SinoGNSS®
By ComNav Technology Ltd.

Z30 GNSS Receiver

User Guide

Version 1.0
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This is the V1.0(March, 2023) revision of the Z30 GNSS Receiver User Guide. It cannot be copied or translated into any language without the written permission of ComNav Technology.

Technical Assistance

If you have any question and can't find the answer in this manual, please contact your local dealer from which you purchased the T300 receiver. Alternatively, request technical support from ComNav Technology Website: *www.comnavtech.com* or technical support email: *support@comnavtech.com*. Your feedback about this Guide will help us to improve it with future revisions. Please email your comments to: *support@comnavtech.com*.

Safety Information

Before using the receiver, please make sure that you have read and understood this user Guide, as well as the safety requirements.

- Connect your devices strictly based on this User guide
- Install the GNSS receiver in a location that minimizes vibration and moisture
- Avoid falling to ground, or colliding with other items
- To reduce radiation, please keep above 2 meters away from the radio station
- Change the cable if damaged

Related Regulations

The receiver contains integral Bluetooth® wireless technology and 4G. Regulations regarding the use of the datalink vary greatly from country to country. In some countries, the unit can be used without obtaining an end-user license. But in some countries the administrative

permissions are required. For license information, please consult your local dealer.

Use and Care

The receiver can withstand the rough treatment that typically occurs in the field. However, the receiver is high-precision electronic equipment and should be treated with reasonable care.

Warning and Caution

An absence of specific alerts does not mean that there are no safety risks involved. A Warning or Caution information is intended to minimize the risk of personal injury and/or damage to the equipment.

WARNING-A Warning alerts you to a potential risk of serious injury to your person and/or damage to the equipment, because of improper operations or wrong settings of the equipment.
CAUTION- A Caution alerts you to a possible risk of damage to the equipment and/or data loss.

Warranty Notice

ComNav Technology does not warranty devices damage because of force majeure (lighting, high voltage or collision).
ComNav Technology does not warranty the disassembled devices.

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1 Introduction

Z30 GNSS receiver is a new generation of portable high-precision GNSS receiver independently developed by ComNav Technology Ltd. With a multi-frequency OEM board that tracks full GNSS constellations, it can obtain accuracy positioning from sub-meter to centimeter.

1.1 Packing list

This section provides Z30 parts list, including basic supplies and customized kits based on your requirements.

Item	Picture
1* Z30	
1*USB cable and charger	

2 Setting up the receiver

This chapter provides general information on appearance and power supply of Z30

2.1 Front panel

Receiver front panel contains three indicator light emitting diodes (LEDs). The indicator LEDs show the status of power, satellite tracking, and Internal GSM/ differential indicator.

Z30

2.2 Lower housing

Z30 Receiver lower housing contains a pole slot, and a Type-C port for charge/power supply with power bank.

Z10

2.3 Power supply

Z30 GNSS receiver supports internal batteries and supply with power bank.

3 General Operation

This chapter introduces all controls for the general operation, including button functions and all LED behaviors on the front panel.

3.1 Button functions

There are two buttons on the front panel, power button and SOS button.

- Power button:

Press the power button for about 1 second to turn on the receiver;

To turn off the receiver, long press the button for 3-4 seconds until all LEDs off.

- SOS button (Z30):

long press the button for 5 seconds to ask help for remote server.

To cancel the warning, long press the button for 5 seconds until warning off

3.2 LED behavior

The LEDs on the front panel indicate receiver working status. Generally, a lit or slowly flashing indicates normal operation, and an unlit LED indicates that no operation is occurring. The following figure and table define each possible LED state:

Z30

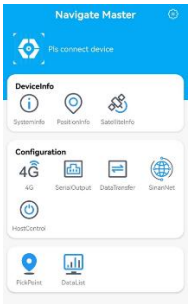
LEDs	States	Description
Power	Lit	Enough power
	Flashing	Low power
Differential Data	Flashes once per second	Receiving differential data /transmit tracking to server
Satellite Tracking	Flash once per second	No satellite received
	Flashes N times every 5 seconds	Received N satellite signals

4 Personnel tracking on NaviCloud/TCP server

This chapter will introduce the procedure of upload tracking to ComNav NaviCloud platform or third-party TCP server.

4.1 Preparation

There will need put a SIM card to Z30/M10/M10 mini, and configure by Navigate Master software to get correction service, and setup address of NaviCloud platform or third-party TCP server. After that, you can manage your device by the platform.

Z30	
Navigate Master Software (based on Android)	
NaviCloud Platform (http://cloud.sinognss.com)	
SIM card (nano)	

4.2 Z30 Mini installation

Insert SIM card to Z30, then power on receiver.

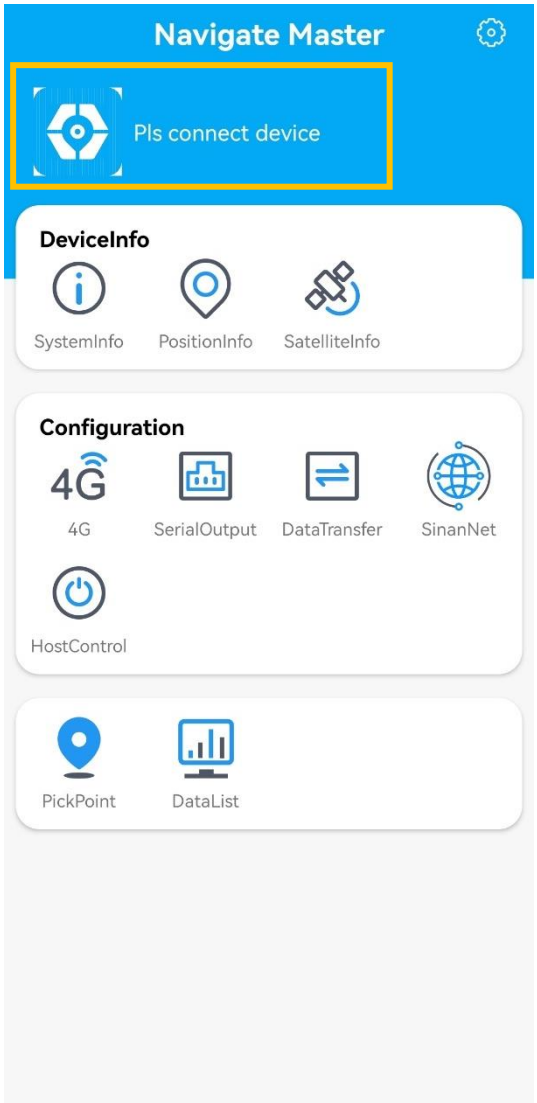
Z30

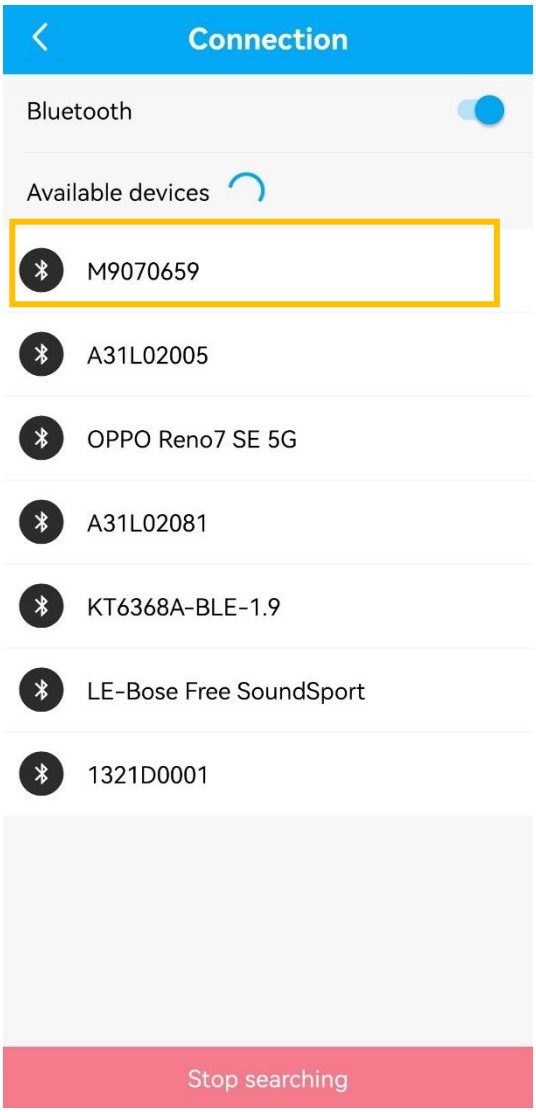
Tip: For Z30, it integrated with internal antenna, so there is no need to connect to external antenna.

4.3 Configuration by Navigate Master

4.3.1 Bluetooth Connection

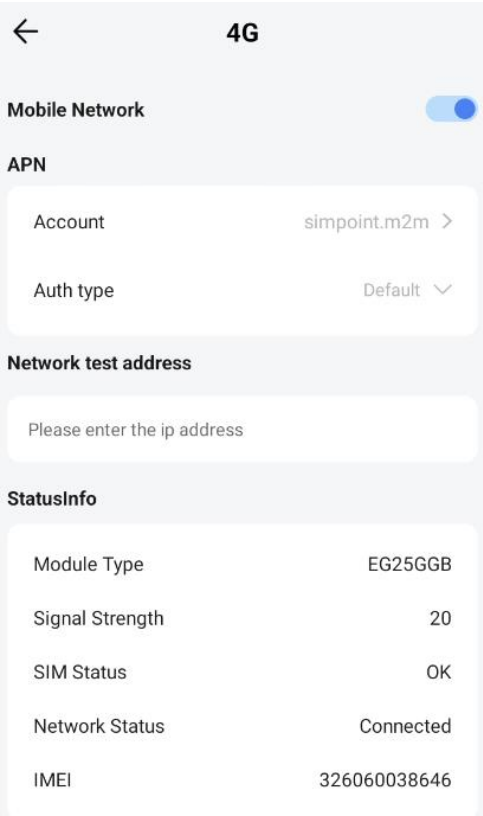
Search the target receiver SN, and tap to connect.





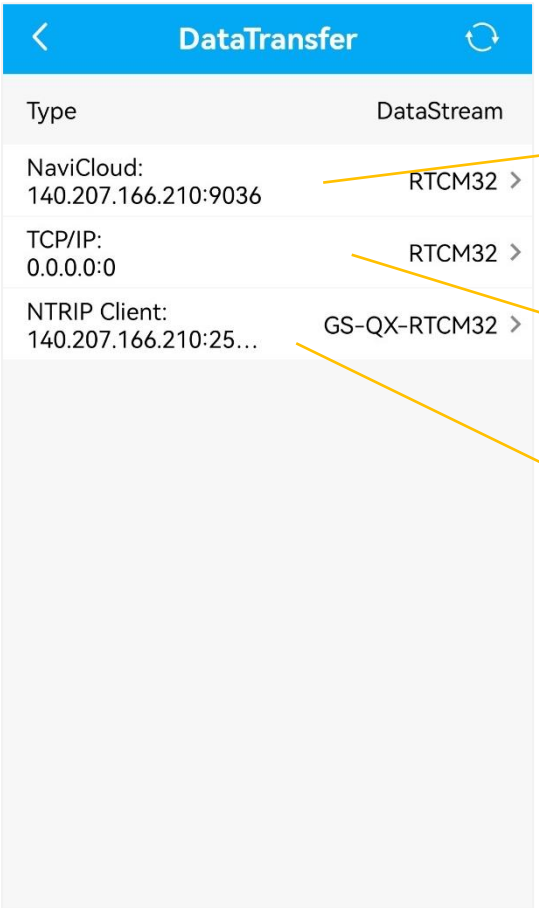
4.3.2 Setup for 4G

Enable mobile network, input APN account, and check the 4G status.



4.3.2 Upload tracking to Navicloud

After Bluetooth connected, go DataTransfer, you can manage the data stream:



NaviCloud:
here you need input the address of NaviCloud platform, so that you can manage this device. The address is: *iot.sinognss.com:9036*

TCP/IP:
this option allows you transfer real time positioning to your own TCP server/service.

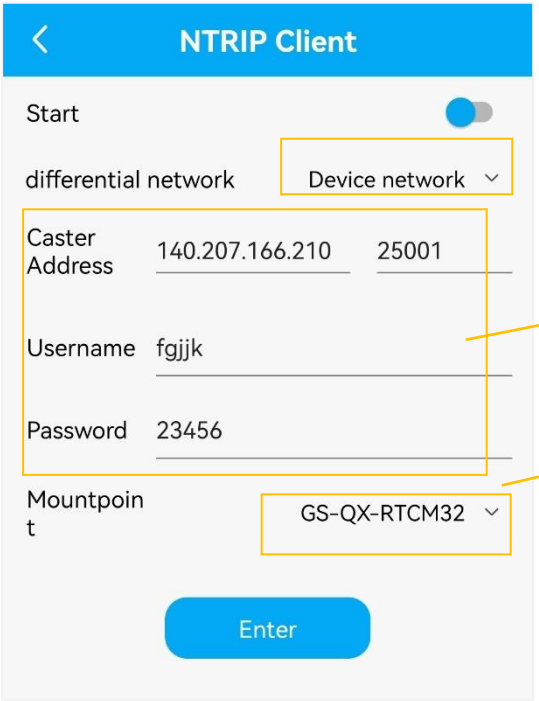
Ntrip Client:
you can get correction service by connect to local cors or a single Base station.

Tip: after you setup tracking address or connected to correction service, the GPRS/differential led on front panel will flash once per second.

- NaviCloud/TCP setup:

Input IP and port for NaviCloud/TCP server.

- Ntrip Client setup:



Device Network: use SIM card internet to get correction service, and tracking upload;

Input CORS account: IP, port, username, and password;

Click to get source list of mountpoints, and select the right one.

The Z30 will auto upload tracking by GPYBM, GPGGA and GPZDA message to NaviCloud.

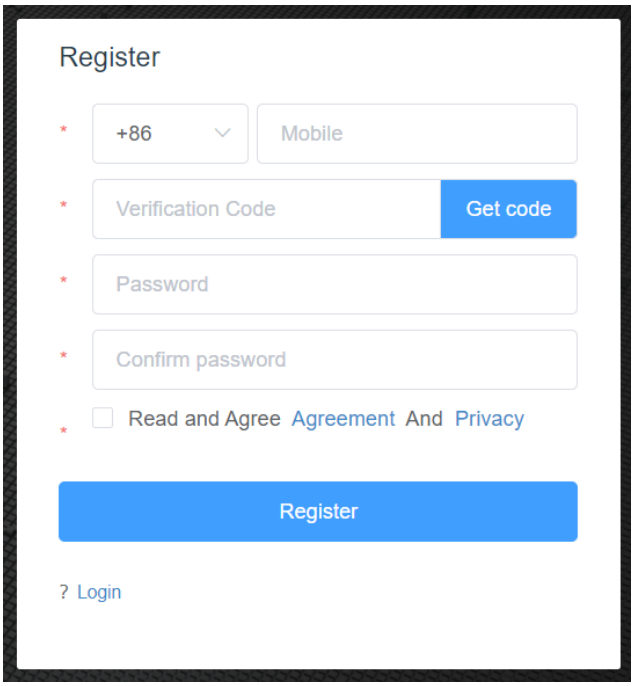
4.4 Management in NaviCloud platform

This chapter will introduce the personnel security module in NaviCloud.

4.4.1 Register and Login

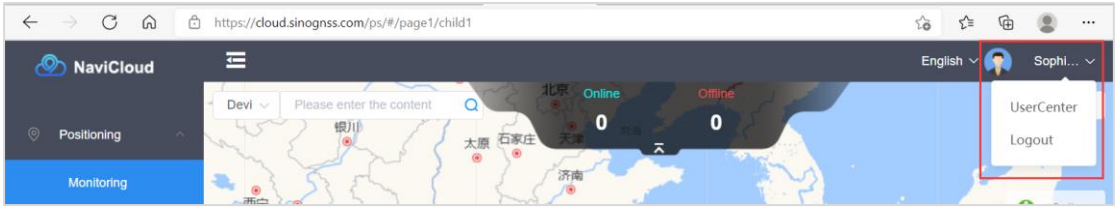
Enter NaviCloud address to browser: http://cloud.sinognss.com

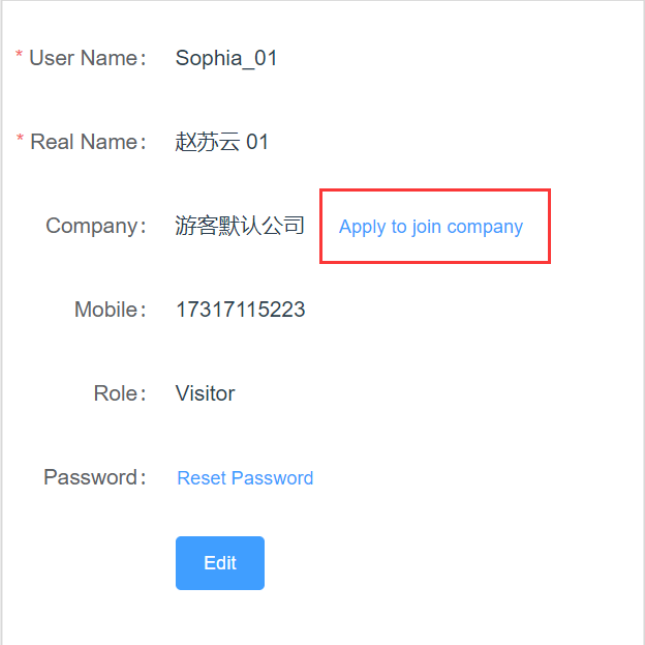
- Register an account of NaviCloud.



4.4.2 Create or join a Company

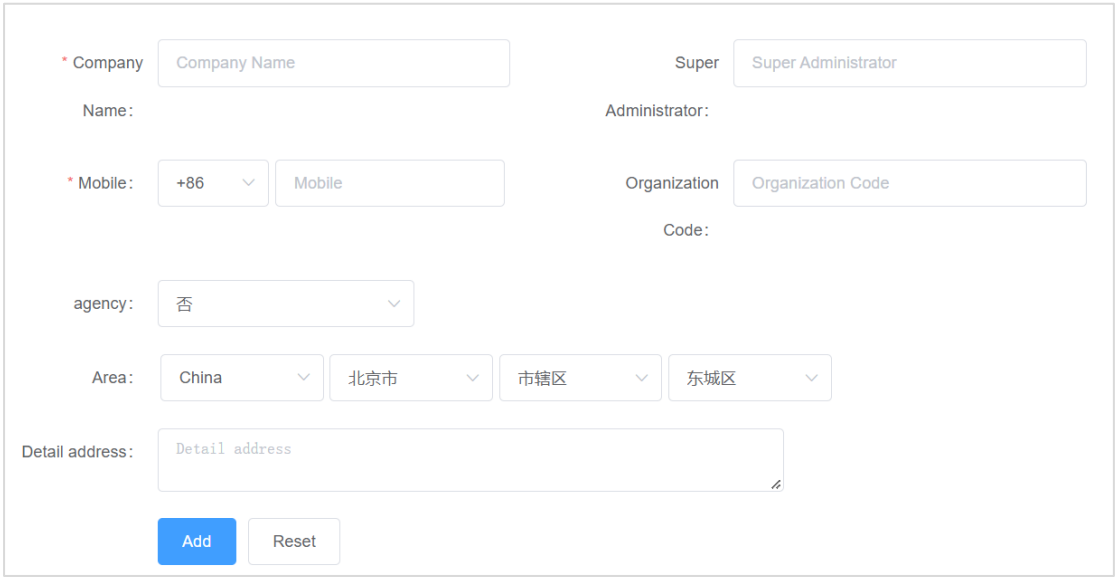
After register and login, go to User center to check the user information. You will need join a company to get more access for different functions in NaviCloud.





Before you join a company, you need Register your own company, so that you can manage all your devices.

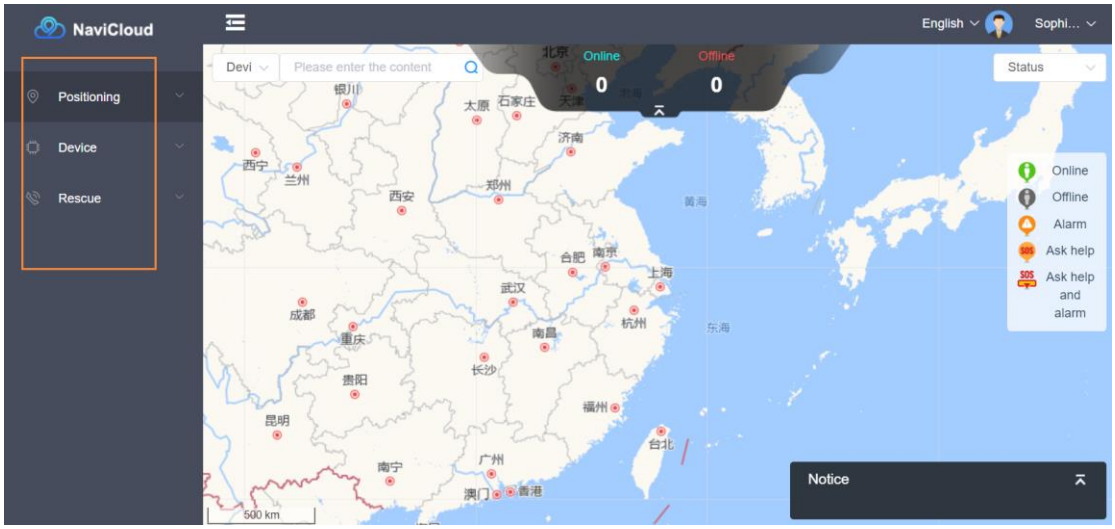
Fill in contents as below, and submit. After review by NaviCloud platform, you can manage your company.



4.4.3 Personnel Security module

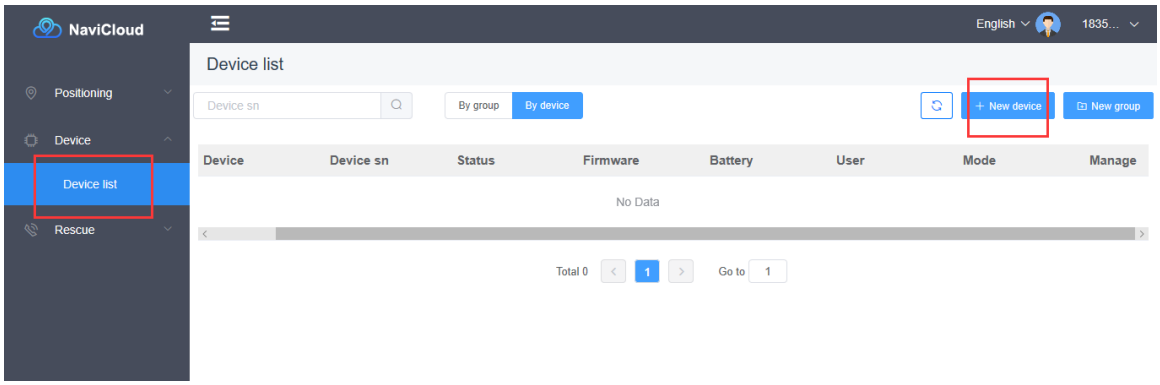
On the main page, our products—personnel security.

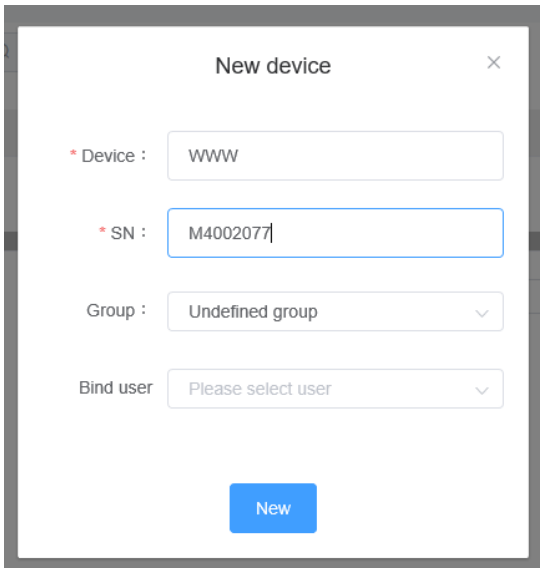
There are three main functions, positioning, device and rescue.



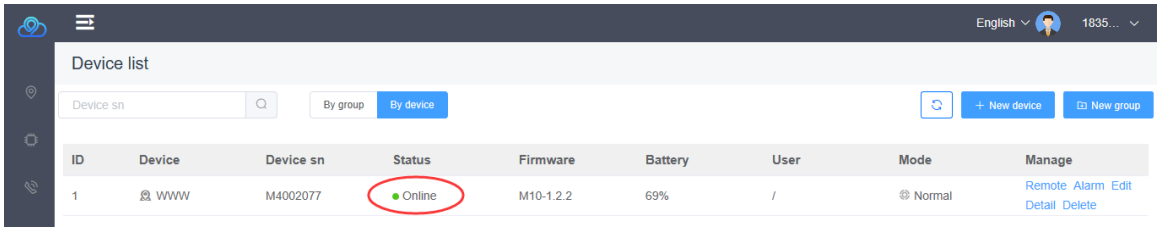
- Add device

In Device--Device list, add your Z30 information (the SN must be same with your device)



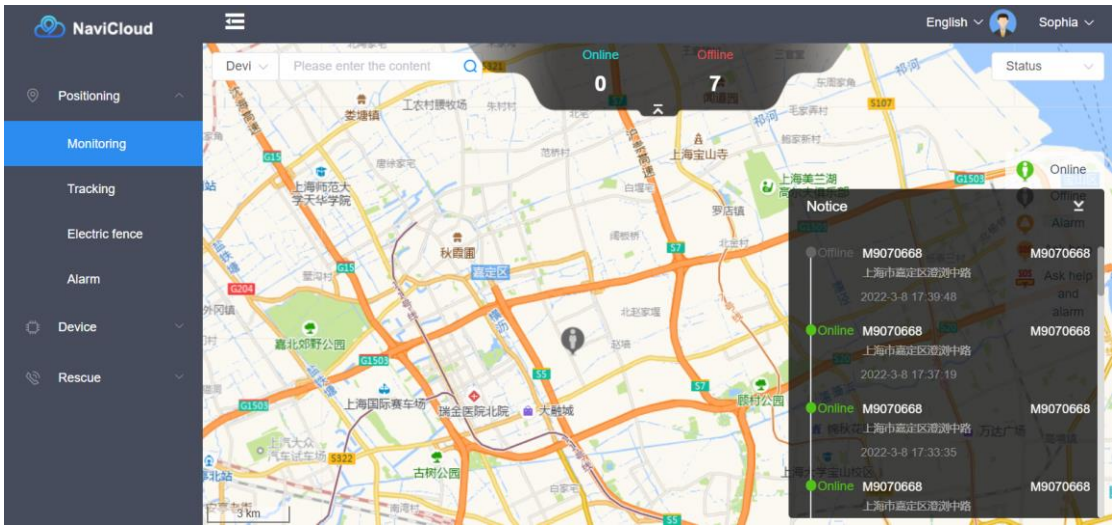


After you add the device succeed, you can check the device status.



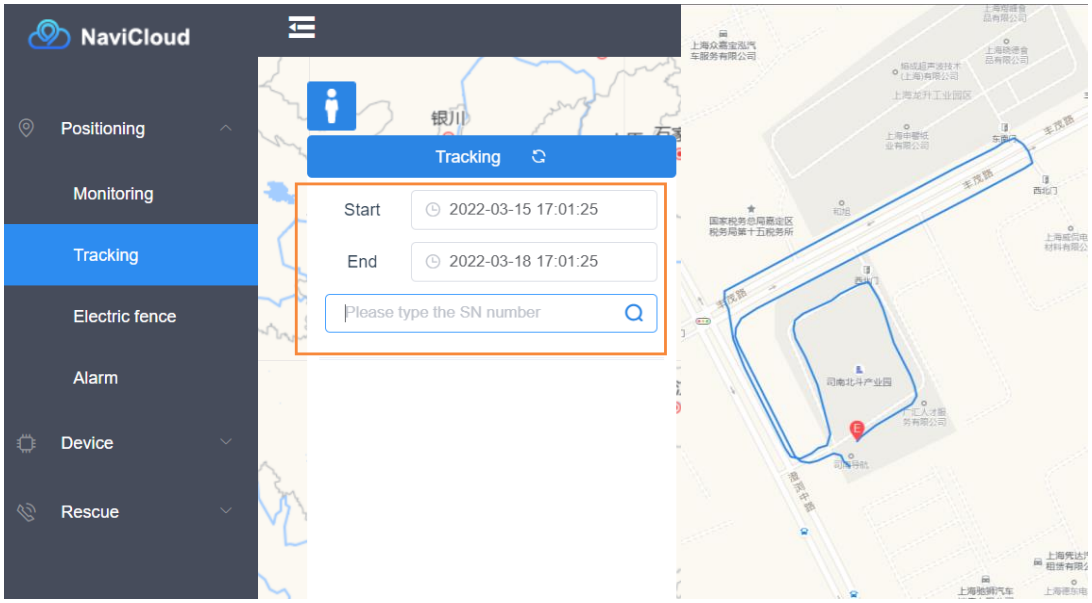
- Monitoring

Go monitoring, you can monitor all devices on map. And on bottom of right interface, it shows real time status for devices.



- Tracking

NaviCloud support check tracking for 3 days. Select the device and date you want to check the tracking, you can also download the tracking as KML format, so that you can open with google map.

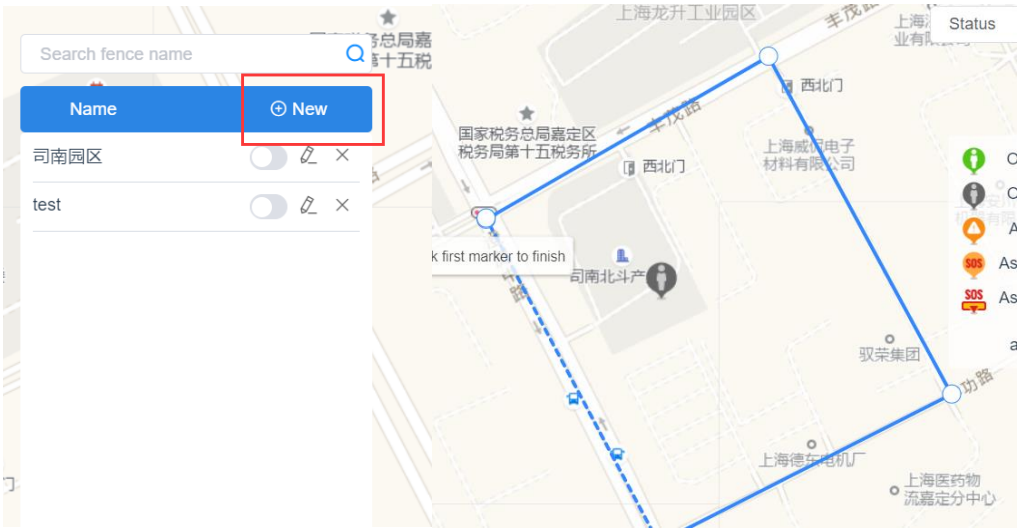


- Electronic fence

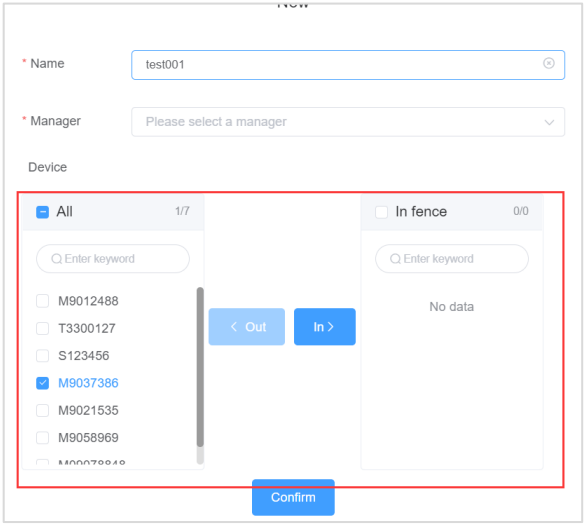
With electronic fence, Z30 can remind the workers in real time with beep sound. The manager build the electronic fence and active it in NaviCloud, once the workers outside of the area, the Z30 will warning, and NaviCloud also will receive message.

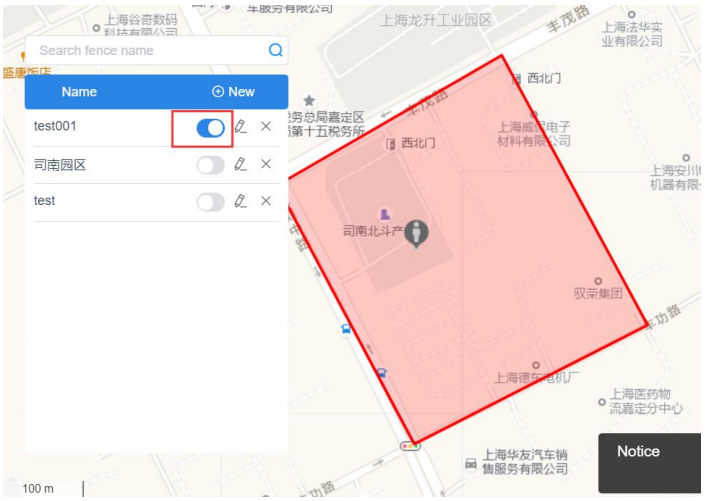
Here shows how to build an electronic fence.

Click New, add the electronic by click on map. Note to click the first point on map again to complete the fence.



It will prompt below interface, give a name of the fence, and select a manager, active the device which need work in the fence.





Appendix

4.3.1.2.15 GPYBM Position, Velocity, Heading, Pitch and PJK information

Description

This message is a non-standard message, which includes position, velocity, PJK information, and also heading and pitch angles output as dual antennas are used.

Message ID	*87*
Recommended Input	*log gpybm ontime 1*
Supported Format	*ASCII*

Reply (ASCII)

```
$GPYBM,SN00520429,070326.00,+31.170243388,+121.398934274,15.286,346.84
0,1.290,0.000,-0.002,0.003,0.002,3449917.897,538032.213,-451.861,1088.
741,4,4,12,1,,,,*4B
```

Field#	Structure	Description	Format
1	$GPYBM	Log header	
2	Serial NO.	Serial Number of OEM board	SNxxxxxxxx, x = 0 ~ 9

Field#	Structure	Description	Format
3	utc	UTC time	HHMMSS.SS
4	Lat	Latitude, in degrees	+: north, -: south; ddd.mmmmmmmmmmm
5	Lon	Longitude, in degrees	+: east, -: west; ddd.mmmmmmmmmmm
6	ElpHeight	Ellipsoidal height of fix (antenna height above ellipsoid)	.xxx (m)
7	Heading	Heading, The angle between true North and Heading (from true north to heading clockwise)	0~360 degree .xxx (deg)
8	Pitch	Pitch, positive from horizontal surface to zenith, negative from horizontal surface to downword	-90~90 degree .xxx (deg)
9	Vel N	Velocity North	.xxx (m/s)
10	Vel E	Velocity East	.xxx (m/s)
11	Vel D	Velocity down	.xxx (m/s)
12	Vel G	Velocity Ground	.xxx (m/s)
13	Coordinate Northing	refer to PTNL,PJK	.xxx (m)
14	Coordinate Easting	refer to PTNL,PJK	.xxx (m)
15	North Distance	Distance to Ref station in North direction, refer to GPNTR	+: north, -: south; .xxx (m)
16	East Distance	Distance to Ref station in East direction, refer to GPNTR	+: east, -: west; .xxx (m)
17	Position Indicator	receiver RTK positioning quality indicator: 0 = fix not available or invalid 1 = GNSS fix 2 = C/A differential 4 = RTK fixed ambiguity solution 5 = RTK floating ambiguity solution 6 = Dead reckoning mode 7 = Manual input mode (fixed position) 8 =Super wide-lane mode	x

Field#	Structure	Description	Format
18	Attitude Indicator	receiver RTK heading and pitch quality indicator, refer to GPTRA, PTNL,AVR	x
19	Sat NO Used	satellite number used in solution	xx
20	Diff Age	differential age	xx
21	Station ID	reference station id	0000
22	Baseline length	distance between master station and slave station (baseline length between two antennas)	.xxx (m)
23	solution sv	number of satellites that anticipate in calculation of slave station	
24	rolling	Only supported by board and overall units which contain inertial module	.xxx (deg)
25	*xx	Checksum	*hh
	[CR][LF]	Sentence terminator	

FCC Statement

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

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

Caution: Any changes or modifications to this device not explicitly approved by manufacturer could void your authority to operate this equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Specific Absorption Rate (SAR) information:

This GNSS Receiver meets the government's requirements for exposure to radio waves. The guidelines are based on standards that were developed by independent scientific organizations through periodic and thorough evaluation of scientific studies. The standards include a substantial safety margin designed to assure the safety of all persons regardless of age or health. FCC RF Exposure Information and Statement

the SAR limit of USA (FCC) is 1.6 W/kg averaged over one gram of tissue. Device types: GNSS Receiver has also been tested against this SAR limit. This device was tested for typical body-worn operations with the back of the GNSS Receiver kept 0mm from the body. To maintain GNSS Receiver with FCC RF exposure requirements, use accessories that maintain an 0mm separation distance between the user's body and the back of the GNSS Receiver . The use of belt clips, holsters and similar accessories should not contain metallic components in its assembly. The use of accessories that do not satisfy these requirements may not comply with FCC RF exposure requirements, and should be avoided.