L 113:22:03.49682E	
HRMS 0.0042		Н 36.5135	
VRMS 0.0100 Azi 216:31:46.46998 Velocity 0.09718 UTC 2015-04-28 11:12:56		Baseline 2.0948 Length Azimuth 113:22:47.20560	
Reset RTK	Reset Antenna		
Connect Net Disconnect Net			
Location Info	Base Station	Location Info Base Station	

(2) Stellar map



◇ Distribution situation of projection position of satellite can be viewed. 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.



 \diamond View elevation cutoff angle of GNSS satellite rapidly and drag horizontal slider to input "elevation cutoff angle" and click "Set" to set the elevation cutoff angle of receiving satellite.



 \diamond 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:

Sats 28	PDOP	Elevation 10	(°) Set
SNR			
	46 ⁴⁷ 45 45 39		¹² ⁴³ 40 35 → RTKInt
12 14 1	18 22 25 26 31	32 65 66 67 7	76 77 78 12
	16 35		AT Info

(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.

Sats 28	PDO	Р .9	Elevation(10	?) Set
Prn	Azi	Ele	L1	L2
12	40	18	39	24
14		52	47	34
18	160	40	48	32
22	201	71	50	+ BTKInt 2.0
25	61	54	47	37
26	201	20	40	23
31	282	48	50	37
SATVi	ew	Status	SA	T Info

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 Measurement and collection

After the settings for the above project and base as well as rover are completed successfully, enter into data collection interface for collection. And there are three collection methods.

- 1. Single-point collection,
- 2. Average collection,

3. Automatic collection. Corresponding collection methods can be selected according to different demands.

The steps entering into the collection interface: Survey->Detail Survey;

VerticalVerticalVerticalVerticalVerticalDetail SurveyStake PointsStake LineDetail SurveyStake PointsStake LineStake RoadStore Cross- sectionStake DeintsStake RoadStore Cross- sectionRoad DesignCross-section PointsEarthwork CalculationConfigureProjectDeviceSurveyCoof	Click "Survey"->Detail Survey
• • • • • • • • • • • • • • • • • • •	Detail Survey interface
▶ base8 ♥ ★	
26.00 cm	

1.Single-point collection

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

(1) Click " 🔦 "->" 🍳 "



(2) Input information of collection point, including point name, target height (the first point needs to be measured and the next points can be defaulted) and point position description (non-input optional).Click "OK" to complete the collection of the point.

¥ 👩 🛈	A Save Point	₹ îni îni t	11:25 OK
Name	pt1		
Target H	1.8	⊗	Pole
Desc		Ţ	
Station	0.0000		
Status:RT N:256735 E:136011 Z:35.4187	K Int 5.2308 4.5276 7 0.64262N	≂:0.00 /	10

Name: Input the point name. Target H: Target height (determined according to actual height), including three kinds: Pole, Vertical And Slant. As shown figure:

		Target-H			
Meas	sure-Type	е			
۲	Pole		P [†] R -		
۲	Vertical		v s		
۲	Slant				
Ante	nna				
Ante	nna	[V60] GNSS Ani	tenna >		
Desc: I	Descriptio	on(Optional)			
Station	Station: Station(Non-filling optional)				
The sol	The solution state, position coordinate and				
relative error σ (unit: m) can be viewed in this					
interface (including BLH, local coordinate,					
etc.).					

2. Average collection

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

(1) Click " 🗡 " to collect -> click "OK"

Text Image: Constraint of the second seco	Detail Surve 7 + RTKInt 2.0 238%	ey Config	
♦ ♥ ♥ Graph	a 🔹 🔹 🛿 🕯 🗟	Config	After the average collection, click "OK"
 ♥ Graph N:2567355 E:1360114 	Average	Config	After the average collection, click "OK"
Graph N:2567355 E:1360114 Z:34.5486	Average 5.2394 o:0 5.5287 o:0 5.5287 o:0	Сопfig 0.0096 0.0145 0.1514	After the average collection, click "OK"
● ♥ Graph N:2567355 E:1360114 Z:34.5486 Name	A A A A A A A A A A A A A A A A A A A	Config 0.0096 0.145 0.1514 E ►	After the average collection, click "OK"
Graph R:2567355 E:1360114 Z:34.5486 Name 1	A A AVERAGE 5.2394 cr.0 5.237 cr.0 5.237 cr.0 N 2567355.2475	2.0096 0.0145 0.1514 E ► 1360114.5545	After the average collection, click "OK"
Graph N:2567355 E:1360114 Z:34.5486 Name 1 2	A A AVerage 5.2394 c.0 5.2394 c.0 5.2394 c.0 5.2394 c.0 6.5287 c.0 6.5287 c.0 7.5287 c.0 7.528	Config 0.0096 0.0145 0.1514 E 1360114.5545 1360114.5543	After the average collection, click "OK"
Graph N:2567355 E:1360114 Z:34.5486 Name 1 1 2 3	A Contraction of the second se	Config 0.0096 0.0145 0.1514 E ► 1360114.5545 1360114.5543 1360114.5543	After the average collection, click "OK"
Graph N:2567355 E:1360114 Z:34.5486 Name 1 2 3 4	A A AVERAGE 5.2394 C.C 5.2394 C.C 5.2395 C.C 5.2395 C.C 5.2475 C.C 5.2330 C.C 5.2567355.2330 C.C 5.2567355.2330 C.C 5.2567355.2330 C.C 5.2567355.2330 C.C 5.2567355.2330 C.C 5.2567355.2330 C.C 5.2567355.2330 C.C 5.2567355.2330 C.C 5.257355.2330 C.C 5.257355.2330 C.C 5.257355.2330 C.C 5.257355.2330 C.C 5.257355.2330 C.C 5.257355.2330 C.C 5.257355.2330 C.C 5.257355.2330 C.C 5.25755.2330 C.C 5.257555.2330 C.C 5.257555.2330 C.C 5.257555.2355555555555555555555555555555	Config Config 0.0096 0.0145 0.1514 E ► 1360114.5545 1360114.5543 13601+£543 13601+£543 13601+£228	After the average collection, click "OK"
Image: Constraint of the second se	A Constant of the second secon	Config Config Config Config 0.0096 0.0145 0.1514 E ► 1360114.5545 1360114.5543 1360114.5543 1360114.5212 1360114.5212	After the average collection, click "OK"
Image: Constraint of the second se	A A	Config Config 0.0096 0.0145 0.1514 E ► 1360114.5545 1360114.5543 1360114.5212 1360114.5212 1360114.5212 1360114.5106	After the average collection, click "OK"

(2) Input information of point name -> click "OK" for saving;

🥹 🦞 🇭 📵	د الله الله الله الله الله الله الله الل	Input information of point name (Name), target height (Target H),
Name	pt2 😵	description (Desc) and station
Target H	1.8000 Pole	After inputting, click "OK"
Desc	v 🌗 🖸	
Station	0.0000	
Status:RT N:256735 E:1360114 Z:34.5486 B:22:59:00 L:113:22:0 H:34.5486 Time:2019 Tile:00:00:	K Int 5.2394 4.5287 5. 0.64290N 0:0.0096 03.49692E 0:0.0145 5. 0:0.1514 5-04-28 11:39:44 00.00000	
• • • • • • • • • • • • • • • • • • •	Detail Survey Config	At the moment, the point will be saved
P	Point pt2 is Saved!	
	26.00 cm	

- (3) Cautions: Setting method of average collection:
- 1) Click "Config" in the average collection interface;

Sraph	Average	Config
N:2567355.2386 E:1360114.5222 Z:34.6182).0061).0040).0102
Name	Ν	E Þ
1	2567355.2530	1360114.5140
2	2567355.2387	1360114.5258
3	2567355.2368t	1360114.5215
4	2567355.2331	1360114.5260
5	2567355.2303	1360114.5208
6	2567355.2345	1360114.5239
⊛ s	tart	✓ OK

Click "Config" to enter into average collection setting interface.

2) Times of "Average" ≥ 10 ;

🛉 🛦 🗟 🔮 🖞) S S	11:48 ам	Available to	set the average tin
	Average			
Average Method	Average	>		
Status	Single	>		
Ave Precision		OFF		
Ave Times	10			
σN	0.0200			
σΕ	0.0200	RTKInt 2.0		
σΖ	0.0300			

3. Automatic collection

Automatically record measurement point according to the configured record condition.



(2) Collection setting, including sampling interval (time or distance), point name and number, etc. (user-defined available)

🎯 ହ୍ୟ 🛐 🖲	Auto	🧟 îн îн 🗎 11:51 ам ОК	Auto: Time, Dist, Slant Dist for optional
Auto	Time	>	Interval: Sampling
			interval(Determined as needed)
Interval	5		Prefix: Prefix of name point
Prefix	pt		(user-defined available)
	·		ID: Start number of point
ID	4		Desc: Description
Desc			
		RTKInt 2.0	

(3) Click "OK" to start collection

🇳 ହ୍ୟ 🛜 🖲	a a a a a a a a a a a a a a a a a a a	11:58 ам ОК	Click "OK" to start collection
Auto	Time	>	
Interval	5		
Prefix	pt		
ID	4		
Desc			
		RTKInt 2.0	
🌢 🕂 🌅 🖲		11:59 ам	The collected point can be stored
Text	Detail Survey	Config	automatically.
2.3	* 2.0 * 29%	2	
		\sim	
	Point pt5 is Saved!	5	
	+ pt1	н	
	+ ^{prs}	9	
۲	+ pt4	☀	
		26.00 cm	

(4) Click " 📕 " to stop automatic collection;



4. View all collected points

(1) Click "Project->Points" in the software main interface



\delta 🖞 🖪	A	4	8	ኛ АН АН 📕 2:00 рм	
Coor	d	Stake		Control	
Name	4	N		E ►	
pt8	2567	7355.2376		1360114.5285	
pt7	2567	7355.2266		1360114.5233	
pt6	2567	7354.1453		1360116.9575	
pt5	2567	7355.1295		1360114.6789	
pt4	2567	7354.9076		1360114.6879	
pt3	2567	7355.2386		1360114.5222	
pt2	2567	7355.2394		1360114.5287	
pt1	2567	7355.2378		1360114.5276	
્ Sea	rch			🕸 Set	

Inquire the point library

3.3 Export of data achievement

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

The export procedures are as follows.

(1) Project->Data Transfer



Click" Data Transfer"

(2) Select "Export".

Raw Da	ata Stake	। Point	а́ll 🗋 2:05 рм Control	Select "Export"
Exchange	Types 🤇	Export 🤇	Import	
Directory	/storage/se	dcard0/ZHD/	Out	
E	abc.txt	aj.txt	ttest.txt	
C) tttest.txt	sfhk.txt	result.txt	polski.txt	
zdytxt_04	2814			
User-defin	ed(*.txt)		>	
	~	ОК		

(3) Define name of file exported -> select saving path;



(4) Select file format (take *.dxf for example) ->click "OK" to complete data export.



3.4 staking out

lofting, also called staking-out, refers to mark the plane position and elevation of buildings and structures planned and designed on the design drawing on the ground with certain measuring method according to required precision as the basis of construction.

Confirm coordinate system of staking out coordinate file before staking out and if coordinate system is inconsistent, the staking out will fail.

•Stake line

Procedure:

1. Click "Survey"->Stake Points (Enter into stake point interface)





2. Click" \rightarrow "(enter into point selection interface)

	Click " 🔶 "
 ↓ pt1 ↓ pt5 ↓ pt4 ▲ 	
27.18 cm	



2. This step has three point selection methods (Choose either), namely, A. Input coordinate; B. Select from coordinate library; C. Select from graph.

A. Directly input coordinate

1) Input "Name"->Input NEZ coordinate->Click "OK"



2) Add the input coordinate point to "Stake points list"->Click "OK" to start stake.





🎯 🖞 🛅	A 🛎 💧	🛜 📶 📶 📋 3:35 рм
Coord P	oint Stake Poin	t Control >
Name	Ν	E 🕨
pt10	2567355.2398	1360114.5382
pt9	2567355.2422	1360114.5345
pt8	2567355.2376	1360114.5285
pt7	2567355.2266	1360114.5233
pt6	2567354.1453	1360116.9575
pt5	2567355.1295	1360114.6789
pt4	2567354.9076	1360114.6879
pt3	2567355.2386	1360114.5222
pt2	2567355.2394	1360114.5287
pt1	2567355.2378	1360114.5276

Jump into point library and select coordinate point.

2) Tick Save to stake Pts Lib->Click "ok"



Tick Save to stake Pts Lib->click "ok", add the coordinate point from the point library to the stake point library.

3) Input keyword->Click " Q " of point name in "Name"



Input keyword of "Name"

🎯 🖞 🖸	A #	8	Ŝ xul x	dl 📋 3:4	2 рм
	S	earch Res	ults	ОК	
Pt Name	•	Ν		Е	►
pt4	256	57354.9076	1360	114.68	79
pt4	256	57354.9076	1360	114.68	79

Inquire result, select the required point and click "OK" to start stake.

4) Start staking-out





C.Select from graph;

1) Click "Select stake point on Map. Click " Select stake point on Map. Click " sequence or negative sequence for stake.

🥹 🖞 🗐	▲ ● 8 (令 加 加 ● 3:50 PM Select Stake Point OK	Click "
Detail	< > 🤉 🛒 🛃	
Name:	þt4	
N:	2567354.9076	
E:	1360114.6879	
Z:	34.6027	
	Save to Stake Pts Lib	



2) Click "OK" to start staking-out





Stake interface (indicate position of target point) 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

•Stake line

- 1. Click "Survey"->"Stake Line"->Click" 🔌 " to enter into the stake line interface; Click

"Survey"->"Stake Line"





2. Click " Solution "->Click "Add"



🚳 ų 🗊 🖌	A 444	8 📚 ,'II ,'	1 📋 4:00 рм
	Stake	Line Lib	ОК
Line Name	Туре	2 Points	Start N
\oplus Add	🖊 Edit	🖻 Delete	···· More

3. Define straight line: Line



A. "2Points to define the line"

1) Select "2Points"->Input "name of line" ->Select "Start Point" and "End Point" ->Click "OK";

😵 y 🔋 🛦 🛤	8 🗢 11 11 🛔 4:05 PM Line OK	
Туре		Tick "2Points" to define the straight
Line	● 3D-line	line;
Method		Line name: Define the straight name;
2 Points	Point+Azi	"2Points to define the straight line"
Name		need two elements of "Start Point"
Line Name	LI	and "End Point". (Addition method
Start Point	🛞 式 🐋	shall be in conformity with the method to add the stake coordinate
Name		point in the "stake point").
N	0.0000	
o y 🖬 A 📾	Line	Select "Start Point" and "End Point" and click "OK"
Start Point	🛞 🛒 😿	
Name	pt17	
Ν	2567355.2492	
E	1360114.5343	
z	34.6107	
End Point	* 🗟	
Name	pt14	

2) At the moment, the straight line is added successfully, which also can be edited and deleted, etc.

Line Type L1 Line Or Add ✓ Edit Or Y Or A Or Y Or A Stake Line Line Type L1 Line	t The Line Line Line Line Line Line Line Lin	ОК Start N 2567354.94 е ••• Моге	The added straight line can be viewed in the interface.
Line Type Name Line Line Add Line Stak Line Type Line Line	2 Points Yes	Start N 2567354.9	viewed in the interface.
L1 Line Add ✓ Edition ♦ ● Add ✓ Edition Stake Line Type L1 Line	Yes t	2567354.9 e •••• More	
 Add ✓ Edition ★ ■ Stake Line Line 	t 前 Delet	е •••• Моге	
Image: wide wide wide wide wide wide wide wide	8 ╤×I	1 👬 📋 4:13рм	
Line Type Name Li Line		ОК	The operation, such as edition and
L1 Line	2 Points	Start N	delete, can be conducted by selecting
	Yes	2567354.90	a certain straight line.

B. "one point + azimuth angle"

1) Click "Add"->line->"Point + Azi"



2) Select "Start point"->Input "Azi"->Click "Length" to input length of stake line->Click "OK" to complete the addition of straight line;



3) Add the straight line successfully

Stake Line Lib OK Line Type 2 Points Start N
Line Type 2 Points Start N
Name
L1 Line Yes 2567354.9
L2 Line No 2567355.2

3.Start to stake after adding the stake straight line successfully.

(1)Click " \rightarrow "->click "Milestone" to input milestone of point to be staked->click "OK" to enter into the stake interface.

Cautions: Where the milestone and offset can be accumulated automatically according to the increment.





Stake direction: Prompt direction of target location Station of current stake: Refers to current milestone of stake

(2)Click "
 " again to enter into next point station in which station and offset can be accumulated automatically based on increase.

🚳 Y 🗊 🗚	8 🖘 8	ăil 📋 4:42 рм
	Sample Point	ОК
Station		
Milestone	20.0000	
Step	10.0000	▼
Offset		
Offset	0.0000	
Step	0.0000	•
Direction		Right
Other		

•Dxf stake

Procedure:

1. Import Dxf file

1) Return to main interface>Project->Data Transfer;


Under "Project" of the main interface>Data Transfer;

2) Select Stake Point->Import;



3) Select "Dxf" file to be imported -> click "OK"



4) Click "Blank" part->select import format, such as (Name,N,E,Z, etc.), and click "OK" to complete the import.

Set Custom	n Format	ОК	
Import Content			
ID,Name,N,E,Z	nt format		
Supported Fields	Selected		
ID	ID	Selecte	d item
Name	Name	4	
Ν	Ν		
E	E		
亩 Delete 🔺	Up 👻	Down	

2.Return to the stake interface and make stake using the same methods as that of stake line.



Quick Guide of SurvCE

4.Quick Guide of SurvCE

•Establish a new project

1.Open "SurvCE" software



".

2.Select "Select New / Existing Job"->Input "file name" ->Click"



3.After project establishment, enter into "setting" in the coordinate system.

There are two ways: A. User-defined coordinate system; B. Import existing coordinate system.

A.User-defined coordinate system;

1)"System"-> Edit Projection List -> Add User Defined;

SurvCE C C C C C C C C C C C C C C C C C C	Click "System"->Edit Projection List
SurvCE Coordinate Projection Coordinate ProjectiProjection Coordinate Projection Coordinate Projection Coordin	Add User Defined: add user-defined coordinate system.

HI • TARGET		Quick Guide of SurvCE
?) Input information of	f coordinate ->cli	≥k" <mark>✓</mark> "
SurvCE	# č] • œ 7	Information of coordinate system: Including name of system (user-defined named), projection and
System: 123		measuring scale (Scale Factor).
Projection Transv	verse_Mercator	
Datum:		
Load File	User Defined	
Scale Factor:	1	
C. Meridian:	0	
Zone Width:	6	
Lat. of Origin:	0	
False Northing:	0 m	
False Easting: (0 m	
L		

B. Import existing coordinate system.

1) Click "Add Predefined"->Select coordinate system->Click" volume (in addition of

coordinate system

SurvCE 👫 🎦 < 🔁 7:31	Click "Add Predefined"
Selection List: USA/NAD83/KY North MALAYSIA STATE/GDM2000/SELANG MALAYSIA STATE/GDM2000/JOHOR MALAYSIA/STATE/GDM2000/PERAK UTM/WGS 84/Automatic Zone Select	
Delete Add Predefined Edit Add User Defined	

SurvCE	∑] ◀× (로 7:32	Click " 🗸 " to complete the
<mark></mark> Coordinate Projec	tion	addition of coordinate system
Country:		
USA/NAD83		
LITHUANIA	~	
MIDDLE EAST		
MOROCCO		
MALAYSIA		
MALAYSIA STATE	_	
NAVAJO NATION	\sim	
AK V		
AK VI		
AK VII		
AK VIII		
AK IX	_	
AK X	\sim	

4.Connect instrument and set Base

The connection between handheld controller and receiver is also completed by bluetooth.

1) Click "Equip"->GPS Base



urvCE 👫 ∑ 📢× 🖅 8:02	Interface of GPS Base setting:
	Manufacturer: Select "Hi-Target"
urrent Comms Receiver RTK	Model (optional): Select
Manufacturer: Hi-Target Model: V60	corresponding model
Save Rename Delete Defaults	Model drop-down box for selection
GPS Base 💽 🗸	
Manufacturer: Hi-Target	
Model: V60 V30 HiTarget H32 QStar 6 QStar 8 Save Rename Delete Defaults	



4) Select instrument as "Base">Set Device PIN>click ", at the moment, the bluetooth connection is successful.

Please select from these available device Pocket_PC 10214309 11001649	click
SurvCE 🗰 🎦 ┥× 建 8:30 È Bluetooth Devices	Set Device PIN
SurvCE 🕂 🏠 🔹 8:30	Set Device PIN
SurvCE Asse BT Device Receiver Name Receiver ID	Set Device PIN
SurvCE A State of the set of the	Set Device PIN
SurvCE Asse BT Devices Receiver Name Receiver ID 11001649 11001649 00:8	Set Device PIN
SurvCE	Set Device PIN
SurvCE C Set Device Name Set Device Set Device Name Set Device Set Device Set Device Set Device Name Set Devic	Set Device PIN
SurvCE	Set Device PIN



3) Click "RTK" to configure base

(Take built-in UHF for example) ->set difference scheme-> \mathbf{X} , configure power, transceiver channel and air Baud rate (Base shall be in conformity with Rover) ->click " \mathbf{V} " to save the setting.



SurvCE	Click enter into transceiver setting
SurvCE EN Configure Internal UHF Radio Configure Internal UHF Rad	Power: Low, medium and high for optional Channel:1-116(DDTR domestic transceiver) 1-32 (PCC imported transceiver) Base is in conformity with the rover Air Baud rate Base is in conformity with the rover When the setting is complete, click"

6)For obtaining coordinates of base, click "Read from GPS"->smooth obtaining ->click "Yes"



¥ SurvCE	Average beginning (available to stop or cancel smooth)
Taking Reading #3 of 10 3 Valid readings recorded.	
SATS:14 STATUS:AUTONOMOUS HSIG:8.989 VSIG:19.711 Stop Averaging and Store Cancel Averaging	
₽ SurvCE 📰 🏹 🕊 📼 🗙	Click "Yes" for completion
Broadcast ID: Latitude: N 22°59'01.05689" Longitude: E 113°22'03.45975" Ellipsoid Hgt: 123.994	
Continue with Base Setup? Yes <u>No</u>	

At the moment, the setting for the base is completed and middle lamp of base begins to flash and the difference is transmitted.

5. Set the rover

1) Click "Equip"->GPS Rover-> select Man facture and Model;



2) Configure the bluetooth (with the same method as Base method) > 😯 -> Find Device ->Set Device PIN (PIN code: 1234, same as that of base);

SurvCE	Click "Comms" Type: Select "Bluetooth" Click "
NurvCE III 7 ← C ×	Click "Find Device" to look for bluetooth device
Select Rover BT Device	
Receiver Name Receiver ID 11001649 11001649 00:8	
Find Device	
Set Device Name	
Set Device <u>P</u> IN	

3) Select connected device (for example: 10214309 is rover) -> click "_______", and the bluetooth connection is successful.





4) Click "RTK" setting (difference scheme, channel and air Baud rate shall be in conformity with those of base) and click "

SurvCE Image: Constraint of the second	Click "RTK" to enter into RTK setting interface(Take UHF for example); Select "Internal UHF" Including format of RTCM, sCMRx, and RTCM3.0, etc(The base shall be in conformity with the rover.)
SurvCE SurvCE	Click to enter into the transceiver setting interface.
Cancel	



6. Click "Store Points" to enter into measurement interface



Click "Store Points" to enter into measurement interface



Technical parameters

- GNSS specification
- Precision of receiver
- UHF transceiver
- Interfaces
- Physical characteristics
- Environment requirements

5.Technical parameters

This chapter introduces:

- GNSS specification
- Precision of receiver
- UHF transceiver
- Interfaces
- Physical characteristics
- Environment requirements

5.1 GNSS specification

GPS: Synchronously track L1C/A, L2E, L2C and L5.
BDS: Synchronously track B1 and B2.
GLONASS: Synchronously track L1C/A, L1P and L2C/A (only limited to GLONASSM) as well as L2PSBAS, WASS, MSAS and ENGOS
GALILEO: (upgrade reservation)
Generally, initialization time<10s
Initialization reliability>99.9%
1Hz, 2Hz, 5Hz, 10Hz, 20Hz and 50Hz positioning output
Difference scheme supports: sCMRx.CMR.CMR+.RTCM2.1.2.2.2.3.3.0.3.1.3.2
Navigation output format supports: ASCII:
NMEA-0183GSV.AVR.RMC.HDT.VGK.VHD.ROT.GGK.GGA.GSA.ZDA.VTG.GST.PJT.PJK.B
PO.GLL.GRS.GBS

5.2 Precision of receiver

Precision of static state and rapid static state: Horizontal: $\pm(2.5 + 1 \times 10D)$ mm Vertical: $\pm(5 + 1 \times 10D)$ mm RTK positioning precision Horizontal: $\pm(10 + 1 \times 10D)$ mm Vertical: $\pm(20 + 1 \times 10D)$ mm

5.3 UHF transceiver

Compatible with of all kinds of Hi-Target products of transmit-receive radio module of 460MH. Differential signal received and transmitted function and the transmitting power can be adjustable among 1W, 2W and 5W. Total 116 channels are available for flexible switchover. 9.6Kbps wireless transmission rate is defaulted and 19.2Kbps wireless transmission rate is at maximum.

5.4 Interfaces

Two serial interfaces RS232 One USB interface One SIM card interface One SD card interface One UHF antenna interface One bluetooth interface One internal lithium battery interface Two external DC power import interfaces

5.5 Physical characteristics

Internal IGB memory: Volume: φ182mm×h98mm Weight: 1.25kg (Not including lithium battery) Resist natural falling from the height of 2m and temporary immersion underwater of 2m. Internal large capacity lithium battery with 5000m Ah for power supply. Continuous working hours of new battery: Static state 12 hours, 9 hours under the GPRS mode, 7 hours for 2W radio transmission. Available for external DC power supply and wide input voltage within 6-28V, and automatic switchover is available between internal and external power supply.

5.6 Environment requirements

Protection grade: IP67 Working temperature:-40℃-65℃ Storage temperature:-40℃-75℃ Power consumption of receiver (under the static state):≤3.5W 130

CHAPTER 6

Trouble shooting

- Reset operation
- Upgrade firmware
- Correction data transmitting issues
- Internet accessing issue
- Transceiver issue
- Signal descriptions of 5-core/8-core socket
- Signal descriptions of V60 indicator lamp

6. Trouble shooting

6.1 Reset operation

Reset mainboard:

Purpose: Restore the mainboard to the initial mode.

Usage status: 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. Method and Procedure: Press Fn for super long time (hear of Ding-dong sound four times).

6.2 Upgrade firmware

Purpose: Optimize instrument system or upgrade the instrument firmware to the latest version to solve relevant problems.

Usage status: When the bluetooth is not connected, satellite searching fails and network connection fails and difference transmission fails, the operation can be conducted in case that mainboard resetting does not work.

Procedure/Method:

1.Connect the V60 by USB port



2. Then the update disk appear, copy the firmware software file to the "update disk"

📑 Videos	;			
💻 Comput	er			
🚢 Local 🕻	Disk (C:)			
👝 Local 🕻	Disk (D:)			
👝 Local 🛙	Disk (E:)			
👝 Local 🛙	Disk (F:)			
👝 Remov	vable Disk (I:)			
👝 update	e (K:)			
👝 static ((L:)			
👝 Remov	vable Disk (M:			
🗣 Network	:			
8	items			
	and the second se	-	_	-
🗢 📥 🕨 Compute	er ▶ update (K:)	 		
Edit View Tools	Help			
nize 🔻 📄 Open	New folder			
avorites	Name	Date modified	Туре	Size
Desktop	V60-33-P3.103.htb	30.09.2014 11:27	HTB File	311 KB
Downloads Dropbox				

3. Then reboot the V60 and you will hear the voice "Upgrade firmware.... Upgrade successful" and finish the upgrading.

(Other operations related to the receiver, including judging that Base or Rover does not transmit the difference data, and how to troubleshoot problems in case of disconnecting with the network and incompatibility of communication between XDL transceiver and other transceivers).

6.3 Correction data transmitting issues

1. Base does no transmit the difference data

Judgment: Under UHF mode, differential lamp (middle lamp) does not flash (The red lamp flashes regularly under the normal condition). There is no public satellite displayed on the software screen and the solution state is single point. Under the network mode, the middle differential lamp does not flash as yellow green. (Namely, the green lamp is on constantly and yellow flashes regularly.).

Solutions:

1) Inspection of hardware and setting (Premise: The environment where the receiver is located is in a good condition without serious barrier, severe electromagnetic interference, etc. and the parameter of handheld controller is set correctly);

2) **Mode of transceiver** (The following mentioned transceiver shall be used under the supporting mode: Domestic-domestic, import-import, and their frequency band shall be consistent.);

A. Confirm whether the rover is equipped with internal transceiver receiving antenna;

B. Confirm whether the rover is within signal cover of transceiver in the base (Generally, the cover range of external transceiver is within 20km and that of internal transceiver is within 5km. And specific circumstance can be determined according to actual region and landform.)

C. Confirm whether the channel and Baud rate set by rover is in conformity with that by base;

D. Confirm whether the contact between internal transceiver module and receiver is in a good condition;

E. Confirm whether the function of internal transceiver is in normal condition;

3) Network model

Confirm whether the receiver is connected with the network. If connected with the network, the receiver can make ding-dong sound once (the receiver with voice), at the same time, the differential signal lamp can be green constantly; Otherwise, please check whether the SIM card is in normal condition (whether the phone can connect with network normally when the SIM card is inserted into the phone), whether it is inserted into the card slot of receiver or handheld controller (handheld controller difference) correctly, and whether the external GPRS antenna is installed (Minicomputer); B. Confirm whether the receiver logins in the server normally, if it logins in the server, the receiver can make ding-dong sound once again and broadcasts "connecting successfully", otherwise, please call query staff for confirming whether the server is running normally;

C. Confirm whether differential lamp (middle lamp) of receiver flashes normally. C o n s t a n t green lamp is on that indicates that the network has been connected, red lamp flashes once for 1s that indicates that the difference is transmitted once for 1s).

4) Power off and reboot;

- 5) Reset the mainboard;
- 6) Refresh receiver firmware.

2. Rover does not receive difference.

Judgment: Middle differential lamp does not flash (Red lamp flashes regularly under the normal condition.). There is no public satellite displayed on the software screen and software collection interface and the solution state is single point.

Checking methods:

1) Inspection of hardware and setting (Premise: The environment where the receiver is located is in a good condition without serious barrier, severe electromagnetic interference, etc. and the parameters of handheld controller are set correctly);

2) **Mode of transceiver** (The following mentioned transceivers shall be used under the supporting mode: Domestic-domestic, imported-imported, and their frequency band shall be consistent);

A. Confirm whether the rover is equipped with internal transceiver receiving antenna;

B. Confirm whether the rover is within signal cover of transceiver in the base (Generally, the cover range of external transceiver is within 20km and that of internal transceiver is within 5km. And specific circumstance can be determined according to actual region and landform);

C. Confirm whether the channel and Baud rate set by the rover is in conformity with that by base;

D. Confirm whether the contact between internal transceiver module and receiver is in a good condition;

E. Confirm whether the function of internal radio is in normal condition;

3) Network model

A. Confirm whether the receiver is connected with the network; if connected with the network, the receiver can make ding-dong sound once (the receiver with voice), at the same time, the differential signal lamp can be green constantly; Otherwise, please check whether the SIM card is in normal condition (whether the phone can connect with network normally when the SIM card is inserted into the phone), whether it is inserted into the card slot of receiver or handheld controller (handheld controller difference) correctly, and whether the external GPRS antenna is installed (Minicomputer);

B. Confirm whether the receiver logins in the server normally, if it logins in the server, the receiver can make ding-dong sound once again and broadcasts "connecting successfully", otherwise, please call query staff for confirming whether the server is running normally;

C. Confirm whether differential lamp (middle lamp) of receiver flashes normally (Constant green lamp is on that indicates that the network has been connected, red lamp flashes once for 1s that indicates that the difference is transmitted once for 1s).

- 4) Power off and reboot;
- 5) Reset the mainboard;
- 6) Refresh receiver firmware of rover.

6.4 Internet accessing issue

ection of hardware and setting (Premise: The environment where the receiver is located is in a good condition without serious barrier, severe electromagnetic interference, etc. and the parameters of handheld controller are set correctly);

Solutions:

1) Check whether the settings are correct [IP address, port, operator, communication mode, grouping number, group number (or source node, VRS user name, code, data protocol), etc.] (In case of minicomputer, it must be connected external GPRS antenna);

2) Confirm whether phone card is in arrears condition or is damaged and the installation is correct (whether it is loose); Check whether the phone card is compatible;

3) Check signal strength of GPRS network in the place where the instrument is located, if it is lower than 20, it indicates that local signal is poor. Please try to replace the network or position;

4) Inquire whether CORS server is in normal condition (if it is connected with VRS, it is required to confirm whether the account is effective or is occupied), and judge whether the problem is caused by the machine by logging in with other instrument;

5) Check whether the network module of the receiver is in normal condition(Check module by pressing Key F2 for 6s for V30)

6) Check whether the network module of the receiver is loose, if it is, directly weld to reinforce it;

7) Reset the mainboard;

8) Refresh receiver firmware.

6.5 Transceiver issue

Hi-Target radio

Under normal operation of the receiver, there is no difference communication between base and rover, namely, red differential lamp of base flashes regularly and differential lamp of rover does not flash (stating the rover does not receive the difference). Then it is caused possibly by the incompatibility of transceiver.

1) Please check whether the transceiver module is inserted properly;

2) Whether the antenna is installed properly;

3) Whether the selected air Baud rate (of base and rover) is consistent, generally, 19200 and 9600 can be optional;

PCC radio

1) Please check whether the transceiver module is inserted properly;

2) Whether the antenna is installed properly;

3) Whether the selected air Baud rate (of base and rover) is consistent, generally, 19200 and 9600 can be optional;

4) Check whether the transceiver frequency parameter is in conformity with the communication protocol, if not, please configure them by using the transceiver management software.

6.6 Signal descriptions of 5-core/8-core socket

Small 5-core signal			Big 8-core signal
1	Ground GND	1	Data input RXD
2	Ground GND	2	USB D -
3	Power supply into Vin	3	USB D +
4	Data input	4	USB V +
5RXD	Data output TXD	5	Power supply into Vin
		6	Cable insert mark GC-2
		7	Data output TXD;
		8	Ground GND

Table 1.1 Signal descriptions of 5-core/8-core socket

6.7 Signal descriptions of V60 indicator lamp

Operation	Meaning	Big 8-core signal
Power lamp	Always on	Normal voltage Internal battery voltage>7.6V,
(Yellow)		external voltage>12.6V
Power lamp	Always on	Normal voltage7.1V <internal battery="" td="" voltage≤7.6v,<=""></internal>
(Red)		11V <external td="" voltage≤12.6v<=""></external>
	Slow flash	Under voltage: Internal battery voltage≤7.1V,
		external voltage≤11V
	Quick flash	Indicate electric quantity Quickly flash 1-4 times for
		every minute to indicate electric quantity
Signal lamp	Off normally	In case of not using GSM
(Green lamp)		
	Always on	GSM is connected with server.
	Slow flash	In case of using GSM, indicate that the GPRS
		network has been logged in.
	Quick flash	In case of using GSM, indicate that the GPRS
		network is being logged in.
Data lamp	Ouick flash	1. Transmit-receive data of data chain (Rover only
(Red lamp)	Quick nucli	prompts the reception and the base only prompts
		the transmission)
		2. The data collected under the static state
	Slow flash	An error occurs under static state There is not
		sufficient memory space available in FLASH.
	Always on	Data chain device that is being used by the rover or
		base cannot carry out communications, because the
		communication module fails without data output

Satellite lamp	Always on	Satellite lock	
(Green)			
	Slow flash	Search the satellite or unlock satellite	
	Quick flash	In the case of the satellite is locked or inquiring,	
		report number of satellites once every minute	
	Off normally	1. When resetting the receiver, the mainboard fails	
		2. Under the static mode, the mainboard fails	
		without data output	