Wildlife Tracker User Manual (V3.1)

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1. Product Introduction

HQXS wildlife micro-tracker uses satellite positioning technology and dual-mode hybrid positioning technology to obtain information such as latitude and longitude, speed, heading, altitude, etc. At the same time, the device is equipped with a variety of sensors to collect other corresponding data. All collected data is sent to the company's data center via GSM/4G/satellite network, and the data can also be stored inside the tracker. The solar panel outside the device can ensure the long-term power supply of the product, and the built-in lithium battery ensures that the product can run normally when there is no sunlight. This product is independently developed by our company and has completely independent intellectual property rights. It has ultra-small size, ultra-low power consumption, and high-precision positioning characteristics.

2. Daily maintenance of products

- After purchasing this product, if it has not been used for more than one month, please put it in the sun to charge for three days, and then charge it once a month regularly (charge in the sun for three days).
- When installing this product, please contact our company two days in advance. The technicians will set relevant parameters for your product to ensure that the product can be used normally. Before installation, please place this product in an open and sunny place (such as an open yard, roof of a house, etc.)
- A magnetic switch controls the power switch mode of the tracker. The device is in shutdown mode when the magnetic strip is attached to the product. When the magnetic stripe is removed, the device will automatically turn on. The factory default is the shutdown state (with the magnetic strip attached). Before releasing the species into the wild, please be sure to remove the magnetic stripe. Otherwise, the device will not work properly.
- To ensure this product's standard and stable operation, the company provides complete management services for each product.
- If you fail to implement the above items, it may cause the product not to be used normally, and please be aware.

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3. The meaning and description of each indicator of the tracker

3.1 The meaning of the indicators of the tracker

No.	Index Parameter	Explanation
1	Time	The time when the location point was collected (subject to Beijing time)
2	Longitude	GPS longitude, in degrees, accurate to five decimal places, using the WGS-84 geodetic coordinate system
3	Latitude	GPS latitude, in degrees, accurate to five decimal places, using the WGS-84 geodetic coordinate system
4	Speed	Km/h
5	Course	The angle formed by the clockwise direction with the north direction of 0°
6	Altitude	The altitude with sea level as a reference, this parameter has reference value only when GPS is 3D positioning mode
7	Temperature	The temperature value collected by the device, in degrees Celsius
8	Voltage	Device battery voltage
9	Exercise	The number of activities in a collection period
10	Accuracy	The accuracy of GPS positioning is divided into five grades: A, B, C, D and E. See the table below for details.
11	HDOP	Horizontal precision factor, reflecting the GPS positioning error, the smaller the parameter, the higher the GPS positioning accuracy
12	VDOP	Vertical precision factor
13	Raw X-axis acceleration	Acceleration sensor X-axis raw data
14	Raw Y-axis acceleration	Acceleration sensor Y-axis raw data
15	Raw Z-axis acceleration	Acceleration sensor Z-axis raw data
16	X-axis acceleration	Acceleration of gravity in the x-axis
17	Y-axis acceleration	Acceleration of gravity in the y-axis
18	Z-axis acceleration	Acceleration of gravity in the z-axis
19	Dynamic global acceleration(ODBA)	ODBA (Overall Dynamic Body Acceleration) is the overall dynamic acceleration of an animal, an indicator derived by processing and calculating information about the change in acceleration of an object in three axes at different points in time.

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3.2 Description of positioning accuracy

(1) Overview of positioning accuracy

Positioning accuracy is the closeness between a spatial entity's location information (usually coordinates) and its true location. Our company's products provide the original GPS positioning accuracy factor data, and the equipment positioning accuracy adopts the linear regression analysis method: Error=2.679243*HDOP+0.59144.

(2) Accuracy class and deviation

The Hunan Provincial Institute approves the HQXS satellite tracker of Quality Supervision and Inspection of Products. The specific accuracy grades and deviations are as follows:

A	B	C	D	E
5 meters	10 meters	20 meters	100 meters	2000 meters

(3) Reliability of positioning accuracy

The positioning accuracy of the satellite tracker is 95% reliable.

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4. Parameters and Specifications

Model	HQNT	HQBV10016	HQBV1002	HQBV0702	HQBG0603
Category	Backpack	Backpack	Backpack	Backpack	Backpack
Weight	0.6 ~ 20 g	1.9 g	2.2 g	2.2 g	3 g
Height	Customization	11 mm	12 mm	18 mm	7.5 mm
Width	Customization	10 mm	10 mm	12 mm	17 mm
Length	Customization	23 mm	23 mm	7 mm	21 mm
Inner Diameter	-	-	-	-	-
Default Frequency	1-60 s	1-4 h	1-4 h	1-4 h	1 h
Dense Tracking	-	1 min	1 min	1 min	1 min
ACC data period	-	10 min	10 min	-	-
ODBA	-	Support	Support	-	Support
Data Storage Capacity	-	260000 points	260000 points	5000 points	260000 points
International Roaming	-	-	-	-	Support
No Signal Processing	-	Local storage	Local storage	Local storage	Local storage
Positioning Method	TDOA	BDS/GPS/ GLONASS	BDS/GPS/ GLONASS	BDS/GPS/ GLONASS	BDS/GPS/ GLONASS
Positioning Accuracy	-	5 m	5 m	5 m	5 m
Signal Transmission	VHF/LORA	VHF	VHF	VHF	CAT1/GSM
Antenna	External	External	External	External	External
Duration without Light (built-in lithium battery)	7-900 days	7 days	15 days	7 days	7 days
Lifetime in the Wild ıge sunshine 2 hours)	-	>5 years	>5 years	>5 years	-
Waterproof Level	IP68	IP68	IP68	IP68	IP68
Waterproof Depth	10 m	10 m	10 m	10 m	10 m
Operating Temperature	-40~70℃	-40~70℃	-40~70℃	-40~70℃	-40~70℃
Working Altitude	<10000 m	<10000 m	<10000 m	<10000 m	<10000 m
Low Battery Protection	Support	Support	Support	Support	Support
Death Warning	Support	Support	Support	Support	Support
Client Software	-	Windows Android IOS	Windows Android IOS	Windows Android IOS	Windows Android IOS

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Model	HQBG1202	HQBG1203	HQBG1204	HQBG1205	HQBG1206
Category	Backpack	Backpack	Backpack	Backpack	Backpack
Weight	2.9 g	3.5 g	5.1 g	5.7 g	6.5 g
Height	12 mm	13 mm	12 mm	12 mm	12 mm
Width	13 mm	13 mm	18.5 mm	18.5 mm	20 mm
Length	24 mm	24 mm	30 mm	30 mm	33 mm
Inner Diameter	-	-	-	-	-
Dense Tracking	1 min	1 min	1 min	1 min	1 min
Default Frequency	1 h	1 h	1 h	1 h	1 h
ACC data period	10 min	10 min	10 min	10 min	10 min
ODBA	Support	Support	Support	Support	Support
Data Storage Capacity	260000 points	260000 points	260000 points	260000 points	260000 points
International Roaming	Support	Support	Support	Support	Support
No Signal Processing	Local storage	Local storage	Local storage	Local storage	Local storage
Positioning Method	BDS/GPS/ GLONASS	BDS/GPS/ GLONASS	BDS/GPS/ GLONASS	BDS/GPS/ GLONASS	BDS/GPS/ GLONASS
Positioning Accuracy	5 m	5 m	5 m	5 m	5 m
Signal Transmission	Cat-M1/ Cat-NB2	Cat-M1/ Cat-NB2	CAT1/GSM	CAT1/GSM	CAT1/GSM
Antenna	External	External	External	External	External
Duration without Light (built-in lithium battery)	15 days	20 days	7 days	7 days	7 days
Lifetime in the Wild rage sunshine 2 hours)	>5 years	>5 years	>5 years	>5 years	>5 years
Waterproof Level	IP68	IP68	IP68	IP68	IP68
Waterproof Depth	10 m	10 m	10 m	10 m	10 m
Operating Temperature	-40~70℃	-40~70℃	-40~70℃	-40~70℃	-40~70℃
Working Altitude	<10000 m	<10000 m	<10000 m	<10000 m	<10000 m
Low Battery Protection	Support	Support	Support	Support	Support
Death Warning	Support	Support	Support	Support	Support
Client Software	Windows Android IOS	Windows Android IOS	Windows Android IOS	Windows Android IOS	Windows Android IOS

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Model	HQBG1507	HQBG2009P	HQBG1310	HQBG2210	HQBG1512S
Category	Backpack	Backpack	Backpack	Backpack	Backpack
Weight	7.1 g	9 g	10 g	10 g	13 g
Length	35 mm	35 mm	36 mm	47 mm	48 mm
Width	18.5 mm	21 mm	19 mm	21 mm	21 mm
Height	12.5 mm	16 mm	13 mm	22 mm	15 mm
Inner Diameter	-	-	-	-	-
Dense Tracking	1 min	1 min	1 min	1 min	1 min
Default Frequency	1 h	1 h	1 h	1 h	1 h
ACC data period	10 min	10 min	10 min	10 min	10 min
ODBA	Support	Support	Support	Support	Support
Data Storage Capacity	260000 points	260000 points	260000 points	260000 points	260000 points
International Roaming	Support	Support	Support	Support	Support
No Signal Processing	Local storage	Local storage	Local storage	Local storage	Local storage
Positioning Method	BDS/GPS/ GLONASS	BDS/GPS/ GLONASS	BDS/GPS/ GLONASS	BDS/GPS/ GLONASS	BDS/GPS/ GLONASS
Positioning Accuracy	5 m	5 m	5 m	5 m	5 m
Signal Transmission	CAT1/GSM	CAT1/GSM	CAT1/GSM	CAT1/GSM	CAT1/GSM
Antenna	External	External	External	Internal	External
Duration without Light (built-in lithium battery)	7 days	7 days	7 days	15 days	7 days
Lifetime in the Wild (average sunshine 2 hours)	>5 years	>5 years	>5 years	>5 years	>5 years
Waterproof Level	IP68	IP68	IP68	IP68	IP68
Waterproof Depth	10 m	10 m	10 m	10 m	10 m
Operating Temperature	-40~70℃	-40~70℃	-40~70℃	-40~70℃	-40~70℃
Working Altitude	<10000 m	<10000 m	<10000 m	<10000 m	<10000 m
Low Battery Protection	Support	Support	Support	Support	Support
Death Warning	Support	Support	Support	Support	Support
Client Software	Windows Android IOS	Windows Android IOS	Windows Android IOS	Windows Android IOS	Windows Android IOS

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Model	HQBG2512L	HQBG2715S	HQBG2512S	HQBG1815S
Category	Backpack	Backpack	Backpack	Backpack
Weight	13 g	17 g	15 g	18 g
Height	23.5 mm	27 mm	25 mm	18 mm
Width	20 mm	26 mm	24 mm	23 mm
Length	51 mm	55 mm	55.5 mm	63 mm
Inner Diameter	-	-	-	-
Default Frequency	1 h	1 h	1 h	1 h
Dense Tracking	1 min	1 min	1 min	1 min
Data Storage Capacity	260000 points	260000 points	260000 points	260000 points
ACC data period	10 min	10 min	10 min	10 min
ODBA	Support	Support	Support	Support
International Roaming	Support	Support	Support	Support
No Signal Processing	Local storage	Local storage	Local storage	Local storage
Positioning Method	BDS/GPS/ GLONASS	BDS/GPS/ GLONASS	BDS/GPS/ GLONASS	BDS/GPS/ GLONASS
Positioning Accuracy	5 m	5 m	5 m	5 m
Signal Transmission	CAT1/GSM	CAT1/GSM	CAT1/GSM	CAT1/GSM
Antenna	Internal	Internal	Internal	Internal
Duration without Light (built-in lithium battery)	7 days	7 days	7 days	7 days
Lifetime in the Wild verage sunshine 2 hours)	>5 years	>5 years	>5 years	>5 years
Waterproof Level	IP68	IP68	IP68	IP68
Waterproof Depth	10 m	10 m	10 m	10 m
Operating Temperature	-40~70℃	-40~70℃	-40~70℃	-40~70℃
Working Altitude	<10000 m	<10000 m	<10000 m	<10000 m
Low Battery Protection	Support	Support	Support	Support
Death Warning	Support	Support	Support	Support
Client Software	Windows Android IOS	Windows Android IOS	Windows Android IOS	Windows Android IOS

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Model	HQBG2715L	HQBG3621L	HQBG3621S	HQBG2830L	HQBG5037L
Category	Backpack	Backpack	Backpack	Backpack	Backpack
Weight	17 g	24 g	23 g	24 g	62 g
Height	24 mm	35 mm	36 mm	28 mm	44 mm
Width	24 mm	24 mm	26 mm	27 mm	39 mm
Length	58 mm	70 mm	55 mm	63 mm	98 mm
Inner Diameter	-	-	-	-	-
Default Frequency	1 h	1 h	1 h	1-6 h	1 h
Dense Tracking	1 min	1 min	1 min	1 min	1 min
ACC data period	10 min	10 min	10 min	10 min	10 min
ODBA	Support	Support	Support	Support	Support
Data Storage Capacity	260000 points	260000 points	260000 points	260000 points	260000 points
International Roaming	Support	Support	Support	Support	Support
No Signal Processing	Local storage	Local storage	Local storage	Local storage	Local storage
Positioning Method	BDS/GPS/ GLONASS	BDS/GPS/ GLONASS	BDS/GPS/ GLONASS	BDS/GPS/ GLONASS	BDS/GPS/ GLONASS
Positioning Accuracy	5 m	5 m	5 m	5 m	5 m
Signal Transmission	CAT1/GSM	CAT1/GSM	CAT1/GSM	CAT1/GSM	CAT1/GSM
Antenna	Internal	Internal	Internal	Internal	Internal
Duration without Light (built-in lithium battery)	7 days	15 days	15 days	80 days	30 days
Lifetime in the Wild (average sunshine 2 hours)	>5 years	>5 years	>5 years	>5 years	>5 years
Waterproof Level	IP68	IP68	IP68	IP68	IP68
Waterproof Depth	10 m	10 m	10 m	10 m	10 m
Operating Temperature	-40~70℃	-40~70℃	-40~70℃	-40~70℃	-40~70℃
Working Altitude	<10000 m	<10000 m	<10000 m	<10000 m	<10000 m
Low Battery Protection	Support	Support	Support	Support	Support
Death Warning	Support	Support	Support	Support	Support
Client Software	Windows Android IOS	Windows Android IOS	Windows Android IOS	Windows Android IOS	Windows Android IOS

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Model	HQLG4037S	HQNG4625	HQAN40L	HQAN40M
Category	Leg ring	Neck ring	Collar	Collar
Weight	37~44 g	34~75 g	500~800 g	300~600 g
Height	51mm	40~80 mm	-	-
Width	-	32 mm	50 mm	32 mm
Length	-	-	-	-
Inner Diameter	14~24 mm	30~60 mm	Customize	Customize
Default Frequency	1 h	1 h	1 h	1 h
Dense Tracking	1 min	1 min	1 min	1 min
ACC data period	10 min	10 min	10 min	10 min
ODBA	Support	Support	Support	Support
Data Storage Capacity	260000 points	260000 points	260000 points	260000 points
International Roaming	Support	Support	Support	Support
No Signal Processing	Local storage	Local storage	Local storage	Local storage
Positioning Method	BDS/GPS/ GLONASS	BDS/GPS/ GLONASS	BDS/GPS/ GLONASS	BDS/GPS/ GLONASS
Positioning Accuracy	5 m	5 m	5 m	5 m
Signal Transmission	CAT1/GSM	CAT1/GSM	CAT1/GSM	CAT1/GSM
Antenna	Internal	Internal	External	External
Duration without Light (built-in lithium battery)	7 days	15 days	1000 days	800 days
Lifetime in the Wild (verage sunshine 2 hours)	>5 years	>5 years	>5 years	>5 years
Waterproof Level	IP68	IP68	IP68	IP68
Waterproof Depth	10 m	10 m	10 m	10 m
Operating Temperature	-40~70℃	-40~70℃	-40~70℃	-40~70℃
Working Altitude	<10000 m	<10000 m	<10000 m	<10000 m
Low Battery Protection	Support	Support	Support	Support
Death Warning	Support	Support	Support	Support
Client Software	Windows Android IOS	Windows Android IOS	Windows Android IOS	Windows Android IOS

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Model	HQAN40S	HQAI-L	HQAI-M	HQAI-S
Category	Collar	Collar	Collar	Collar
Weight	120~200 g	800~1600 g	350~700 g	160~250 g
Height	-	-	-	-
Width	22 mm	50 mm	44 mm	22 mm
Length	-	-	-	-
Inner Diameter	Customize	Customize	Customize	Customize
Default Frequency	1 h	1 h	1 h	1 h
Dense Tracking	1 min	1 min	1 min	1 min
ACC data period	10 min	10 min	10 min	10 min
ODBA	Support	Support	Support	Support
Data Storage Capacity	260000 points	260000 points	260000 points	260000 points
International Roaming	Support	Support	Support	Support
No Signal Processing	Local storage	Local storage	Local storage	Local storage
Positioning Method	BDS/GPS/ GLONASS	BDS/GPS/ GLONASS	BDS/GPS/ GLONASS	BDS/GPS/ GLONASS
Positioning Accuracy	5 m	5 m	5 m	5 m
Signal Transmission	CAT1/GSM	CAT1/GSM/iridium	CAT1/GSM/iridium	CAT1/GSM/iridium
Antenna	External	External	External	External
Duration without Light (built-in lithium battery)	365 days	900 days	700 days	90 days
Lifetime in the Wild (average sunshine 2 hours)	>5 years	>5 years	>5 years	>5 years
Waterproof Level	IP68	IP68	IP68	IP68
Waterproof Depth	10 m	10 m	10 m	10 m
Operating Temperature	-40~70℃	-40~70℃	-40~70℃	-40~70℃
Working Altitude	<10000 m	<10000 m	<10000 m	<10000 m
Low Battery Protection	Support	Support	Support	Support
Death Warning	Support	Support	Support	Support
Client Software	Windows Android IOS	Windows Android IOS	Windows Android IOS	Windows Android IOS

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Model	HQAB-L	HQAB-M	HQAN40MC	HQZN
Category	Collar	Collar	Collar	Customize
Weight	1000~1600 g	500~1000 g	500~1000 g	Customize
Height	-	-	-	Customize
Width	50 mm	44 mm	44 mm	Customize
Length	-	-	-	Customize
Inner Diameter	Customize	Customize	Customize	Customize
Default Frequency	1 h	1 h	1 h	> 1 s
Dense Tracking	1 min	1 min	1 min	Customize
ACC data period	-	-	10 min	10 min
ODBA	Support	Support	Support	Support
Data Storage Capacity	260000 points	260000 points	260000 points	Customize
International Roaming	Support	Support	Support	Support
No Signal Processing	Local storage	Local storage	Local storage	Local storage
Positioning Method	BDS/GPS/ GLONASS	BDS/GPS/ GLONASS	BDS/GPS/ GLONASS	BDS/GPS/ GLONASS
Positioning Accuracy	5 m	5 m	5 m	5 m
Signal Transmission	CAT1/GSM/ Beidou short message	CAT1/GSM/ Beidou short message	4G/Iridium	CAT1/GSM/Beidou short message/Iridium
Antenna	External	External	External	Customize
Duration without Light (built-in lithium battery)	800 days	600 days	800 days	Customize
Lifetime in the Wild (average sunshine 2 hours)	>5 years	>5 years	>5 years	>5 years
Waterproof Level	IP68	IP68	IP68	IP68
Waterproof Depth	10 m	10 m	10 m	10 m
Operating Temperature	-40~70℃	-40~70℃	-40~70℃	-40~70℃
Working Altitude	<10000 m	<10000 m	<10000 m	<10000 m
Low Battery Protection	Support	Support	Support	Support
Death Warning	Support	Support	Support	Support
Client Software	Windows Android IOS	Windows Android IOS	Windows Android IOS	Windows Android IOS

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Start-up Test and Debugging

➢ **Unpacking inspection**

After receiving the product, please check whether the appearance is in good condition and whether the installation accessories are complete (see the list of accessories). If you have any questions, please contact our company in time.

➢ **Installation**

（1） Start the Product

When installing this product, please contact our company two days in advance, and the technicians will set relevant parameters for your product to ensure that the product can be used normally.

（2） Product Registration

Please note the product number and study species number when installing the product. After installing the product, please contact our company in time, and submit the installation information to the engineer so that the technician can bind the product and the species for you in the background and provide better service.

➢ **Product Management**

When the product is turned on, if it is not used for a short period, please notify the company to turn it off in time to maintain the power of the product and avoid extra communication charges.

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5. Software Operation Process and Use Method

1.1. Software Installation

(1) Quickly Understand

- The operating systems are WindowsXP, Windows7 (32-bit/64-bit), and Windows8.
- Operating environment: .NET Framework 4.5.2.
- Installation time: If your computer has .net Framework 4.5.2 installed, it only takes 30 seconds to complete the installation.

(2) Installation steps

Step 1: Open the installation folder, run Setup.exe, and start the program installation. Figure 1:

Figure 1

Step 2: If the computer does not have the .net Framework 4.5.2 environment installed, it will automatically start to install the .net Framework 4.5.2, as shown in Figure 2. (If the computer has already installed .net Framework 4.5.2 or above, go directly to the fourth step, as shown in Figure 4.)

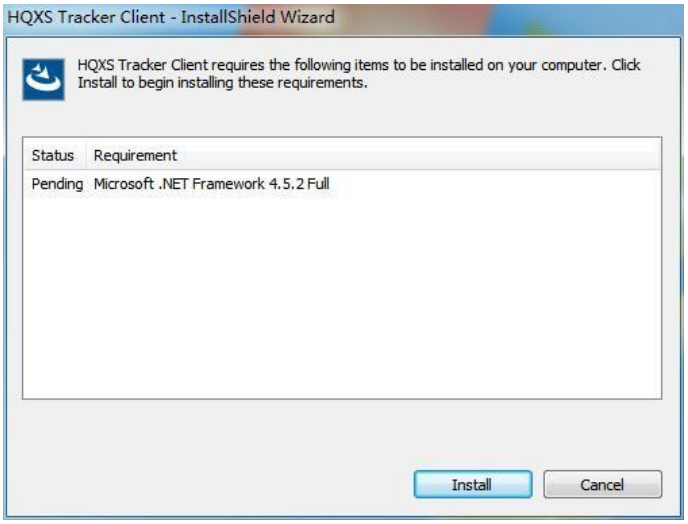

Figure 2

Step 3: Select "Install" to start the automatic installation of .net Framework 4.5.2, about 2-3 minutes, as shown in Figure 3.

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Figure 3

Step 4: After the installation of .net Framework 4.5.2 is completed, enter the "InstallShield Wizard for HQXS Tracker Information Service Platform", as shown in Figure 4.

Figure 4

Step 5: Select "Next" to start the installation, as shown in Figure 5.

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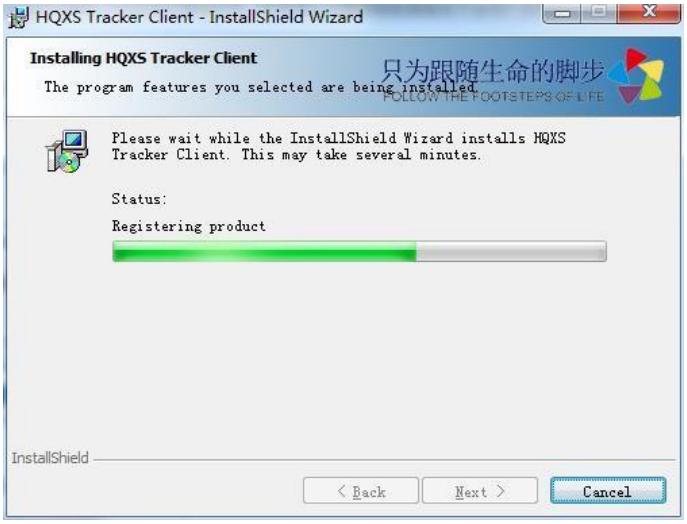

Figure 5

Step 6: Click "Finish" to complete the installation, as shown in Figure 6.

Step 7: The desktop will generate a shortcut icon of "Global Messenger", as shown in Figure 7.

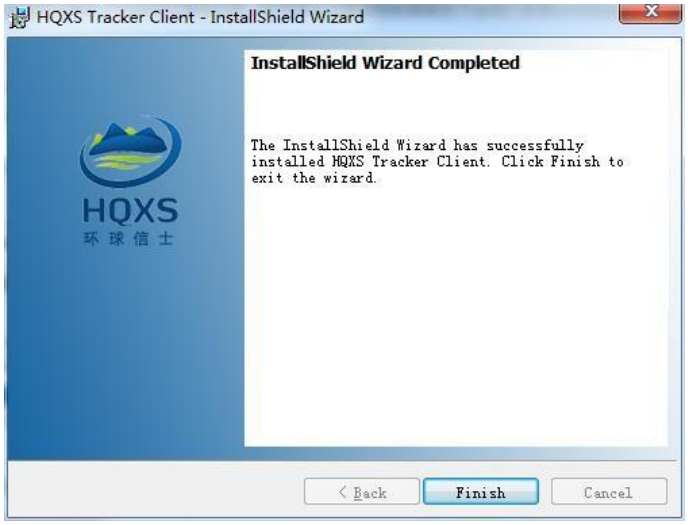

Figure 6

Figure 7

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Global Messenger Tracker Information Service Platform

User Manual（V3.04）

1. Platform Introduction

The Global Messenger Satellite Tracking Data Service Platform V3.04 is a specialized software for the management and data services of Hunan Global Messenger Technology Co., Ltd.'s wildlife satellite tracker products. The system is developed based on GIS technology and incorporates knowledge related to movement ecology. It has functions such as equipment management and remote control, track data management, extended sensor data management, animal ecology analysis, map services, data visualization, and data interaction. The system interface is shown in the following figure:

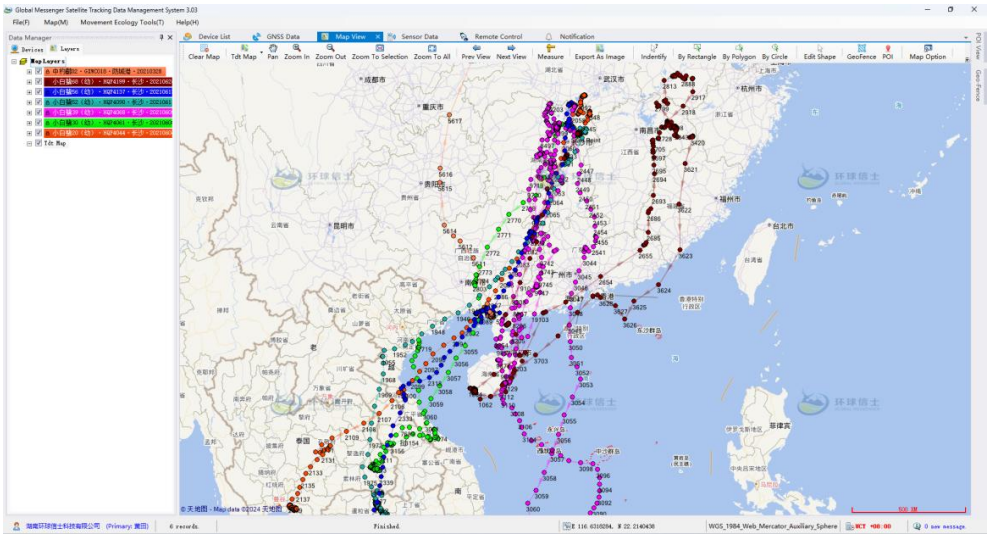

Figure 1.1 system interface

2.Account And Permission

The current version of the account is provided by Hunan Global Messenger Technology Co., Ltd. (hereinafter referred to as the "Company"). The 3.05 version will enable users to freely register accounts. Additionally, it supports guest login without an account, as illustrated in the figure below.

Figure 2.1 login interface

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2.1.Account registration

After clicking User Registration on the login interface, enter the account, password and email address to be registered, and then click Next, and then you will receive a verification code for the email address you fill in, and enter the received **verification code** into the pop-up window to complete the account creation.

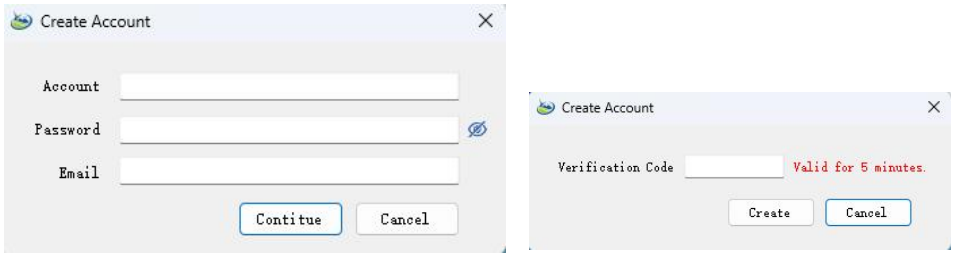

Figure 2.2 account registration

2.2.Language And Site Settings

It supports two language versions: Chinese and English, and provides three access sites in Asia, Europe, and North America, as shown in the figure below.

Figure 2.3 settings interface

2.3.Account Information Maintenance

The [Account Information] interface allows you to modify your profile picture, region, phone number, password, and email address. This is shown in the figure below.

Figure 2.4 account information

[Update Email] Enter a new email address and enter the verification code received by the email address to change the email address, as shown in the following figure.

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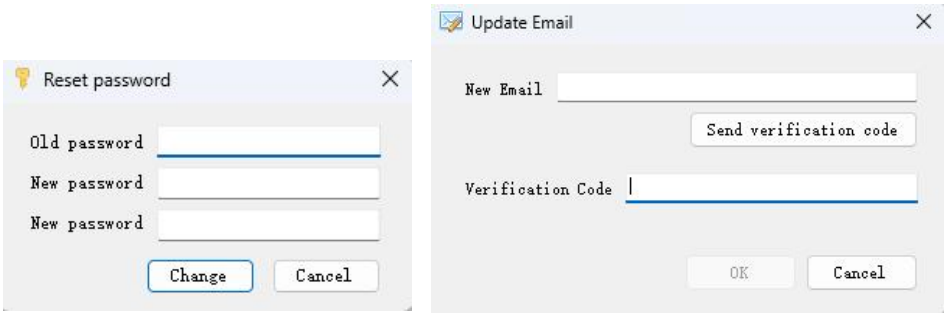

Figure 2.5 change your password and email address

3.Device Management

3.1.Device List

The list adopts a multi-level hierarchical structure, and users can create any folder as needed. The device directory can be managed by dragging and dropping with the mouse. As shown in the following figure.

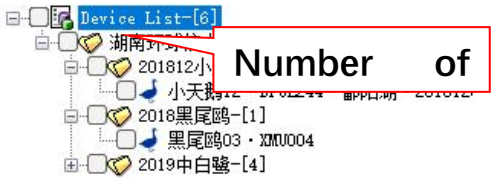

Figure 3.1 device list

(1) Experience Devices: All users can get the full data permission of 2 devices, which can be used to experience the functions and data management mode of the tracking product. You can right-click [Device List] to open the experience area, and you can also close the experience directly when you don't need it.

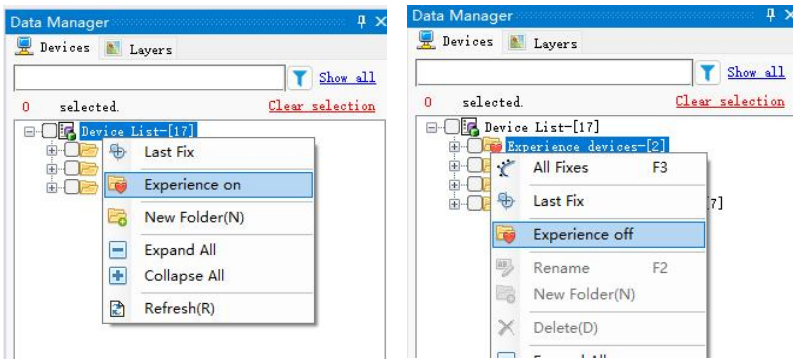

Figure 3.2 Turn the experience device on and off

(2) Device Search： Enter the device name, IMEI, species name, device type, sensor type, battery, shareable, duration, and last active time in the search box to quickly find the device. Fuzzy query is supported, as shown in the following figure.

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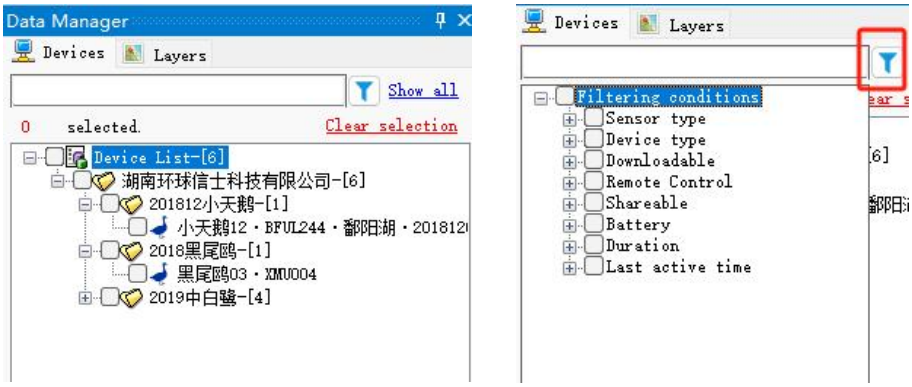

Figure 3.3 device search

(3) Query Latest Location： Select "Last Fix" from the right-click menu of folder nodes and device nodes to display the latest location distribution of devices on the map, as shown in the following figure.

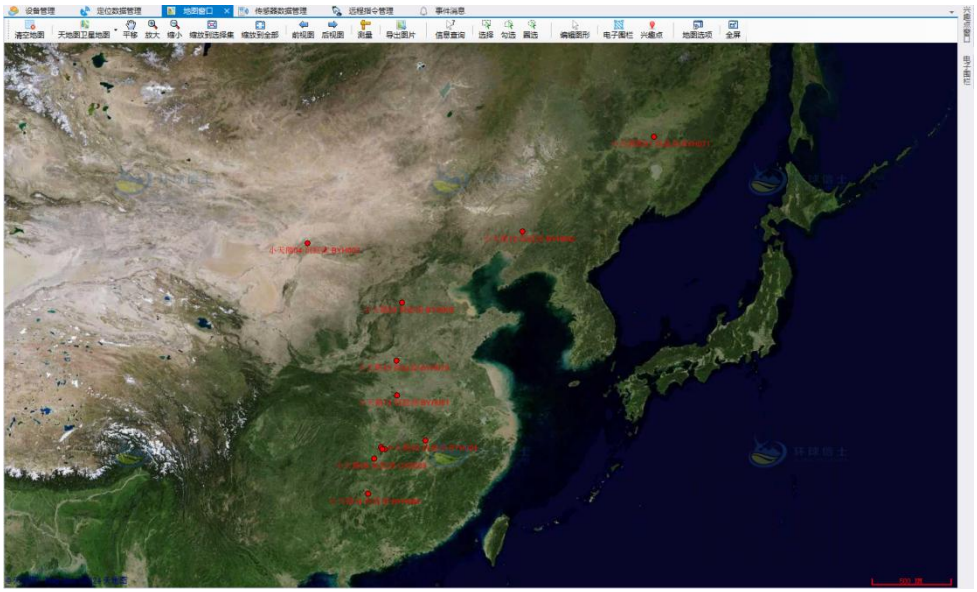

Figure 3.4 last position of the device

3.2.Directory Management

(1) Create A New Folder： The main account can create new folder nodes, modify folder names, and manage the dependency relationship between folders and devices by dragging the mouse.

(2) Remove Folders： The main account can delete folder nodes that do not contain devices.

3.3.Device Management

(1) Device Renaming： Accounts with renaming permission can modify device names.

(2) Device Location Change： The main account can drag the device with the mouse to change its location to a different folder.

(3) Remote Control： In the device list, select a single device and choose "Change Collection Schedule" or "Change Transmission Schedule" from the context menu. The collection time can be set to hourly or customized, and you can view the device's remaining battery life and last working time. The data return time can be adjusted based on the number of collection points. Changes can be monitored in the Remote Control window, as illustrated below.

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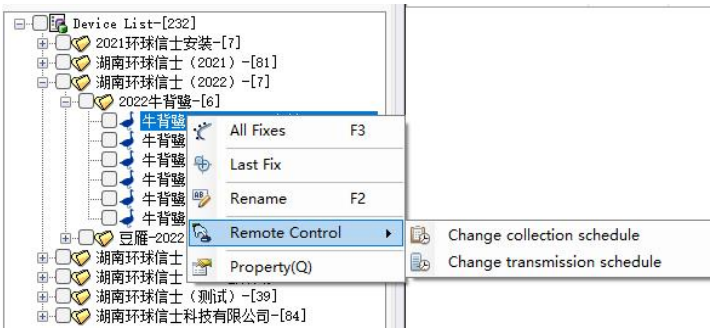

Figure 3.5 remote control

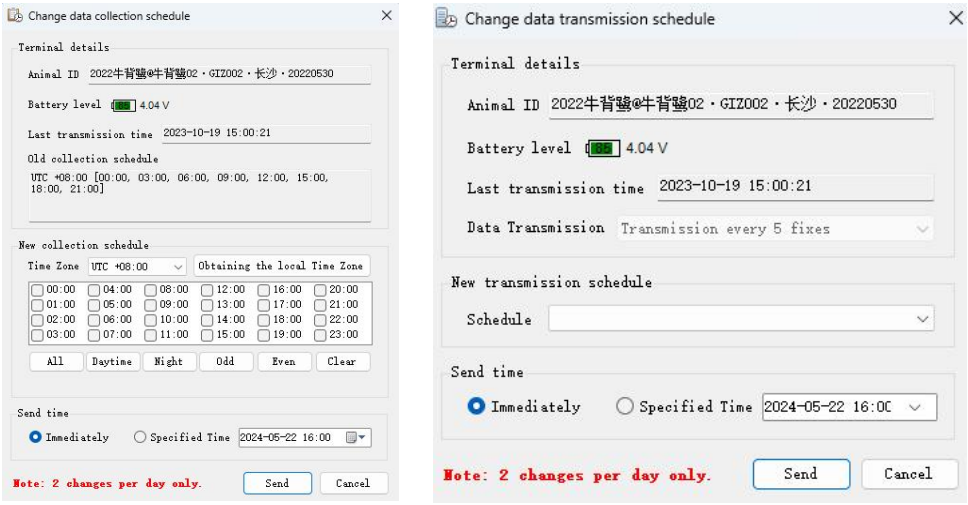

Figure 3.6 change collection and transmission schedule

(4) Device Details : Right click on the device and click on [property(Q)], or double-click on the device node to view the information of the device, including IMEI, name, caption, owner, model, status, battery, transmission, expiry date, description, sensors, subscribe, and other information. Click on "Species Information" in the bottom left corner of the device details interface to display the detailed information of the species, as shown in the following figure.

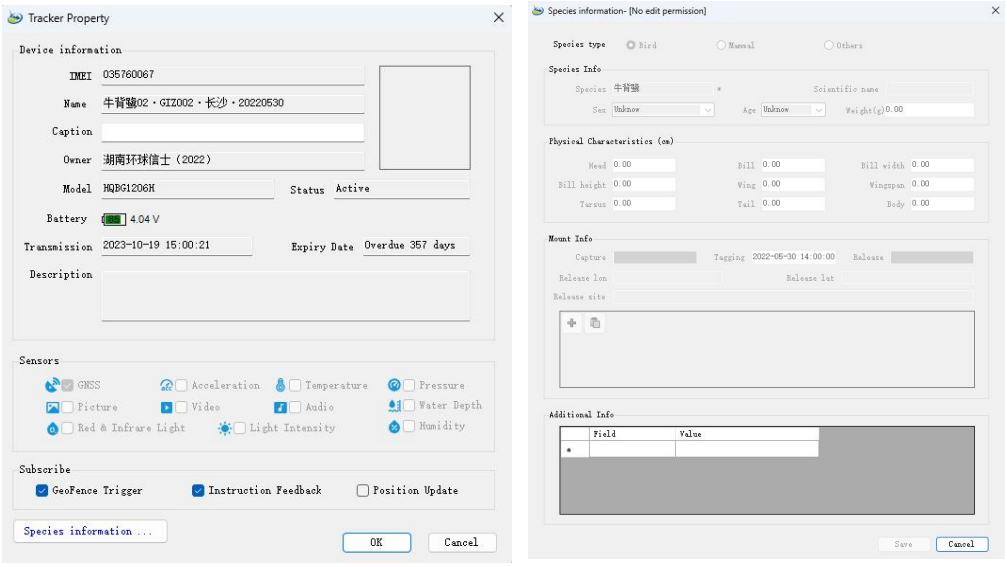

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Figure 3.7 tracker property and species information

(5)Device List: Select [Device List] from the navigation bar at the top of the interface to display all device details under the current account, which can be exported to an Excel spreadsheet, as shown in the following figure.

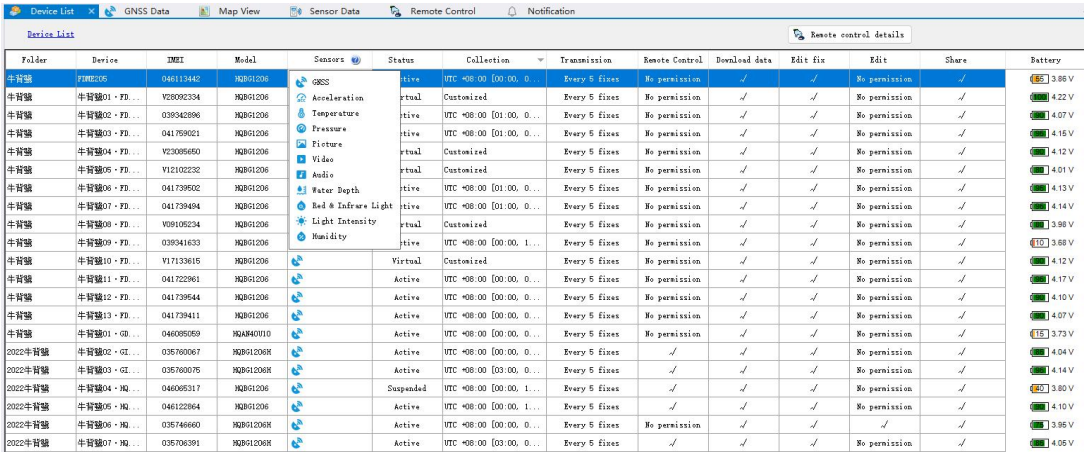

Figure 3.8 device list

4.Track Data Query

4.1 Quick Query Track

In the device list, select a single device and select "All Fixes" from the right-click menu to query all tracks and fixes of the device, which will be displayed on the map, as shown in the following figure.

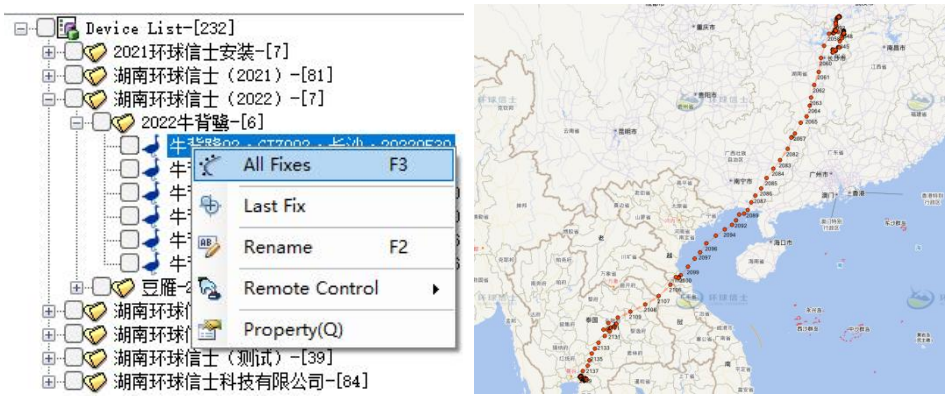

Figure 4.1 view all tracks and fixes of a single device

4.2. Query Track By Criteria

After checking the devices to be queried in the device list, enter the location data management window. You can query the track of multiple devices according to three time methods: [last] days, [by year] and [time range], or add more query conditions, such as speed, course, altitude and temperature, as shown in the figure below.

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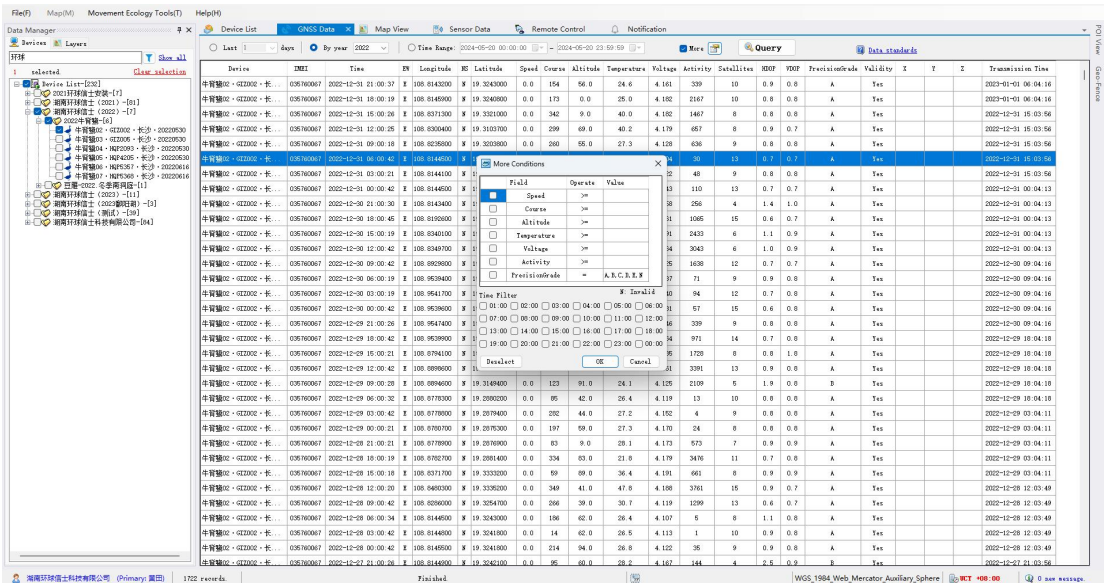

Figure 4.2 query the track by condition

4.3 Invalid Data Processing

When some loci need to be masked, you can choose to "Convert to invalid data", which will be filtered out when create tracks or statistic (note: this operation is irreversible，Please be cautious).

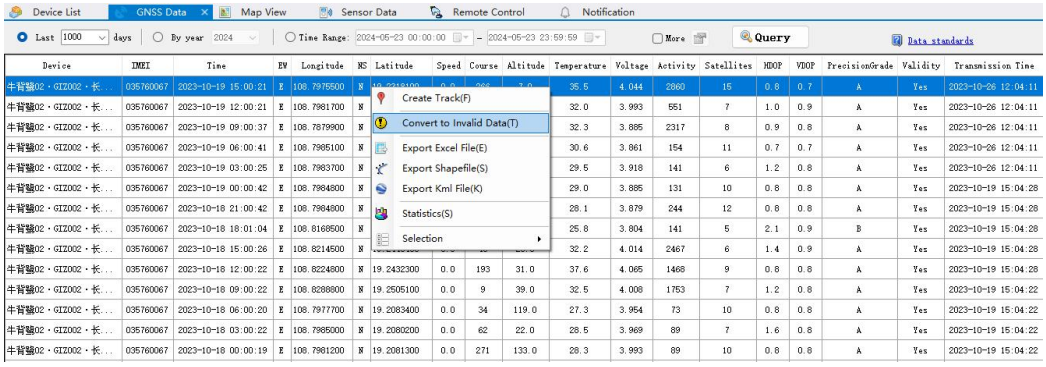

Figure 4.3 convert to invalid data

5.Track Graphics Generation

5.1. Create Track

In the location data management window, select "Create Track" in the right-click menu to generate all row data, or right-click a line, click ‘selection’, and then click generate track to generate the corresponding track diagram of the line, as shown in the figure below.

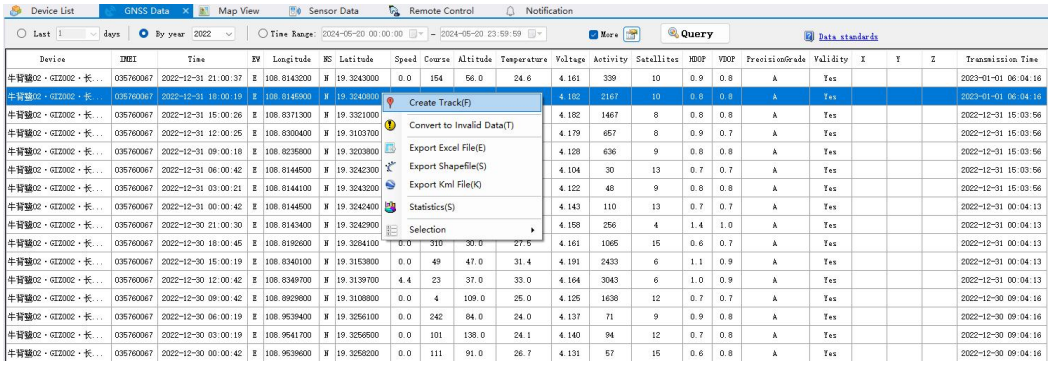

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Figure 5.1 create track

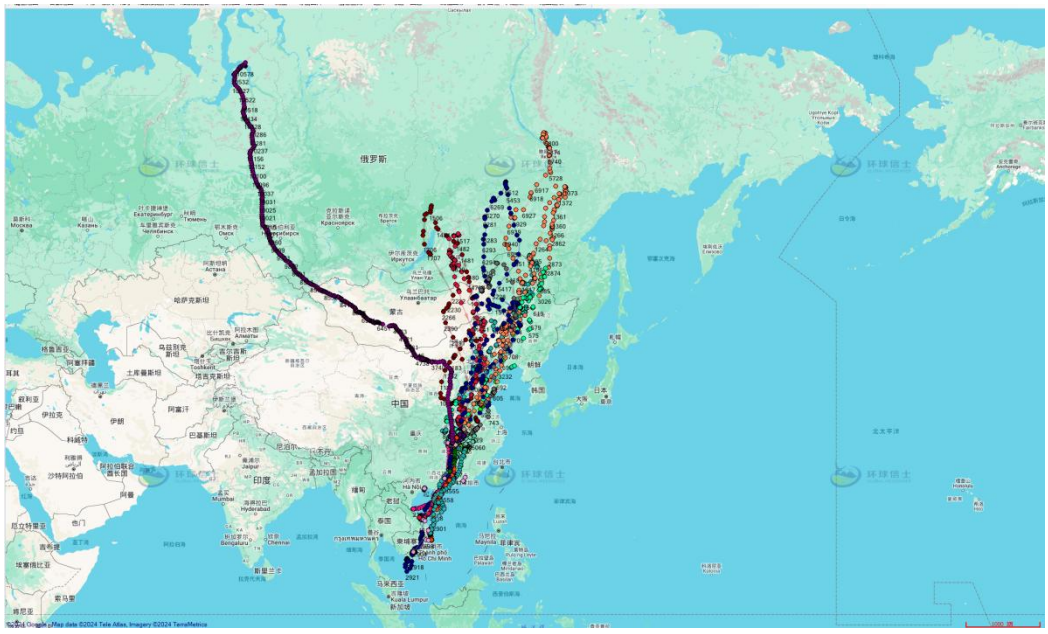

Figure 5.2 track map interface

5.2.Export Track Data

In the location data management window, select "Export Excel File", "Export Shp File" and "Export Kml File" in the right-click menu, to export all row data as Excel / csv, Shape file, Kml format files, the coordinate system of the exported data is Wgs 84 geographic coordinates, or select a row to right-click the select row to export the data of the row.

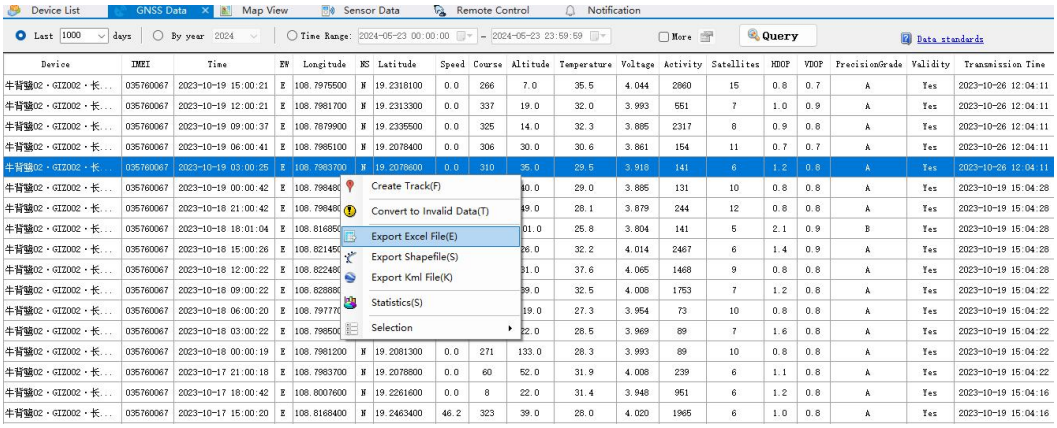

Figure 5.3 data export

6.Map Operation

6.1. Online Map Selection

The platform supports three online maps: Tianditu, ESRI map and Google map, with vector map, satellite map, hybrid map, terrain map and other modes. The map coordinate system is Web Mercotor projection coordinates.

6.2. Clear The Map

You can directly click the ‘clear map’ button to empty all the data on the map layer.

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6.3. Map Browsing

(1) Pan: Press the left mouse button and then move the map.

(2) Zoom in: Box the map on the map.

(3) Zoom out: Box it down on the map to shrink the map.

(4) Zoom to all: Zoom the map to the geometric range of all the objects.

(5) Zoom to selection： Zoom the map to the geometric range of the selected object.

(6) Prev view: Switch the map view to the previous view.

(7) Next view: Switch the map view to the next view.

6.4. Selection Function

(1) By rectangle： Draw a rectangle on a map to select geometric objects.

(2) By polygon： Draw a polygon on a map to select geometric objects.

(3) By circle： Draw a circle to select geometric objects on a map.

(4) Layer save： Select any site or line, and the right key can be saved as a layer, as shown in the figure below.

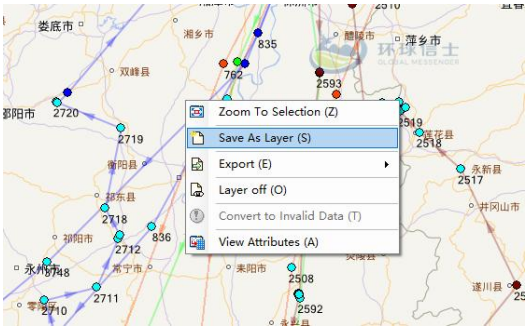

Figure 6.1 select the data to save as a layer

6.5. Indentify

The [Indentify] tool can query the attribute information of graphic objects in the map window. Click the "Previous" and "Next" buttons in the information box to browse the adjacent objects in the same layer in turn, and can choose whether to display the selected objects in center; click on any location on the map to query information about that location. As shown in the figure below.

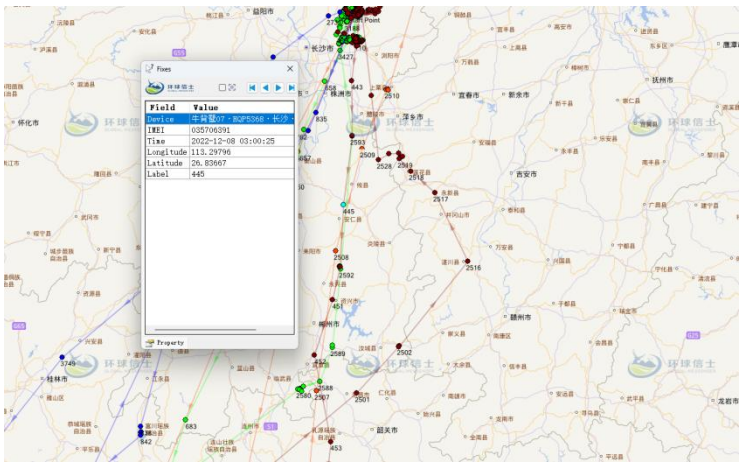

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Figure 6.2 graphic information query

Address information can be queried on the Web map. This function needs to right-click the map layer, click "selectable", and then click on any location on the map to query information about that location.

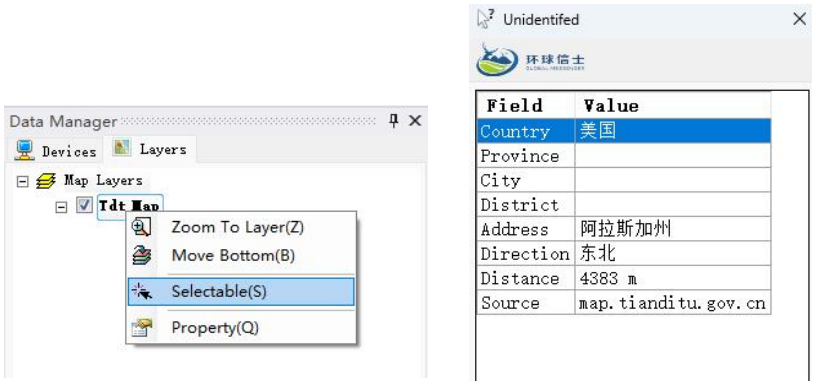

Figure 6.3 the address query function

6.6 Measure Tools

Multipoint distance measurements and area measurements were performed by mouse picking points in the map window, as shown in the following below.

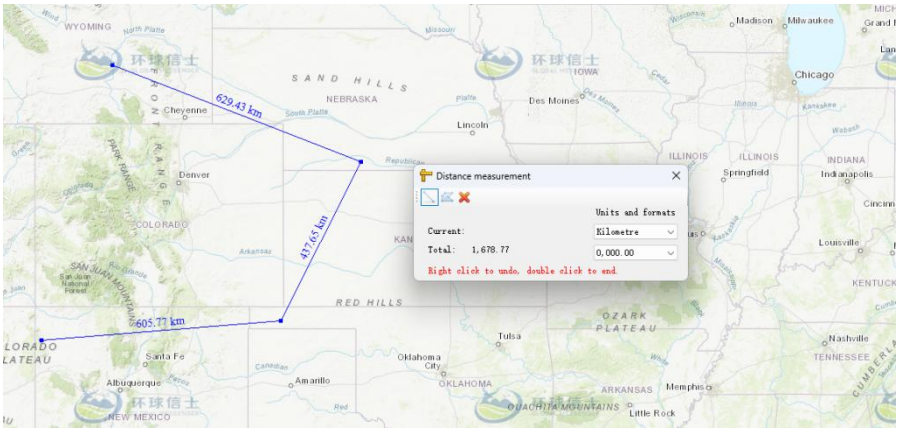

Figure 6.4 measured range

6.7. Map Option

Set the map background color, the coordinate format, the meridian offset degree, and the Tianditu key, as shown in the figure below.

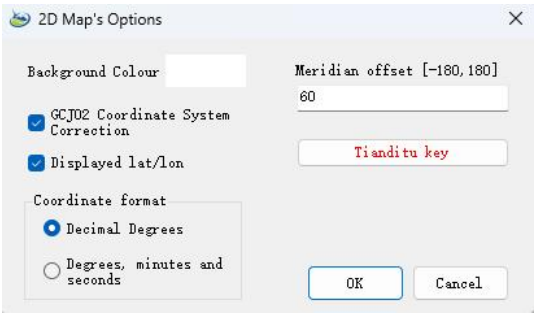

Figure 6.5 map option setting

6.8. Full Screen Display

You can click the Full-Screen button to display the map in full screen.

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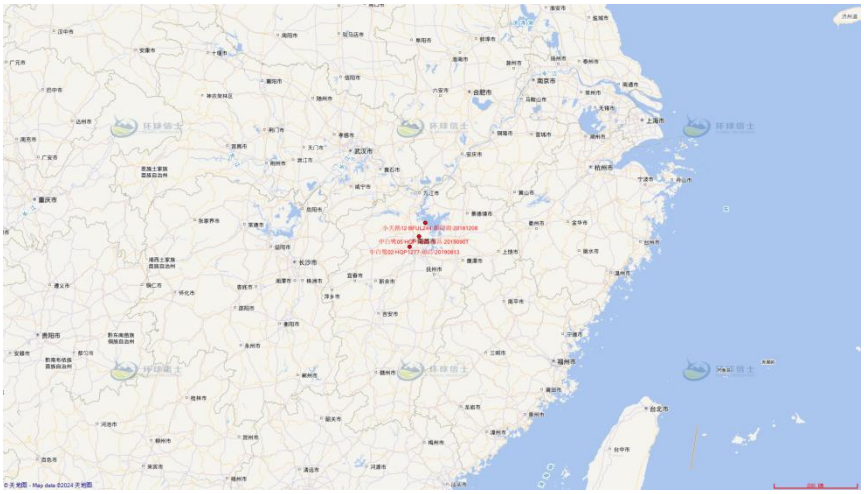

Figure 6.6 full screen show

6.9. Map Image Export

Users with data download permission can export the current map window content into pictures, supporting ordinary export pictures and HD export pictures.

(1) Default export pictures： After setting the image format, image quality, and export path of the exported image, export the current map content directly as the image.

(2) Exporting pictures in High Quality： Select the area to be exported in the box on the map, set the export map level, click [Cache Tile], when the tile cache is completed, click the [Export] button to generate high-quality pictures.

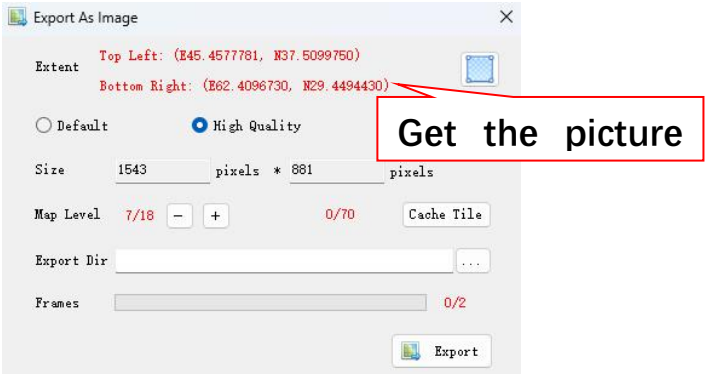

Figure 6.7 Map Export Interface

7. Layer Management

Layer Manager is similar to Windows resource Manager, which is divided into three nodes: layer list, layer group, and layer group. Layer group can contain multiple layers or multiple layer groups. Layer types are divided into points, lines, planes, vector layer, raster layer, and Web map layers.

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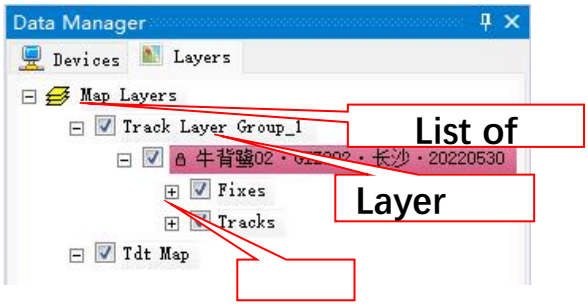

Figure 7.1 layer management

7.1. Layer List Operations

The layer list corresponds to the current map framework, and has the functions of adding map layer, Spatialite layer, and Wms layer, creating a new group, importing the offline group, and delete the map data.

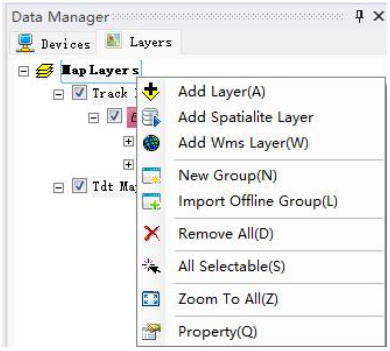

Figure 7.2 layer list Menu

(1) Add layer： Add local spatial data to the map, with support for vector, raster, and image data, and the coordinate system for importing the data is automatically converted to the current map coordinates.

(2) Add Spatialite layer： The spatial data was read from the Sqlite database and added to the map.

(3) Add Wms layers： Get the WMS layers via a network request and add them to the map.

(4) New group： Create a new layer group node in the layer list.

(5) Import offline group： Offline data packets are imported to the map, and the coordinate system that imports the data is automatically converted to the current map coordinates. The offline layer group format is 2D Data group file (*. dg 2), the account with data download permission can export the track data as an offline data package and share it with others.

(6) Clear： Remove all the data in the map, and this operation does not delete the source data.

(7) All selectable： Whether all of the vector layers in the batch setting map are selectable.

(8) Zoom to all： Zoom the map to the maximum visual range that includes all of the objects.

(9) Property： View the coordinate information for the map frame.

7.2. Layer Group Operations

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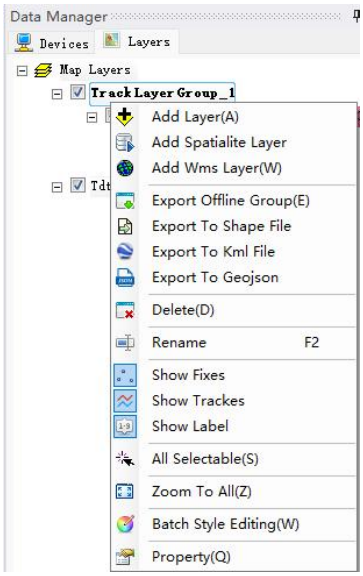

Figure 7.3 layer group menu

(1) Add layer： ditto.

(2) Add Spatialite layer： ditto.

(3) Add Wms layer： ditto.

(4) Export offline group： Users with data download privileges can export the currently selected layer group as an offline packet file (2D Data group file *. dg2).

(5) Export files： You can choose to export the file as a Shape file, Kml file, or Geojson file

(6) Delete： Delete the currently selected layer group, and delete all the sublayer groups and layers below the layer group, and this operation does not delete the source data.

(7) Separate control track points, track line, and point numbers are shown ：If the layer group type is a system-generated track layer group, you can individually control the visibility of track points, track lines, and track point numbers.

(8) All selectable： Batch sets whether all the vector layers in the layer group are optional.

(9) Zoom to all： Scale the map to the geometric range of all the objects in the selected layer group.

(10) Property： View the coordinate information of the selected layer group, and all the layer coordinate systems in the layer group are consistent.

(11) Batch style editing： Personalized the track points, track lines and so on in batches, as shown in the figure below.

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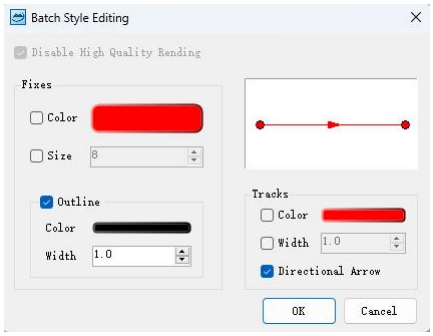

Figure 7.4 batch style editing

After selecting and right-click the track or the fixes, you can modify the style, as shown in the figure below.

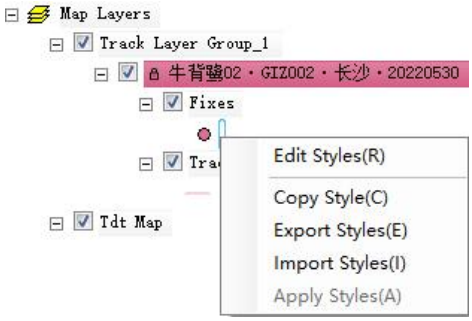

Figure 7.5 modify fixes, tracks styles

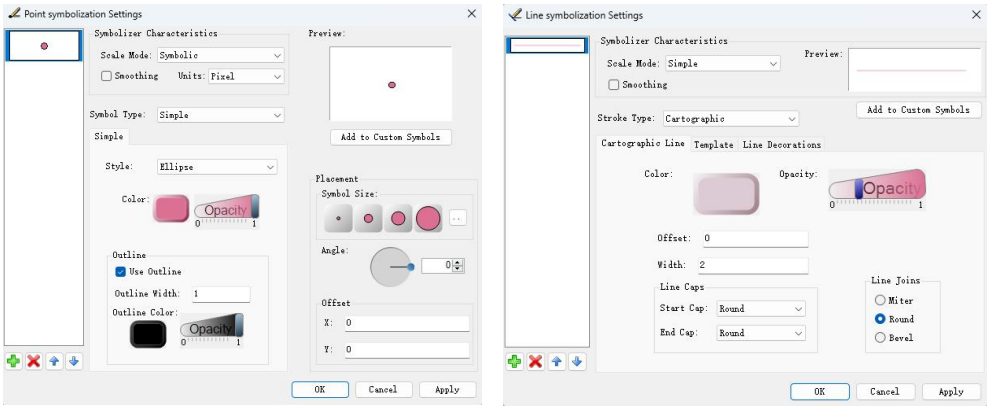

Figure 7.6 point and line symbolization setting

7.3. Layer Operation

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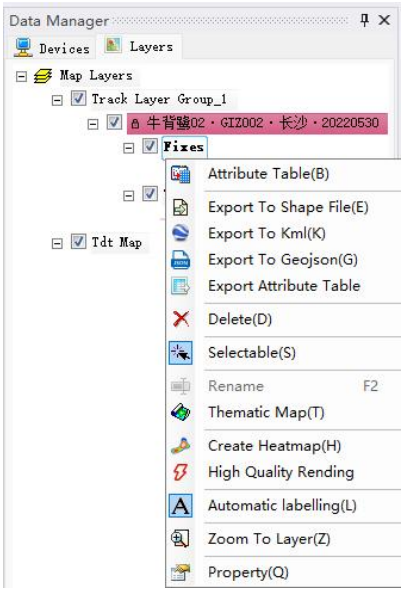

Figure 7.7 layer menu

(1) Attribute table ：View all the attribute data of the selected layer, and right click to export the attribute table or display it in the map, as shown in the figure below.

Figure 7.8 attribute table window

(2) Export to shape file ：Users with data download privileges can export the currently selected layer as an offline data file in a Shape file format (*. And shp), as shown in the figure below.

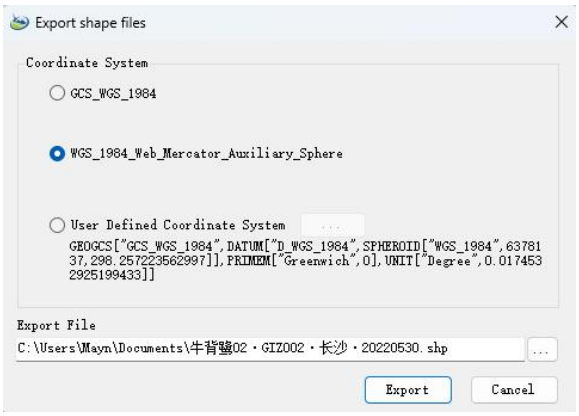

Figure 7.9 export of the shape file data interface

(3) Export to Kml ：Users with data download permission can export the currently selected layer as an offline data file as a kml file.

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(4) Export to Geojson： Users with data download permission can export the currently selected layer as an offline data file as a Geojson file.

(5) Export attribute table ： Users with data download privileges can export the attribute table of the currently selected layer as an excel file.

(6) Delete ： Remove the specified layer from the current layer group does not delete the data source file.

(7) Selectable： Set whether the objects in the vector layer are optional. After setting the selection, you can view the layer object information.

(8) Thematic map： Modifies the various styles of the current layer.

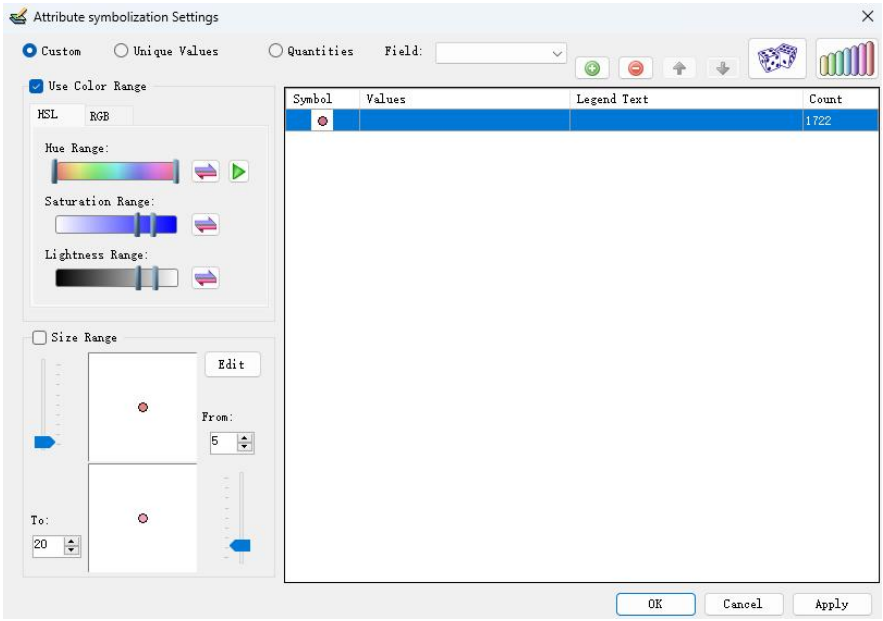

Figure 7.10 thematic map setting

(9) Create heatmap： Select the point layer to create the heat map, and the gradient can be personalized, as shown in the figure below.

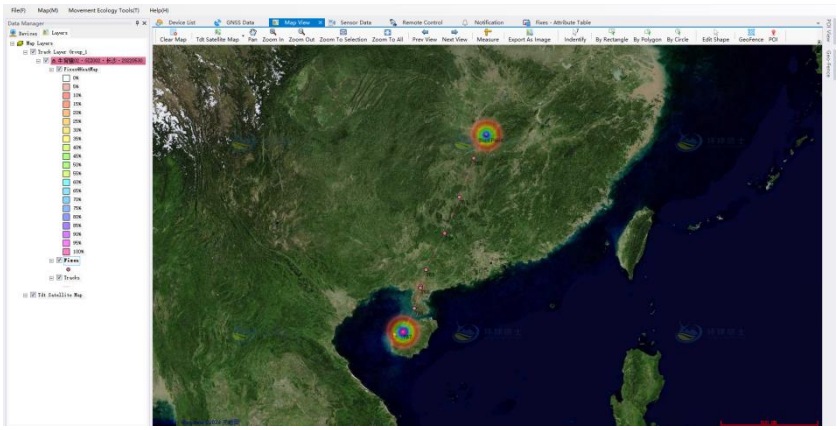

Figure 7.11 heat map interface

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(10) High quality rending： After the high-quality rendering mode is opened, you can set up a richer point symbols and lines, but the graphics rendering speed will be reduced, it is not recommended to open.

(11) Automatic labelling： Disows or hides the number of trace points.

(12) Zoom to layer： Zoom the map to the maximum range of the current layer.

(13) Property： View the scope of the layer space, the number of figures, the coordinate information, etc.

8. Trace Statistics And Analysis

The station has statistical functions such as time sequence and aggregation. Right-Click "Statistics" in the [GNSS Data] window to open the Statistics Chart.

8.1.Time Series

Time series of the longitude, latitude, height, speed, and temperature and other attributes of the track data, as shown in the figure below.

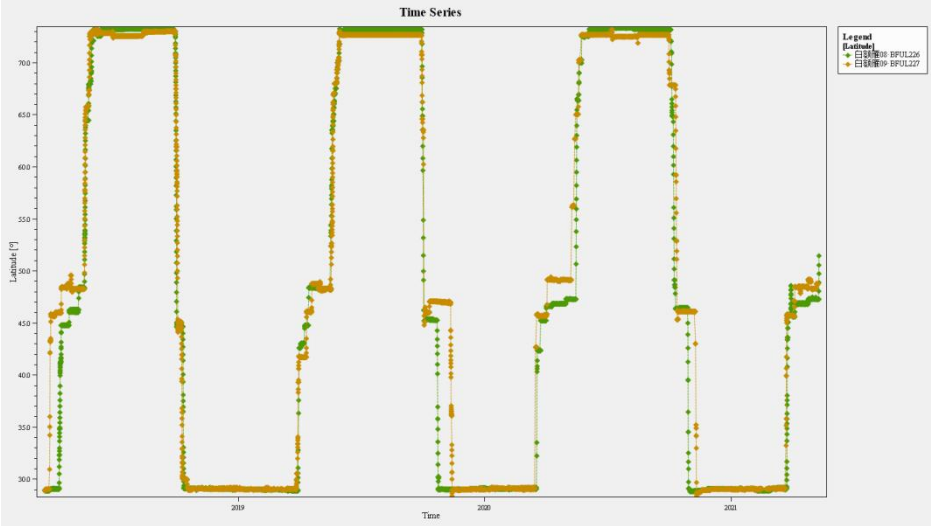

Figure 8.1 time series

8.2.Aggregation

The aggregation of the longitude, latitude, height, speed and temperature of the track data can be analyzed, as shown in the following figure.

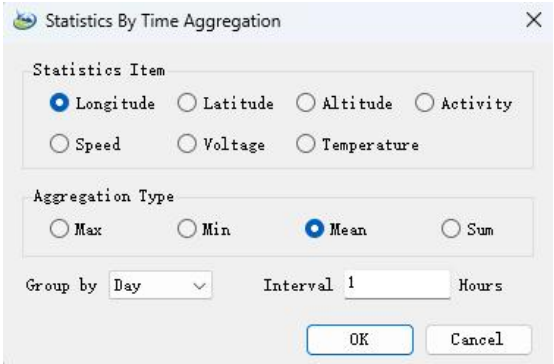

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Figure 8.2 aggregation parameter

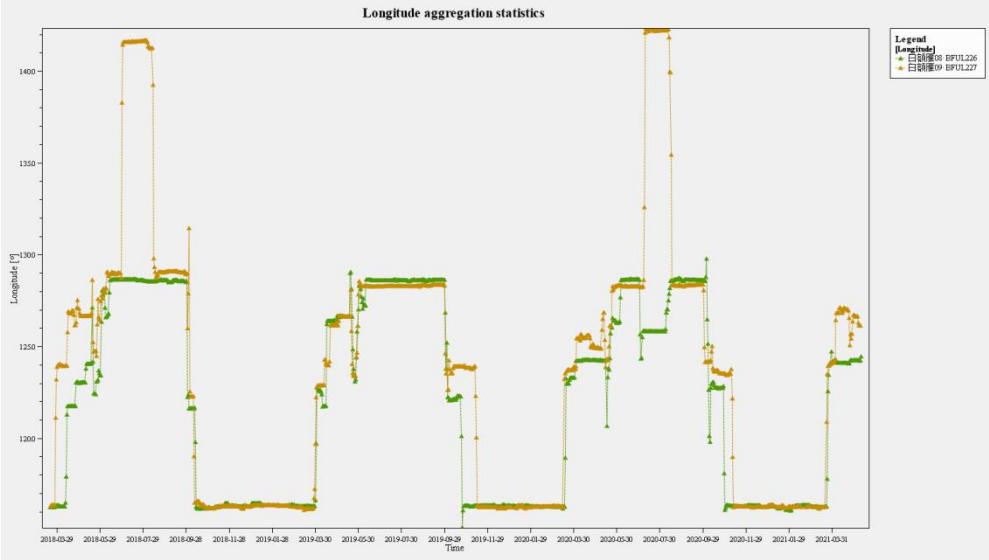

Figure 8.3 aggregation

8.3.Time Period

The longitude, latitude, height, speed, temperature and other attributes of the track data can be statistical analyzed on time period, as shown in the figure below.

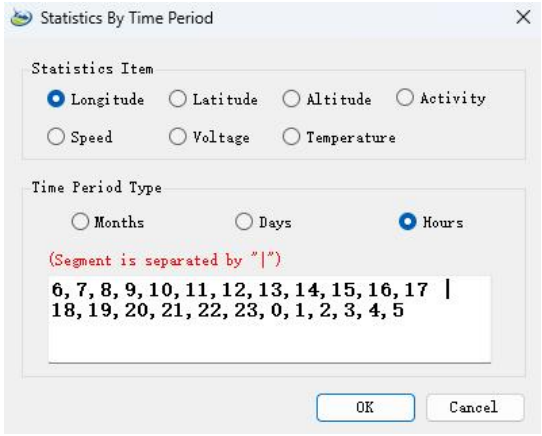

Figure 8.4 time period parameter

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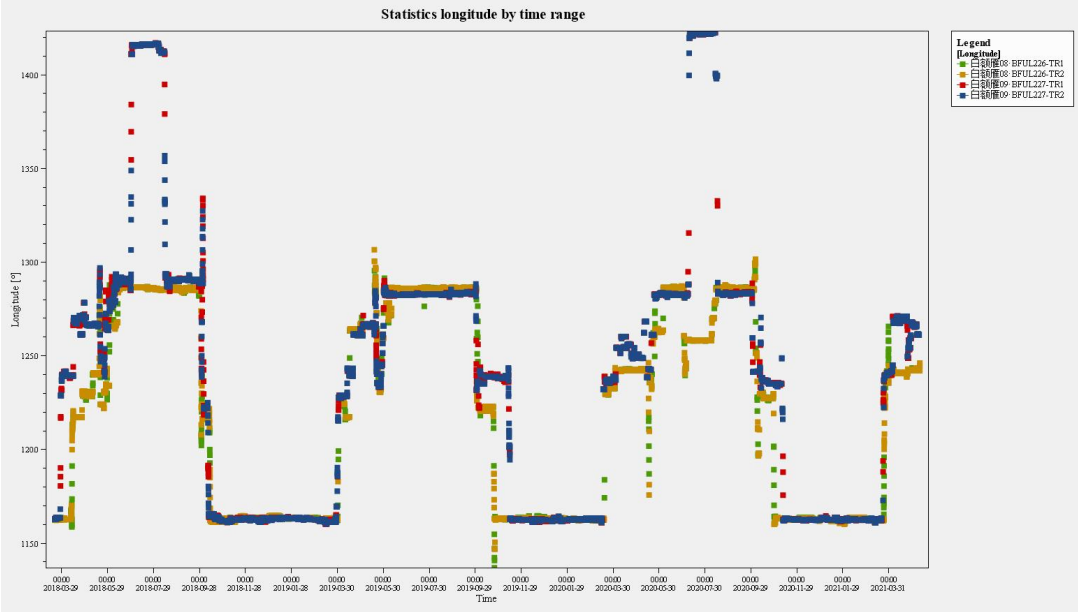

Figure 8.5 time period parameter interface

8.4. Activity Statistics

The activity amount of the device over a period of time can be color distinguished, and the activity amount can be referred to the color table on the right

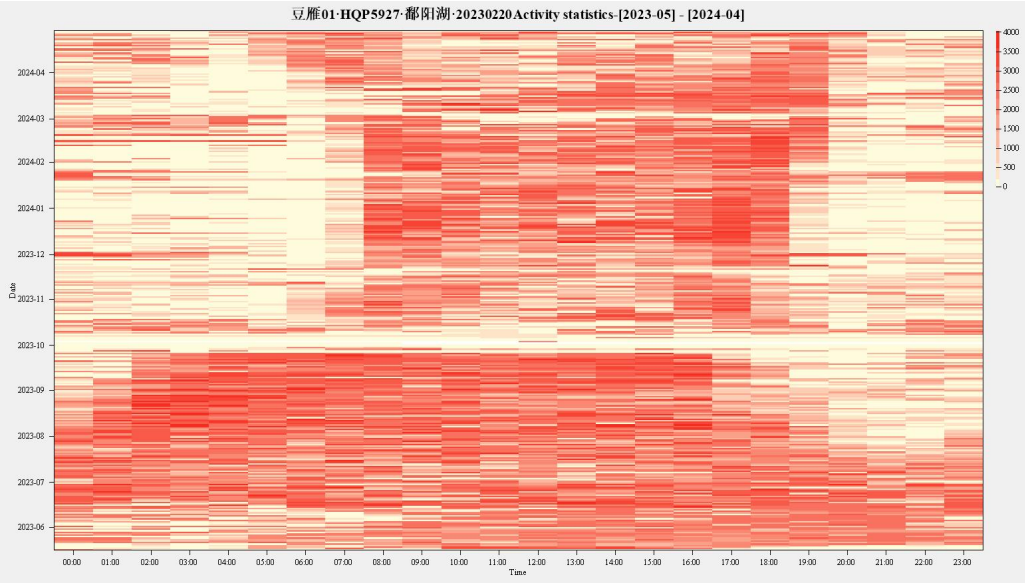

Figure 8.6 activity statistics

8.5. Tracking Duration

One working time of the equipment can be displayed statistically, as shown in the figure below.

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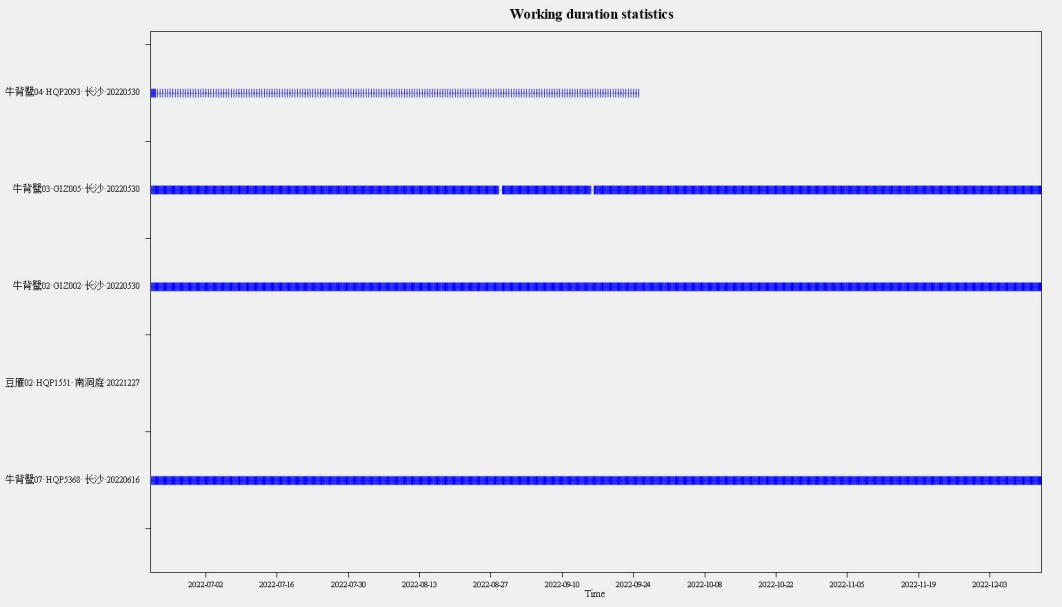

Figure 8.7 tracking duration statistics

8.6. Positioning Accuracy

The statistics of the positioning accuracy of the track data, and the number and percentage of loci of different location levels can be counted, as shown in the figure below.

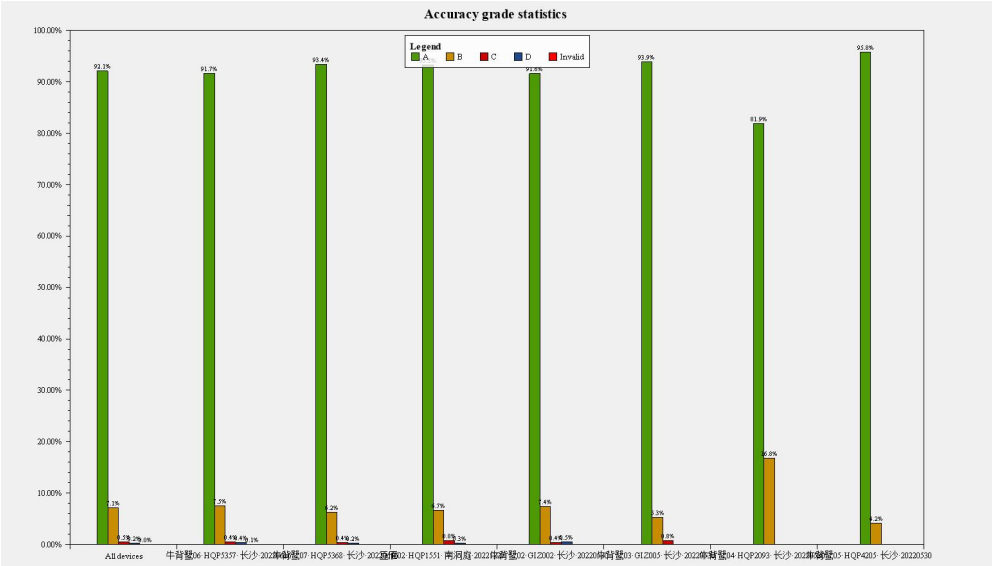

Figure 8.8 positioning accuracy statistics

8.7. Fixes Frequency

The statistics of the fixes frequency of the device over a period of time shows that if there are multiple species in the data, the union statistics or single species statistics can be selected.

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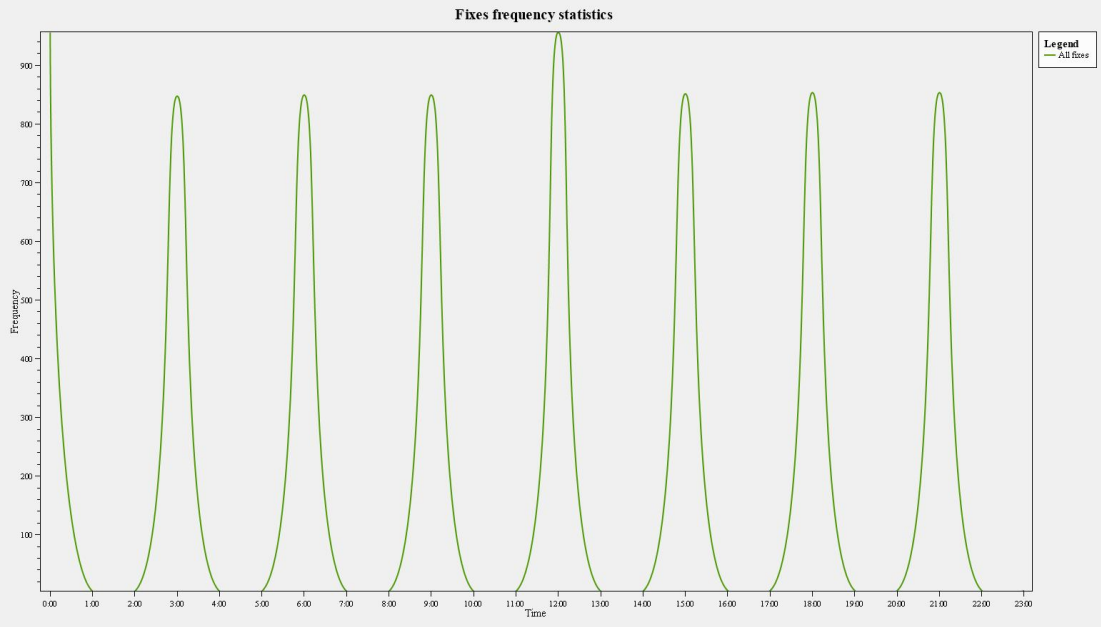

Figure 8.9 fixes frequency

8.8. Series Symbology, View All, Export

You can style modify the linetype of the display chart, restore the default display of the data, and export the current data chart.

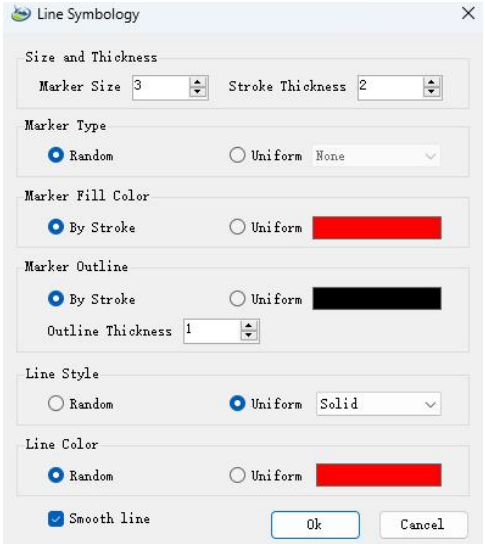

Figure 8.10 line symbology

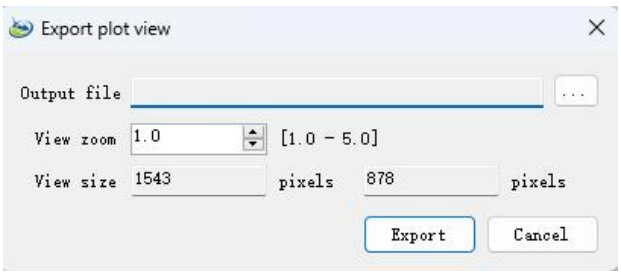

Figure 8.11 export plot

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9. Movement Ecology Tools

The platform functions as a tool for movement ecology. Select the track layer, click [Movement Ecology Tools] in the main menu, and select the minimum convex polygon (MCP), kernel density estimator (KDE), and identify habitat (T-DBSCAN), and split fixes by time.

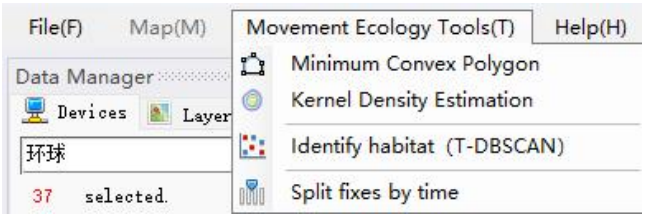

Figure 9.1 movement ecology tools

9.1.Minimum Convex Polygon(MCP)

Select the track layer or track layer group, select the time field according to the requirements, and calculate the minimum convex polygon algorithm. The result line layer and surface layer can be generated on the map. The attribute contains the information of selection percentage, area and so on, as shown in the figure below.

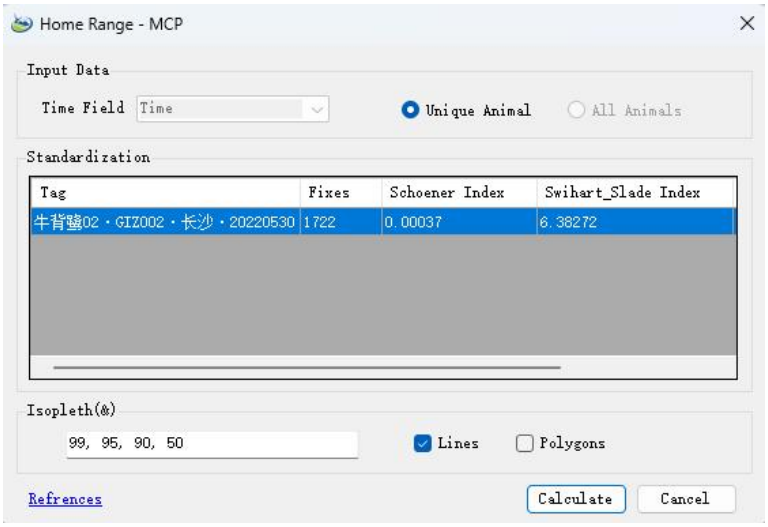

Figure 9.2 minimum convex polygon setting

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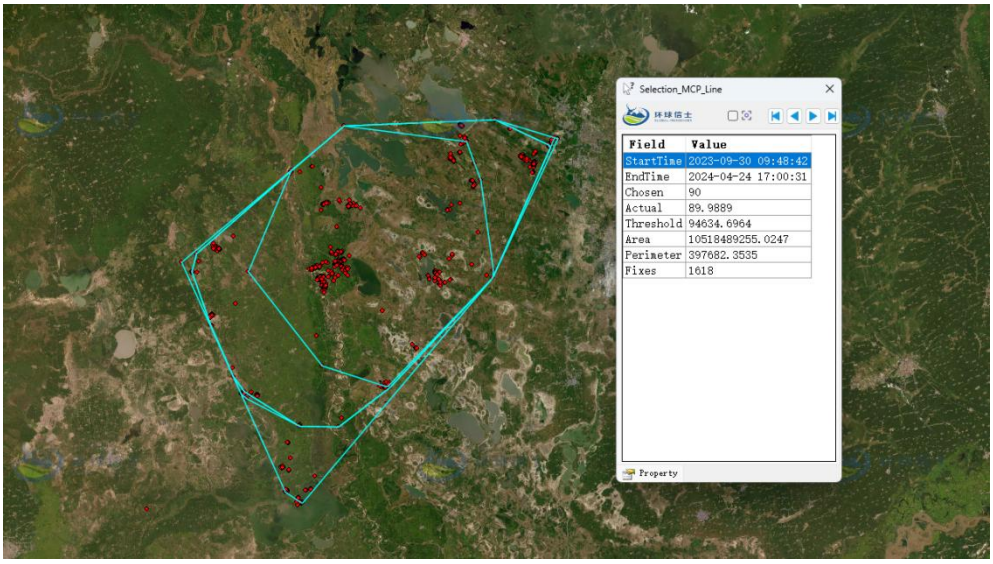

Figure 9.3 minimum convex polygon （MCP） calculation model

9.2.Kernel Density Estimator (KDE)

Select the track layer or track layer group, select the time field, and set the generating kernel method, grid parameters and broadband (kernel smoothing) parameters, and calculate the kernel density analysis for each individual or all individuals through the kernel density estimation algorithm. The parameter selection interface is shown in the following figure.

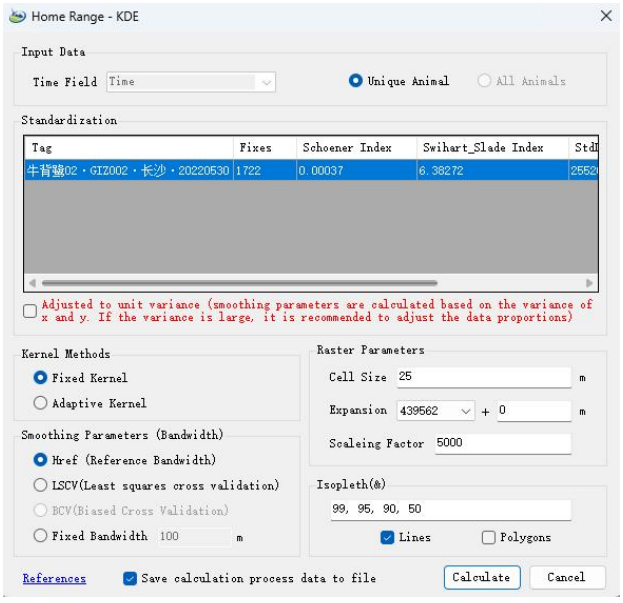

Figure 9.4 kernel density estimator setting

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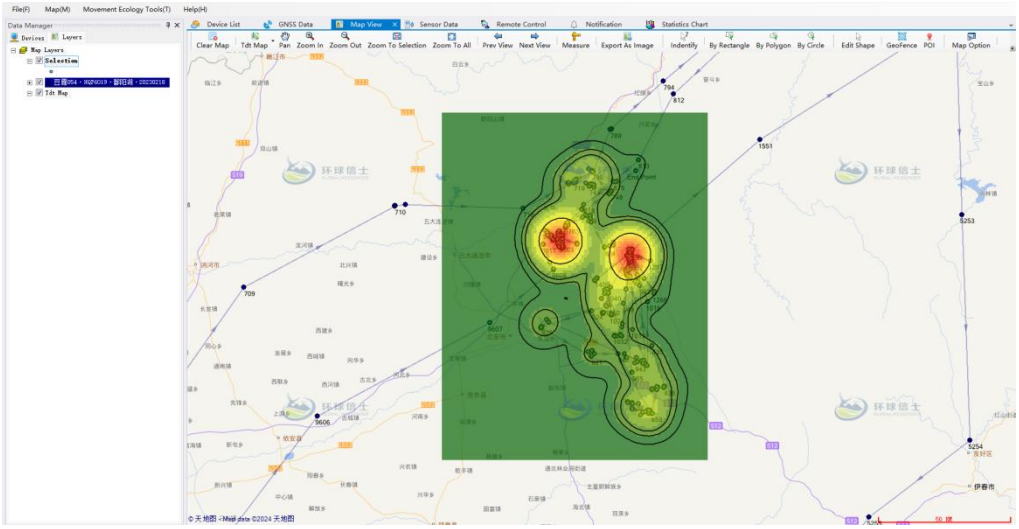

Figure 9.5 nuclear density （KDE） calculation model

9.3. Identify Habitat(T-DBSCAN)

Select the track layer or track layer group, select the species type, set the habitat parameters and analysis result parameters, and generate the habitat fixes layer and migration route layer. The parameter selection interface is shown in the figure below.

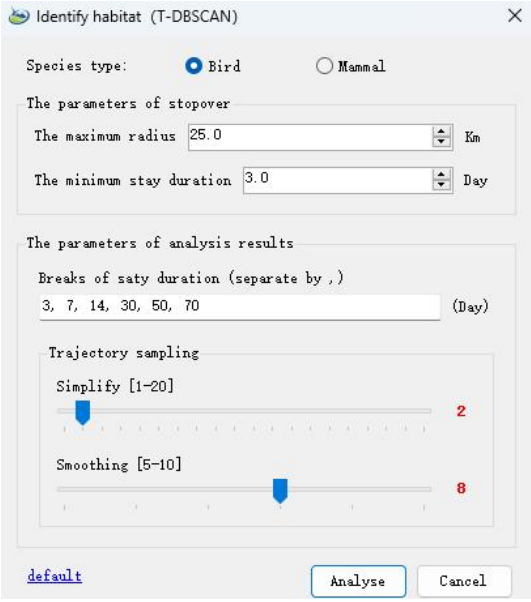

Figure 9.6 identify habitat Parameter settings

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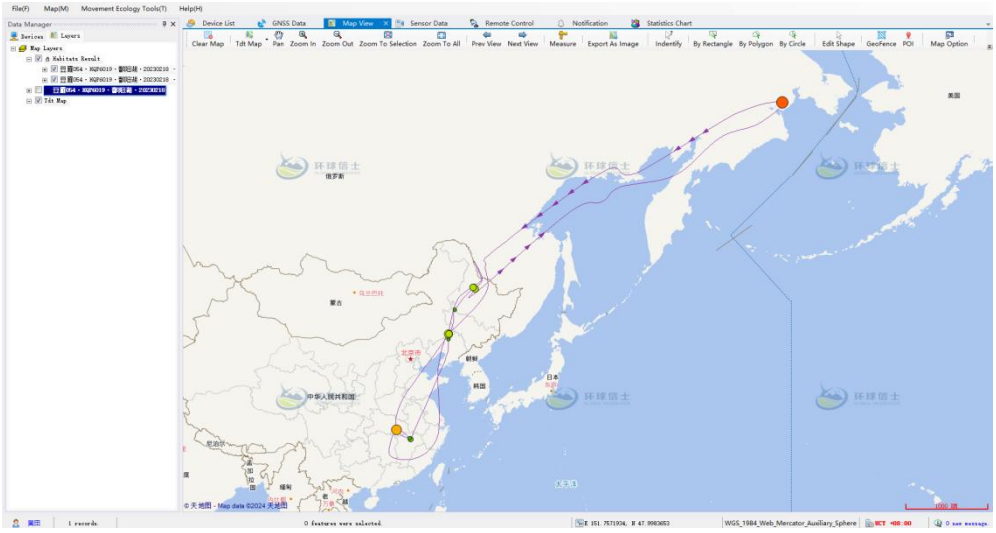

Figure 9.7 identify habitat result

9.4 Split Fixes By Time

Select the track layer or track layer group, and select the division items (such as by month, quarter, day and night) to generate the division result layer, as shown in the following figure.

Figure 9.8 different split by

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Figure 9.9 comparison of different split fixes

10. Sensor Data

10.1 Data Queries

Select the device with extended sensors in the device list, and you can query the sensor data of multiple devices according to the latest [Recent] and [Time Period] two time modes, the types of sensors are acceleration sensors, GNSS sensors, temperature sensors, pressure sensors, water depth sensors, image, video, audio sensors, illuminance sensors, humidity sensors, red & infrared light sensors, the type will be displayed in the upper left corner of the interface, and the query interface is shown in the following figure.

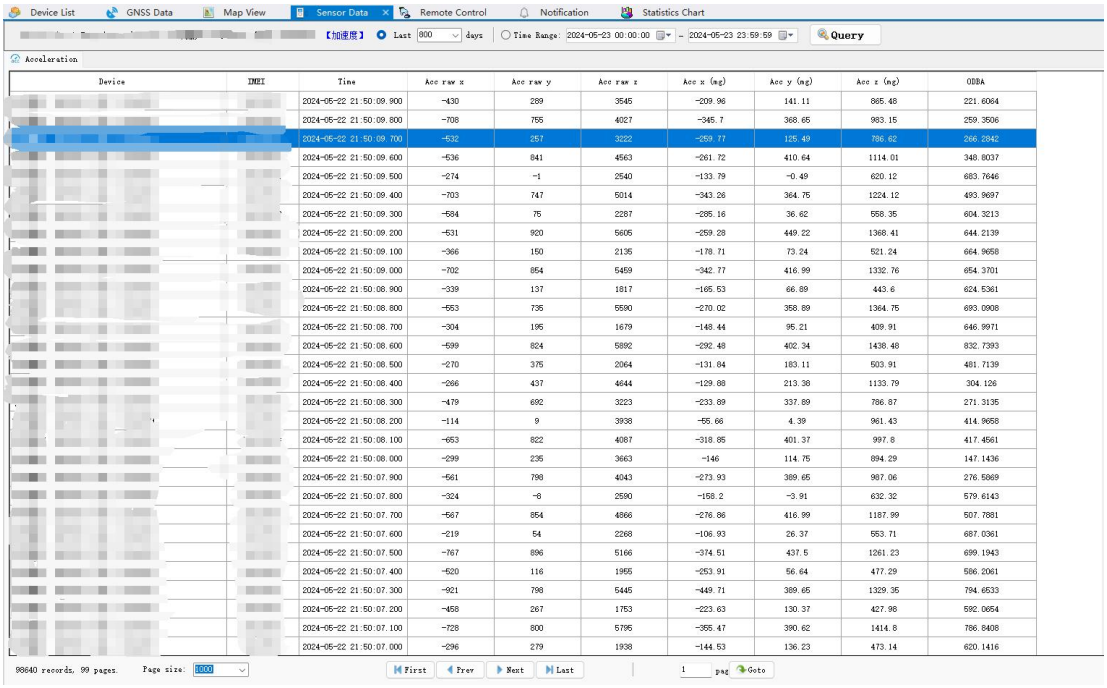

Figure 10.1 sensor data query interface

Image, video, and audio sensor data can be viewed, played, downloaded, and downloaded in batches, as shown in the following figure.

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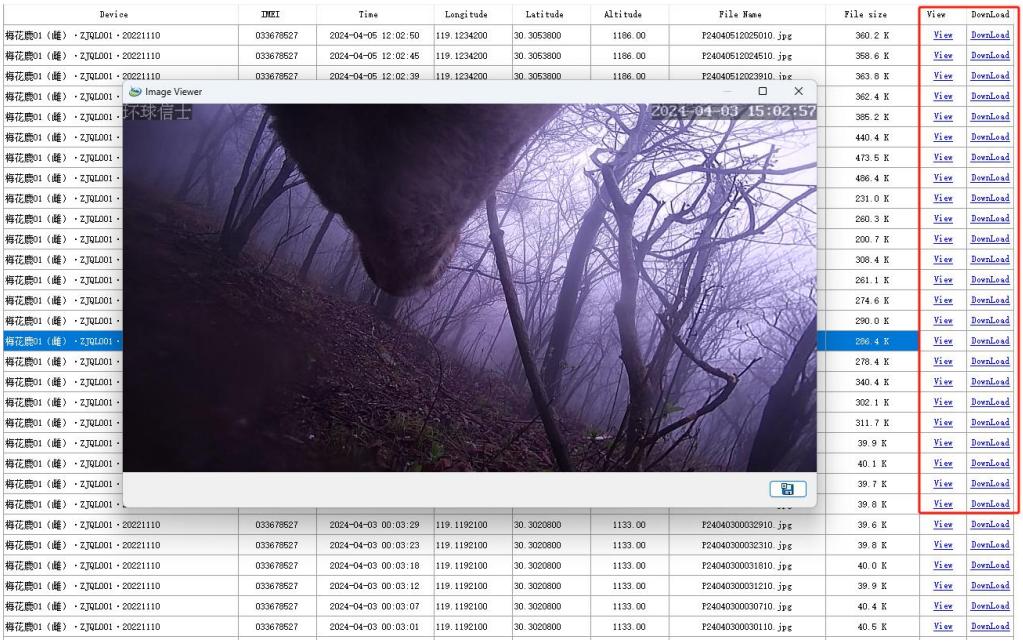

Figure 10.2 Image data query interface

10.2. Data Export

After the data query is successful, you can right-click the row in the list to export the selected records, or export all records in Excel table, as shown in the following figure.

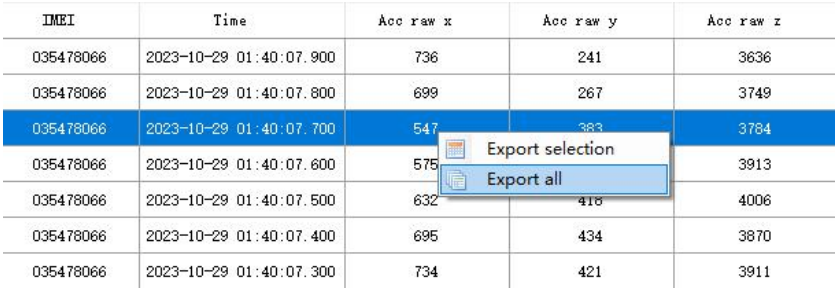

Figure 10.3 data export

11.Remote Control

Select the remote control window in the top navigation bar, where you can search according to the keywords, and all the instructions sent can be revoked within two minutes through the right click.

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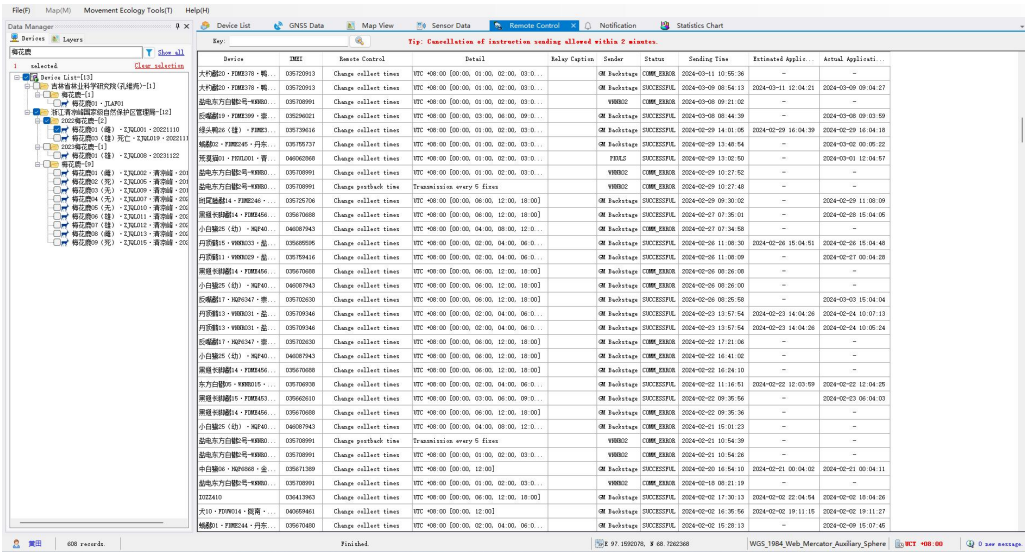

Figure 11.1 remote control interface

12. POI Management

12.1 New POI

Select [POI] in the map window toolbar, and in the point of interest window on the right, click New POI to add relevant attribute information and picture information to the POI, as shown in the figure below.

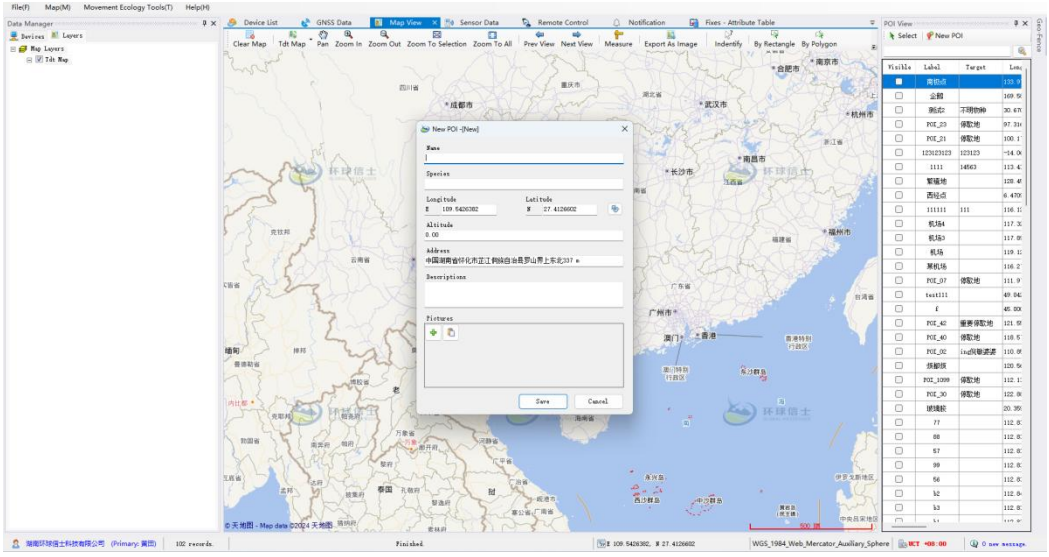

Figure 12.1 new POI

12.2.POI Edit

Select the POI in the POI View window, right-click to edit, and you can re-edit the attribute information and pictures of the POI in the map window.

12.3. POI Adjust

Open the POI window in the navigation bar menu, users can view all the POI under their account, edit, delete, display, refresh the POI, and also generate the display POI on the map, as shown in the figure below.

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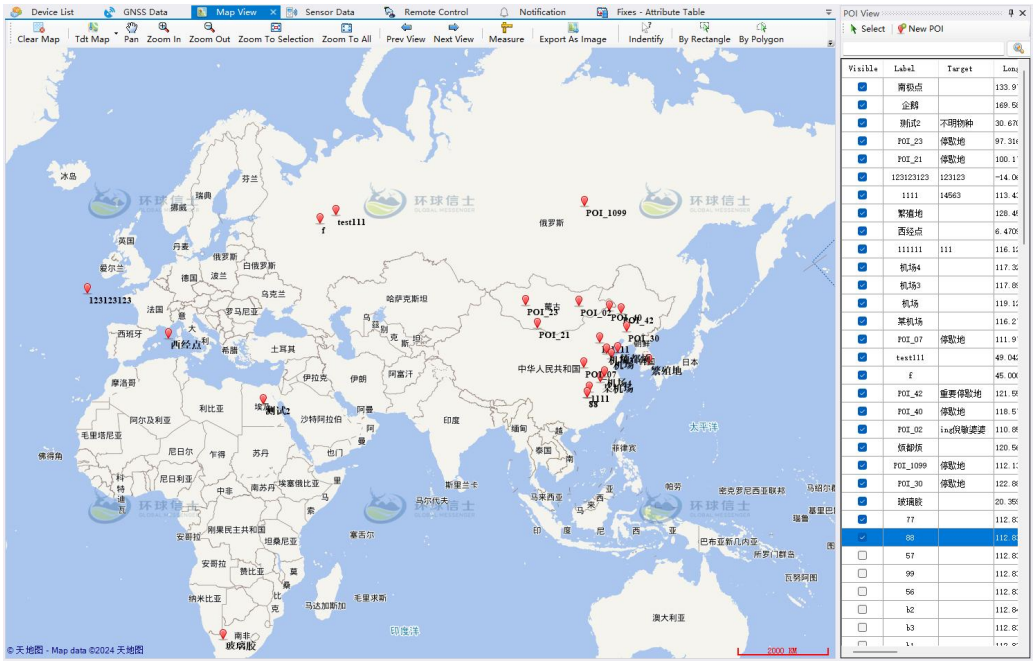

Figure 12.2 POI are shown in the map

13.GeoFence Management

13.1 New GeoFence

Select [GeoFence] in the toolbar of the map window, select Draw Circle or Draw Polygon, fill in the Fence Name and save to create a new GeoFence.

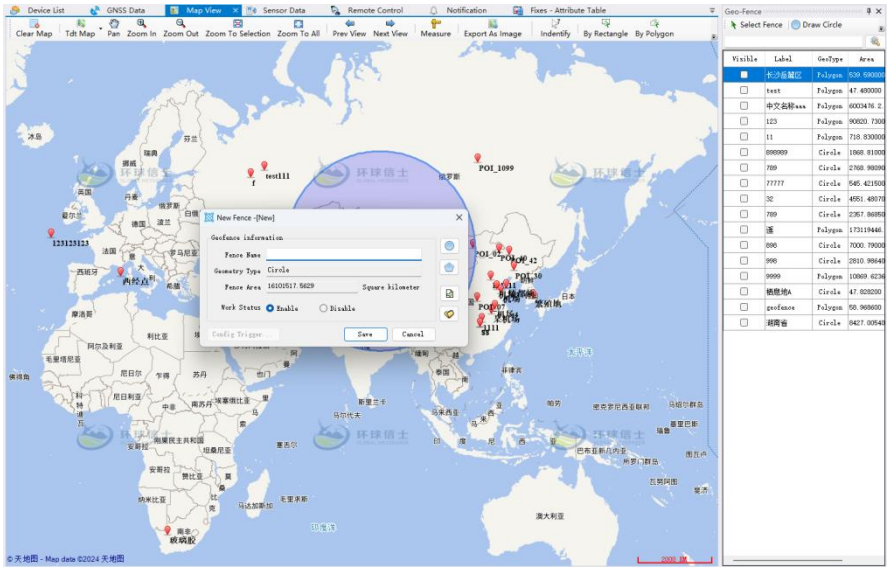

Figure 13.1 new geofence

13.2 GeoFence Edit

Right-click the GeoFence in the GeoFence window, the GeoFence can be modified, deleted, displayed, or Config Trigger.

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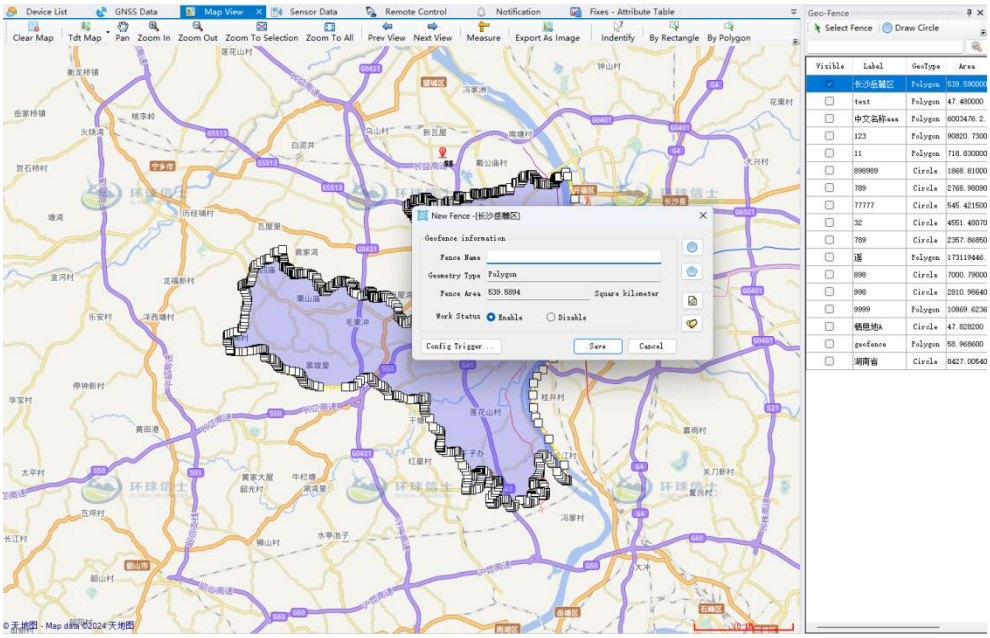

Figure 13.2 edit GeoFence

14.Notification

14.1 Search For Notification

Click [Notification] in the navigation bar menu, you can select Event Type and enter Key as the filter condition, search the required Notification, and right click message can select Export, Notification type can also be modified.

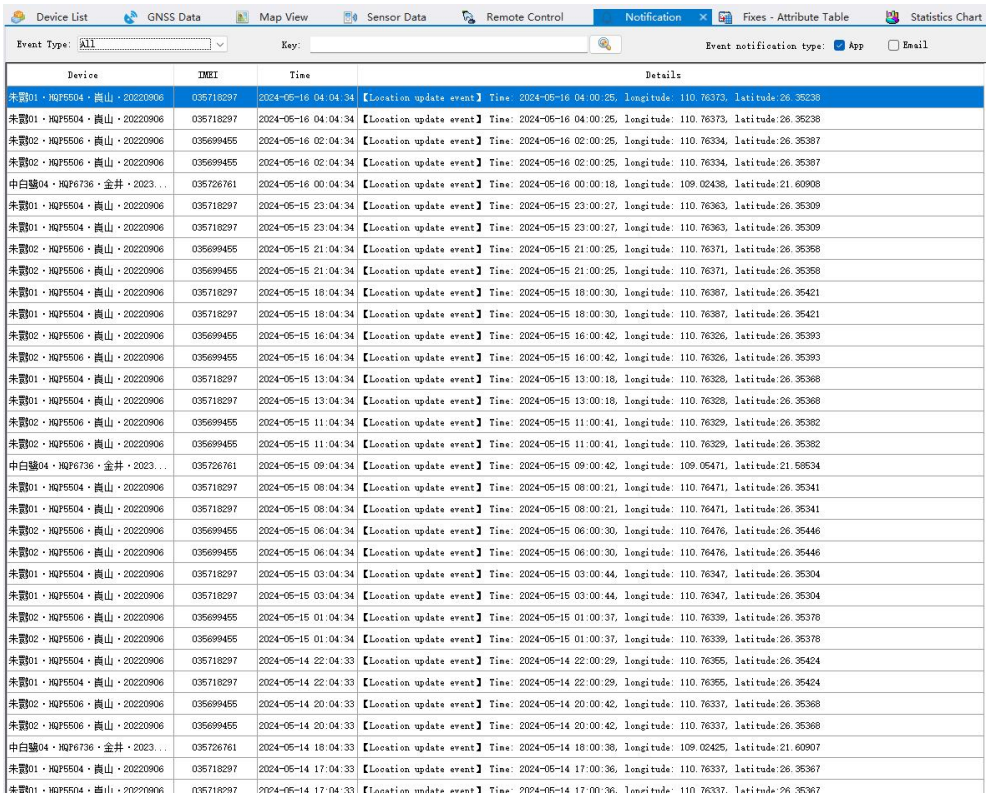

Figure 14.1 notification list

14.2 Data Export

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After selecting the message, right-click, you can choose to export to Excel file format.

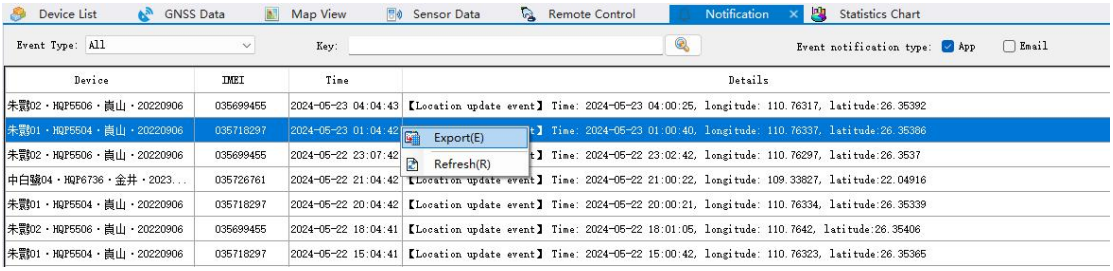


Figure 14.2 data export

15. Data Specification

In the "Help" menu, you can view the standards of each data item in the system, software version history, etc.

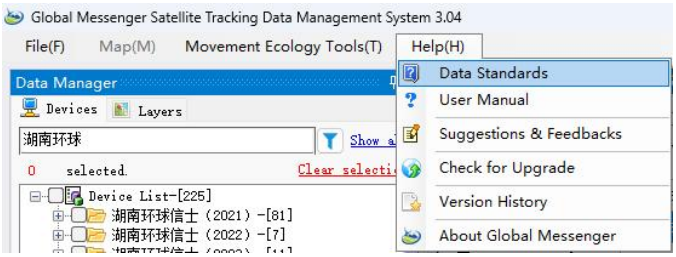
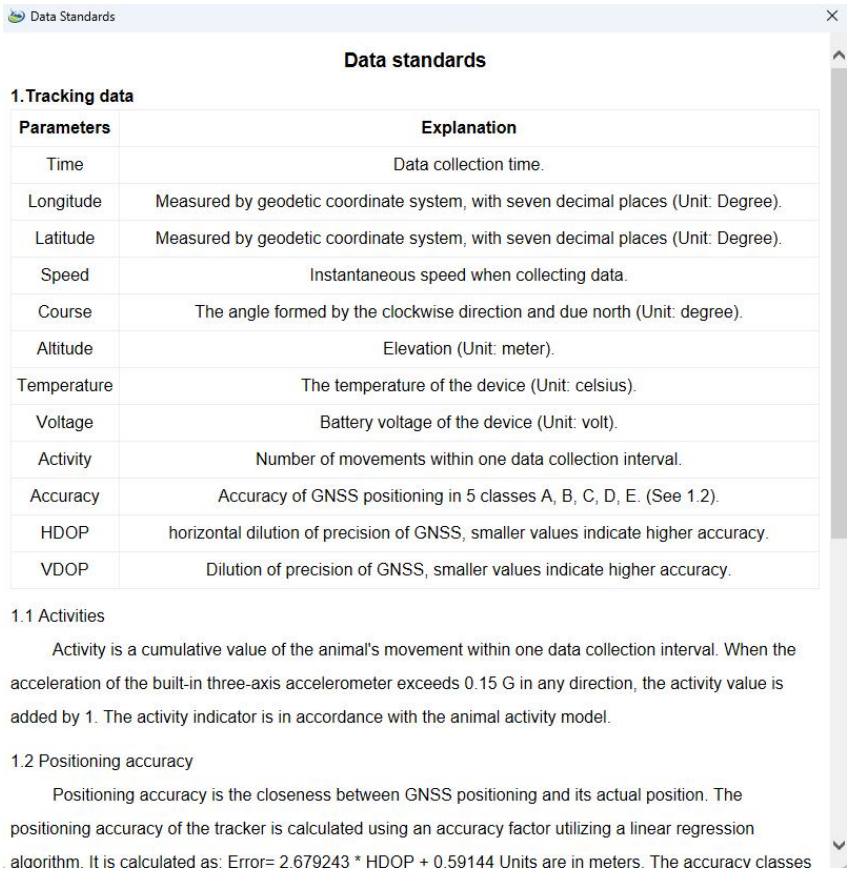


Figure 15.1 help menu



Data Standards

Data standards

1.Tracking data

Parameters	Explanation
Time	Data collection time.
Longitude	Measured by geodetic coordinate system, with seven decimal places (Unit: Degree).
Latitude	Measured by geodetic coordinate system, with seven decimal places (Unit: Degree).
Speed	Instantaneous speed when collecting data.
Course	The angle formed by the clockwise direction and due north (Unit: degree).
Altitude	Elevation (Unit: meter).
Temperature	The temperature of the device (Unit: celsius).
Voltage	Battery voltage of the device (Unit: volt).
Activity	Number of movements within one data collection interval.
Accuracy	Accuracy of GNSS positioning in 5 classes A, B, C, D, E. (See 1.2).
HDOP	horizontal dilution of precision of GNSS, smaller values indicate higher accuracy.
VDOP	Dilution of precision of GNSS, smaller values indicate higher accuracy.

1.1 Activities

Activity is a cumulative value of the animal's movement within one data collection interval. When the acceleration of the built-in three-axis accelerometer exceeds 0.15 G in any direction, the activity value is added by 1. The activity indicator is in accordance with the animal activity model.

1.2 Positioning accuracy

Positioning accuracy is the closeness between GNSS positioning and its actual position. The positioning accuracy of the tracker is calculated using an accuracy factor utilizing a linear regression algorithm. It is calculated as: Error= 2.679243 * HDOP + 0.59144 Units are in meters. The accuracy classes

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Figure 15.2 data standards

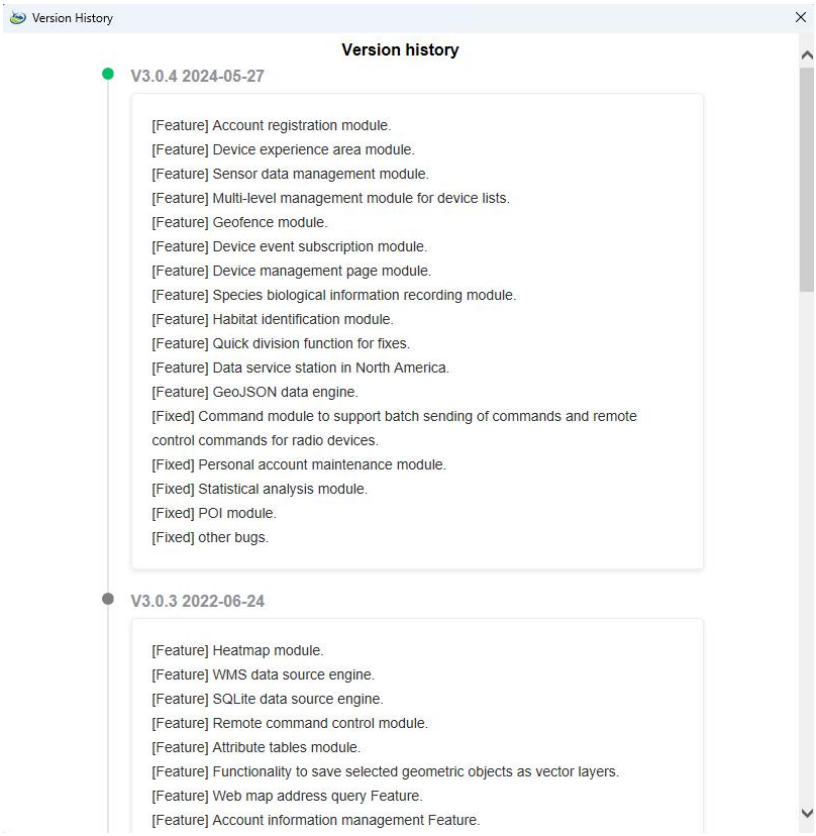

Figure 15.3 version history

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