Handheld GPS Navigator

User's Guide

Please read this guide thoroughly before starting.

GPS Handheld Device User Manual

1. Introduction

Thank you for choosing our global satellite positioning handheld product (hereinafter referred to as the device). This is a cost-effective, easy-to-operate, and practical product. You can collect and edit waypoints, routes, and tracks, and view them on offline maps with the device. Before using this device, please read this operation manual carefully. The pictures shown in this manual are for illustrative reference only, and relevant updates may not be timely. Please consult the distributor for the latest electronic version of the manual.

Important Note: Please use the device under open sky. After turning on the device, please wait for about 5 minutes and wait for the satellite signal to stabilize at more than 3 bars before starting to use the device. Please ensure to use the USB charger with 5V1A output to charge the device. Please make sure the device battery has enough power before turning it on. When you encounter a problem that the device will not turn on or cannot be charged, please try poke the reset key on the right side of the USB port.

2. Button



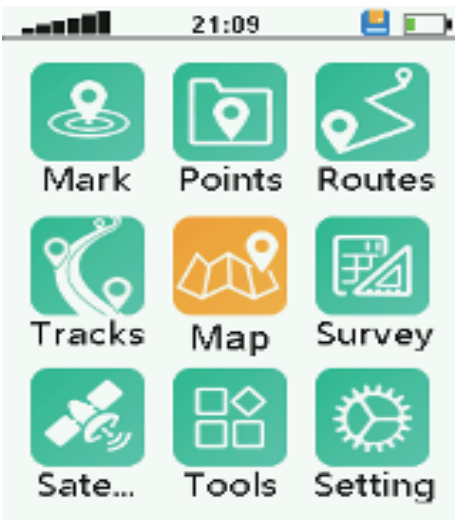
This device has several function buttons, namely:

- 【Power】: Press and hold to turn on/off the device.
- 【Zoom Out】: In the map screen, pressing this button can zoom out the map.
- 【Zoom In】: In the map screen, pressing this button can zoom in the map
- 【Back】: Back to the previous screen or exit the current operation.
- 【Up】: Move the cursor upwards or perform the function of the "+" sign when editing numbers.
- 【Down】: Move the cursor downwards or perform the function of the "-" sign when editing numbers.
- 【Left】: move the cursor to the left.
- 【Right】: move the cursor to the right.
- 【OK】: confirm the operation or pop-up menu or start to measure.
- 【Mark】: In the main screen, pressing this button can quickly mark the current position.
- 【Settings】: In the main screen, pressing this button can quickly open the settings screen.
- 【Tracks list】: In the main screen, pressing this button can quickly open the tracks screen.
- 【Reset】: Lift the rubber cover on the bottom of the device, and there is a reset hole on the right side of the USB port. When the machine hangs or crashes, poke the reset key in the hole with a sharp object, and the device will be forced to power off and reset.

3. Main Screen

After turning on the device, the main screen is displayed. The top of the main screen is the status bar, and the below is the nine-square grid of applications.

3.1 Status Bar Information



- **Satellite Positioning Status:** When the signal is weak, it shows in red font "Weak Signal"; 1 - 5 bars represent the signal strength from weak to strong. For accurate measurement results, it is strongly recommended to start measurement when the positioning signal reaches 3 or more bars under the open sky.
- **Satellite Time:** The current time is provided by the satellite. When not positioned or when the satellite signal is weak, the time may not be obtainable.
- **Status Icons:** Indicate the status of the embedded memory card, the status of track recording or the status of USB connection.
- **Battery Level:** Show the level of battery power and the status of charging.

3.2 Applications Entry

The application icon can be selected by operating the direction buttons. The Press the OK button to run the application.

4. Applications

4.1 Mark

4.1.1 Create a new waypoint

Quickly get the current location coordinate, and save to a new waypoint.
The fields of name/coordinate/altitude can be edit. Use the UP and DOWN to select the field, and press the OK to enter the editing mode, then use LEFT/RIGHT/UP/DOWN to modify the content.

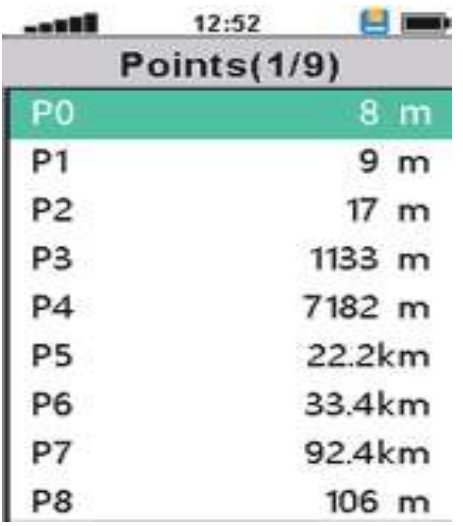


4.1.2 Choose coordinate system

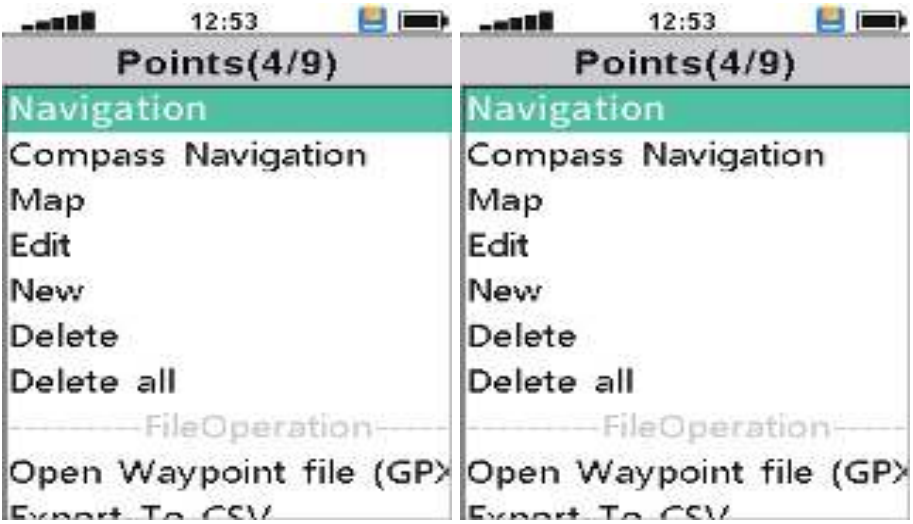
When you firstly use the device, you should set the correct coordinate system which you need. There are two commonly used coordinate systems (WGS84 and UTM). WGS84(Longitude and Latitude) is the default coordinate system in the device. You also can change to UTM like the format of “35V 414668 6812844”.



4.2 Points (Waypoints)



- **Waypoints:** A waypoint is a saved location at specific GPS coordinates. One or more waypoints are saved in a .GPX waypoint file. The system can operate all waypoints in the current waypoint file. When used for the first time, the system will open the waypoint file named “default.gpx” by default, and newly created waypoints will be saved in this file. The system only open one waypoint file at a time and supports switching multiple different waypoint files.
- **Waypoint-related features:** You can see and operate waypoints in the current waypoint file; You can create/delete/select another waypoint file; You can export all WGS84 longitude and latitude points in the current waypoint file to CSV excel table file and also can Import an CSV file in the same template format into a waypoint file that can be opened by the device.
- **Waypoint List Screen:** The left column of the waypoint list shows the waypoint name, and the right column shows the distance between the waypoint and the current location. Use the up and down buttons to move the cursor, the left and right buttons to quickly page through, and press the OK button to pop up the operation menu, including map navigation, compass navigation, Map, Edit, New, Delete, Delete all, Open GPX waypoint file, export to CSV file, and Import CSV to GPX.

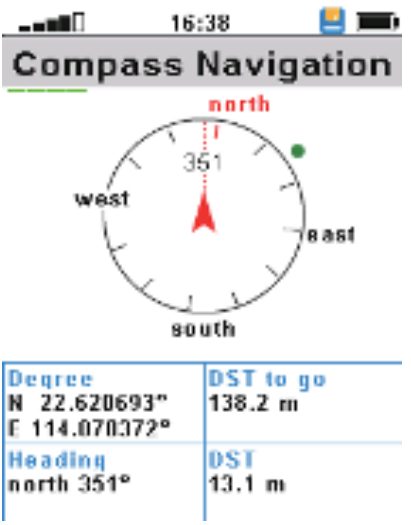


4.2.1 Map Navigation: The red arrow represents the current point, and the small flag represents the target waypoint.



4.2.2 GPS Compass Navigation: The green dot represents the target point, and the red arrow represents the forward direction.

Note: The direction data of the compass comes from the mixed data of satellite positioning signals and geomagnetic sensors. It is recommended to use it for mobile navigation when the signal is above 3 bars. The geomagnetic sensor is easily affected by iron objects. When affected, the system will automatically pop up the calibration interface. Please follow the instructions to rotate the six faces of the device in a figure-eight pattern to complete the calibration.



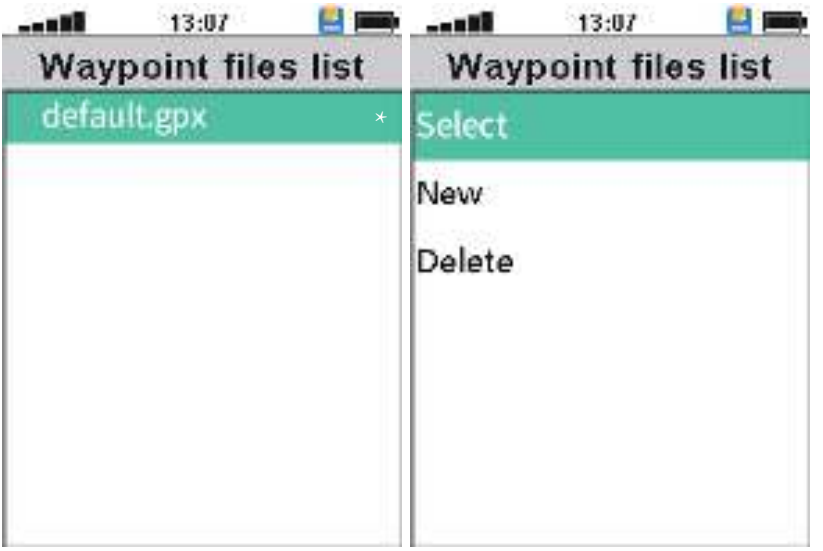
4.2.3 Map: The red dot represents the current point, and the small flag represents the target waypoint.



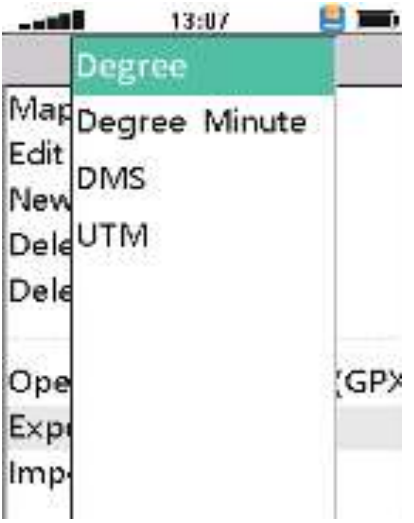
4.2.4 Edit: You can modify the information of the selected waypoint, including name, coordinates, and altitude.



4.2.5 New: To get the current location coordinate, and save to a new waypoint .The function is the same as the "Mark" function on the main screen. Please refer to 4.1.
4.2.6 Delete: Delete the selected waypoint.
4.2.7 Delete All: Delete all waypoints in the current waypoint file.
4.2.8 Open Waypoint File: In the waypoint list, press the OK button to pop up the option window, select "Open GPX Waypoint File", then a "Waypoint File List" window will pop up. The new device has a default “default.gpx” waypoint file by default. You can also press the OK button to create a new empty waypoint file or open another already exist waypoint file. After selecting another waypoint file, this file becomes the current waypoint file of the system, and the waypoints displayed/created/edited by the system will be bound to this current waypoint file.



4.2.9 Export to CSV File: The waypoints in the current waypoint list exist as a GPX file in the WGS84 longitude and latitude coordinate format, but they can be conveniently converted into .CSV spreadsheet file in different formats or different coordinate systems. The .CSV file can be imported into the computer and opened and edited with Excel.

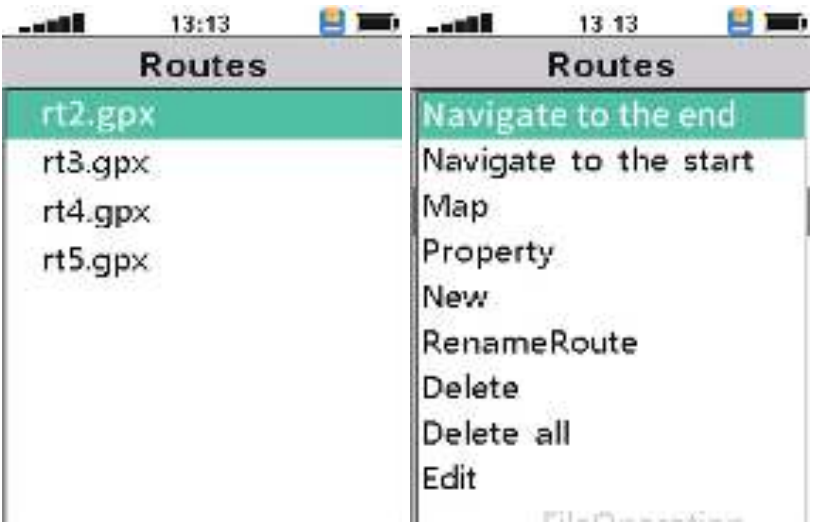


4.2.10 Import CSV to GPX: External data in different formats or different coordinate systems can be edited on the computer according to the same format of the .CSV file exported in 4.2.9 (both the table format and file naming method are the same as the .CSV format exported in 4.2.9), then you can select "Import CSV to GPX" to import it into the device and become a GPX waypoint file that the device could read.



4.3 Routes

- A route is a pre-defined path created from a group of waypoints entered into the handheld in the sequence you desire to navigate them. A Route is saved in a .GPX file which can be used for reviewing or editing the route in platforms that read .GPX files.
- In the route file list screen, you can edit the saved routes or create a new route. Press the OK button to pop up the operation menu, including navigation, Map, Property, Edit, New, Rename, Delete, Delete all, export to CSV file.



4.3.1 Navigate to End point: Navigate to the end point of the route from the current position. The red arrow represents the current position, and the red triangle represents the endpoint.



4.3.2 Navigate to Start point: Navigate to the first point of the route from the current position. The red arrow represents the current point, and the red triangle represents the start point.



4.3.3 Map: Show the route in the map. The red dot represents the current point, and the red triangle represents the endpoint which is always centered on the map.

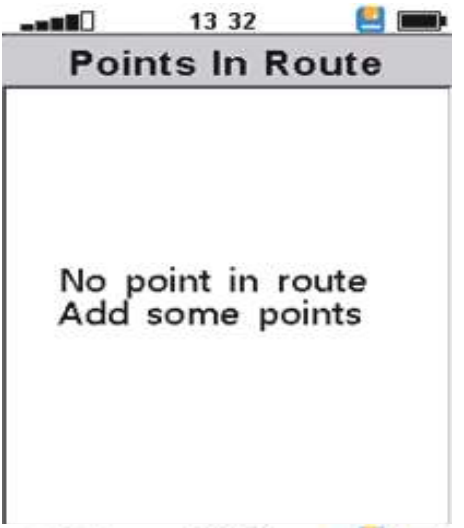


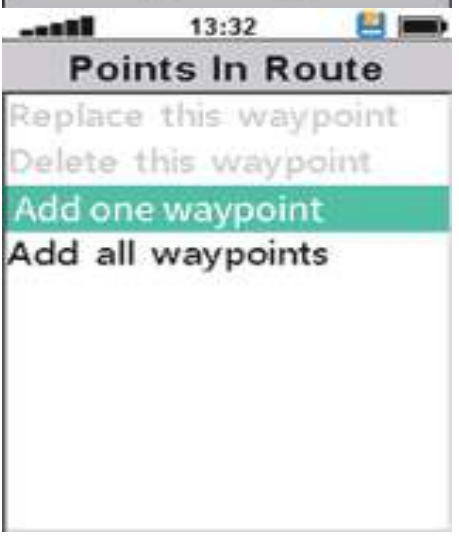
4.3.4 Property: show the number of waypoints in the route, and show the length, and the enclosed area of the route.

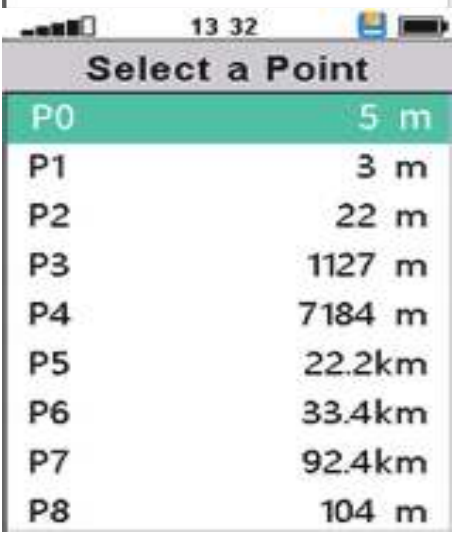


4.3.5 New: Select "New" to create a new route. Firstly, input the route name, then in the pop-up window perform operations such as adding/replacing/deleting the waypoints in this route.









4.3.6 Rename: Rename the selected route.
4.3.7 Delete: Delete the selected route.
4.3.8 Delete All: Delete all routes.
4.3.9 Edit: Edit the selected route. You can add/delete/replace waypoints in the route.
4.3.10 Export to CSV File: The route exists as a .GPX route file in WGS84 longitude and latitude coordinates. It can be conveniently converted into a .CSV spreadsheet file in different formats or different engineering coordinate systems. The.CSV spreadsheet file can be imported into a computer and opened and edited with Excel.

4.4 Track

A track is a set of coordinates connected together the movement trajectory and their associated data (elevation, time, etc.). Tracks are saved in a .GPX file format which can be used for reviewing track data in platforms that read .GPX files.
You can manage the saved track files, start or end a new track recording in this tracks list screen.

4.4.1 Start Track Recording:

In the tracks list, move the cursor to "Start Record" and press the OK button to start recording the track and automatically jump to the map screen. The green line represents the track, and the red arrow represents the moving direction of the current point. During track recording, the "footprint icon" will flash in the upper right corner of the status bar.



4.4.2 End Track Recording:

After exiting the map screen, the track recording will not stop. To stop the track recording, you need to enter the tracks list screen again and select "End Record". After ending, a track .GPX file will be automatically generated, and the file name is named after the satellite time.



4.4.3 Track Settings: Before starting recording, you can select the "Settings" button to pop up the track settings window and adjust the interval recording time according to your needs.



4.4.4 Track Operations: In the track file list, select a track and Press the OK button to pop up the operation menu, including navigation, Map, Property, Delete, Delete all, export to CSV file



4.4.4.1 Navigate to End point: Navigate to end point of the track. The green track should be displayed on the map, the red arrow is the current point, and connect to the track end point.

4.4.4.2 Navigate to Start point: Navigate to start point of the track. The green track should be shown on the map, the red arrow is the current point, and connect to the track end point.



4.4.4.3 Map: The green track should be in the map, the flag is the track end point, and the red dot is the current point.



4.4.4.4 Property: show the number of waypoints in the track, and show the length, and the enclosed area of the track.



4.4.4.5 Delete: Delete the selected track.
4.4.4.6 Delete All: Delete all tracks.
4.4.4.7 Export to CSV File: The track exists as a .GPX route file in WGS84 longitude and latitude coordinates. It can be conveniently converted into a .CSV spreadsheet file in different formats or different coordinate systems. The.CSV file can be imported into a computer and opened and edited with Excel.

4.5 Map

4.5.1 This screen shows information of the current position in the map



4.5.2 In map screen, you can move the flag by pressing the direction buttons, and press the OK button to select < Save Flag as Waypoint> to save a new waypoint.

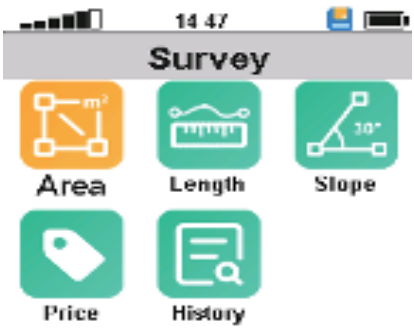


4.5.3 You can press the OK button to select <Set Data Item Content> to define the multiple information windows of the bottom four grids.



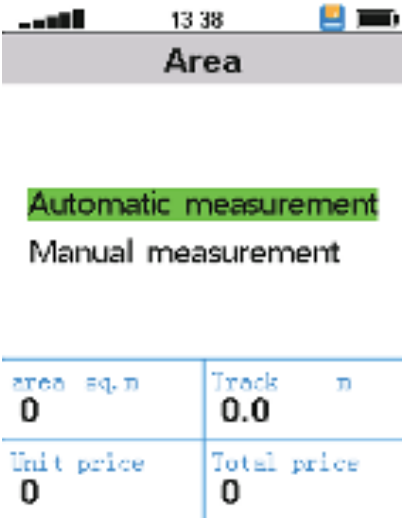
4.6 Survey

This window includes applications for the measurement of area/length/slope.



4.6.1 Area Measurement: Area measurement is divided into automatic area measurement and manual area measurement.

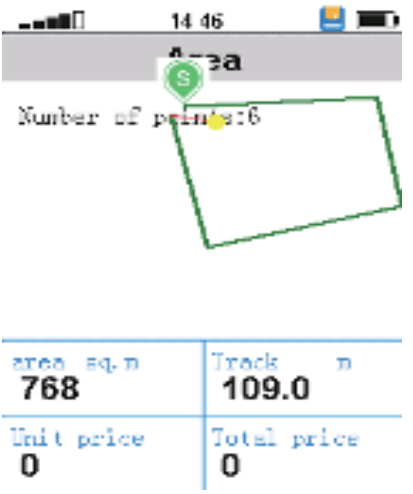
Note: The track in area measurement cannot cross, otherwise the calculation will be inaccurate. For accurate measurement, keep the signal above three bars.



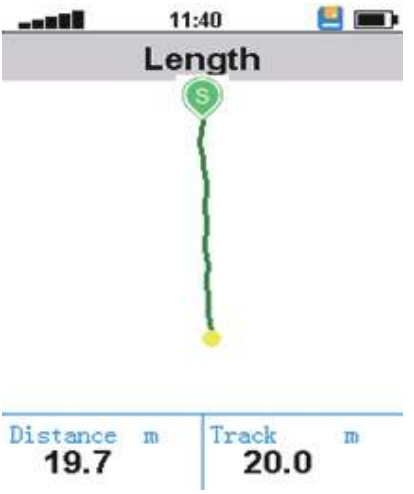
4.6.1.1 Automatic measurement: Walk around the edge of the area to be measured and press the OK button to end the area measurement. The system will automatically calculate the area enclosed by the track points. During the measurement, press the Back button to pause the measurement and press the Back Button again to continue.



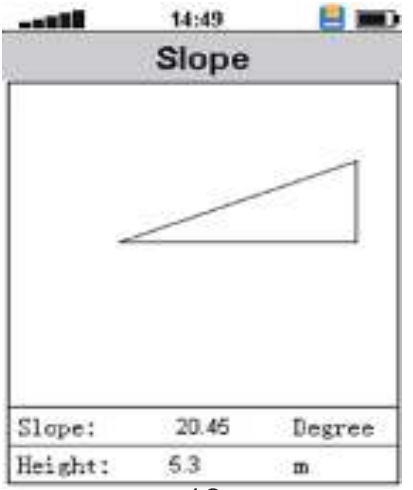
4.6.1.2 Manual measurement: Manually collect the feature points of the regular area graph, and the system will automatically calculate the area of the polygon formed by the collected points. Press the OK button at the inflection points of the area to be measured to manually collect points. After collecting more than three points, you can press the Back button to end the area measurement.



4.6.2 Length Measurement: The length measurement method is the same as that of area measurement. Press the OK button to start the measurement and press the Back button to end the measurement.



4.6.3 Slope: Measure the slope. At the low point of the slope, enter the slope measurement screen to start the measurement. When moving towards the high point of the slope, the height difference and slope between the starting point and the current point will be displayed in real-time. Note that the travel distance is recommended to be greater than 5 meters. If it is too small, it may cause a large calculation error.



4.6.4 Price: Set the unit price for area measurement if you need.

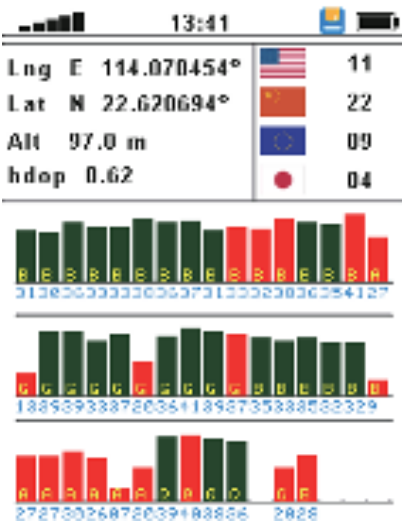


4.6.5 History: This screen shows the measurement records of area, length. Move the cursor to select the record to be viewed and press the OK button to pop up the operation menu, including View, Delete, and Delete all.



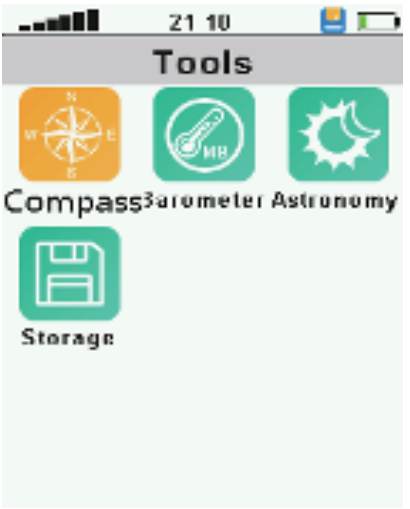
4.7 Satellite

This screen shows the details of current position and satellites.



4.8 Tools

This window includes multiple applications.

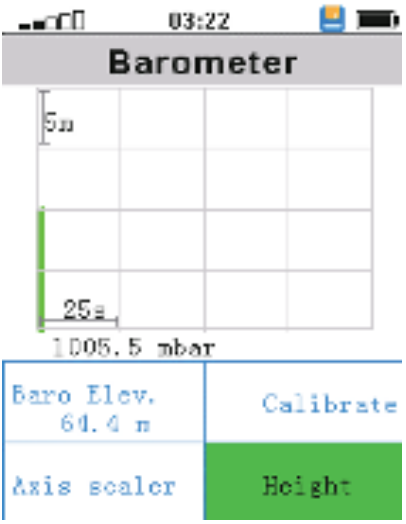


4.8.1 Compass: Show the direction information and other information that can be selected in the gird.

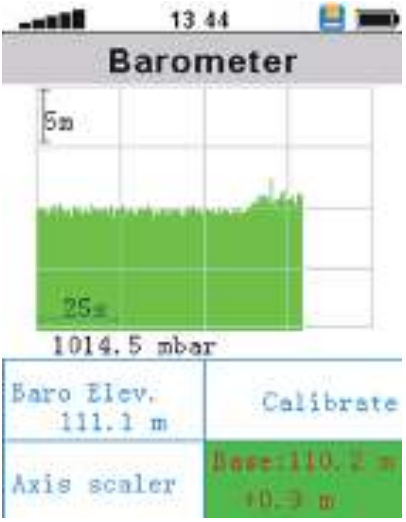
Note: The direction data of the compass comes from the mixed data of satellite positioning signals and six-axis orientation sensor. The geomagnetic sensor is easily affected by iron objects. When affected, the system will automatically pop up the calibration interface. Please follow the instructions to rotate the six faces of the device in a figure-eight pattern to complete the calibration.



4.8.2 Barometer: This screen is used to view the air pressure and displays the "barometer altitude" calculated according to the air pressure value.



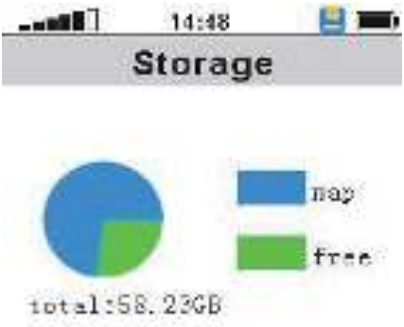
- **Baro Elev.:** This interface is used to view the "barometric altitude" estimated based on the air pressure value.
- **Altitude Calibration:** When the altitude value calculated by the air pressure becomes inaccurate due to environmental changes, you need to press the "Calibration" button to calibrate. Enter the known altitude value of the current point in the pop-up window for calibration. If you do not know the altitude value of the reference point, please enter the "satellite altitude" value of the current position.
- **Axis Scaler:** Press the " Axis Scaler " button, use the up and down buttons to adjust the height scale of the vertical axis of the drawing, and use the left and right buttons to adjust the time scale of the horizontal axis of the drawing.
- **Relative Height Measurement:** Barometric altitude can be used to measure elevation (elevation = end point height - start point height) both indoors and outdoors. As shown in the figure, select "Height" at the measurement start point, and the height difference between the current point and the start point (reference point) will be displayed in real time. In environments with small air pressure fluctuations (including indoor and outdoor), the height measured by the barometer can reach a decimeter-level accuracy.



4.8.3 Astronomy : This screen is used to view the moon phase, sunrise and sunset times, as well as moonrise and moonset times. Press the left and right buttons to switch days, and press the up and down buttons to switch months.



4.8.4 Storage Status: Displays the storage space usage of the memory card. The remaining space is related to the size of the map files.



4.9 Setting

This window includes several applications.



4.9.1 Map: Select the current map file.



4.9.2 Settings: Set the system parameters

Altitude mode: You can choose to use "satellite altitude" or "barometer elevation ". When the outdoor satellite signal is strong, it is recommended to use "satellite altitude"; in an environment with stable local temperature and air pressure or indoors without a satellite signal, it is recommended to use "barometer elevation ".

Brightness level: Adjust the brightness of screen. There are four modes available: Automatic, Level 1 (Low), Level 2 (Medium), and Level 3 (High)

Screen Off: Screen backlight auto-off time. Press any key to restore.

Coordination format: Set the longitude and latitude coordinate format displayed on the screen. There are three formats available: Degree, Degree/Minute, Degree/Minute/Second

Map offset: Default is OFF. ON is set when using the very special map in some country.



4.9.3 Units: Select the appropriate measurement units according to your needs.



4.9.4 Time Zone: The system default time zone is set to Auto. Users should set your local time zone by manual.



4.9.5 Clear: Restore to factory settings. All parameters or options that set by user in the current system should be clear to the factory default state. This function should not clear the data files existing in the storage. Please use this function with caution.



4.10 Data file exchange

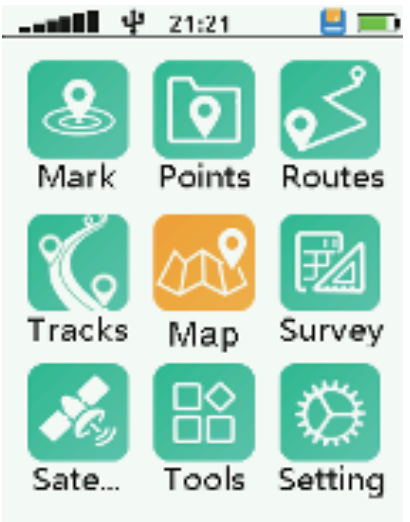
4.10.1 Common concepts

- **.GPX file:** The .GPX file is a commonly used general file format for saving longitude and latitude coordinates. Many third part application software can directly read such as google map .GPX files of waypoints, routes, and tracks. GPX can also be conveniently converted into other format files.
- **.CSV file:** the .CSV file is a spreadsheet file that can be easily opened and edited with Excel on a computer. The CSV used in this system has a fixed format. Please modify, delete, or append the table content according to the exported CSV format, but do not change the format of the table (file naming, rows, columns, table headers, and other rules).

- **Waypoints:** A waypoint is a saved location at specific GPS coordinates. One or more waypoints are saved in a .GPX waypoint file. The system can operate all waypoints in the current waypoint file. When used for the first time, the system will open the waypoint file named “default.gpx” by default, and newly created waypoints will be saved in this file. The system only open one waypoint file at a time and supports switching multiple different waypoint files.
- **Routes:** A route is a pre-defined path created from a group of waypoints entered into the handheld in the sequence you desire to navigate them. A Route is saved in a .GPX file which can be used for reviewing or editing the route in platforms that read .GPX files.
- **Tracks:** A track is a set of coordinates connected together the movement trajectory and their associated data (elevation, time, etc.). Tracks are saved in a .GPX file format which can be used for reviewing track data in platforms that read .GPX files.

4.10.2 Connect to Computer

- With the handheld device turned off, press and hold the power button to turn it on and enter the main screen.
- Connect the handheld device to the computer using the provided USB data cable.
- After a while, the computer will automatically recognize a removable disk drive, and at the same time, a USB connection icon will appear in the top status bar of the handheld device interface, indicating that the handheld device has been successfully connected to the computer.



- On the computer side, click the removable disk drive letter to enter and view the multiple folders in the internal memory card of the handheld device.

4.10.3 Folders

When connected, on the computer side, click the removable disk drive letter to enter and view the multiple folders:



- Points folder: All waypoint .GPX files are placed in the points folder.
- Route folder: All route .GPX files are placed in the route folder.
- Track folder: All track .GPX files are placed in the track folder.
- Measure folder: All measurement results .GPX files are placed in the measure folder.
- Csv folder: All exported spreadsheet .CSV files are placed in the track folder.
- Zzz folder: All map files are placed in the zzz folder.

Appendix 1: Recommended GPX tools

The data storage, import and export of this device's waypoints, routes, and tracks are all based on GPX files. Via GPX files, you can interact with Google Maps conveniently. Below are some recommended tools that can help users connect the data of this device with Google Maps through GPX files.

You can easily import GPX files to Google Maps or export a GPX file from Goggle Maps. Please refer to the following website for details.

Link: https://www.alphr.com/gpx-google-maps/
The following two web links can also be used as learning materials and tools.
Link: https://gpx2maps.com/gpx-to-google-maps
Link: https://330k.github.io/gmapgpx/

Appendix 2: Recommended offline map download tools

For professional users, there may be a need for offline maps of specific areas with higher zoom levels. When this device leaves the factory, only some basic maps are pre-installed because high-level offline maps covering large areas require massive storage space. However, users can use tools to download higher

zoom levels maps for small areas they are interested in by themselves.

You can use the following recommended tool to download offline maps of the small areas(such as a city, a mountain) you're interested in at a higher zoom level. Then copy the downloaded map files to the zzz folder of the device and select the map file in the map screen of the device (4.9.1).

Mobile Atlas Creator(MOBAC) is an open source program which creates offline atlases for GPS handhelds. Please refer to website https://mobac.sourceforge.io to learn more.

Here is also an introduction to the installation and how to use MOBAC:

1. Download and install JDK（Java Runtime Environment）and Mobile Atlas Creator(**MOBAC**)

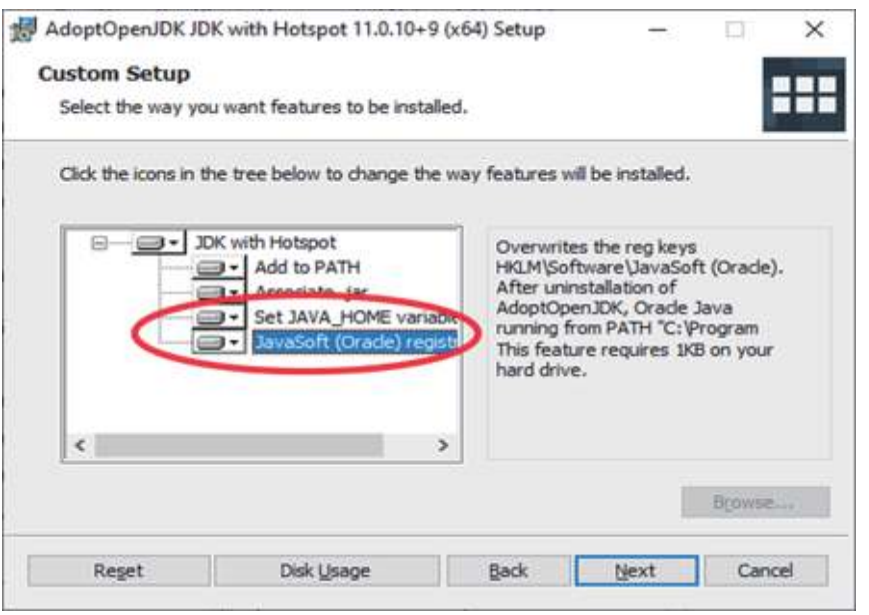
Windows:

- Download Eclipse Adoptium openJDK for windows x64 from https://adoptium.net
- Install the downloaded JDK file(such as OpenJDK21U-jdk_x-64_windows_hotspot_21.0.8_9.msi)

When executing the OpenJDK installer make sure to enable the two options that are disabled by default:

Set JAVA_HOME variable,
JavaSoft (Oracle) registry keys

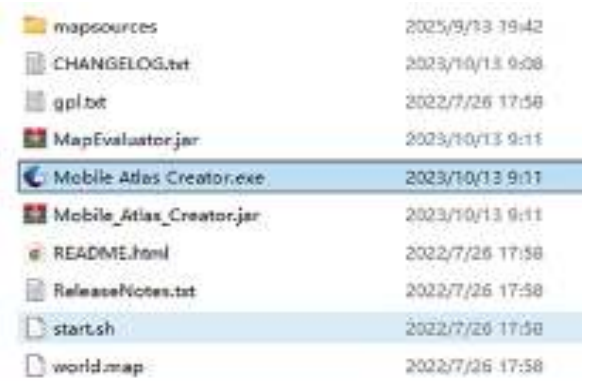
If you don't enable those options MOBAC will not be able to find the installed Java Runtime!



- Download the Windows version zip package of **MOBAC** and **unzip** it(such as Mobile Atlas Creator 2.3.3.zip) from https://sourceforge.net/projects/mobac/



- Locate the Mobile Atlas Creator.exe file and double-click it to run the program.



Mac:

- Install JDK, which can be downloaded from the official website and installed in the MacOS version of the dmg file.
- Download the MOBAC package from sourceforge.net and unzip it.
- Double-click the Mobile_Atlas_Creator.jar file in the directory to launch the software.

Linux:

- Ensure that the Java Runtime Environment is installed in your system.
- Download the Linux version zip package of Mobile Atlas Creator and unzip it.
- Open a terminal, navigate to the unzipped directory, and execute the start.sh script to launch the program.

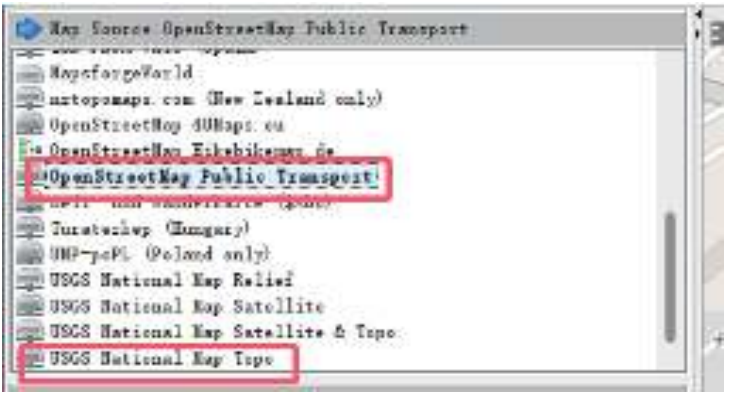
2.How to use MOBAC to download offline maps

The usage steps.

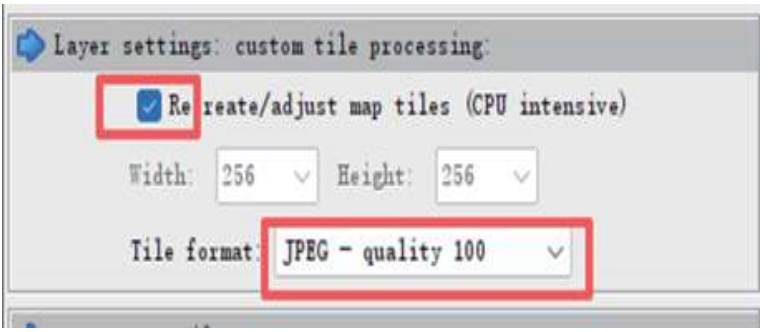


Step 1: **Select Map Source**

- Run the Mobile Atlas Creator.exe and choose the desired map source from the **map source bar**, such as “OpenStreetMap Public Transport” ,“USGS National Map Topo”, etc. (Some map sources may not load due to network restrictions, and you can also customize map sources).



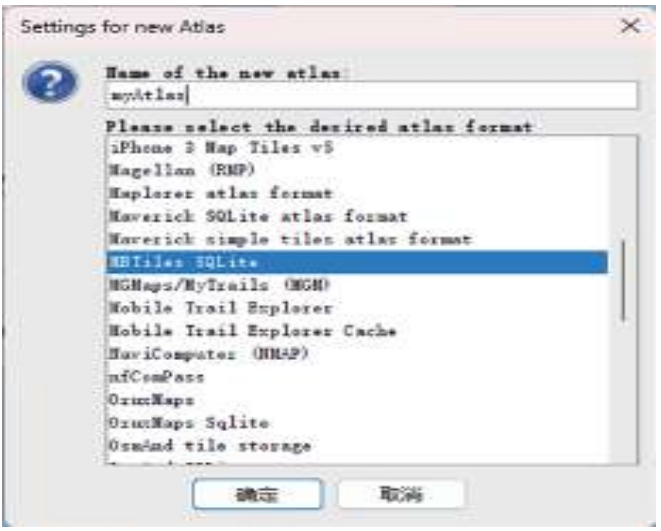
Step2: Set Image Conversion Format to JPEG



Step3: Create a new atlas

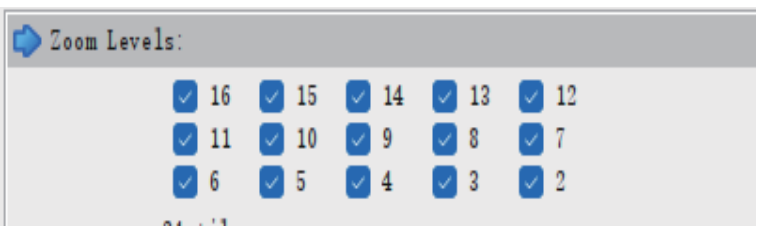
- Click "New" in "Atlas Content" and select MBTiles format (Important Note: the device only supports the MBTiles format of the atlas file), and name the atlas.





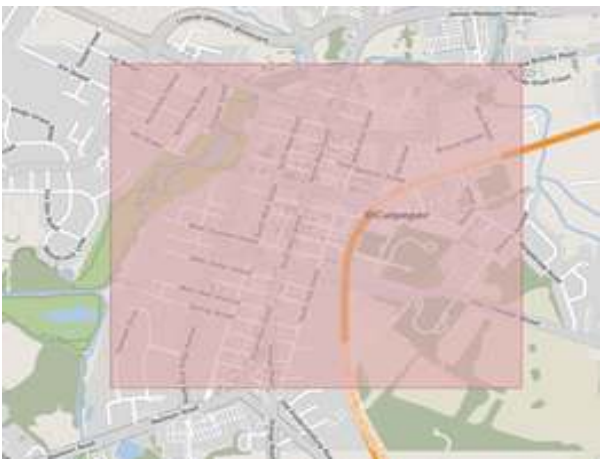
Step 4: Select Zoom Levels

- Select the zoom levels you want to download



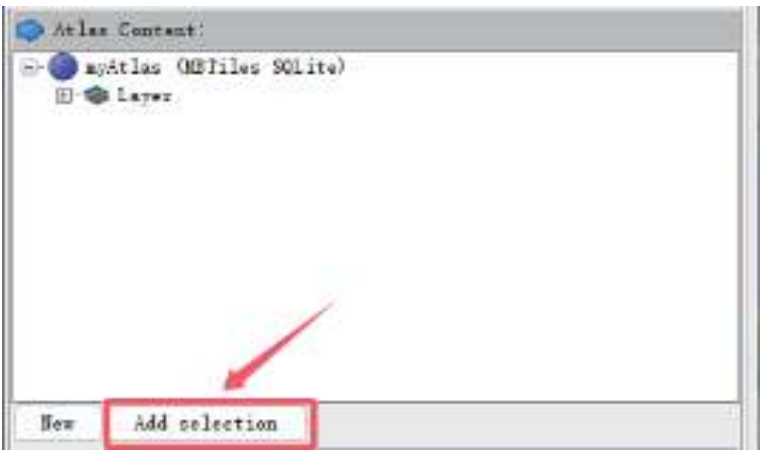
Step5: Select Region

- Press and hold the right mouse button to move the map; press and hold the left mouse button to select a rectangular area that you want to download.



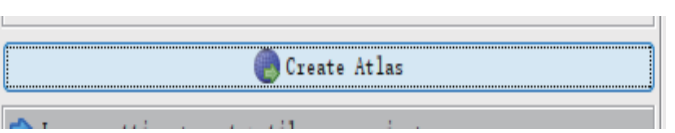
Step6: Add Region

After selection, click the "Add Selected" button. The larger the zoom scale, the more detailed the map but also the larger the space it occupies. For the initial test, it is recommended to choose a smaller zoom level.



Step7: Start Downloading the Atlas

- Click the "Create Atlas" button, and the software will start downloading the selected area and zoom level map tiles and automatically combine them into an offline map file named.mbtiles.



Step8: Import to Device

- After the map download is completed, import(copy) the generated offline map .mbtiles file into to the zzz folder of the device through USB connection and select the map file in the map setting screen of the device .Then you can see the map that you made by yourself on the map screen.

Thank you for choosing our product. We highly value your experience feedback. If it did not meet your expectations, we deeply apologize and sincerely hope that you can contact our customer service team first. We're here to help and are dedicated to finding a satisfactory solution for you.

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