



Accurate
positioning

22°43'59.57617"N 114°03'03.61546"E



P16

RTK helmet



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Contents

Update	3
1. Product Description	错误！未定义书签。
2. Terms And Definitions	错误！未定义书签。
3. Technical specifications	4
3.1 Specification parameters	5
3.2 Main functions	7
3.3 Usage reference	9
3.4 Indicator light definition	11
3.5 Button Definition	12
3.6 Parking list	13
4. Instructions for use	13
4.1 Testing platform	13
4.2 Configuration of high-precision differential account	14
5. Test effect	错误！未定义书签。
6. After-sales service	错误！未定义书签。

Update

Version	Date	Author	Revision
V1.0	2021.6.11	ATA	Initial version

1. Product Description

High-precision positioning smart helmet P16 adopts 4G Cat1 communication program, integrates BDS 3-generation high-precision RTK positioning module, the helmet body adopts integrated design, the communication mode adopts TCP/IP, supports JT808 protocol, and the docking of system platform is simple and fast.

BDS high-precision positioning smart helmet built-in BDS III RTK high-precision module, support GPS L1, BDS B1 (including BDS III), QZSS L1 multi-system joint positioning. In case of accessing the differential service provided by BDS differential reference station, the positioning accuracy can reach centimeter level.

The helmet has built-in system resources such as voice announcement and gravity sensor, which is convenient for customers to define project functions.

The helmet has a default built-in 4000mAH battery, and the helmet adopts low-power design technology, which allows you to define the working default of the helmet according to the product's working time or motion state, such as continuous working or dormant mode;

2. Terms And Definitions

The following terms and definitions are used in this document

Terms	Definitions
BDS	Beidou Satellite Navigation System
GPS	U.S. Global Positioning System
GLONASS	Russian Global Positioning System
QZSS	Quasi-Zenith Satellite System
GNSS	Global Navigation Satellite System
GSM	Global System for Mobile Communications
GPRS	General Packet Radio Service
AGNSS	Auxiliary Global Positioning Satellite System
G-sensor	Gravity sensors
SIM	Customer Identification Module
Wi-Fi	Wireless Local Area Network
LBS	Location-based services
RFID	Radio Frequency Identification (RFID)
SOS	International Morse Code distress signaling
APP	Third-party applications
FOTA	Over-the-air downloadable software upgrades
EMC	Electromagnetic compatibility

3. Technical specifications

3.1 Specification parameters

Category	Name	Description
Solution	Communication Network	LTE-TDD:B34/B39/B40/B41 LTE-FDD:B1/B3/B5/B8
	Network System	Cat.1
	Positioning method	BDS+GPS+LBS
	Vibration detection	Support For Adaptive Work, Sleep Mode
	SIM Holder	Built-in SIM Card
	Button	3 Button (on/off button, SOS button, power + time announcement and illumination multiplexing button)
	Front light	1W high brightness LED
	Satellite positioning mode	Differential positioning
Performance	Positioning accuracy	Single point positioning: 2.5m Differential positioning: RTK mode Static: 2cm Dynamic: better than 10cm AGNSS Support First positioning time Cold start: ≤32s Hot start: ≤2s
	AGNSS	Support

	First positioning time	Cold start: $\leq 32s$ Hot start: $\leq 2s$ AGNSS assisted localization: $\leq 10s$
	Reporting	Differential mode: 1s Without access to differential mode: 30s Can be set on the platform(App)
electroacoustic(al)	Speaker	Support
	Microphone	Support(Optional)
Electrical specification	Built-in battery	4000mAh
	Charging Interface	TYPE-C
	Charging time	Approx. 3 hours
	Battery level detection	Support
	Working Voltage	3.7V
	Operating time	18-20 hours (1Hz real-time reporting)
Environmental	Operating temperature	-20°C ~ 60°C
	Storage temperature	-30°C ~ 75°C
	Operating Humidity	10% ~ 85%RH, non-condensing
	Waterproof	IP54
	Weight	485.5g (without interior) , 576g (with the interior)
	Size	291*240*140mm

	Color	Default red, can be customized white, blue, yellow, orange (500 sets from order)
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3.2 Main Functions

1. High-precision positioning, built-in BDS III high-precision RTK positioning module, supports centimeter-level positioning at the highest;
2. 2.4G Cat1 communication, adopting Open CPU 4G Cat1 communication program
3. Silent alarm, when the personnel is not moving in one place for a long time, the helmet and the background will be alarmed, which can be switched on and off by commands according to the demand, and requires the background to cooperate with the development;
4. Fall alarm, the operator falls or receives a violent impact after the background will prompt the receipt of the alarm, the background needs to cooperate with the development;
5. Dangerous rescue, helmet built-in SOS rescue system, convenient for operators to get timely rescue when in danger;
6. Electronic fence, the management side can create an electronic fence to prohibit helmet wearers from going out or entering, which is convenient for management and improves the safety of operating

personnel;

7. Alarm, built-in BDS RTK high-precision algorithms, real-time provision of centimeter-level elevation information, real-time monitoring of the height above ground and make the corresponding warning function, the background needs to be developed in conjunction with;
8. Hat off alarm, built-in light sensor, in the working hours, such as the operator appears to take off the hat operation, the platform and the equipment side will be issued hat off alarm prompts
9. Trajectory playback, the management side can view each operator's trajectory for a certain period of time, record the path of the personnel operation, and trace the progress of the operation history;
10. Lighting, the product built-in 1W bright LED lighting, support for night operations to provide lighting, while supporting the sound and light alarm function;
11. TTS voice broadcasting, support the platform to send text, equipment side voice broadcasting;
12. Public network intercom: support single call, group call, multi-group switching;
13. Support remote configuration: differential account number, reporting frequency, platform IP and other information;;

3.3 Usage Reference

POWER	ON	long press the on/off switch for 3 seconds, power on
	OFF	long press on/off for 3 seconds, power off
Operating Mode	Differential mode	When the helmet is connected to a differential signal, the device is in continuous operation mode and the reporting interval mode is 1 second; in this mode, the device supports silent alarms, i.e., the gsensor issues silent alarms based on the movement or stationary state of the device.
	Non-differential mode	The helmet is in non-differential mode, the device reports position information at 30 seconds intervals if no differential signals are connected, and at 3 seconds intervals if there is a bend in the road, etc. In this mode, the device supports silent alarms, i.e., the gsensor sends out silent alarms based on the motion or stationary state of the device.

	Intelligent mode	Intelligent mode is to close the silent alarm when the helmet according to the movement or stationary state of the equipment or according to the operating time end of the intelligent judgment of the working mode of the equipment, such as equipment such as continuous movement state, and access to differential signals, the device will work in differential mode; such as the device is in a continuous state of motion, but not access to differential signals, the device will work in the nondifferential mode; such as the device is in If the device is in stationary mode, the device will automatically enter sleep mode;
Basic	Positioning Method	GPS+BDS+QZSS differential positioning
	Clock Timing	After each power-on or reset restart, the terminal ensures the accurate time in the software through the timing mechanism.
	data	Each message carries information such as battery level, CSQ signal strength, GPS positioning type, number of BeiDou satellites and so on.
Voice	Voice broadcast	The background sends text and the terminal actively broadcasts the text;

	Public network intercom	Public network intercom: single call, group call, multi-group console switching (with the voice broadcasting function of one or the other)
Alarm	Low power	Support
	SOS	Support
Remote upgrade	Reporting version	1. When powering on or restarting: actively report MTK software version and hardware version to the upgrade platform. 2. 2、 Otherwise, the software version number is not reported to the upgrade platform
	Execute upgrade	Support
Terminal Software Stability	Restart	Mechanism The terminal will automatically restart under appropriate circumstances to ensure software stability and reliability:
	location Replacement	1000(max)

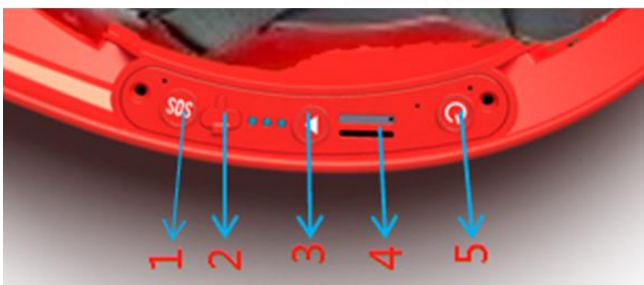
3.4 Indicator Definition

light	Status	LED effect
Power	Charging	Red Light Lighting (charging)
	above 90%	Green Light Lighting (charging)

	Battery level >90%	Green lighting (power on status)
	Battery level 20%-90%	Blue lighting (power on status)
	Battery level <20%	RED lighting (power on status)
Positioning Indicator	Non-positioning	Light off
	Positioned	3s 1t
	RTK Floating Point	3s 2t
	RTK fixed solution	Green lighting
Network Indicator	No SIM card	3s 2t
	Search /card arrears	Blue lighting
	GSM registration	3s 1t
	Successful server connection	3s 2t

NOTE: **s:second** **t: times**

3.5 Button Definition



1: SOS distress button (long press for three seconds to take effect)

2: Charging port (Type-C type)

3: broadcast button (short press 1 second battery level + time broadcast +
long press 5 seconds to turn on the flashlight / long press 5 seconds to turn off

the flashlight)

4: SIM card holder

5: On/Off button (long press 3 seconds to turn on/long press 3 seconds to turn off)

3.6 Parking List

NAME	QTY	UNIT
P16 Safety Helmet	1	PCS
Charger + Charging Cable	1	PCS
Manual (warranty card)	1	PCS
Certificate	1	PCS

4. Instructions for use

4.1 Test Platform

Platform address: <http://www.18gps.net/Skins/DefaultIndex/>

Login method:

1、Equipment IMEI login-login account of the device under test

Account number: IMEI (take the last 12 digits value example: IMEI: 861193042515610, then the account number is 193042515610)

Password: 123456



2、Enterprise account login - all equipment under the same customer's name is under this account

Account number: platform allocation - equipment manufacturers request

Password: 123456



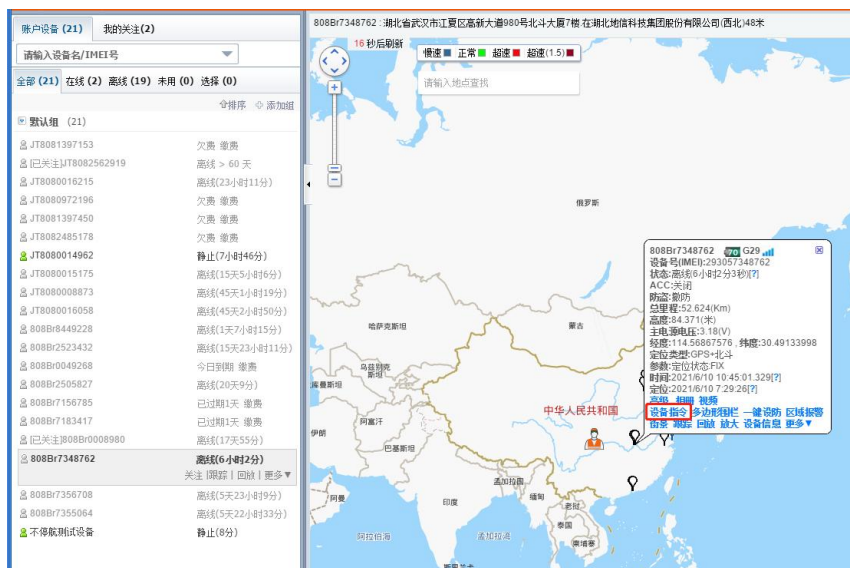
4.2 High-precision differential account configuration

High-precision differential account configuration mode: platform mode configuration, serial port configuration

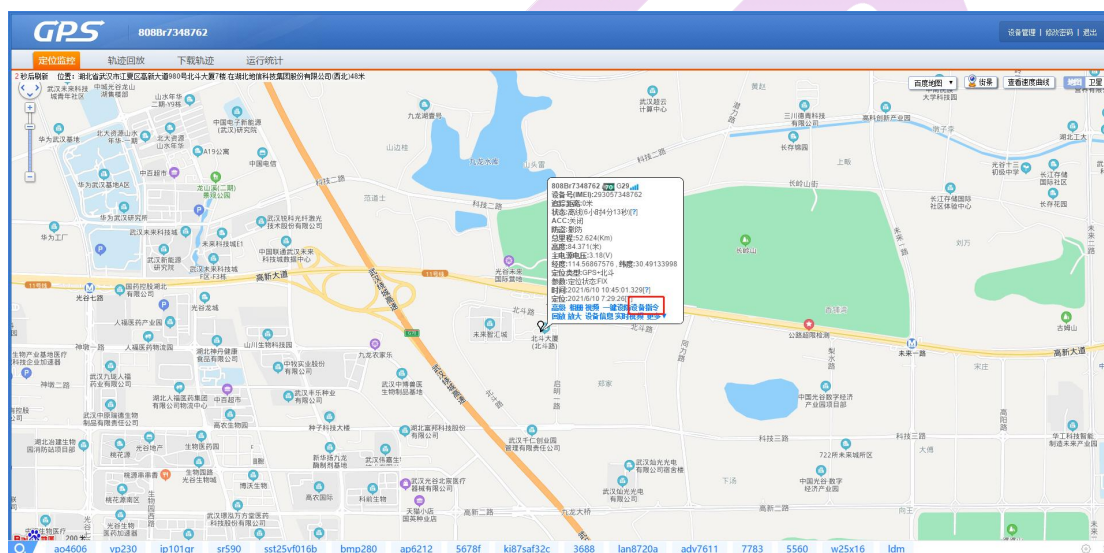
1. Platform Configuration

1.1 Login to the corresponding enterprise or device account name, select the device that needs to be configured, and select "Device Command"

A. Corporate Account

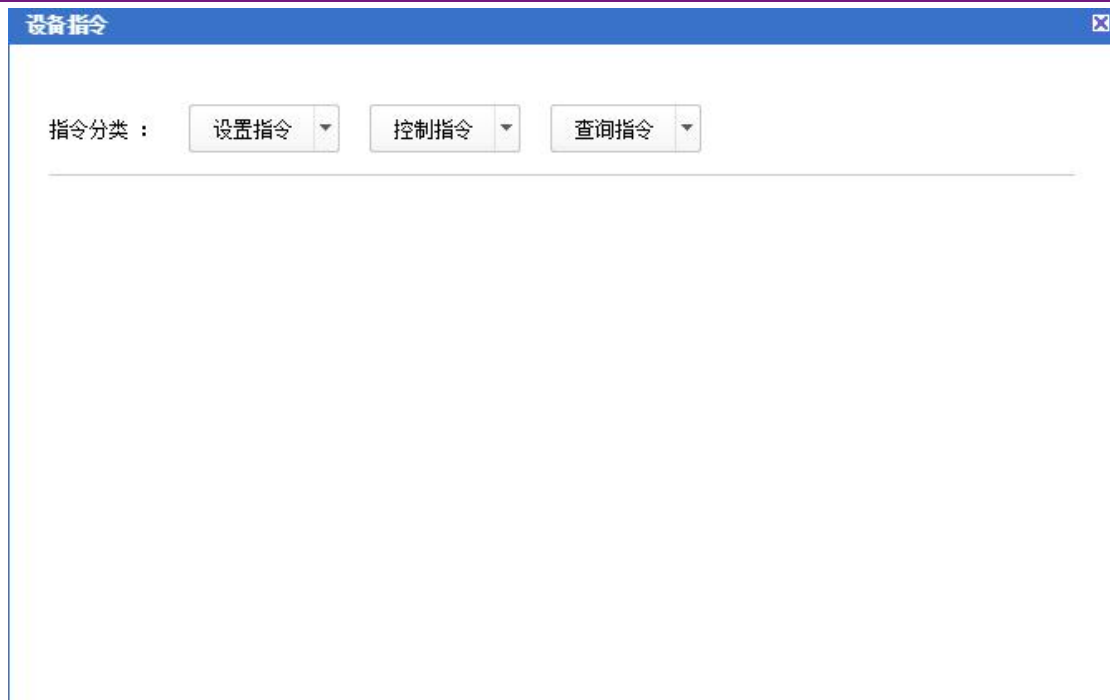


B. Equipment Account Number



1.2 After opening the “Device Command” , the following screen will appear

Note: To use the device command option, you need to change the initial login password to a combination of numbers and letters.



设备指令

指令分类： 设置指令 控制指令 查询指令

Select Transmission in the “Setup Command” , as shown below



设备指令

指令分类： 设置指令 控制指令 查询指令

指令名称：透传

设备名称：808Br7348762

发送方式： ☒ 即时发送 ☐ 延时发送

命令： atcmd

发送

截图(Alt + A)

The corresponding command information is shown below:

SMS/8300 Commands

1) Setting up the JT808 server

* Example: service,39.105.241.141,8808

2) Setting the JT808 positioning interval, unit: second

* Example: reinterval,10

3) Set the speed of JT808 speed alarm, unit: kilometer.

* Example: speed,20

Configuring Differential Accounts

atcmd,AT+GNTRIPCFG="addr","106.14.240.153"

atcmd,AT+GNTRIPCFG="port","6000"

atcmd,AT+GNTRIPCFG="mount","DIZHENJU"

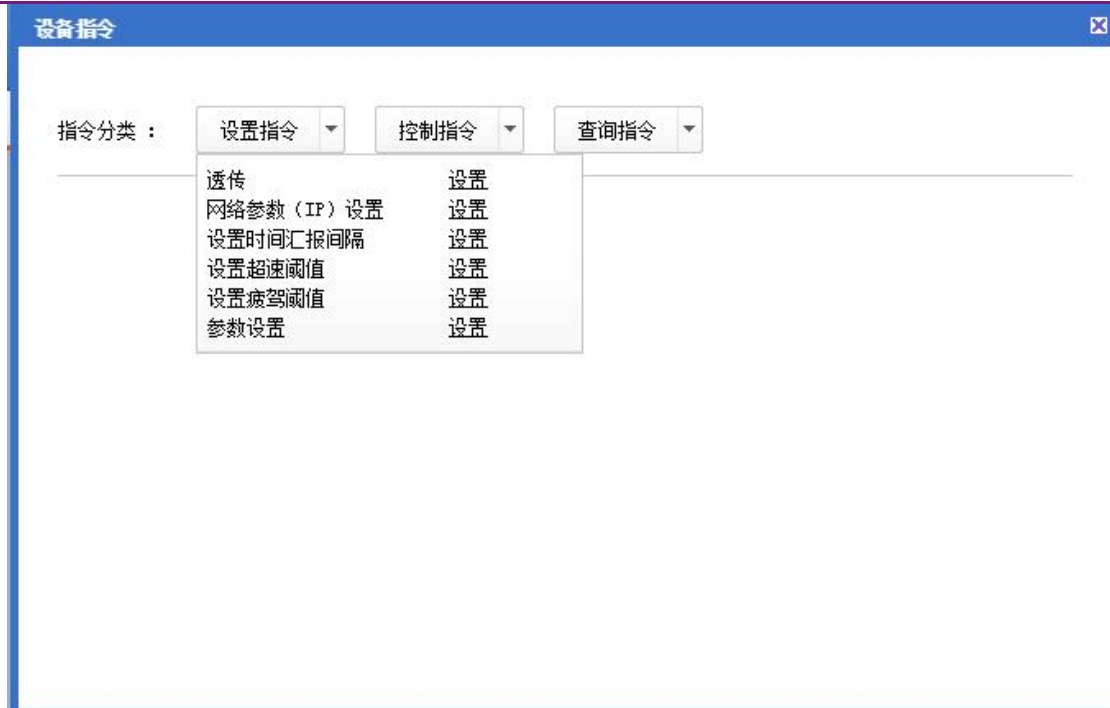
atcmd,AT+GNTRIPCFG="user","dzj00001"

atcmd,AT+GNTRIPCFG="pswd","123456"

Reset Command

atcmd,AT+RESET

Note: A reset command must be sent after the command has been sent in order for the configuration to take effect!



Note: 1: Modification of the platform server IP port can be modified directly through the network parameter (IP) settings;

2: Modifying the positioning reporting interval can be modified directly through the Setup Time Reporting Interval setting;

2. Serial Port Configuration

Connect the TYPE C interface cable with the TTL-3.3V serial port board through the general-purpose TYPE C interface cable with data line (wire sequence definition: 4-wire typeC serial port cable: green connects to RXD, white connects to TXD, black connects to GND), and connect with the helmet Type-C to carry out the corresponding configurations;

Serial port configuration instructions are as follows;

AT+GCJTCFG="jc808_sec","5" Modify upload frequency

AT+GCJTCFG="jc808_addr","39.105.241.141" Change platform IP

AT+GCJTCFG="jc808_port","8808" Modify platform port

AT+GCJTCFG?

Query platform modification result

AT+GNTRIPCFG="addr","106.14.240.153"

Modify high precision

service IP

AT+GNTRIPCFG="port","6000"

Modify high precision service

port

AT+GNTRIPCFG="mount","tangshan"

Modify mount point

AT+GNTRIPCFG="user","tangshan"

Modify the account number.

AT+GNTRIPCFG="pswd","123456"

Change the password.

AT+GNTRIPCFG?

Query the result of high precision account
modification.

Debug output related commands:

GGA/RMC open command: AT+DEBUG=NMEA,3

GNSS full statement command: AT+DEBUG=NMEA,4

GGA/RMC close command: AT+DEBUG=NMEA,0

Save command: AT+DEBUG=SAVEALL

JT808 message open command: AT+DEBUG=JT808,3

JT808 message close command: AT+DEBUG=JT808,0

Save instruction: AT+DEBUG=SAVEALL

AT+EGMR=0,7 IMEI number lookup command

AT+RESET Reset Instruction

Note: A reset command must be sent after the command has been sent in order for the configuration to take effect!

5. Test Effect

Test time: June 9, 2021 19:44:12-20:07:12

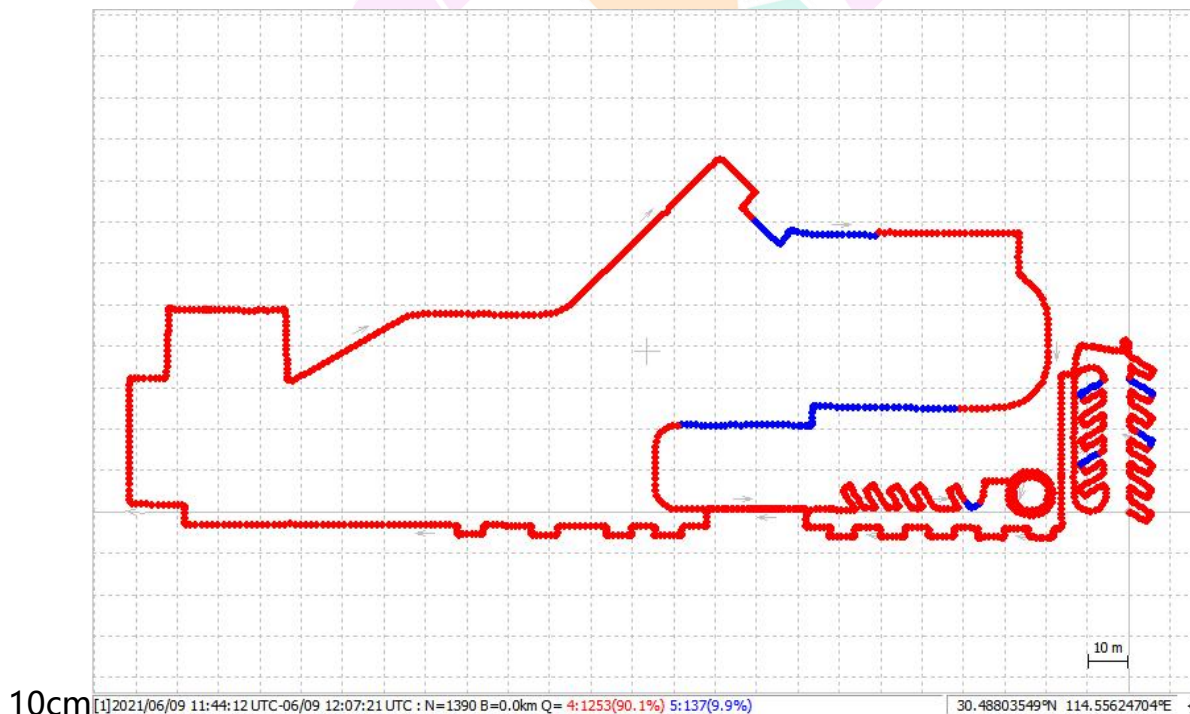
Test Location: Beidou Building Park

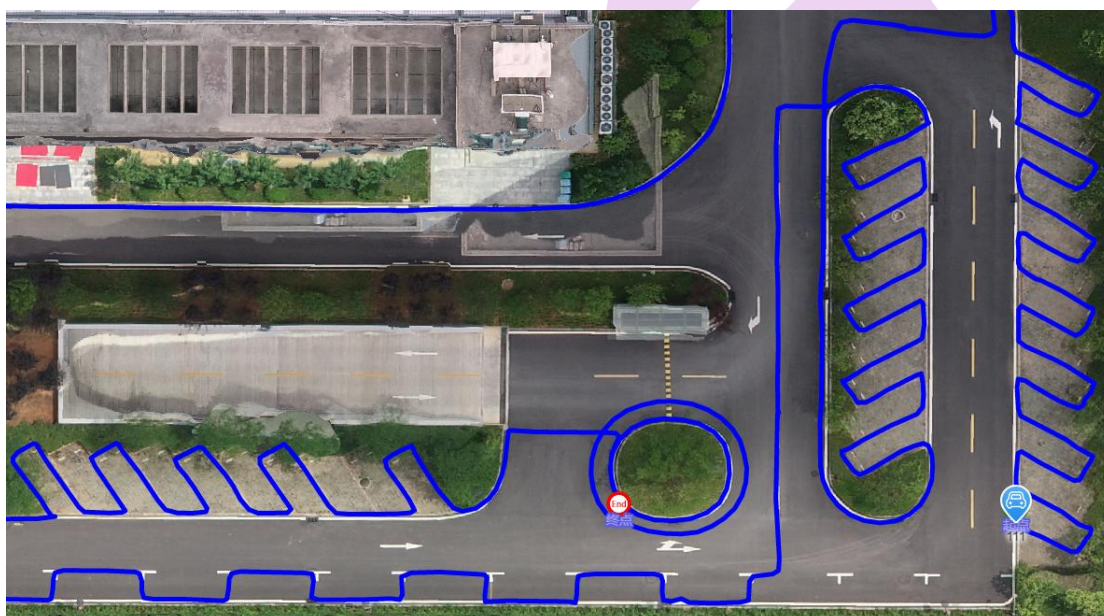
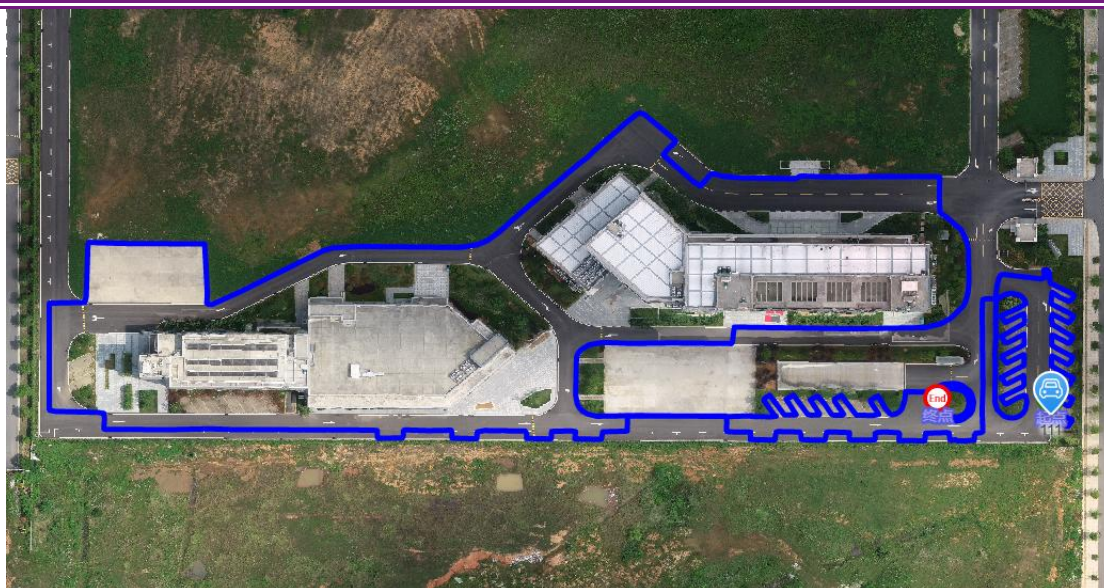
Test Mode: Walking, helmet on the head

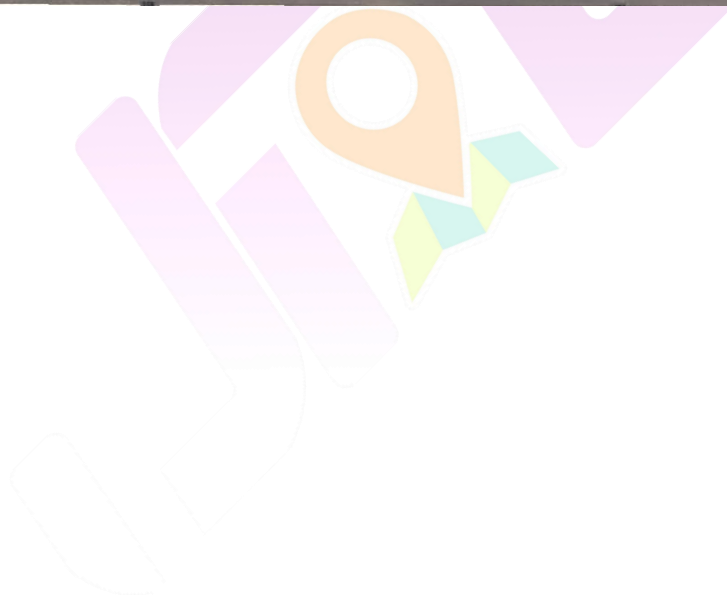
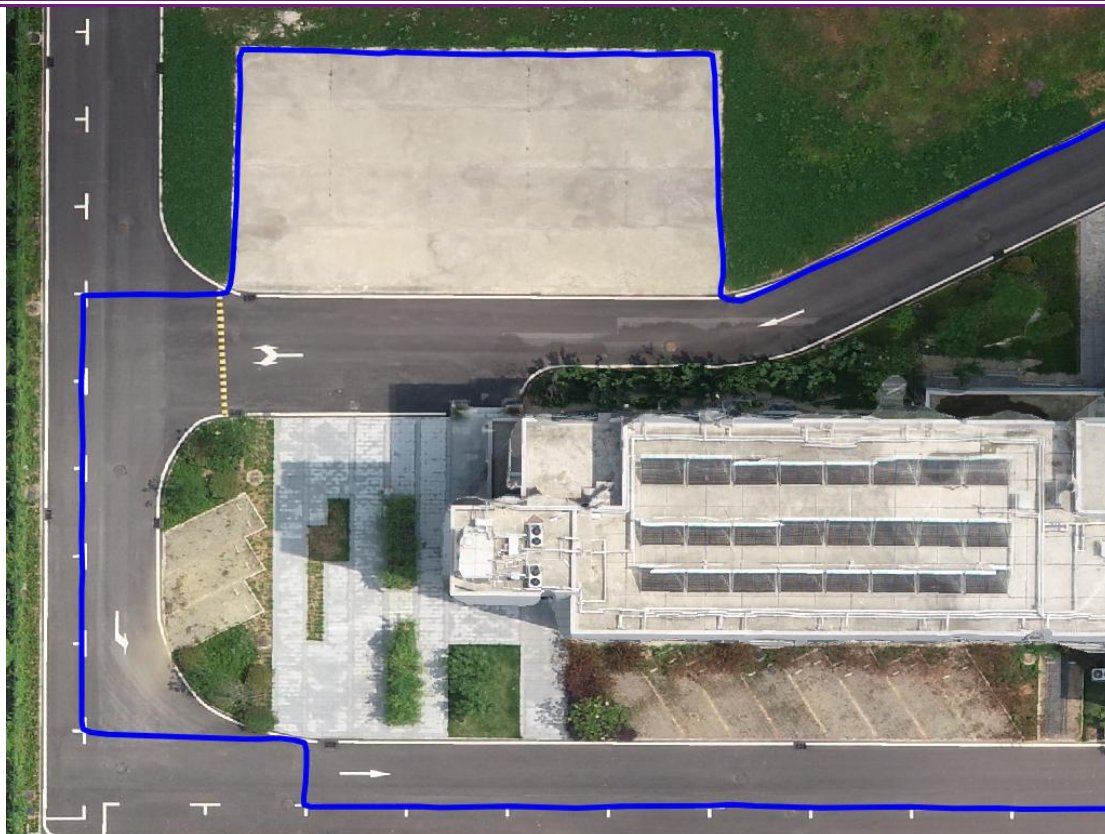
Test Features: BeiDou high-precision smart helmet + BeiDou 3rd generation differential base station + high-precision map

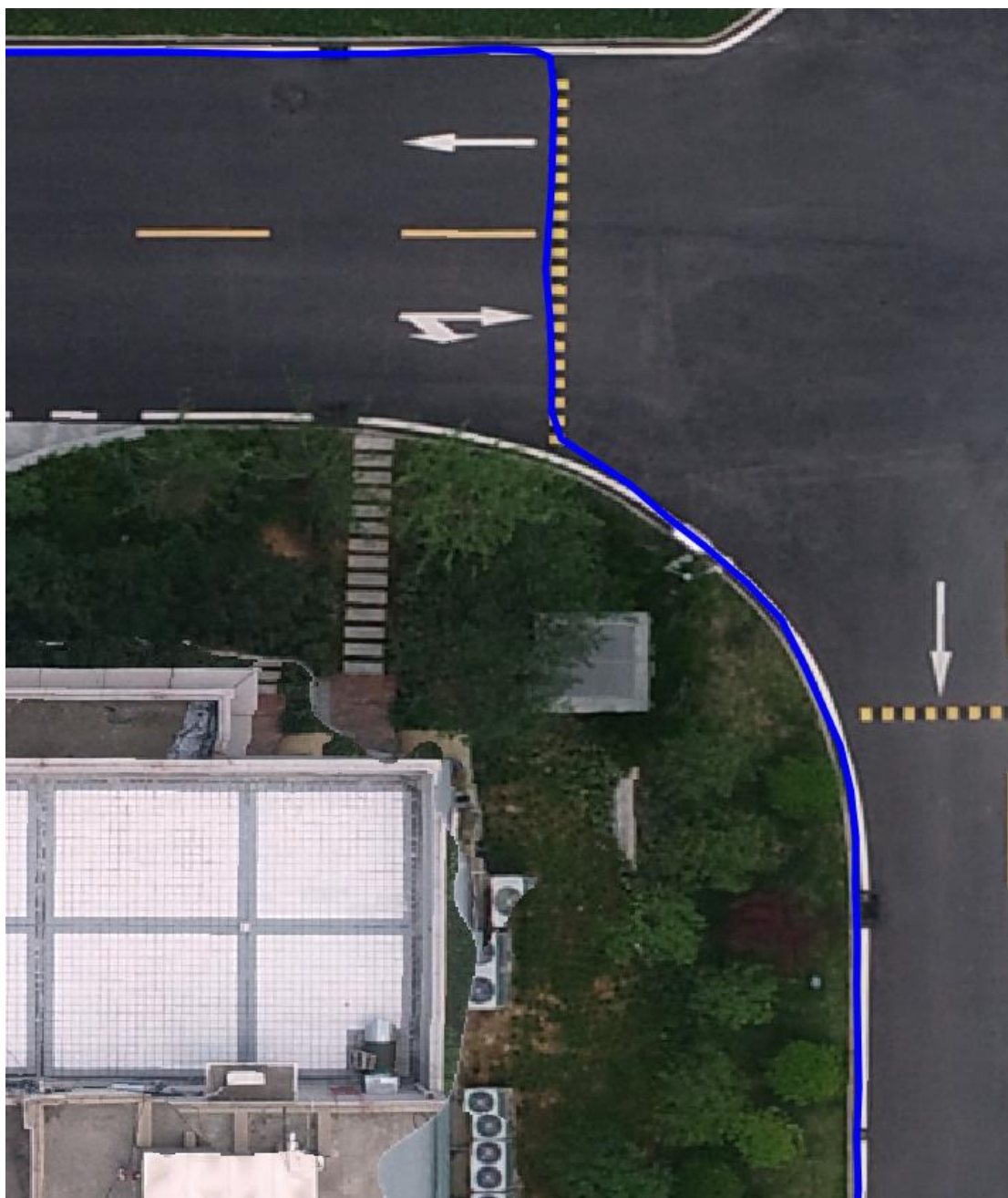
Test Scene: Covering open sky, tree shade, and high building shade

Test Result: Fixation rate over 90%, positioning accuracy better than









6. After-sales service

1. This product is covered by one-year warranty from the date of installation.
2. No repair for damage caused by customer's private dismantling or force majeure (e.g., flood, vehicle accident).
3. After the expiration of the warranty period, due to the use of the product damage, failure, but need to charge the cost of repair materials.
4. Free to provide customers with product purchase, use, installation and other consulting and technical services.

Name			
ADD			
Phone NO.			
Distributor			
Date of Purchase		Module	
Place of Purchase		No.=Number	
Date	issues		

To better provide the service, please keep the (warranty card) properly.