LT400 SERIES HANDHELD GPS/GIS DATA COLLECTOR USER MANUAL

Shanghai HuaTuo Satellite Navigation Technology Ltd.
Shanghai China

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Remember, saving energy prevents pollution

Because most computer equipment is left on 24 hours a day, power management features are important for saving energy and are an easy way to reduce air pollution. By using less energy, these products help lower consumers' utility bills, and prevent greenhouse gas emissions.

Where to Find Information

This manual is designed to guide you through the LT400 series procedures. You can find additional information in the LT400 series Reference Manual and also the HuaTuoSat Technical Training Video.

FCC Statement

Federal Communications Commission (FCC) Statement

This device complies with Part 15 of the FCC Rules. 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 of the device. You are cautioned that changes or modifications not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.

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.

FCC RF Radiation Exposure Statement:

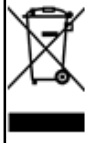
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. This transmitter must not be colocated or operating in conjunction with any other antenna or transmitter.

Contents

Chapter 1 Announcements

This user manual contains important security and correct use product information, please read it carefully before using.

- The touching screen of LT400 is imported from aboard, it's little hard; in order to guarantee long time using, it is better to using touch pen from HuaTuoSat, never using sharp tools tap the screen.
- Although the product with highly standard functions of waterproofing and anti-falls, please avoid any colliding while using it.
- The other accessories contained in the package are only used for LT400; please do not use accessories of others.
  The battery ,adapter or charger intended to be used with LT400 requires user to purchase additionally.
- Contact us if you have any confusion of LT400. And never disassemble the product by yourself; otherwise you will lose warranties.
- If you have a problem and cannot find the information you need in the product documentation, contact your local Dealer. Alternatively, please request technical support using the HuaTuoSat Website at (www.chcnav.com) or HuaTuoSat technical support email: support@chcnav.com.



Correct Disposal of this product

This marking indicates that this product should not be disposed with other household wastes throughout the EU. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmental safe recycling.

Chapter 2 technical specifications

This chapter will do the basically technical specification of LT400 GIS data collect.

- GNSS characteristic
  12 channels, GPS L1, including 2×SBAS, update 1HZ data output.

- System Configuration
  Operation System: window mobile 6.1
  Processer: 806 MHz.
  Internal Memory: 2GB Flash
  External Memory: TF Card Slot, 2GB as Standard

- Performance Specifications
  Stand alone: 2m
  SBAS real time accuracy: 1m
  RTD accuracy: 0.5m
  Post Processing accuracy: 0.3m
  Static accuracy:
  ----Horizontal: ± (5mm+1ppm) RMS
  ----Vertical: ± (10mm+1ppm) RMS
  Baseline Length: ≦10km

- Communications
  Built-in Bluetooth Class 2, version 2.0+EDR protocol
  High-speed USB 2.0 port
  RS232
  Internal GPRS module
  External antenna connector

- Physical
  Size (L×W×H): 200mm×88mm×44mm
  Weight: 0.6kg (battery included)
  Working temperature: -30℃-- +65℃
  Storage temperature: -45℃-- +75℃
  Shock and vibration: Survive from 1.2 meter drop onto concretes

- Electrical
  Power consumption: 3.0w
  Charging power: 5 VDC,1A

- Display Screen
  QVGA-TFT 3.7 colored touch screen
  480×640 pixel resolution
  LED backlight

- Software(optional)
  LandTour GIS field software
  LandTour office software for Kinematic Post-processing

Chapter 3 Introductions of appearance and keyboard

This chapter introduces you to the external appearance of your device.

The design inspiration of LT400 series GIS data collector comes from the human body esthetics, its concept is “exquisite curve, completely grasping”. LT400's crown and base no longer use the partial half surrounding structure which will encapsulate(this kind of design only to destroy product overall modeling esthetic sense and fine feeling), and the similar products from home and abroad either have this kind of design.

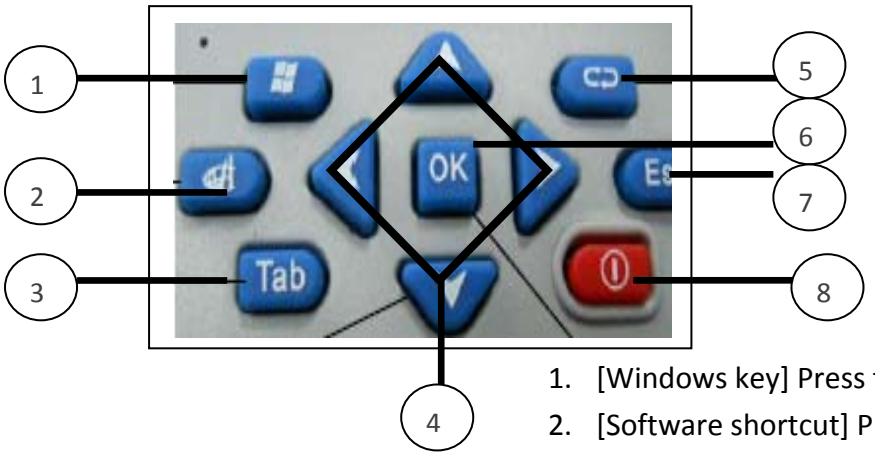
The knee bend design of crown breaks out the coordination in the GPS antenna's receive direction, lets the operator have very direct-viewing impression, knows this to have the high accuracy GPS antenna's GIS product for the assembly. The overall modeling does not lose for the curve in resolutely, and conforms to the person of body engineering various part of compositions and functions as shown in **Figure 3.1-1**

Figure 3.1-1

3.1 Front Components

1. GPS antenna
2. Port of external GPS antenna
3. Touch Screen
4. Control Panel
5. Power LED

the key board



1. [Windows key] Press to open the “start” menu.
2. [Software shortcut] Press to start the related software.
3. [Tab key] Press to switch to the next position.
4. [Navigation key]The navigation key includes four direction keys up, down, left and right.
5. [Confirmed key]Press to confirm the commands or inputs.
6. [Esc key]Withdraws from either stops some procedure or some kind of operation.
7. [Reset key]Press it for 2 seconds to reboot the system.
8. [Power key]Short press - Standby/Long presses – Turn on/off the system.

Tips: Combination key: In the power off mode, simultaneously press the power key and down direction key for 2 or 3 seconds to enter the system updating mode.

3.2 Bottom Components

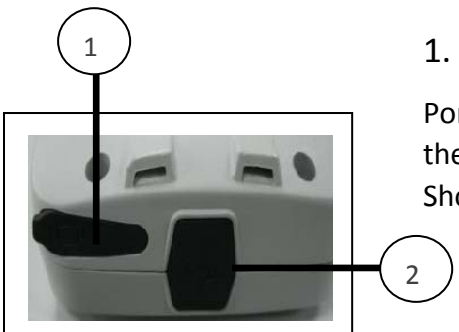


Figure 3.2

1. [Port of LEMO(7 pin)] Connect LT400 with computer via Port of LEMO and USB2.0, can realize the data transmission, the battery charging and GIS sampler power supply and so on. Shown in the **Figure 3.2**

2. [Logo] On Logo Lid, there is HuaTuoSat Log, it’s artistic, natural and fits the whole shape of LT400. At the same time, it has the function of shockproof.

3.3 Back view

Figure 3.3

1. Touch pen
2. Speaker
3. Camera
4. Belt
5. Battery cover

3.4 insert SIM card and memory card

Open back cover, take off the battery, you will see two slots; one is for SIM card and the other one for memory card. Please insert SIM card like **Figure 3.4**

Figure 3.4

Chapter 4: Accessories introduction

4.1 LT400 data cable

Figure 4.1

Figure 4.1

Connect LT400 with computer via LT400 data cable: insert the LEMO port to LT400 and insert USB2.0 port to computer. The connection can be used in the GIS data collector and computer synchronizes, sampler data transmission, battery charge and so on.

Chapter 5: basic operation

This chapter familiarizes you with the basic operations of your device.

5.1 Use of touch pen

LT400 series GIS data collector touch pen has a function the same as a personal computer's mouse, it can be used to move or select file.
Click: Click the screen softly with a touch pen to select or choose a file, click is equivalent to choosing a file with the left mouse on a personal computer.
Tap and hold: When tap and hold an option, a drop-down menu will pop on the right. Tap and hold is the equivalent of clicking the right mouse on a personal computer.

5.2 Power on/off

Figure 5.2

Power on: hold on the power button for two seconds, power LED lights on, the system will booting for 20 seconds, after that show in right **figure 5.2**

Screen lock: Click Lock, the screen will enter locked state; Click Unlock, then click the dialog box come out to unlock the device.

Standby: In the power on mode, press the power button fast, the system will standby (power saving mode), the screen is blank; Press the power button or click the screen, the system returns to normal mode.

Power off: hold on the power button for 2 seconds, the power light turns off, GIS data collector exit the system.

5.3 Align screen

In device unlocked mode, click [Start] → [Settings] → [System] → [screen], clicks Align Screen. Like show in **Figure 5.3-1~5.3-2.**

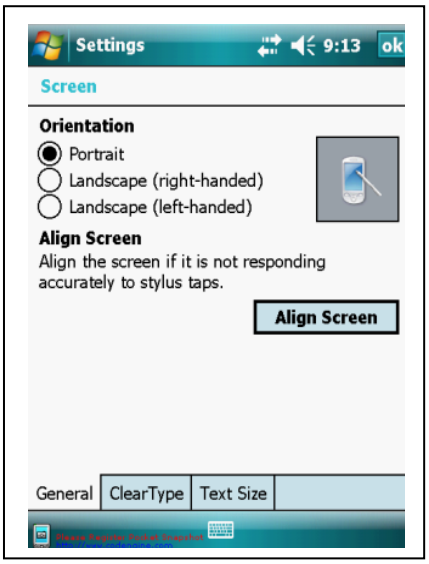


Figure 5.3-1

Figure 5.3-2

5.4 Set date and time

In device unlocked mode, click [Start] → [Settings] → [System] → [Clock & Alarms]. Like show in **Figure 5.4-1~5.4-2.**

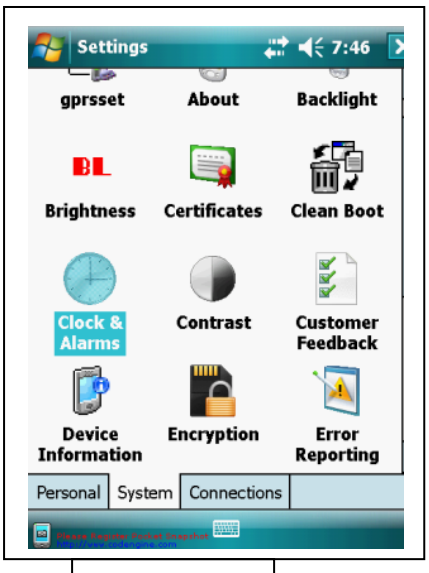


Figure 5.4-1

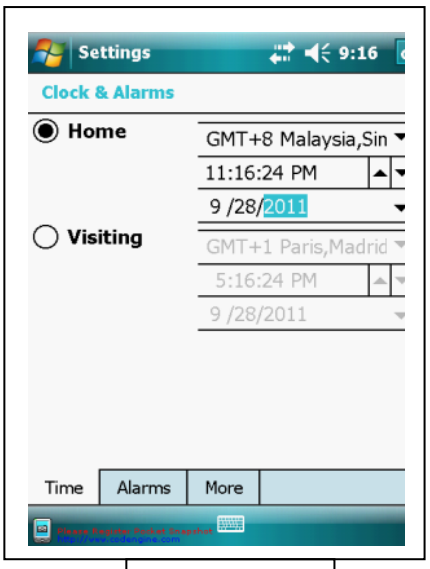


Figure 5.4-2

User can also set sound and backlight in Settings according to specific needs. Open the options and follow the prompts to complete the operation.

5.5 Battery management and charging

Battery management:

LT400 GIS data collector is used 5400MAh lithium-ion as battery, which can be removable. Under normal using, LT400 can work for 10 hours.
To make the battery long time using, user can take the following measures:

1. Reasonable use of the backlight. Based on the actual situation, adjust the display brightness to the appropriate.

2. Reasonable adjustment of the volume. According to need, user can go to [settings] → [personal] → [Sound & Notifications] to set the volume.

Battery charging:

1. Charge the battery in LT400.

   Install the battery in LT400, insert data line LEMO side to LT400, insert USB side to computer or adapter. The adapter requires the user to purchase, and is compatible with mobile phone charger adapter.

   when GIS data collector power light turns dark red, the battery is in a state of charge.

   Tips: User can go to [Settings] → [System] → [Power] to check Battery level and charging status.

Chapter 6: System Interface Description

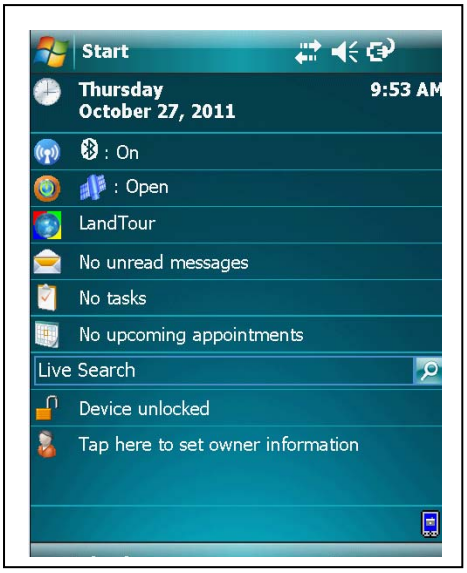


Figure 6-1

See the figure 6-1

Open the "Start" menu.

Connecting or set the connection.

Adjust the volume.

Show the collector current status information and battery information, set the time how long will it standby.

The time setting, alarm setting and clock display position setting.

The Bluetooth settings, show Bluetooth status.

:Turn on/off GPS.

Click here to set owner information.

E-mail account setting.

Click here to increase new duty.

Set whether there is dating tips

Unlock the screen.

Lock the screen.

[Calendar] Click to view the calendar.

[Contact person] Click to enter the contact settings interface

[Unlock] When the screen is locked, click the [Unlock] → [unlock], to release the lock on the device.

Chapter 7 Install application software

The operation system of LT400 serials is window mobile, all software basic of Window mobile can install in this device. To using the internal GPS module, please install the LTSET tools, also you can try to install LandTour (HuaTuoSat GIS collect software), other GIS software like Arcpad.

The first step: before installing software, users need to establish connection between the collector and computer, follow these steps:

First, install the synchronization software on the computer (The Windows XP system needs to install synchronization software, the Windows 7 systems does not need to install synchronization software). After installation, Connect LT400 with computer via data cable.

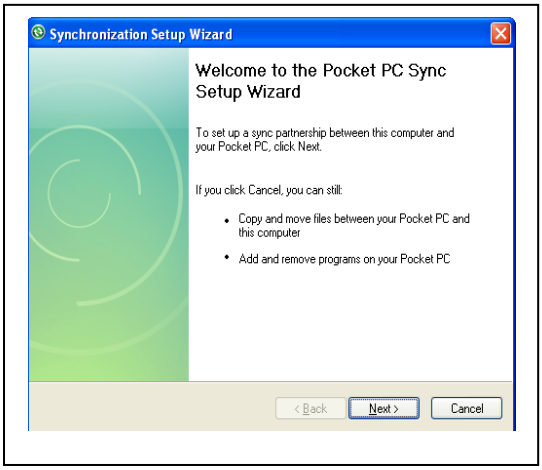


Figure 7-1

Click [Next], in the pop-up interface using the default settings, click [Next], like **Figure 7-1**.

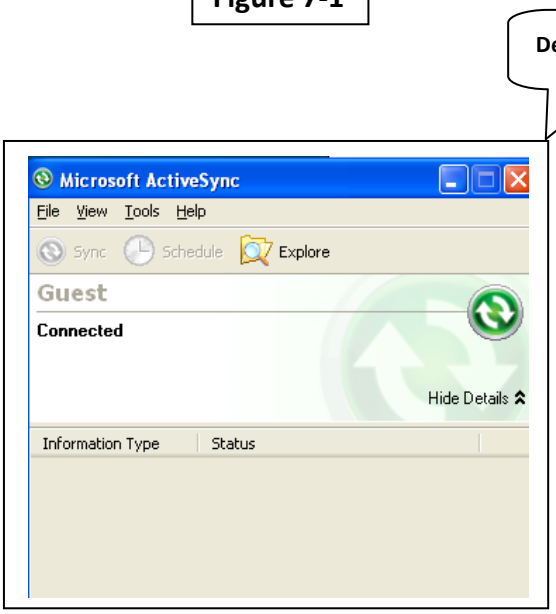


Figure 7-2

Click [Finish], collector and computer synchronized successfully, as shown in **Figure 7-2**. The “Sync” icon turns from gray to green, the interface window displays “Connected”.

Second step: install HuaTuoSat application software.

After establishing the synchronized relations of collector and computer, copy software *.cab file to **[my device],** then turn to **[Start] -> [File Explorer],** in **[my equipment**] → [**My Documents]**, double-click the *.cab file of the software, you can install the software to the specified directory.

※ Note: For more details of installation of HuaTuoSat application software, please read the appropriate user manual, user can download the user manual from HuaTuoSat website (http://www.huace.cn).

Chapter 8: main function

8.1 GPRS connection

·Setting up a Cellular (GPRS) Connection. take off the battery, insert the SIM card into the controller.
Cellular (GPRS) is a long-distance wireless data connection that is available through some mobile service operators. (Select models only).

NOTE: You must subscribe to GPRS service with your mobile operator.

You must obtain the settings (APN name) from your mobile operator before you start this procedure, and follow this step by step.

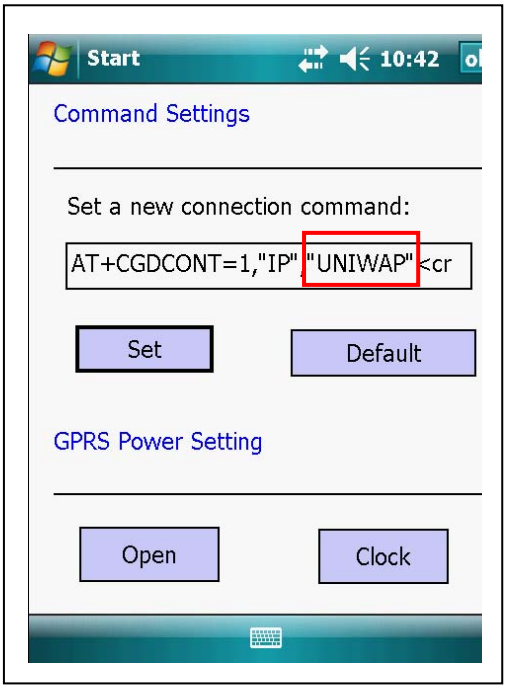


Figure 8.1-1

Set the APN name:
Insert SIM card to the controller, go to **start->settings->system->gprsset**, change the APN name, then click Set exit this setting, shown in **Figure 8.1-1**:
Attention: the APN name is different according to mobile server Provider Company, you must change the APN name of your local then you can log on internet.

·Dialling the number and log on internet
After setup the GPRS connection, go to **start->settings->Connections->Connections->Manage exiting** connections, in the **My ISP** option there is already one connection **Manage exiting connections**, tap this connection and go to the next page, tap this and select "**Connect**", then the controller will try to log on internet.

Attention: never delete **"Manage exiting connection",** you can only using the exited connection; so if you delete the connection, you can not logon internet.

8.2 Built-in high accuracy specialized GPS module

Start GPS

Turn on LT400, tap the  **on the desktop, then go to the screen shown Figure 8.2-1,** Tap the menu to turn on and turn off the GPS, tap the  to exit the software.

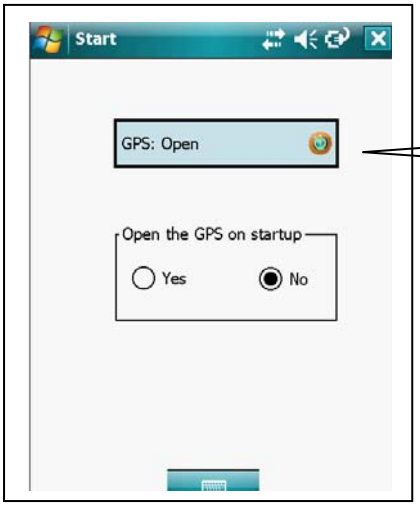


Figure 8.2-1

Tips: when GPS is open, it will increase power consumption. So it is according to clients needs whether the GPS is on or off when LT400 power on.

Step 2. Launch LTSet, using internal GPS positioning.

Tap start->setting->system->Internal GPS, in the next page shown the GPS status, such as satellites map, satellites state, **figure 8.2-2, 8.2-3, and 8.2-4.**

Figure 8.2-2

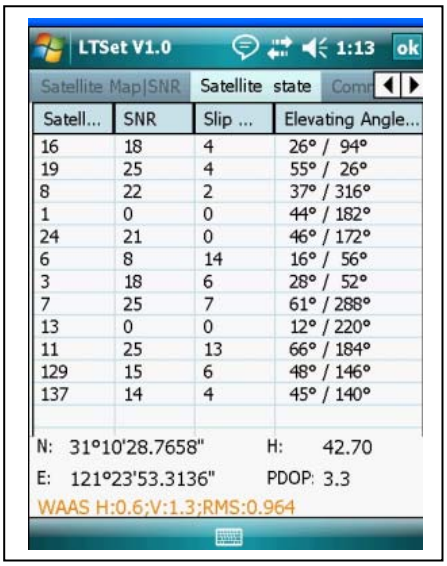


Figure 8.2-3

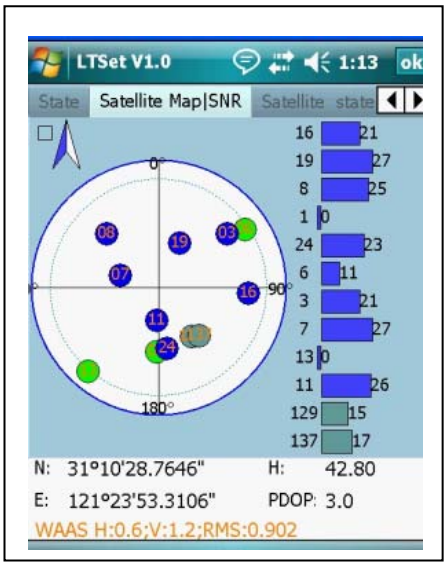


Figure 8.2-4

Set the internal GPS module to compatible with other GIS software.

Set the NMEA 0183 data output: the output serial port is COM3, band rate is 19200, select the NMEA 0183 data output type and click set, shown in the **figure 8.2.5**

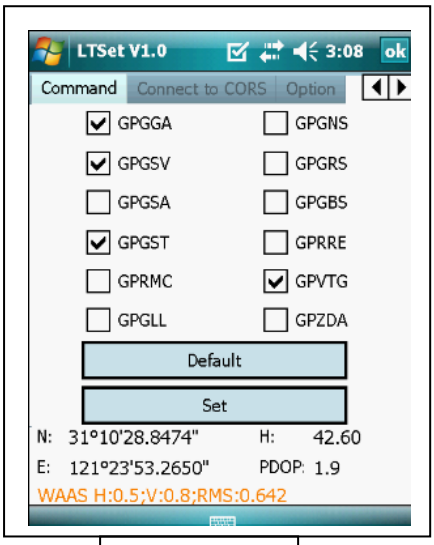


Figure 8.2-5

Log on CORS server, LT400 can work compatible with CORS system, by using the internal GPRS module which can get the different data from CORS sever. Show in **Figure 8.2-6,** key in the CORS IP and port, click get source list, select the appropriate source list of RTD (RTD- Real Time pseudo range Differentials), and click Connect, **figure 8.2-7**.

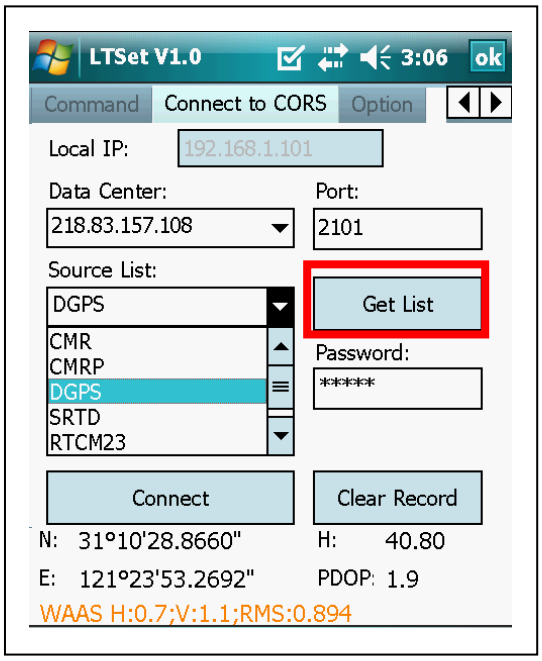


Figure 8.2-6

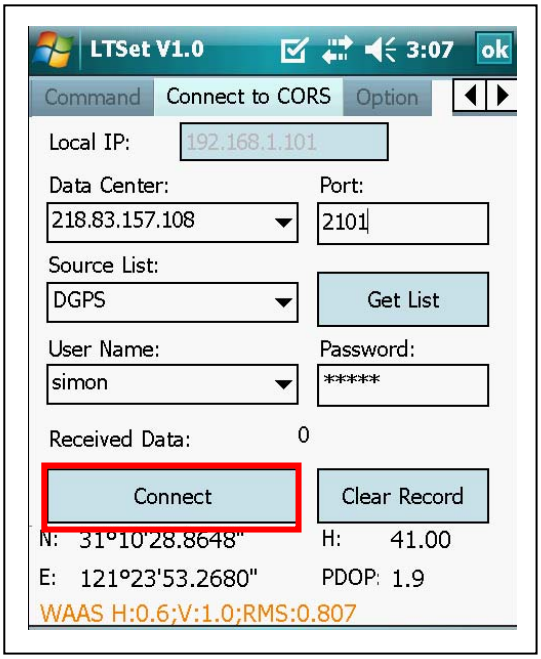
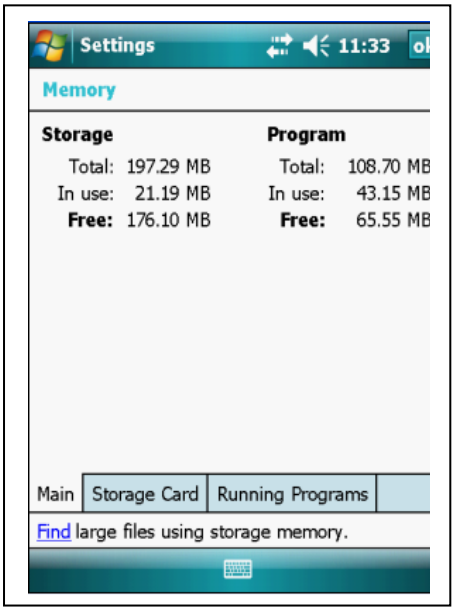


Figure 8.2-7

8.3 Memory superiority

The LT400 series provided two kinds of memory, flash memory (not to be easy to lose memory) and RAM (random access memory), both of them supply memory to application software and data.

The flash memory is a type of constantly-powered non-volatile memory, when the battery is removed from controller or battery is low, the data storage in will not losing; on the contrary, RAM memory will losing all the data when you removed the battery. Please check the memory status of controller in **start->settings->system->Memory**. See the follow two **figures 8.3-1, 8.3-2.**



Figures 8.3-1

Figures 8.3-2

In **Figures 8.3-2**, you can manage the current running programmers, select the current running programmer, and click stop.

Chapter 9: Configuration list

11-1

11-2

11-3

Number	Name	Amount	Notes	Schematic
1	LT400 controller	1		Photo 11-1
2	LT400 data cable	1		Photo 11-2
3	2G TF storage card	1		Photo 11-3
4	Touch pen	2		
5	LT400 Satchel	1		
6	CD	1		
7	Warranty card	1		
8	specification	1		

Chapter 10 : Troubleshooting and Maintenance

This chapter gives solutions to common device problems you may encounter.

- **Touch screen not sensitive reaction**

Check the touch screen carefully, especially the edge of touch screen, if any small stone is blocked take it off. Do align screen.

- **System crashed.**

  The controller is dead because of running lots of programs, please do software reset to solve the problem. LT400 only can do soft reset. The soft reset can not lead losing data.

- **Failure to dialing the GPRS network**

  The possibility of fail to log on internet:
  SIM card checking: take the SIM card off the controller, and insert the SIM card to phone (with the GPRS function), then try to log on internet by your phone, if phone can log on internet, we confirm that SIM card no problem; if not, check the fee inquiry and open the GPRS function.

- **Cannot distinguish the TF card**

Make sure insert the TF card in right way, try to take off the TF card and install again.

- **SBAS non-difference**

SBAS is used the local wide area differential enhancement system that geostationary orbit satellite establishes. Regarding to SBAS, it is depend on local position, so firstly please check whether current position received the SBAS satellites signal.

Take the receiver in one open area, power on receiver. Start ->settings->System ->internal GPS, double-clicks internal GPS, check the satellites Map/SNR and satellites state menu, whether the receiver the SBAS satellites**.(For southeastern Asian Masas, Europe Egous**)

- **Cannot establish a connection with a computer via USB.**

Make sure that your device and your computer are both switched on before trying to establish a connection.

Make sure that the cable is securely plugged into the USB port on your computer and on your device. Connect the USB cable directly to your computer—do not run the cable through a USB hub.

Restart your device before connecting the cable. Always disconnect your device before you restart your computer.

In some specific cases, your device may experience connection problems when it is connected to a Windows computer running ActiveSync. To resolve the problems, please tap **Settings Connections USB to PC**, and then clear **Enable advanced network functionality**.

- **Cannot establish connection with internal GPS**

Firstly: please check the GPS serial port setting, the serial port of GPS is COM4; then check if any running software occupied the serial port.

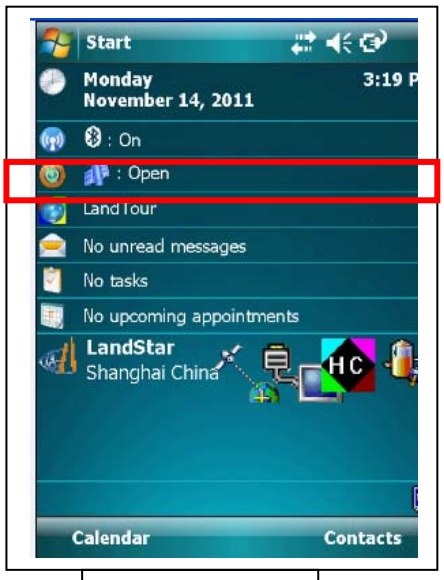
Go to **start->settings->system->Memory**, shut down the software that may occupied the serial port.

Secondly: check the band rate of GPS communication, open the com master tools, select the COM4, band rate as 19200, click open; type down the command"$jbaud,9600" and click send the command; go back and change the baud rate as 9600, send the command"$jsave

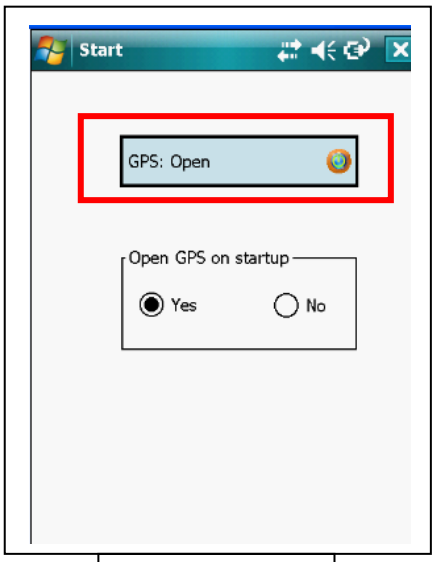
Appendix A: Arcpad+LT400

How to set LT400 GIS controller with Arc Pad software?

1. Active the internal GPS module of LT400.

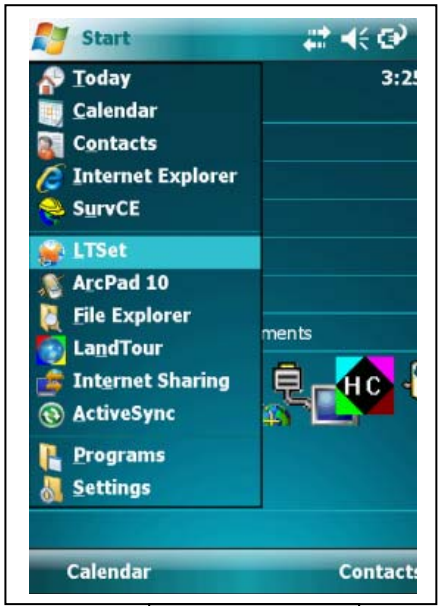


Appendix A-1

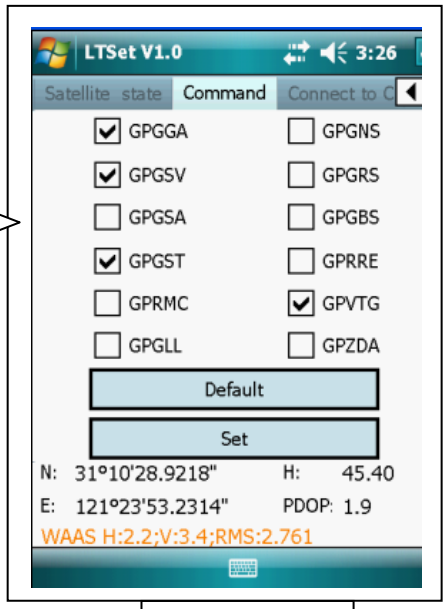


Appendix A-2

2. Set the NMEA 0183 Data output by LTSet software,then exit the software

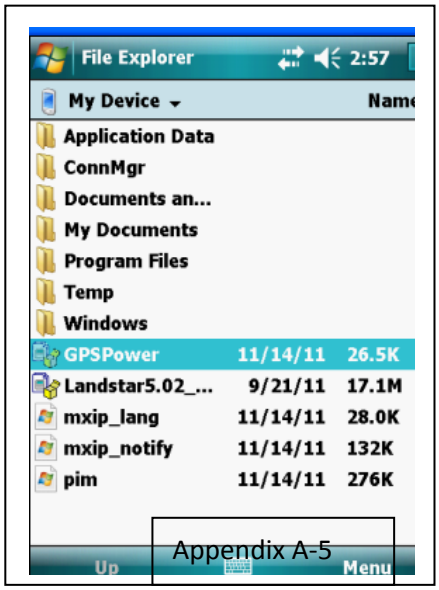


Appendix A-3



Appendix A-4

3. Copy the installation CAB file GPS Power to contoller, double click install the software.

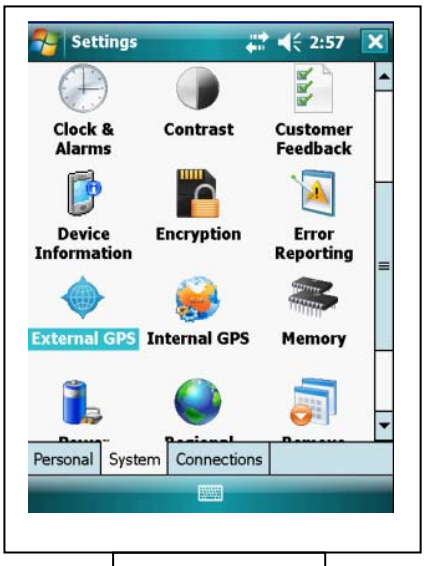


Appendix A-5

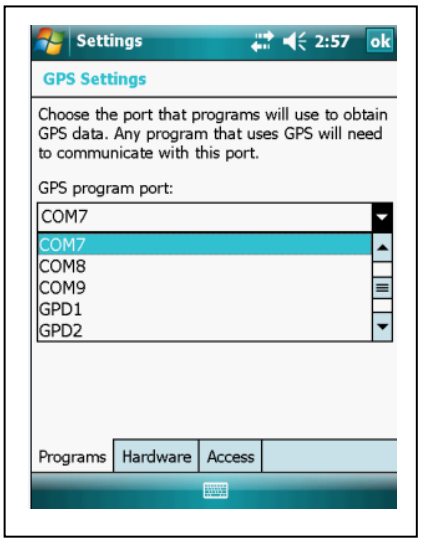
4. Distribute communication port of internal GPS.

GPS program port: if any software want to using GPS data, in the software there is the communication port, here you can select Com1 or COM7

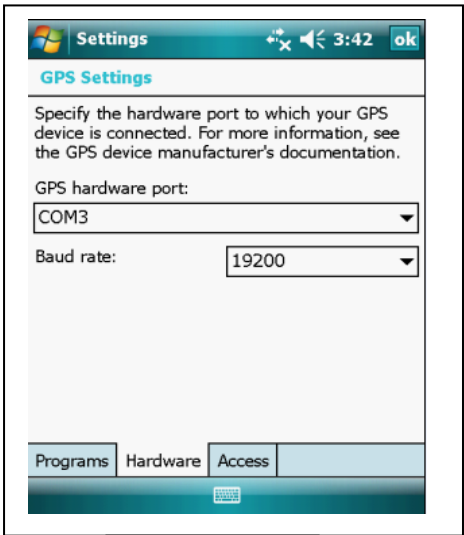
GPS hardware port: the GPS hardware port, you must set as Com3 and 19200



Appendix A-6

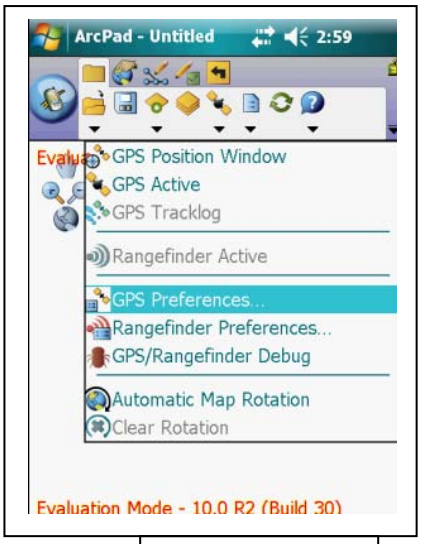


Appendix A-7

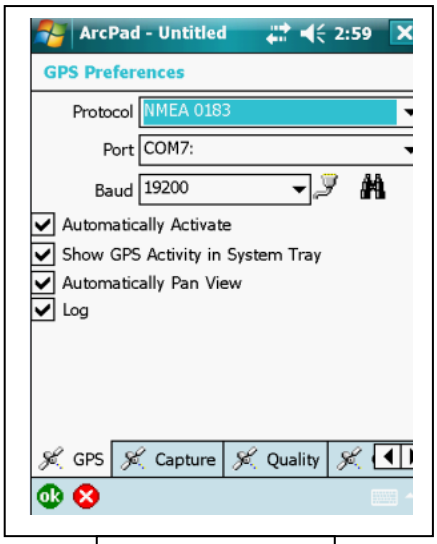


Appendix A-8

5. Run the Arc Pad software, set the communcation port with internal GPS module.

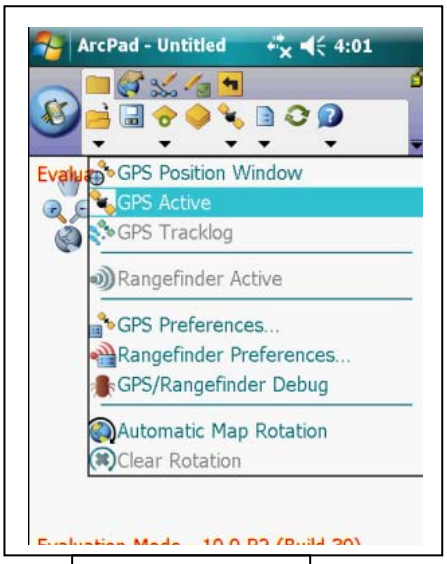


Appendix A-9

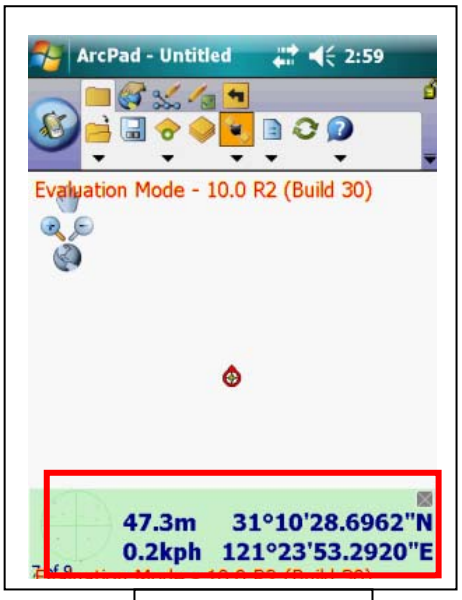


Appendix A-10

6. Active GPS, and check the current postion.



Appendix A-111



Appendix A-12