

LT400HS | GETTING STARTED GUIDE

GNSS/GIS HANDHELD RECEIVER



Copyright

Copyright 2009-2013 CHC Shanghai HuaCe Navigation Technology Ltd. All rights reserved. The CHC is trademark of Shanghai Huace Navigation Technology Limited. All other trademarks are the property of their respective owners.

Trademarks

All product and brand names mentioned in this publication are trademarks of their respective holders.

Safety Warnings

The Global Positioning System (GPS) is operated by the U.S. Government, which is solely responsible for the accuracy and maintenance of the GPS network. Accuracy can also be affected by poor satellite geometry and obstructions, like buildings and heavy canopy.

FCC interference statement

This equipment has been designed to comply with the limits for a class B digital device, pursuant to part 15 of the FCC Rules in the Portable Mode. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

Operation is subject to the following two conditions:

(1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.



Changes or modifications made to this equipment not expressly approved by Shanghai Huace Navigation Technology Ltd. may void the FCC authorization to operate this equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The SAR limit adopted by USA (FCC) is 1.6 Watts/kilogram (W/kg) averaged over one gram of tissue. Device types (FCC ID: SY4-B01003) has also been tested against this SAR limit. The highest SAR value reported under this standard during product certification for GSM mode is 0.86 W/kg. The highest SAR value reported under this standard during product certification for 2.4GHz WLAN mode is 0.16 W/kg. The highest SAR value reported under this standard during product certification for simultaneous mode is 1.02 W/kg. This device was tested for typical body-worn operations with the back of the handset kept 0 cm from the body.

To maintain compliance with FCC RF exposure requirements, use accessories that maintain a 0 cm separation distance between the user's body and the back of handset. The use of belt clips, holsters and similar accessories should not contain metallic components in its assembly. The use of accessories that do not satisfy these requirements may not comply with FCC RF exposure requirements, and should be avoided.

Table of Contents

1.	Introduction.....	1
1.1.	Technical Assistance.....	1
1.2.	Your Comments.....	1
2.	Overview.....	2
2.1.	Features.....	2
2.2.	Specifications.....	2
3.	Description.....	4
4.	First-Time Use.....	6
4.1.	Inserting the Battery, Storage card and SIM card.....	6
4.2.	Charging the Battery.....	6
4.3.	Turning the device on/off or standby.....	7
4.4.	Connect to Office Computer.....	7
4.5.	Installing Software.....	8
4.6.	Using GNSS Positioning.....	8
4.7.	Using GNSSViewer.....	8
4.8.	Using the camera.....	10
4.9.	Establishing Wireless connection (Bluetooth /Wi-Fi).....	10
5.	Getting started with SurvCE 3.....	11
6.	Getting started with DigiTerra explorer 7.....	12
7.	Outputting NMEA 0183 data from the 9-pin port.....	13
8.	Frequent Settings.....	14

1. INTRODUCTION

Thank you for choosing LT400HS GNSS Handheld Receiver.

This Getting Started Guide will provide useful information about your receiver. It will also guide you through your first steps of using LT400HS in the field.

1.1. TECHNICAL ASSISTANCE

If you have a problem and cannot find the information you need in the product documentation, contact your local dealer from which you purchased the LT400HS. Alternatively, please request technical support using the CHC Website at (www.chcnave.com) or CHC technical support email support@chcnave.com

1.2. YOUR COMMENTS

Your feedback about this Getting Started Guide will help us to improve it in future revision. Please e-mail your comments to support@chcnave.com

2. OVERVIEW

2.1. FEATURES

LT400HS is a handheld GNSS RTK receiver and a precision GIS data collector that incorporate a survey-grade professional L1/L2 GNSS core engine as well as Microsoft Windows Mobile® 6.1 operating system. LT400HS comes in a rugged design suitable for all your demanding survey and construction environment as well as numerous mapping applications. LT400HS is optimized to run with Carlson SurvCE® 3 field survey software and/or DigiTerra Explorer 7 GIS data collection software.

2.2. SPECIFICATIONS

GNSS characteristics

- 120-channel professional NovAtel OEM6 core
- GPS+GLONASS, L1/L2
- SBAS support (WAAS, MSAS and EGNOS)
- Update Rate: 1Hz
- Time to first fix : < 50 s typical
- Initialization time in Network RTK mode: <30 s typical
- External Antenna support

Performance specifications ⁽¹⁾

- Autonomous: < 2 m RMS
- SBAS real-time accuracy: < 1 m HRMS typical
- Network RTK
 - Horizontal (External Antenna): 2 cm + 1 ppm
 - Horizontal (Internal Antenna): < 10 cm + 2 ppm
 - Initialization time: < 30 s typical
 - Initialization reliability: > 99.9%

System configuration

- Windows Mobile 6.1 operating systems
- 3.7" VGA sunlight readable screen
- 806 MHz Intel PXA processor
- Internal memory : 256MB RAM and 256 MB internal flash storage
- Micro SD card slot up to 8 GB
- 5.0 megapixel camera with autofocus

Communications

- GSM/GPRS (850/900/1800/1900 MHz) phone and data transmission
- Bluetooth V2.1 Class 3
- 802.11 b/g wireless LAN
- Built-in microphone and speaker
- RTCM and NMEA 0183 protocol support

Physical

- Size (L x W x H): 158 mm x 85 mm x 25mm
- Weight: 0.600 Kg with battery
- Working Temperature: -20 °C to +60 °C
- Storage Temperature: -30 °C to +70°C
- Dust proof: IP65
- Shock : survive a 1.2 meters drop onto concrete

Electrical

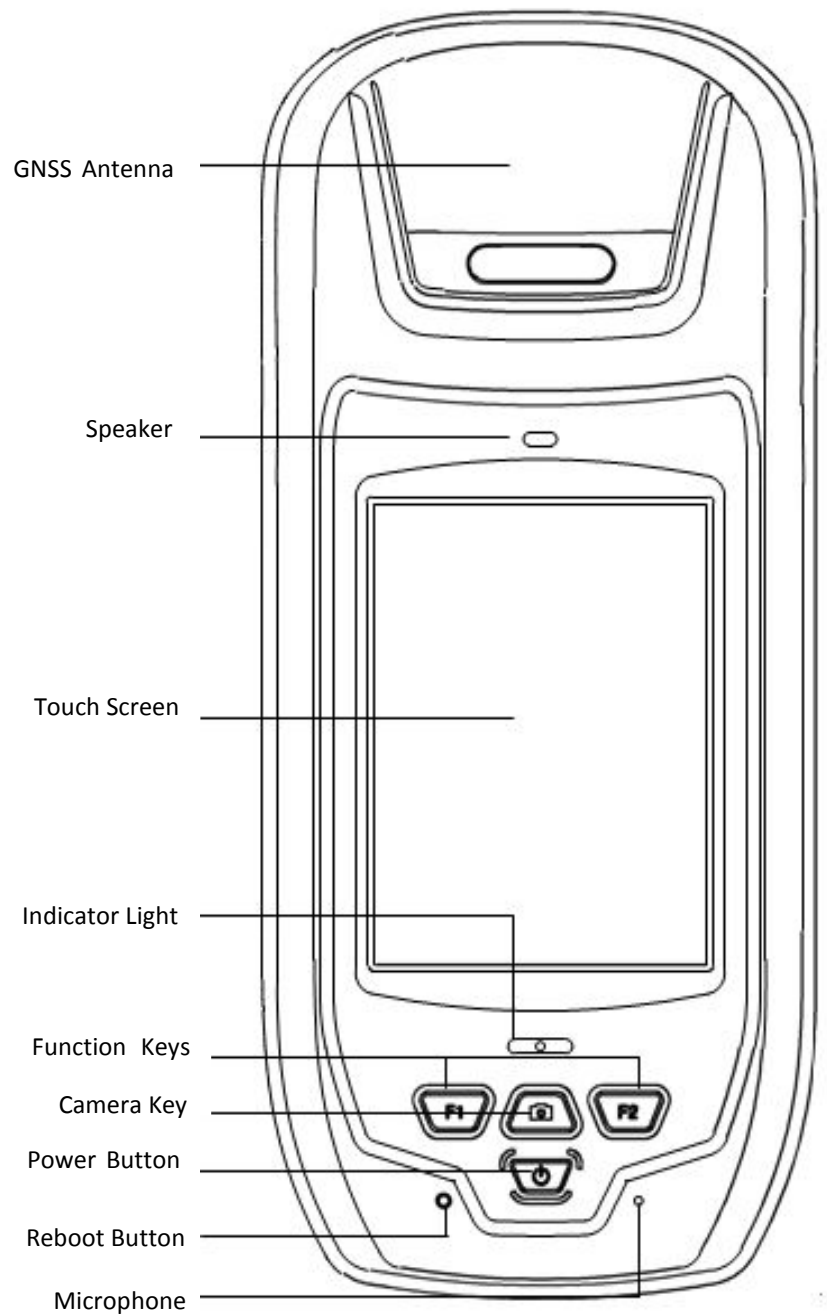
- Li-ion battery capacity : 6800 mAh
- Battery life : up to 8 hours

Package content

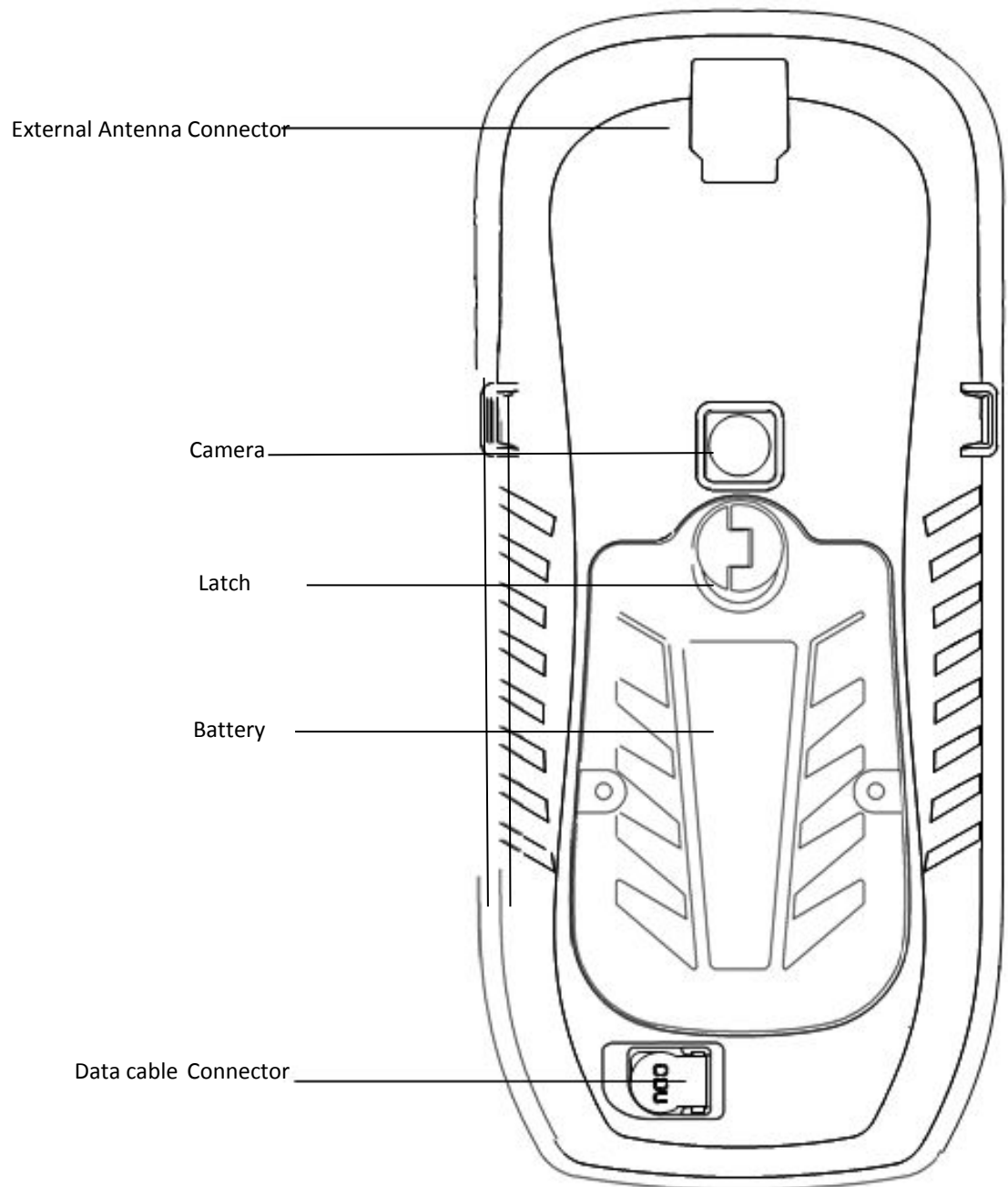
- 1x LT400HS Handheld GNSS Receiver
- 1x Li-Ion battery
- 1x AC Adapter
- 1x Stylus
- 1x 4GB memory card
- 1x LEMO to USB Data Cable

3. DESCRIPTION

Front view



Rear view



4. FIRST-TIME USE

4.1. INSERTING THE BATTERY, STORAGE CARD AND SIM CARD

- Lift the latch of the battery and turn it counter-clockwise to the unlock position (vertical). Then, detach the battery from the device. See Figure 1.

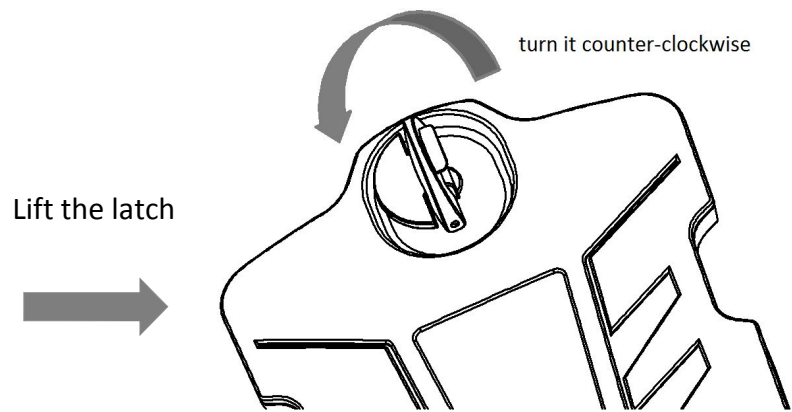


Figure 1

- Two slots are located at the battery compartment: the SIM card slot and TF card slot. Please insert the cards according to the icons engraved on the interior of the battery compartment.
- Insert the Li-Ion battery onto the battery compartment, turning the latch clockwise to fix the battery.

Note: When new all devices have been protected by protective film. Please remove the protecting film before the first time use.

4.2. CHARGING THE BATTERY

- Fix the appropriate plug to the AC Adapter and connect the USB cable.
- Connect the AC adapter to a power plug.
- Connect data cable to the LT400HS to start charging the battery.
 - If the receiver is off, a charging icon will display on the screen.
 - If the receiver is on, a charging icon will show on the top right corner of the screen.

Note: You can also connect LT400HS to your computer via power cable to charge the receiver but charging time will be longer.

4.3. TURNING THE DEVICE ON/OFF OR STANDBY

- Make sure that the receiver battery is charged OR that the LT400HS is connected to PC via data cable (internal battery shall always be installed).
- Press the power button for 3-5 seconds to turn on/off the device.



Note: If you need to perform soft reset, use the stylus to press the **Reset** key (located beside the power button). This will re-boot the Windows Mobile operating system. Before operation, please make sure your task performing has been stored.

4.4. CONNECT TO OFFICE COMPUTER

- To install software or access to the LT400HS, you can use your office computer and a Microsoft ActiveSync connection to transfer the installation files from the computer to LT400HS.
- It means Microsoft Windows Mobile Device Center or ActiveSync should first be installed on your computer. You can download this software for free from the Microsoft website.

Note : choose the ActiveSync version that is suitable for your computer.

- Connect the USB data cable between the LT400HS and a USB port on your computer.
- Turn on LT400HS. Wait the computer to start automatically the connection through the synchronization software.
- Sync icon will appear at the bottom right corner of your computer screen. Simultaneously a Synchronization Setup Wizard window will pop up, you can close it to continue by clicking **Cancel**.
- You can click Explore on the Microsoft Sync window to explore the folders on LT400HS, and exchange data between LT400HS and your computer.



4.5. INSTALLING SOFTWARE

- First, make sure LT400HS is connected and synchronized with your computer.
- Select and click on the installation file to install, or if the installation file runs only on LT400HS, please copy the file to LT400HS, double click it to install. You can also copy files to LT400HS's relevant location to save it.
- Choose a location to install the program, click the Install icon to start installation.

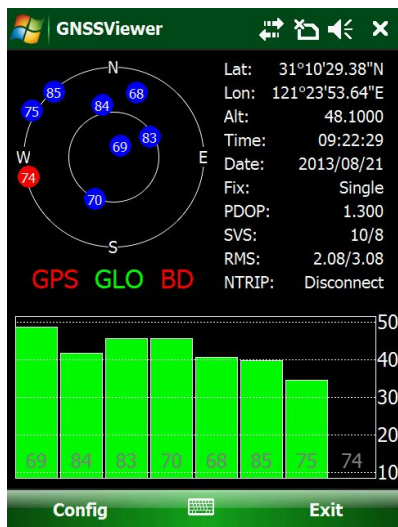
Note: CHC recommends installing 3rd party software on **Device Memory** and select the **Extended Storage SD card** to save your projects data.

4.6. USING GNSS POSITIONING

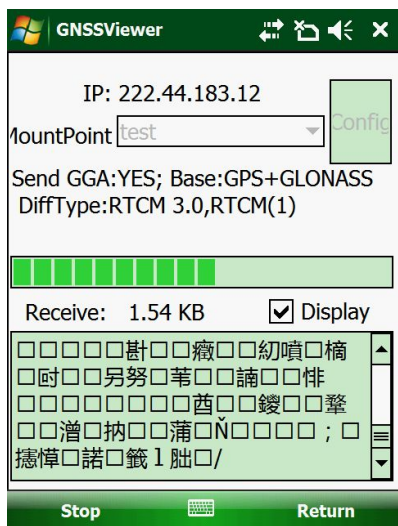
- To use the LT400HS with Carlson SurvCE or DigiTerra Explorer (with embedded DGPS management feature) installed on the LT400HS, go to Start-->Settings-->System, click External GPS to GPS Settings:
 - Programs-->Choose GPS program port: COM4,
 - Hardware-->Choose GPS hardware port: COM3, Baud rate: 57600,
 - Access, tick the Manage GPS automatically (recommended).
- In SurvCE, choose COM3 and baud rate 57600 for GNSS connection.

4.7. USING GNSSVIEWER

- To use the LT400HS with 3rd party software (without embedded DGPS management feature such as ESRI Arcpad®) installed on LT400HS, go to Start-->Settings-->System, click External GPS to GPS Settings
 - Programs-->Choose GPS program port: COM6,
 - Hardware-->Choose GPS hardware port: COM3, Baud rate: 57600,
 - Access, tick the Manage GPS automatically (recommended).



- Open GNSSViewer software:
 - Run "My Device" - "Program Files" - "GNSSViewer".
 - The symbol "GNSSViewer" will appearing at the bottom right corner of the main screen when the software is running. Double click the icon will take you come back to software interface.
 - Choose Com6 and 57600 for connecting GPS Port. See figure



- To configure Ntrip stream: Input Ntrip IP, Port , User name and password by clicking on "Config" - "Ntrip" - "Ntrip Client" - "Config"
 - Click Start to update SourceTable
 - Choose the desired MountPoint name from "MountPoint" list, start streaming.
 - Minimize the windows by clicking on X on the top right corner of the screen.
- In ARCPAD, choose Com4 and 57600 bauds to receive the GNSS position.

4.8. USING THE CAMERA

- Press the Camera key to enter in the picture taking mode.
- Press the Camera Key again to take a picture.
- Click the OK icon on the top right corner to exit.

4.9. ESTABLISHING WIRELESS CONNECTION (BLUETOOTH /Wi-Fi)

- Using Bluetooth
 - 1) Go to *Start-->Settings-->Connections-->Wireless Manager*.
 - 2) Click on the icon  on the right side of Bluetooth to open Bluetooth function.
 - 3) Go to *Start-->Settings-->Connections-->Bluetooth*.
 - 4) Click *Add new device*, the system will search for Bluetooth Devices.
 - 5) Select a device to connect with and tap *Next*, Enter a password.
 - 6) Click *Next*. In the external Bluetooth device, input the same password. The external Bluetooth device connection is now completed.

Note: The password used for pairing Bluetooth devices can be freely defined (e.g., 1234). Just make sure the same PIN code is entered for two devices to be paired.

- Using WIFI connection
 - 1) Go to *Start-->Settings-->Connections-->Wi-Fi*
 - 2) Choose one available network
 - 3) Follow the process to finish the settings as prompt by the configuration software.

5. GETTING STARTED WITH SURVCE 3

Configure the LT400HS

1. Go to Start menu --> Settings --> System
2. Select External GPS icon
3. On the Software port tab: select COM4
4. Then on the Hardware port tab: select COM3 and Baud: 57600

Start SurvCE 3:

1. Go to GPS Rover, in Current tab--> choose Manufacturer CHC, Model: LT400HS
2. In Comms tab, select Cable, Port COM3 and Baud 57600 automatically.
3. In Receiver tab, choose the relevant antenna type and input other information (Note: Position Rate is limited to 1 Hz).
4. In RTK tab, use Data Collector Internet as Device type, and input the Network information to connect to NTRIP, then tick the right green icon to establish the connection.

6. GETTING STARTED WITH DIGITERRA EXPLORER 7

1. Go to Start menu --> Settings --> System
2. Select External GPS icon
3. On the Software port tab: select COM4
4. Then on the Hardware port tab: select COM3 and Baud: 57600

Start DigiTerra Explorer 7:

1. Go to Settings > GNSS tab Port: COM3 Baud: 57600
2. If you intend to use RTCM corrections go to the Settings > NTRIP tab and set Port: COM4 and Baud: 57600
3. Finally select the proper script from the /Scripts/CHC folder in the installation directory on the Settings > Command tab > Command File button and then you can connect to the GNSS receiver on the GPS > Status panel.

Available scripts for LT 400 HS:

LT400HS-GLONASS.txt

LT400HS-NTRIP.txt

LT400HS-SBAS.txt

Note: Users should run the scripts when switching connection from SurvCE to DigiTerra.

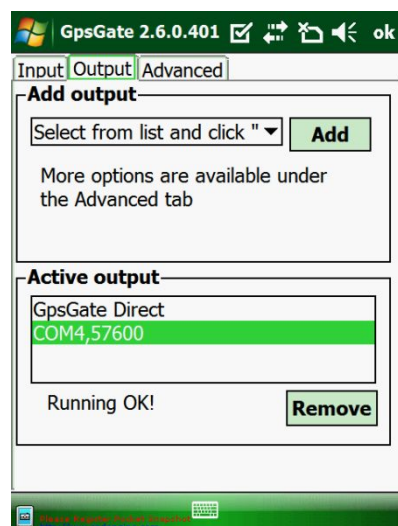
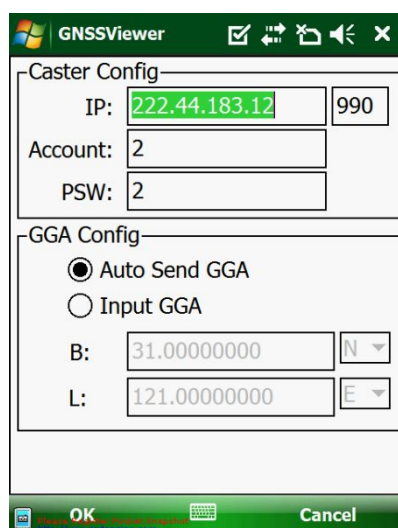
7. OUTPUTTING NMEA 0183 DATA FROM THE 9-PIN PORT

The LT400HS can output the default NMEA 0183 V2.2 messages at 1Hz: GPGGA, GPGSA, GPGSV, GPGST, GPRMC.

1. Go to Start menu --> Settings --> System
2. Select External GPS icon
3. On the Software port tab: select COM6
4. Then on the Hardware port tab: select COM3 and Baud: 57600

To set NTRIP Connection if required, run GNSSViewer:

1. Select BoardType-->NovAtel, GPS Port-->COM6, and BaudRate-->57600, press OK.
2. Go to Config-->Ntrip-->Ntrip Client-->Config, input the IP, Port, Account, Password and click OK to finish.
3. Click Start to update SourceTable, after successful connection, choose the relevant source table, Click Start, when data comes, minimize GNSSViewer.



To output NMEA data on serial port, run the GpsGate application:

1. Go to Settings-->Input, click Settings, choose Com6 and 57600, press OK to return.
2. Click Open to start data.
3. Go to Output-->Add output, select from list and click, choose COM Port, click Add, set COM4 and 57600, leave other settings as default, click Ok to return.
4. NMEA0183 data are now stream from the 9 pin COM port.

8. FREQUENT SETTINGS

- **Stylus Setting**
Go to Start-->Settings-->System-->Screen
Click Align Screen to start the stylus setting.
- **Backlight Setting**
Go to Start-->Settings-->System -->Backlight,
Adjust settings according to your requirements.
- **Power Setting**
Go to Start-->Settings-->System-->Power-->Advanced,
Adjust settings according to your requirements.
- **Remove Programs**
Go to Start-->Settings-->System-->Remove Programs,
Choose the relevant program then click Remove.
- **Boot cleaning / Restore Factory Default**
Go to Start-->Settings-->System-->Clean Boot,
Follow the instructions as prompted.



WARNING: Cleaning boot will erase all the data stored on the receiver; uninstall all software and restore settings to factory defaults.



CHC - Shanghai HuaCE Navigation Technology Ltd.
Building 35, n° 680 Guiping Road
200233 Shanghai – China

Tel : +86 21 542 60 273

Fax : +86 21 649 50 963

Email : sales@chcnav.com | www.chcnav.com