FSS-NAV618D PRO High Precision Integrated Navigation System

FSS-NAV618D PRO Product Manual

Product Overview

FSS-NAV618DPRO is a multi-sensor integrated navigation product based on industrial IMU platform and full system multi-frequency dual antenna RTK.NAV618DPRO has a unique array IMU sensor built into the Forsense Company, which supports external odometer information to provide accurate, continuous and real-time posture and velocity location information in urban canyons, tunnel elevations and other scenarios. Provides records of RTK original observations combined with IMU sampling mechanism of space-time synchronization, which facilitates high-precision post-processing for users. Convenient and diverse ways to import differential data, supporting differential data from mobile phone Hotspots or external 4G modules.

Product Features

（1）Built in system wide multi frequency point high-precision RTK board. Support BDS B1 / B2 + gpsl1 / L2 + GLONASS L1 / L2 + Galileo E1 / e5b.

（2）The built-in array IMU sensor provides real-time and accurate attitude, speed and position information through perfect integrated navigation algorithm and space-time synchronization mechanism.

（3）Supports 4G/WIFI wireless configuration, import the differential data and download the log.

（4）Supports the recording of RTK raw observations and calendars for post-processing and compatibility with IE post-processing software.

（5）Supports external milemeters.

Catalogue

1. Performance Index

System Accuracy	Positioning accuracy(RMS)		Single point：1.5m RTK：1cm+1ppm	
	Positioning accuracy（RMS）		0.2 ° / 1 m baseline	
	Speed accuracy (RMS)		0.05m/s	
	Update rate		20hz	
	Initialization time		<5s	
IMU Index	Gyro Range		±500°/s	
	Gyro bias instability		3.5deg/h	
	Accelerometer range		±6g	
	Zero Bias Stability of Accelerometers		0.035mg	
	Update rate		100hz	
Integrated Navigation System Performance	GNSS Interruption time	Positional Accuracy (1σ)	Attitude accuracy (1σ)	Velocity accuracy (1σ)
	0s	2cm	0.15°	0.05m/s
	60s	2.5‰	0.25°	0.15m/s
Interface	2×RS232 1×CAN 2×GNSS Antenna interface 1×4G Antenna interface 1× Power Interface			

2. Electrical Characteristic

Parameter	Symbol	Min	Type	Max	Unit
Power input	VCC	8	12	36	V
Power ground	GND				
Power dissipation	I	2.4	3.6	4.8	mA
Temperature	T	-40		85	℃

3. Serial Port Data Protocol

3.1 String Output

RS232-A port default output GPGGA, GPRMC, GPATT data, default baud rate 460800

3.1.1 GPGGA

The frame is used to output positioning results, positioning status, and so on.

Examples of formats:

$GPGGA,014434.70,3817.13334637,N,12139.72994196,E,4,07,1.5,6.571,M,8.942,M,0.7,0016*79

The structure of the data frame and the field definitions are as follows:

$GPGGA,<1>,<2>,<3>,<4>,<5>,<6>,<7>,<8>,<9>,M,<10>,M,<11>,<12>*xx<CR><LF>

$GPGGA：Start guide and statement format description (this sentence is GPS positioning data);

<1>UTC Time，the format is hhmmss.sss;

<2> latitude，the format is ddmm.mmmm (the first bit is zero will also be transferred);

<3> Latitude hemisphere，N or S (North or South)

<4> longitude，the format is dddmm.mmmm (the first zero will also be transferred)；

<5> Longitude hemisphere，E or W (East or West)

<6> GPS Status, 0 Initialization, 1 Single Point Positioning, 2 Code Difference, 4 Fixed Solutions, 5 Floating Point Solutions

<7> Use number of satellites，from 00 to 12 (the first zero will also be transferred)

<8> HDOP-Horizontal Precision Factor, 0.5 to 99.9, generally assumes that the smaller the HDOP, the better the quality.

<9> Altitude, -9999.9 to 9999.9 meters

M refers to unit meter

<10> Abnormal difference of geoid height, -9999.9 to 9999.9 meters

M refers to unit meter

<11> Differential GPS Data Duration (RTCM) SC-104), the number of seconds to set up the final RTCM transmission, if not differential positioning, is empty

<12> Differential reference base station number, from 0000 to 1023 (the first 0 will also be transmitted).

* Statement End Marker

XOR check for all ASCII codes from $ to *

<CR> Carriage Return, End Mark

<LF> Line break, end tag

3.1.2 GPRMC

The frame is used to output information such as speed, date, positioning status, and so on.

Examples of formats:

$GPRMC,<1>,<2>,<3>,<4>,<5>,<6>,<7>,<8>,<9>,<10>,<11>,<12>*hh

<1> UTC Time，hhmmss.sss (minutes, seconds, milliseconds) format

<2> Location Status, A = Valid Location, V = Invalid Location

<3> Latitude ddmm.mmmm (degrees) format (the previous 0 will also be transferred)

<4> Latitude hemisphere N (Northern hemisphere) or S (Southern hemisphere)

<5> Longitude dddmm.mmmm (degrees) format (the previous 0 will also be transferred)

<6> Longitude Hemisphere E (East) or W (West)

<7> Ground rate (000.0-999.9 knots, the previous 0 will also be transferred)

<8>Ground course (000.0-359.9 degrees, with due north as reference, the previous 0 will also be transferred)

<9> UTC Date，ddmmyy (day, month, year) format

<10> Magnetic declination (000.0-180.0 degrees, front 0 will also be transferred)

<11> Magnetic declination direction, E (east) or W (west)

<12> Mode indication (NMEA0183 version 3.00 output only, A = autonomous positioning, D = differential, E = estimation, N = invalid data)

XOR sum of all characters after HH from $to

3.1.3 GPATT

Examples of formats:

GPATT data is used to output attitude information for integrated navigation, including roll, pitch, heading, and IMU data

$GPATT,000011.700,-162.71,3.61,0.64,0,-0.0375,-0.0208,-0.0321,0.0637,0.2984,0.9527*4F

The structure of the data frame and the field definitions are as follows:

$GPATT,<1>,<2>,<3>,<4>,<5>,<6>,<7>,<8>,<9>,<10>,<11>*xx<CR><LF>

$GPATT：Start guide and statement format description:

<1> UTC Time，the format is hhmmss.sss;

<2> Roll-over angle in dd.dd (in degrees), -180-180 degrees;

<3> Pitch angle in dd.dd (in degrees), -90-90 degrees;

<4> Direction angle in dd.dd (degrees), 0-360 degrees

<5> Posture Effectiveness

1：Indicates uninitialized integrated navigation, heading mode.At this time, the heading angle is the heading relative to the power-on time.

2：Indicates that the combination navigation has completed its initialization and the state is in convergence.

3：Indicates that the combined navigation converges well.

6：Represents the mode of leveling.

<6>to<8>Gyro X, Y, Z Axis Angular Velocity Data, unit deg/s

Accelerometer X, Y, Z Axis Angular Velocity Data, unit G

* Statement End Marker

XOR check for all ASCII codes from $to*

<CR> Carriage Return, end Mark

<LF> Line break, end tag

3.1.4 GPYJ

Examples of formats:

GPYJ data is used to output combined position, speed, posture, IMU data, and various status information.

The structure of the data frame and the field definitions are as follows:

$GPATT,<1>,<2>,<3>,<4>,<5>,<6>,<7>,<8>,<9>,<10>,<11>*xx<CR><LF>

$GPYJ：Start guide and statement format description:

<1> UTC Time，the format is hhmmss.sss;

<2> Direction angle in dd.dd (degrees), 0-360 degrees;

<3> Pitch angle in dd.dd (in degrees), -90-90 degrees;

<4> Roll angle, in dd.dd (in degrees), -180-180 degrees

<5>to<7>Gyro X, Y, Z Axis Angular Velocity Data, unit deg/s

<8>to<10>Accelerometer X, Y, Z Axis Angular Velocity Data, unit G

<11> Latitude, in dd.dd dd dd dd, in degrees

<12> Longitude, in dd.dd dd dd dd format, in degrees

<13> Height in mm.mmm. meters

<14> Northward velocity in m/s

<15> Eastern Velocity, Unit m/s

<16> Direction to speed, unit m/s

<17> Ground speed, unit m/s

<18> Main antenna star count

<19>Number of secondary antenna stars

<20> Status bit

1：Indicates that the integrated navigation is not initialized and the initial alignment is in progress

2：Indicates that the combined navigation has completed its initialization and is convergent

3：Indicates that the combined navigation converges well

6：Represents combined navigation dead reckoning mode

<21> Differential delay in seconds

<22> Reserve

* Statement End Marker

XOR check for all ASCII codes from $to*

<CR>Carriage Return, end Mark

<LF> Line break, end tag

3.2 Binary Output

Supported Nowatai binary protocol outputs are:

Bestposb-Positioning data and positioning status.

Bestbelb-Speed data.

Headingb-Directed data and status.

Inspvab-The combination of navigation posture, speed, position, and state bits supports a 100 Hz update rate.

Corrimub-Triaxial angular velocity and acceleration data of the inertial navigation system.

4. CAN Data Protocol

4.1 Output Protocol

CAN baud rate 500k, standard frame.

4.1.1 IMU Original Value

The gyro data type is float and the unit is deg/s.

The accelerometer data type is float in G.

CAN-ID	Data[0]	Data[1]	Data[2]	Data[3]	Data[4]	Data[5]	Data[6]	Data[7]
0x601 standard frame	X-axis angular velocity float type 0-7 data bits	X-axis angular velocity float type 8-15 data bits	X-axis angular velocity float type 16-23 data bits	X-axis angular velocity float type 24-31 data bits	Y-axis angular velocity float type 0-7 data bits	Y-axis angular velocity float type 8-15 data bits	Y-axis angular velocity float type 16-23 data bits	Y-axis angular velocity float type 24-31 data bits

CAN-ID	Data[0]	Data[1]	Data[2]	Data[3]	Data[4]	Data[5]	Data[6]	Data[7]
0x602 Standard Frame	Z-axis angular velocity float type 0-7 data bits	Z-axis angular velocity float type 8-15 data bits	Z-axis angular velocity float type 16-23 data bits	Z-axis angular velocity float type 24-31 data bits	X-axis acceleration float type 0-7 data bits	X-axis acceleration float type 8-15 data bits	X-axis acceleration float type 16-23 data bits	X-axis acceleration float type 24-31 data bits

CAN-ID	Data[0]	Data[1]	Data[2]	Data[3]	Data[4]	Data[5]	Data[6]	Data[7]
0x603 Standard Frame	Y-axis acceleration float type 0-7 data bits	Y-axis acceleration float type 8-15 data bits	Y-axis acceleration float type 16-23 data bits	Y-axis acceleration float type 24-31 data bits	Z-axis acceleration float type 0-7 data bits	Z-axis acceleration float type 8-15 data bits	Z-axis acceleration float type 16-23 data bits	Z-axis acceleration float type 24-31 data bits

4.1.2 Attitude

The attitude data type is int16 in deg*0.01.123 means 1.23 degrees.

CAN-ID	Data[0]	Data[1]	Data[2]	Data[3]	Data[4]	Data[5]		
0x604 Standard Frame	Roll angle Int16 Type 0-7 data bits	Roll angle Int16 Type 8-15 data bits	Pitch angle Int16 Type 0-7 data bits	Pitch angle Int16 Type 8-15 data bits	Heading angle Int16 Type 0-7 data bits	Heading angle Int16 Type 8-15 data bits		

4.1.3 Speed

The speed data type is int16 in cm/s

CAN-ID	Data[0]	Data[1]	Data[2]	Data[3]	Data[4]	Data[5]	Data[6]	Data[7]
0x605 Standard Frame	Northward velocity Int16 Type 0-7 data bits	Northward velocity Int16 Type 8-15 data bits	Eastern Speed Int16 Type 0-7 data bits	Eastern Speed Int16 Type 8-15 data bits	Toward speed Int16 Type 0-7 data bits	Toward speed Int16 Type 8-15 data bits	Ground Speed Int16 Type 0-7 data bits	Ground Speed Int16 Type 8-15 data bits

4.1.4 Latitude and longitude

Latitude and longitude data type is int32 in deg*1.0e-7.That is, 310000000 represents 31.0000000 degrees.

CAN-ID	Data[0]	Data[1]	Data[2]	Data[3]	Data[4]	Data[5]	Data[6]	Data[7]
0x606 Standard Frame	Latitude Int32 Type 0-7 data bits	Latitude Int32 Type 8-15 data bits	Latitude Int32 Type 16-23 data bits	Latitude Int32 Type 24-31 data bits	Longitude Int32 Type 0-7 data bits	Longitude Int32 Type 8-15 data bits	Longitude Int32 Type 16-23 data bits	Longitude Int32 Type 24-31 data bits

4.1.5 Height

The height data type is int32 in mm.

CAN-ID	Data[0]	Data[1]	Data[2]	Data[3]				
0x607 Standard Frame	Height Int32 Type 0-7 data bits	Height Int32 Type 8-15 data bits	Height Int32 Type 16-23 data bits	Height Int32 Type 24-31 data bits				

4.1.6 Locate Information

CAN-ID	Data[0]	Data[1]	Data[2]	Data[4]	Data[5]	Data[6]	Data[7]	Data[4]
0x608 Standard Frame	Positioning Status Uint8 type 0:Unlocated 1:Single point 2:Code Difference 4:Fixed Solution 5. Floating-point solution	Number of Satellites Uint8 type	Combined Navigation Status Uint8 type 0: uninitialized 1: Satellite Guidance Mode 2: Initialization of integrated navigation complete 3. Integrated Navigation FINE 4. Inertial Recursion					

4.2 Input Protocol

4.2.1 Odometer Data

The left and right wheel speed data type is int16 in cm/s.

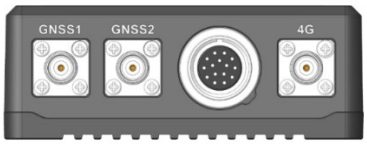
The steering wheel angle data type is int16 in deg*0.01.123 means 1.23deg.

CAN-ID	Data[0]	Data[1]	Data[2]	Data[3]	Data[4]	Data[5]	Data[6]	Data[7]
0x618 Standard Frame	Left wheel speed Int16 data type 0-7 data bits	Left wheel speed Int16 data type 8-15 data bits	Right wheel speed Int16 data type 0-7 data bits	Right wheel speed Int16 data type 8-15 data bits	Steering wheel angle Int16 data type 0-7 data bits	Steering wheel angle Int16 data type 8-15 data bits	Gear Uint8 data type 0: neutral 1: Forward gear 2: Reversing gear 3: Parking gear	

5. Hardware Interface and Installation

5.1 User Interface

5.1.1 Front Panel Interface



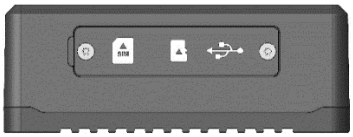
The front panel has four interfaces, one COM port, one 4G antenna interface and two GNSS interfaces.

COM：Connect the airline harness connection with a waterproof cover.

GNSS1/2：Connect the RTK antenna.

4G：Connect a 4G antenna.

5.1.2 Rear Panel Interface



The rear panel has three sockets. The left-most SIM socket stores the SIM card, the middle one stores the memory card, and the right-most one is the USB harness interface.

5.1.3 Front Panel

The product name NAV618D-PRO is labeled on the front and the X, Y, Z axes are labeled.

The front panel has five LED lights to indicate the status.

PWR:Power status indicator

WIFI:WIFI status indicator

RTK:RTK status indicator

NAV:Integrated Navigation Status Indicator

4G:4G status indicator

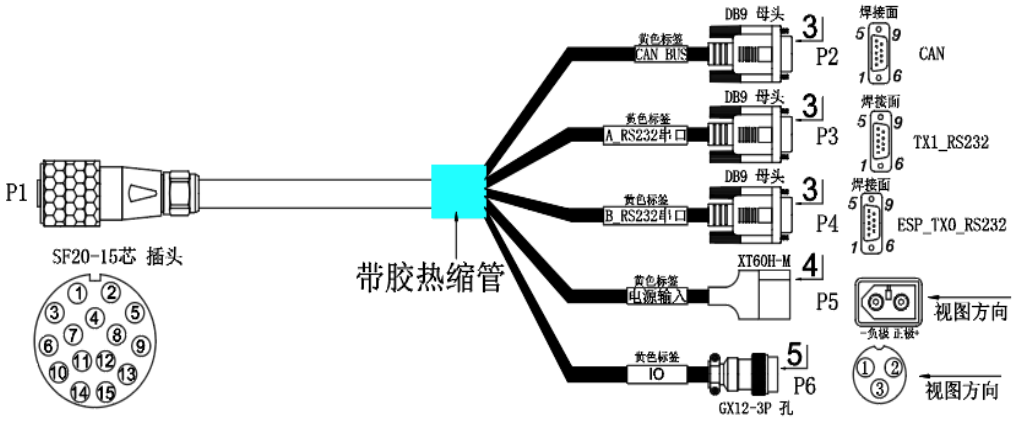
5.2 Parts

This chapter provides accessories information. Before installation begins, verify that the accessories used in the project conform to the specifications and standards.

5.2.1 Configuration List

Name	Describe	Photo
NAV618DPRO	Host	
Airline Data Line	Aviation plug line*1	
4G antenna	4G antenna*1	
GNSS antenna	Four-star full-frequency measuring antenna*2	
GNSS antenna adapter	Adapter*2	
Suction cup + Pillar	（Suction cup + Pillar）*2	

5.2.2 Data Line Interface Definition



Aerial PIN Sequence	Definition	Port
1	PPS	RTK seconds pulse signal/
3	ESP_TX0_232	A_RS232 Serial Port
5	ESP_RX0_232	
9	TX1_232	B_RS232 Serial Port
11	RX1_232	
12	CAN_L	CAN BUS
14	CAN_H	
2	GND	Analogously/digitally
4	GND	
6	GND	
7	GND	
8	GND	
10	GND	
13	VIN	Power input
15	VIN	Power input

(1) A_RS232: Output NEMA data, parameters can be set by the upper computer, default baud rate 460800;

(2) B_RS232: Debug serial port, monitor differential data status, query WIFI address, etc., default baud rate 115200;

(3) CAN: Output integrated navigation data, input mileage data, baud rate 500 Kbps;

(4) Power input: Input voltage range 9V to 32V, power 4~5W;

5.2.3 Accessory Equipment

(1) Power supply: Regular manufacturer adapters or batteries are recommended

(2) Communication cable: DB9 Serial, CAN, etc.

(3) Computer or industrial computer

5.2.4 Auxiliary Software

(1) Serial debugging tool: For data reading and storage

(2) Browser: Recommended use of Google browser or Microsoft IE browser

(3) Maps: Recommended use of Google Maps

5.3 Environmental considerations

5.3.1 Temperature Range

Use temperature：- 40℃ to +75℃

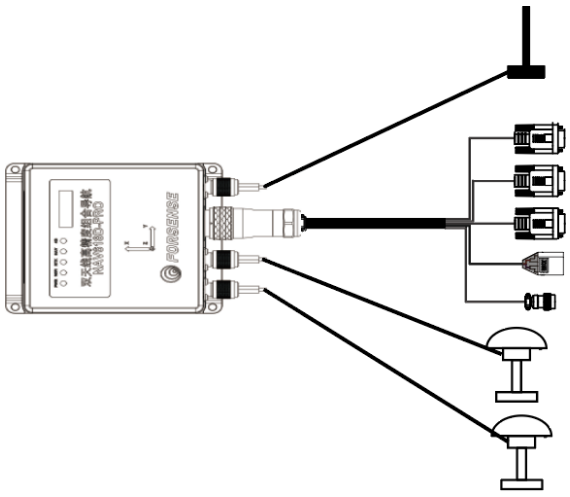
Storage temperature：- 40℃ to +85℃

5.3.2 Humidity Range

The receiver is designed for IP67 to be waterproof and dustproof, but the connection between the power supply is not waterproof and short circuit may occur. If the environment is wet, shield the power supply connection.

5.4 Installation Instructions

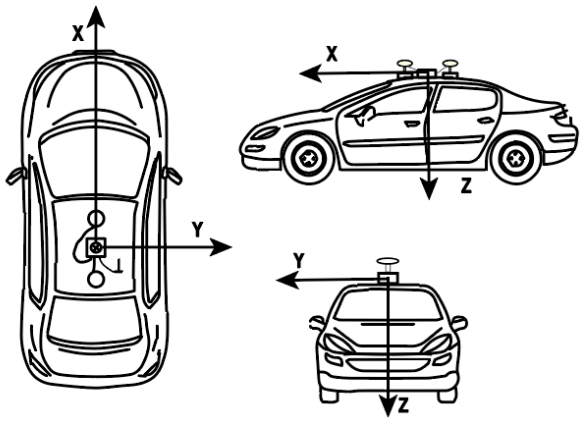
The NAV618DPRO data cable is connected as shown in the following figure, including the device host, 4G antenna, aerial data cable, and GNSS antenna.



5.4.1 Vehicle Installation

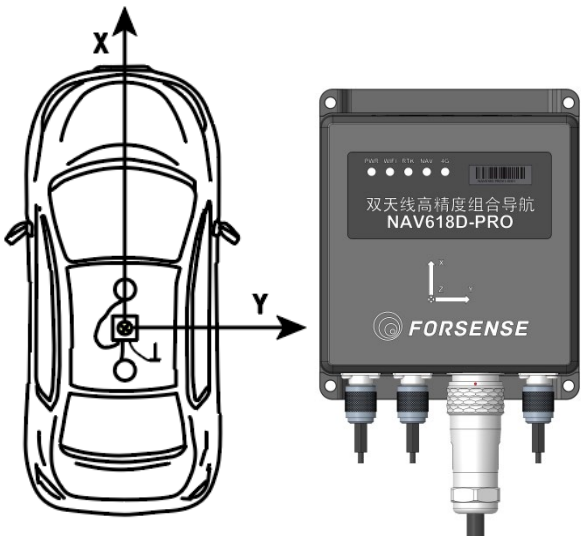
The GNSS antenna is screwed onto the strong magnetic suction cup and fixed in the center position of the test carrier. Place it as high as possible on the test carrier to ensure good GNSS signal reception.As shown in the following figure.

Note: For optimal performance, the distance between the GNSS main antenna and the device host, especially the horizontal distance, should be minimized.



5.4.2 Host Installation

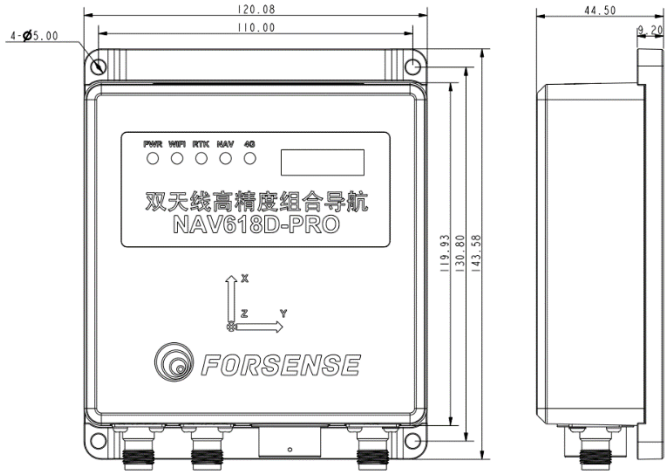
Install the NAV618DPRO host on the carrier. As shown in the following figure, the coordinate system plane marked on the host plate is as parallel as possible to the carrier's measured datum and the X axis is parallel to the center axis of the carrier's forward direction.



Note: The host unit must be securely connected to the tested carrier.

5.4.3 Architecture Master Diagram

The size specifications are as follows:



6. Status Indication

NAV618DPRO has three status LEDs, which are defined as follows:

All three lights flash at 1Hz: entering AP mode, NAV618DPRO for external connection for host WIFI;

All three lights flash at the same time according to the frequency of the click: SD card has insufficient usable space and needs to delete the log;

（1）Blue WIFI light:

5Hz flash: Indicating no connection to WIFI;

2Hz slow flash: Indicates connection to WIFI, no ntrip data requested;

Constant brightness:Indicates requesting ntrip data;

（2）Orange navigation result indicator:

No light: Indicates that the combination navigation is not initialized

2Hz Slow Flash: Indicates that the Initialization of Integrated Navigation is complete

Constant brightness: Indicates good initial navigation convergence for integrated navigation

（3）Yellow RTK light:

No light: No RTK data received;

5Hz fast flicker: Represents RTK single point solution;

2 Hz slow flicker: Floating point solution;

Constant brightness:Represents a fixed solution;

(4) Green 4G status indicator

Slow Flash (200ms High/1800ms Low) Find Network Status

Slow flash (1800ms high/200ms low) standby state

Fast Flash (125ms High/125ms Low) Data Transfer Mode

模式	灯状态指示	
电源指示灯		常亮
SD卡错误		滴滴哒闪烁
蓝色WIFI指示灯		
没有连接到WIFI		5Hz快闪
连接到WIFI，没有请求到ntrip数据		2Hz慢闪
请求到ntrip数据		常亮
黄绿色RTK指示灯		
没有接收到RTK数据		不亮
RTK单点解		5Hz快闪
RTK浮点解		2Hz慢闪
RTK固定解		常亮
橙色导航结果指示灯		
组合导航未初始化		5HZ快闪
组合导航初始化完成		2Hz慢闪
组合导航初始导航收敛良好		常亮
绿色4G指示灯		
找网状态		200ms高/1800ms低
待机状态		1800ms高/200ms低
数据传输模式		125ms高/125ms低

7. Simple Operation Instructions

NAV618D PRO supports two ways to connect to Differential Services, one through a built-in 4G module and the other through WIFI.

7.1 Connect 4G

Insert a 4G card, connect a 4G antenna, connect serial port B by referencing the software after power-on, set the differential connection mode to 4G by referencing section 6.7, and then connect the differential service by 4G after restart.

WIFI of NAV618DPRO is in log download mode in 4G mode.Referring to section 6.9, you can download the log by connecting its WIFI hotspots.

7.2 Connect WIFI

After power-on, connect serial port B by referring to the software. Refer to Section 6.7 to set up the differential connection mode as WIFI mode. After restart, the differential service can be connected through WIFI.

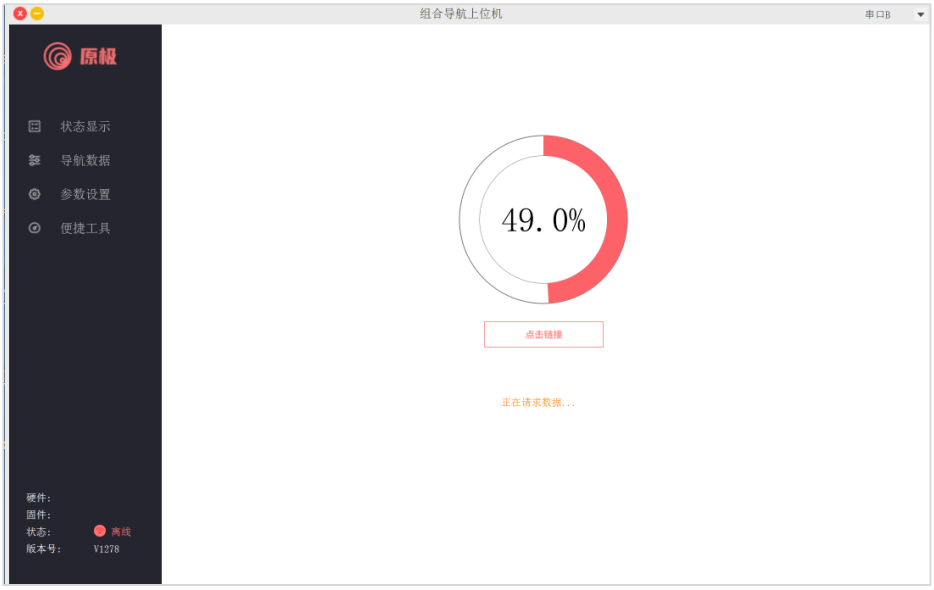
The default mode is log download mode (AP mode) after power-on in WIFI mode. If RTK has signal (above single-point solution), it starts to connect to the differential server and exits log download mode.

NAV618DPRO can provide WIFI connection through mobile hotspots and routers.The WIFI accounts that the system connects by default are as follows:

Name: forsense

Password:12345678

7.3 Connect PC Upper Computer



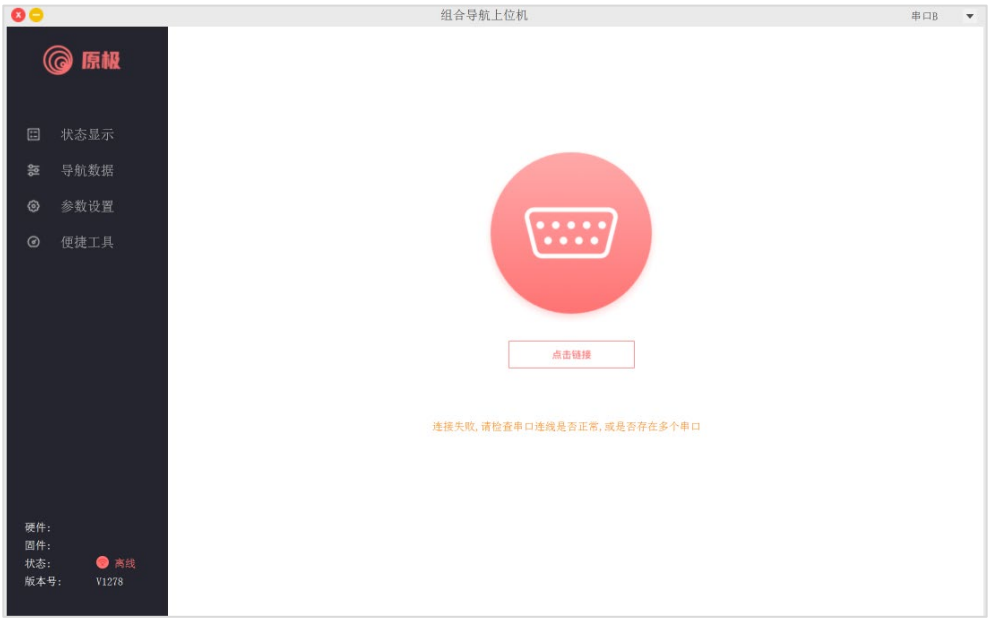
Connect NAV618DPRO to the computer through Serial Port B and click Refresh Connection System.

If the computer connection fails, the possible reasons are:

(1) No serial driver is installed;

(2) There are multiple COM ports in the computer;

Please restart the software to connect again.



7.4 Status Display

Enter the status display interface after successful connection.The status display includes:

（1）IMU, RTK, odometer, differential account, navigation accuracy, etc.

（2）Network status, WIFI address;

（3）Firmware version number, hardware version, etc.

（4）Main parameters display;

（5）SD card free space, number of files, current file name, etc.

7.5 Navigation Data

Navigation data includes information such as displaying IMU data, RTK data, posture, odometer, etc., which is refreshed once per second.

If the computer is connected to the Internet, you can view the online map to get the driving track.

7.6 IMU Parameter Settings

The main functions are as follows:

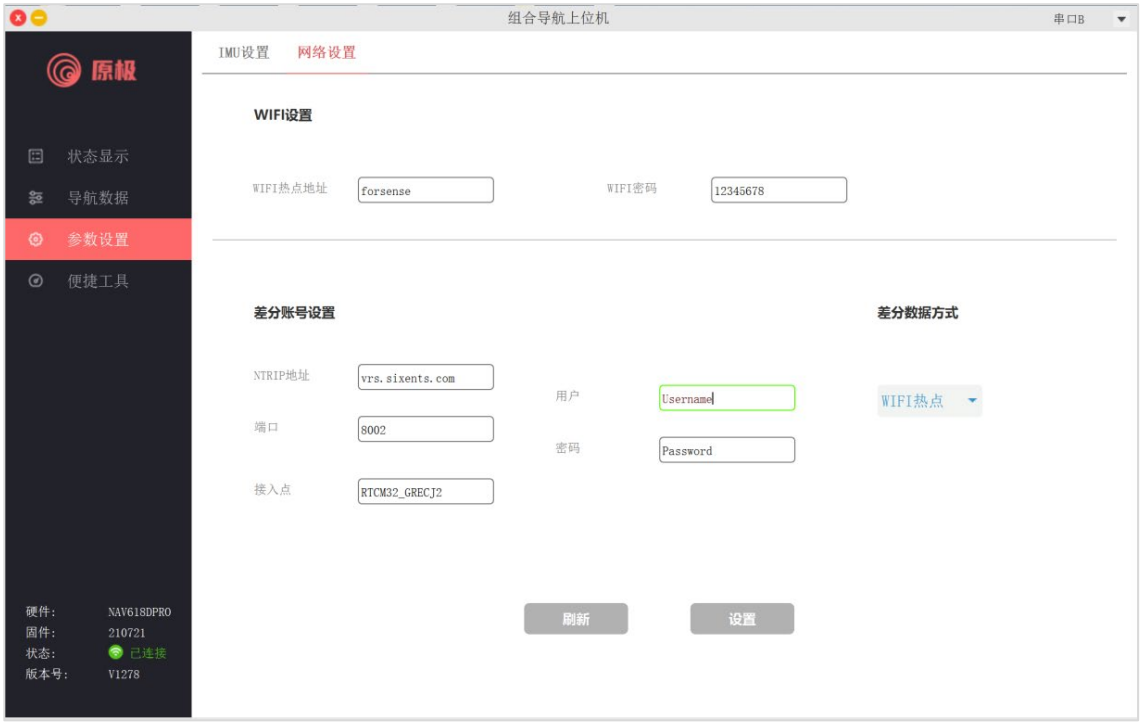
Configurable serial output frequency, each option can be configured separately;

Configurable RTK installation deviation and installation deviation angle;

Configurable serial baud rate, filter (vibration suppression), CAN enablement, CAN parameters, etc.

After setting the parameters, wait for the reminder parameters to be set successfully.

7.7 Network Parameter Settings



WIFI Settings: You can set the WIFI hotspot name and password. The default name is forsense. Be careful to use the English name when setting a new address. Restart after WIFI settings take effect.

Differential Service Settings: NTRIP server address, account, etc. can be set.

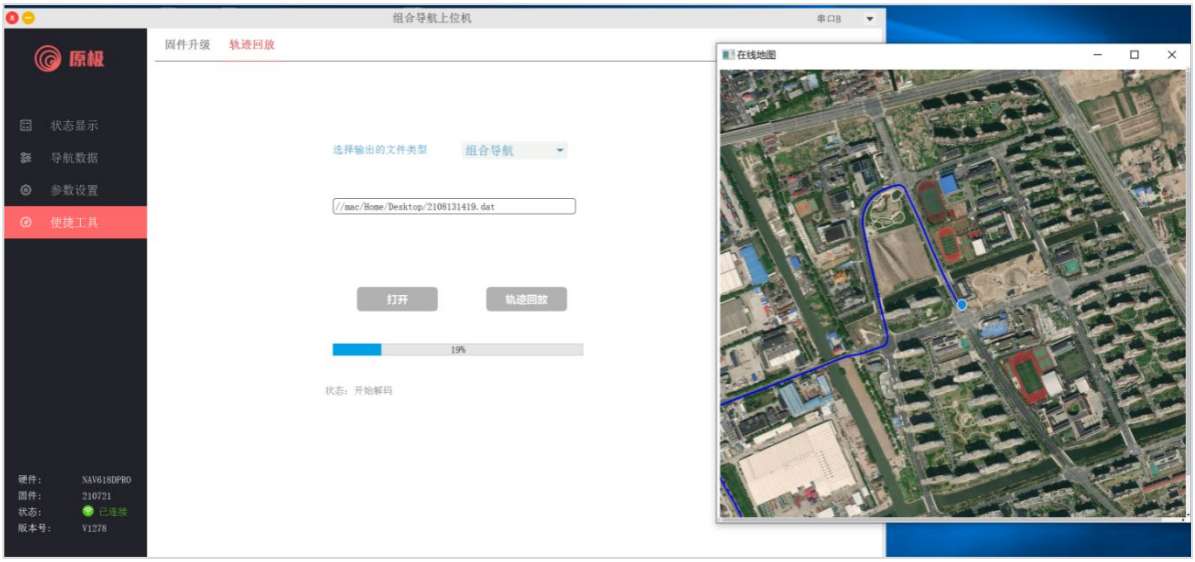
Differential data mode: supports WIFI hot spot mode and 4G/serial DTU import differential data mode.

7.8 Firmware Update

Open with.Esp_suffixFirm format file, click Upgrade, restart the integrated navigation system and upper computer software after the upgrade is completed.

7.9 Log Playback

You can download the log using the method described in section 6.10, then view the track using the log playback function.



8. Frequently Asked Questions

1) What is the forward sign when installing the device?

There is a coordinate of the XYZ axis on the device, and the X axis of the icon points forward to the device.

2) Which one of GNSS1 and GNSS2 is the main antenna?

GNSS1 is the main antenna and GNSS2 is the secondary antenna.

3) When testing, do I need a network to view online maps?

Viewing online maps requires a network.

4) Differential data mode, what do you need to pay attention to when you turn on the 4G/Serial DTU mode?

Switching on the 4G/Serial DTU requires a 4G antenna.

5) Device not positioned for a long time?

Check to see if the differential account has expired.

6) Differential data mode, after switching on 4G/Serial DTU mode, do you need to turn on phone hotspots?

4G/DTU mode does not require turning on phone hotspots.

7) Differential data mode, what are the considerations after turning on WIFI hot spot mode?

The hot spot needs to be turned on by the mobile phone to provide differential data to the device. The hot spot name and password of the mobile phone need to be consistent with the parameter adjustment software "WIFI Settings".

8) What parameters need to be set before testing?

Differential account and RTK installation deviation need to be set.

9) Connect parameter adjustment software, which serial port?

Please use B-RS232 serial port.

10) Turn on the hotspot, the name and password are correct, what happens when the device can't connect to the hotspot?

The device is not positioned, the default is AP mode when it is not positioned. After the card is positioned, it will cut to WIFI mode. When it is in WIFI mode, the device will automatically connect to hot spots.

11) What is AP mode?

Log download mode.

12) What is the CAN BUS baud rate in NAV618DPRO?

500K。

13) What is the baud rate of NAV618DPRO serial A-RS232 and B-RS232?

Serial A-RS232 baud rate 460800;Serial B-RS232 baud rate 115200.

14) Connect parameter adjustment software, differential data method, WIFI hot spot, no differential data, positioning status has been "1". What's wrong?

This mode needs to be confirmed, the phone hotspot is turned on, the hotspot name is "forsense" password "12345678".

15) Connect parameter adjusting software, differential data mode, 4G serial DTU, no differential data, positioning status has been "1". What's wrong?

This mode needs to confirm whether there is a 4G mobile card inserted and whether the network account configuration is normal.

9. Version History

Version Number	Release Time	Edit History
V1.0	June 18, 2021	First Generation Manual Official Release
V1.1	August 26, 2021	Pro version update