



Falcon X User Manual

Ver1.01

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1. CHAPTER I SUMMARY

1.1. Introduction

Once, the foundation of the surveying and mapping industry relied on optical instruments (such as total stations and levels) and GNSS receivers (such as GPS and BeiDou), which represented milestones in high-precision angle/distance measurement and global real-time positioning, respectively. However, these technologies still face limitations in efficiency, accuracy, or informational dimensions when dealing with complex, dynamic, large-scale, or obscured surveying scenarios.

Today, the surveying and mapping industry is undergoing a profound “intelligent fusion revolution.” Its core is no longer about pushing the performance limits of individual devices but rather the systematic integration and data fusion of multiple advanced sensing technologies, with **LiDAR** serving as a key driving force in this fusion. From “point-based observation” to “panoramic perception,” from “fieldwork-dominated” to “integrated field and office workflows”, and from “delivering drawings” to “providing spatiotemporal information models and services”, the integration of LiDAR epitomizes this transformation. It is not merely the addition of a new sensor but acts as a critical “three-dimensional geometric framework,” deeply integrating with other technologies (positioning, imaging, AI) to collectively drive the industry into a new era of **holistic, real-time, and intelligent capabilities**. Its services and applications are extending into broader fields such as autonomous driving, the metaverse, and the Internet of Things.

Falcon X is a groundbreaking surveying mobile terminal that integrates GNSS, high-precision vision modules, and LiDAR to redefine traditional RTK workflows. By combining SLAM with high-accuracy RTK and a powerful core processor, it delivers real-time point cloud coordinate calculations and establishes a unified coordinate system for both indoor and outdoor environments. With no post-processing required, data is immediately ready for engineering design, greatly improving efficiency and precision.

1.2. Key Features

Falcon X offers advanced features that include:

- 1408-channel GNSS engine supporting GPS, GLONASS, Galileo, BeiDou, QZSS, and SBAS.
- 1.3-inch industrial-grade LED display with high brightness and 240 x 240 resolution.
- Dual 48 MP panoramic lenses for generating a colored point cloud.
- 5 MP visual layout camera with integrated Augmented Reality (AR) navigation.
- Multi-mode communication architecture that includes 4G, UHF, Wi-Fi, and Bluetooth.
- Integrated scanner with a sampling rate of up to 200,000 points/s.
- Measuring range: 0.1 m to 40 m at 10% reflectivity, and 0.1 m to 70 m at 80% reflectivity.
- Unified coordinate framework for indoor and outdoor operation.

2. CHAPTER II HARDWARE COMPONENTS & ACCESSORIES

2.1. Hardware components



Figure 2-1 Overall View



Figure 2-2 Back View



Figure 2-3 Left View



Figure 2-4 Right View



Figure 2-4 Bottom View

1. GNSS receiver module
2. RGB Left camera (1)
3. LiDAR sensor
4. Auxiliary (AR) camera
5. Clip-on rechargeable battery pack
6. Control point marker plate
7. RGB Right Camera (2)
8. LED info display (1.3 in)
9. Power button
10. Battery lock (release) button
11. Battery level indicator button (4-LED)
12. 5-pin LEMO connector (I/O)
13. UHF radio antenna connector
14. Speaker grilles
15. USB Type-C port & microSD card slot
16. Ventilation grilles (do not block)
17. GNSS pole mounting thread (5/8"-11)
18. Nano-SIM card slot

2.2. In The Box



Standard unit package:

- A** Falcon X protective carrying case – 1 pc.
- B** Falcon X unit – 1 pc.
- C** Control point marker plate – 1 pc.
- D** Falcon X USB-A to USB-C cable (USB 3.0, fast data) – 1 pc.
- E** Battery charger (for clip-on battery pack) – 1 pc.
- F** Clip-on rechargeable battery pack – 2 pcs.
- G** UHF radio antenna – 1 pc.
- H** SD card reader – 1 pc.

Advanced unit package:

- A** Falcon X protective carrying case – 1 pc.
- B** Falcon X unit – 1 pc.
- C** Control point marker plate – 1 pc.
- D** Falcon X USB-A to USB-C cable (USB 3.0, fast data) – 1 pc.
- E** Battery charger (for clip-on battery pack) – 1 pc.
- F** Clip-on rechargeable battery pack – 2 pcs.
- G** UHF radio antenna – 1 pc.
- H** SD card reader – 1 pc.
- I** Android device pole holder – 1 pc.
- J** Android device USB-A to USB-C cable (data & charging) – 1 pc.
- K** Android device USB power adapter (5 V, for A-TAB)) – 1 pc.
- L** AlphaGeo A-TAB Android tablet – 1 pc

3. CHAPTER III OPERATIONS

3.1. Getting Started

Press and hold on the power button for about 3 seconds, the power indicator will light up in green along with a beeping sound. (Fig. 3-1 ~ Fig. 3.2)



Figure 3-1



Figure 3-2

Release the button and the indicator will turn into blue then appears **α-GEO** logo on the screen. Then some of the device information will be displayed on the screen after the logo passes. (Fig. 3-3 ~ Fig. 3-4)



Figure 3-3



Figure 3-4

3.2. Falcon X Display View



- 8.1** SLAM Power on/off
- 8.2** Local time
- 8.3** Battery level
- 8.4** Scanning status
- 8.5** Scanning time
- 8.6** Scanning distance
- 8.7** Project quantity & storage
- 8.8** Equipment check status
- 8.9** RTK solution
- 8.10** Datalink
- 8.11** Working mode
- 9** Power Button

3.3. Falcon X Software Platform

Falcon X operates together with the AlphaGeo SurPro V6.0 Android application, which is used to manage surveying, SLAM scanning, and device configuration functions.

The SurPro V6.0 app runs on a compatible Android device and connects to Falcon X via Bluetooth®. Through this wireless connection, users can:

- Configure GNSS and SLAM parameters
- Perform RTK surveying and point collection
- Control SLAM scanning and point cloud acquisition
- Monitor device status and positioning quality.

The Android device serves as the control terminal, while Falcon X performs data acquisition and processing.

3.4. Bluetooth Pairing

1. Turning on the Falcon X (refer to section 3.1).
2. Power on the Android data collector and launch SurPro 6.0.
3. Tap **Device**, then tap **Communication**. (Fig.3-5 ~ Fig.3-6)
4. In **Device Type**, select **SLAM-RTK**.

The **Model Type** will be selected automatically. (Fig. 3-7)



Figure 3-5



Figure 3-6



Figure 3-7

5. Open **Available Bluetooth Devices** to search for nearby devices.
6. Find the Bluetooth device whose **serial number matches the one on the Falcon X receiver label**. (Fig. 3-8)
7. Tap the corresponding Bluetooth serial number, then tap **Connect**. (Fig. 3-9)
8. When the Bluetooth pairing request appears, tap **Pair** to confirm the connection. (Fig. 3-10)



Figure 3-8



Figure 3-9



Figure 3-10

8. Wait for the connection to be complete. This usually takes **less than 10 seconds**.
9. Once connected successfully, the **Communication** and **Rover** icons will turn **green**. (Fig. 3-11)



Figure 3-11

3.5. Rover Mode Configuration

Detailed operation of AlphaGeo SurPro V6.0 is described in a separate Software User Manual.

1. Tap the **Rover** icon to enter the **Rover mode** settings. (Fig. 3-12)
2. Tap **General Parameters** to modify settings if necessary. Otherwise, keep the default values and tap OK. (Fig. 3-13 ~ Fig. 3-14)



Figure 3-12



Figure 3-13



Figure 3-14

3. Tap **Datalink** to select the correction data link. The available options are **Device Internet**, **Internal Radio**, **Phone Internet**, and **PPP**. Here, **Phone Internet** is used as an example. (Fig. 3-15 ~ Fig. 3-16)
4. Tap **Connecting Mode** and enter the correction service provider information (**IP address**, **Port**, **Username**, **Password**). Then tap **OK**. (Fig. 3-17)



Figure 3-15



Figure 3-16



Figure 3-17

5. In **Mountpoint Settings**, tap **Get** to download the mountpoint list. (Fig. 3-18)
6. Select an appropriate mountpoint from the list. (Fig. 3-19)
7. In **RX Data Status**, tap **Start** to begin receiving correction data. (Fig. 3-20)



Figure 3-19



Figure 3-20



8. Tap **Apply** and return to the **Device** menu. Once correction data is received successfully, a **Fixed solution** can be achieved. (Fig. 3-21 ~ Fig. 3-22)



Figure 3-21



Figure 3-22

3.6. Regular RTK Point Survey

1. Tap the **Survey** menu. (Fig. 3-23)
2. Tap **Point Survey** to enter the map interface. (Fig. 3-24)
3. When the device reaches a **Fixed solution**, tap the **Collect** button to store the point. (Fig. 3-25)



Figure 3-23



Figure 3-24



Figure 3-25

4. Alternatively, tap the **IMU** button to enable tilt measurement. After IMU initialization is complete, tap **Collect** to store the point. (Fig. 3-26 ~ Fig. 3-27)



Figure 3-26



Figure 3-27

3.7. Wi-Fi Connection

1. Tap the **Survey** menu, then select **Modeling**. (Fig. 3-28)
2. The system **Wi-Fi settings** will open automatically. In the Wi-Fi network list, find and select the network whose **serial number matches the Falcon X device**. (Fig. 3-29)
3. When the message “**This network has no internet access. Stay connected?**” appears, tap **Yes** to continue (Fig. 3-30)



Figure 3-28

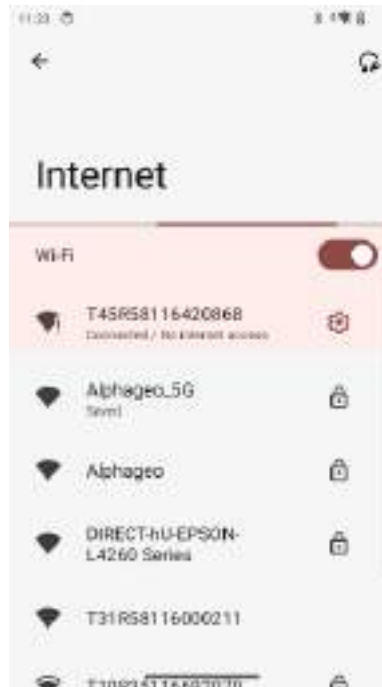


Figure 3-29



Figure 3-30

Note: This Wi-Fi connection is used for communication with Falcon X and **does not** provide internet access.

3.8. SLAM Scanning Modes

Falcon X supports two methods for performing SLAM scanning:

1. Standalone Mode (No Controller Required)

Double-press the **Power** button to start SLAM scanning directly on the Falcon X unit, without using an Android device.

2. Controller Mode (Using Android Device)

SLAM scanning can also be performed using the **AlphaGeo SurPro V6.0 (SLAM version)** application on a compatible Android device. In this mode, Falcon X connects to the Android device via Bluetooth®, allowing full control of scanning, point collection, and project management.

Note: Controller Mode provides full visualization, project naming, and point cloud management, while Standalone Mode is intended for quick or basic scanning tasks.

3.8.1. Standalone SLAM Scanning (Without Android Controller)

Note: Insert the microSD card into Falcon X before powering on the device. The SD card is required for storing SLAM and survey data. Do not insert or remove the card while the device is powered on.

Falcon X can perform SLAM scanning directly without an Android device.

1. Turn on Falcon X (**see Chapter III, 3.1 Getting Started**).
2. During boot, the status screen will appear. When the device is ready, the display shows:

SLAM_ON (green)

SCAN: SCAN_READY

Time: 00:00:00

Dis: 0.000 m

Disk: available/total storage (depends on microSD capacity and used space)

Info: EC_Success

This indicates the system is ready to operate. (Fig.3-31)

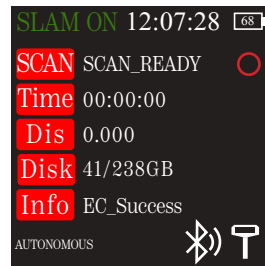


Figure 3-31

3. Place Falcon X on a stable surface.
4. **Double-press** the **Power** button to start scanning. (Fig. 3-32)
5. The device will emit a beep, and the display changes to:

SCAN: SCAN_STARTING

Falcon X performs initialization. **Do not move or touch the device during this process.**

Initialization typically takes **about 25 seconds**. (Fig. 3-33)

6. When initialization is complete, the timer starts counting and the display shows:

SCAN: SCAN_MODELLING

Falcon X is now scanning. (Fig. 3-34)

7. When scanning is complete, **double-press** the **Power** button to stop scanning.

8. Wait while the project is being saved to the microSD card. The display shows:

SCAN: SCAN_STOPPING (Fig. 3-35)

9. When saving is complete, the display shows:

SCAN: SCAN_STOPPED (Fig. 3-36)

10. You can power off the device or start a new SLAM scan.



Figure 3-32

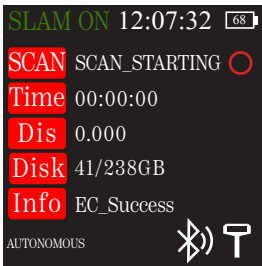


Figure 3-33

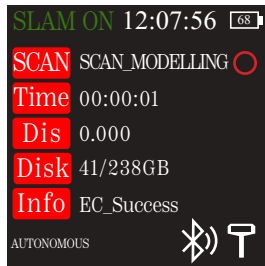


Figure 3-34



Figure 3-35

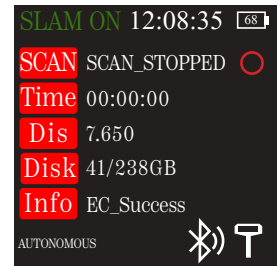


Figure 3-36

3.8.2. SLAM Scanning in Controller Mode (Using Android Device)

Note: Insert the microSD card into Falcon X before powering on the device. The SD card is required for storing SLAM and survey data. Do not insert or remove the card while the device is powered on.

1. After establishing the Wi-Fi connection (3.7 WiFi Connection), tap the **Survey** menu, then tap **Modeling**. (Fig. 3-37)
2. Enter the modeling interface. Check the two status indicators in the upper-right corner — they will turn **green** (from red) when all connections are established. (Fig. 3-38 ~ Fig. 3-39)



Figure 3-37



Figure 3-38

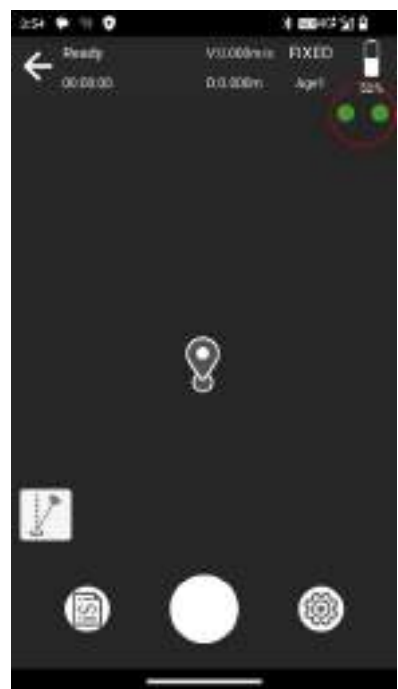


Figure 3-39

3. Tap the **Settings** button to open the settings interface. (Fig. 3-40)
4. Enable **Point Collection**, then tap OK. (Fig. 3-41)
5. A red **Collect** button will appear on the right side of the screen. (Fig. 3-42)

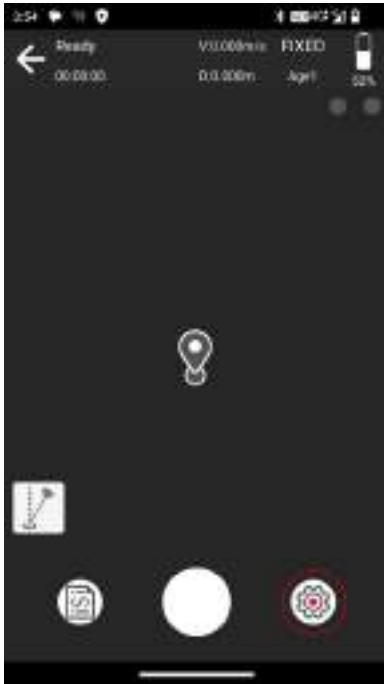


Figure 3-40



Figure 3-41

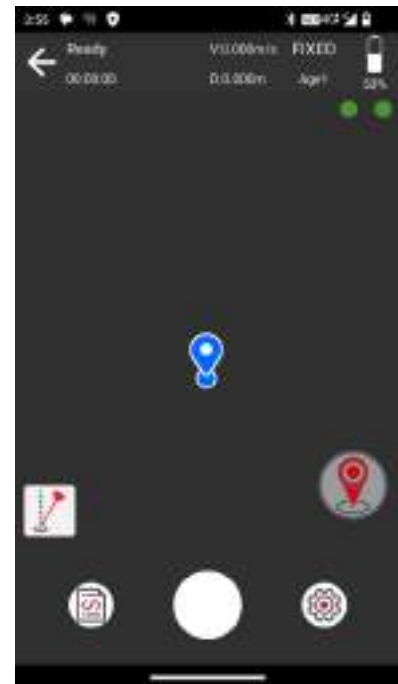


Figure 3-42

6. Place Falcon X on the ground and keep it still before starting the scan.
7. Tap the **white circular button** at the bottom center of the interface to start scanning. (Fig. 3-43)
8. In the pop-up window, enter a **project name** and tap **OK**. (Fig. 3-44)
9. Falcon X will take some time to complete scan initialization. (Fig. 3-45)

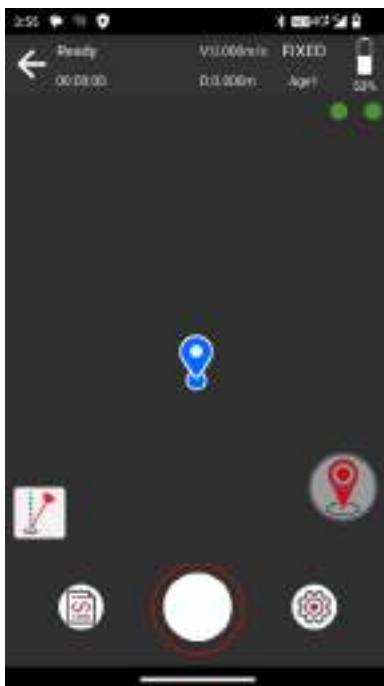


Figure 3-43



Figure 3-44



Figure 3-45

- When the point cloud appears on the screen, pick up Falcon X and begin walking to scan the area. (Fig. 3-46)
- Walk in an “L”-shaped path to help initialize the SLAM solution. The Collect button will turn green (from red) when the system is ready. (Fig. 3-47)



Figure 3-46



Figure 3-47

- Align the cross mark on the base plate of Falcon X with the point to be collected.
- Tap the **Collect** button to save the point coordinate together with the point cloud data. (Fig. 3-48 ~ Fig. 3-49)
- In the point-saving interface, select **Cross** or **Pole Tip**, then tap **OK**. (Fig. 3-50)



Figure 3-48

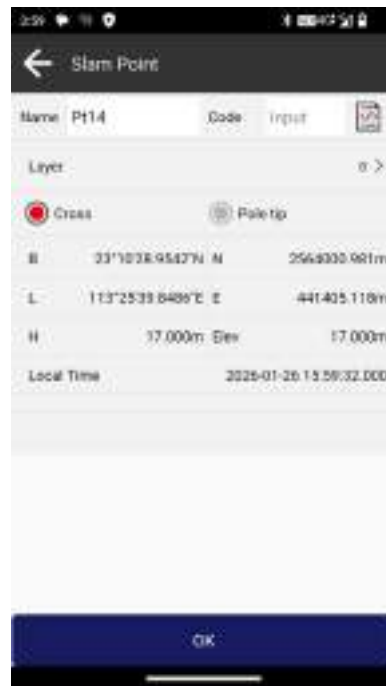


Figure 3-49



Figure 3-50

15. Place Falcon X on a stable surface or return to the starting point.
16. Tap the **circular button** at the bottom center of the interface again to stop scanning. Processing time will vary depending on the amount of collected data. (Fig. 3-51 ~ Fig. 3-52)



Figure 3-51

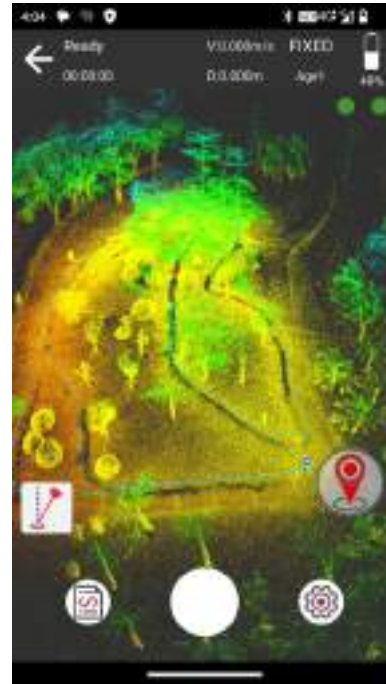


Figure 3-52

3.9. Export Point Cloud

1. Tap the **Settings** button to enter the settings interface. (Fig. 3-53)
2. Enable **USB Disk Mode**, then tap **OK**. (Fig. 3-54)
3. “USB Disk Mode” will be displayed in the upper-left corner of the interface. While this mode is active, scanning functions are unavailable. (Fig. 3-55)

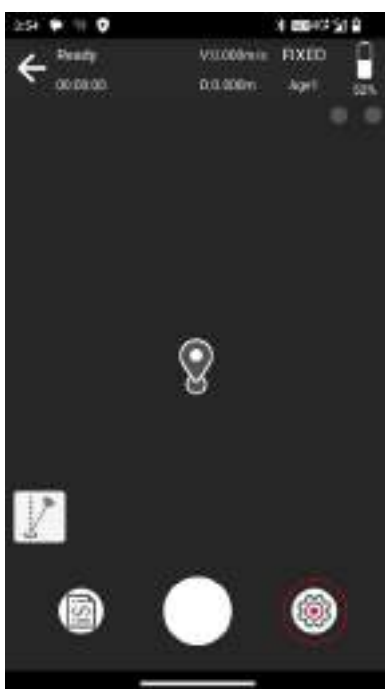


Figure 3-53



Figure 3-54

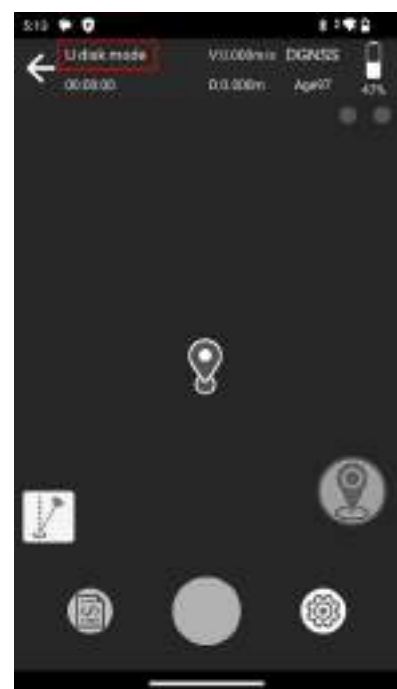


Figure 3-55

4. Connect the USB Type-C cable to the Falcon X Type-C port and to a USB port on the PC. (Fig. 3-56 ~ Fig. 3-57)



Figure 3-56



Figure 3-57

5. Falcon X will be recognized as a removable drive on the PC. Open the drive to find the **model** folder in the root directory. (Fig. 3-58)

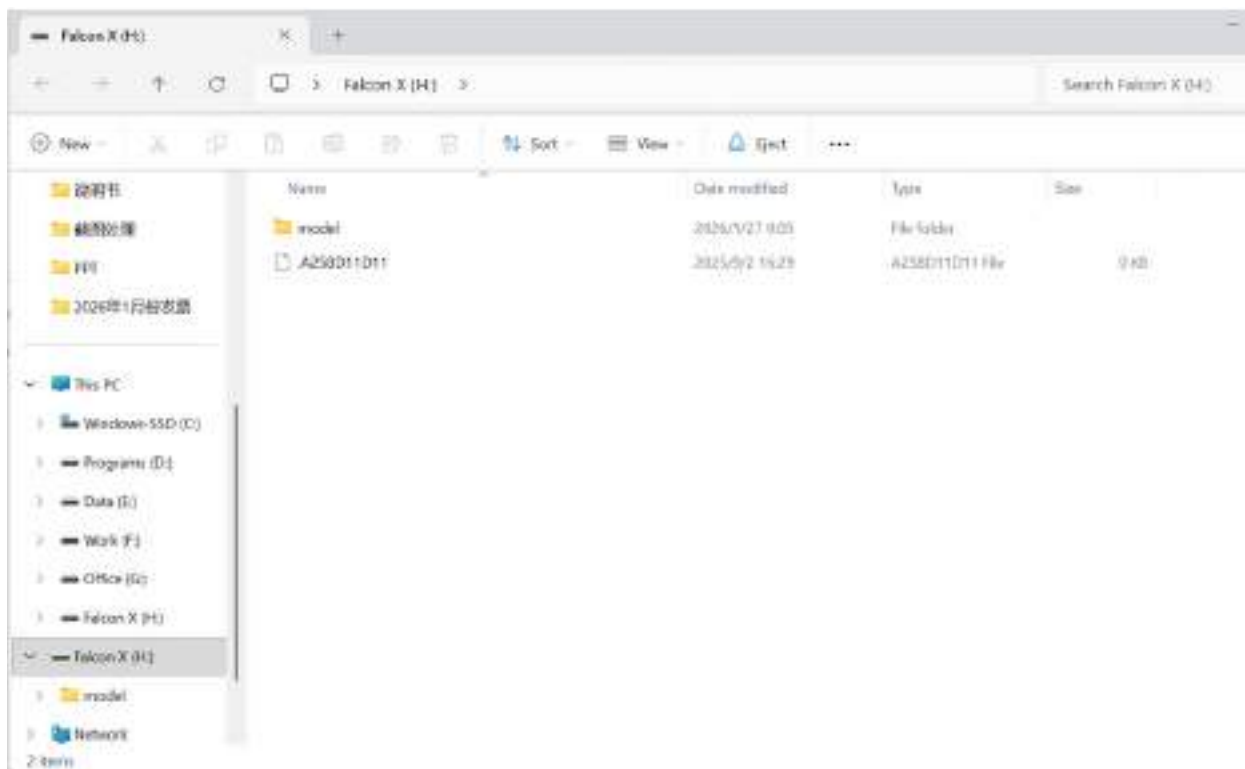


Figure 3-58

6. Open the model folder and locate the required project. (Fig. 3-59)

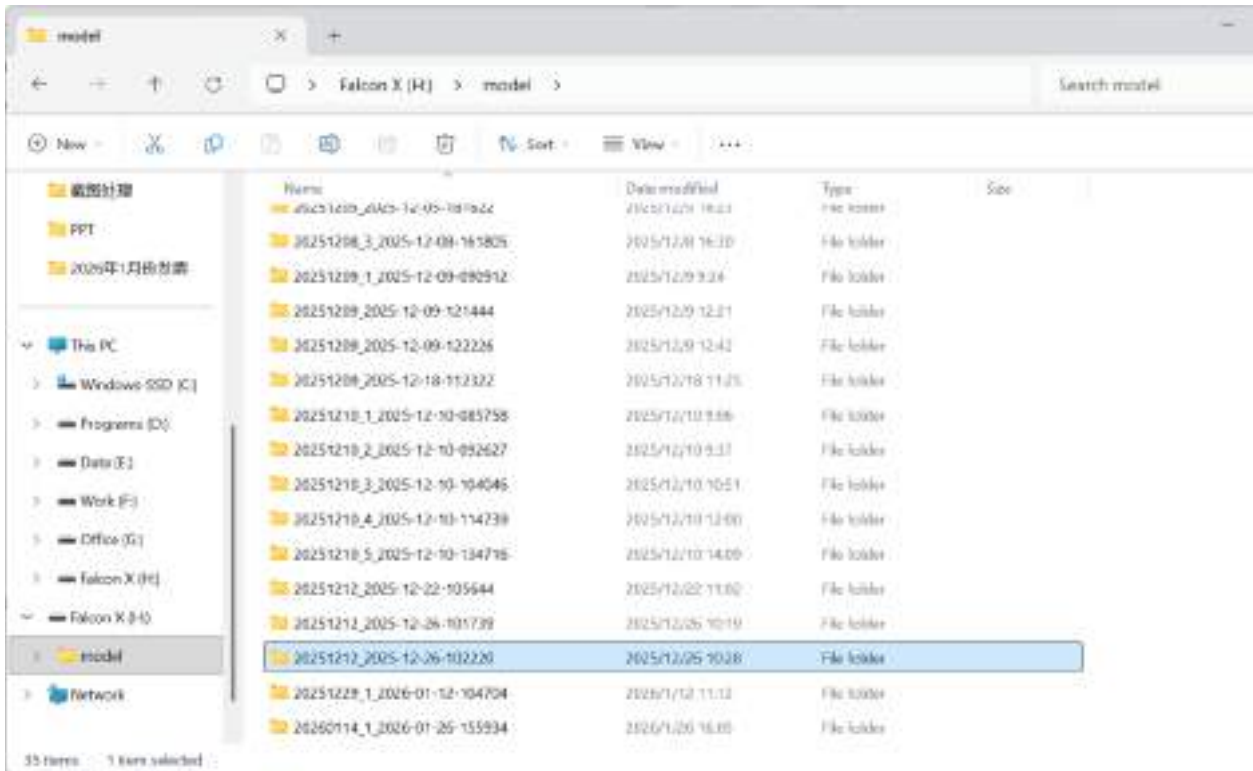


Figure 3-59

7. Copy the project folder to a desired location on the PC for further processing. (Fig. 3-60)

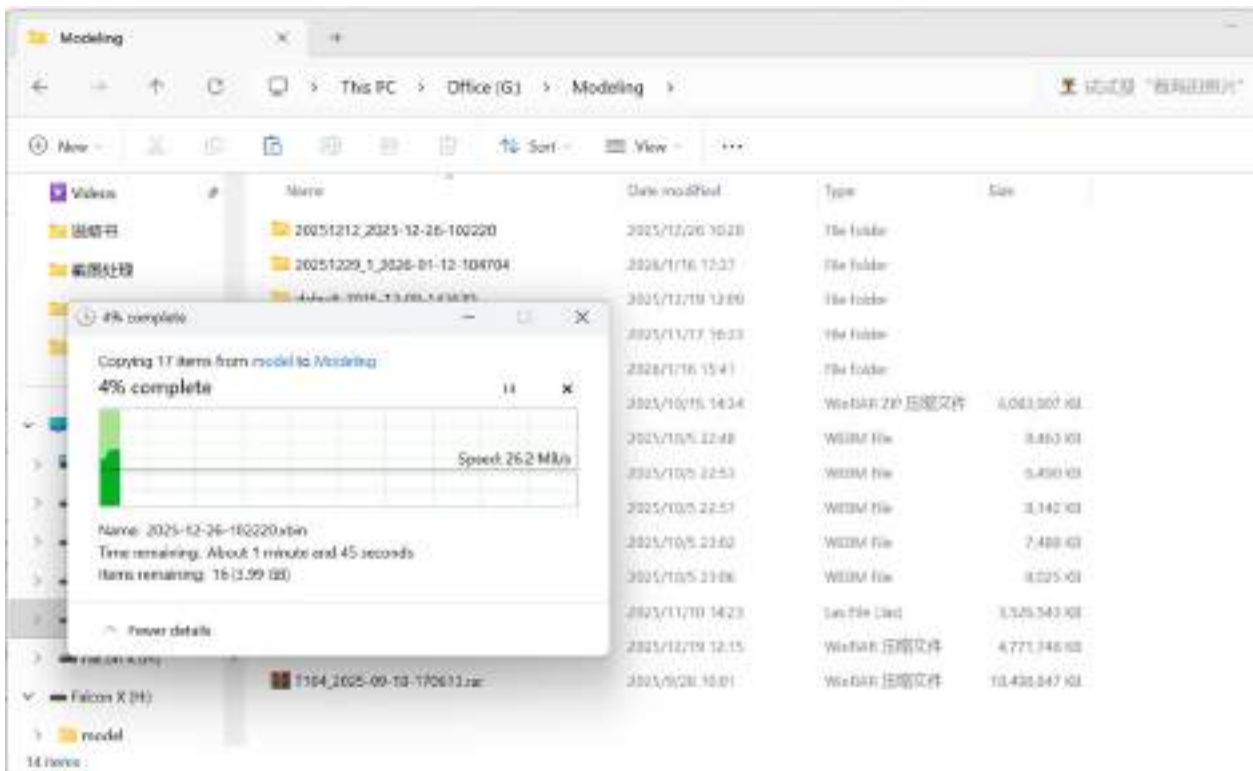


Figure 3-60

3.10. Power OFF

Press and hold the Power button for approximately 3–5 seconds until you hear three beeps, then release the button. Falcon X will power off.

The cooling fan will stop, and the screen will turn off. (Fig. 3-61)

Note: Do not remove the battery while the device is shutting down.



Figure 3-61

4. CHAPTER IV WEB UI INTRODUCTION

4.1. Web UI Login

Falcon X can be fully configured and monitored by using the Web UI. Any Wi-Fi terminal can connect to Falcon X via the Web UI. The steps on how to connect to Wi-Fi are as below:

1. Wait until Falcon X has fully booted after switching on (about 30 seconds). (Fig. 4-1)
2. The wireless access point name will be displayed and is same as the serial number of Falcon X, as shown in following figures. Enter the password 12345678 if it is required. (Fig.4-2)



Figure 4-1



Figure 4-2

3. Run a browser and type the IP 192.168.10.1 in the address bar, if requires username and password, type “admin” for both username and password. The browser will open the ‘Overview’ page of Falcon X, as shown in following screenshot. Basic information of receiver will be displayed in this interface, including receiver SN, firmware version, position information, etc. (Fig. 4-3)

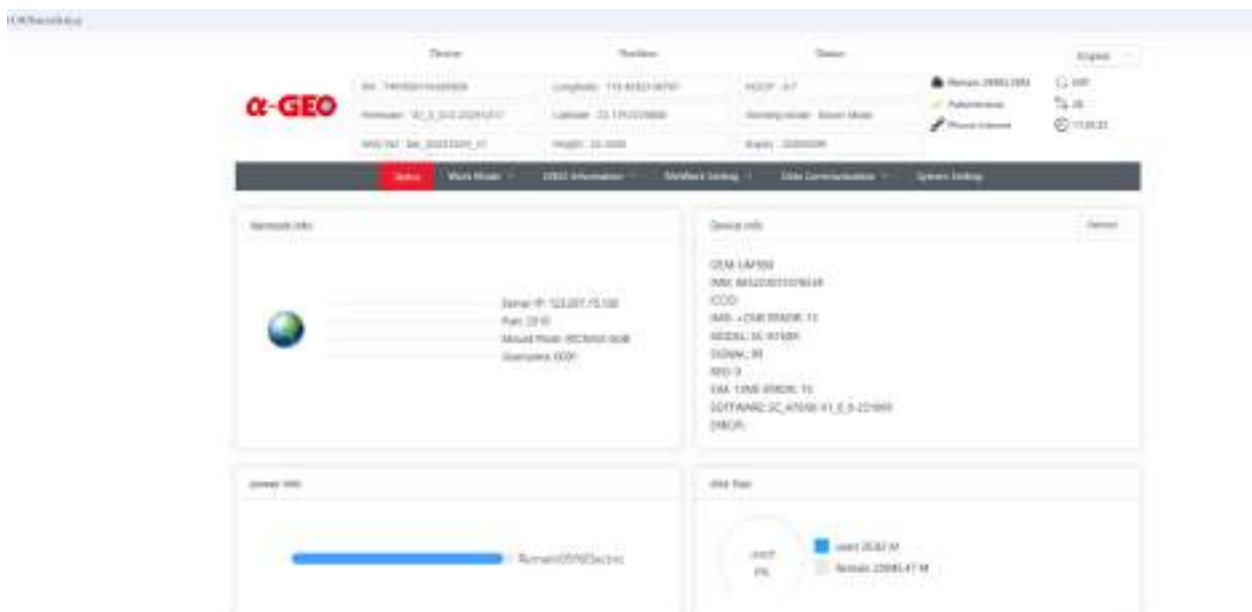


Figure 4-3

4.2. Status

In addition to the device basic information that is constantly displayed at the top of interface, the status interface also shows previously connected network information, device details, battery status, and storage status. (Fig. 4-4)

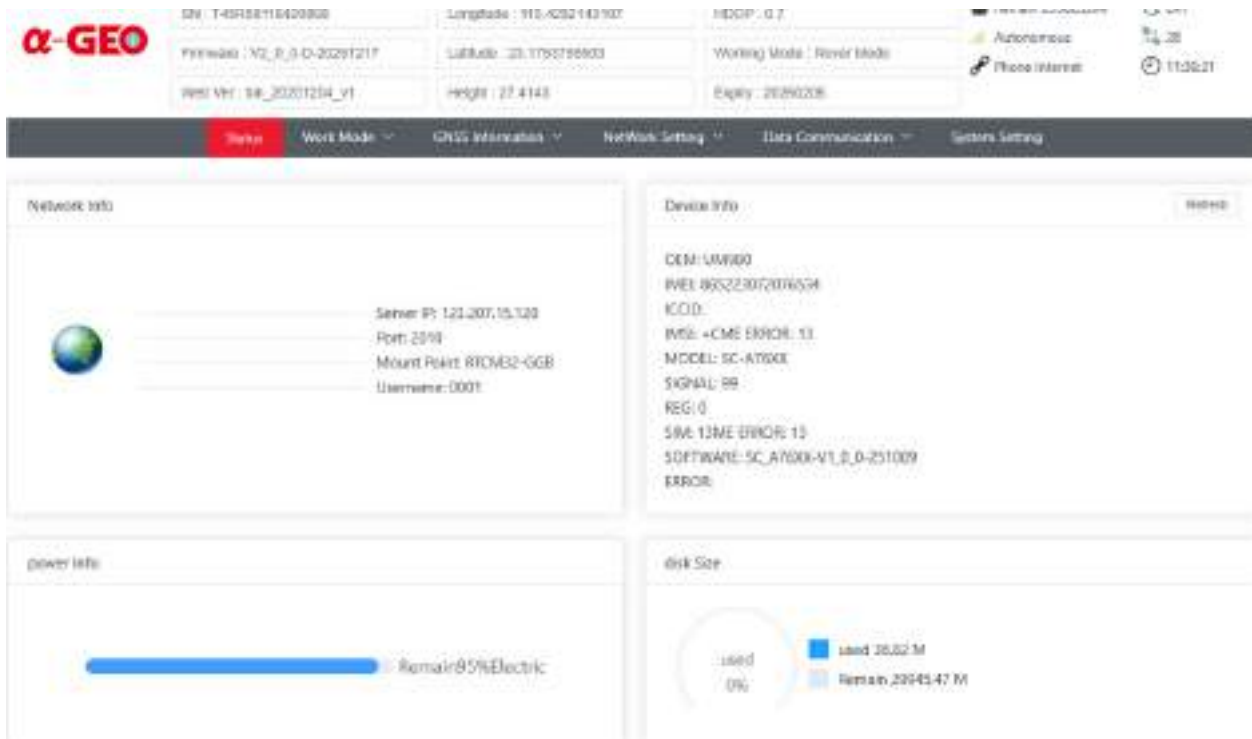


Figure 4-4

4.3. Work Mode

In the **Work Mode** interface, usually there are three working modes available for configuration: Rover, Base and Static. However, for Falcon X, it currently only supports the Rover mode. Therefore, the Base and Static modes do not require configuration. For the Rover mode settings, options include whether to record raw data, mask angle, and differential age settings. Additionally, datalink settings are available. Falcon X supports multiple datalinks, such as internal radio, built-in network, and controller network, which can be configured based on on-site requirements. (Fig. 4-5)

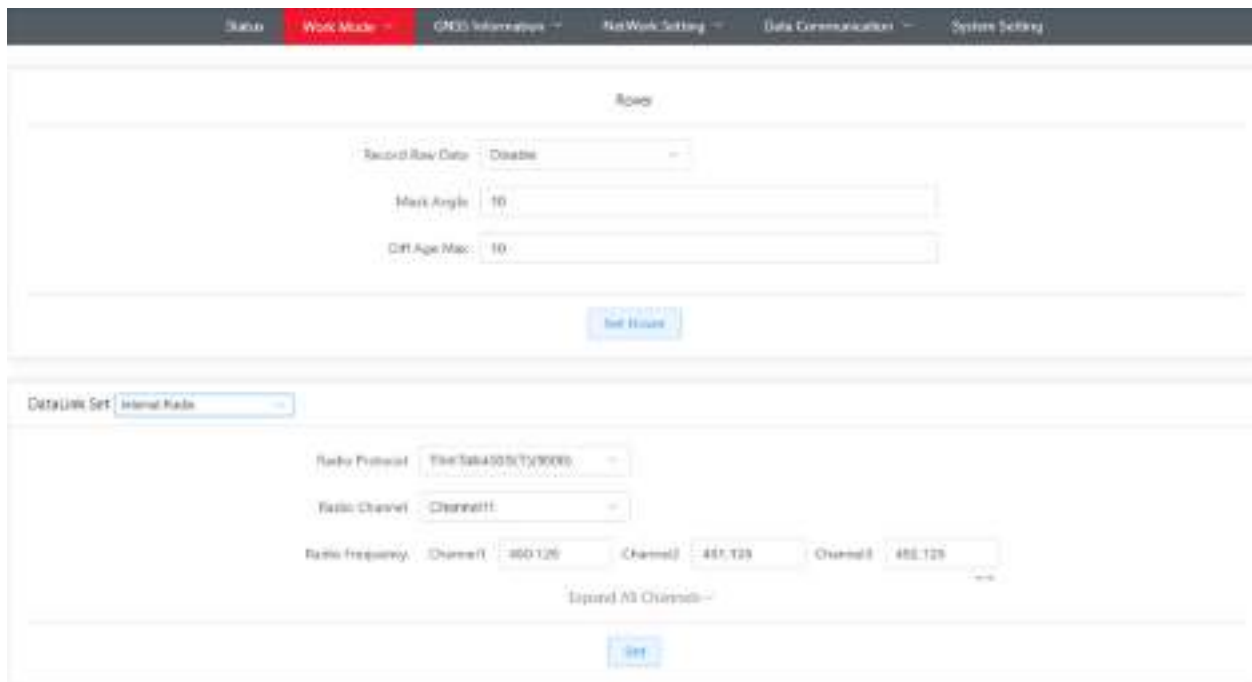


Figure 4-5

4.4. GNSS Information

On the GNSS page, you can primarily view the device's satellite tracking status, including satellite signal-to-noise ratio and the satellite skyplot. (Fig. 4-6)



Figure 4-6

4.5. Network Settings

Network Settings primarily include mobile network settings and Wi-Fi settings. Mobile network settings mainly involve configuring the APN according to the local SIM card. Wi-Fi settings allow you to disable Wi-Fi, configure it as an AP (Access Point) mode, or set it to AP+Client mode. (Fig. 4-7)

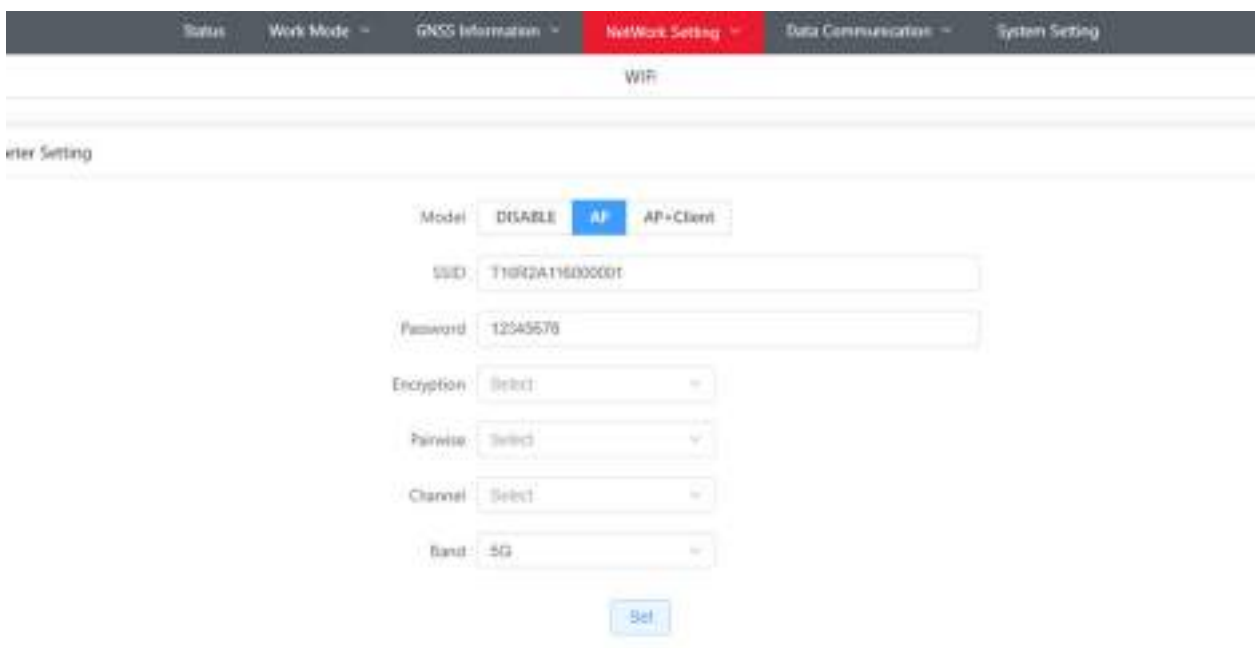


Figure 4-7

4.6. Data Communications

Data Communications include file management, NTRIP settings, data stream settings, serial port settings, system log, and debug window. (Fig. 4-8 ~ Fig. 4-9)

Figure 4-8

File: Under the file option, when the device has collected static data, you can use this option to download the corresponding static data.

The socket option is used for data forwarding, but this function is not required for Falcon X.

NTRIP Client: NTRIP Client is the software element used by the rover (the GNSS devices out in the field) used to connect to an NTRIP Caster such as SurPro6.0 to gain access to the data stream with the positional corrections it needs.

NTRIP Server: NTRIP Server is a broadcast internet server that manages authentication and password control for differential correction sources such as VRS networks, and relays corrections from the source that you select.

NTRIP Caster: NTRIP Caster is a HTTP server which receives streaming RTCM data from one or more NTRIP Servers and in turn streams the RTCM data to one or more NTRIP Clients via the internet. This function is not required for Falcon X because it doesn't work as Base.

NMEA Config: NMEA Config allows to define the NMEA messages output.

Serial Port Config: Serial Port Config is a function that enables receiver serial port to output data.

System Log: System Log mainly displays information about receiver actions.

WebSocket: This window provides a debug function which you can send commands to check the receiver's working status, and the NMEA data stream can be shown here as well.

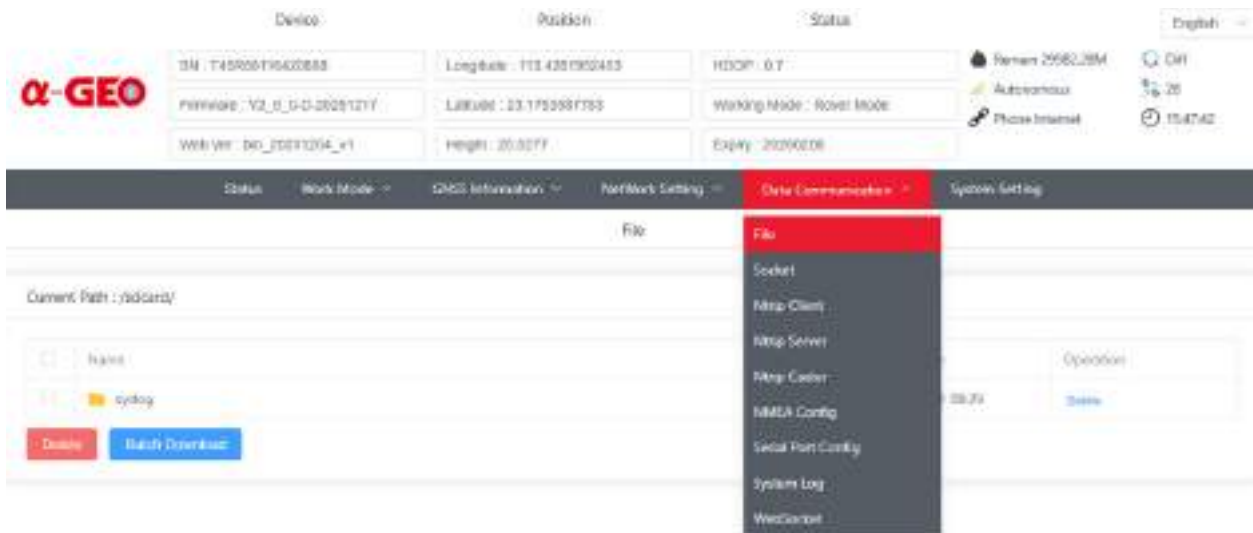


Figure 4-9

4.7. System Settings

System Settings provide some operations for the device, such as shut down, register, function register, time zone and voice broadcast, as well as the firmware upgrade, which includes receiver firmware upgrade, OEM firmware upgrade and IMU firmware upgrade.

And we can also set the device auto boot while connecting with charger. (Fig. 4-10)

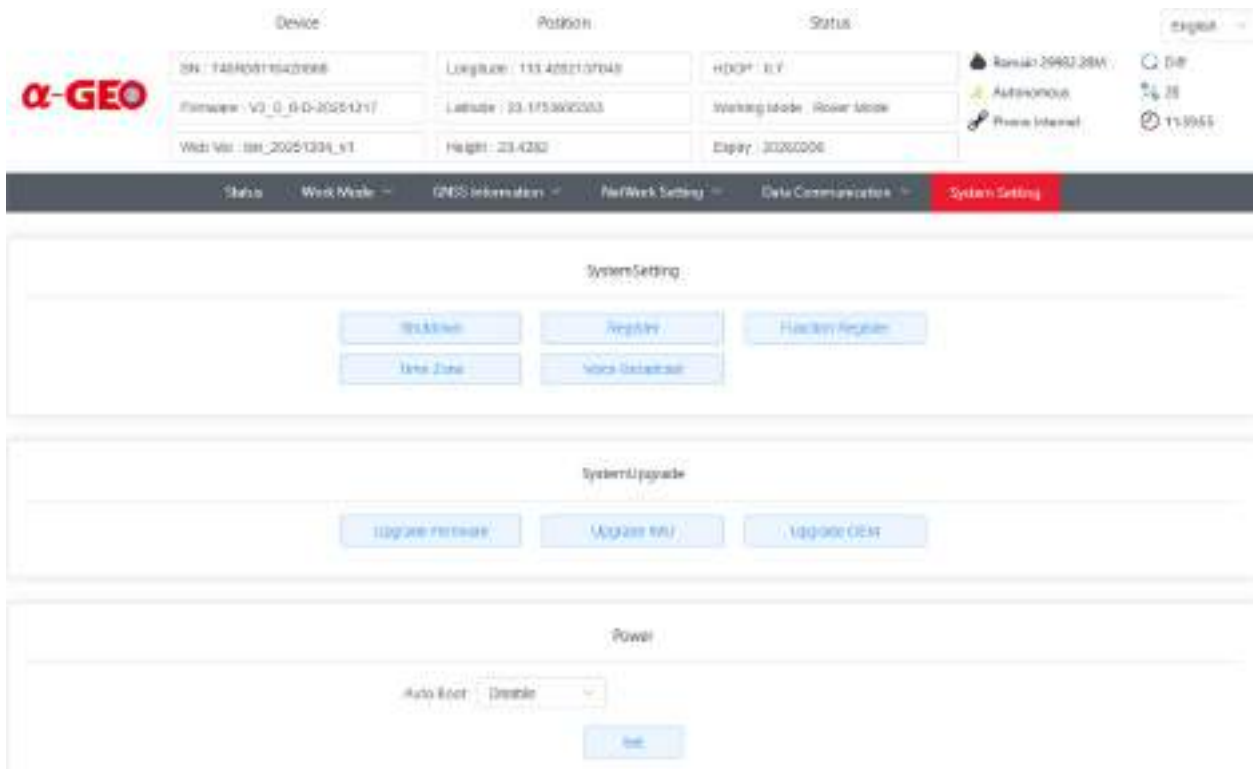


Figure 4-10

5. CHAPTER V SPECIFICATIONS

GNSS PERFORMANCE	
Signal tracking	GPS: L 1 C/A, L2C, L2P, L5
	GLONASS: L 1, L2, L3*
	BDS: B1, B1C, B2, B2a, B2b, B3
	GALILEO: E1, E5a, E5b, E6*
	QZSS: L 1, L2, L5, L6*
	IRNSS: L5*
	SBAS: L1, L5
L-Band	B2b (BDSPPP), E6B (HAS)
Channels	1408
Cold start	<60s
Hot start	<15s
Positioning output rate	1Hz ~ 50Hz
Signal reacquisition	<1s
RTK initialization time	<5s
Initialization reliability	>99.99%
Time accuracy	20ns
GNSS ACCURACY ^[1]	
Code differential GNSS positioning	H: 0.25m + 1ppm RMS V: 0.50m + 1ppm RMS
SBAS differential positioning	Typically < 5m 3DRMS
Static GNSS surveying	H: 2.5mm + 0.5ppm RMS V: 5mm + 0.5ppm RMS
RTK surveying(baseline<30km)	H: 8mm + 1ppm RMS V: 15mm + 1ppm RMS
Network RTK	H: 8mm + 0.5ppm RMS V: 15mm + 0.5ppm RMS
TILT PERFORMANCE	
IMU	Supported, 4D IMU initialization in 3 seconds
Update rate	400Hz
Accuracy	<2.5cm within 120°
Tilt compensation	0~120°
SLAM PERFORMANCE	
Laser channels	40
Scanning range	0.1m~40m @10% reflectivity, 0.1m~70m @80% reflectivity
Measurement rate	200,000 points/s
Scanning speed	10Hz
Laser FOV	360°*-7°~52°
Laser safety class	CLASS 1
Laser wavelength	905 nm
Processing mode	Real-time & post-processing
Point cloud format	.las

Real-time color point cloud	Not supported	
Processing color point cloud	Support	
RTK fusion processing	Support	
SLAM ACCURACY		
Absolute accuracy (Indoor) ^[2]	≤5cm	
Absolute accuracy (RTK) ^[3]	≤6cm	
Point cloud thickness	≤3cm	
Relative accuracy	<1.2cm	
Horizontal angle resolution	≤0.05°	
CAMERA		
Cameras	3	
Coloring camera	2*48 MP	
FOV	190°*190°	
AR camera	5 MP	
COMMUNICATIONS		
I/O interface	1*LEMO5	
	1*TF card slot	
	1*NanoSIM card slot	
	1*Type-C interface	
	1*SMA UHF antenna interface	
	1*1.3-inch color LED with resolution 240*240	
Internal UHF	Internal 1.5W UHF	
Frequency band	410MHz ~ 470MHz	
Protocols	Trimtalk450S, Alphataalk15, South, Satel, PCC-EOT	
Cellular network	Multi-band 4G modem, supports TDD-LTE/FDD-LTE/WCDMA/CDMA2000	
Wi-Fi	802.11a/b/g/n/ac	
Bluetooth	Bluetooth 5.2	
Differential data format	RTCM2x, RTCM3x	
DATA STORAGE		
External memory	256GB, extendable up to 512GB (microSD card)	
Power suply		
Battery	14.4V, 47.52Wh Li-ion battery	
Battery life ^[4]	180min SLAM mode, typically 8 hours RTK mode (phone internet)	
Battery charging	2 hours	
Power consumption (SLAM)	<25W	
Power consumption (RTK)	2.5W	
PHYSICAL SPECIFICATION		
Materials	Magnesium alloy	[1] The accuracy performance and reliability may be subject to anomalies due to different factors such as signal obstruction, tilting angle, observation time, multipath and atmospheric conditions. [2] [3] The accuracy obtained under ALPHAGEO test scenarios may deviate in certain situations. [4] The battery life is tested in the ALPHAGEO experimental environment, the actual endurance is subjected to the actual usage environment.
Dimensions (with battery & plate)	138mm(Φ)*301mm(H)	
Weight	1.8kg	
Operating temperature	-20C~+50C	
Storage temperature	-40C~+80C	
Waterproof/Dustproof	IP67	

6. CHAPTER VI COPYRIGHTS & TRADEMARKS

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Release Notice

This is the January 2026 release of the AlphaGeo Falcon X User Manual.

The limited warranties applicable to this product provide specific legal rights. These rights may vary by jurisdiction.

7. CHAPTER VII COPYRIGHTS & TRADEMARKS

7.1. Limited Warranty

This Limited Warranty constitutes the complete agreement between the Customer/Dealer and AlphaGeo™ regarding the product and supersedes all prior agreements or representations.

7.2. Product Warranty

AlphaGeo™ warrants that its products:

1. Are free from defects in materials and workmanship for one (1) year, unless otherwise specified for certain accessories.
2. Have been tested and calibrated prior to shipment.

7.2.1. Product Warranty

The warranty period begins on the date of the original purchase.

During the warranty period, AlphaGeo™ will, at its sole discretion, repair or replace defective products at no charge, provided the defect is not caused by user-inflicted damage.

Repairs or replacements may require up to **30 days** after defect verification.

Replaced or repaired parts are covered for **30 days** or the remainder of the original warranty period, whichever is longer.

7.2.2. Warranty Exclusions

This warranty does not cover damage resulting from:

- Misuse, improper handling, or negligence
- Unauthorized modification or repair
- Improper installation or operation
- Loss or damage during return shipping (customers must insure returned products)

7.2.3. Shipping Policy

The Customer/Dealer is responsible for shipping defective products to AlphaGeo™ for warranty service.

AlphaGeo™ will cover return shipping costs for products repaired or replaced under warranty.

7.2.4. Dead on Arrival (DOA) Return Policy

A **7-day return window** from the date of purchase applies for DOA products.

To qualify, products must be:

- Unused and in original packaging
- Returned with all manuals, accessories, and undamaged packaging materials

Shipping costs are non-refundable. Restocking fees may apply to special-order items.

7.2.5. Firmware and Software Warranty

AlphaGeo™ does not guarantee uninterrupted or error-free operation of firmware or software. Software updates and fixes may be provided to correct non-conformance with published specifications.

7.2.6. Out-of-Warranty Repairs

For products outside the warranty period, the Customer/Dealer is responsible for:

- Repair service charges
- Return shipping costs

7.2.7. Disclaimer and Limitation of Liability

To the extent permitted by law, implied warranties of merchantability and fitness for a particular purpose are limited to the duration of the express warranty period.

AlphaGeo™ shall not be liable for:

- Loss of data
- Loss of profits or business interruption
- Incidental, indirect, or consequential damages
- Damages exceeding the original purchase price of the product

Users are responsible for following all operating instructions to prevent damage, malfunction, or personal injury.

7.3. Environmental Recycling

7.3.1. European Union (EU)

Products marked with the crossed-out wheeled bin symbol must not be disposed of with household waste.

These products must be collected separately and delivered to authorized recycling or collection centers in accordance with EU environmental regulations.

7.3.2. Outside the European Union

For countries outside the EU, please follow local regulations regarding the disposal and recycling of electronic equipment.

8. CHAPTER VIII SAFETY RECOMMENDATIONS

8.1. Warnings and Cautions

Always follow these safety notices when operating the AlphaGeo™ Falcon X.

- **WARNING** – Indicates a potential risk of personal injury or serious equipment damage (for example, improper battery handling).
- **CAUTION** – Indicates a risk of equipment malfunction, data loss, or measurement errors.

Critical Safety Warnings

- **Class 1 Laser Product**

Falcon X uses a Class 1 laser system. Under normal operating conditions, the device is designed to prevent exposure to hazardous laser radiation.

- **Battery Safety**

Do not puncture, crush, incinerate, or expose the battery to water or other liquids.

8.2. Wireless Module Approval

Falcon X includes the following wireless communication modules:

- Bluetooth® 5.0+
- Wi-Fi® (802.11 a/b/g/n/ac)
- Internal UHF radio (1.5 W)
- 4G LTE cellular module

European Regulatory Compliance (CE RED)

- Bluetooth: ETSI EN 300 328 V2.2.2 (2019-07)
- Wi-Fi: ETSI EN 300 440 V2.2.1 (2018-07) / ETSI EN 301 893 V2.1.1 (2017-05)
- UHF Radio: ETSI EN 300 113 V3.1.1 (2020-06)
- 4G LTE: ETSI EN 301 908-1 V13.1.1 (2019-11)

User Responsibility: Always comply with local regulations governing the use of wireless communication equipment.

8.3. Instrument Compliance

Falcon X complies with the following standards:

- EMC: EN IEC 61000-3-2:2019+A1:2021 / EN 61000-3-3:2013+A2:2021
- Safety: EN IEC 62368-1:2020 + A11:2020

Modification Warning: Unauthorized modifications may void regulatory approvals and the product warranty.

8.4. RF and Bluetooth Safety

Bluetooth and Wi-Fi systems operate using low-power radio signals.

To reduce RF exposure:

- Follow all local RF safety guidelines
- Use only AlphaGeo-approved antennas and accessories

RF Separation Distance:

During wireless transmission — especially when the internal UHF radio is active — maintain at least **20 cm** between the device/antenna and the human body, unless local regulations specify otherwise.

Restricted Areas:

Do not operate wireless functions in hospitals, aircraft, or other restricted areas unless permitted by local authorities.

8.5. Regional Compliance

8.5.1. United States (FCC)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

This device complies with FCC RF exposure limits for an uncontrolled environment.

8.5.2. European Union (EU)

Falcon X complies with:

- **Radio Equipment Directive (RED):** 2014/53/EU
- **EMC Directive:** 2014/30/EU

Full compliance details are available through official AlphaGeo channels.

8.6. Lithium-Ion Battery Safety

WARNINGS

Leakage: Battery fluids are corrosive. If contact occurs, rinse immediately with clean water and seek medical attention if irritation persists.

Temperature Limits: Do not expose the battery to temperatures above 60 °C.

Charging: Use only AlphaGeo-approved chargers and accessories.

Stop using the battery immediately if it:

Becomes excessively hot

Emits an unusual odor

Swells or leaks

Shows visible physical damage

Do not charge the battery unattended or near flammable materials.

Protect battery terminals from short circuits (for example, contact with keys, coins, or tools). Always transport batteries in the provided case or an approved protective container.

8.7. Storage Recommendations

If the battery will not be used for more than **three (3) months**, store it with a charge level between **30% and 50%**. Recharge periodically to maintain battery health.

Manufacturer

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Product Information

For product updates, firmware releases, software downloads, and documentation, please visit the official AlphaGeo™ website or contact an authorized AlphaGeo™ distributor.

Documentation Notice

This user manual describes the hardware operation of the AlphaGeo™ Falcon X. Software operation of AlphaGeo SurPro™ V6.0 is documented separately in the SurPro™ Software User Manual.