

Getting the Most Out of Your FJD Trion S2

Product Training

Agenda

1. Introduction
2. Getting started
3. Connecting S2 to FJD Trion Scan
4. How to optimize scanning results when working with S2
5. FAQs

Introduction



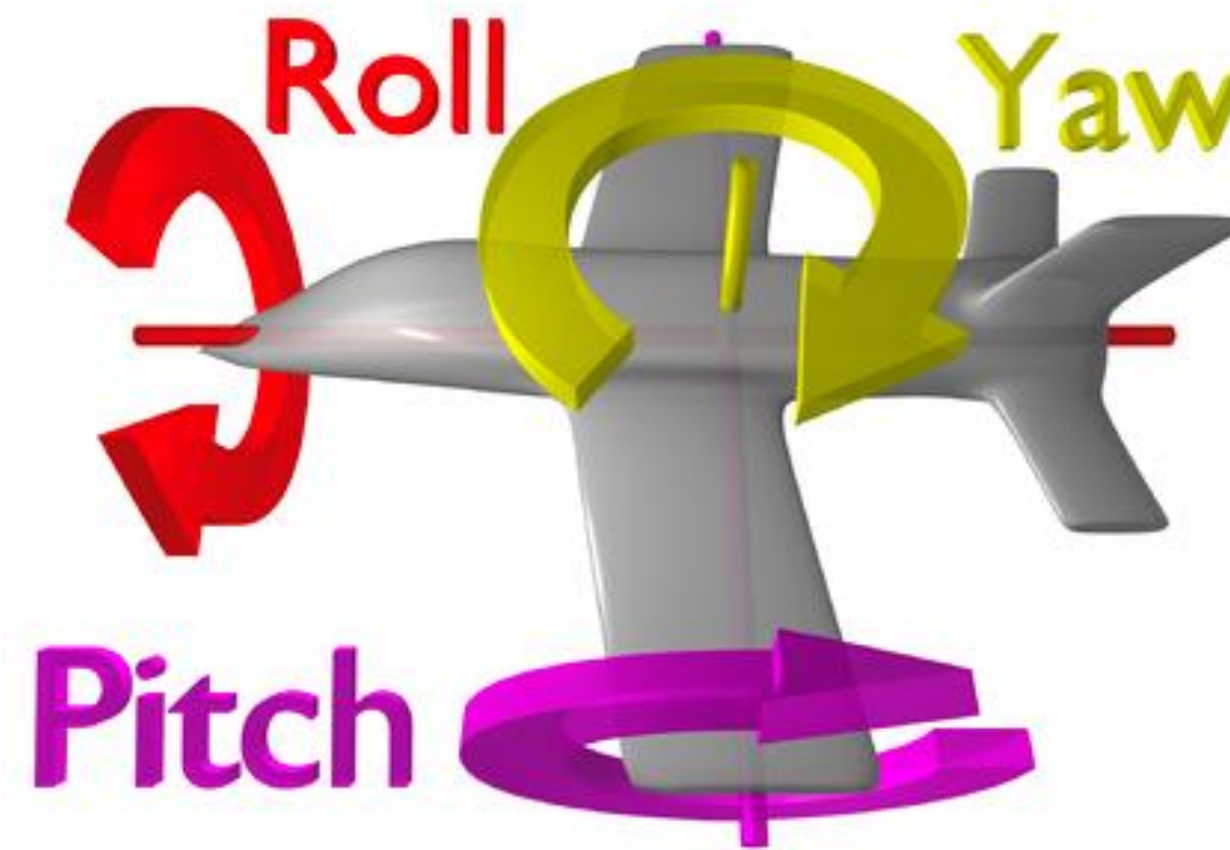
The technology behind S2



LiDAR – light detection and ranging

AKA “laser scanning” or “3D scanning.”

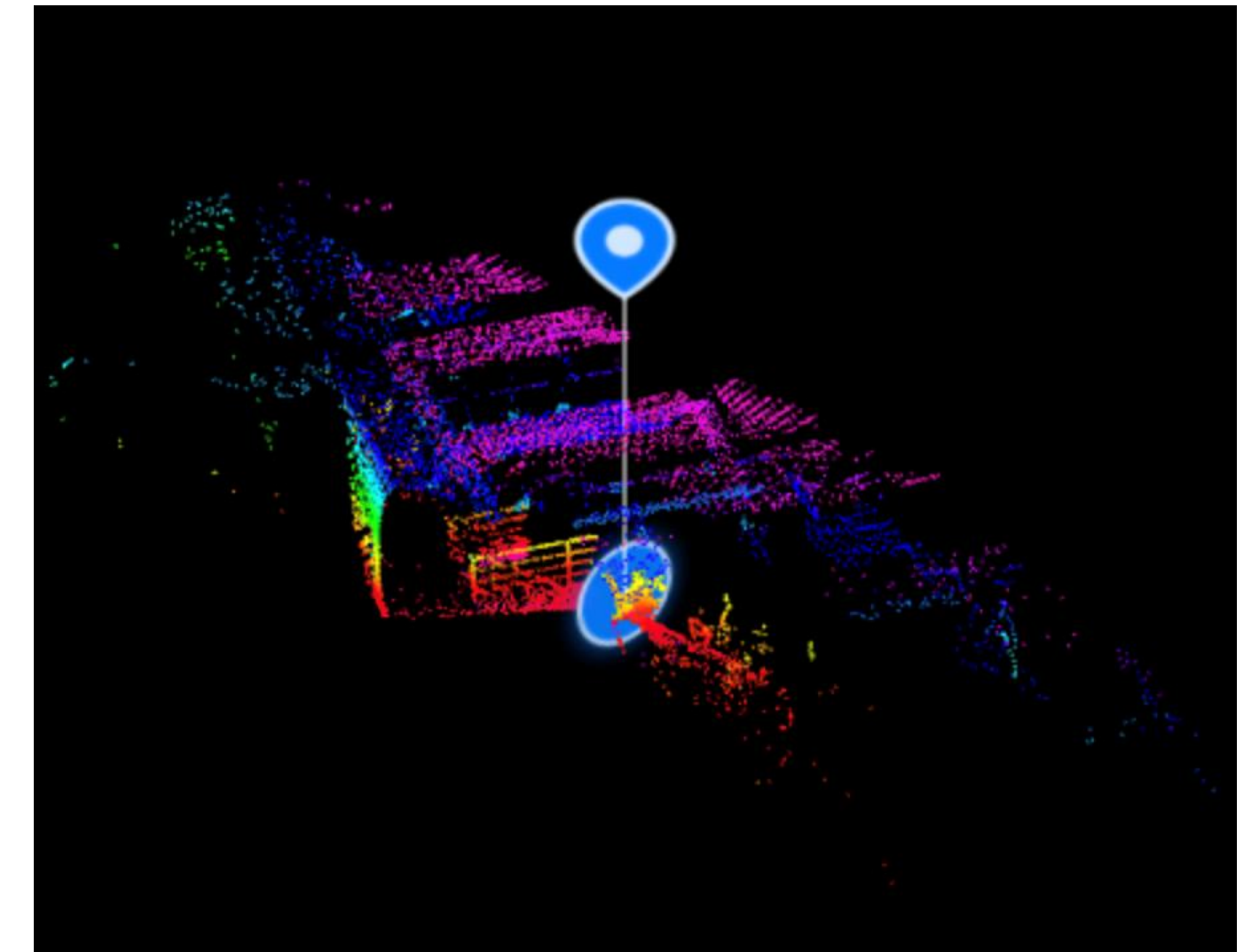
The technology uses eye-safe laser beams to create a 3D representation of the surveyed environment.



IMU – Inertial measurement unit

Combines information from multiple sensors to provide information about the orientation, acceleration, and sometimes angular velocity.

Improves system precision.



SLAM

Simultaneous localization and mapping.

The scanner “knows” where it is and “understands” its surroundings as it maps the environment

The technology behind S2



RTK – Real-Time Kinematic

A high-precision satellite positioning technique that uses real-time corrections from a reference station to achieve centimeter-level accuracy.

Improves system accuracy and stability for outdoor scenarios.



VIO – Visual-Inertial Odometry

A real-time navigation technology that fuses visual data from cameras and motion measurements from an inertial measurement unit (IMU) to estimate a device's position, orientation, and movement in environments where GPS signals are unavailable or unreliable.

How SLAM Works

- **Initialization:** SLAM starts with an initial estimate of the device's position and gradually refines this estimate as it moves through the environment.
- **Feature Tracking:** The system tracks features (landmarks) in the environment using sensor data.
- **Map Update:** As the device moves, it updates the map with new observations and refines existing features.
- **Loop Closure Detection:** Recognizes previously visited locations, correcting accumulated errors and enhancing the overall accuracy of the map.

LiDAR Scanner Solutions



TLS



Mobile



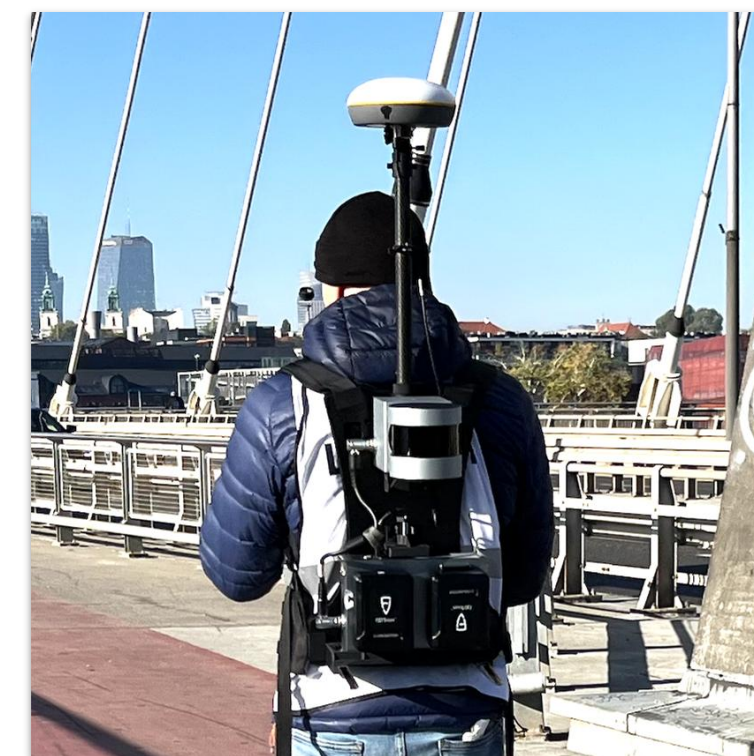
Handheld



Aerial



Robot dog

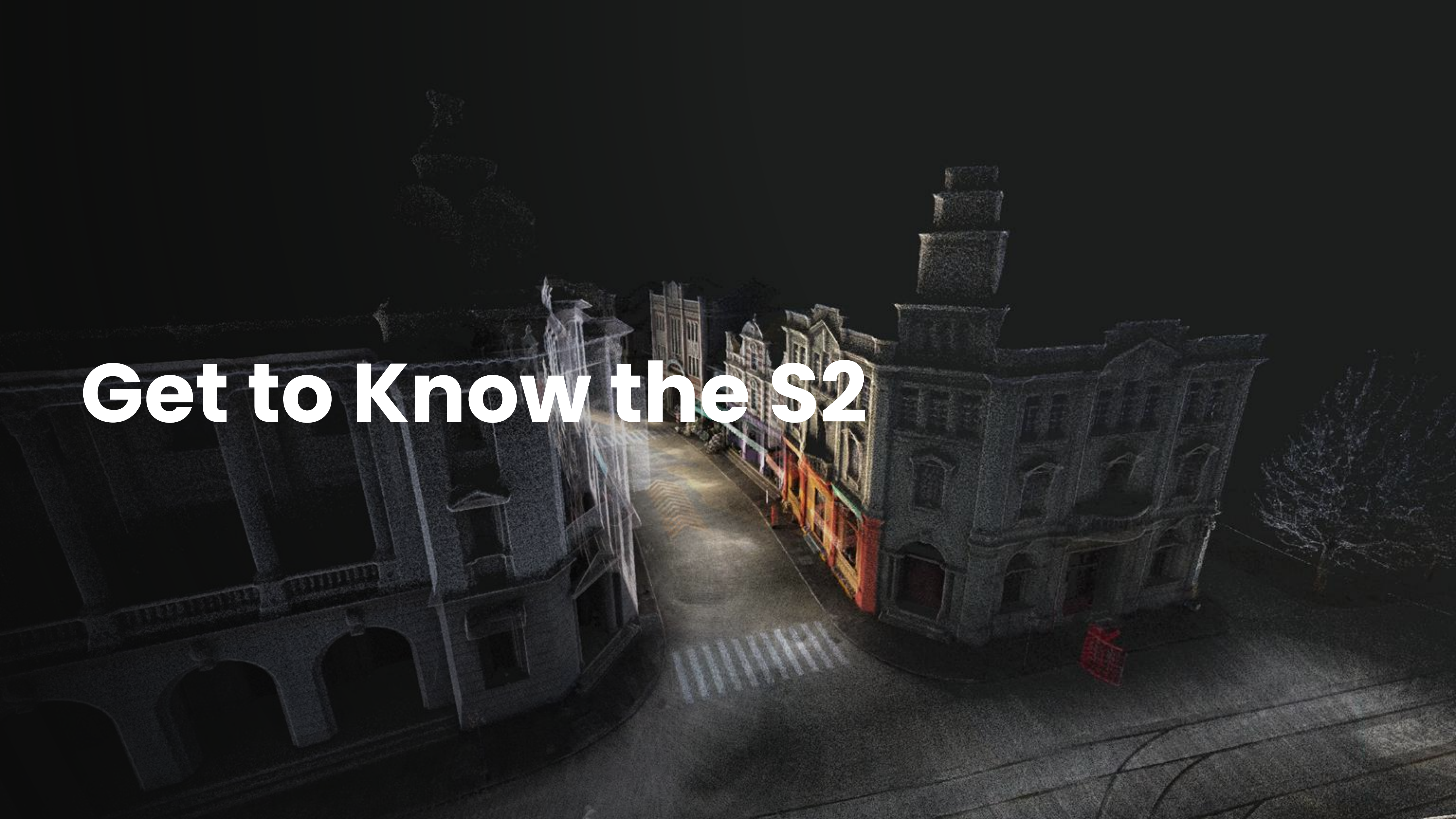


RTK



Car-mounted

Get to Know the S2



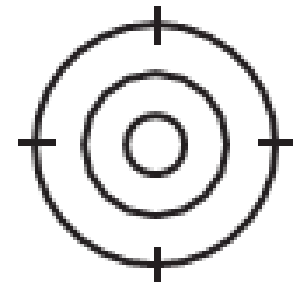


FJD TrionTM S2 LiDAR Scanner

Smaller Size, Larger Capability



Key Features



12cm
Accuracy



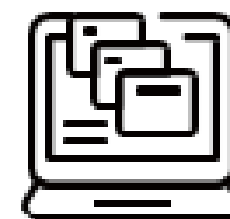
Real-time
Colorization



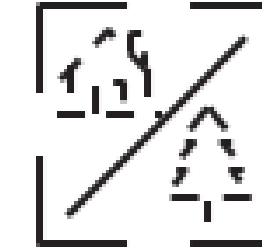
Multi-SLAM
Algorithms



Georeferenced
PointCloud

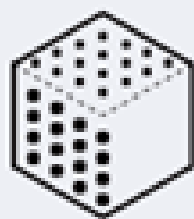


Multi-Scenario
Adaptation



Indoor & Outdoor
Scanning

S2

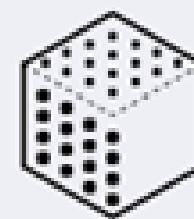


320,000
Points per second



120m
Range

S2 PRO

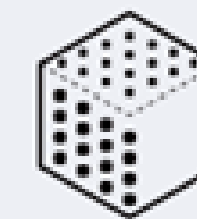


640,000
Points per second



120m
Range

S2 MAX



640,000
Points per second



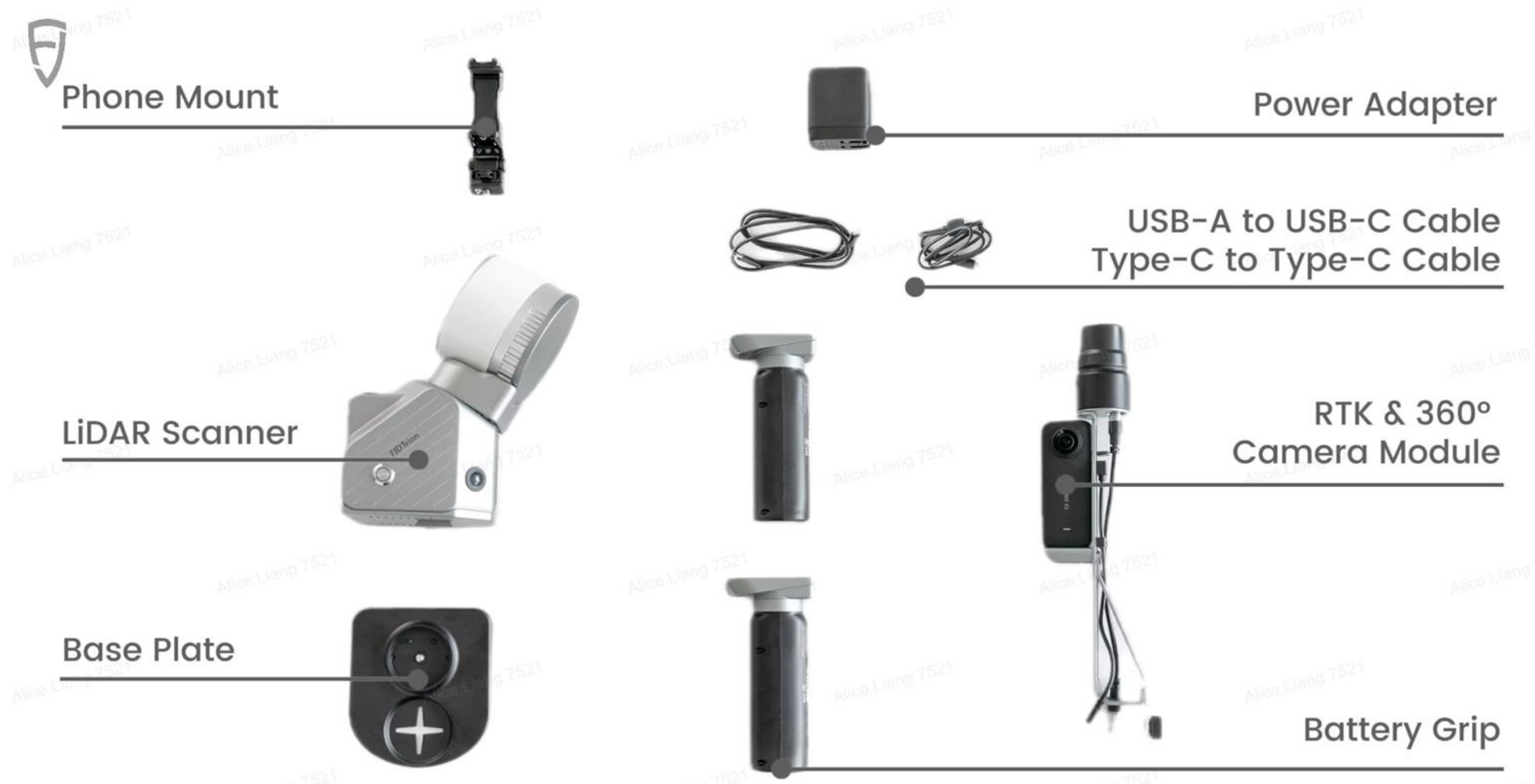
300m
Range



Key Specs

Relative Accuracy	1.2cm
Scanning Range	120m/300m
Weight	1.8kg
LiDAR FOV	360° × 270°
Points Per Second	320,000/640,000
Real-time Point Cloud	Yes
Colorized Point Cloud	Yes
RTK-assisted Mapping	Yes
VIO	Yes
built-in camera resolution	2*12MP

In the Box



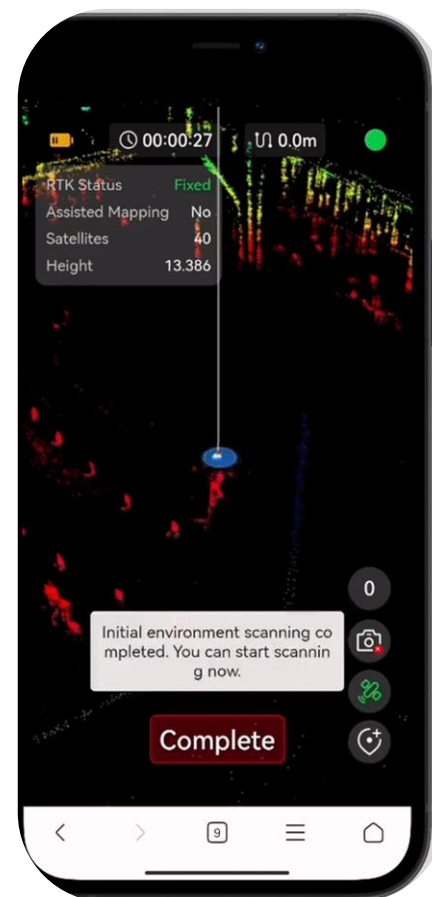
1. Product Documentation* 1 set
3. LiDAR Scanner* 1
5. Base Plate*1
7. Charger*1

2. Target Sheet * 1 set
4. RTK & 360° Camera Module * 1
6. Battery*2
8. Cables

Workflow Overview



FJD Trion S2

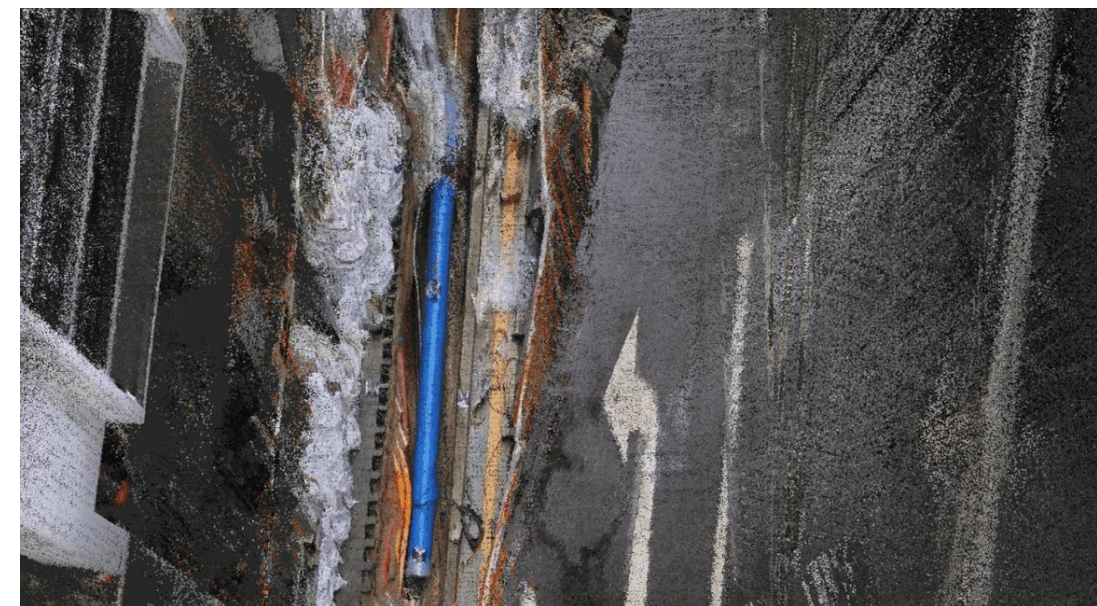


FJD Trion Scan

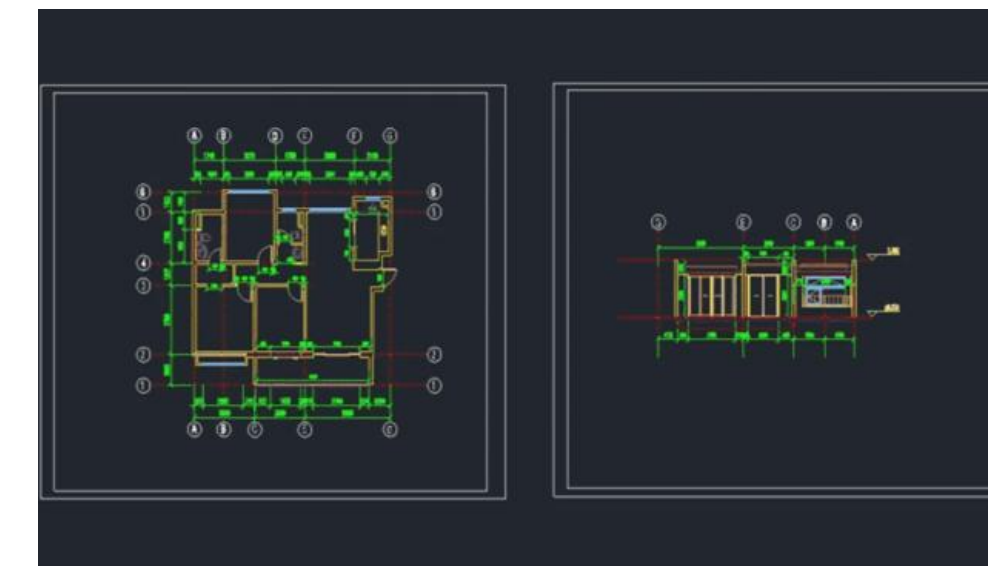
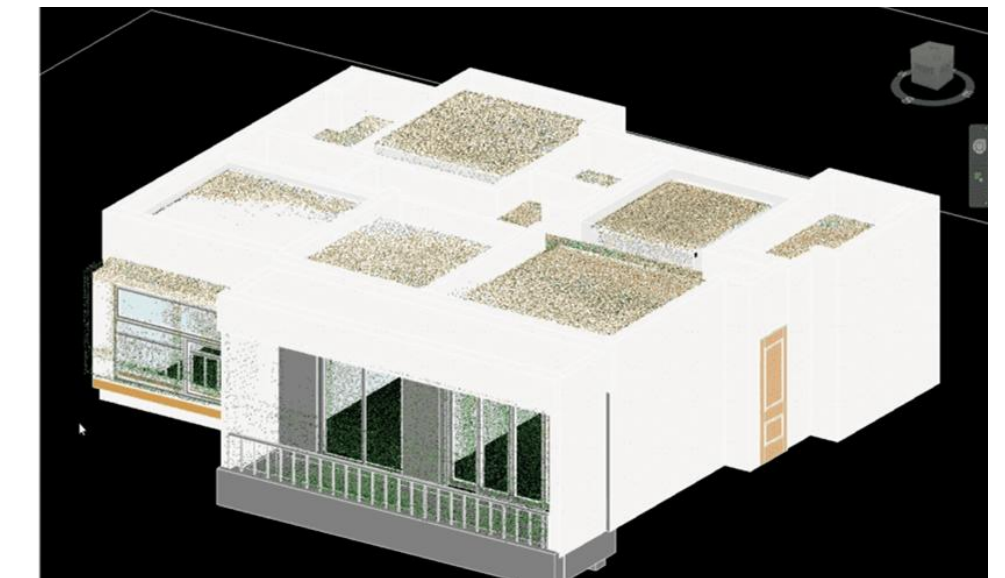
Capture data



FJD Trion Model



Process data



Deliver Results

Getting Started

A dark, atmospheric night scene of a city street. The street is illuminated by a warm, yellow light, possibly from streetlights or building lights, creating a strong contrast with the surrounding darkness. On the left side of the street, there is a large, multi-story building with a prominent arched entrance and a series of windows. On the right side, there is a row of smaller, colorful buildings with red and yellow facades. A crosswalk with white stripes is visible on the street. The overall mood is mysterious and urban.

Connecting the Camera and RTK

1. Install battery, RTK and 360° camera (optional)

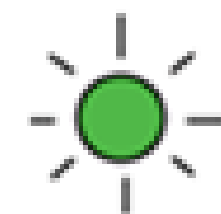
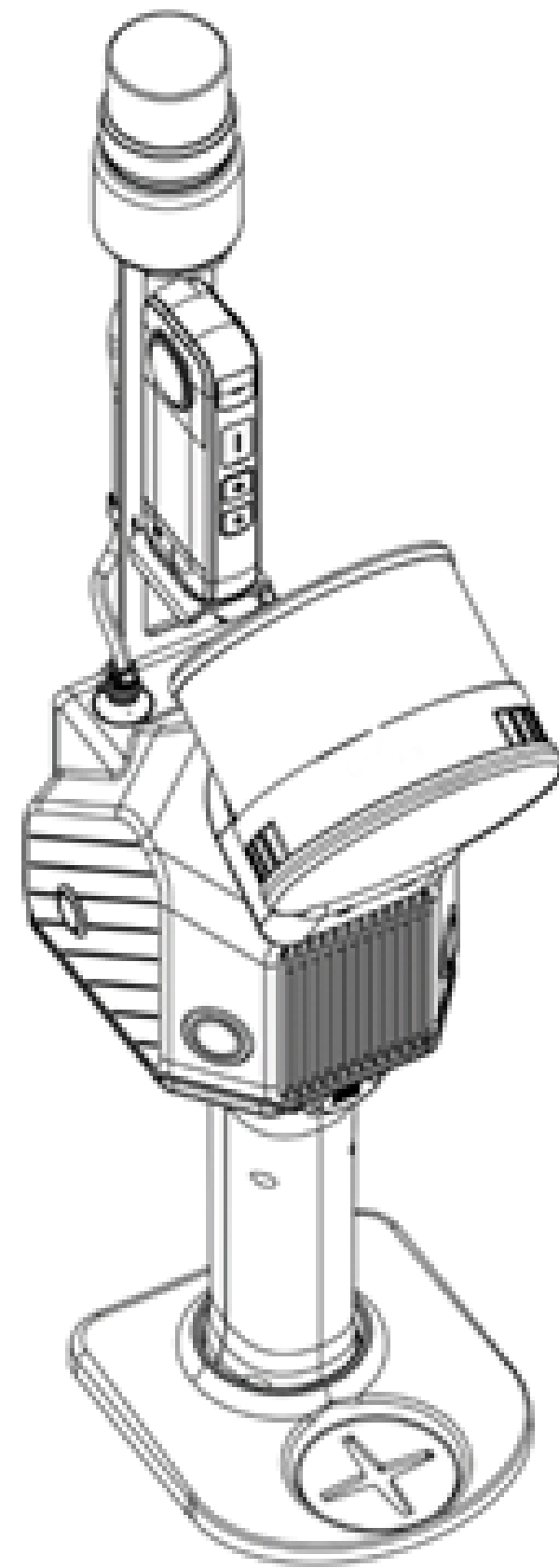


3. Turn on 360° camera and short press the power-on button



2. Connect RTK and 360° camera cable accordingly

Power button



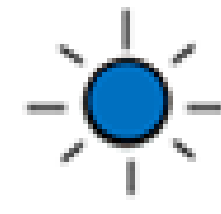
Turn on/off: The button flashes green



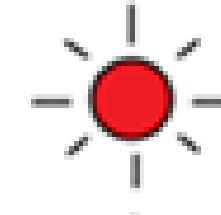
Wi-Fi-STA Standby: The button solid green



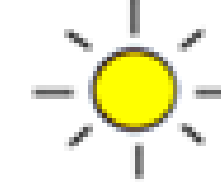
Wi-Fi-AP Standby: The button solid blue



Scan initialization or save: The button flashes blue



Start scanning: The button flashes red



Device exception: The button flashes yellow

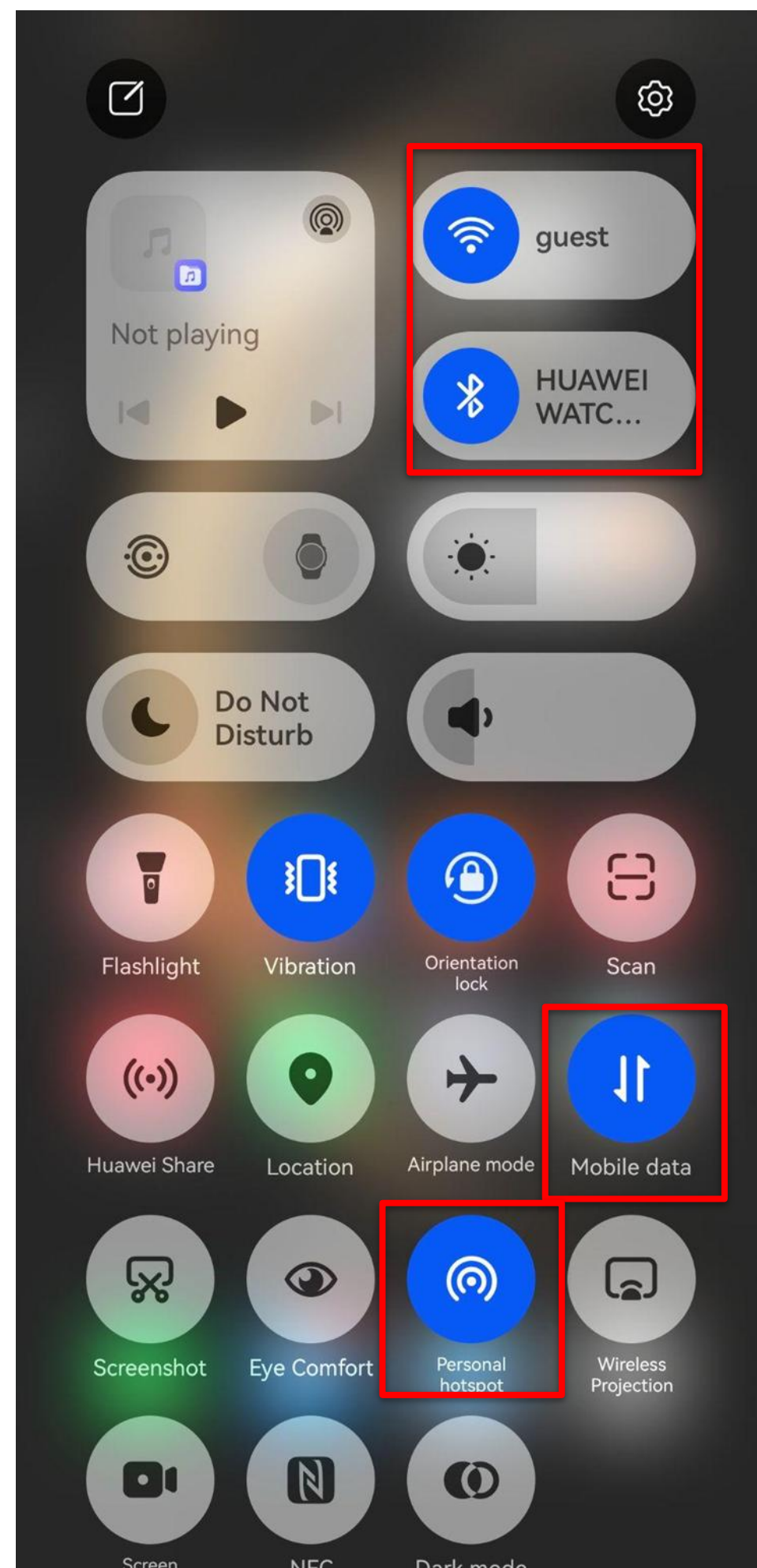
FJD Trion Scan App

The FJD Trion Scan app is a hub for managing your scanners, project files, and point cloud data.

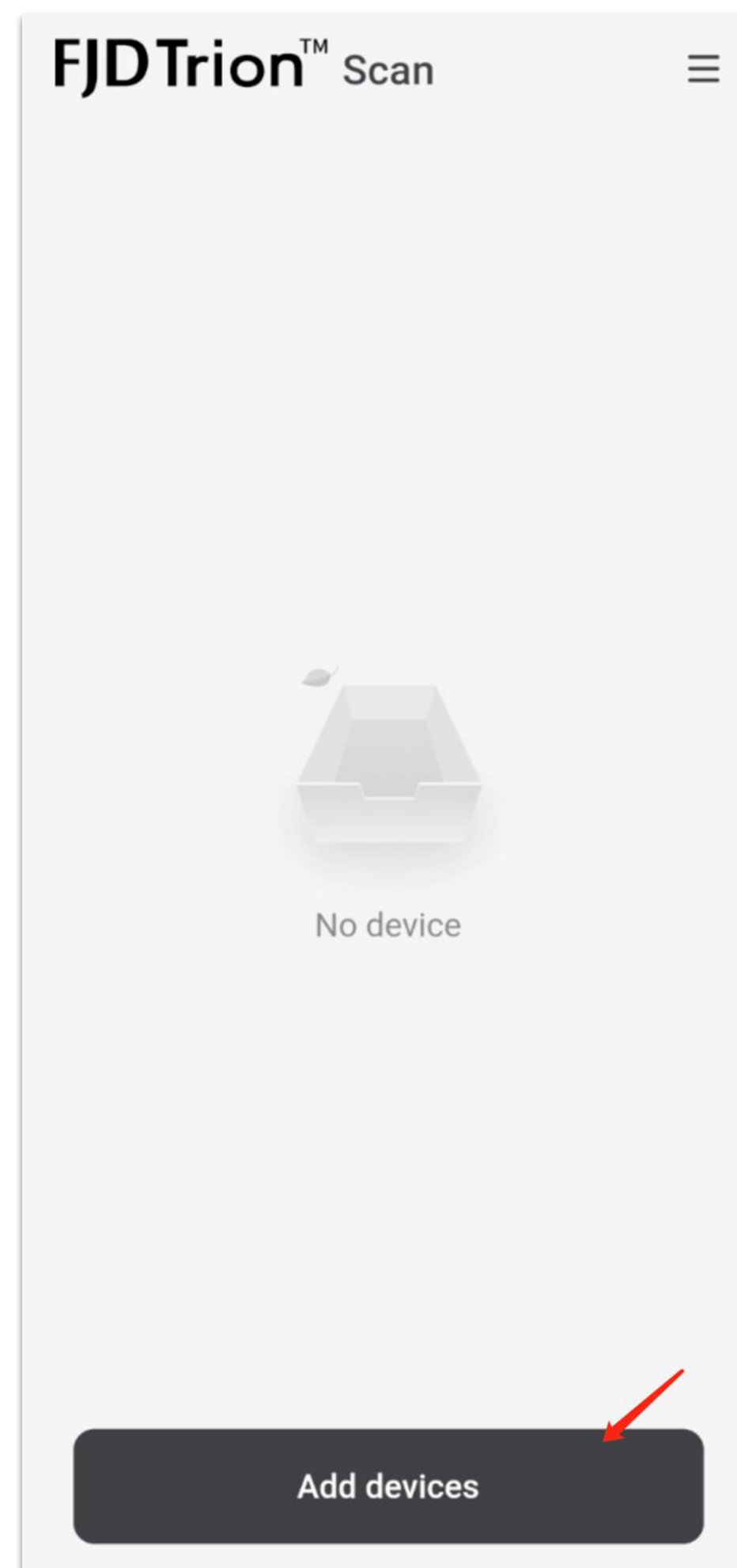




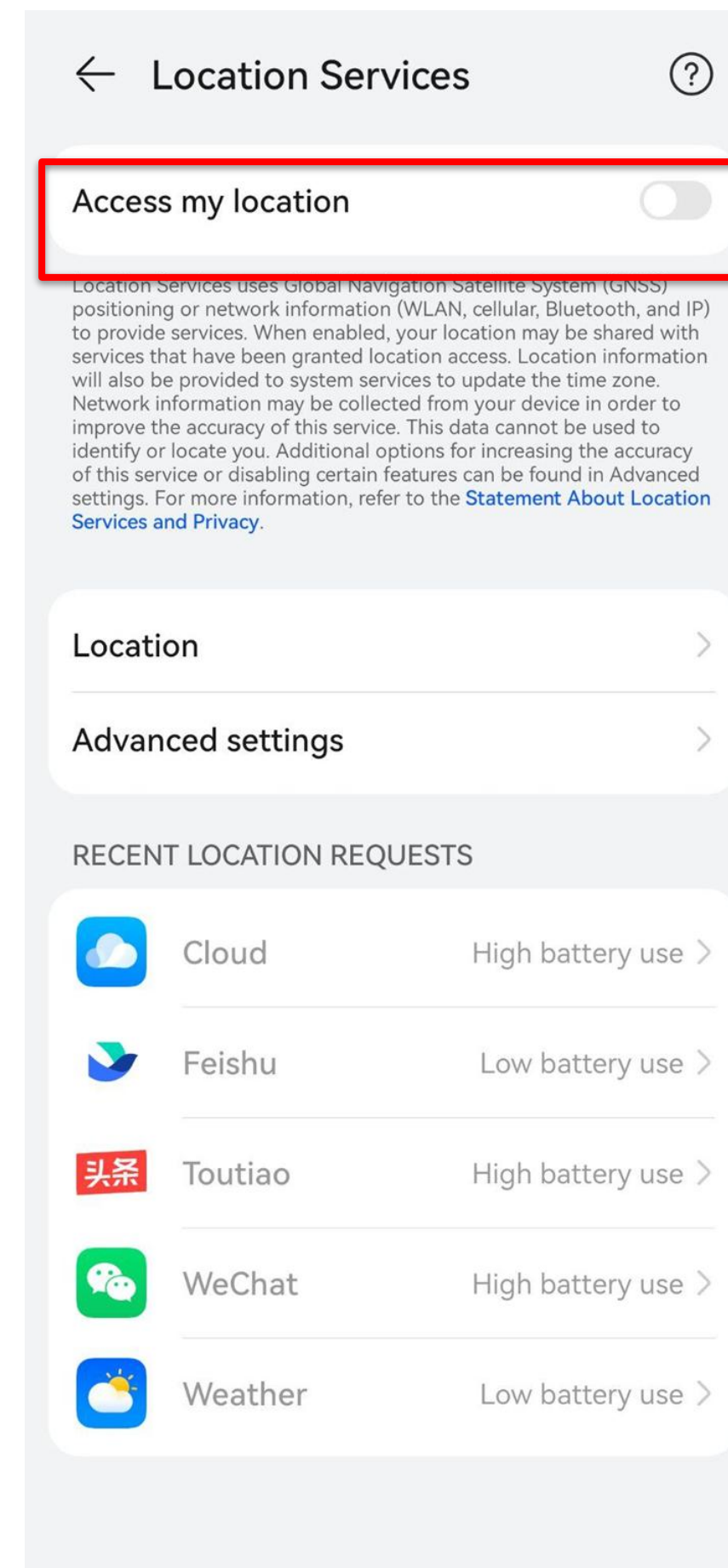
Connect your scanner



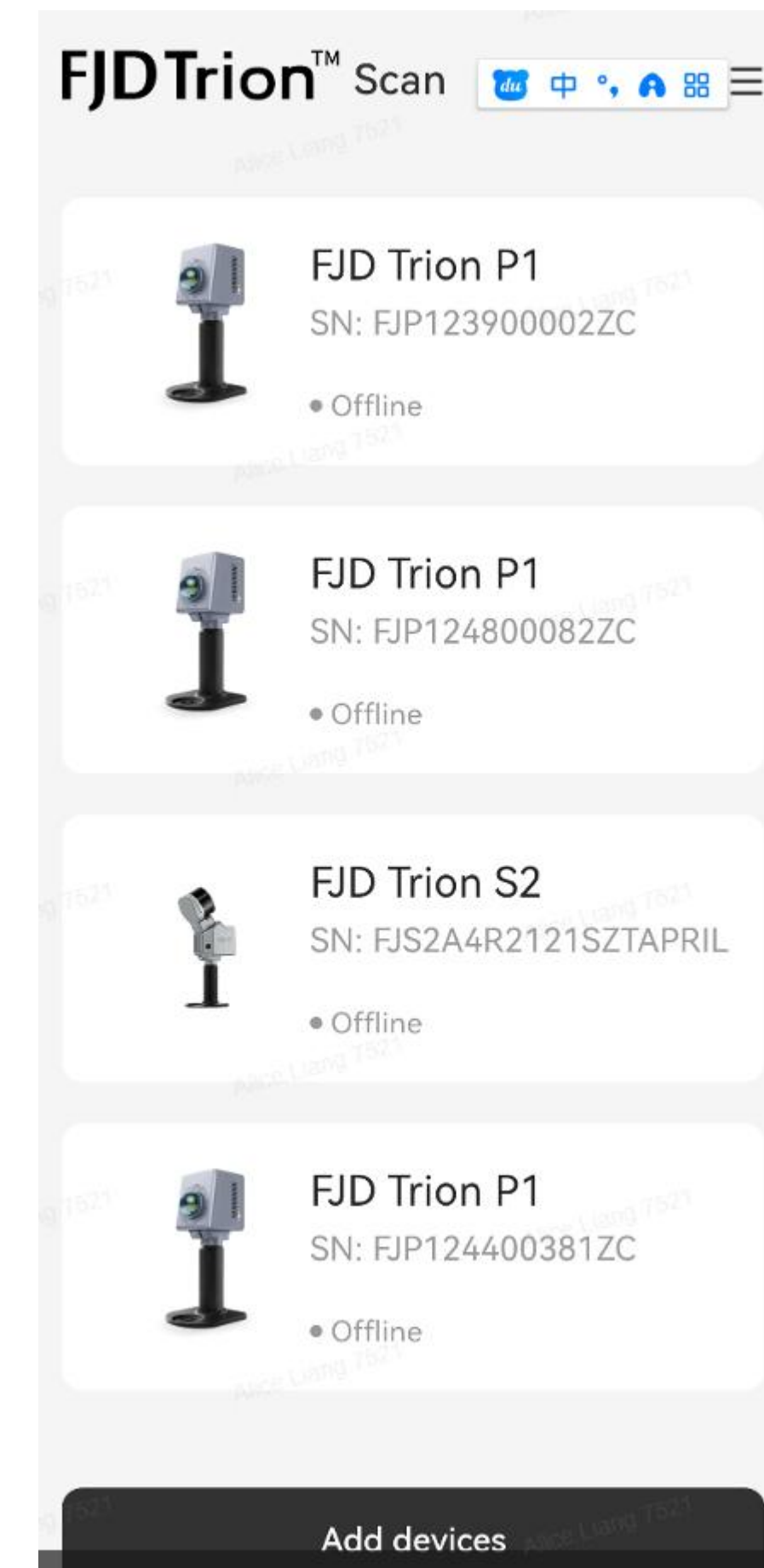
1. Open mobile phone's WIFI, bluetooth, hotspot and mobile data



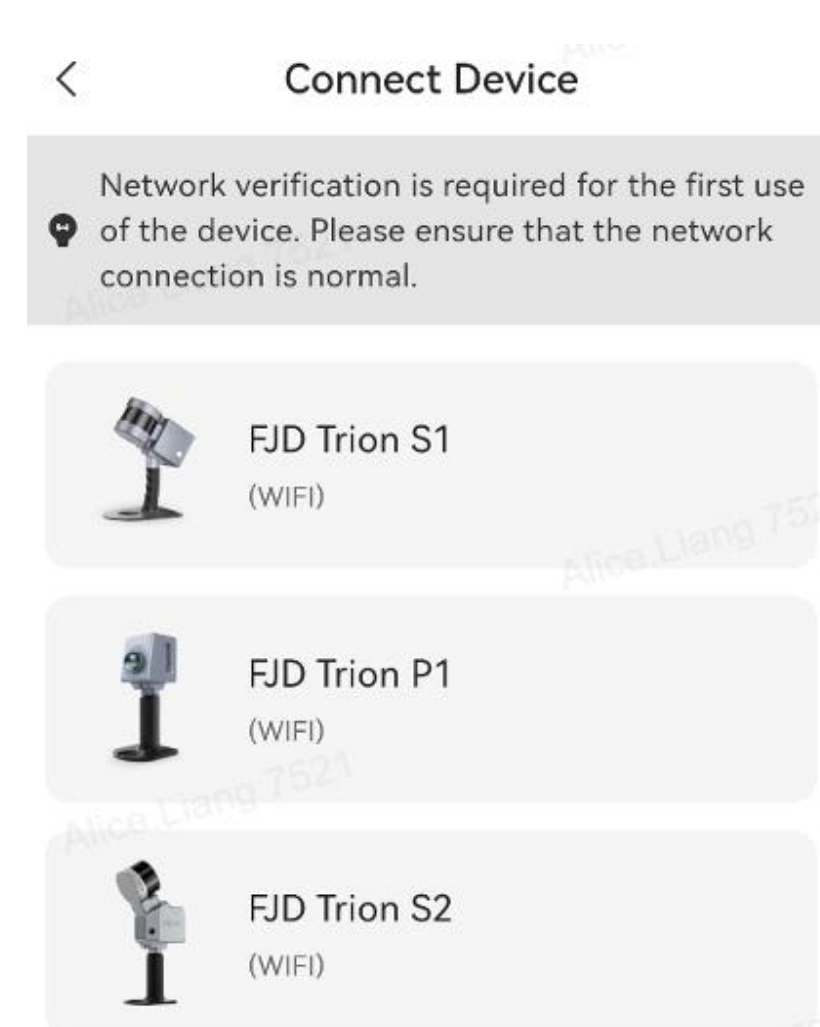
2. Open the FJD Trion Scan App



3. Grant location permissions




4. choose the device connected before or add devices






Connect your scanner via hotspot(default)

FJDTrion™ Scan




FJD Trion P1
SN: FJP123900002ZC

• Offline




FJD Trion P1
SN: FJP124800082ZC

• Offline




FJD Trion S2
SN: FJS2A4R2121SZTAPRIL

• Offline



FJD Trion P1
SN: FJP124400381ZC

• Offline




FJD Trion P1


Add Devices

Connect Device

Step 1: Place the device on a flat and stationary surface.




Step 2: Press the power button on the side of scanner, wait until the button indicator light turns solid green, the initialization is completed and enters standby mode.



If your phone cannot generate a hotspot or if you are currently in an environment without internet connectivity, try [switching connection method](#)(it is not possible to switch for the first use of the device)

Next Step

Connect Device



FJS224C0FELIXZC

Discover 1 number of devices.

Retry

Input hotspot information.

Hotspot information can be modified in the software settings

After enabling the personal hotspot in your phone settings, input the hotspot information.

Personal Hotspot

Allow Others to Join

☒

WLAN Password

***** >

Hotspot Name*


test

Hotspot Password*

12345678

Confirm

Connect Device



FJD Trion S2
SN: FJS224C0FELIXZC

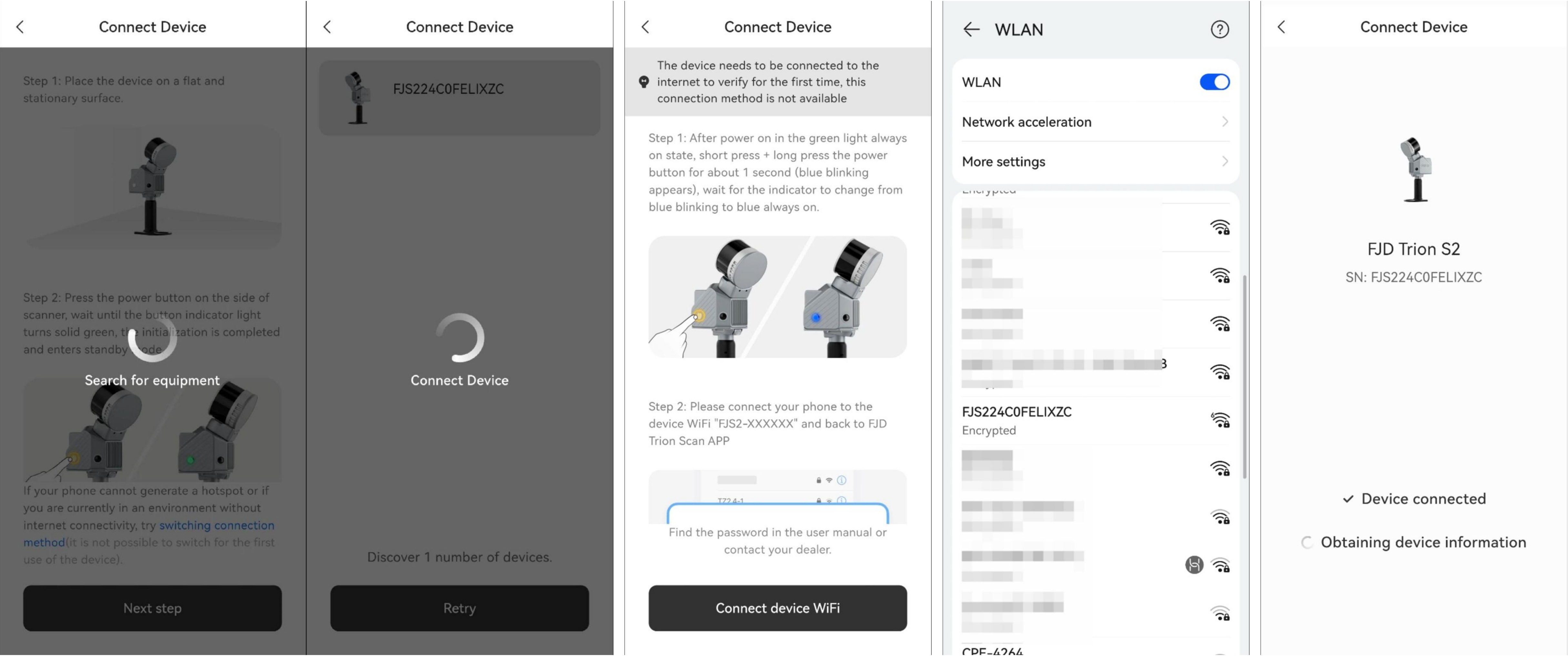
✓ Device connected

○ Obtaining device information

Personal hotspot account and password will be required to enter at first time



Connect your scanner via WiFi



Search for the device and connect

Short press+long press to change to wifi mode, enter Wifi password : fjdtrions2



RTK settings

RTK Model

RTK equipment is detected, please confirm the specific model and parameters.

V1t ☐

V10i ☐

SR ☒

Note: If other types of RTKs are connected, please change the settings in time.

Detailed Settings

OK

Scan

RTK settings

Model SR >

Structure Parameters ☒ Default ☐ Customization

Mobile Station Settings >

Note: If other types of RTKs are connected, please change the settings in time.

V1t

V10i

SR

RTK settings

Model SR >

Structure Parameters ☒ Default ☐ Customization

Mobile Station Settings >

Note: If other types of RTKs are connected, please change the settings in time.

OK

Mobile Station Settings

No configuration

Add

Ntrip

Name Please enter

Server Address Please enter |

Port Please enter

Source Node

Node Please enter |

Username Please enter

Password Please enter |

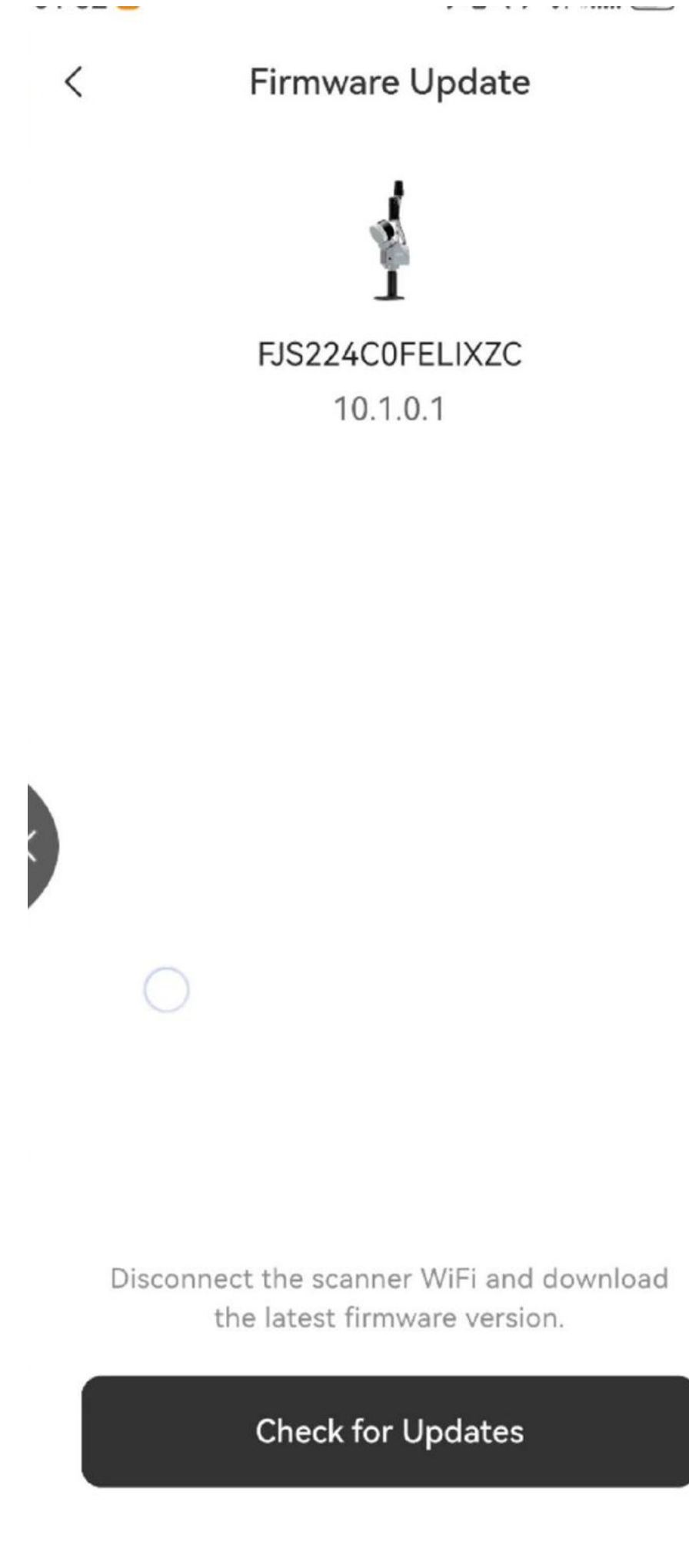
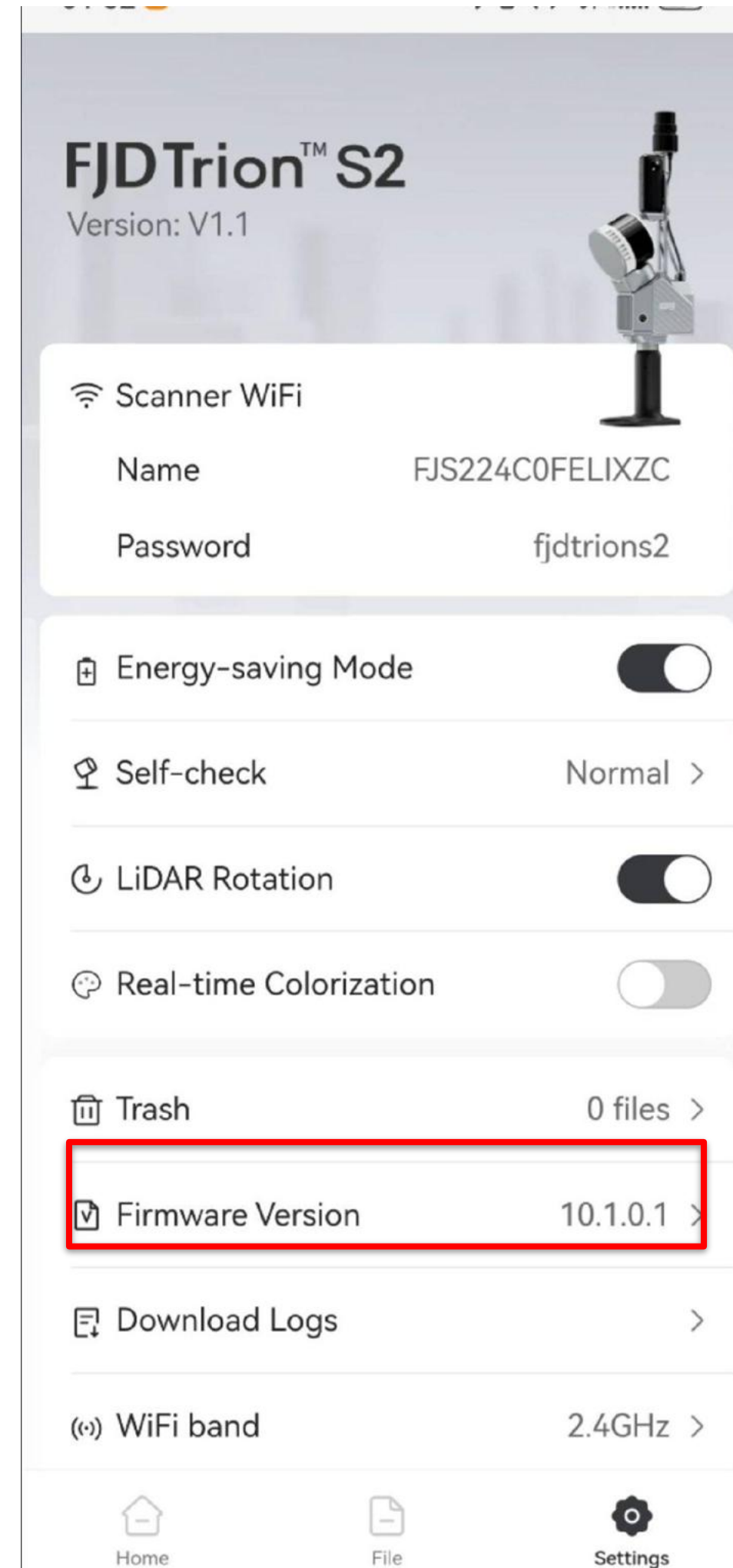
Save Use

Select the right model and add mobile station info at the first time

Enter CORS Username and Password



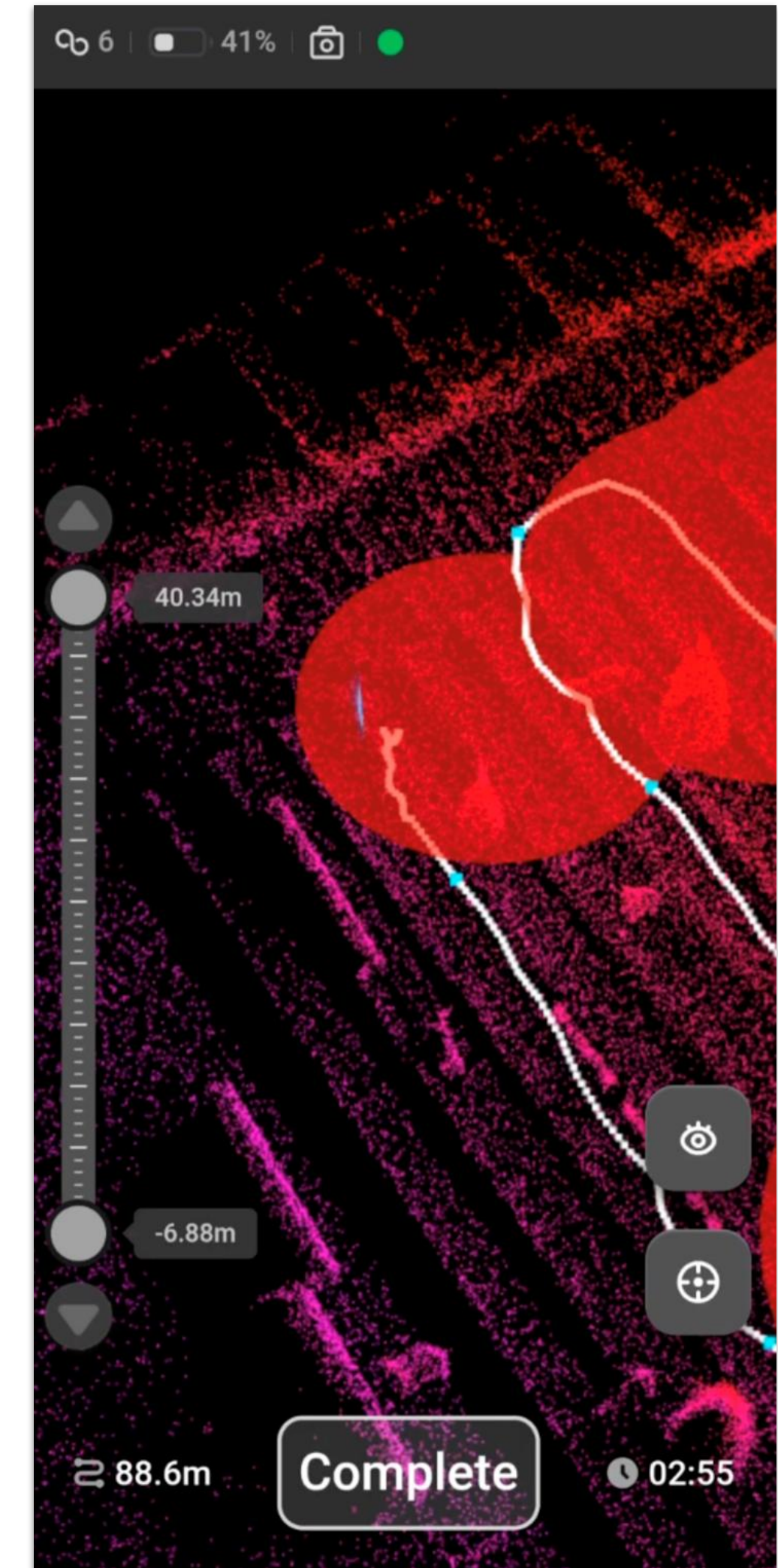
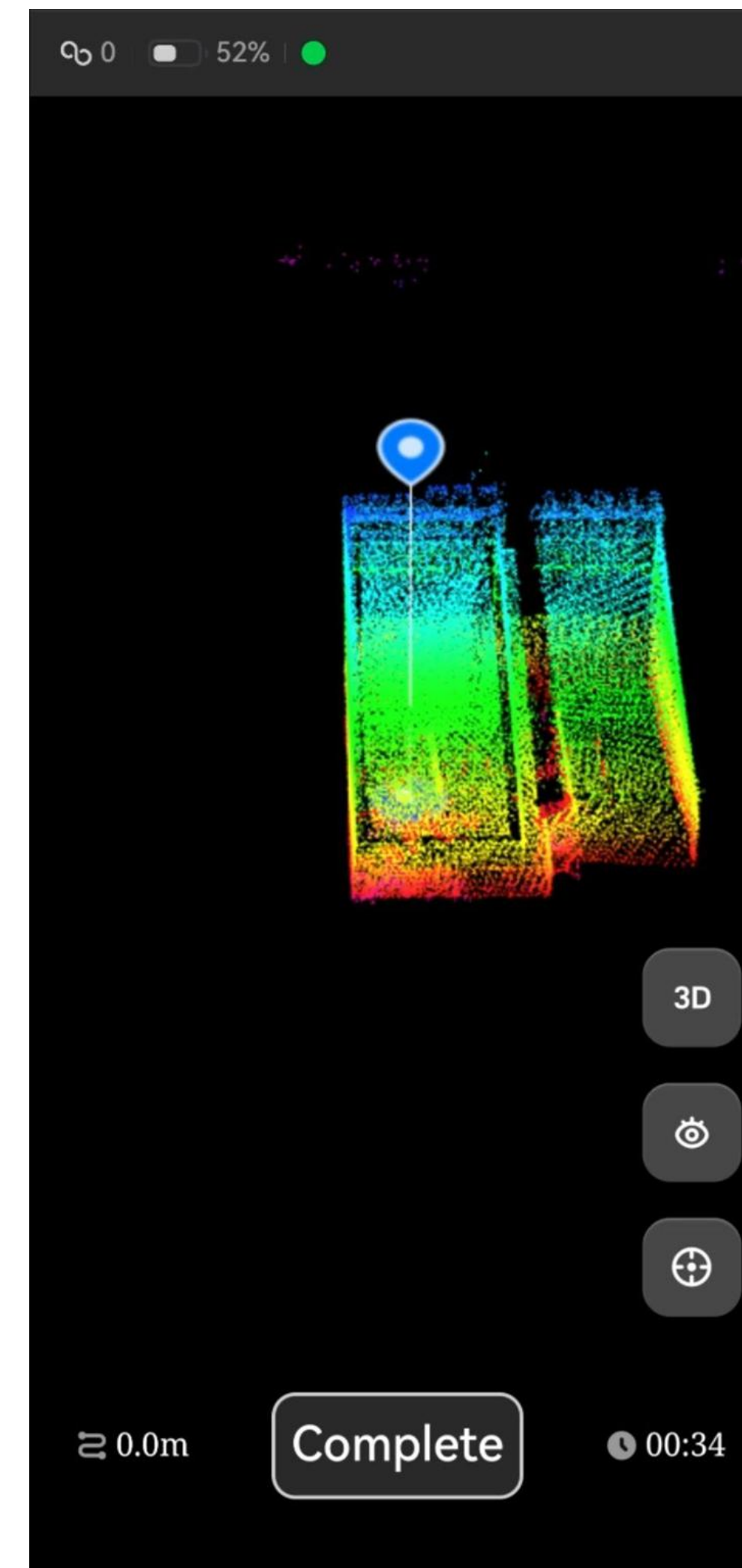
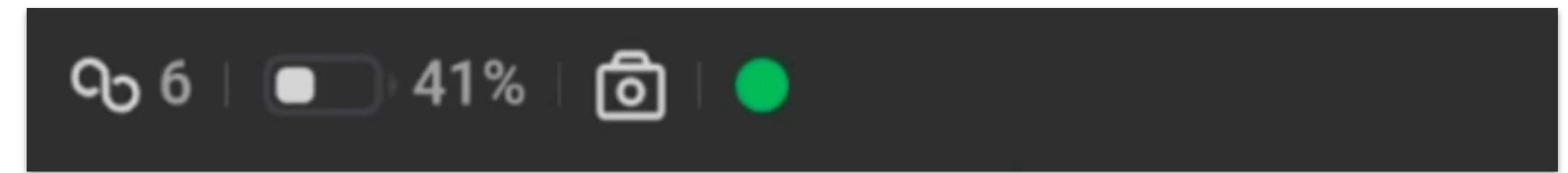
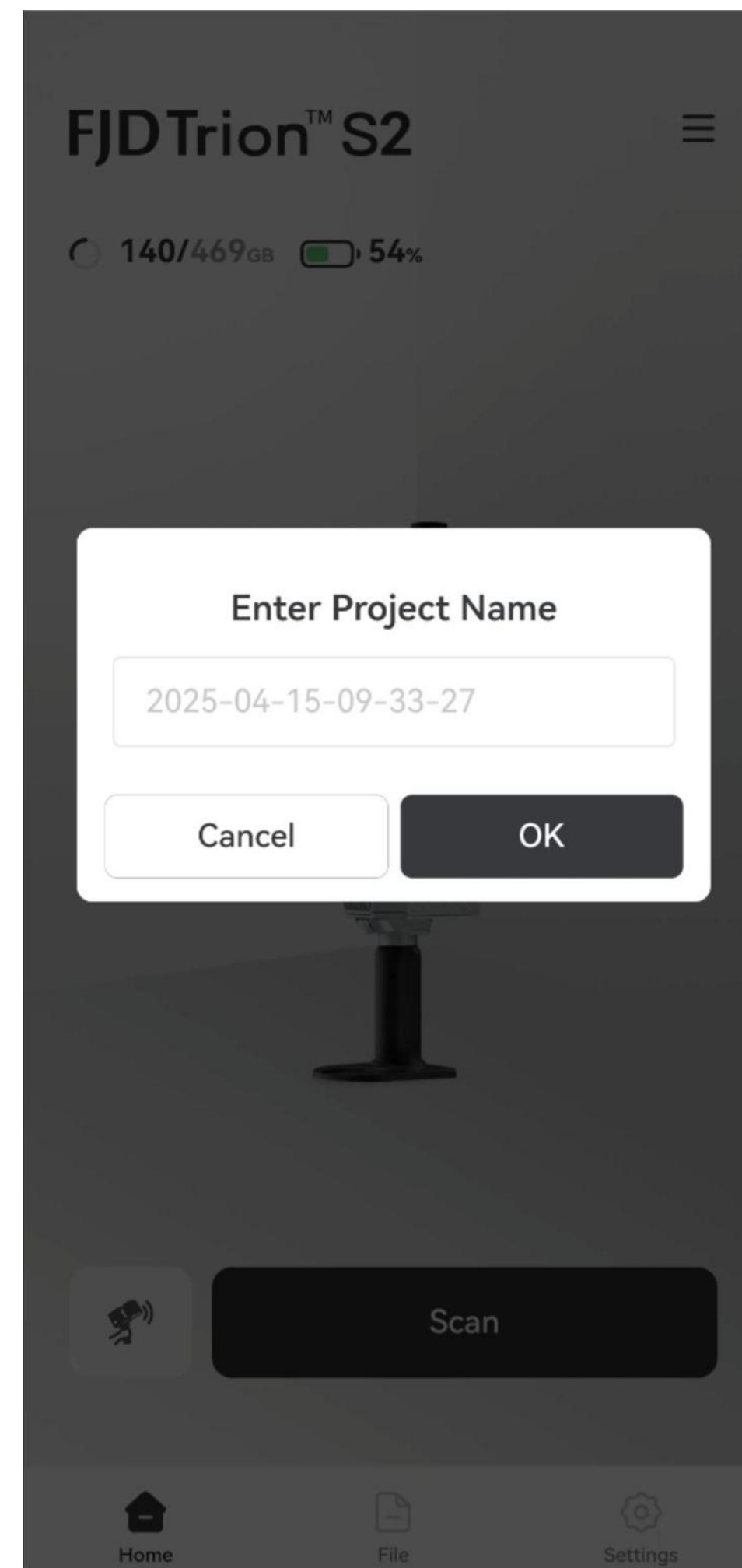
Update the firmware



Go to Settings – Firmware Version – Check for Updates to install the latest update

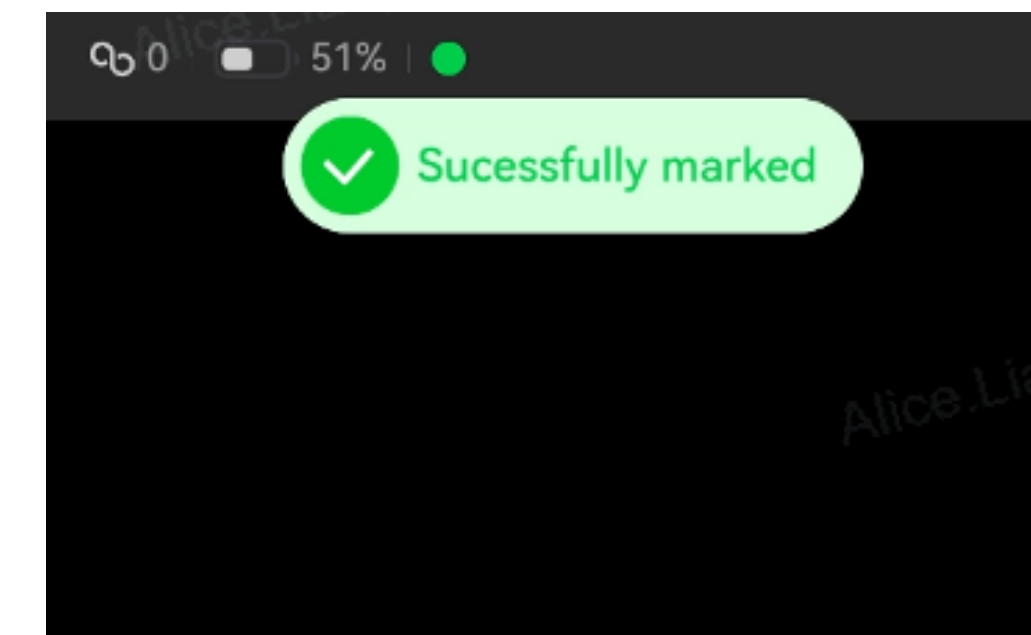
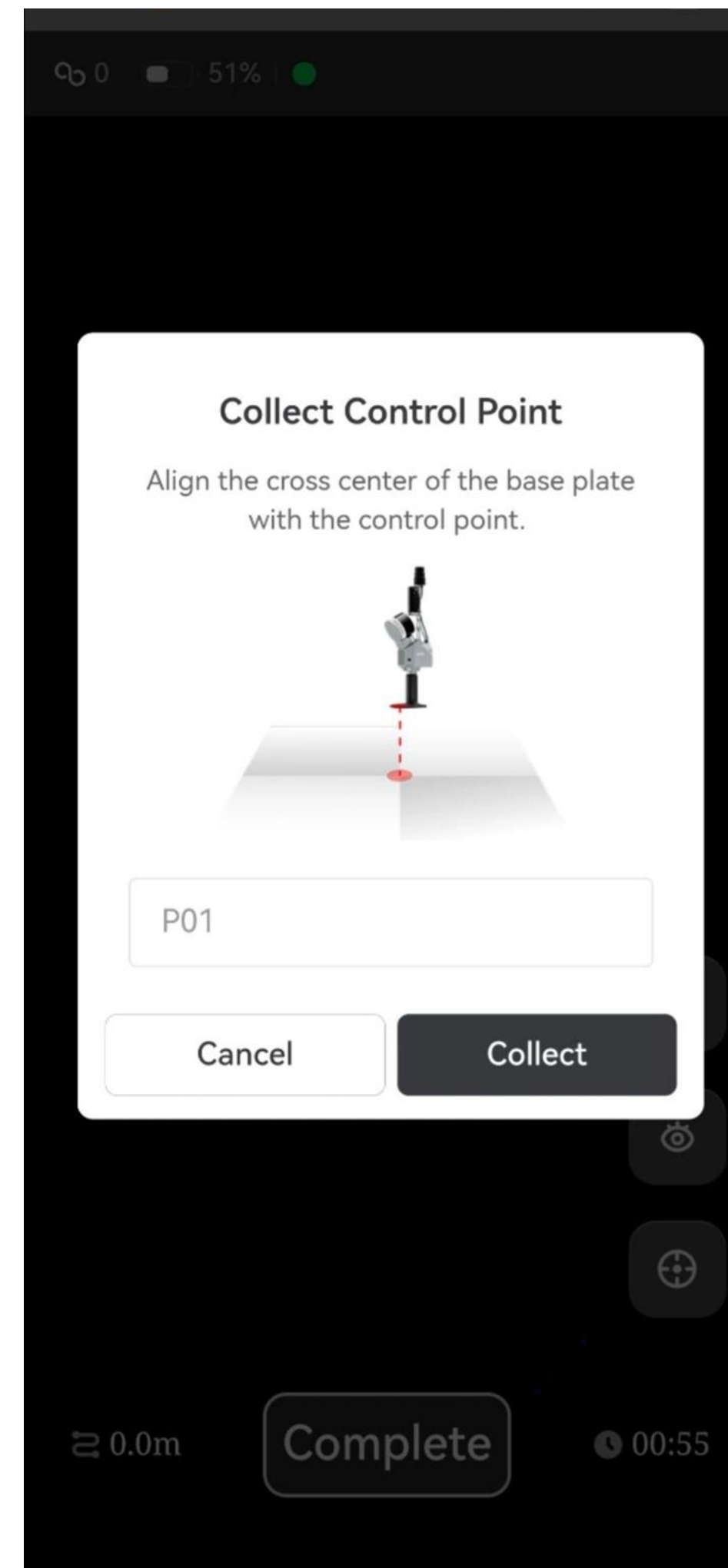
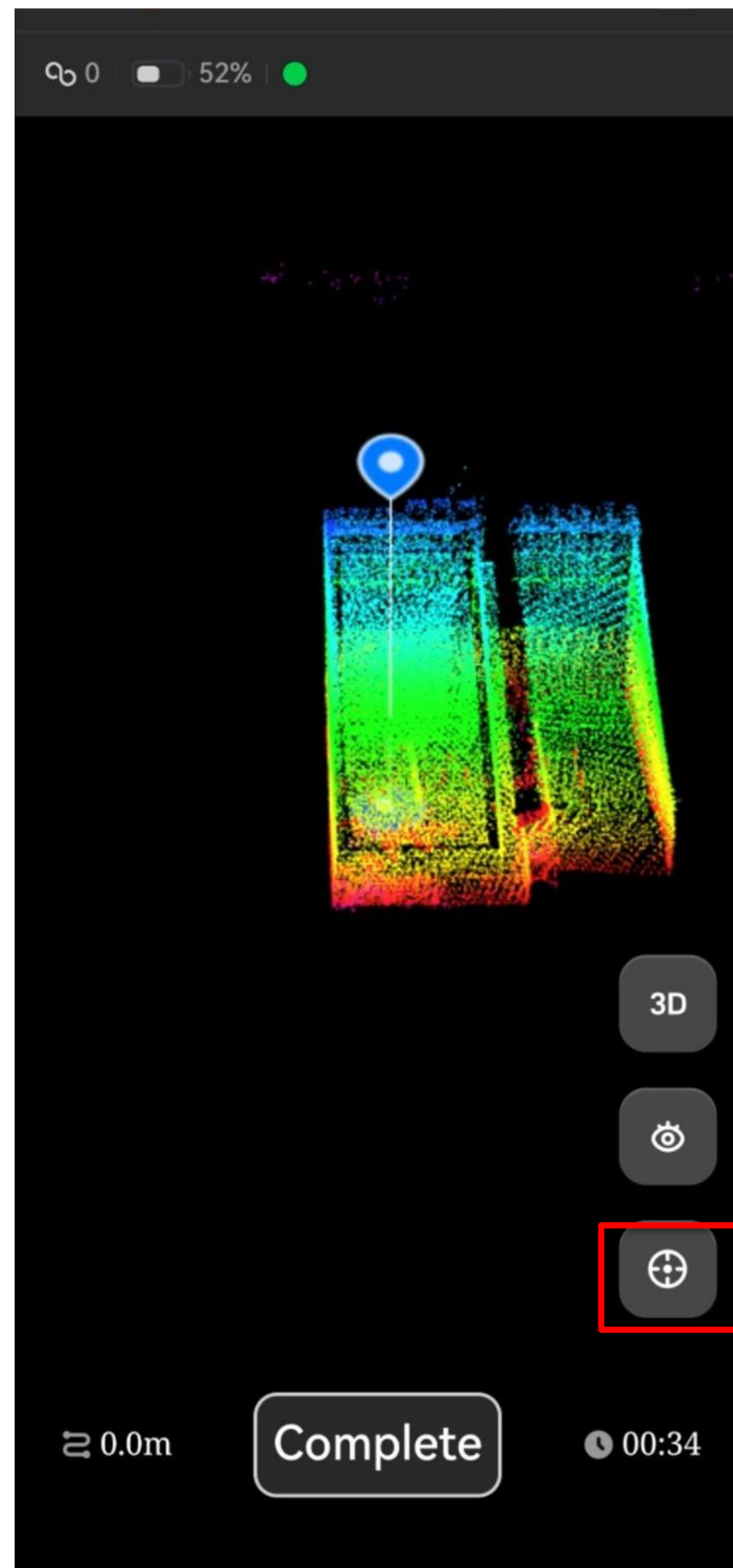


Begin scanning

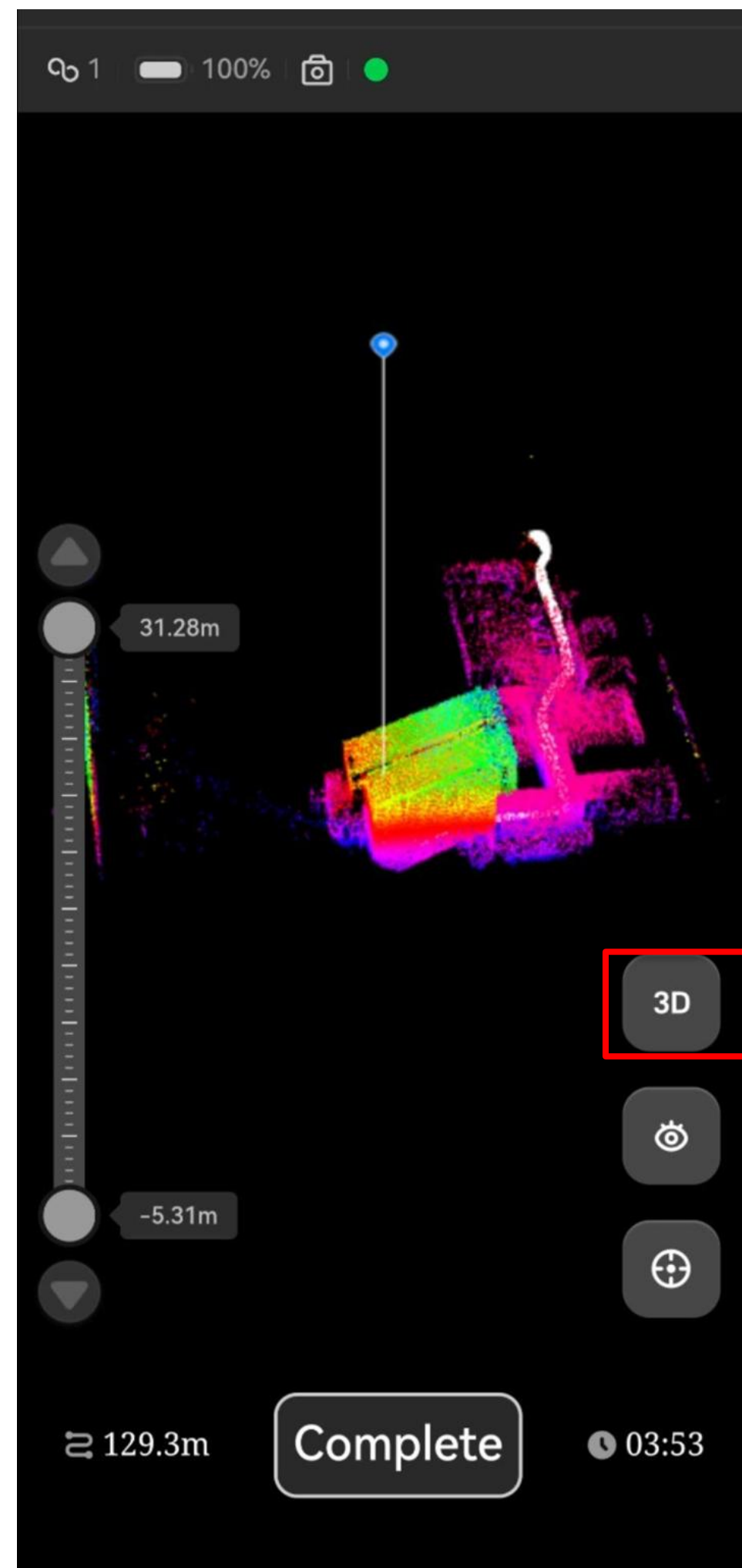


Check loop closure, battery and camera status in real-time.

Control points collection

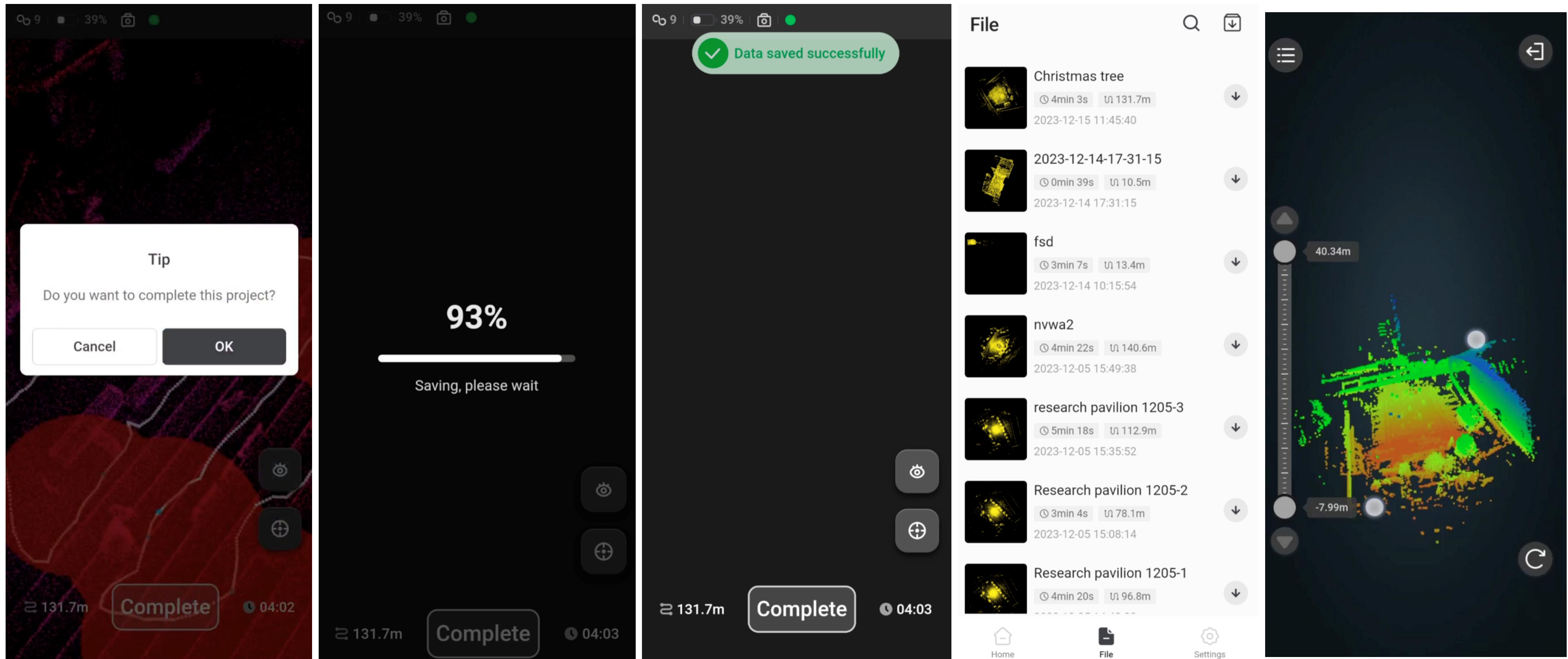


3D/2D view change



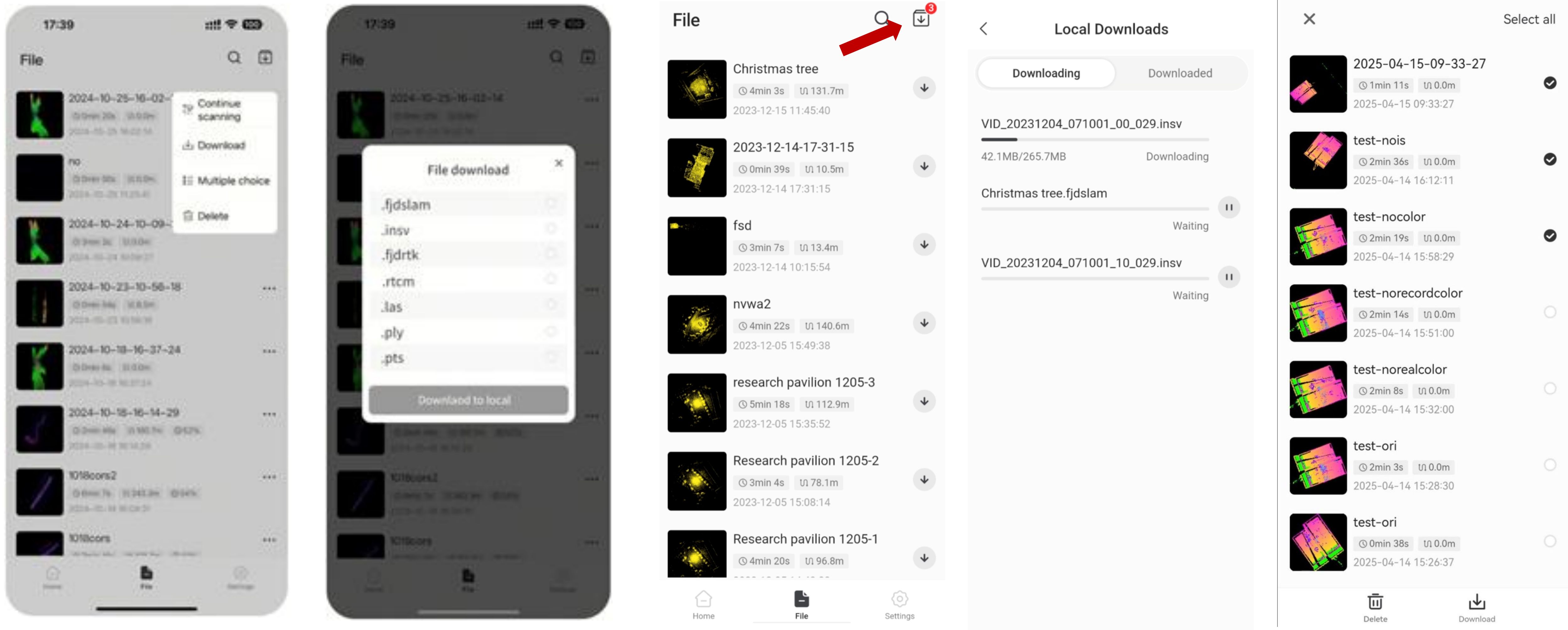


Save and view results





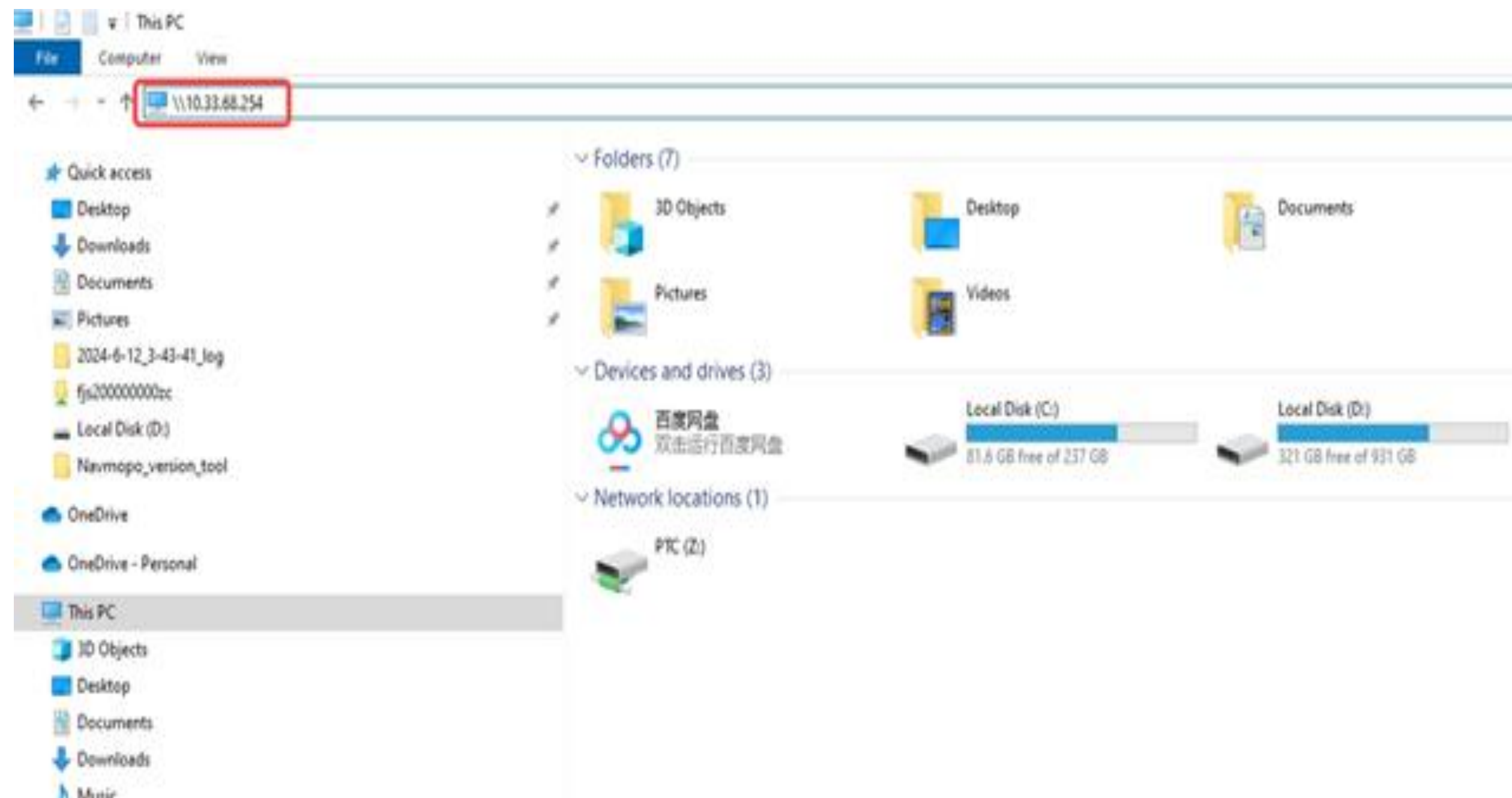
Download results – local



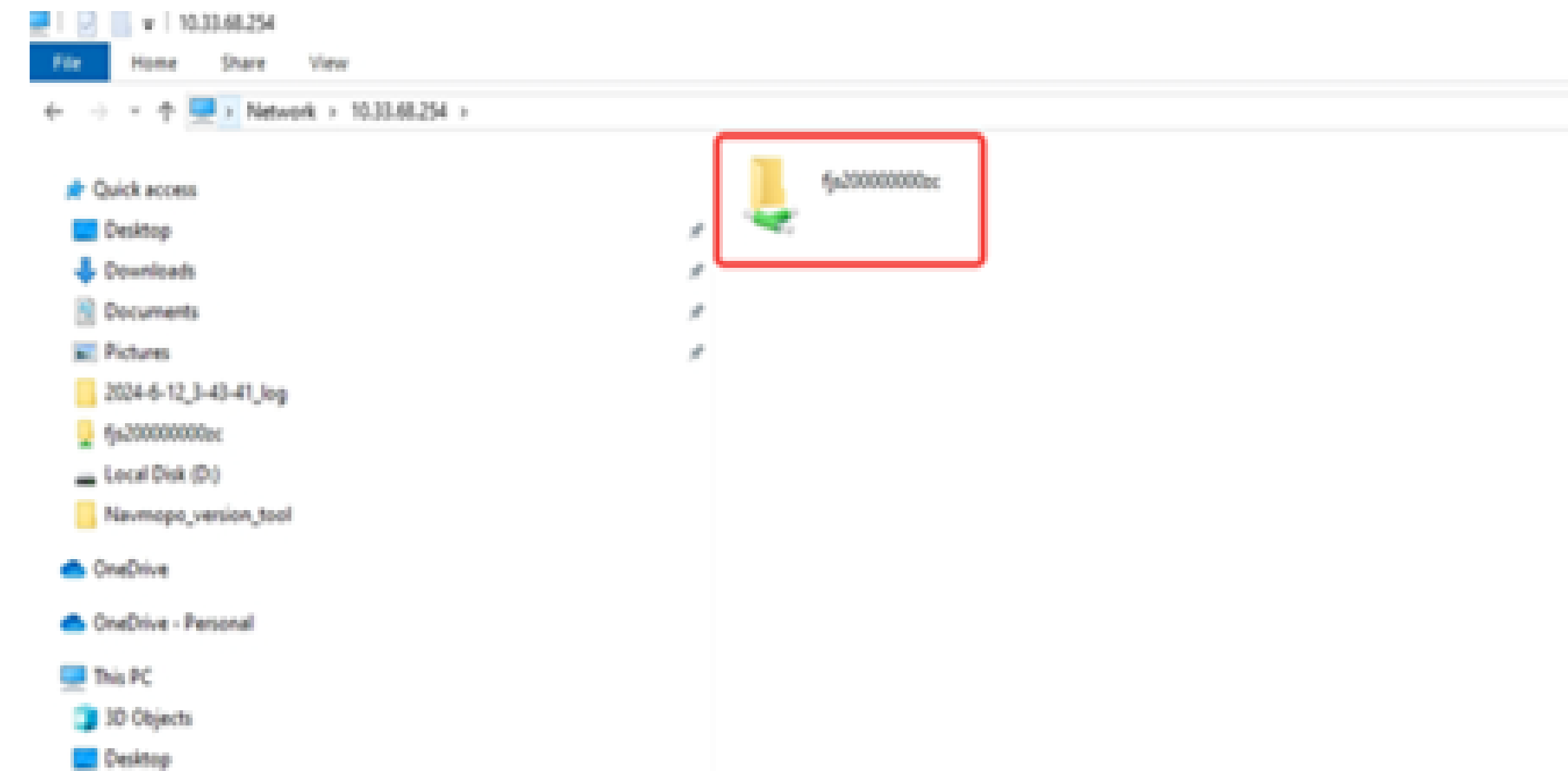
Click “more” and select download

Muti-download supported

Download results - Type-c cable



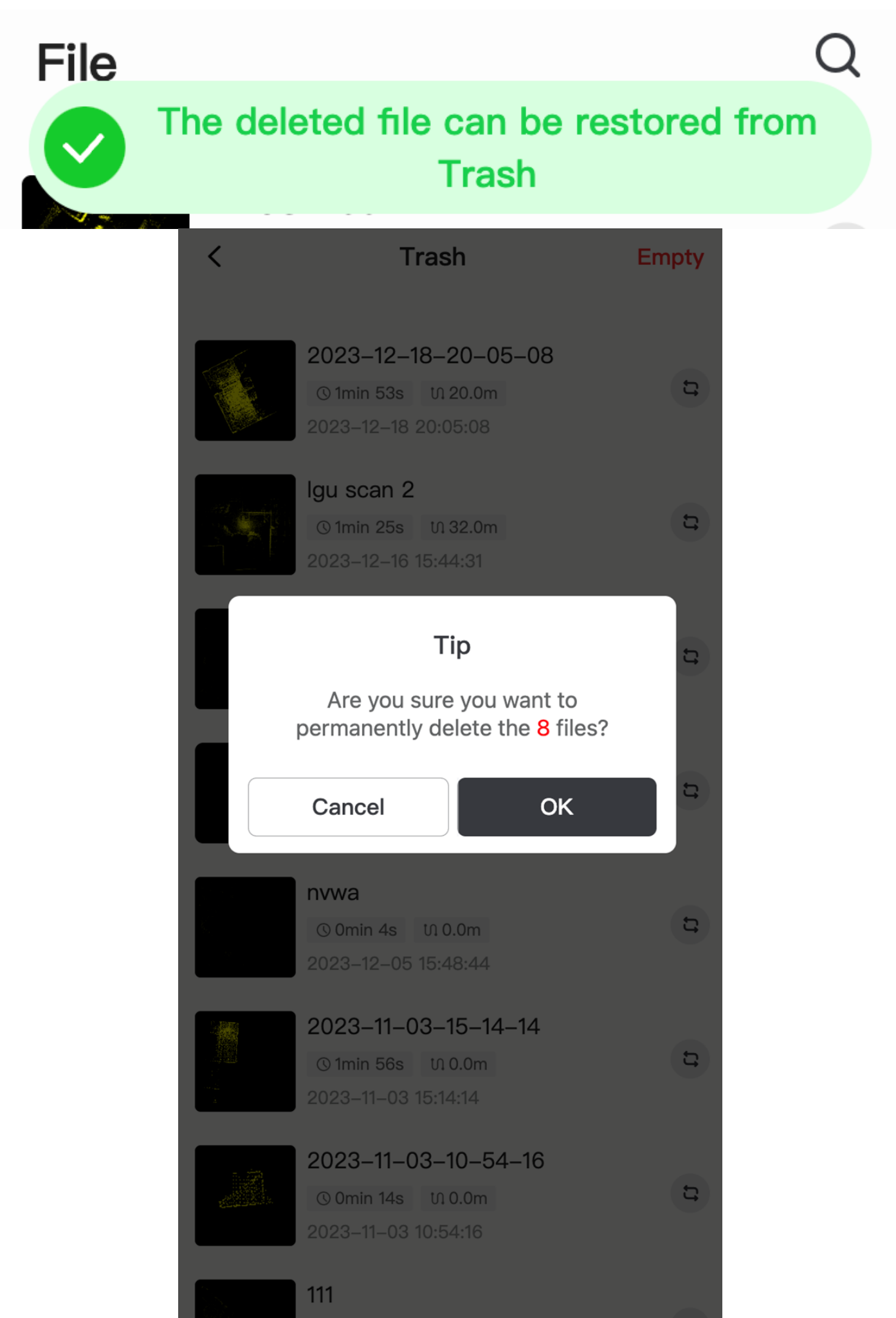
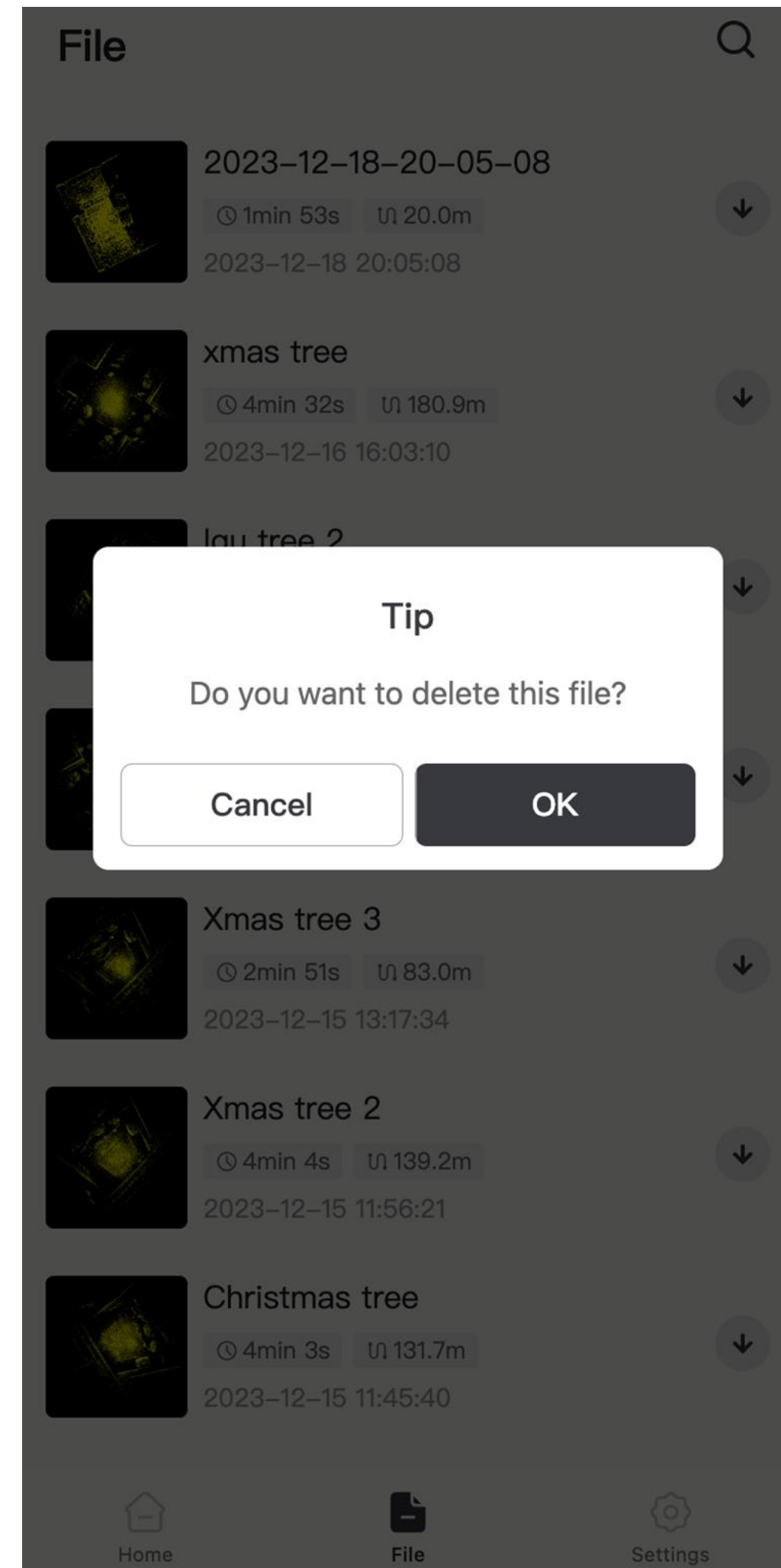
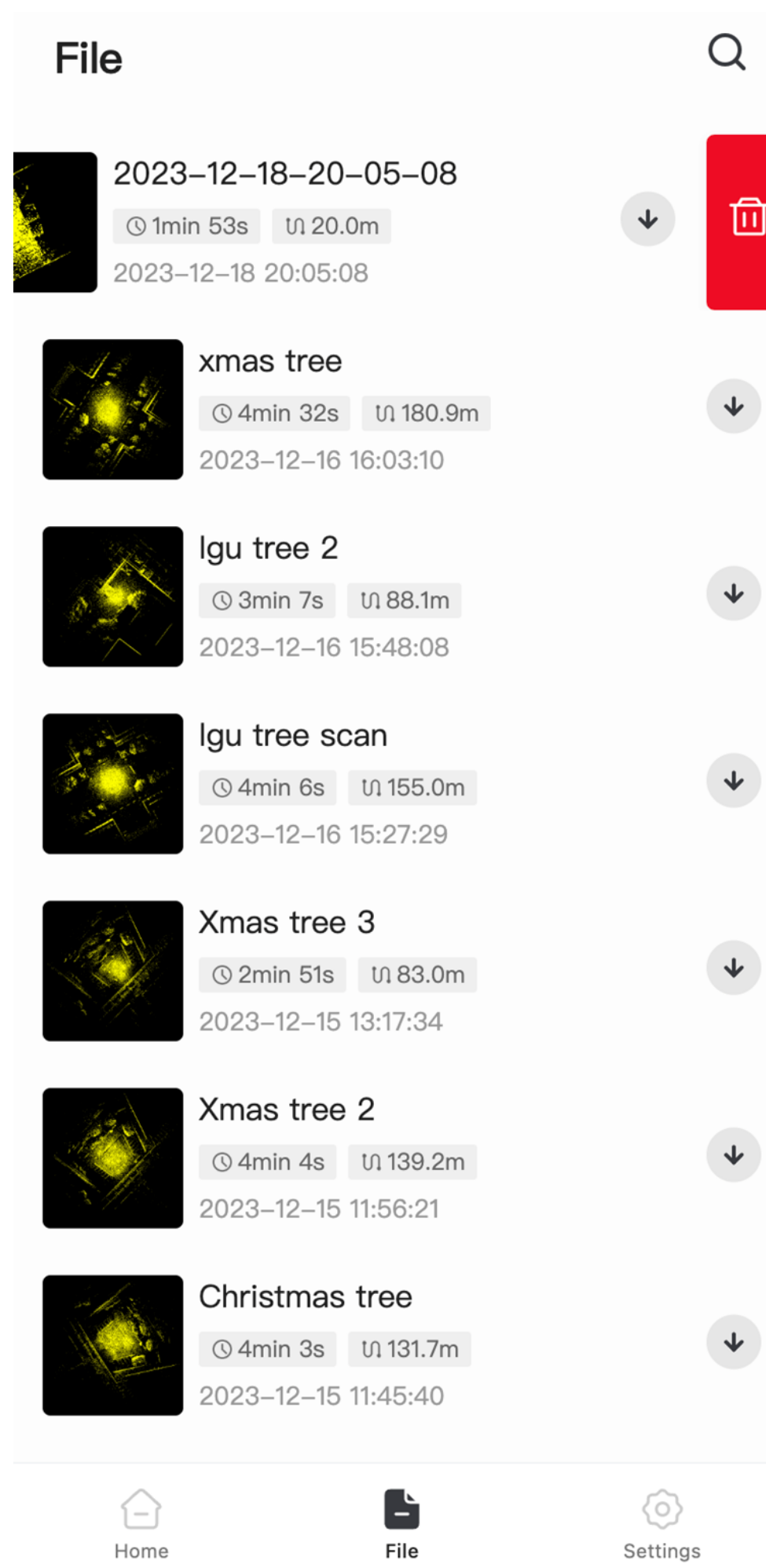
1. Connect Scanner and PC with TypeC cable



2. Enter `\\10.33.68.254` in the computer's file explorer



Manage files



Slide files left to reveal trash bin icon

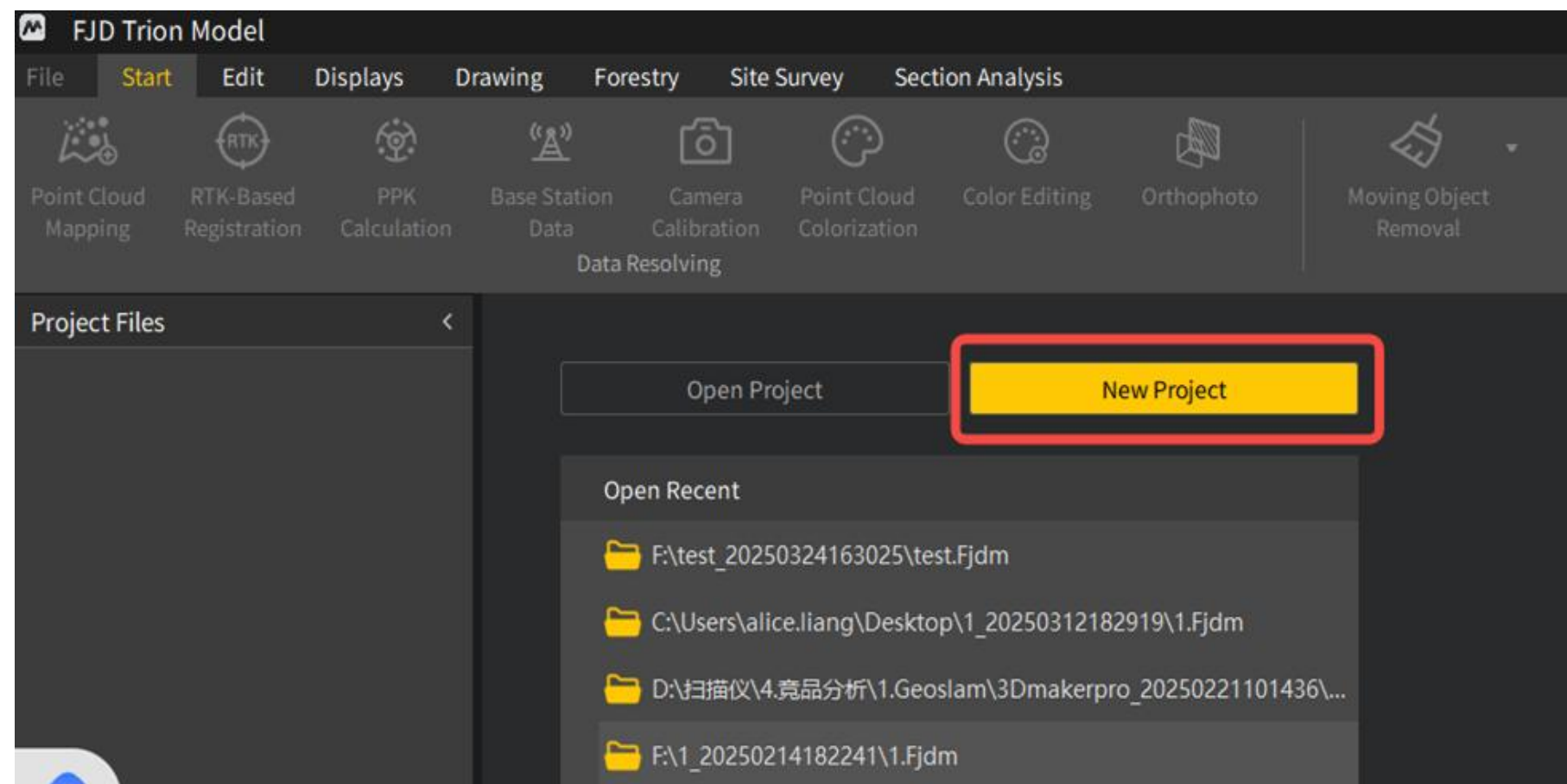
FJD Trion Scan – Browser Version



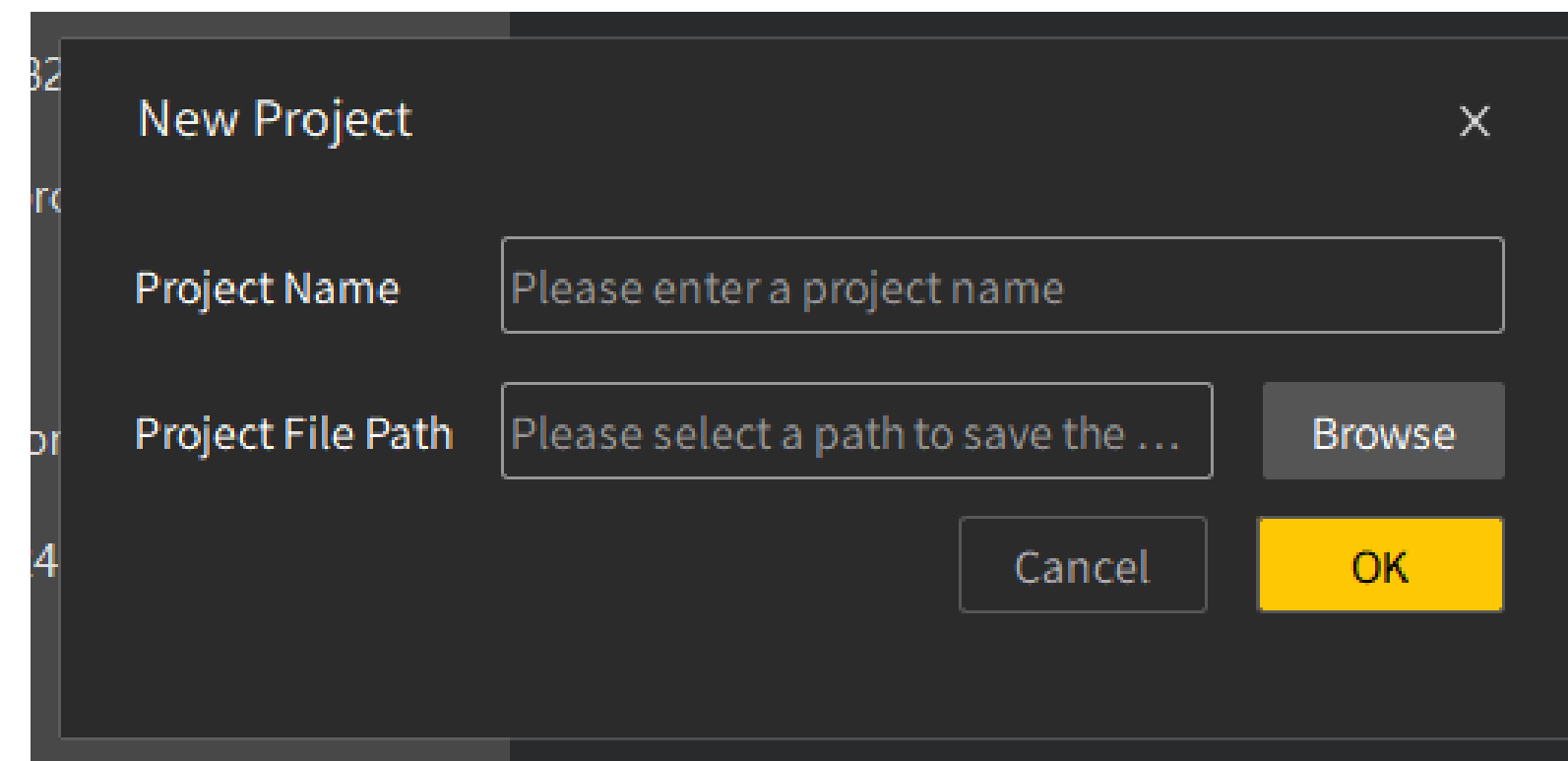
- Nearly identical interface as the App, and is updated in tandem with the App.
- Follow the same steps to connect:
 1. Connect your PC to S2's WiFi
 2. Enter **10.33.68.254** in a browser (Chrome recommended)

Great for downloading data in bulk onto the PC you're running FJD Trion Model on.

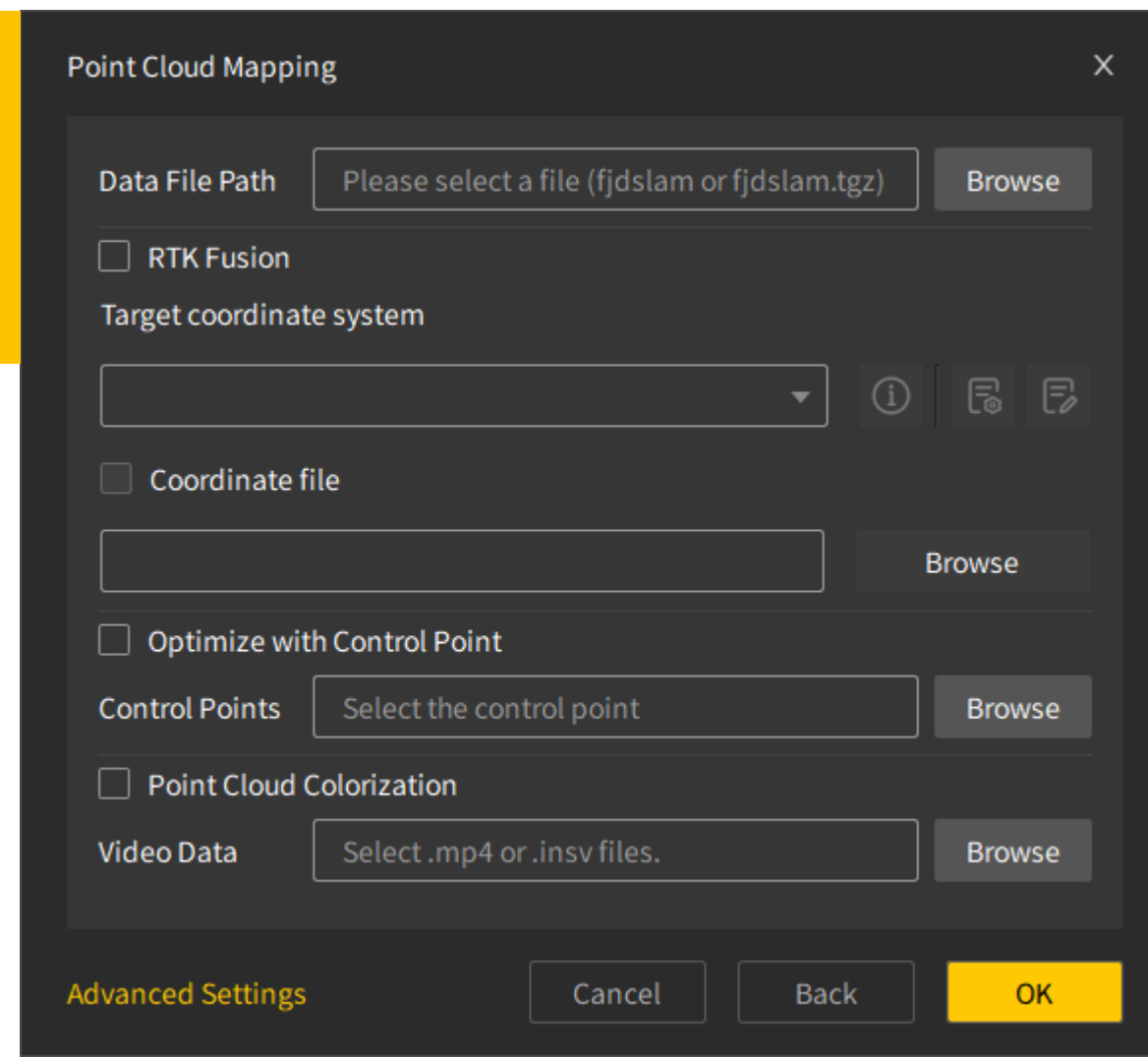
Data processing-get las.data



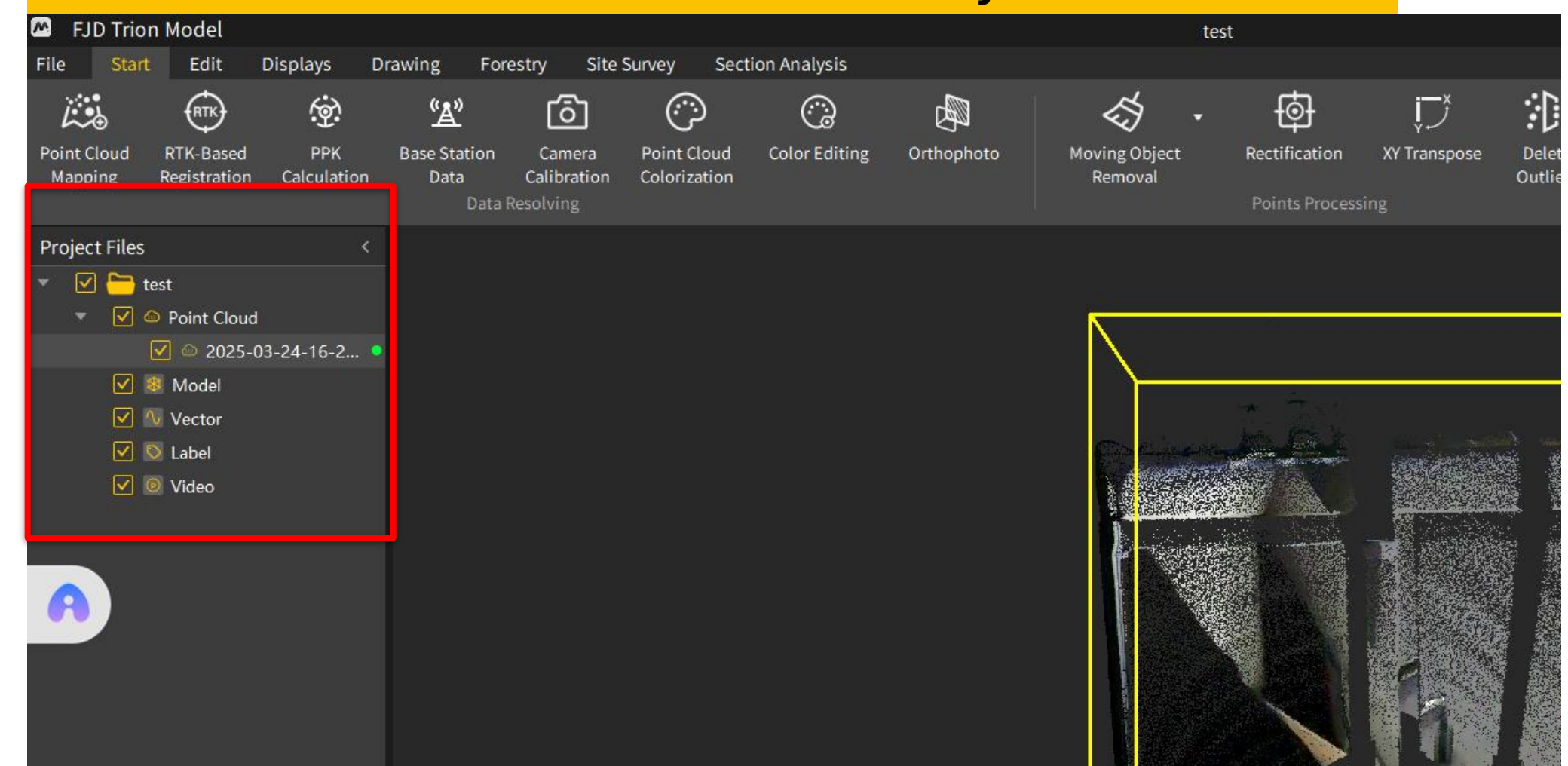
1. Create a new project



2. Click "Point Cloud Mapping" and drop the raw data accordingly



3. Check the las data under Project data



How to Optimize Scanning Results

The background is a dark, atmospheric illustration of a city street at night. On the left, a large, multi-story building with arched windows and doorways is visible. In the center, a street with a white crosswalk leads into the distance. On the right, another building with a prominent chimney and arched windows stands. A small, bare tree is on the far right. The overall scene is dimly lit, with some light reflecting off the street surface.

Principles to remember

1. Evaluate the site ahead of the scan
2. Avoid moving people or objects
3. Initialize on a flat surface
4. Close the loops (Big and Small)!
5. Transition carefully between spaces

Before you start

- **Equipment Check:**

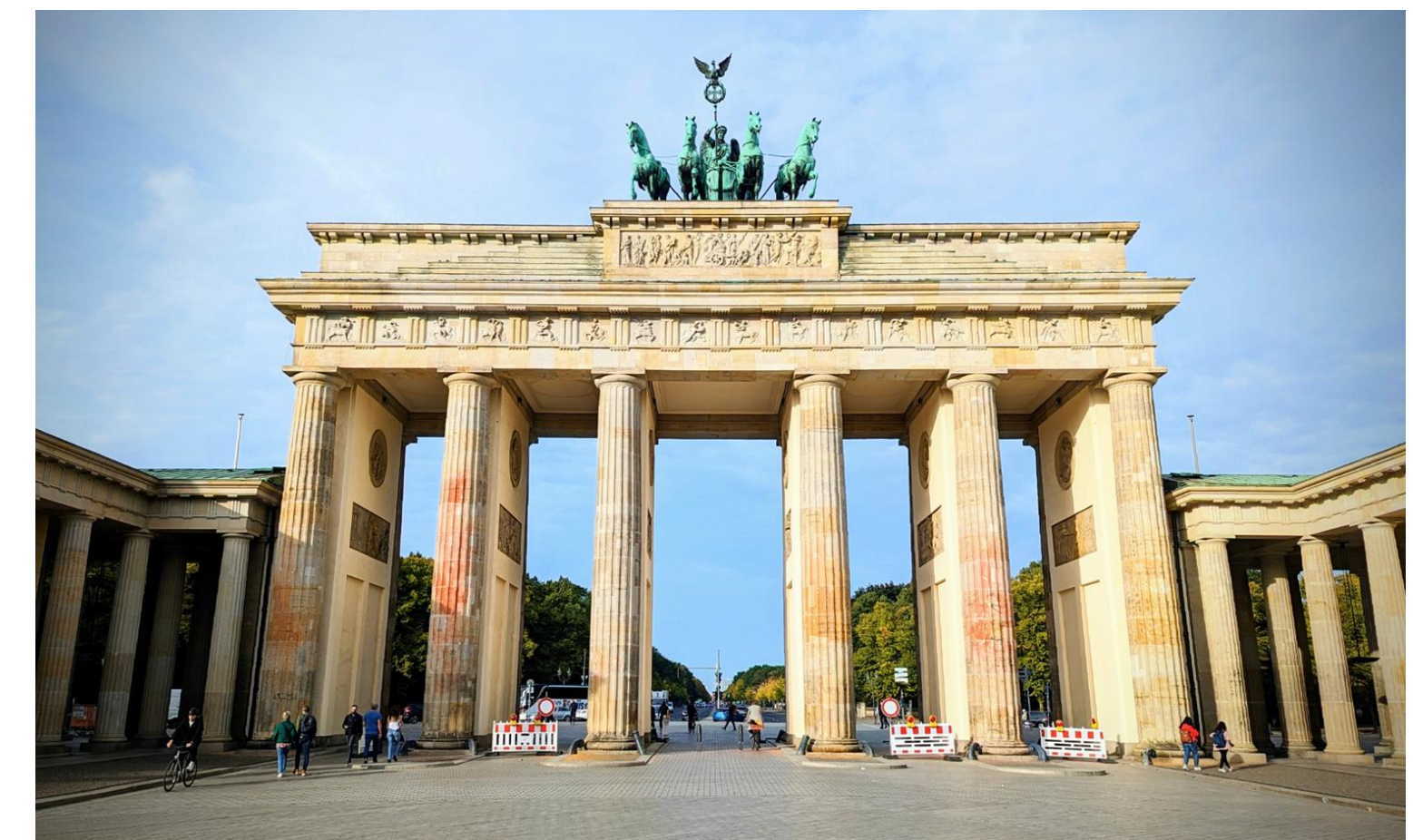
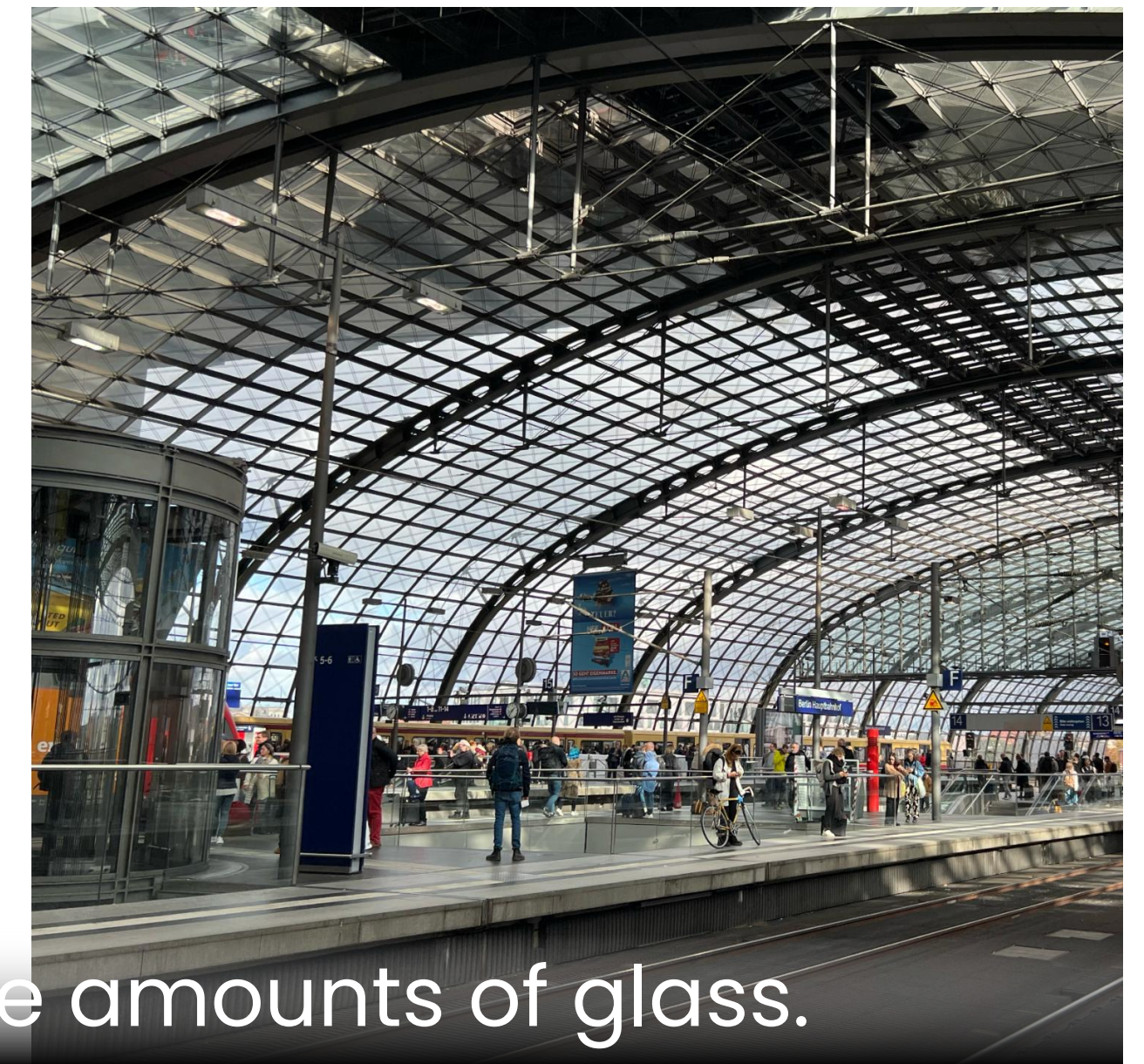
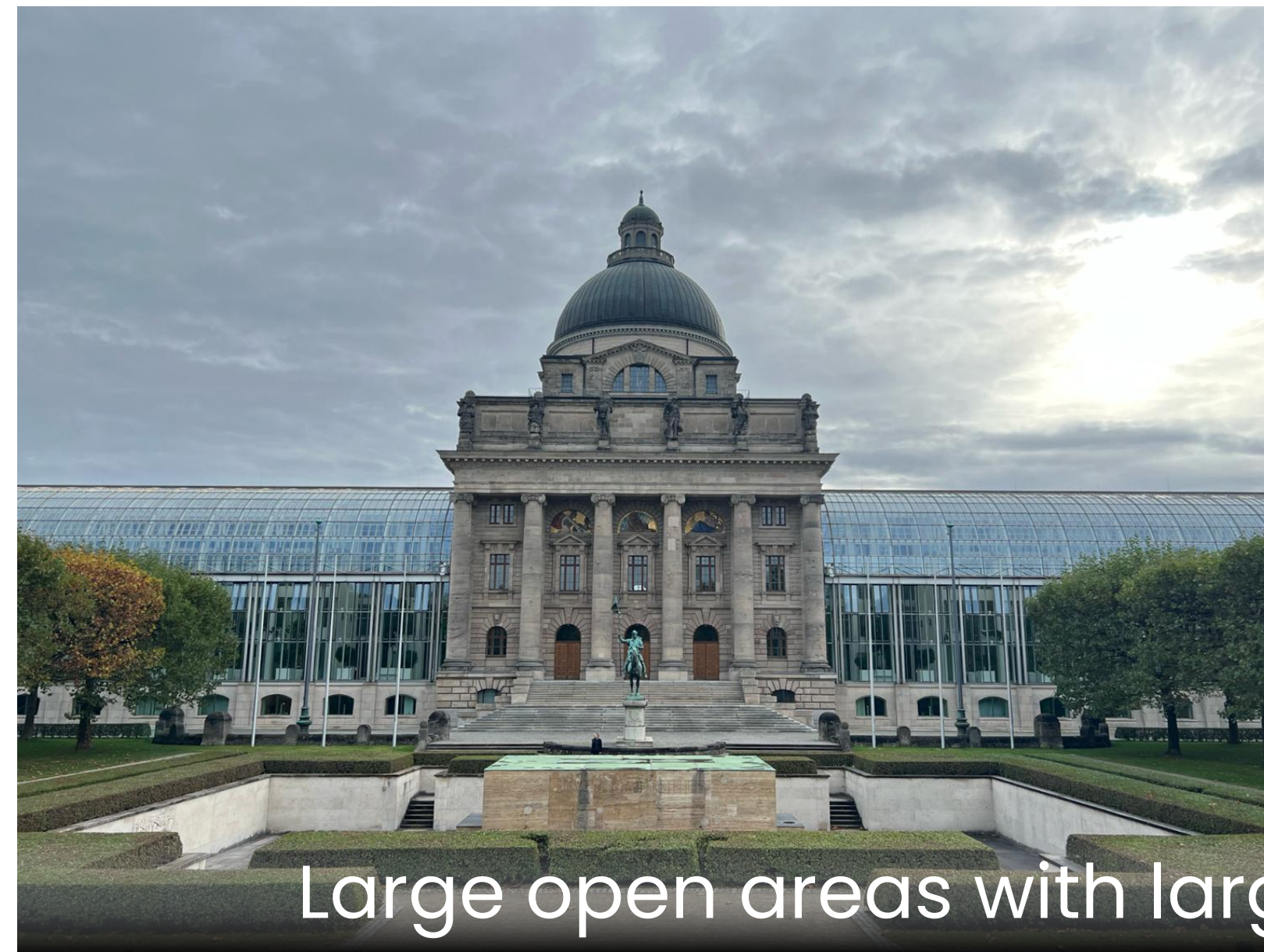
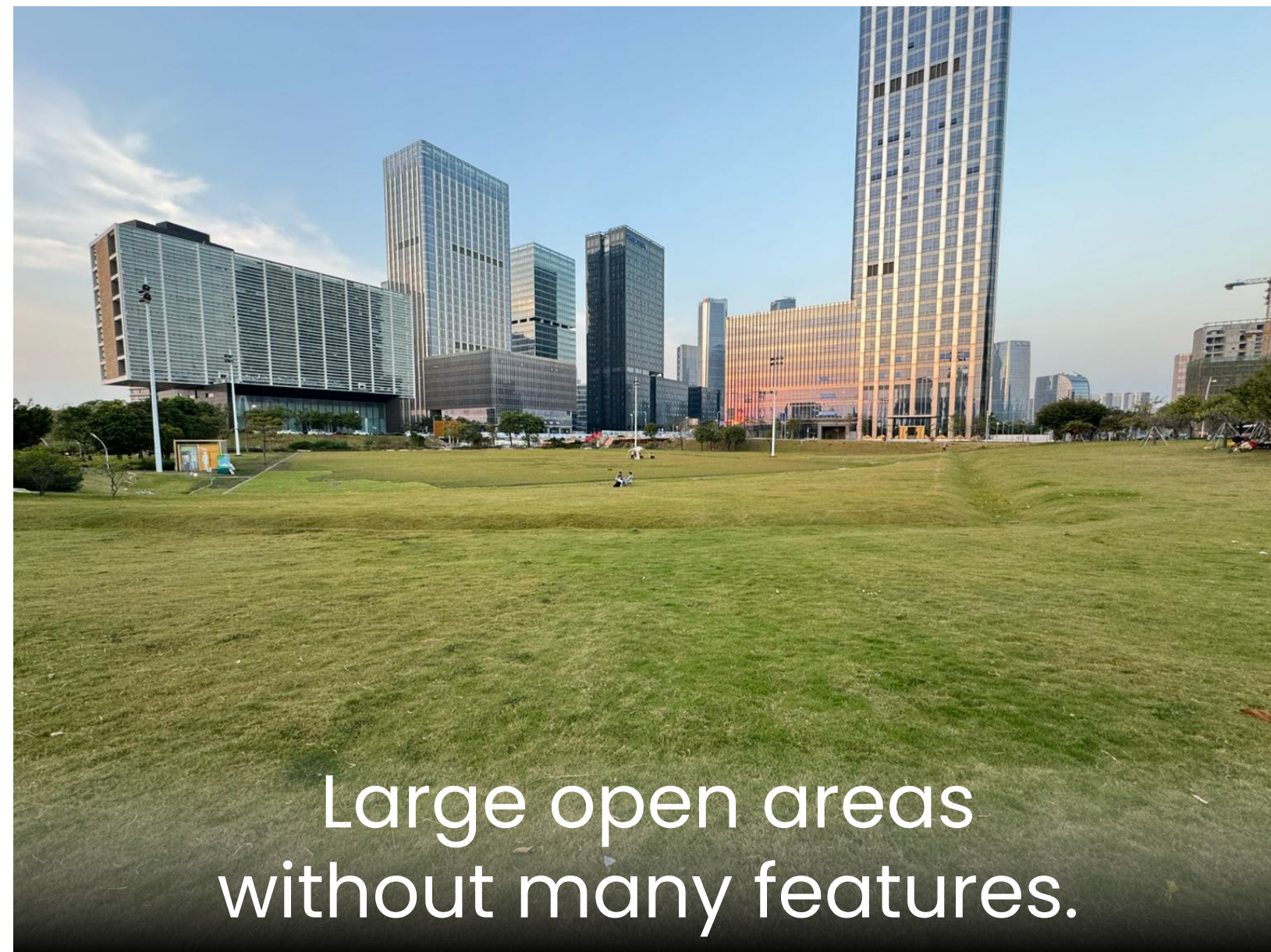
- Batteries charged, all parts of the scanner are in good condition.
- No known data collection or download issues.
- Clean the scanner head before every scan.

- **Site Evaluation:**

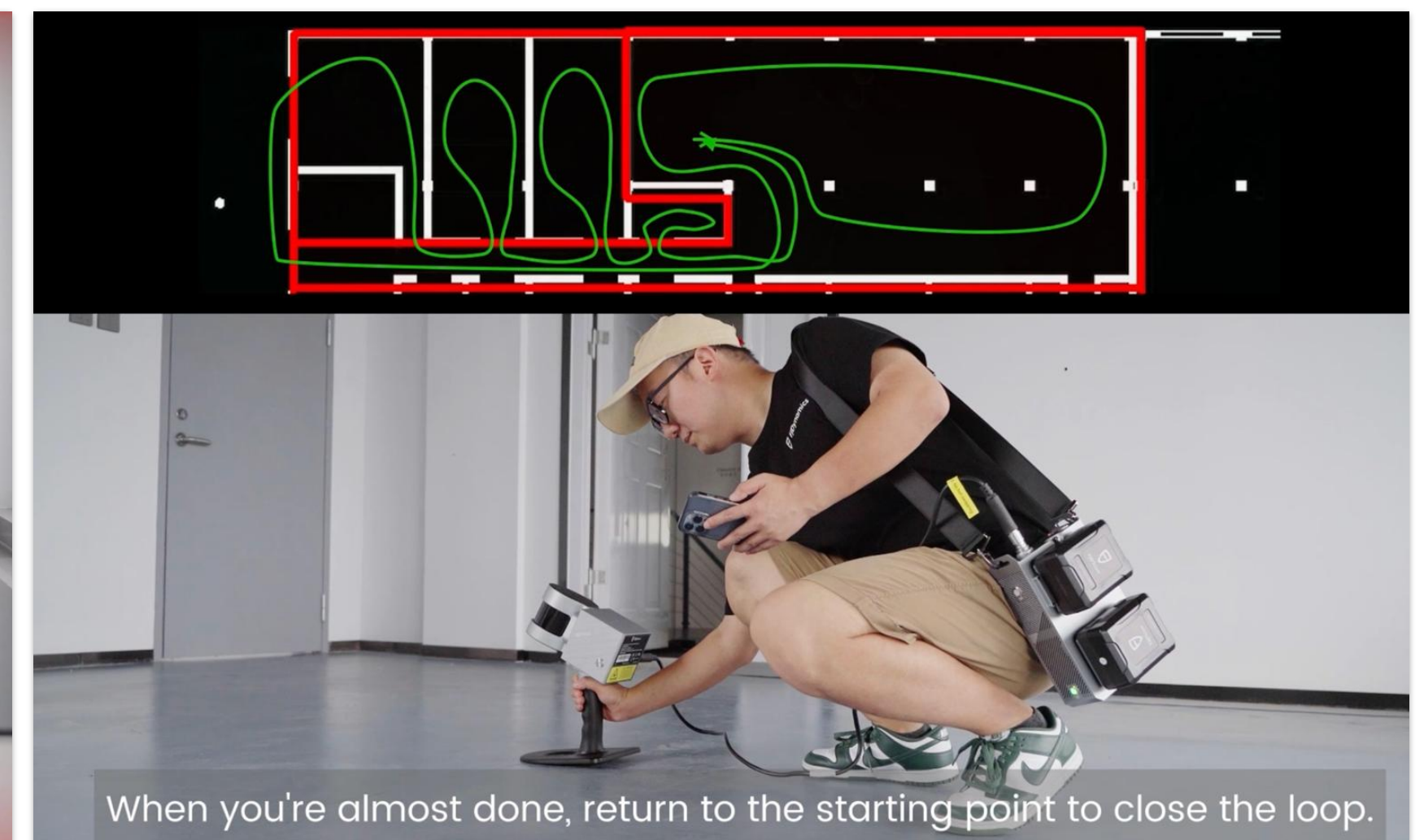
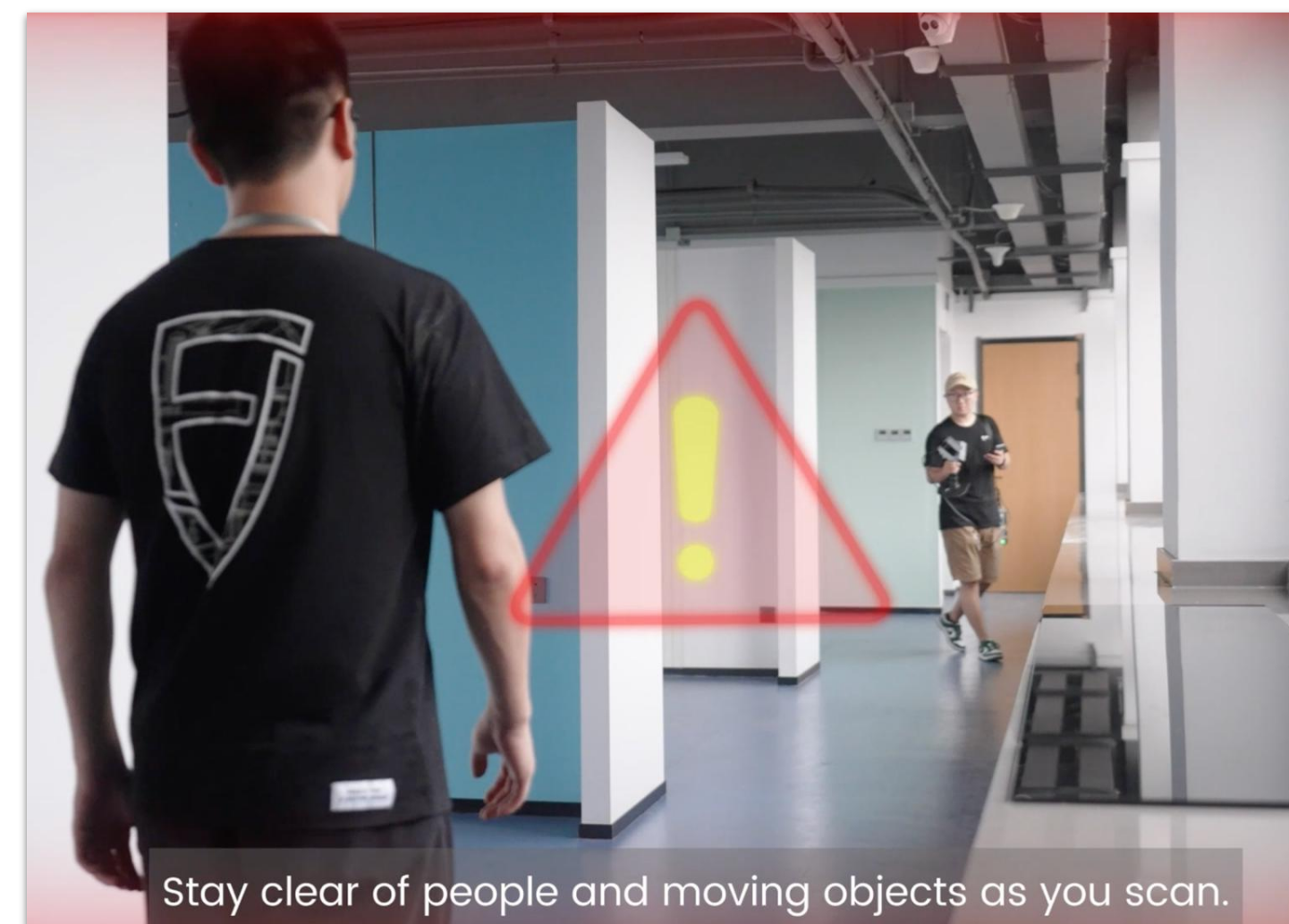
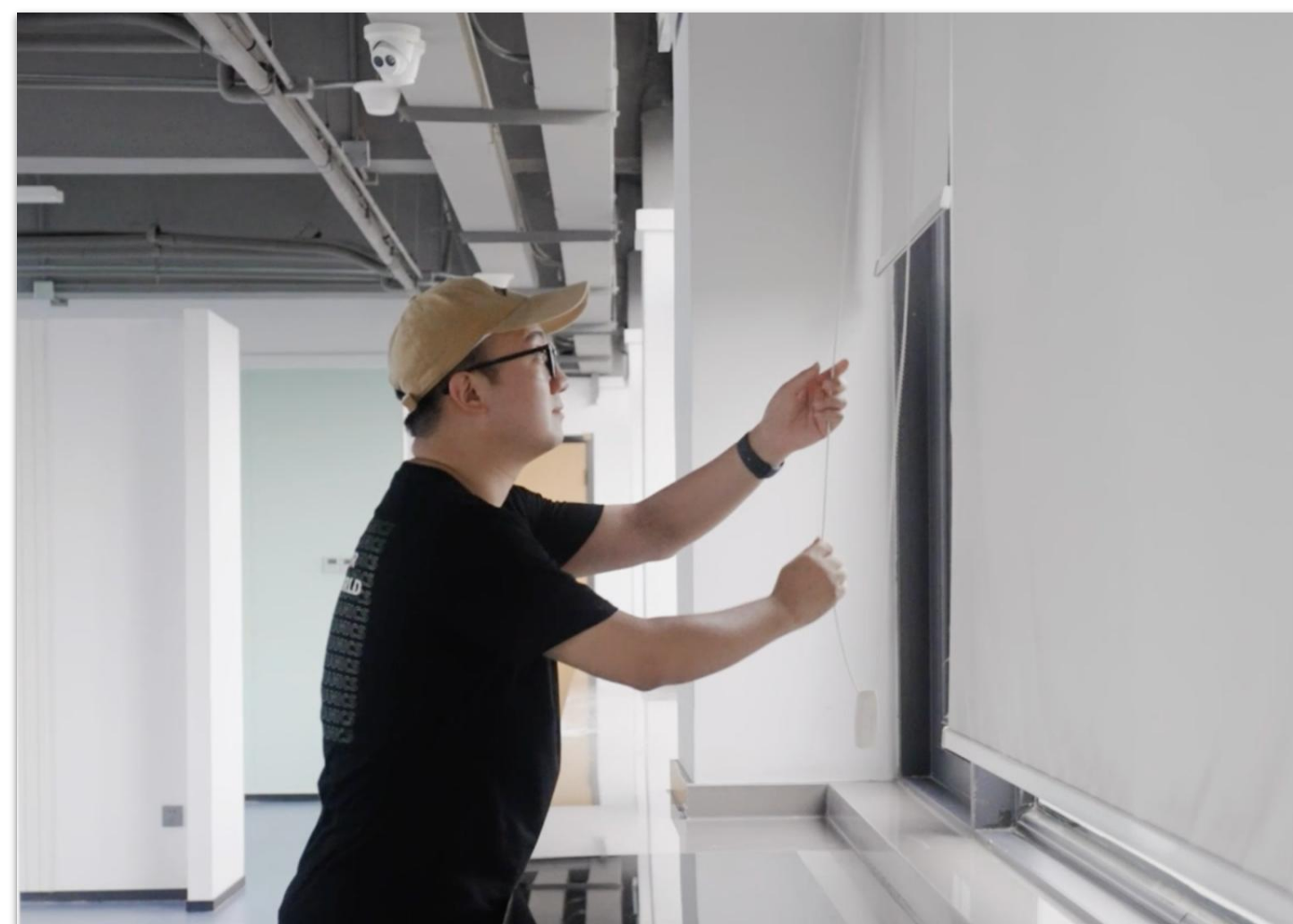
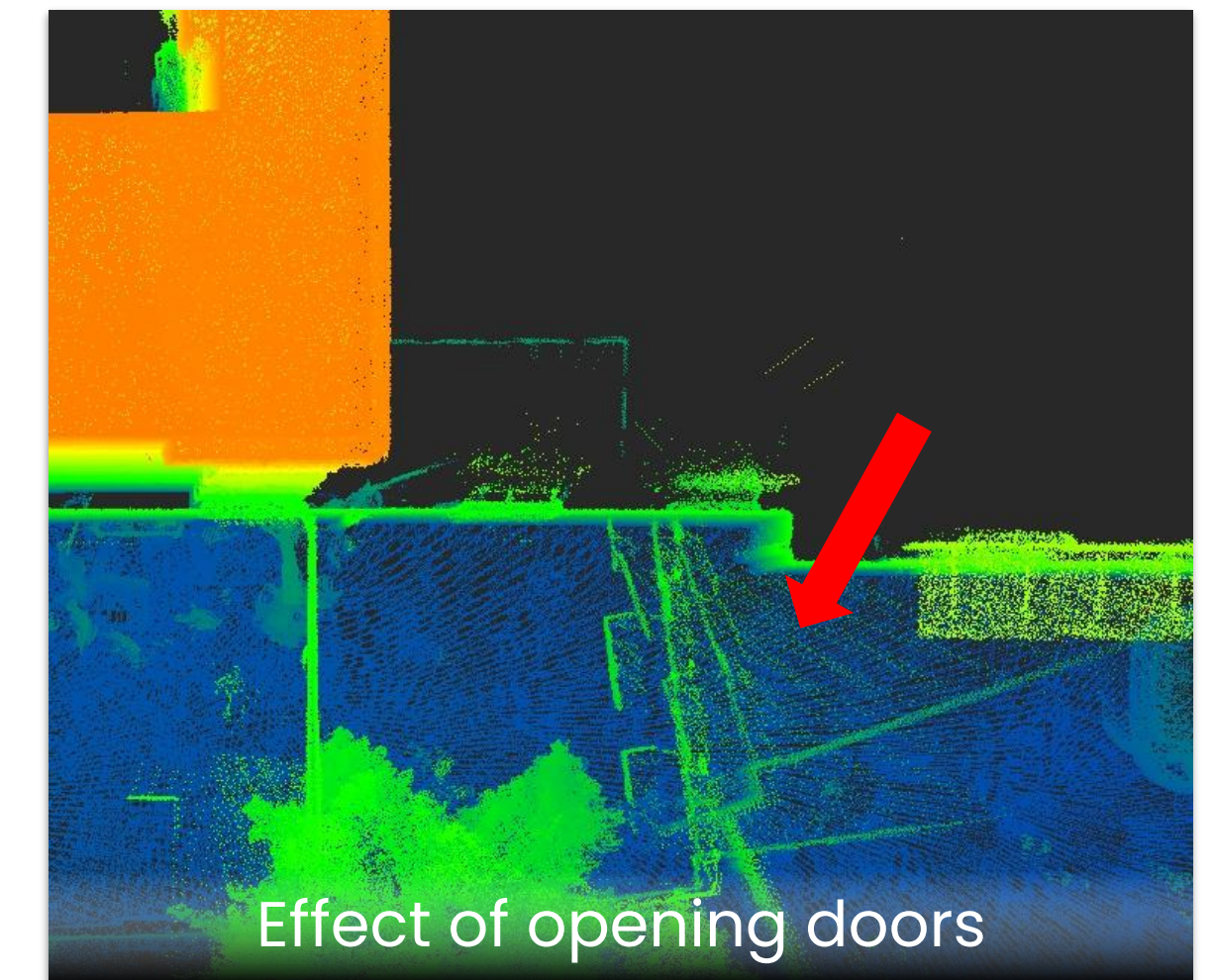
- Before scanning, thoroughly assess the site by considering the following:
 - Divide the scan into sub-tasks if needed
 - e.g. multiple floors, indoor/outdoor, and complexity (staircases, rooms with a lot of windows).
 - Identify challenging areas (inaccessible or with uniform textures), as well as locations that may impact trajectory (obstructions).
 - Organize objects and structures (e.g., open all doors) to minimize movement during scanning.



Potentially Challenging Environments



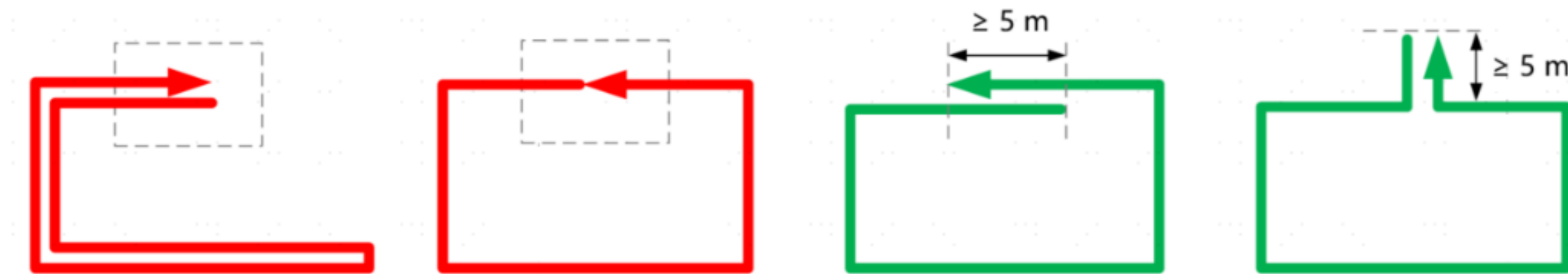
General Recommendations



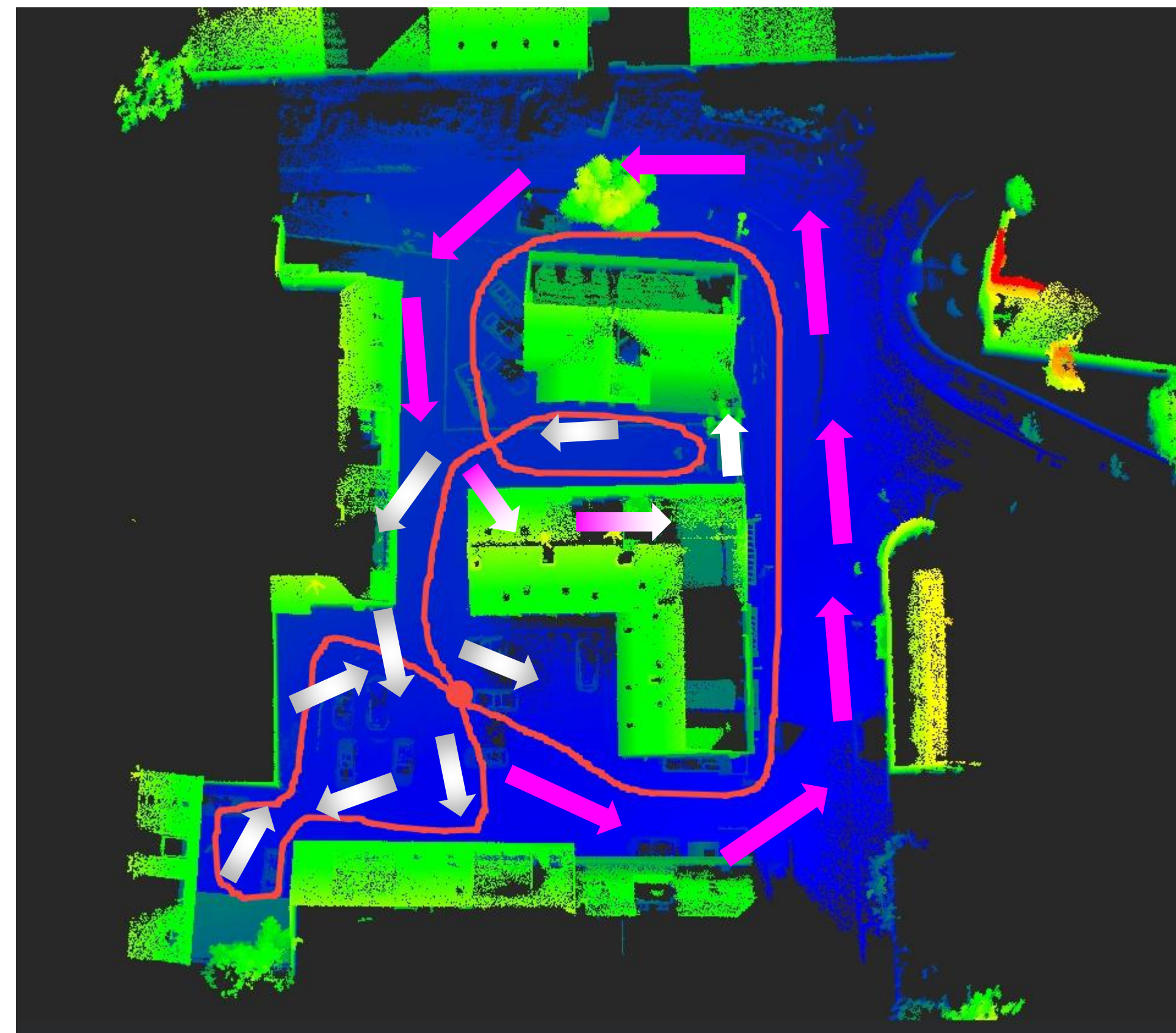
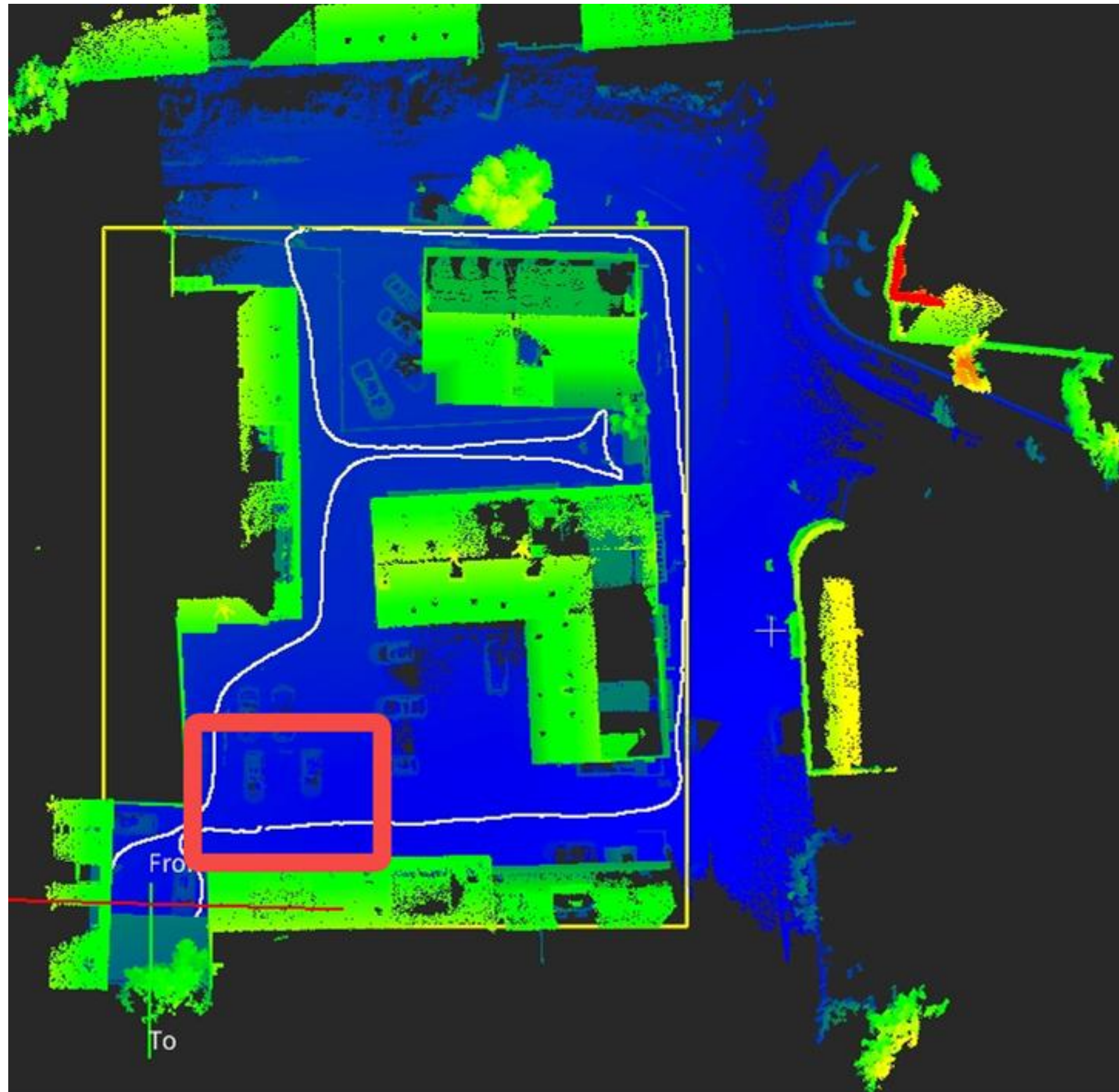
Loop Closure

When in doubt, try to close a loop!

- **Close the loop at start and end** positions to reduce cumulative errors.
- Multiple **smaller loops** are better than 1 large loop.
- Make sure **at least one big loop** can be closed around the perimeter of the site.
- Plan out multiple smaller loops for rooms or areas that are connected to each other.



Loop Closure Optimization Example



Loop Closure – Results

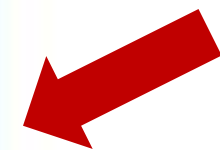


Walking direction

丰疆内部资料，禁止外传
FJ-XA-CL-230032
10.64.86.248
zijun.wang@fjz.local
2025/02/11



colorization target



保持距离正常行走
maintain distance and walk normally

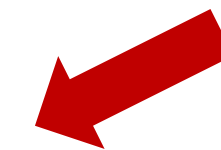
丰疆内部资料，禁止外传
FJ-XA-CL-230032
10.64.86.248
zijun.wang@fjz.local
2025/02/11



丰疆内部资料，禁止外传
FJ-XA-CL-230032
10.64.86.248
zijun.wang@fjz.local
2025/02/11



colorization target



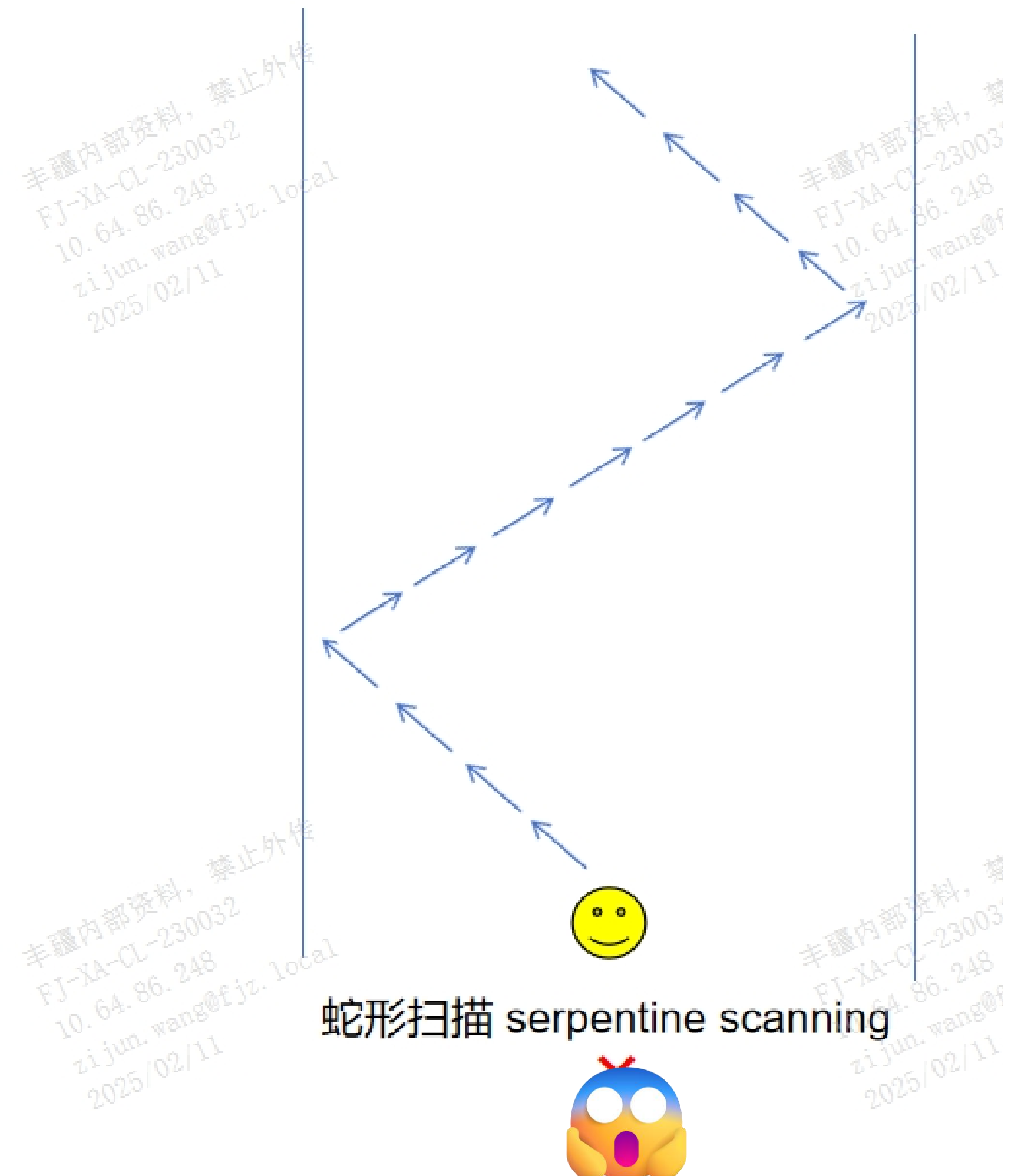
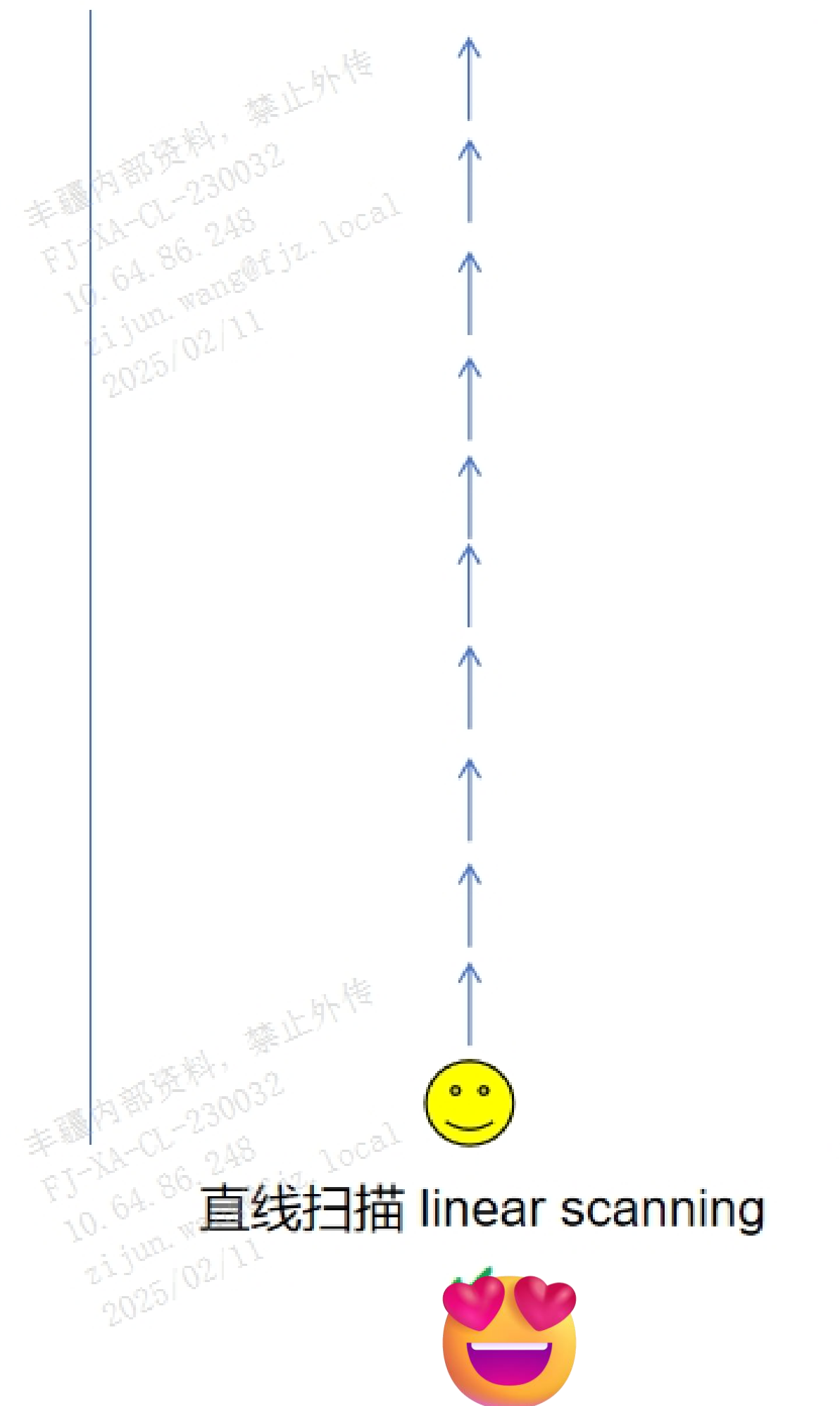
刻意朝向待赋色立面横移
deliberately facing towards the facade

丰疆内部资料，禁止外传
FJ-XA-CL-230032
10.64.86.248
zijun.wang@fjz.local
2025/02/11



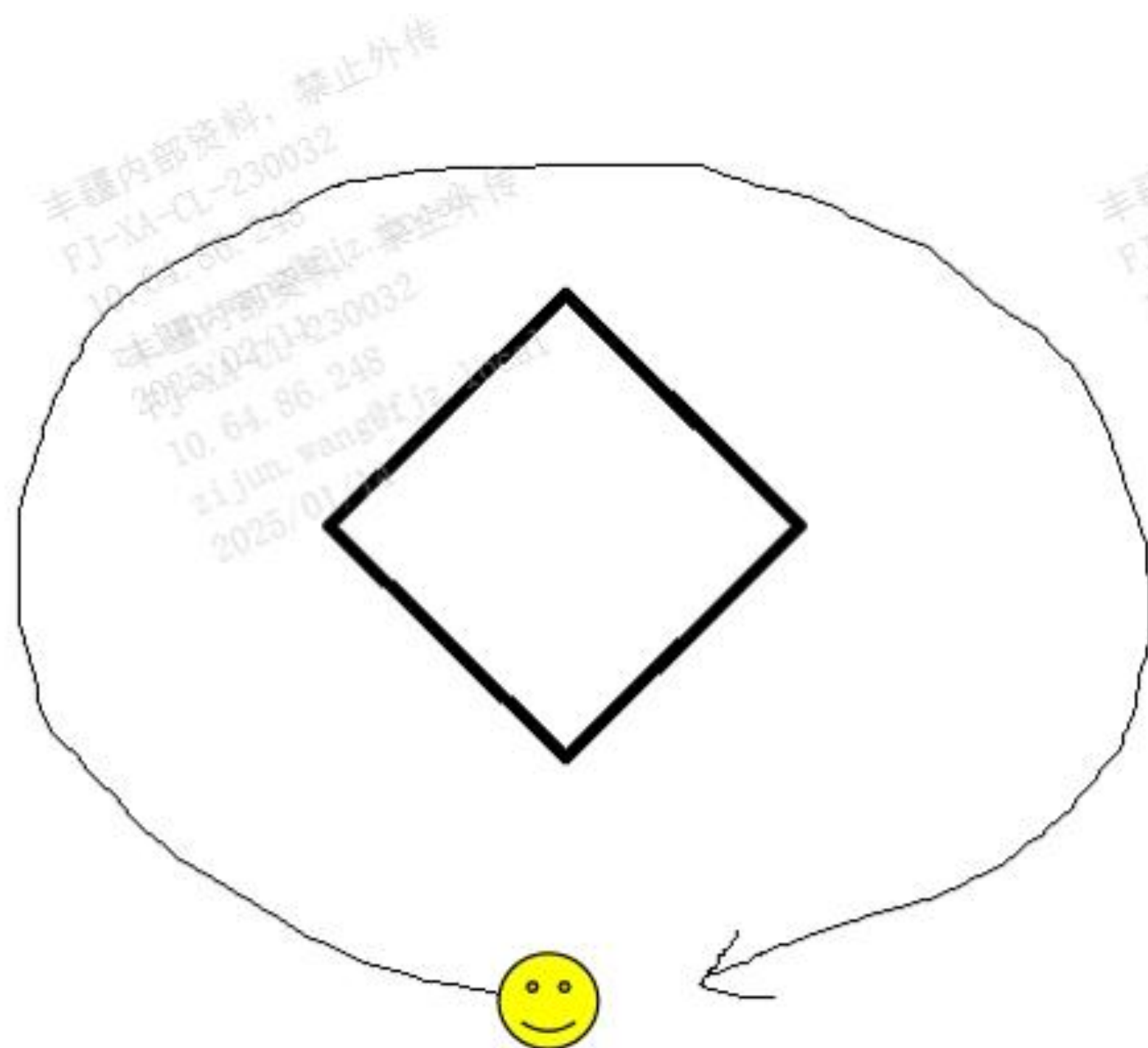
丰疆内部资料，禁止外传
FJ-XA-CL-230032
10.64.86.248
zijun.wang@fjz.local
2025/02/11

Walking direction

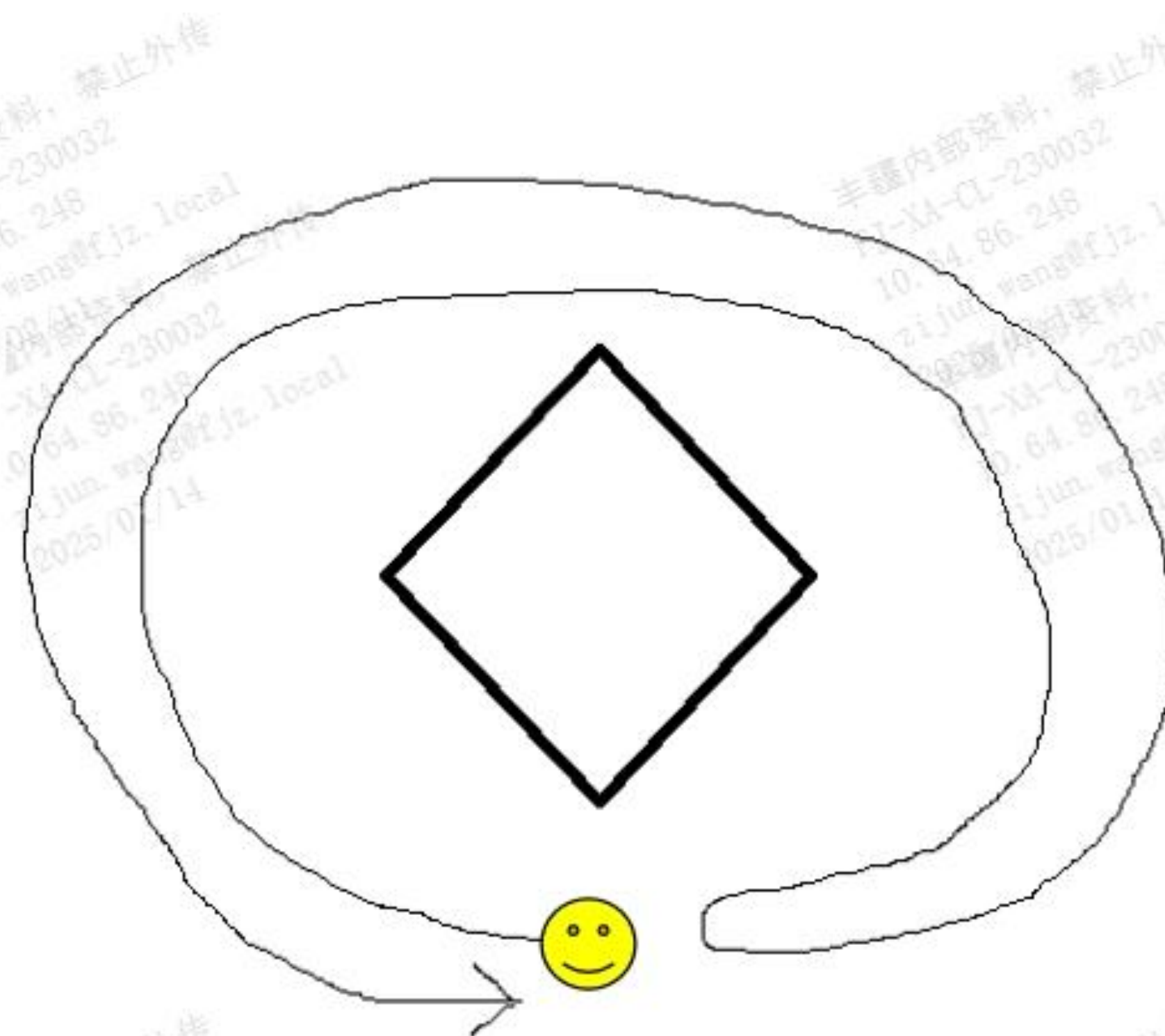




Walking direction



单次扫描 single scan



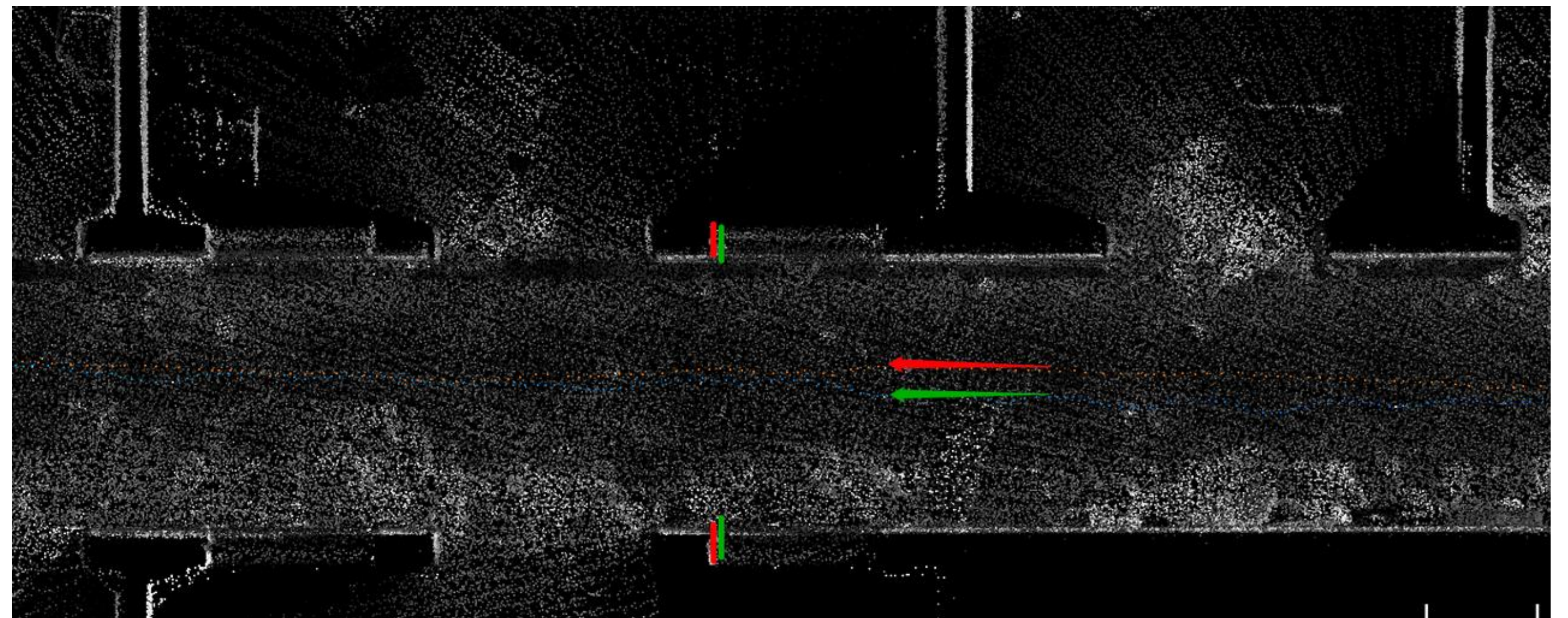
往返扫描 reciprocal scanning



Corridors and Small Rooms

- Consider scanner FOV:
 - S2: $360^\circ \times 270^\circ$
- Scan separately
- Add features manually (chairs/stools etc.)
- Form small closed loops

[Watch video](#)



Pro Tips

Data Processing

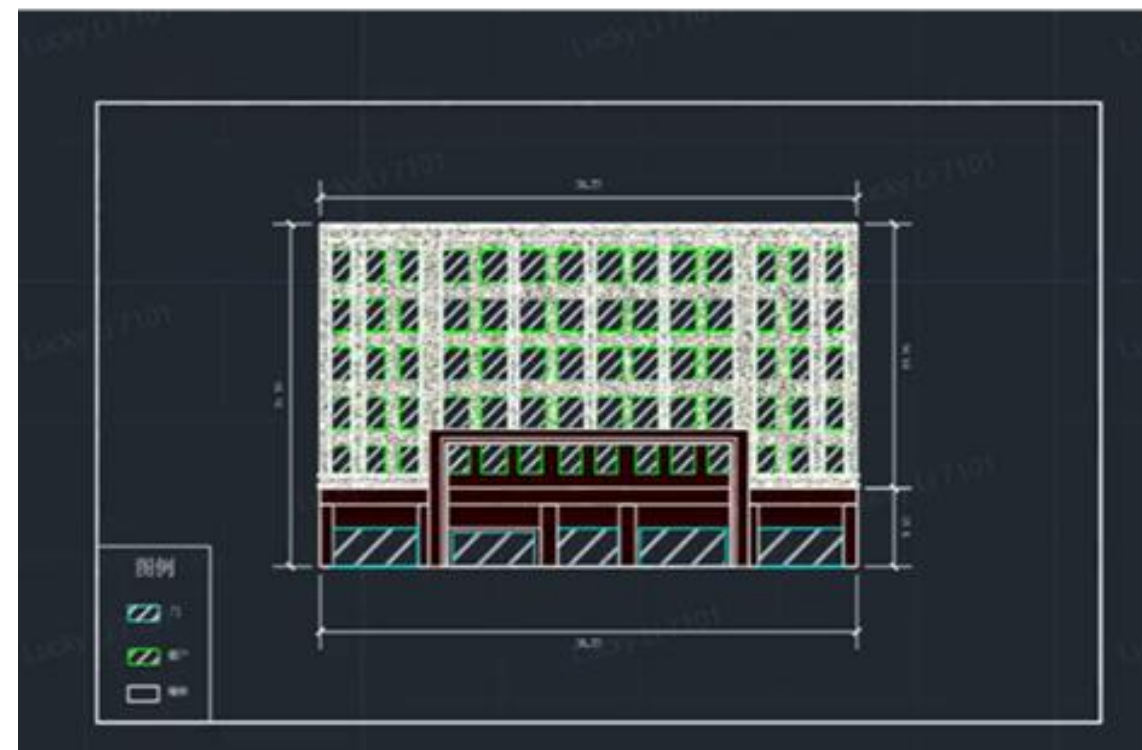
- 1. Clean the point cloud before registration,** like reflections, points behind glass and windows, and obvious noise from mirrors, filtering out low intensity points (values like 0, 1, 2, 3).
- 2. Use targets to register point clouds.** If possible, and for high accuracy projects – use a control network measured with total station or RTK.
- 3. Put the targets along your pre-planned scanning paths.** Best to put them in the direction of the scanner as you walk through the site. It's not ideal to turn the scanner away from the targets.

Case Studies

A dark, atmospheric night scene of a city street. The street is illuminated by warm, yellow light from buildings and streetlights, creating a strong contrast with the deep black night sky. On the left, a large, multi-story building with arched windows and a prominent chimney is visible. On the right, a row of colorful, multi-story buildings with varied architectural styles lines the street. A crosswalk with white stripes is visible in the foreground. The overall mood is mysterious and urban.

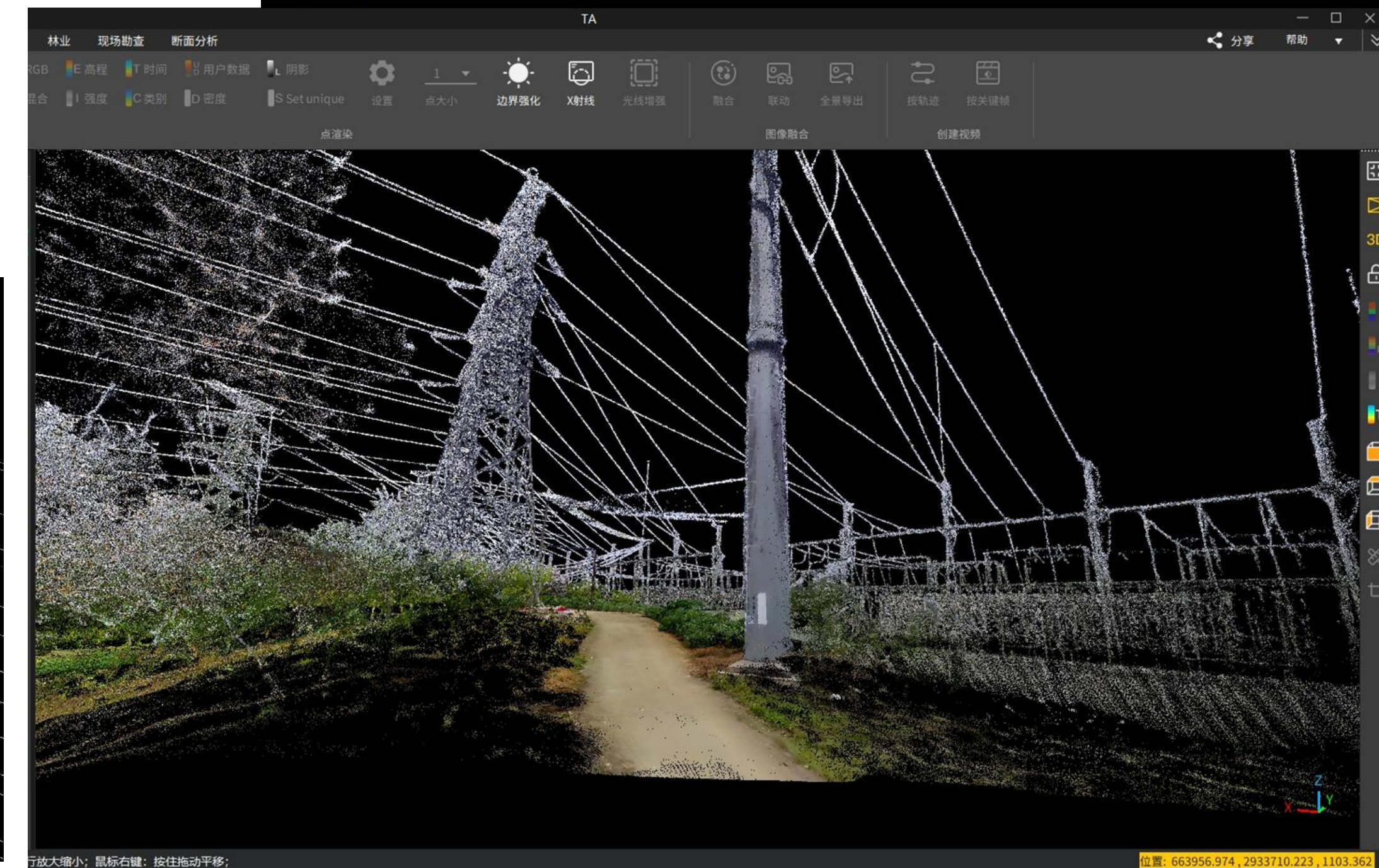
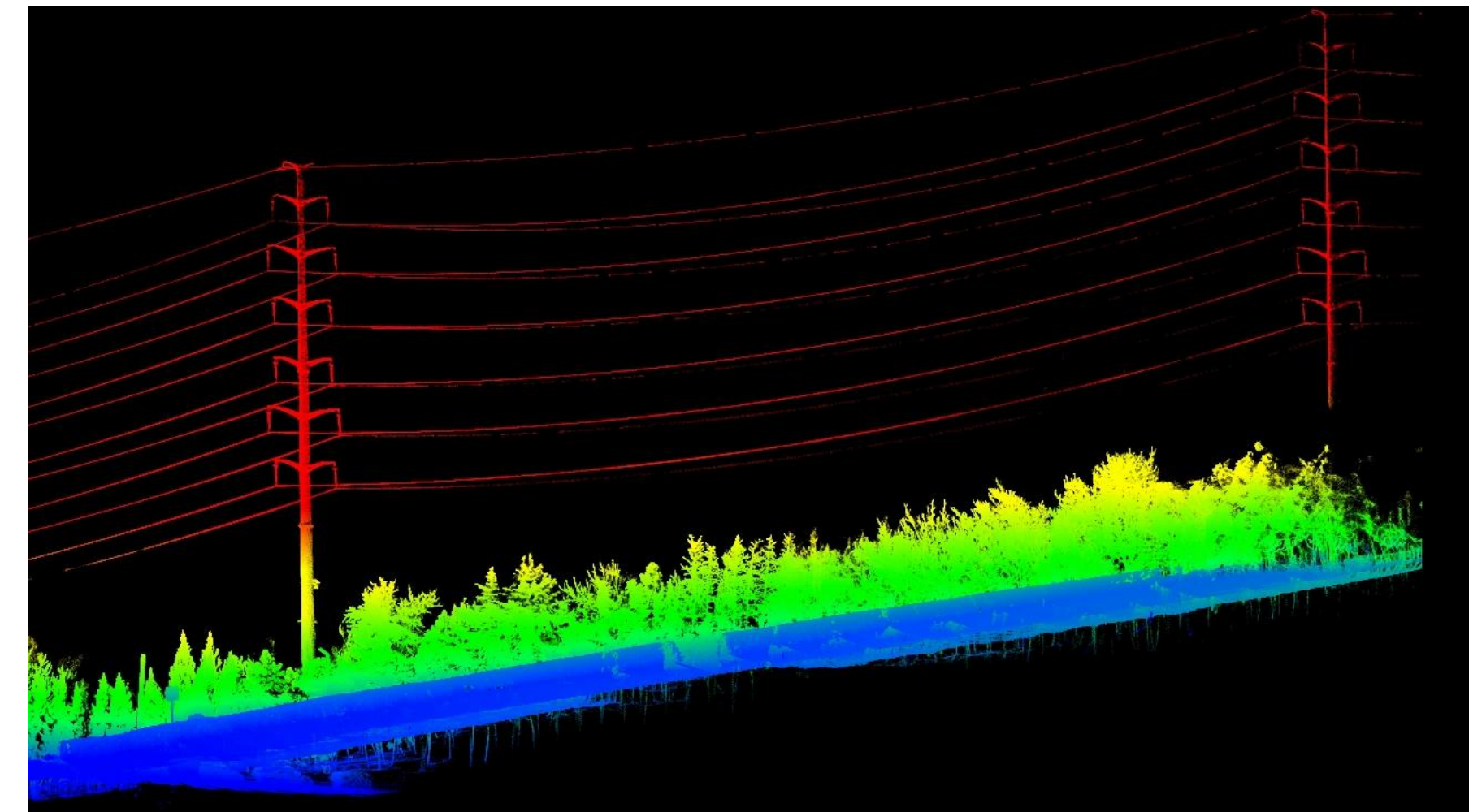
Tokyo university

- High-altitude point cloud coverage
- Uniform density distribution
- Crisp texture information



Powerline

Powerline inspection – scanned in a 20 minute walk

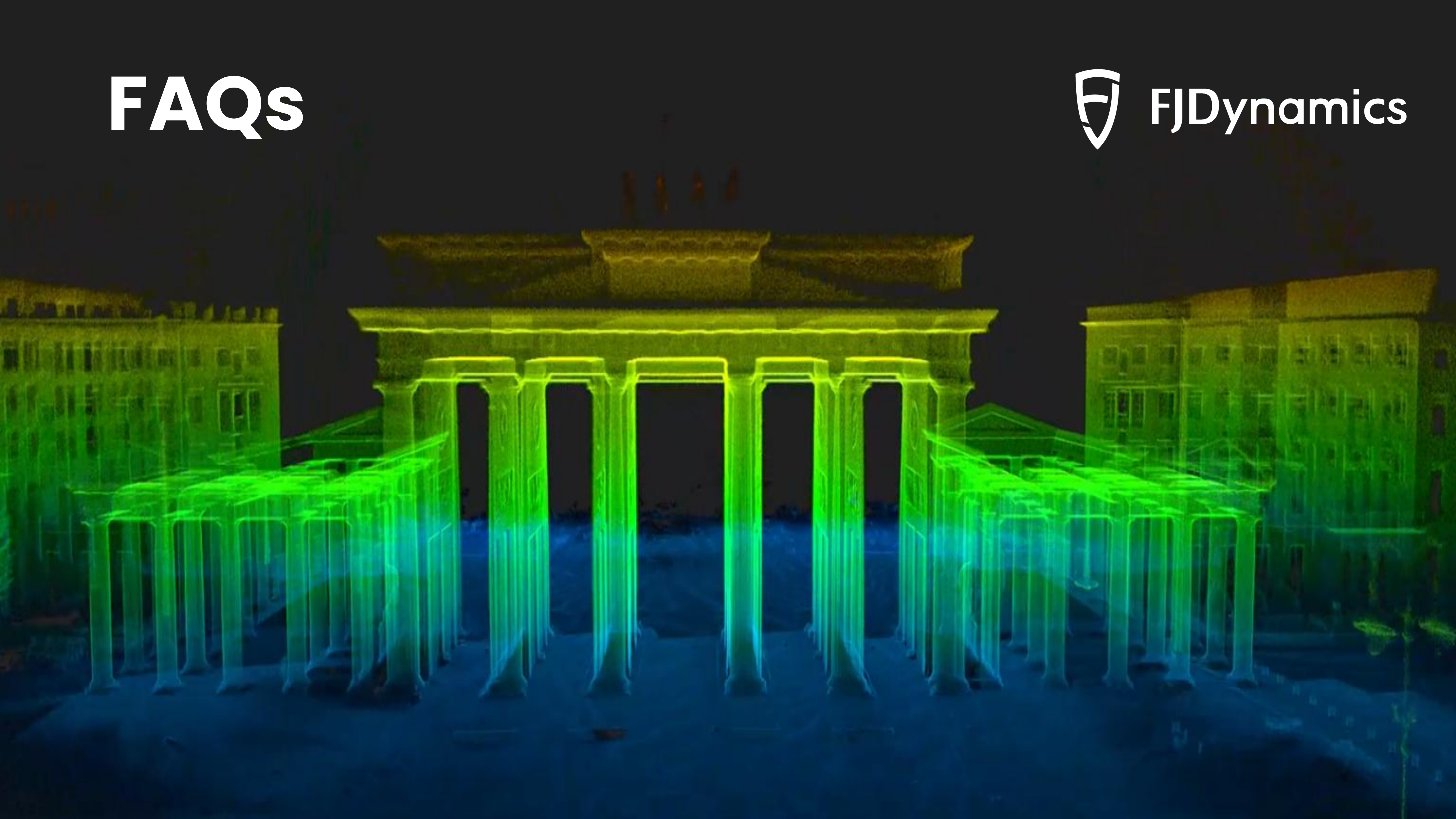


Underground Tunnel

- **Project:** To inspect and digitize the locations of an underground mine in Japan
- **Efficiency and Speed:** Less than 5 minutes of walking covered 142 meters.



FAQs



Thank you!