



Smart Construction Edge 2 User Manual

Product name : Edge computer for construction worksite

Model Name : SC Edge2

Firmware Version: **v11.5.2**

Update date 2026/03/23.

How to use EdgeBox

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This product is a GNSS receiver equipped with post-processing correction software. It supports PPK and RTK methods.

When surveying in the RTK method, a contract with a telecommunications carrier in each EU member state is required to use LTE communication.

This product requires a circumstance which can receive a substantial GNSS satellite signal.

*The data processed by SMART CONSTRUCTION Edge 2 will be used by Earthbrain or his cooperator to investigate the problem, or to improve the point cloud quality, without any notice.

Vender of this product:

EARTHBRAIN Ltd.

Address : 29F Izumi garden tower, 1-6-1 Roppongi, Minato-ku, Tokyo 106-6029, Japan

TEL :

Importer :

EU :

Komatsu Europe International N.V.

Address : Mechelsesteenweg 586 B-1800 Vilvoorde Belgium

Phone : +32 2255241

AUS:

Komatsu Australia Pty. Ltd.

Address : 50-60 Fairfield Street, Fairfield East NSW 2165, Australia

Phone : +61-2-9795-8222



These symbols on the main unit and battery indicate that used electrical and electronic products and batteries should not be disposed of as general waste.





To properly handle, recover and recycle used products and batteries, take them to the applicable collection points in accordance with local regulations.



Correct disposal saves valuable resources and prevents negative consequences for the environment and human health.

Examples of Signal word

 WARNING	Indicates content that, if mishandled, could result in death or serious injury to a person.
 CAUTION	Indicates content that, if mishandled, could result in minor or moderate injury to a person.
NOTICE	Indicates content that may result in product failure or property damage (including data corruption) if handled incorrectly.

 **WARNING**

Do not replace the battery outside. If the water or any foreign objects comes in from the insertion slot, it may cause a short circuit and resulting in an ignition or an injury.

 **WARNING**

Always wear a hard hat during work.
If you drop the product from the top of the tripod by mistake and hit to your head, it may cause an injury.

 **WARNING**

DO NOT leave the product in a hot place (beside the fire, heater, inside a vehicle with a high temperature) with the battery in it.
The batteries may damage and result in an ignition or an electric shock.

 **WARNING**

DO NOT charge the product with a wet condition by water or any liquid (such as rain)
If the electrode gets wet, it may cause a short circuit and result in an ignition or an injury.

 **WARNING**

When using the product in rain, please make sure that all doors including the covers of ports, battery lid, and water-proof USB cap are securely installed.
If any rain comes inside, it may cause a short circuit and result in an ignition or an injury.

 **WARNING**

DO NOT connect to an external radio with USB-Serial conversion cable.
It may cause a short circuit and result in an ignition or an electrical shock.

 **WARNING**

DO NOT put any foreign objects into the SD card slot, the SIM card slot, the USB slot or the ethernet port.
It may cause a short circuit and result in an ignition or an electrical shock.

 **WARNING**

Wearers of a pacemaker or a defibrillator should not approach the product.
Its electric wave may have a negative effect on its operation.

⚠ CAUTION

The main unit should be in a stable, flat place.

If it was placed at unstable place, it may be dropped and cause a damage or a breakage.

⚠ CAUTION

Make sure that no one snagged with cables when using AC adopter, power cable or USB cable.

If anyone snagged with cables, the product dropped and hit your foot and/or break the product.

NOTICE

If the product is used outdoors under the scorching sun for a long time, the product may become hot, and the power supply may be automatically shut off.

This is due to the high temperature abnormal processing function, not the failure.

If the power is automatically cut off, wait a few minutes and press the power button again.

NOTICE

Do not cover the main unit with a plastic bag in rainy weather.

The temperature of the device may rise, triggering the overtemperature abnormality handling function and cutting off the power.

NOTICE

Do not wrap the main unit with cloth while charging.

Heat may accumulate inside the main unit, causing malfunction or damage.

NOTICE

If the main unit interferes with the radio or TV reception, turn off the main unit and move it away from the radio or TV.

About batteries

WARNING

DO NOT leave the battery in a hot place (beside the fire, heater, inside a vehicle with a high temperature) with the battery in the product.

The batteries may damage and result in an ignition or an electric shock.

WARNING

DO NOT throw the battery into a fire or heat it.

If you throw it into the fire, it will burst and it will be very dangerous. Heating may cause liquid leakage, explosion, or ignition.

WARNING

DO NOT disassemble or modify the battery.

Doing so may cause chemical burns from the contents or cause it to burst and catch fire. In addition, modification may impair the function of preventing danger, causing heat generation, an explosion, or an ignition.

WARNING

DO NOT let the battery get wet.

Wetting liquids such as water, seawater, or juice may break the protection circuit and cause a heat generation, an explosion, or an ignition.

WARNING

If the battery leaks, keep it away from fire.

If the leaked electrolyte ignites, it may burst or ignite.

WARNING

DO NOT apply strong impact to the battery or pierce the nail.

If it damage the protective function, it may cause overheating, an explosion, or an ignition.

WARNING

Charge the battery as described in this manual.

Charging in any other way may cause a heat generation, an explosion, an ignition, etc.

WARNING

Do not allow conductive foreign objects (such as metal) or liquids to come into contact with the battery terminals.

It may cause a short circuit and result in a heat generation, an explosion, or an ignition..

NOTICE

When not in use for a long time, remove the battery from the main unit.

Leaving the battery in may result in over-discharge and shorten battery life.

About the AC adopter

WARNING

Attached AC adopter is only for this product. It cannot be used for other product.
Also, no power cable other than the attached can be used for this product.
It might generate heat and resulting an ignition or an electric shock.

WARNING

Do not use the AC adapter outdoors.
If a foreign object or liquid gets on the terminals, it may short-circuit and cause an ignition or an electrical shock.

WARNING

Do not use the AC adapter cord improperly, such as pulling, tying, bending, or stretching. When winding the cord around the AC adapter, wind it loosely rather than tightly wrapping it. It may cause an electrical shock or an ignition.

WARNING

Do not use the AC adapter cord if it is damaged.
It may cause an electrical shock or an ignition.

WARNING

When unplugging the power plug from the outlet, hold the power plug without holding the cord.
It may damage the cord and cause an electrical shock or an ignition.

CAUTION

Make sure the SD card is oriented and insert it straight.
If you force it, it may damage the SD card or this product. Also, if you accidentally insert it and cannot take it out, please contact your Komatsu distributor. If you insert tweezers and try to forcibly remove them, there is a risk of a short circuit.

Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados.

Para consultas, visite: www.gov.br/anatel/

APPENDIX

Install and configure certificate

1. From the tablet (iPad) home screen, tap the Safari icon and enter the following in the Safari address field
`http://scedge.local`


Tips

The following two-dimensional bar codes can be used to access to the URL above.



2. Tap "Install Certificate" on the screen.
3. Follow instructions on the screen to download it.
4. Return to the Home screen and tap "Settings" icon.
5. Tap on the displayed "Profile downloaded" message and follow the on-screen instructions to install
6. Tap General - About - Certificate Trust Settings in the settings screen to enable **##SC EdgeBox CA for Dev##**.

Add a tablet app to your home screen

1. Start Safari on your iPad and access `http://scedge.local`.
2. Tap "Launch App" .
3. After the top page of the App displayed, tap Share icon in Safari, then tap **"Add to Home Screen"**

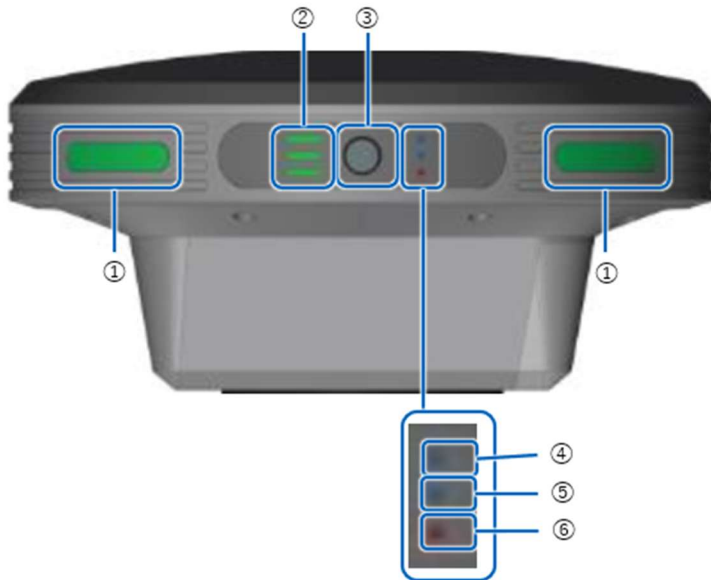
An app icon will be added to the home screen, and you can start the app by tapping this icon next time.

BEFORE USING

Name of each part

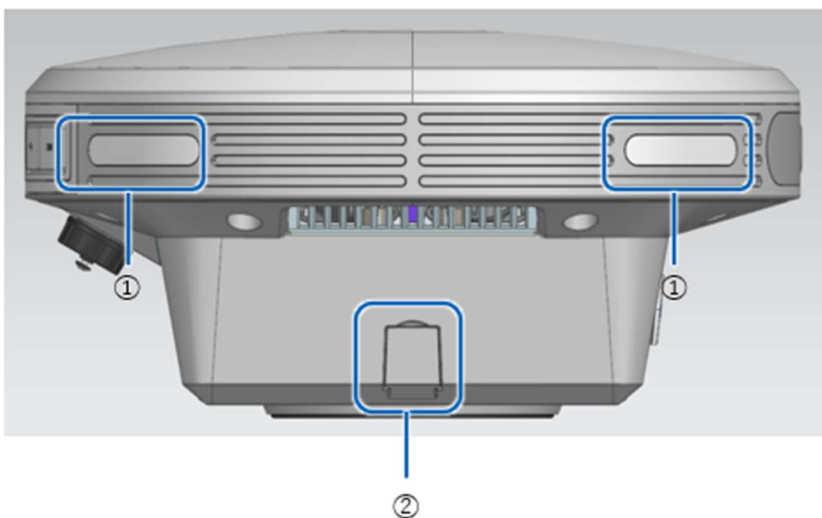
EDGEBOX BODY PART NAME

front of the body



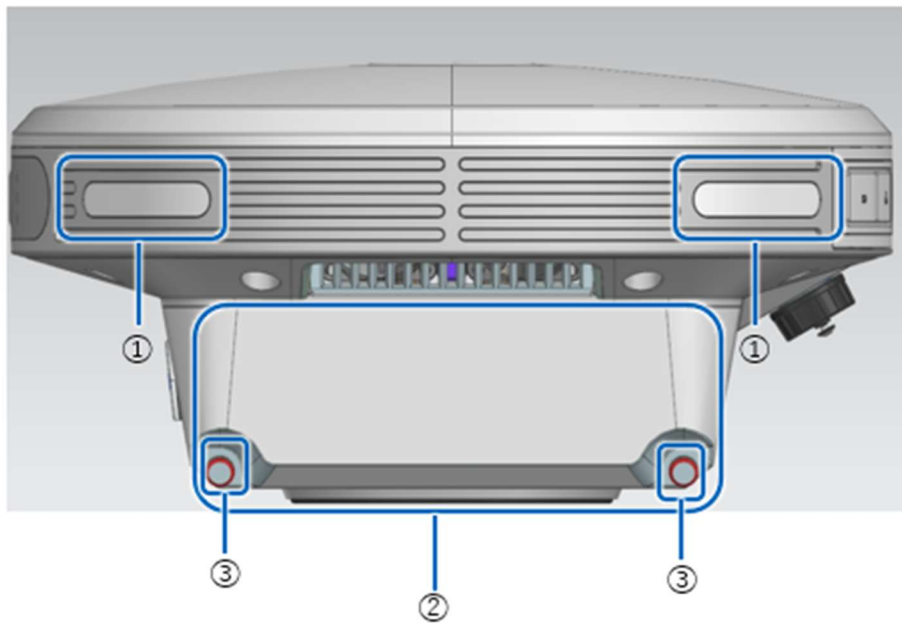
- ① Status LED
- ② battery indicator
- ③ power button
- ④ GNSS Receive Status LED
- ⑤ PPK Logging Status LED
- ⑥ Error/Sub-microcomputer Update LED

Body Right Side



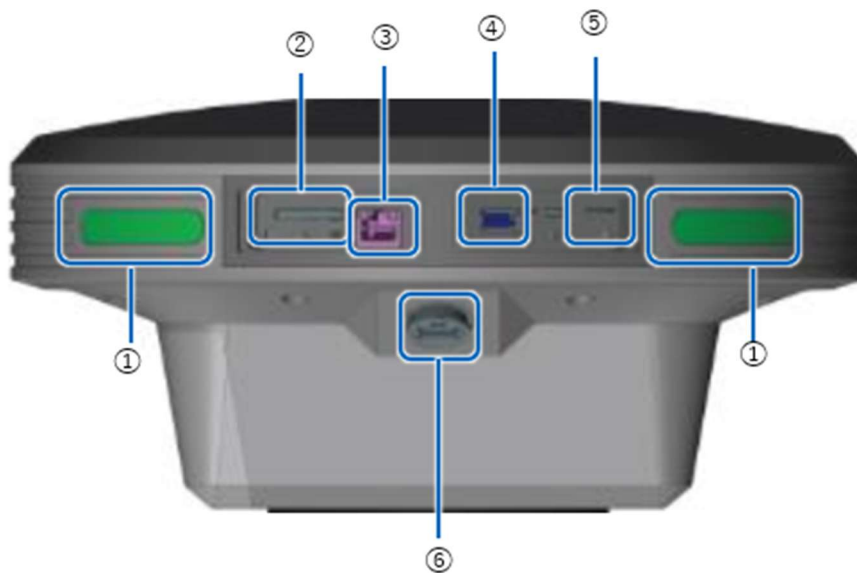
- ① Status LED
- ② AC Adapter Inlet

Body Left Side



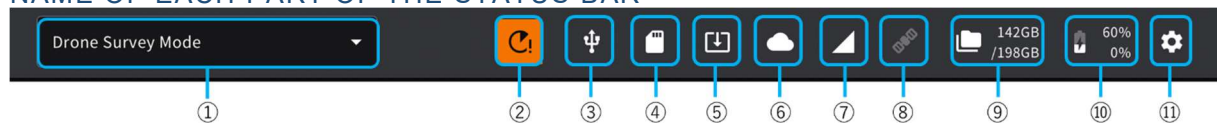
- ① Status LED
- ② Battery Inlet (Inside Lid)
- ③ battery lid screw


back of the body



- ① Status LED
- ② SD card slot
- ③ Ether Cable Terminal
- ④ USB Slot (USB3.0)
- ⑤ SIM CARD SLOT
- ⑥ Waterproof USB Slot (USB2.0)

NAME OF EACH PART OF THE STATUS BAR



- ① mode switching
Tap to switch between drone survey mode and base station mode.
- ② Running job icon
Tap to list the jobs running in the background.
- ③ USB Memory Icon
Displays whether USB memory is recognized. Tap this icon when removing USB memory.
- ④ SD card icon.
Displays whether SD card is recognized. Tap this icon when removing SD card.
- ⑤ Exported data list Icon
Shows the exporting status to USB memory.
- ⑥ Upload List Icon
Shows the uploading status to the SMART CONSTRUCTION dashboard.
- ⑦ LTE icon
Displays the status of the LTE.
- ⑧ GNSS icon
Displays the status of GNSS reception. Tap to view the Acquired Satellite list.
- ⑨ Storage
Displays the amount of storage remaining on the unit.
- ⑩ Battery icon 
Shows the amount of battery life for each of the two batteries and the color of the icon changes when the charge drops.
- ⑪ Settings icon
Tap to open the Settings dialog.

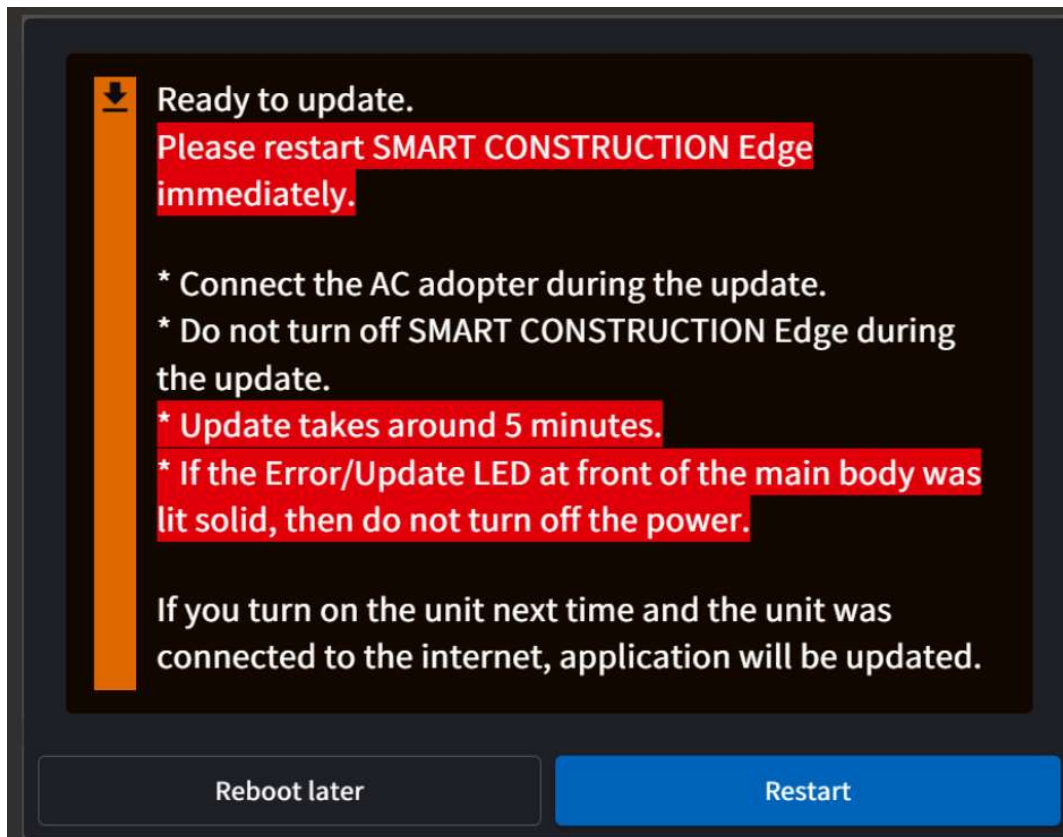
※Version Up Icon

A download icon will appear if there is an Updated program of Edge



The update program can be installed over the Internet or via USB. When the installation is completed, the following message will be displayed, and a reboot will complete the upgrade.

※If the edge version is older, a two-step update of the application and OS may be required.



In a good network environment, such as a wired LAN connection, it will take approximately 30 minutes.

For LTE, it may take 1 hour or more.

By good internet connection, we mean a downstream speed of around 50Mbps.

If the internet connection is poor, the update may take around 3 to 4 hours, and in some cases, considerably longer.

If you are performing the update via USB, please refer to this.

<https://support.smartconstruction.com/hc/en-jp>

Structure from Motion/ Base Station

Smart Construction Edge [model:Edge2]



Manual

Release Note

Frequently Asked Questions

Software Download

Tips

Please confirm all ②Running job ⑤Exporting data and ⑥Uploading data before you turn off the unit. Those jobs could be cancelled if they were turned off before they finish.

System Configuration:

Main unit:



iPad :

」



Batteries :
2 for each set



AC adopter and Power cable:



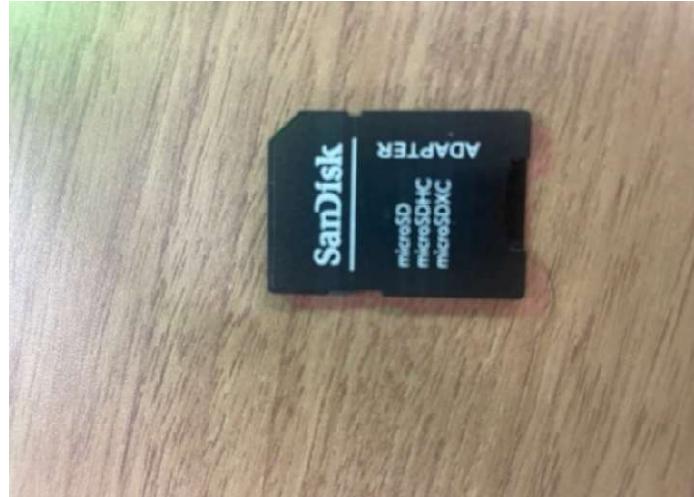
Water-proof USB-Serial conversion cable:



Serial Female-Female cable:



SD card adapter:



iPad Charger:



USB Extender : ***When using USB 3.0, be sure to use through this adapter because the GNSS of Edge 2 is affected by noise.**



PREPARATION IN ADVANCE

Charge batteries

1. Make sure to charge the batteries fully before using SMART CONSTRUCTION Edge. First, remove 2 screws and open the lid to install the batteries.



2. Slide the batteries into the slot.



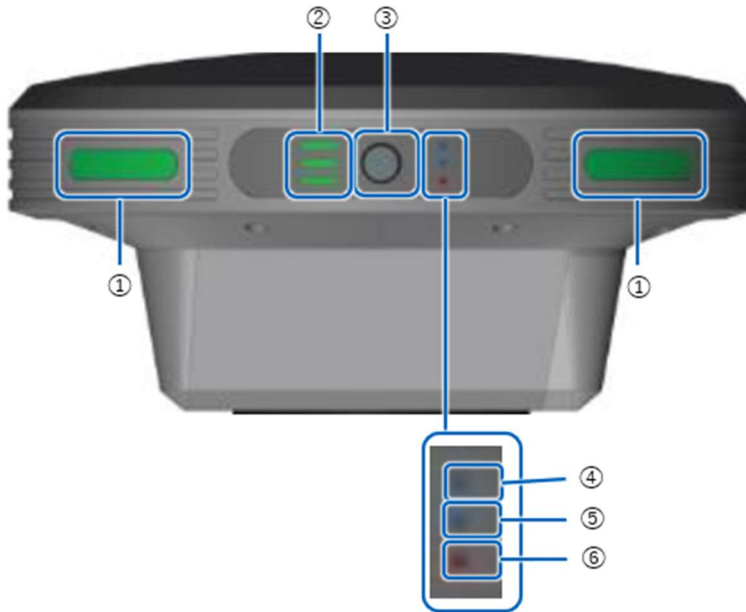
3. Charge fully until Status LED turns all solid. (Orange – Charging, Green – discharging)



Turn on EdgeBox

4. Press and hold the power button on the EdgeBox for about 4 seconds

The Status LED on the unit will flash in green while the main unit is running, and the Status LED will turn green when the starting process has completed.



- ① Status LED
- ② Battery Indicator
- ③ Power Button
- ④ GNSS reception status LED
- ⑤ PPK logging status LED
- ⑥ Error / Update status LED

Connect EdgeBox to the tablet (iPad)

Verify that the Status LED turns green and connect the tablet (iPad as a default option) to the EdgeBox via Wi-Fi.



1. Tap the Settings icon on your tablet.
2. Tap “Wi-Fi” and select the EdgeBox SSID (Serial Number) from the available access point list.
3. Enter your EdgeBox password (default: edge2-ap) in the password field.
Return to the settings screen and make sure your tablet is connected to EdgeBox.

START/STOP USING

Install EdgeBox on the tripod

1. Prepare tripod with 5/8 in. screw on the top. Top of the tripod must be flat.



2. Fix the screw firmly to the bottom screw of EdgeBox. Use a levelling device if needed.

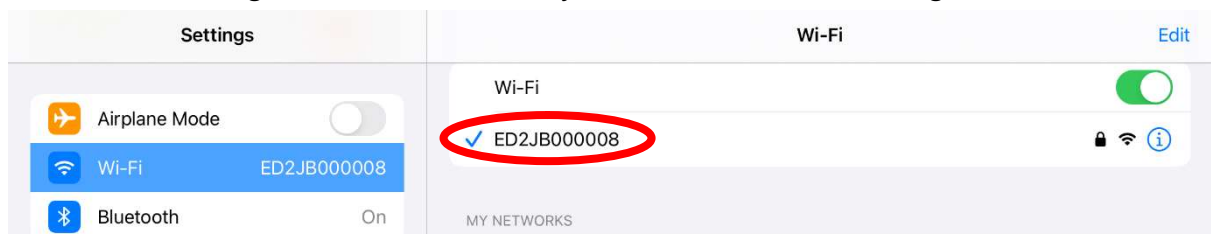



Enable tablet apps

1. Press and hold the power button on the EdgeBox for about 4 seconds. The Status LED on the unit will flash in green while the main unit is running, and the Status LED will turn green when the start is complete.

Tap the Settings icon on your tablet. 

2. Tap "Wi-Fi" and select the EdgeBox SSID (Serial Number) from the available access point list.
3. Enter your EdgeBox password (default: edge2-ap) in the password field. Return to the settings screen and make sure your tablet is connected to EdgeBox.

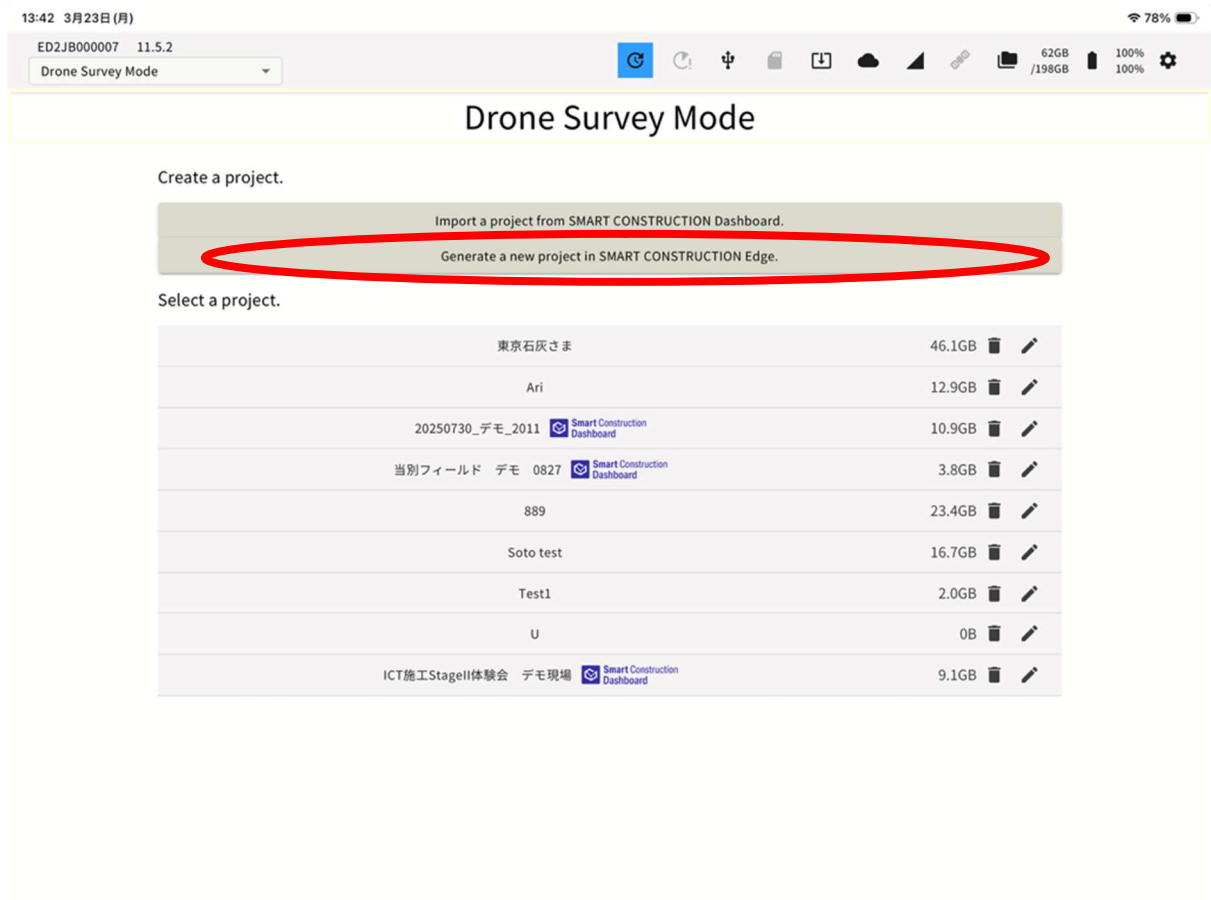


4. If your tablet's Wi-Fi auto-connect destination is set to the EdgeBox, it will automatically connect to the unit.
5. Launch the tablet app. Tap the tablet app icon  that you added to your home screen to launch it.

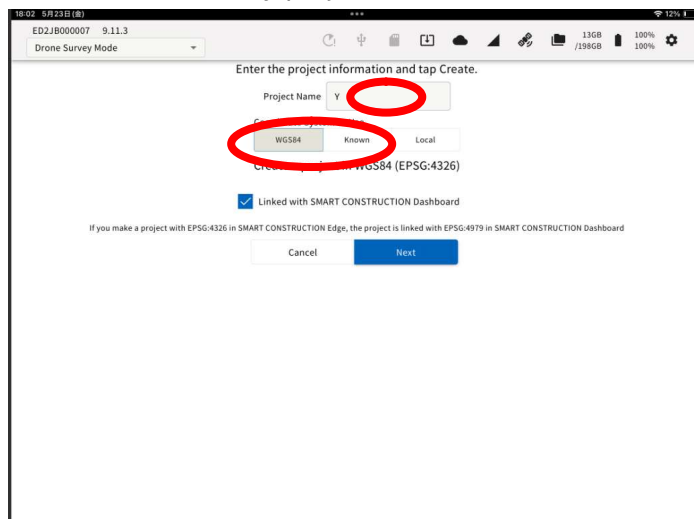
Creating a project

CREATE IN A PUBLIC COORDINATE SYSTEM (USING ESPG CODE)

1. Tap “Create a new project”



2. Make sure “Known” is selected in “Coordinate system to use”, and enter the ESPG code and Geoid. Enter any project name.

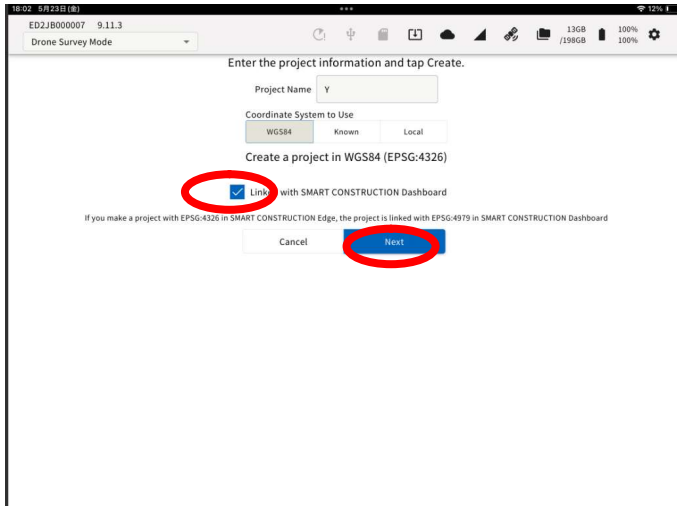


3. If you enter a part of EPSG code, then you will show the candidates.
If you are not going to use Geoid Hight, to select WGS 84, tap the (WGS84) icon.
4. Tap “Create”.

REFLECT PROJECTS CREATED IN EDGE2 ON THE DASHBOARD

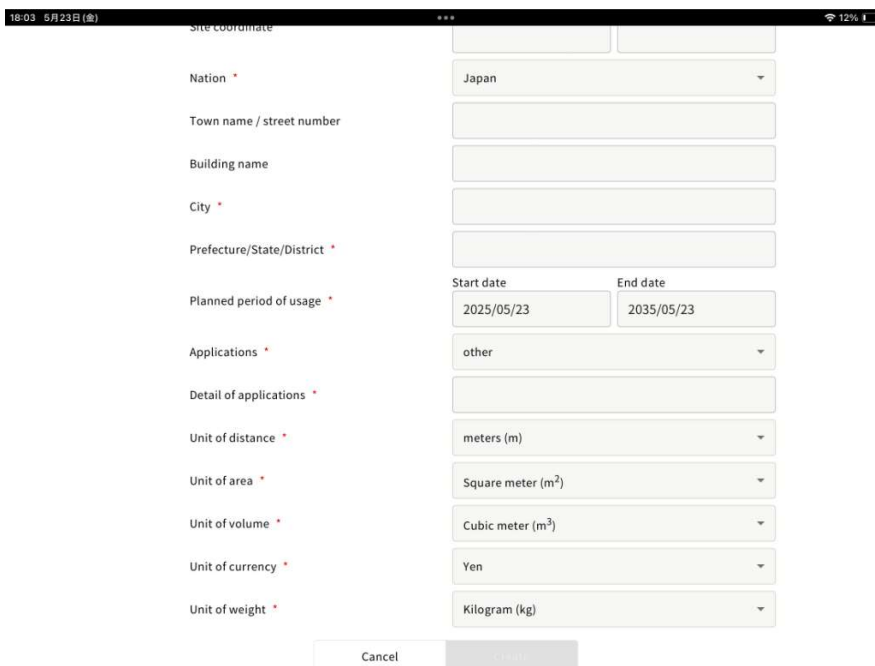
Reflect projects created in Edge2 on the Dashboard

A new feature has been added to allow projects created first in Edge2 to be inherited by the Dashboard. Enter the required information for creating a Dashboard project in the Edge2 application and create the project on the Dashboard.



Check “Linked with SMART CONSTRUCTION Dashboard,” then tap Next.

Enter the required information and press "Create. “A project/site will be created in both Edge2 and the Dashboard.

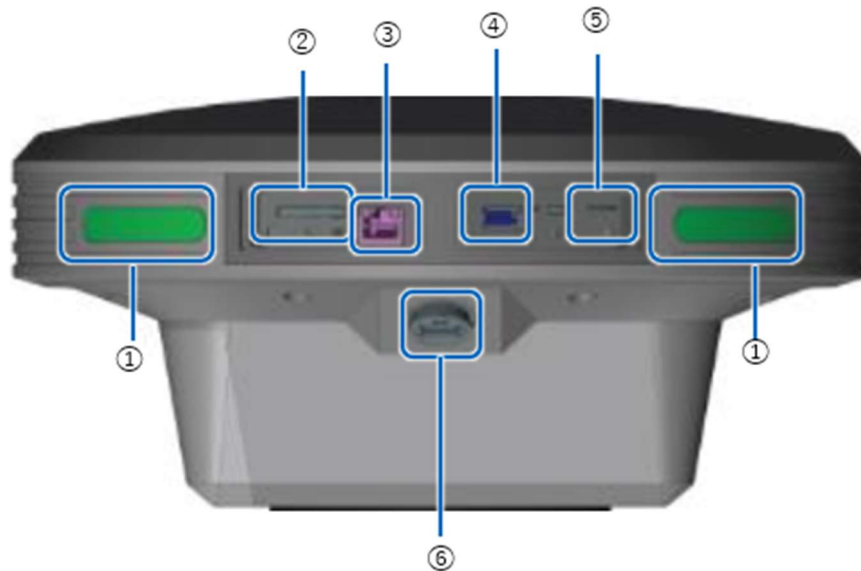


CREATE IN LOCAL COORDINATE SYSTEM (USING LOCALIZATION FILE)

If you have a localization file from a rover, you can also create a project using the localization file. Localization files should be in CSV format and saved in the root directly of the USB memory.

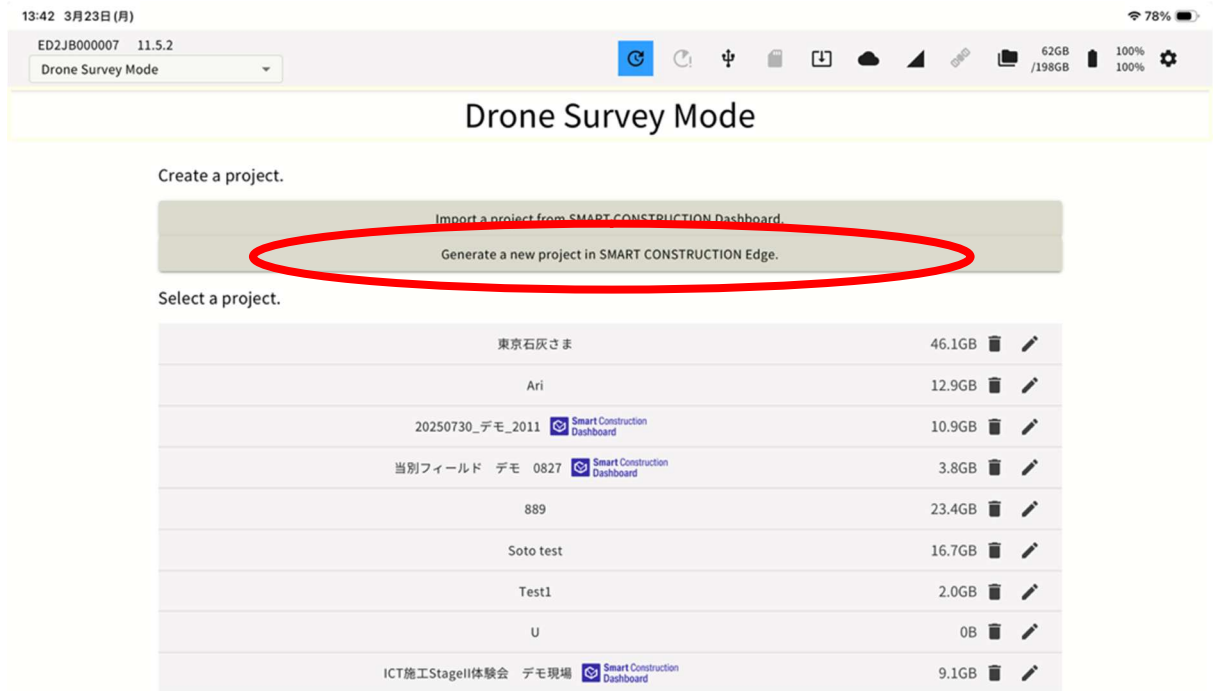
For more information on the format of localization files, s

1. Insert the USB memory into the USB slot (inside the waterproof lid) of the EdgeBox

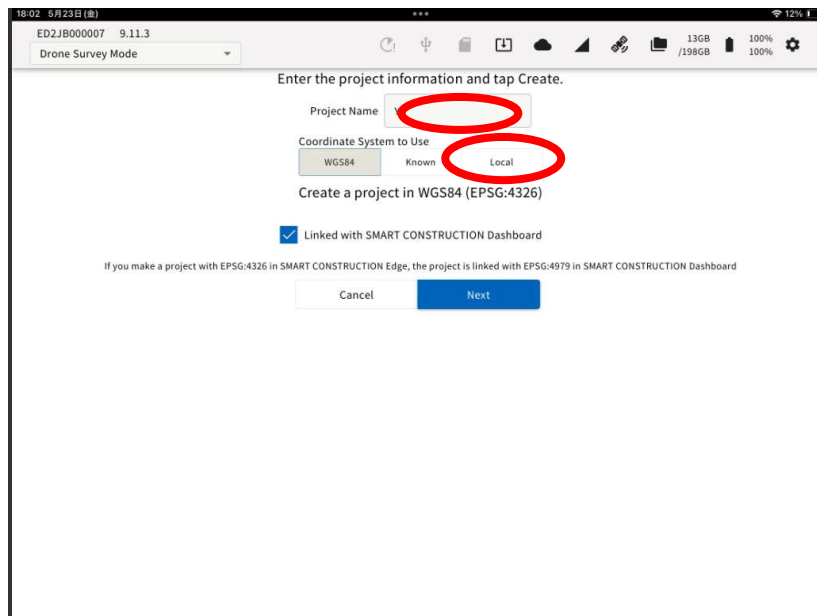


- ① Status LED
- ② SD card slot
- ③ Ether cable port
- ④ **USB slot (USB3.0)**
- ⑤ SIM card slot
- ⑥ Water-proof USB slot (USB2.0) : cannot use this slot for USB memory

2. Tap “Create a new project”



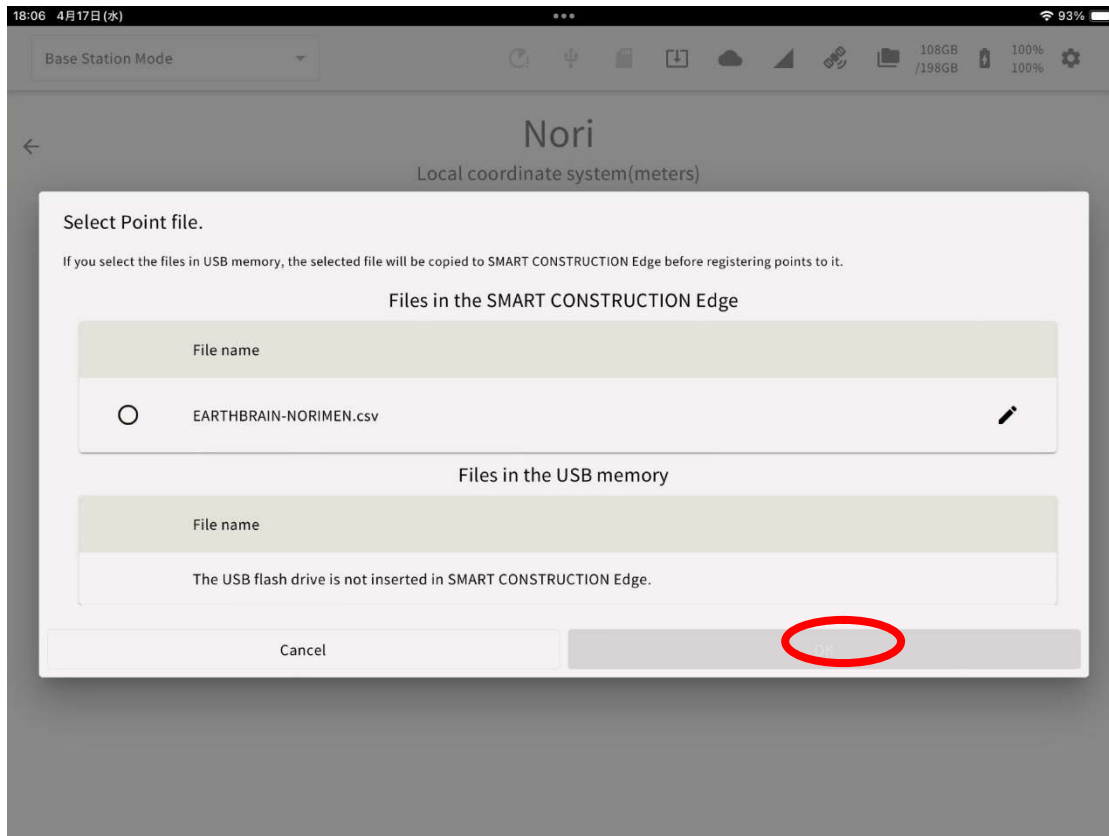
3. Select “Local” in the project coordinate system.



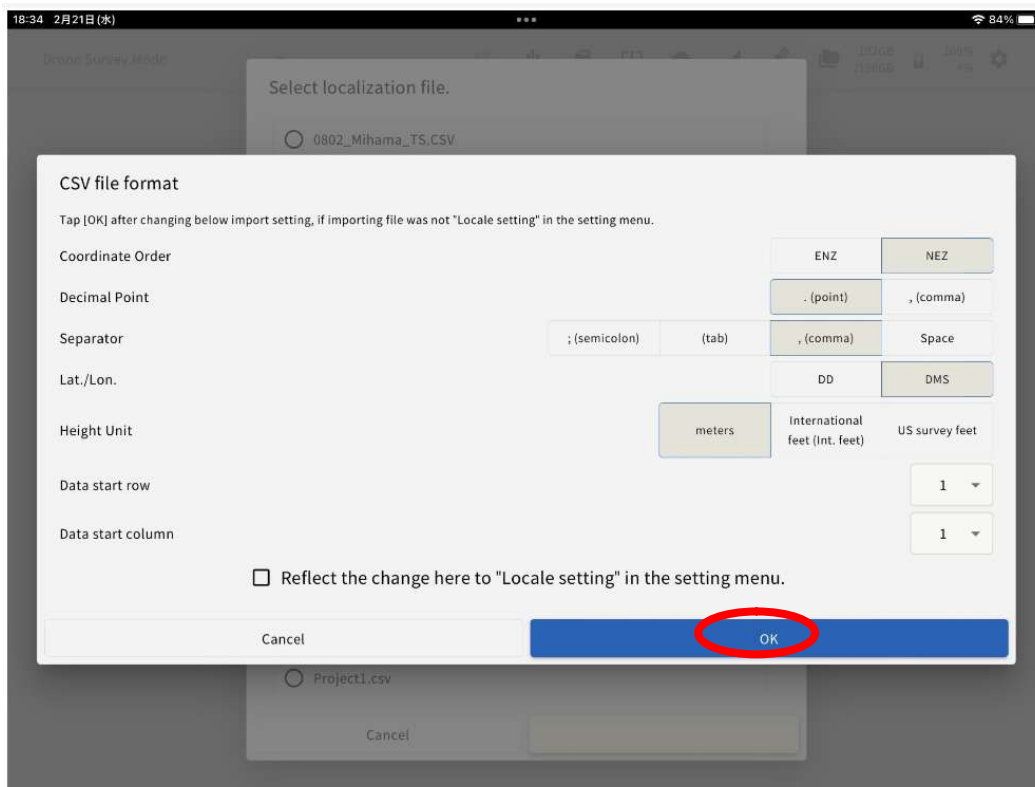
4. Tap “Import Localization File” to specify the file for localization.

5. Files are saved once loaded to the edge and
Files can be selected from USB or from within the Edge's memory.

Tap 'OK' after selecting a file.



- Please prepare the localization file in advance. Set the file format parameter according to the file and tap "OK".



Example of the format above

Order of XYZ : ENZ

Point name	X(E)	Y(N)	Z(Alt.)	Lat.	Lon.	Elipsoidal height
C	-44040.093	22842.649	3.26	35.36100055	140.0507608	38.11
D	-44164.2	22697.367	3.904	35.36059902	140.0501823	38.715
E	-44071.288	22619.448	3.906	35.36090117	140.0458736	38.741
F	-43920.312	22743.991	3.548	35.36139004	140.0503701	38.402

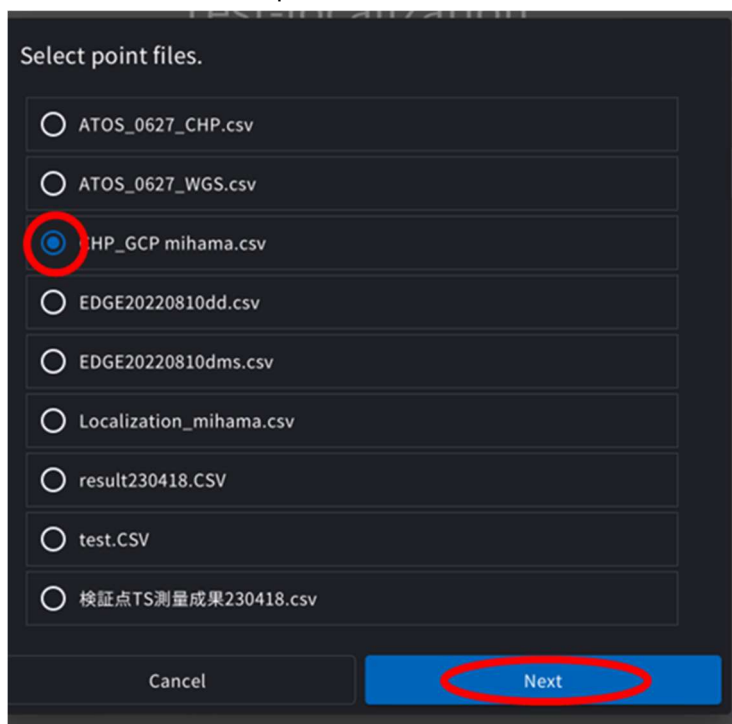
Data starts from 1st raw. (Without any header)

Data starts from 1st Column

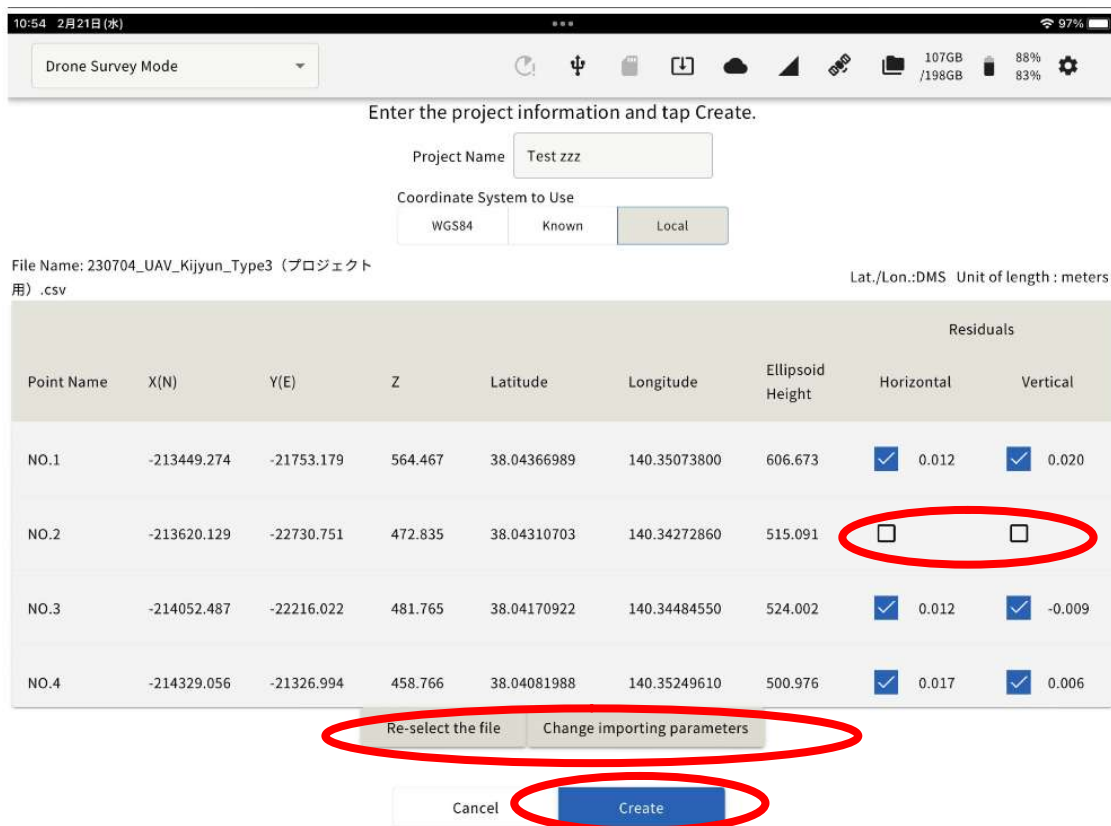
Lat./Lon in DD format. (Decimal)

Unit of XYZ and Elipsoidal height are in feet.

- Select the file and tap “Next”.

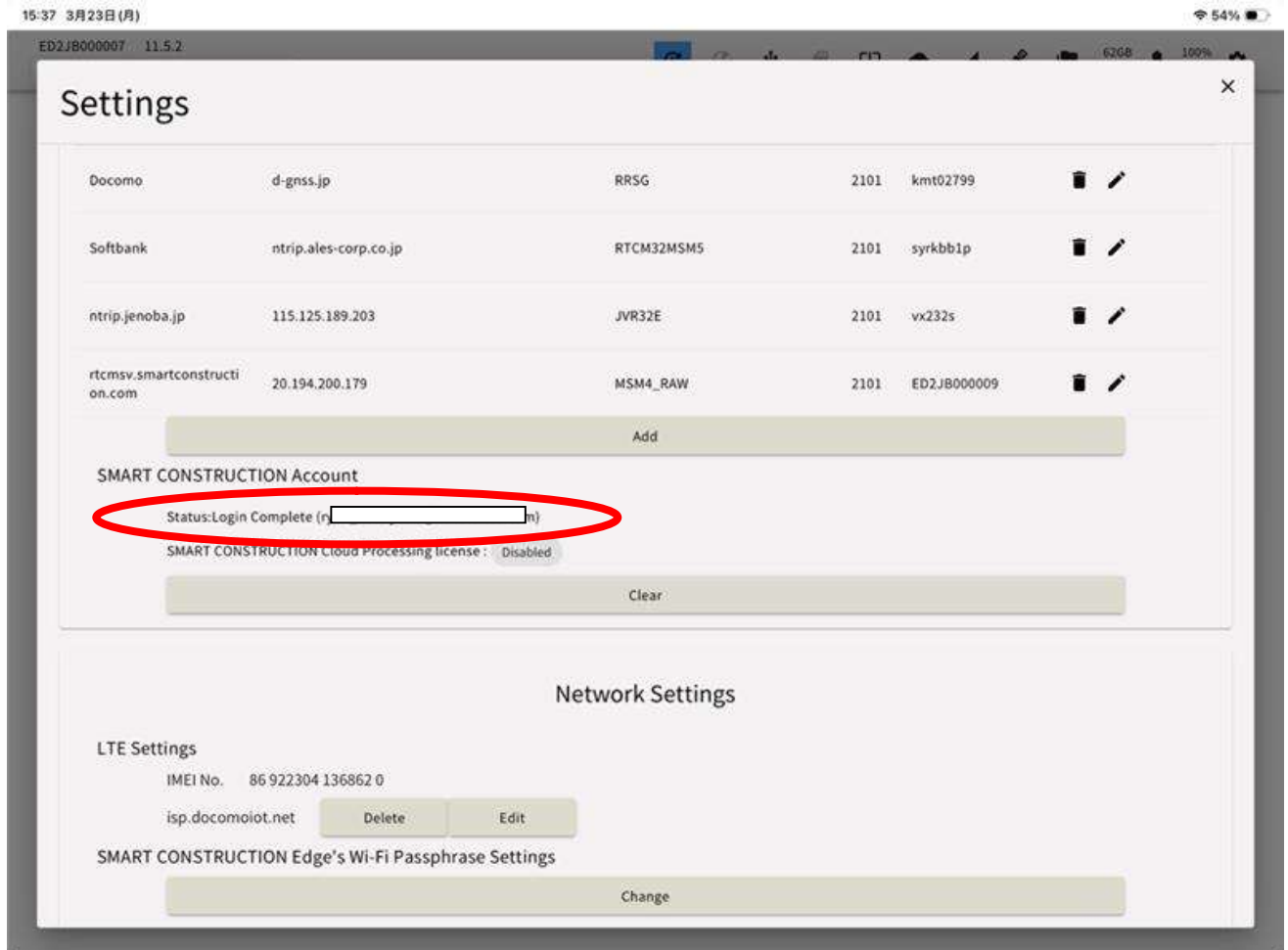


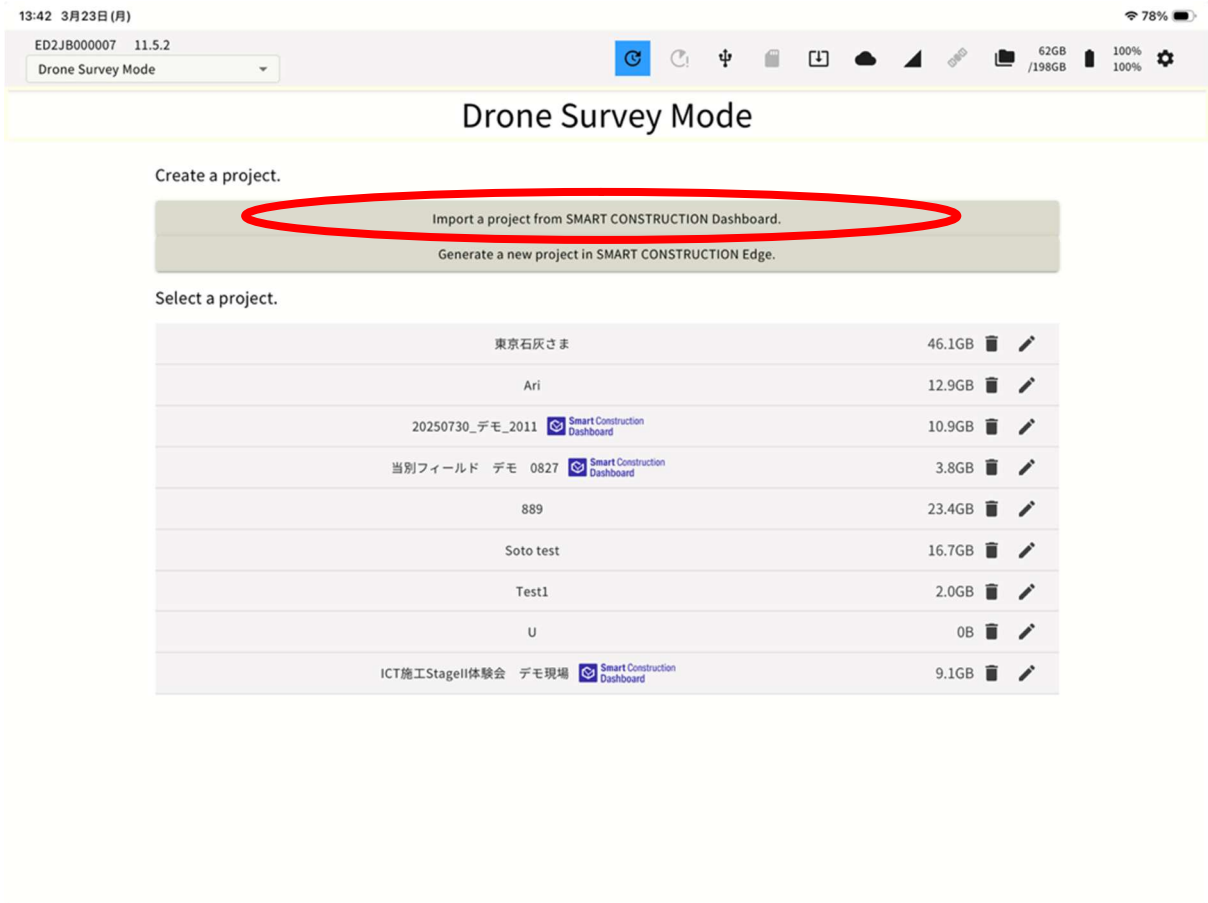
- The contents of the imported localization file are displayed on the screen. Confirm the values are correct and aligned correctly, then tap “Create”.
- You can choose to use or not use horizontal and vertical localization at any point.



CREATE A NEW PROJECT BY CONNECTING TO SMART CONSTRUCTION

If a project has already been created on the Dashboard and you are logged into your Smart Construction account with the following settings, you can import the Dashboard project into EDGE2 (including geodetic coordinate system settings).

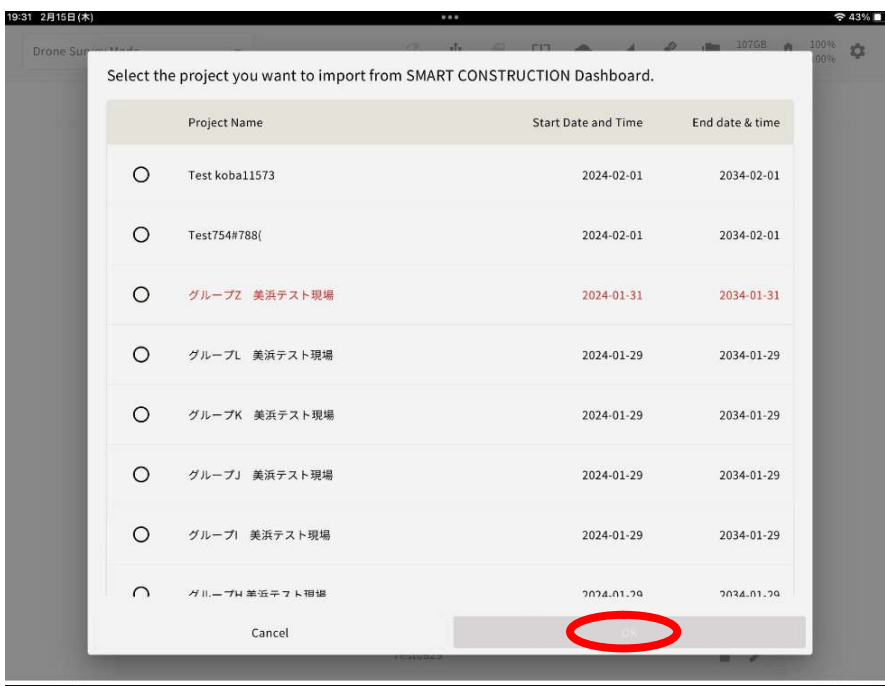




1. (Import a project from SMART CONSTRUCTION Dashboard)

If you tap and are logged in to your account, the Dashboard site will be displayed.

By tapping any site and pressing OK, you can create a project using the same coordinate code as Dashboard.




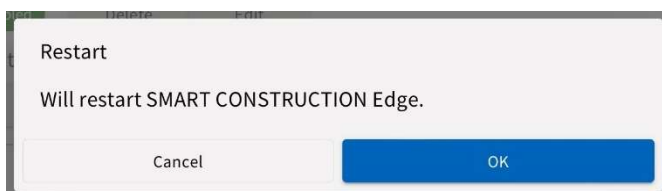
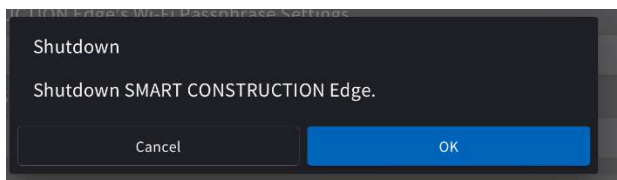
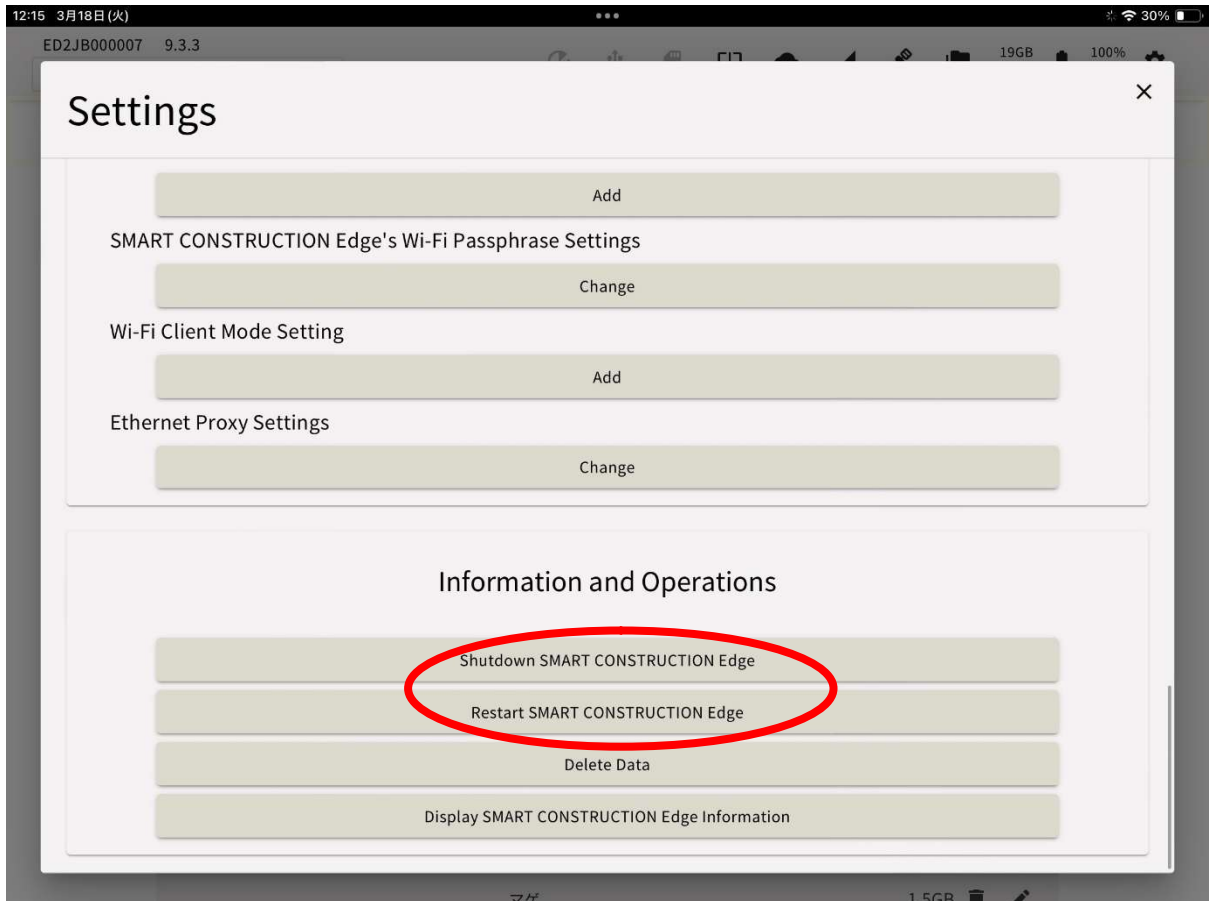
Turn Power Off/Restart

CAUTION

Always follow this procedure when turning off the power. Follow this procedure to turn off EdgeBox before removing the battery or AC adapter.

It may cause a short circuit and result in an ignition or an electrical shock.

1. Tap Settings icon  on the upper-right portion of the tablet app.
2. Scroll down to tap “Shut Down or Restart SMART CONSTRUCTION Edge” in “Information and Operations” section of the Settings screen.



3. You can also turn off the power by pressing and holding the power button on the main body for about 4 seconds.

The Status LED on the main body will flash green during the termination process. The Status LED will go off when the exit process is complete.

NOTICE

Shutting off EdgeBox while doing the following can lead to data corruption or system unavailability.

Please turn off the power **AFTER** these processes are completed.

- Point cloud creation
- PPK logging
- Data Transmission
- Exporting data

DRONE SURVEY FUNCTION

USING NETWORK RTK

Before setting up the EdgeBox location using Network RTK, you must configure APN settings and Network RTK account settings.

For details, please refer below.

Tips

To use Network RTK, a LTE contract and a Network RTK Service contract were required.

1. Place EdgeBox anywhere in the site with a tripod at a wide, open sky.

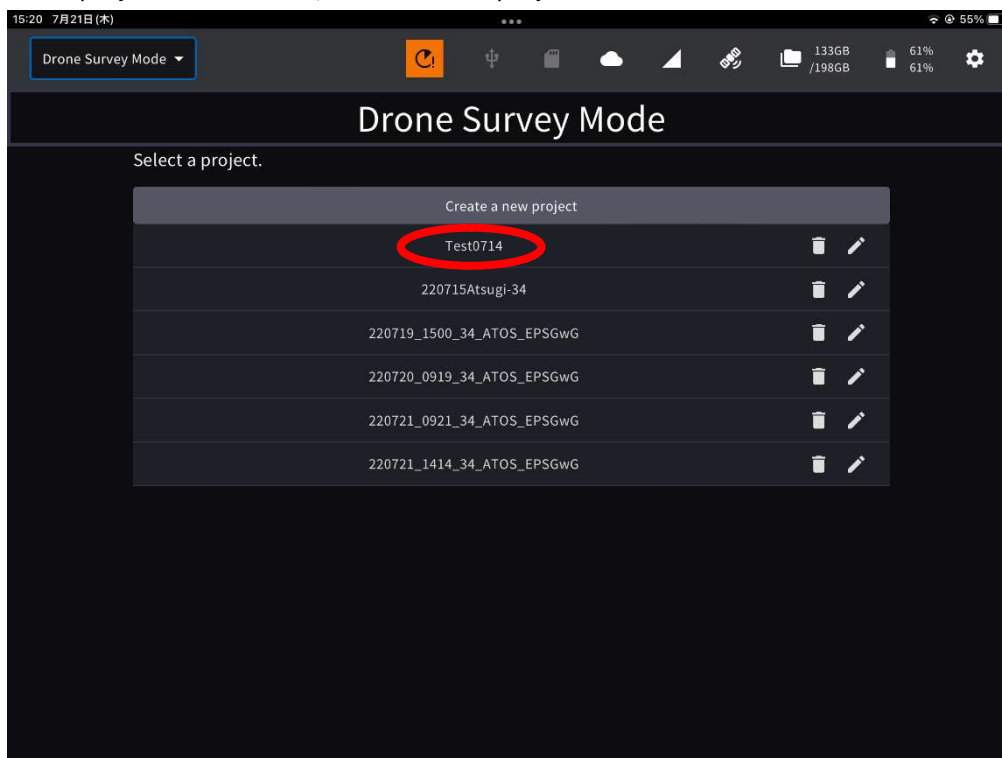
⚠ CAUTION

The main unit should be in a stable, flat place.

If it was placed at unstable place, it may be dropped and cause a damage or a breakage.

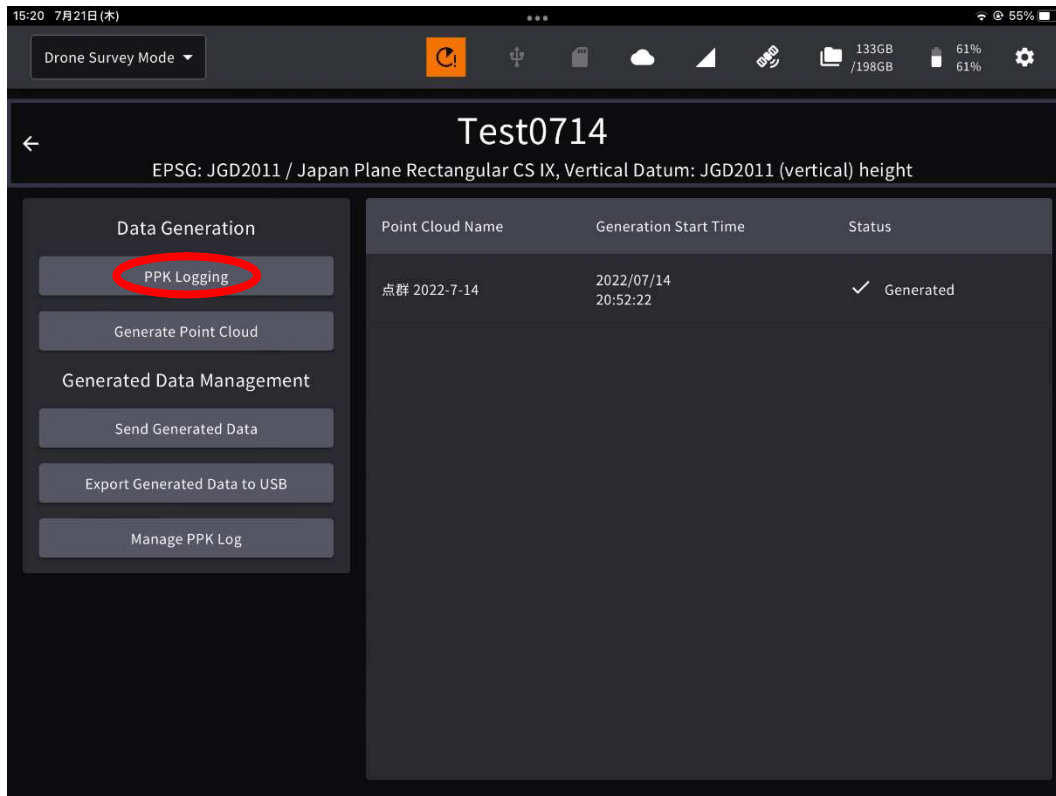
2. Launch the tablet app  and select a project of the work site to survey.

If the project is not listed, create a new project.



3. Tap “PPK Loggin”

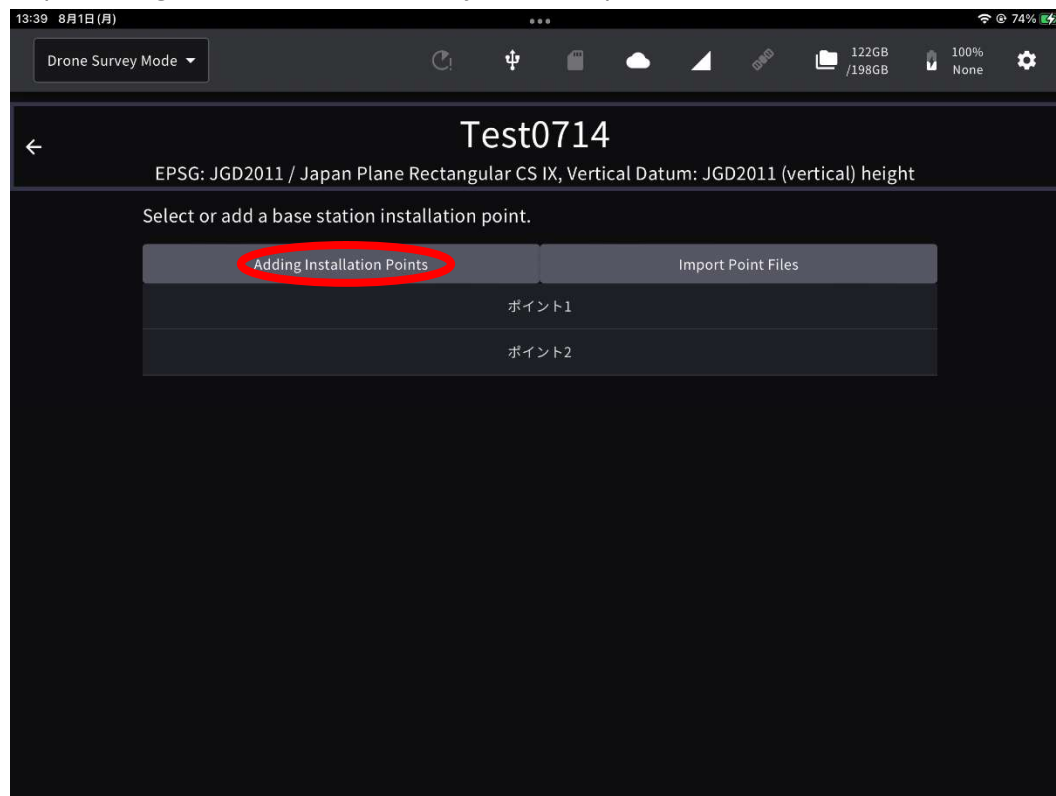
The points you have previously set up or have used for localization will appear as a point list.



Tips

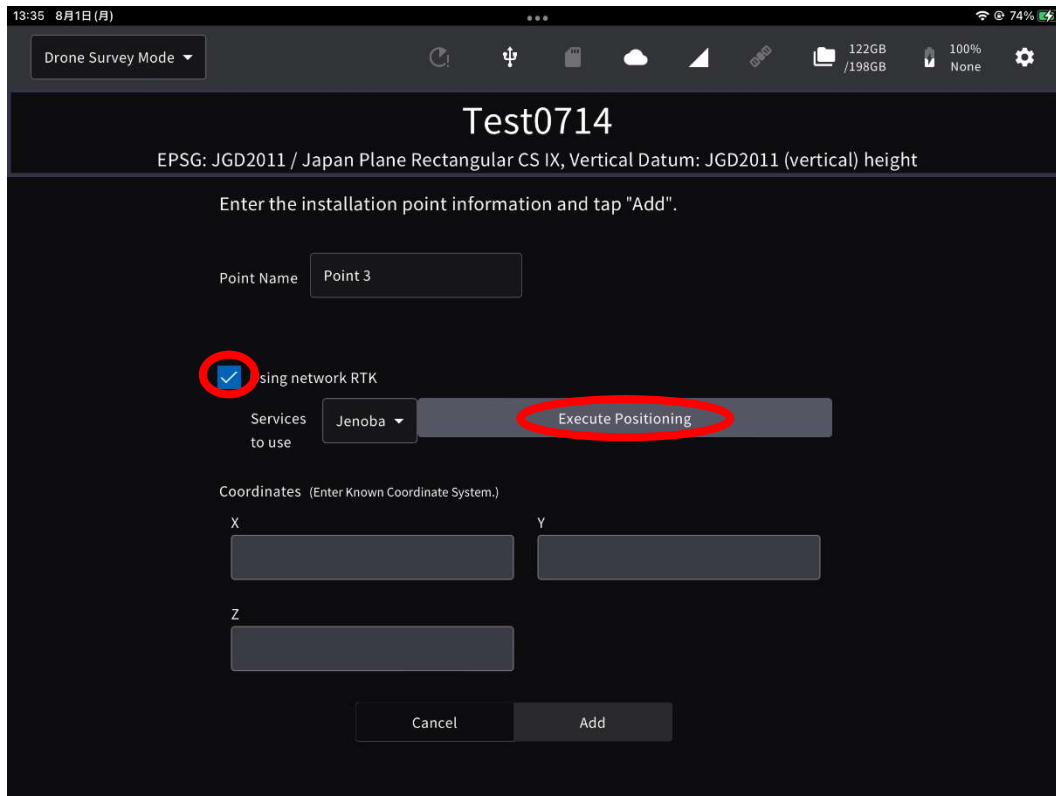
If you have set the EdgeBox on one of these points, you can just tap it to select it. (If not, go to 4.)

4. Tap “Adding Installation Points” or you can import with a CSV file (Go to next chapter.)



5.

6. Enter a point name and tap “Using network RTK” check box
 7. Select the network RTK service from the drop-down list, and tap the “Execute Positioning” button
- When the positioning is done, a surveyed coordinates are automatically entered in the coordinates field.



8. Confirm that coordinates are entered in the coordinates field, then tap "Add"

IMPORT FROM A CSV FILE

1. Align the Edge Box horizontally above the surveyed base point using the levelling device on the top of the tripod.

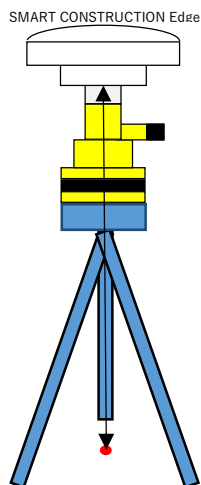



WARNING

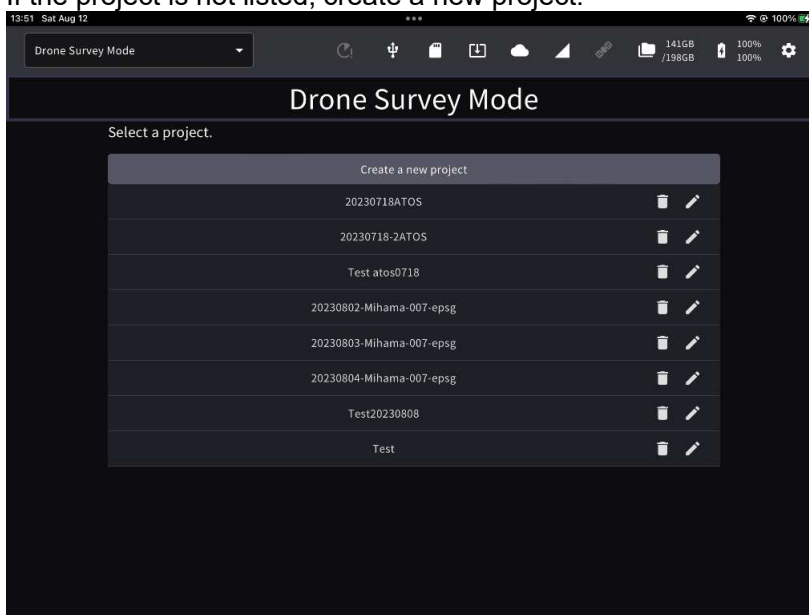
Always wear a hard hat during work.

If you drop the product from the top of the tripod by mistake and hit to your head, it may cause an injury.

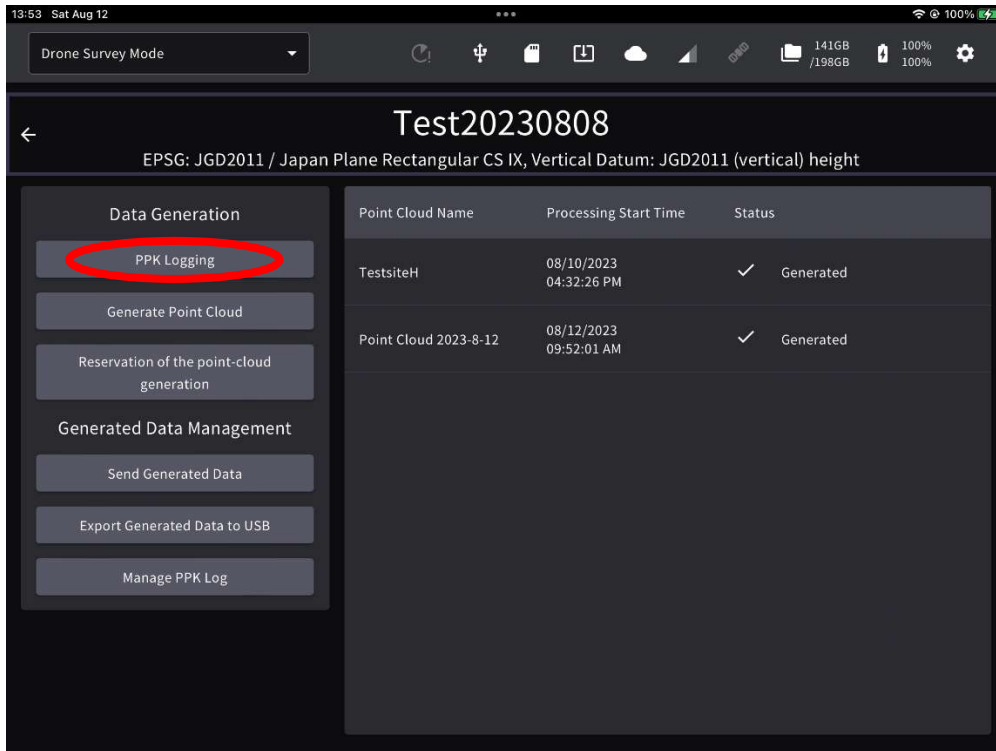
2. Measure the height from the base point to the bottom of the EdgeBox
3. Enter this height as the “pole height”



4. Launch the tablet app  and select a project of the work site to survey. If the project is not listed, create a new project.

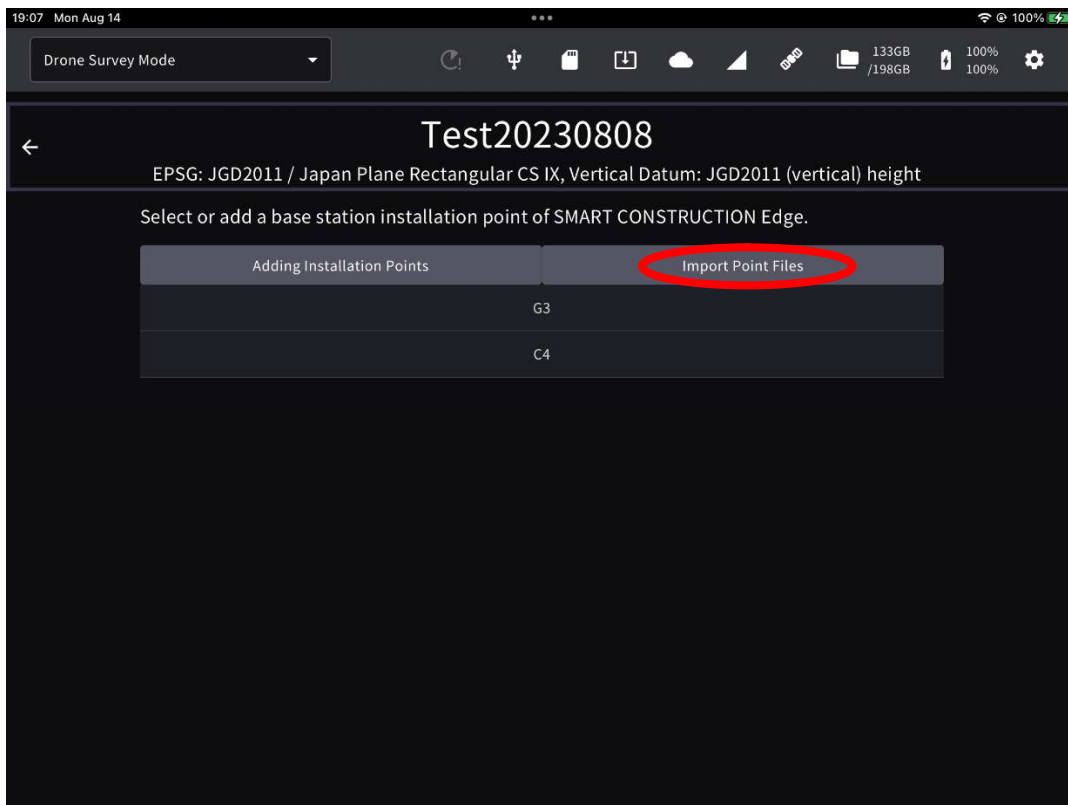


5. Tap "PPK Logging"



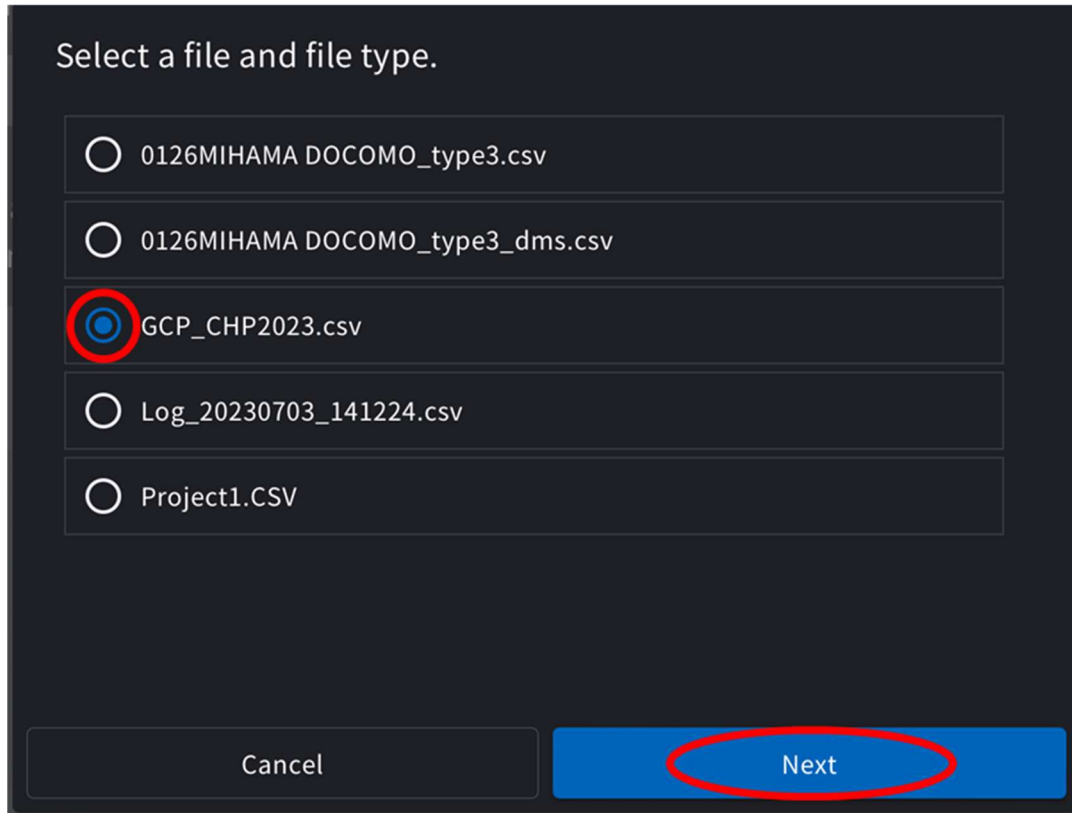
The points you have previously set up or have used for localization will appear as a point list.

6. Tap "Import Point Files" to open the file.

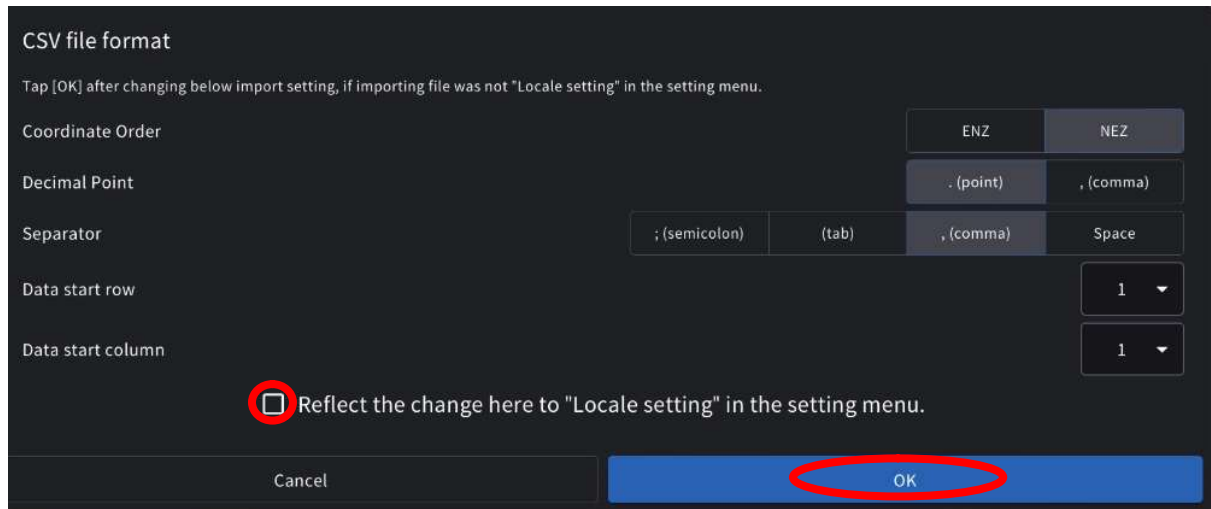


Please prepare the point file in advance.

Select the control point file

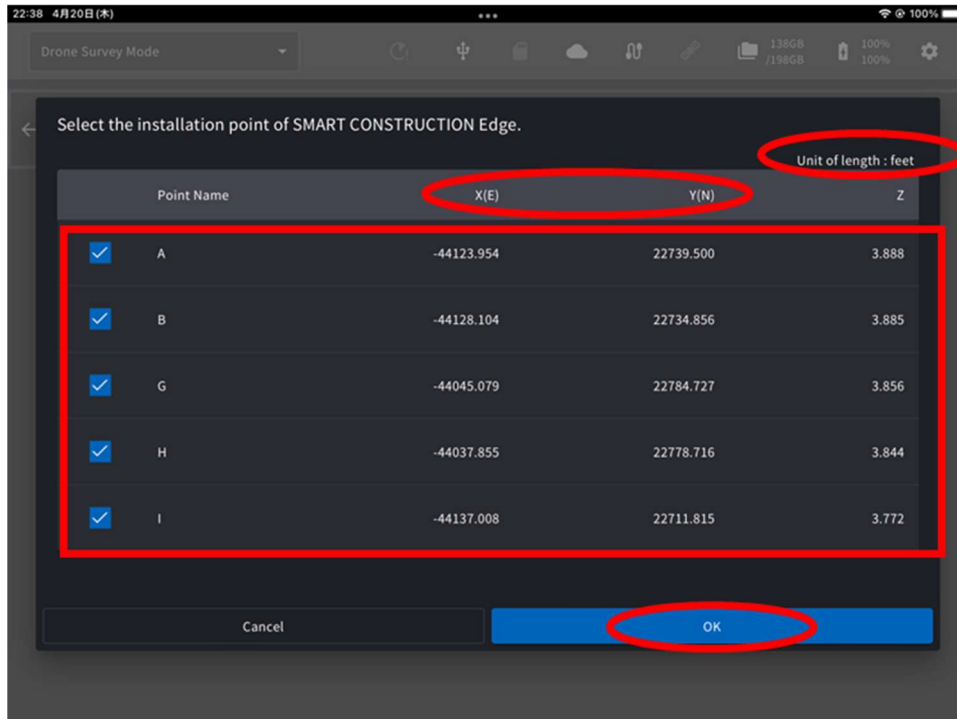


Set the file format parameter according to the file and tap "OK".



If you tap " Reflect the change here" "Locale setting" in the setting menu." these setting will be reflected to your next settings.

7. The contents of the imported localization file are displayed on the screen. Confirm the values are correct and aligned correctly, then tap “OK”.



INPUT MANUALLY

1. Align the Edge Box horizontally above the surveyed base point using the levelling device on the top of the tripod.

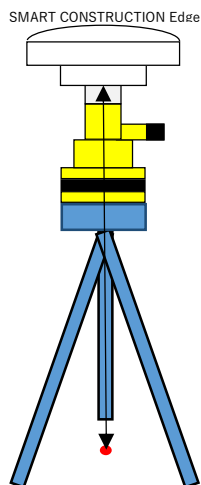



WARNING

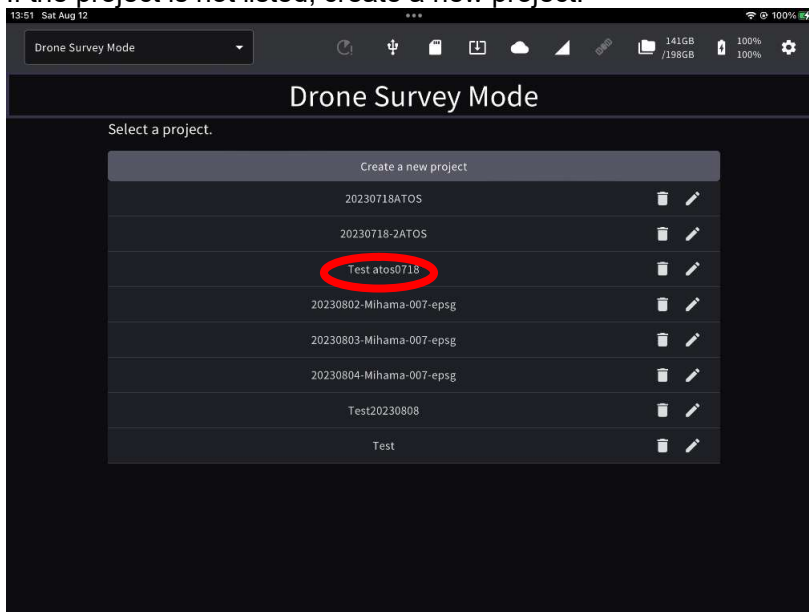
Always wear a hard hat during work.

If you drop the product from the top of the tripod by mistake and hit your head, it may cause an injury.

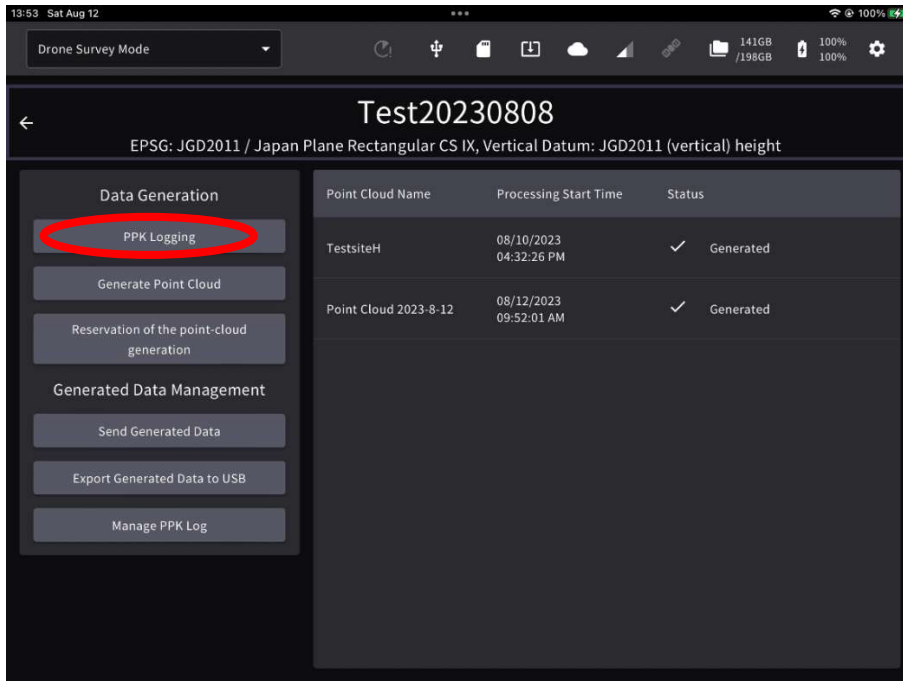
2. Measure the height from the base point to the bottom of the EdgeBox
3. Enter this height as the “pole height”



4. Launch the tablet app  and select a project of the work site to survey. If the project is not listed, create a new project.



5. Tap “PPK Logging”

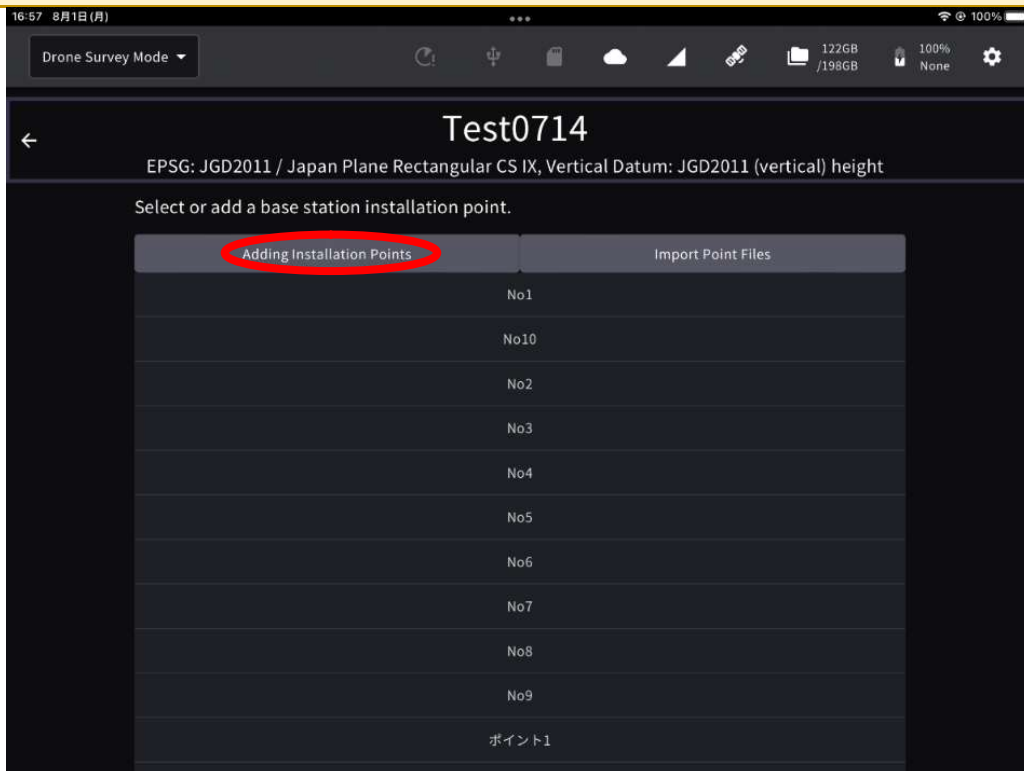


6. Tap “Adding Installation Points”.

The points you have previously set up or have used for localization will appear as a point list.

Tips

If you have selected one of the points in the list, you may just select it instead of typing in the coordinates.



7.

8. Enter the point name and coordinates of the EdgeBox location, and tap “Add”.

13:35 8月1日(月) 74%

Drone Survey Mode

Test0714

EPSG: JGD2011 / Japan Plane Rectangular CS IX, Vertical Datum: JGD2011 (vertical) height

Enter the installation point information and tap "Add".

Point Name

Using network RTK

Services to use

Coordinates (Enter Known Coordinates)

X

Y

Z

Tips

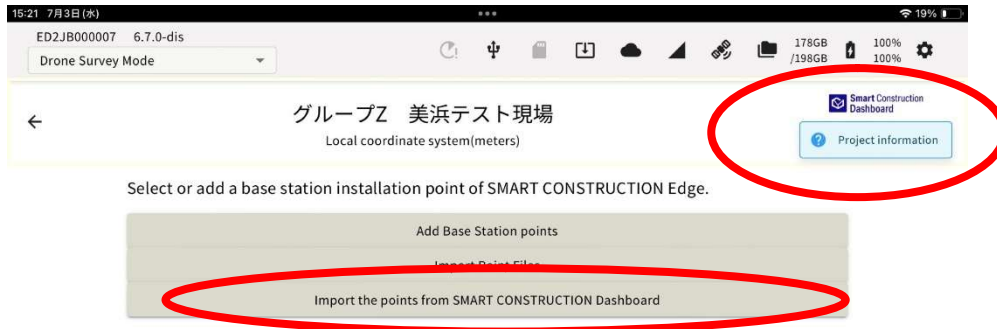
The coordinates you enter must be in the same coordinate system you created the project.

Caution.

[The EDGE2 device must be visible in the Drone images, and it must be set up at a known point during PPK logging as well, for a highly accurate Drone survey.]

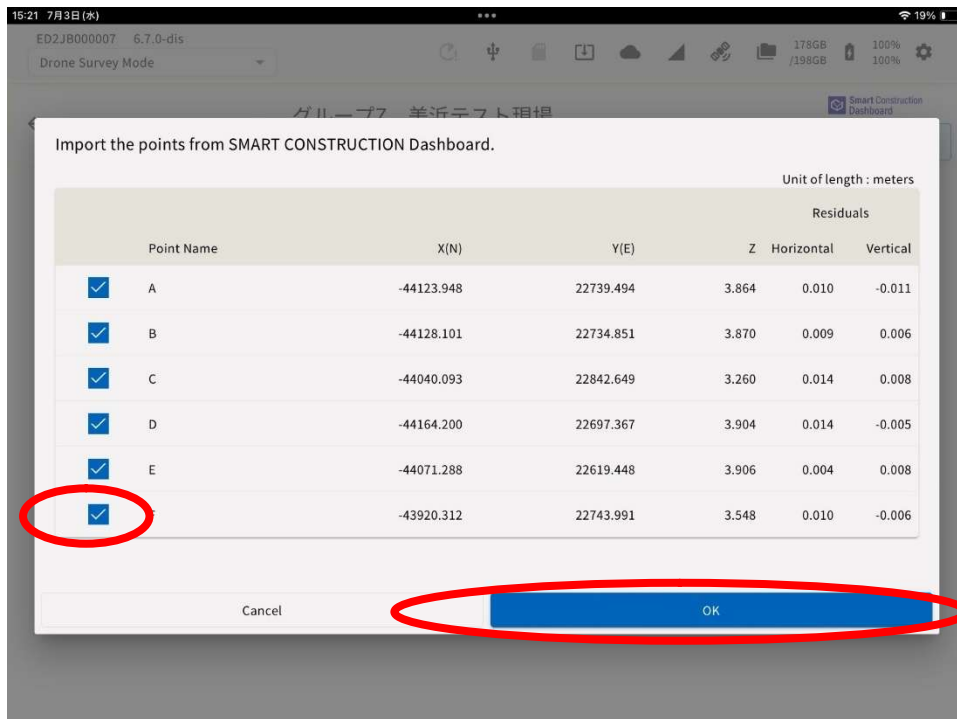
· INHERIT POINTS FROM DASHBOARD

If the project is linked to the Dashboard site, the coordinated data registered on the Dashboard can be inherited.



※The dashboard icon is displayed for projects linked to the dashboard, and tapping the 'project information' icon to view the GC3 information that has been loaded.

1. A list of points registered on the Dashboard is displayed. Select control points and press OK.

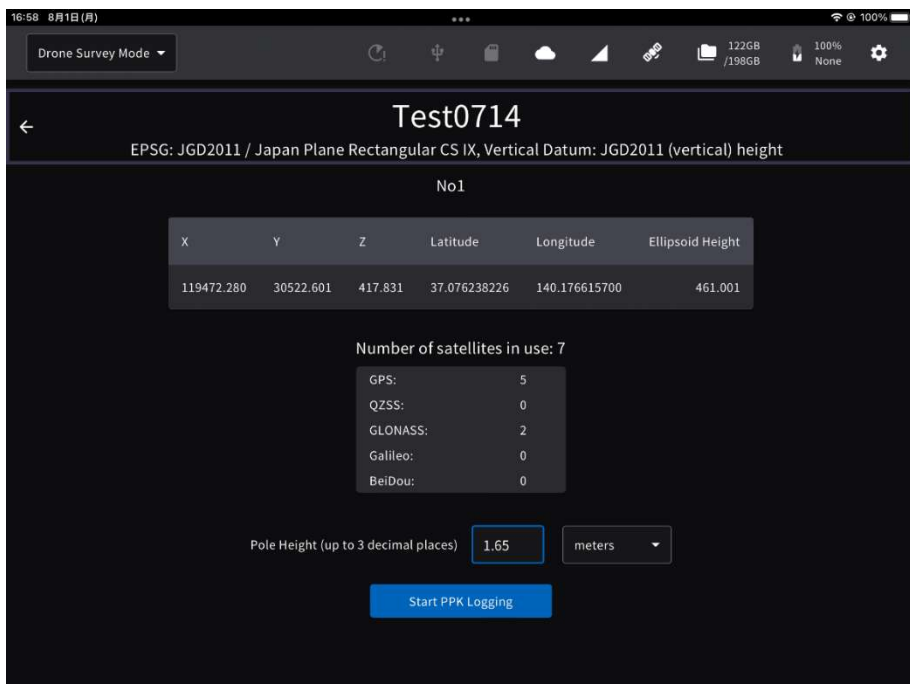


Start PPK logging

1. Select the po.int of EdgeBox from the point list.



2. Check the point data and the number of satellites used and tap the "Start PPK Logging" button.



If you have set points manually or imported from a localization file, you need to enter a pole height in advance.

Tips

Make sure that the PPK logging has started before you start flying the drone.

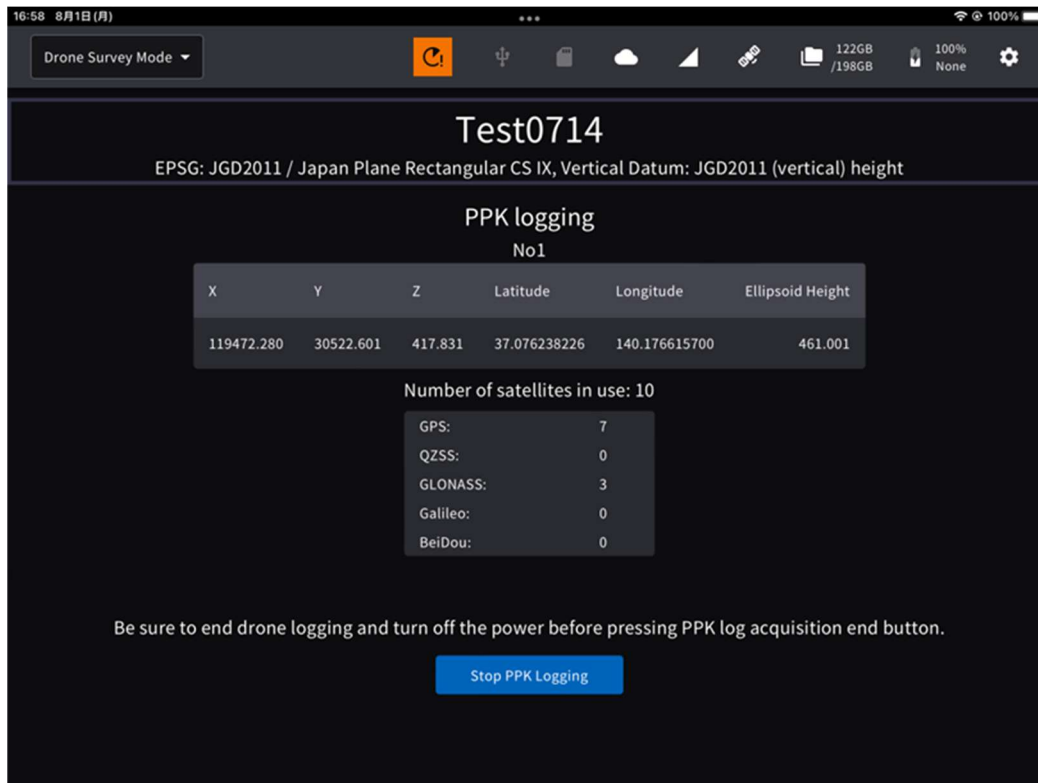
Wait **3 min.** to stabilize GNSS reception after starting PPK logging and then, **2 min.** after turning on the drone.

End PPK logging

Important!

Make sure that your drone has completed its flight and that the drone and controller are powered off before you end PPK logging. This may adversely affect the accuracy of the PPK.

1. Tap the "PPK Logging Complete" button.

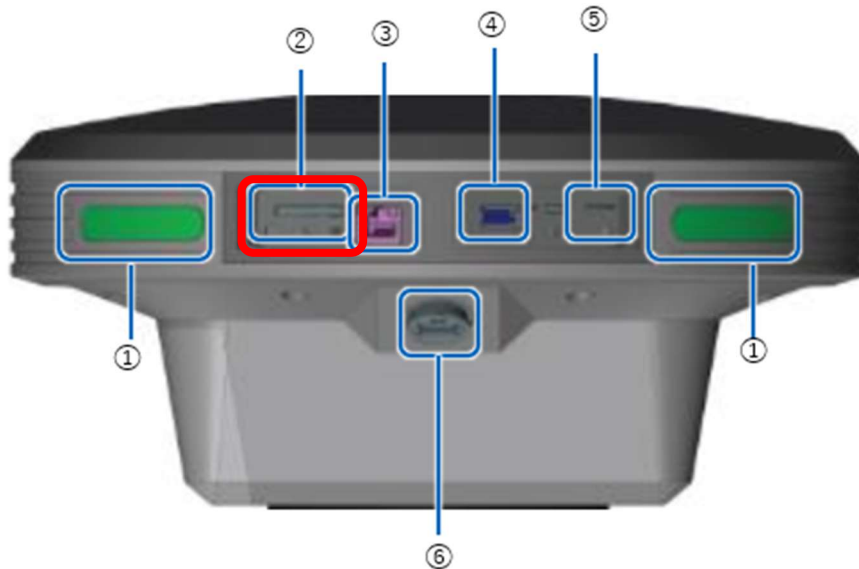


2. If GNSS reception deteriorates during the logging period, an error message may be displayed.

Please note that this may affect the accuracy of the PPK.

Generating Point Clouds

1. After flying the drone, insert the SD card containing photo data from the drone into the SD card slot of the EdgeBox.



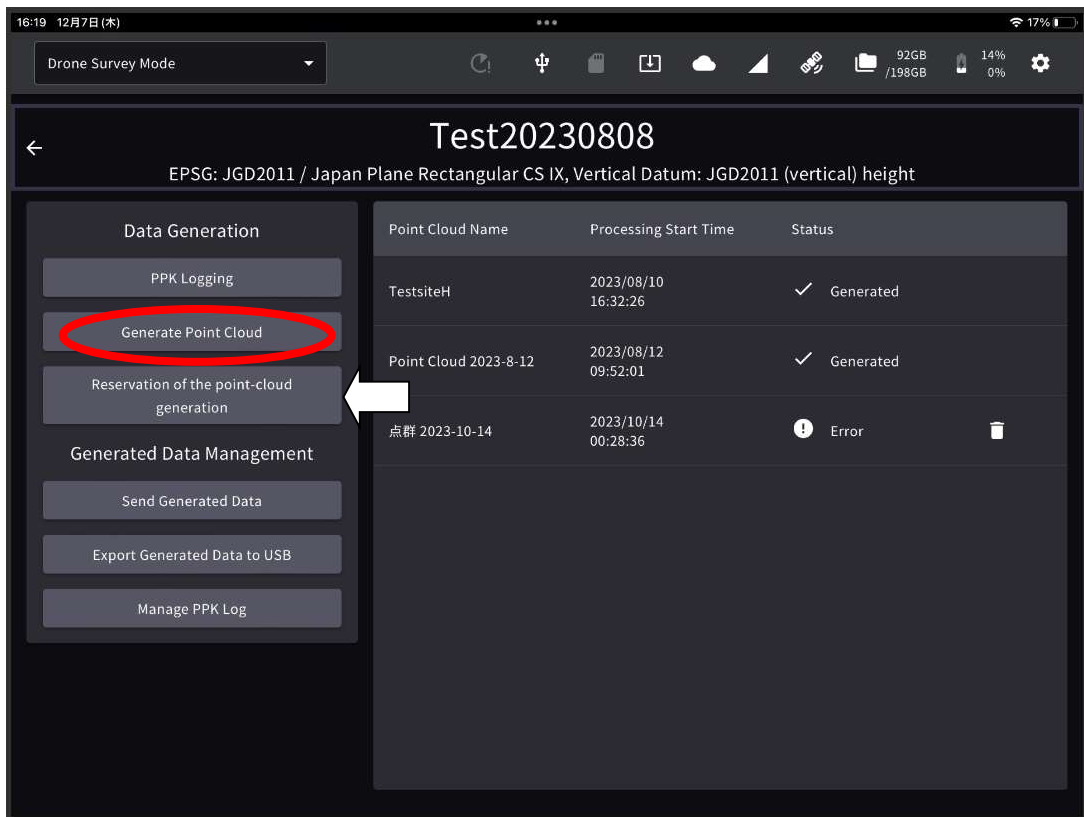
- ① Status LED
- ② **SD card slot**
- ③ Ether cable port
- ④ USB slot (USB3.0)
- ⑤ SIM card slot
- ⑥ Water-proof USB slot (USB2.0)

NOTICE

Before inserting the SD card, please check the direction and insert straightly. If you are forced to insert, damage on the SD card or this product.

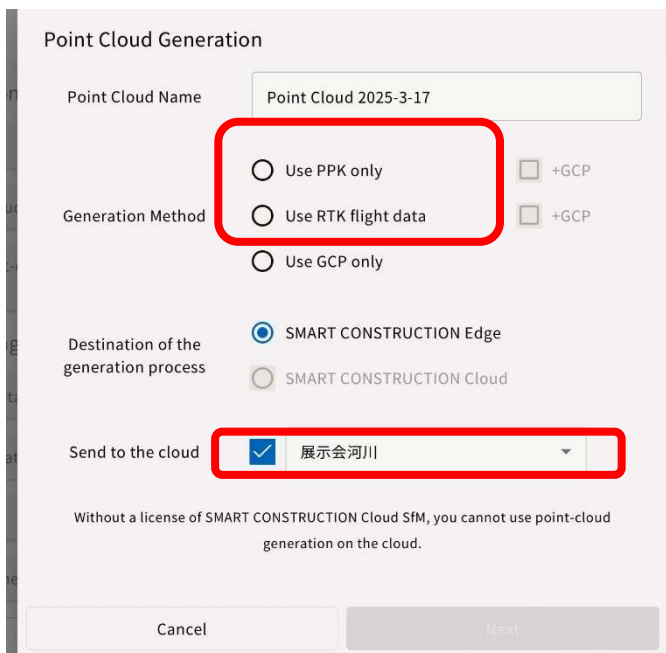
If you insert wrongly and cannot take out the SD card, please contact Smart Construction Helpdesk. Please do not take out the SD card by inserting tweezers and so on, you may damage the product by short circuit.

3. Tap the “Point Cloud Generation” button on the top screen of the project.



Tips Reservation of the point Cloud can automated processing from PPK to Upload-to-Dashboard without manual intervention.

"Reservation of the point Cloud "is not available GCP processing.



*If there is no network connection via wired LAN or LTE when starting SC Edge2, uploading to the Dashboard will not be displayed.

4. Enter the point cloud name and press OK.
Make sure that "Use PPK Only" is selected.

."If Edge 2 cannot be included in the drone photo, a GCP marker can be used to improve the accuracy of the point cloud. When Edge 2 is included in the drone photo, it serves as a GCP, allowing high accuracy with PPK-only processing."

Using RTK flight data will be the same except for the PPK data processing process.

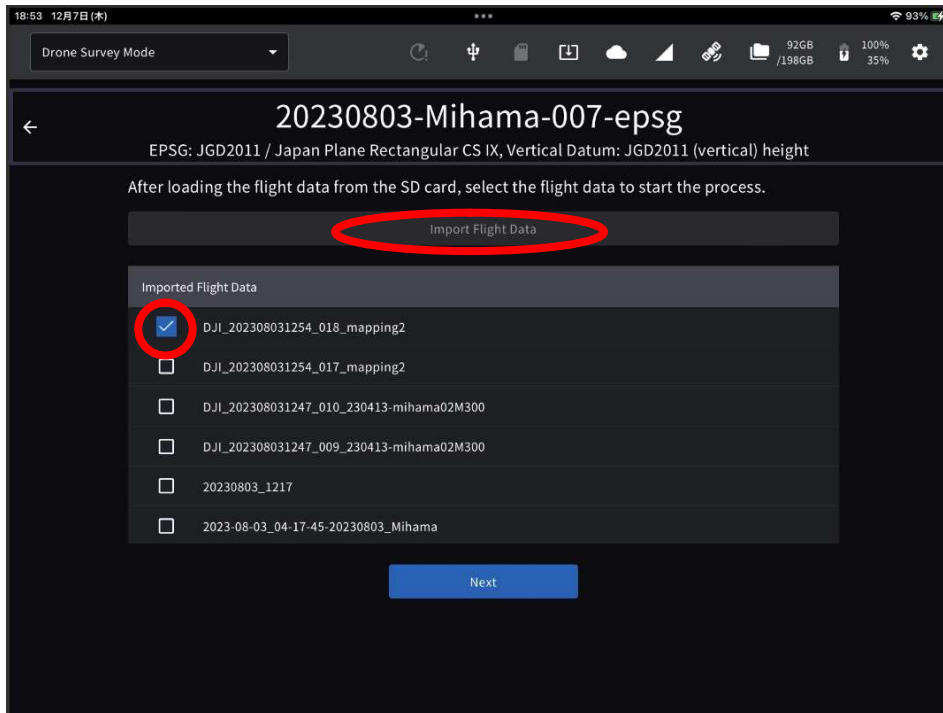
※If you want to automatically upload the point cloud, check (Send to cloud) and select the upload destination.

※When automatic upload is performed from Edge2, the data is automatically registered in the SC Dashboard.

By default, point cloud data (with object removal) and orthophotos are registered. The priority registration settings can be changed.

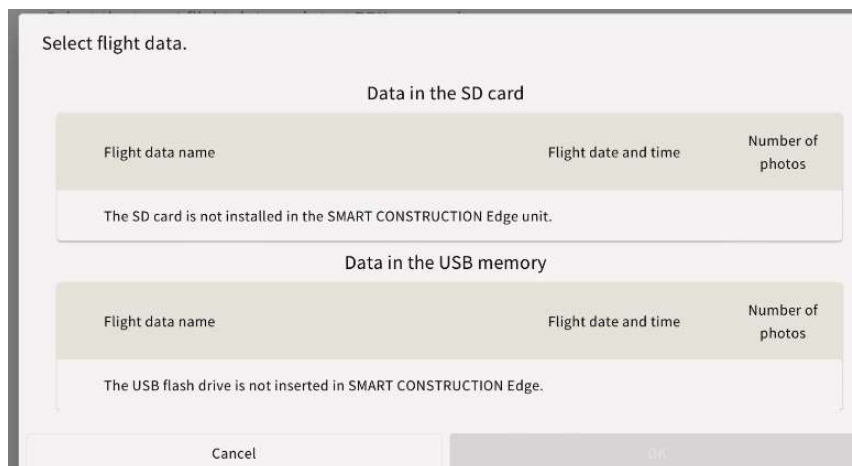
See p.00 for details on changing the priority registration settings.

5. Tap the "Import Flight Data" button and select the drone data to upload to the EdgeBox from the displayed dialog.

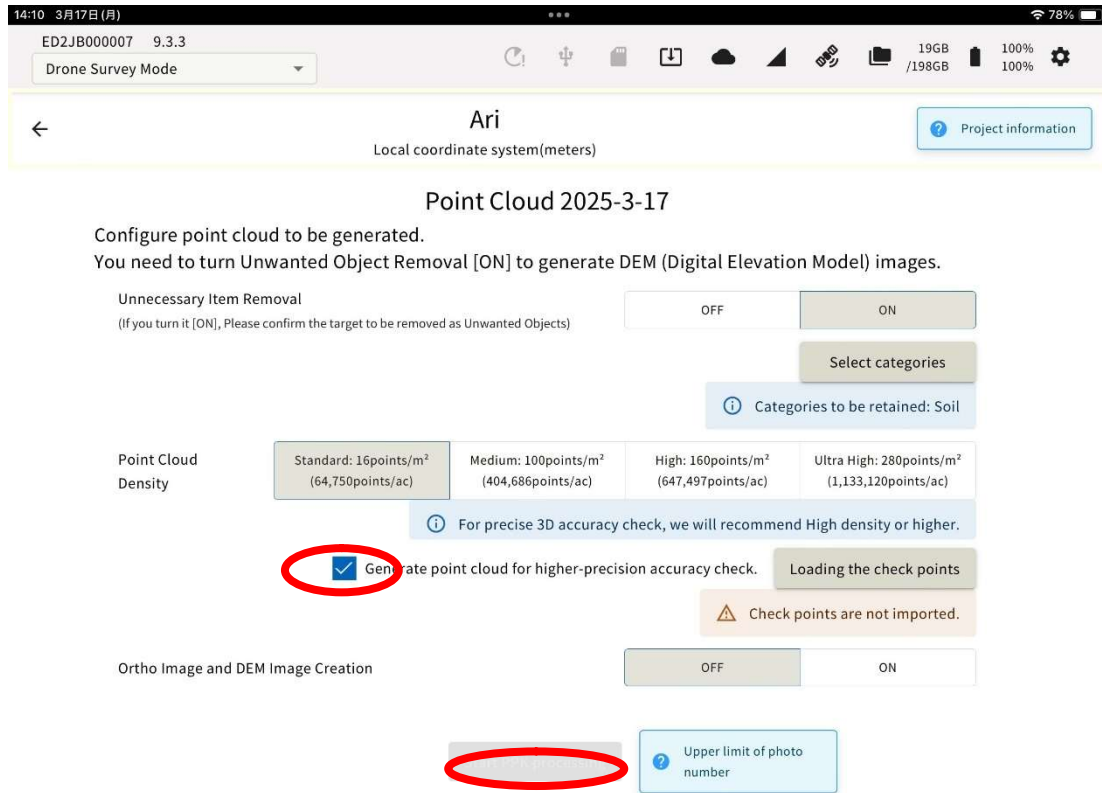


The imported data will be listed. You can also select and import multiple data.

Flight data can be imported from SD or USB.



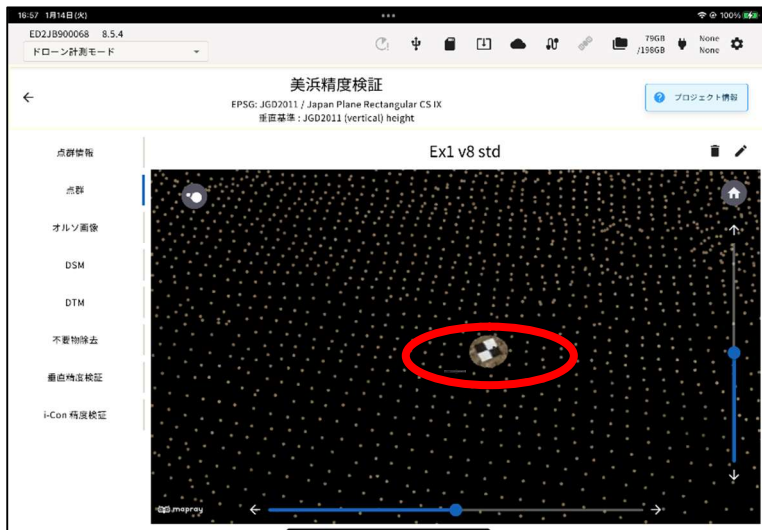
6. Check the flight data to generate point cloud from the imported data list and tap " Start PPK processing" button.



We will show the details of the setting items from next page.

※If you tap "Conditions which was able to generate point cloud" The number of photos loaded and the maximum number of photos processed at each density can be checked.

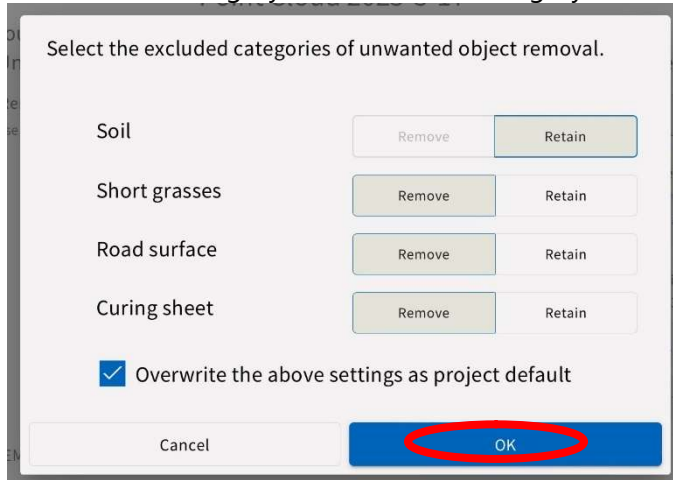
Tips Check “ Generate point cloud for higher-precision accuracy check” before generating point cloud. Increases the point cloud density in the vicinity of the Check Points by loading them in advance. If not checked, the same point cloud is generated as before.



Unnecessary object Removal:

When you toggle ON, it removes unnecessary objects, such as buildings and vehicles, that are not needed for soil volume calculations.

Press "Select Category" to choose the category for removal.



"Short grasses" can remove/retain all Short grasses, other vegetation such as tall trees will be removed, and "Road Surface" can remove/retain road surfaces, including concrete.

The "curing sheet" could remove/retain a green or blue sheet on site.

Point Cloud Density : Adjusts the density of the point cloud

Tips

3 D accuracy check requires Ultra high density . There's area size limitation with this setting.

level	density	Maximum processing area			
		Point cloud + ortho +Unnecessary object Removal point cloud	Point Cloud + Ortho	Point cloud+ Unnecessary object Removal point cloud	Point clouds only
Ultra-high density	280p/m2	5 ha	5 ha	10 ha	10 ha
High-density	160p/m2	15ha	15 ha	18 ha	18 ha
Medium	100p/m2	15 ha	15 ha	30 ha	30 ha
Standard density	16p/m2	50 ha	50 ha	50 ha	50 ha

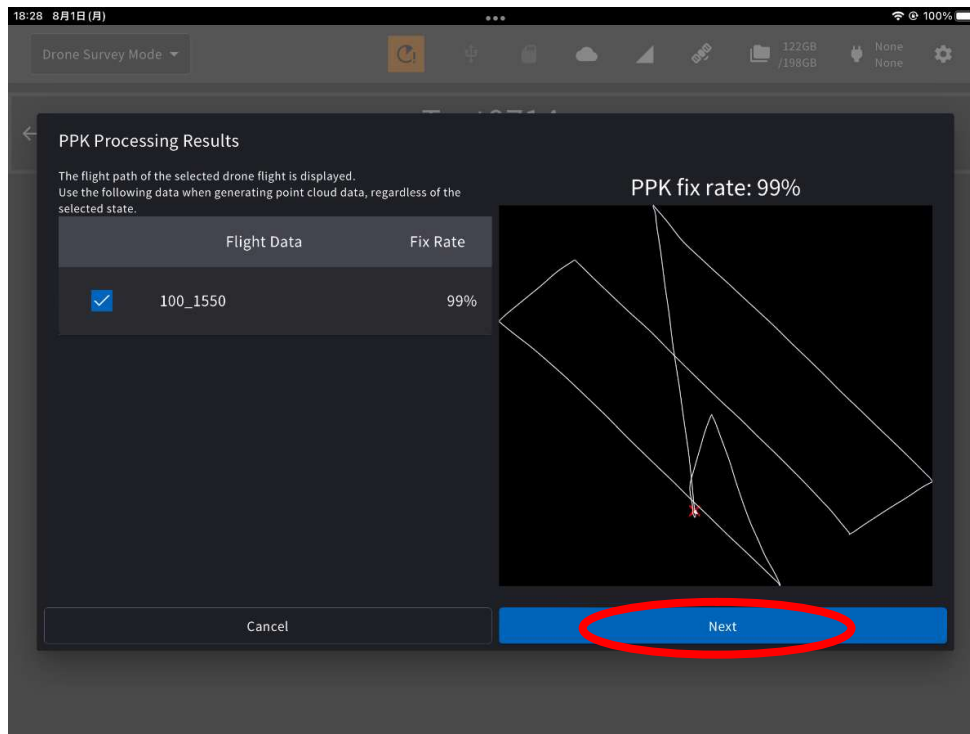
Ortho and DEM image generation:

Generate ortho (sky photo) and DEM (Digital Elevation Model).

Tips

If you do not turn on the ortho generation, you will not be able to output an image showing the verification point positions on the ortho, which is the 3D accuracy check report material.

7. A dialog showing the PPK Fix rate will appear, check the rate and press "Next".



Tips

A low PPK Fix rate may affect the accuracy of the resulting point cloud. At the point where the red × mark on the drone flight route has a worse acquisition of the drone location. Please confirm and fly again if necessary.

- The point cloud viewer screen shows up and the point cloud generation process starts. During this process, it is possible to switch to another window and perform the other work. You can check the generated point cloud by selecting it from the list on the project top screen.

Tips

To generate a Digital Elevation Model (DEM), both the Unwanted Object Analysis and Ortho Image Generation settings must be both ON.

WARNING

If you turn off SMART CONSTRUCTION Edge during the processes below, the data could be corrupted, or the system doesn't work properly anymore.

Please turn it off after these processes are done.



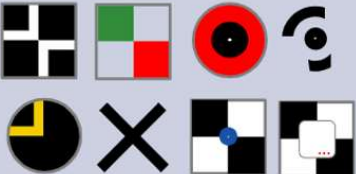
- Point cloud generation
- PPK logging
- Point cloud uploading
- Data exporting

WHEN WE USE GCPS TO IMPROVE THE ACCURACY

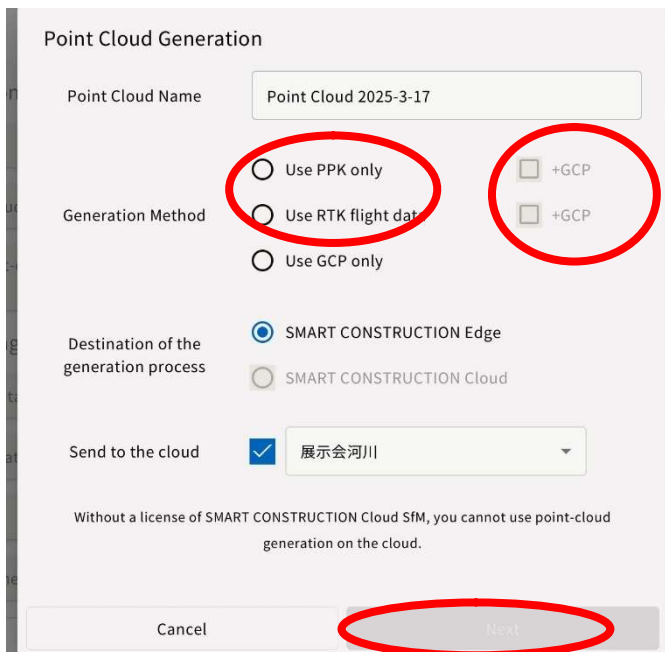
"If Edge 2 cannot be included in the drone photo, a GCP marker can be used to improve the accuracy of the point cloud. When Edge 2 is included in the drone photo, it serves as a GCP, allowing high accuracy with PPK-only processing. Please prepare the drone image with GCPs and coordinate information of GCP.

In v10, when performing SFM processing using GCPs, the positions of the following markers can now be automatically detected.

Detectable markers

Confirmed 検出可能	Possible, but not confirmed 検出可能性あり	Not detectable 非対応
 Black & White with good contrast		

1. Select "Use PPK and GCP" in step 4 of "Generating Point Clouds".



Point Cloud Generation

Point Cloud Name: Point Cloud 2025-3-17

Generation Method:
 Use PPK only
 Use RTK flight data
 Use GCP only

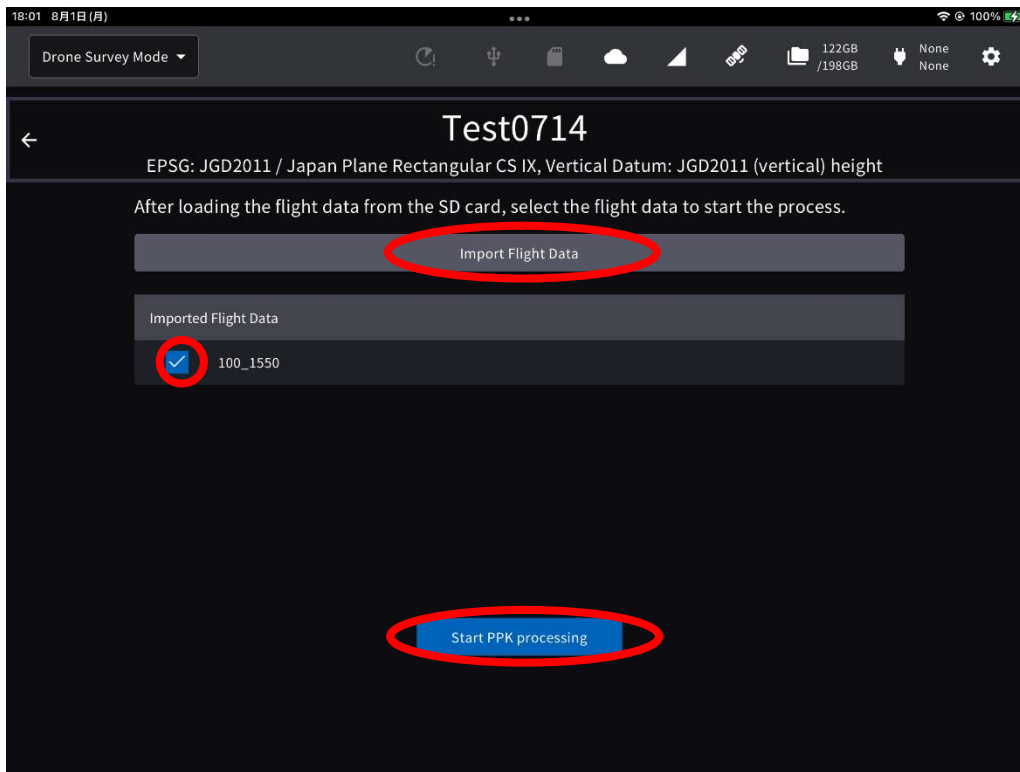
Destination of the generation process:
 SMART CONSTRUCTION Edge
 SMART CONSTRUCTION Cloud

Send to the cloud: 展示会河川

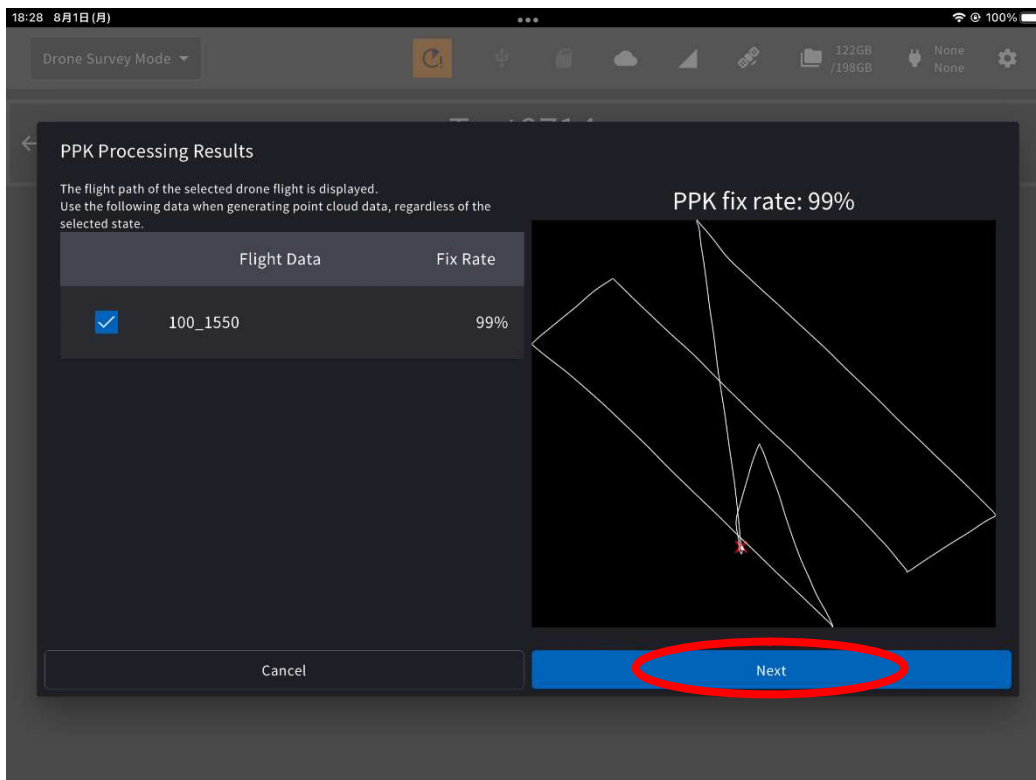
Without a license of SMART CONSTRUCTION Cloud SfM, you cannot use point-cloud generation on the cloud.

Cancel Next

2. Tap the "Import Flight Data" button and select the drone data to upload to the EdgeBox from the displayed dialog.



3. The imported data will be listed. You can also select and multiple imported data.
4. Check the flight data to generate point cloud from the imported data list and tap "PPK processing start" button.
 ※If you want to automatically upload the point cloud, check (Send to cloud) and select the upload destination.
5. A dialog showing the PPK Fix rate will appear, check the rate and press "Next"



Tips

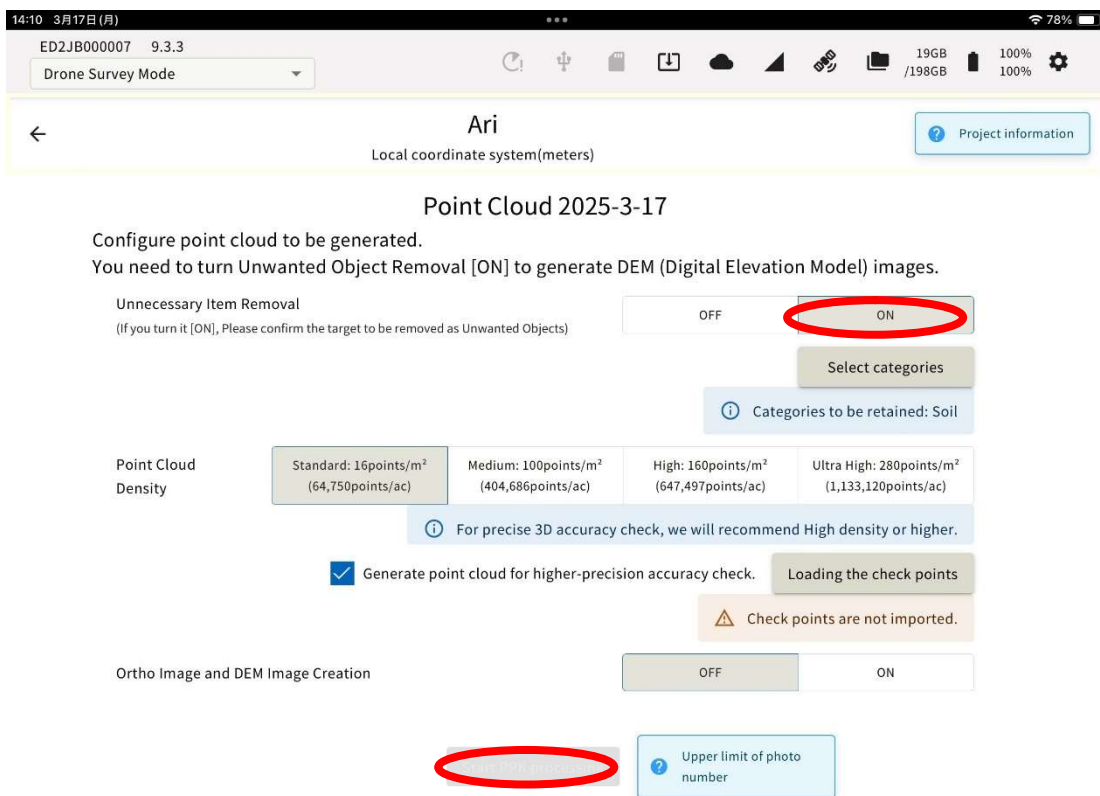
A low PPK Fix rate may affect the accuracy of the resulting point cloud. At the point where the red × mark on the drone flight route has a worse acquisition of the drone location. Please confirm and fly again if necessary.

6. Check the flight data to generate point cloud from the imported data list and tap " Start PPK processing" button.

Tips **Use GCP only**

This is a preliminary functional update based on future updates and will enable GCP-only SFM processing for P4RTK, M3E, and M300. We have confirmed the accuracy, but if there is no need for GCP-only processing, we recommend normal PPK/RTK or +GCP processing for the models listed above at this time.

- 7.



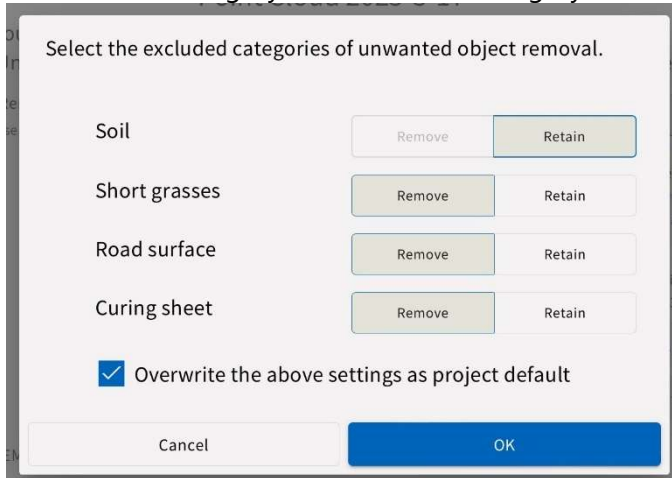
We will show the details of the setting items from the next page.

8. ※If you tap "Conditions which was able to generate point cloud" The number of photos loaded and the maximum number of photos processed at each density can be checked.

Unnecessary object removal:

When you toggle ON, it removes unnecessary objects, such as buildings and vehicles, that are not needed for soil volume calculations.

Press "Select Category" to choose the category for removal.



"Short grasses" can remove/retain all Short grasses, other vegetation such as tall trees will be removed and "Road Surface" can remove/retain road surfaces, including concrete.

The "curing sheet" could remove/retain a green or blue sheet on site.

Point Cloud Density : Adjusts the density of the point cloud

Tips
3 D accuracy check requires Ultra high density . There's area size limitation with this setting.

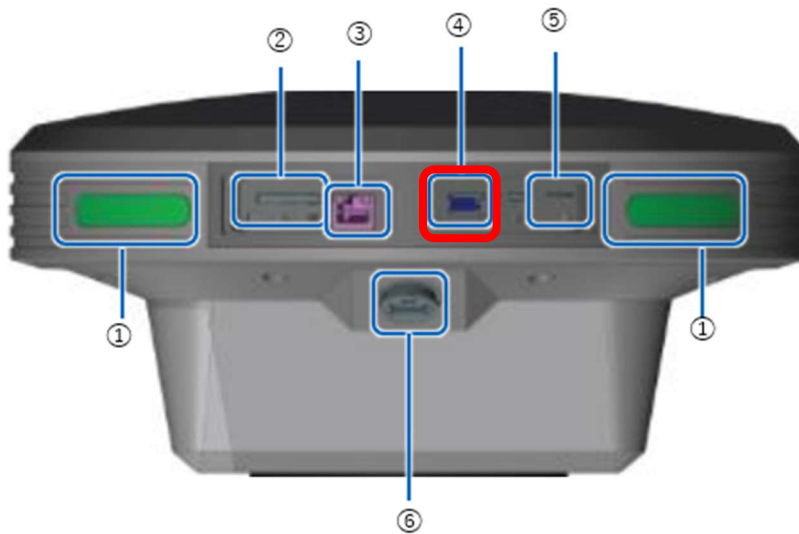
level	density	Maximum processing area			
		Point cloud + ortho +Unnecessary object Removal point cloud	Point Cloud + Ortho	Point cloud+ Unnecessary object Removal point cloud	Point clouds only
Ultra-high density	280p/m2	5 ha	5 ha	10 ha	10 ha
High-density	160p/m2	9 ha	9 ha	18 ha	18 ha
Medium	100p/m2	15 ha	15 ha	30 ha	30 ha
Standard density	16p/m2	50 ha	50 ha	50 ha	50 ha

Ortho and DEM image generation:

Generate ortho (sky photo) and DEM (Digital Elevation Model).

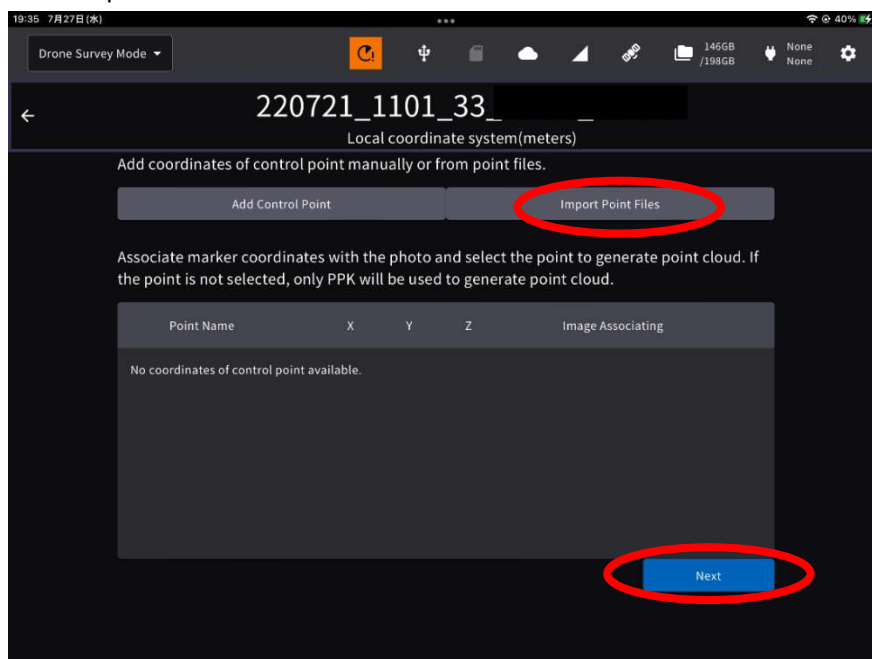
Tips
If you do not turn on the ortho generation, you will not be able to output an image showing the verification point positions on the ortho, which is the 3D accuracy check report material.

9. Insert the USB memory with GCP coordinates file (.csv) in the USB slot of SMART CONSTRUCTION Edge. Please refer to the file format [here](#).
 Insert the USB memory into the USB slot (inside the waterproof lid) ④ of the Edge Box




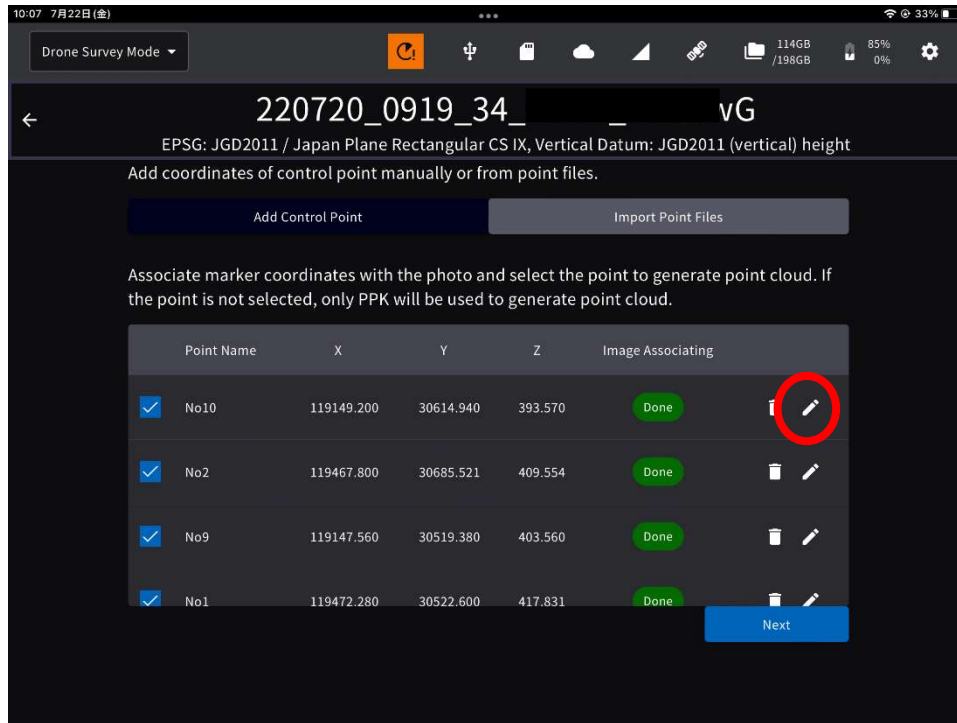
- ① Status LED
- ② SD card slot
- ③ Ether cable port
- ④ **USB slot (USB3.0)**
- ⑤ SIM card slot
- ⑥ Water-proof USB slot (USB2.0) : cannot use this slot for USB memory

10. Tap the "Import Point File" button and specify a CSV file from displayed dialog, which contains coordinates of GCP. You may select "Add Control Point" if you manually add a control point.



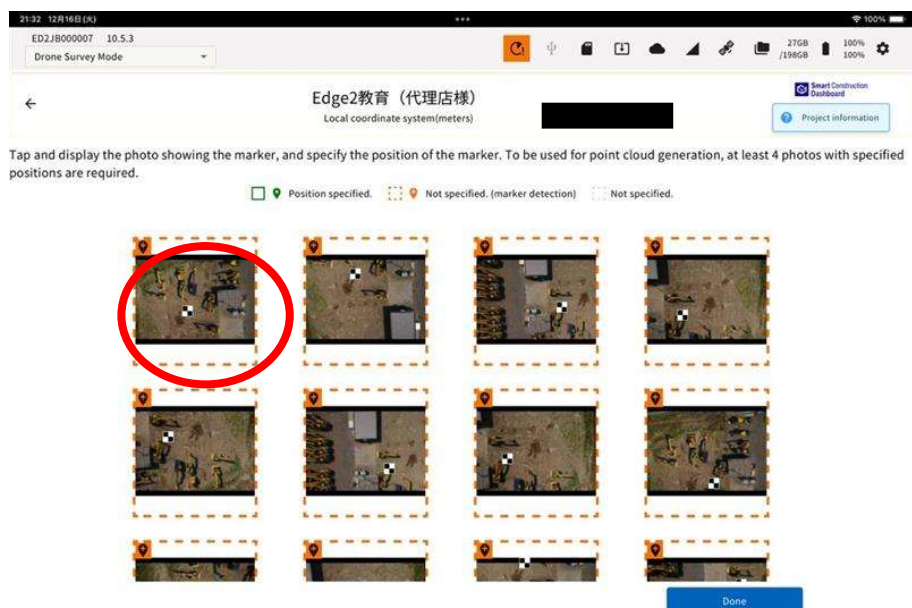
11. Set the file format parameter according to the file and tap "OK".

12. Tap edit button  of each GCP to display a thumbnail of the image that may have the selected GCP in the image.



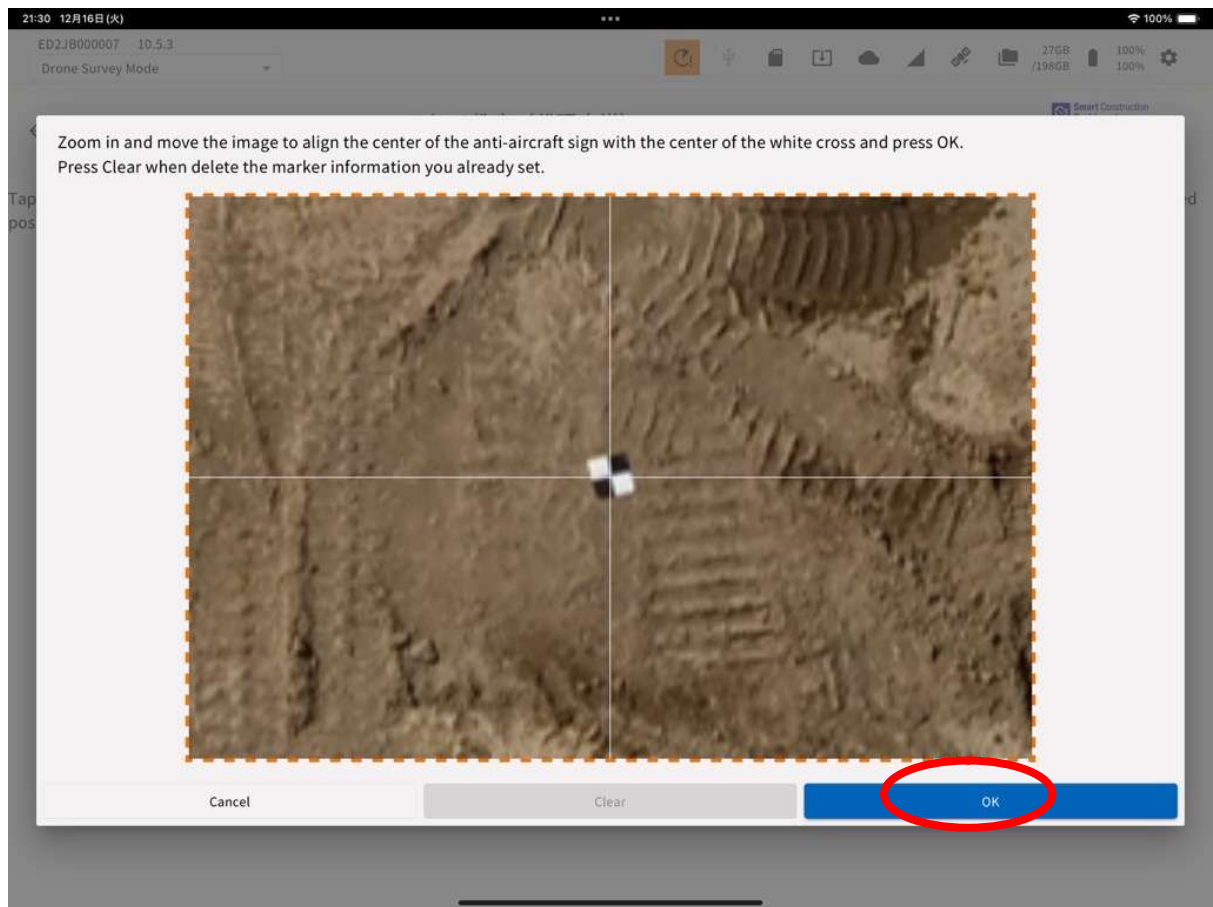
13.

14. Tap the thumbnail of the image, align the center of the cross mark to the center of GCP in the image, and tap "OK"
Automatically detected and highlighted in orange.



15.

You can zoom in and out by pinching in and out, move the displayed portion by swiping.

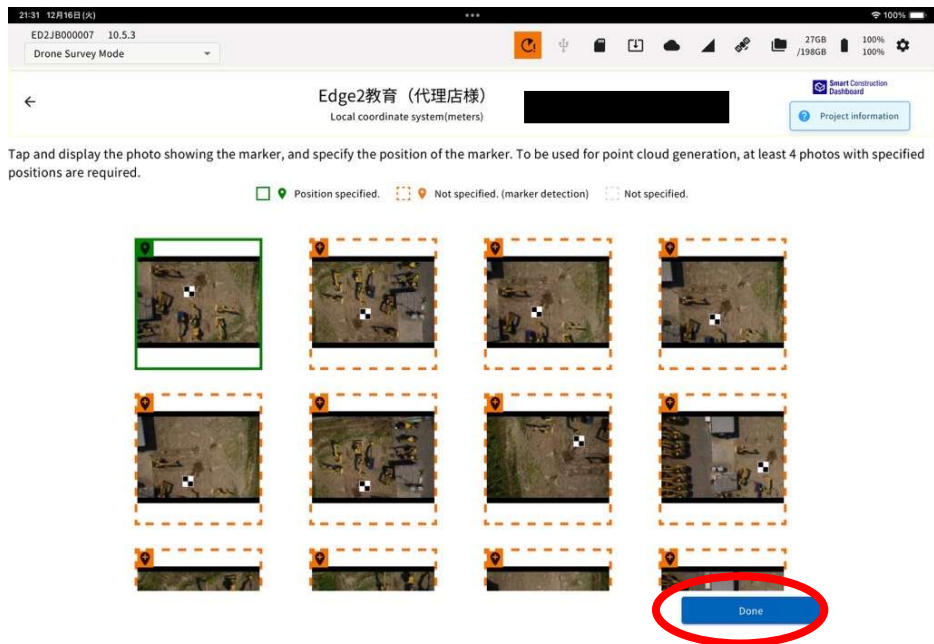


More than four images are required to align a GCP.

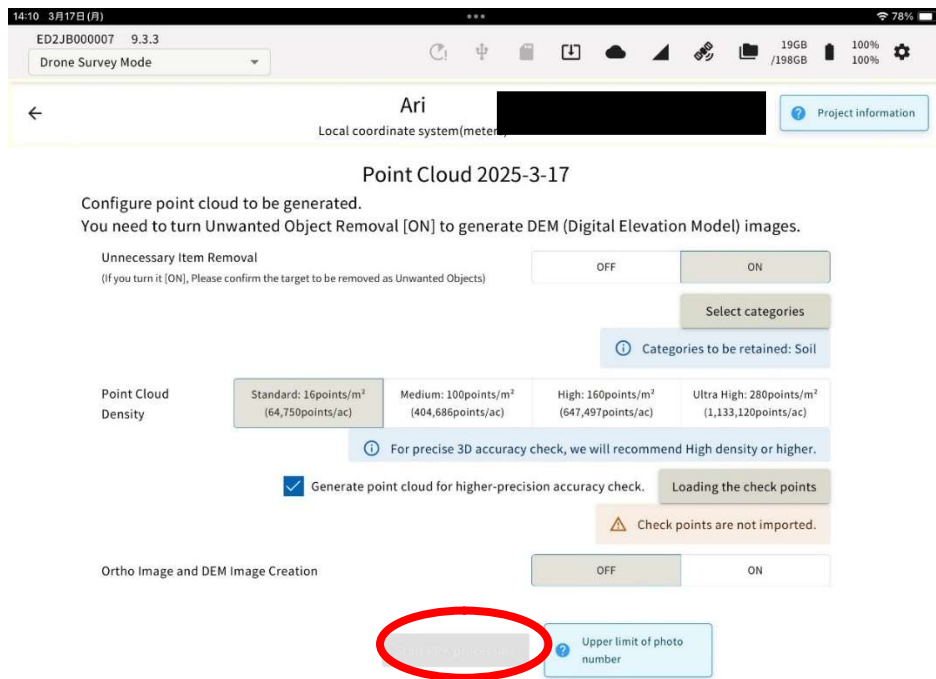
At least more than 1 GCP must be selected and aligned like this. If you proceed without selecting a GCP, point cloud is generated only with PPK.

16. When you finish matching the coordinates of the GCP (at least 4 of them) with the image center, tap the "Done" button.

If the GCP center is confirmed it will be highlighted in green



17. Set the parameters of point cloud generation and tap the “Start” button.



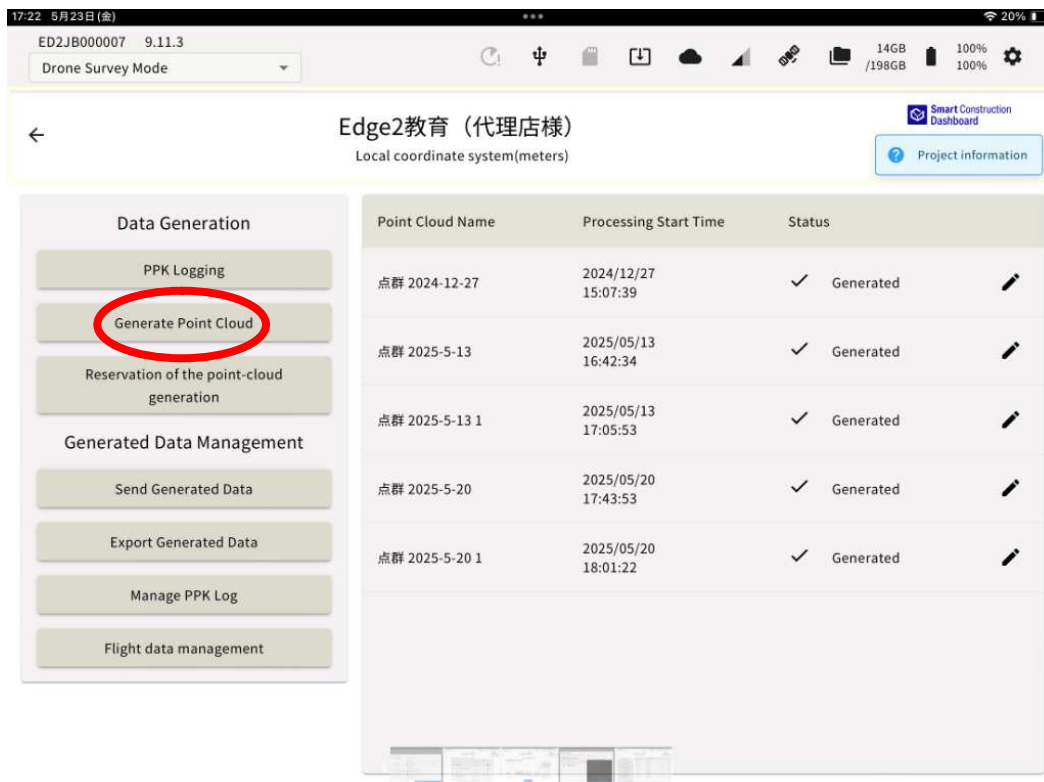
18. The point cloud viewer screen shows up and the point cloud generation process starts. During this process, it is possible to switch to another window and perform the other work. You can check the generated point cloud by selecting it from the list on the project top screen.

Tips
To generate a Digital Elevation Model (DEM), both the Unwanted Object Analysis and Ortho Image Generation settings must be both ON.

EDGE/CLOUDSFM INTEGRATION

- We have added a new feature that allows point cloud generation, visualization, and accuracy verification using Cloud-based SfM processing for large-scale sites that cannot be handled within Edge2.
The SfM processing results (point clouds) completed on SC Cloud can be viewed in the Edge2 application.
The Edge2 application tracks the progress of SfM processing on SC Cloud until completion.

Tap “ Generation Point Cloud”



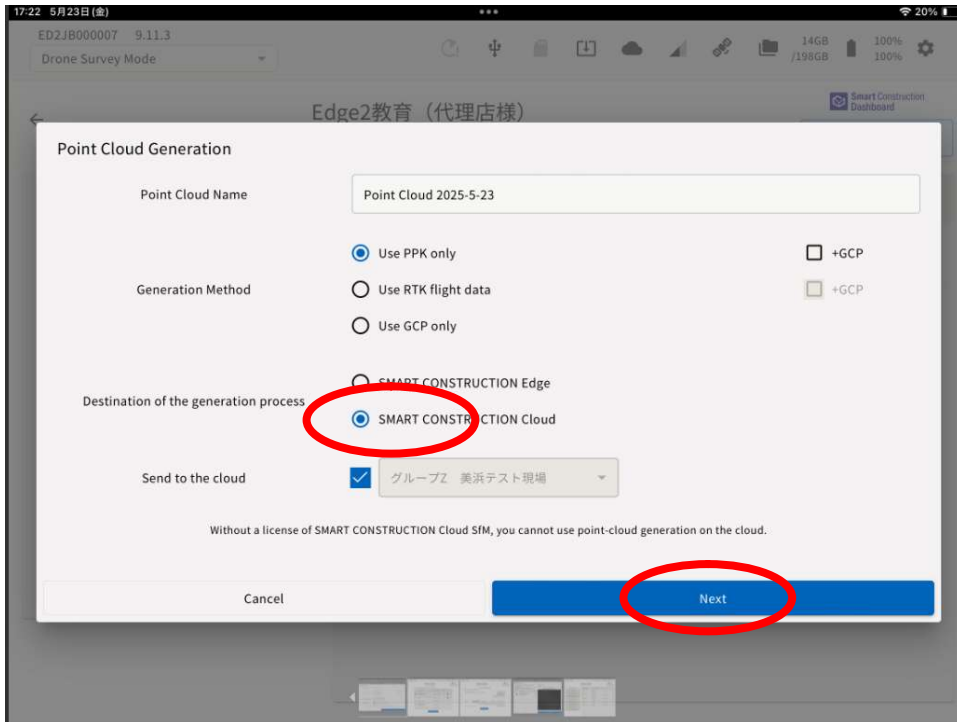
“Select “SMART CONSTRUCTION Cloud” and the cloud destination, then tap Next.

Display Conditions for SMART CONSTRUCTION Cloud

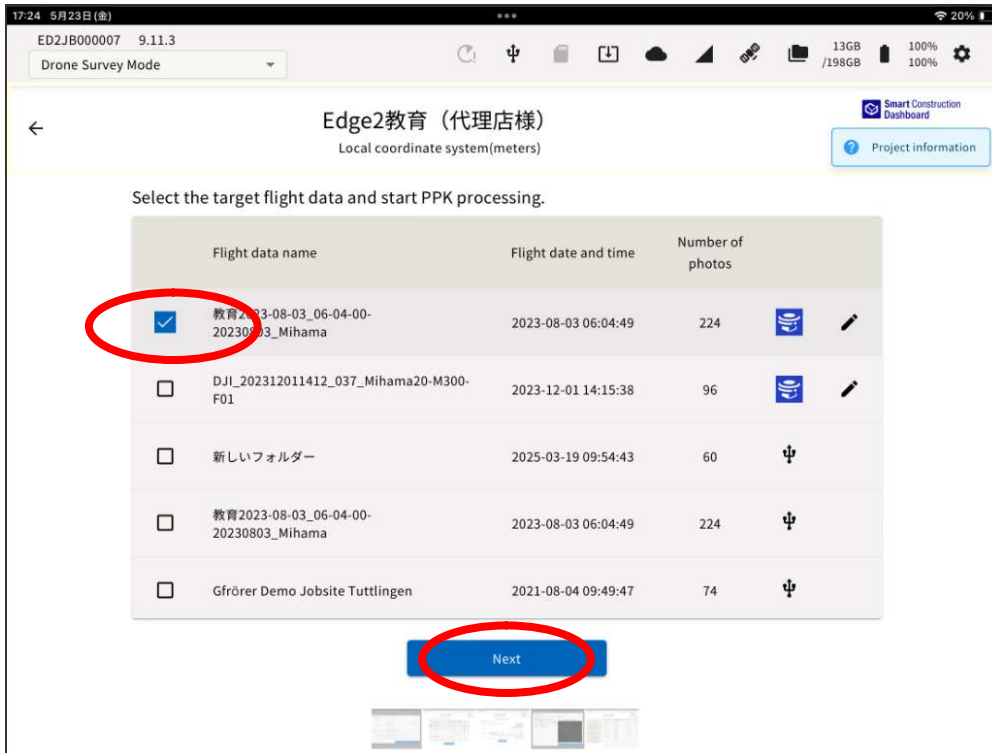
- Network must be online
- Cloud account must be logged in
- UI language must be set to Japanese or English

※To use CloudSFM, a separate license agreement is required.

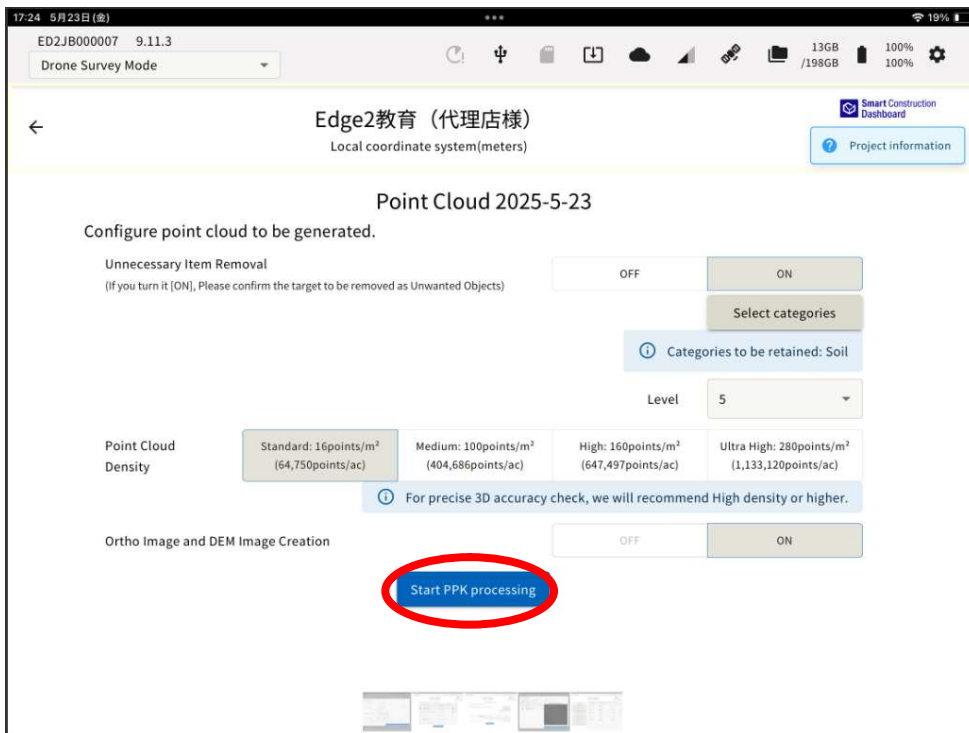
For details, please contact an EarthBrain authorized product distributor.



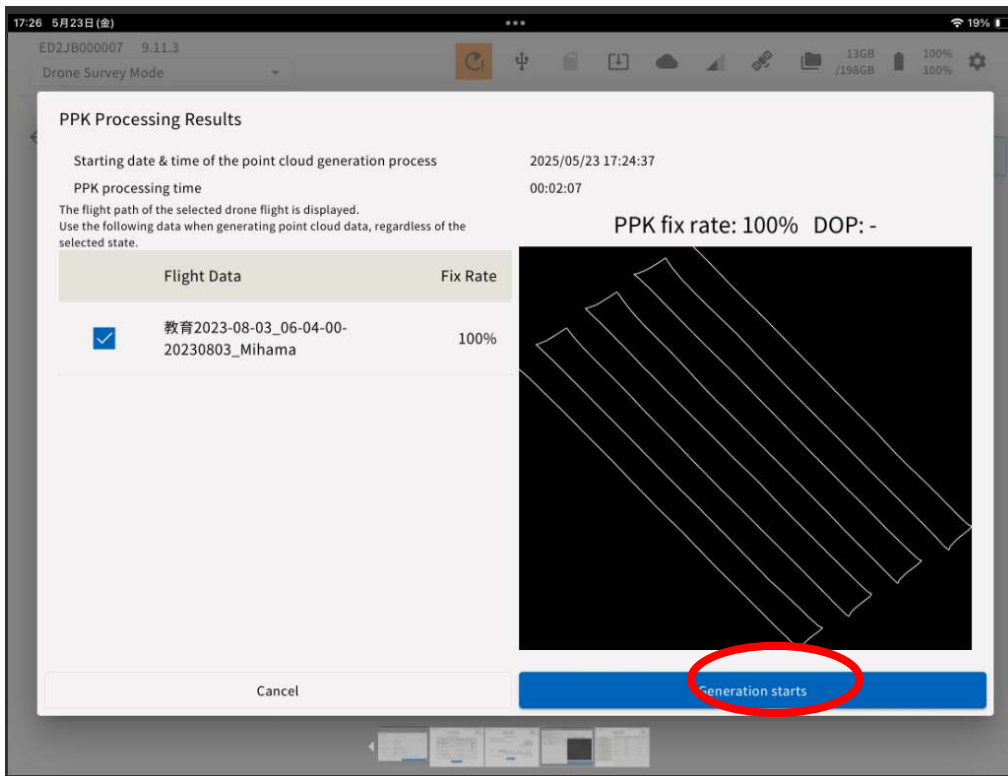
Select the flight data, then tap Next.



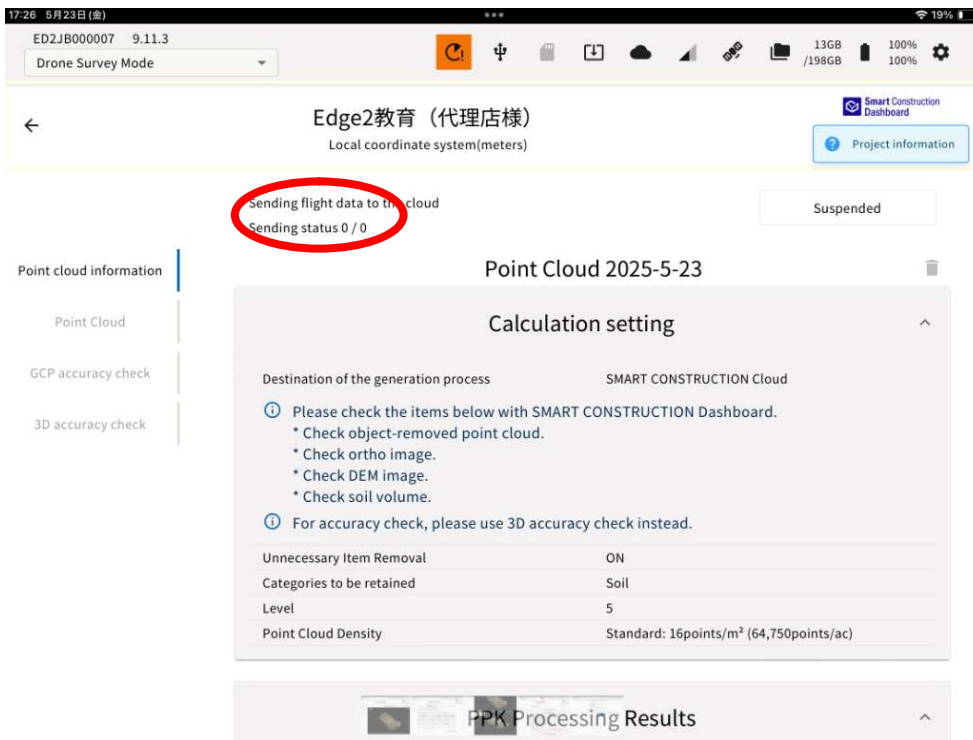
Set the conditions for the point cloud to be generated, then tap “Start PPK Processing.”



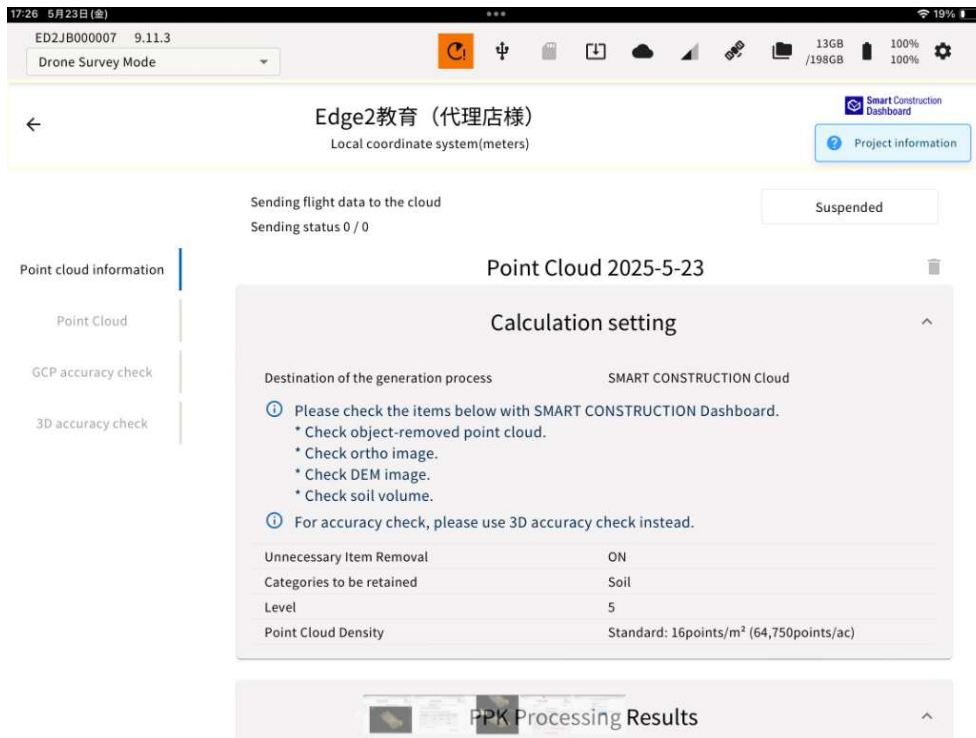
Once PPK processing is complete, tap “Generation Start.”



Sending flight data



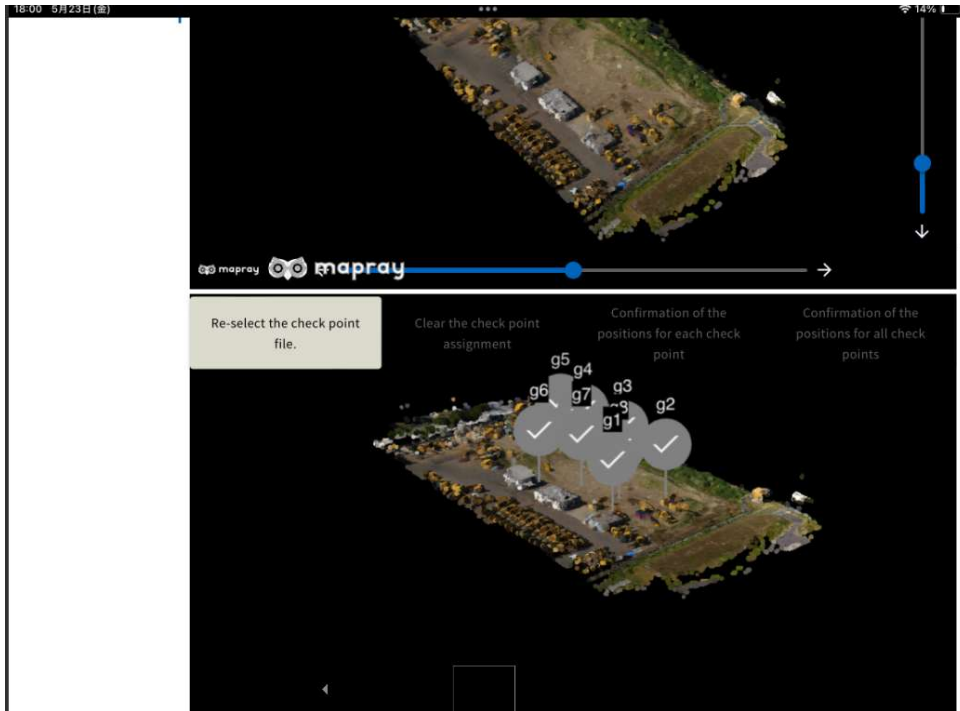
Generating point cloud on cloud



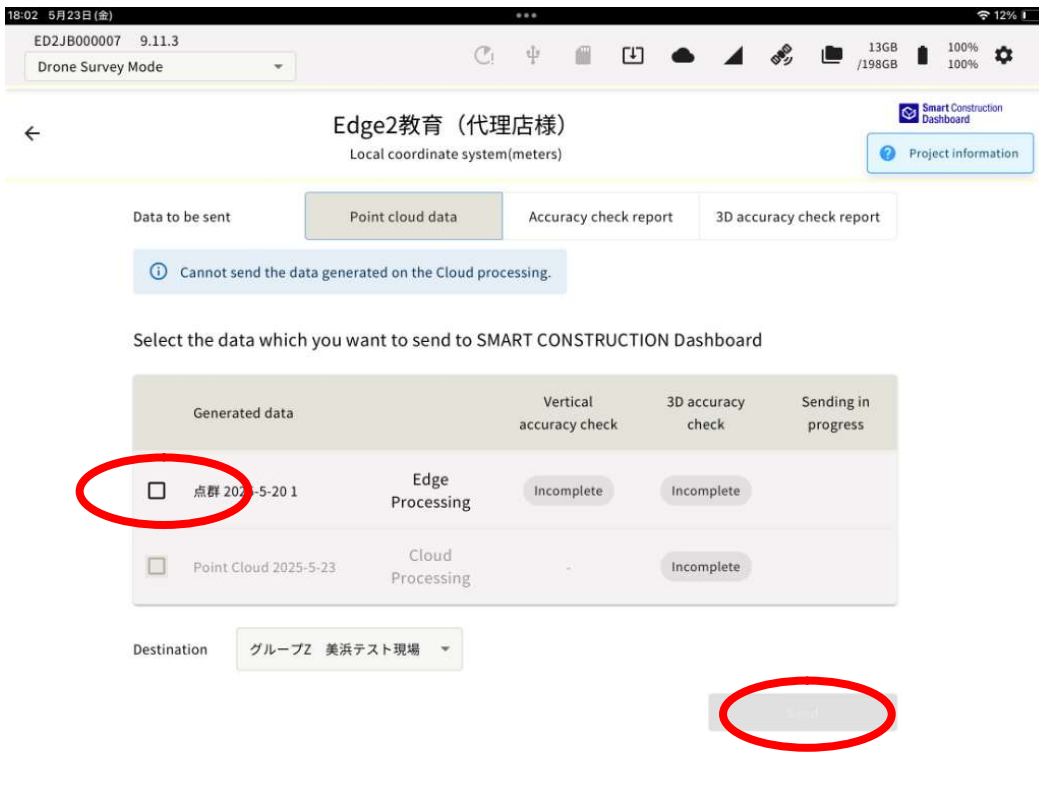
Once point cloud generation is complete, the point cloud will be displayed in the Edge2 application.
(Display only; the point cloud data will not be downloaded to Edge2.)



Accuracy verification on Edge2 app

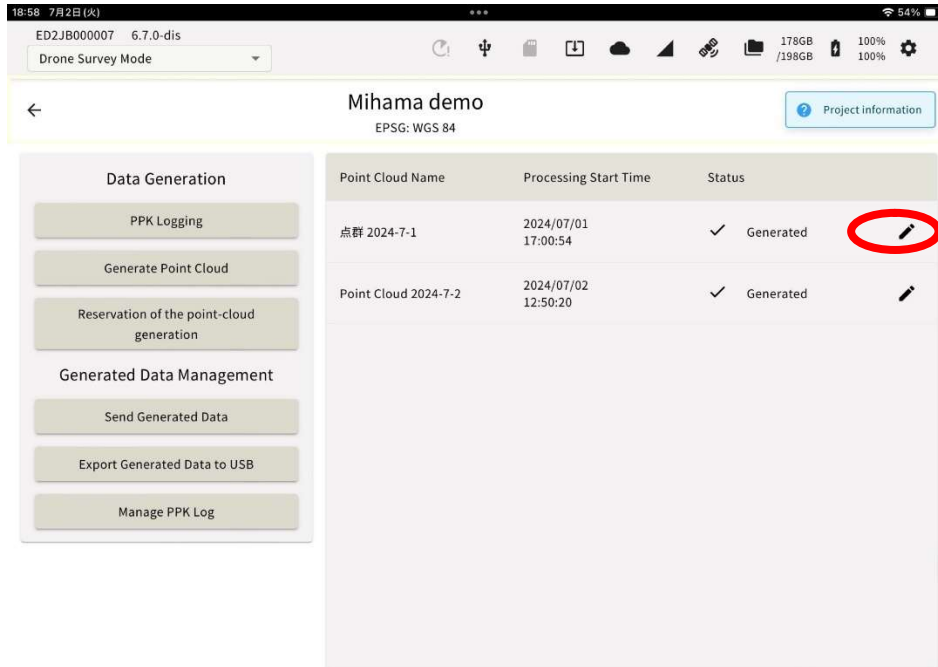


Select the results you want to send and tap "Send"



View the generated point cloud

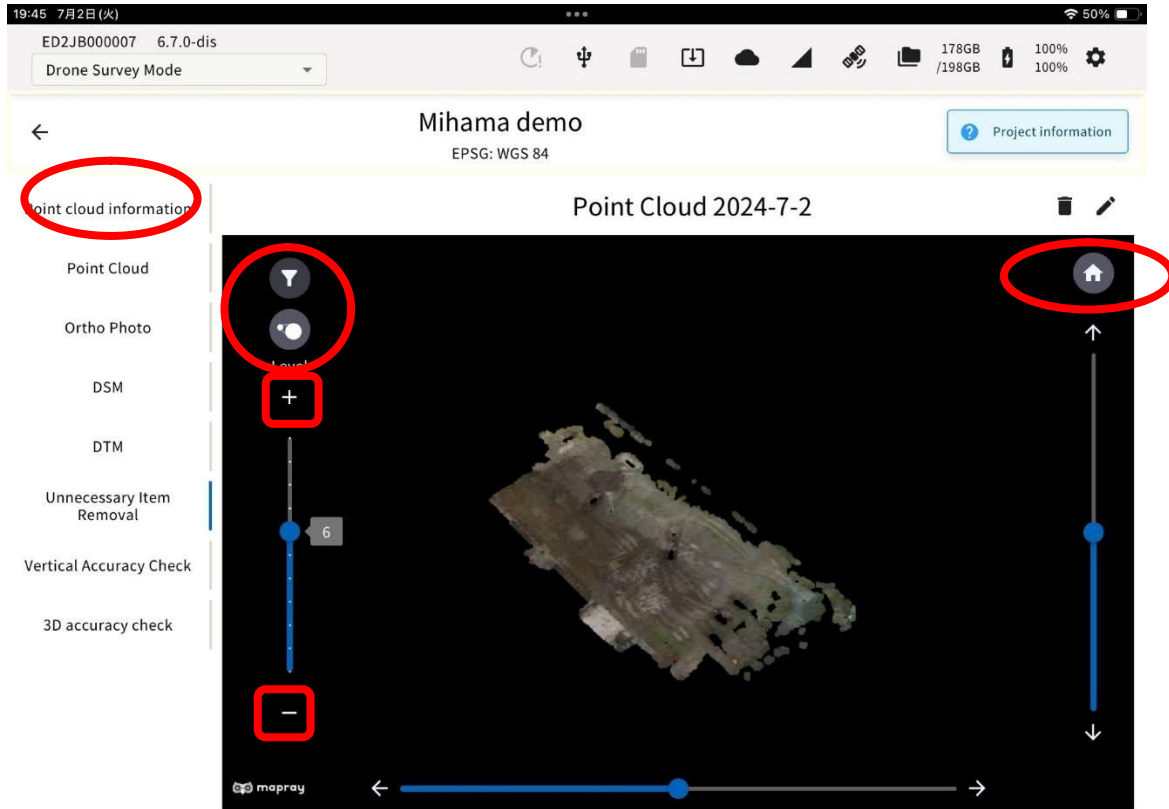
The right pane of the project top screen displays a list of point clouds and detailed information. You can see the generated point cloud in the Point Cloud Viewer by tapping the list.



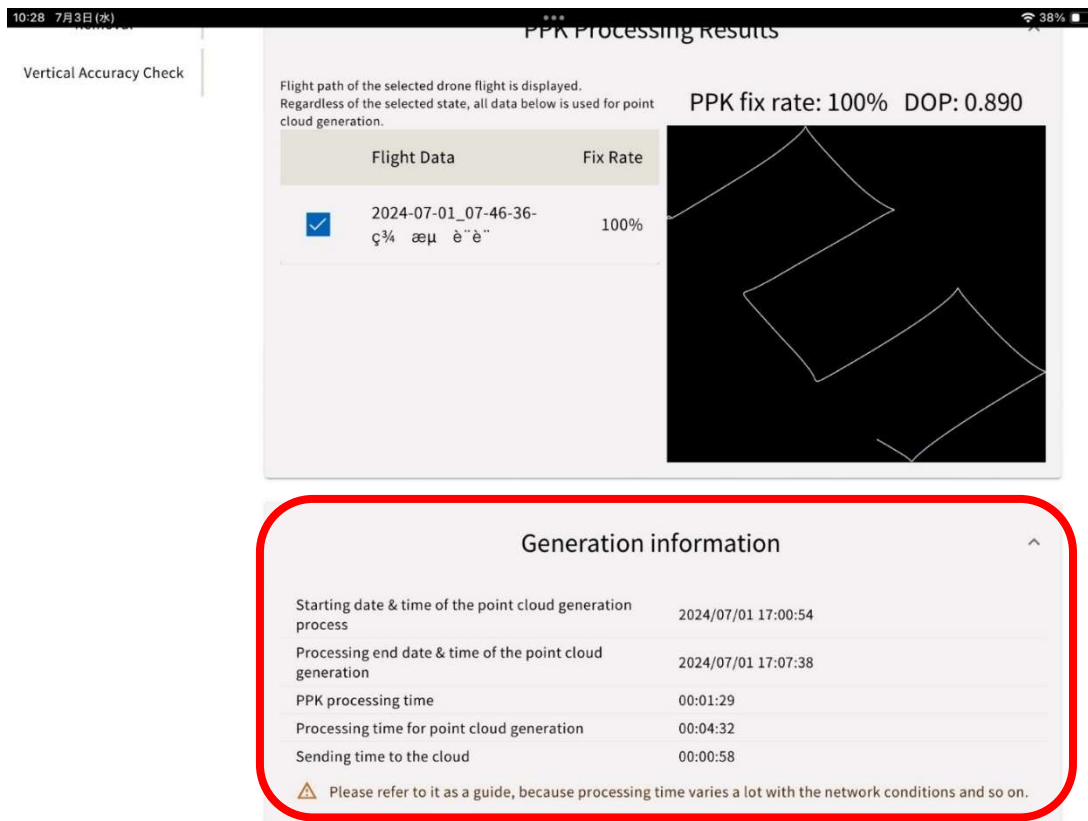
Press the pen icon at the right end of the point you can change cloud name display.



POINT CLOUD VIEWER SCREEN PART NAMES



In point cloud information Scroll down to "Generated Information" is displayed




Point Cloud: Displays the generated point cloud

Ortho Image: Displayed only when the Ortho image option and DEM image option was "ON" upon the point group generation. Select to display the ortho image.

DSM/DTM: Displayed only when the Ortho image option, DEM image option and Unwanted Object analysis was "ON" upon the point group generation.

Vertical Accuracy Check: Enables you to verify the accuracy of the generated point cloud.


Unwanted Object Removal: Only displayed when Unwanted Object Removal was "ON" upon point cloud generation. If this was selected, displays a point cloud with the Unwanted Object Removal filter applied. You can also change the strength of the filter by tapping the icon .

The intensity of object removal can now be changed with the +/- buttons as well as the slide bar.

The point cloud displayed in the Viewer area can be


- Shrink/Enlarge: Pinch in/out

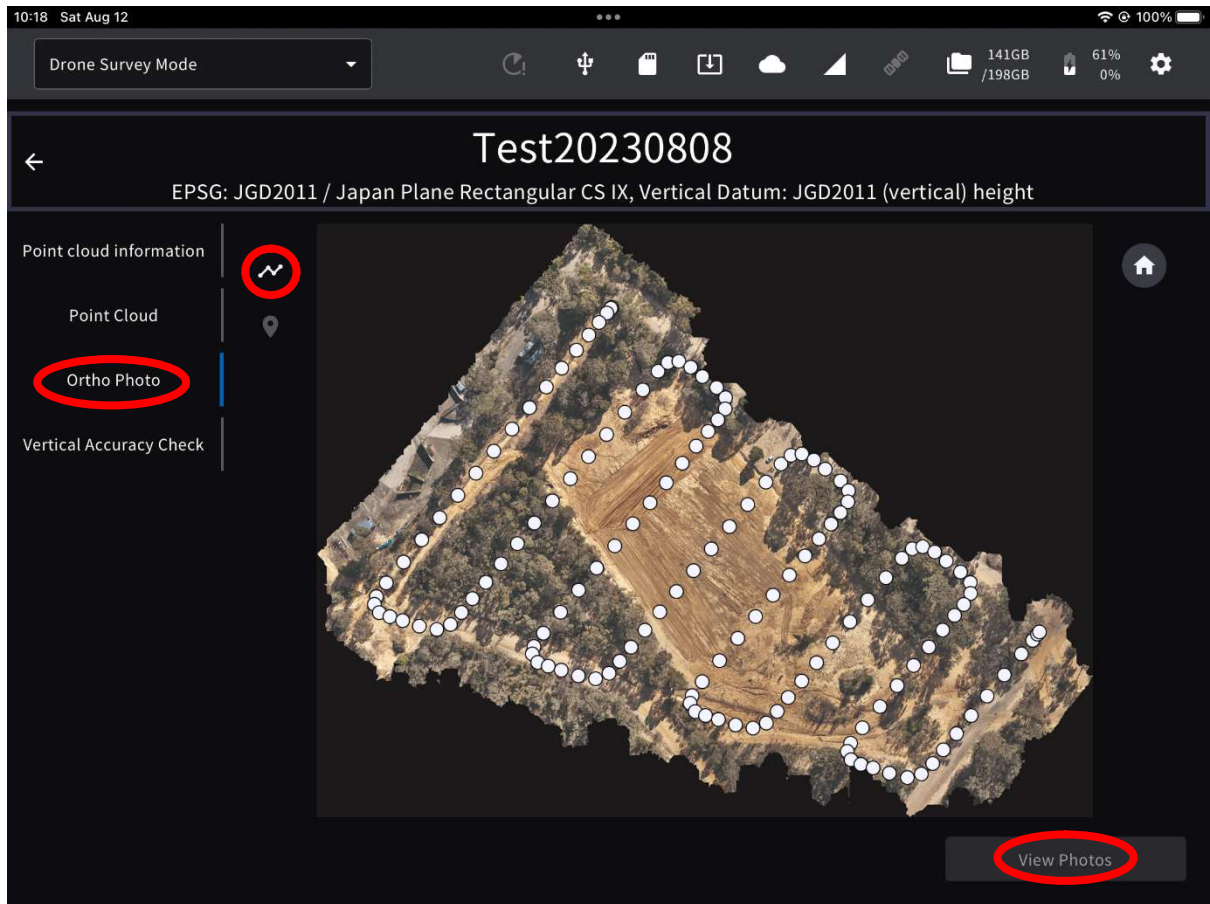
Vertical/Horizontal Rotation: The slider in the Viewer Area is displayed vertically and horizontally. You can also use the arrow buttons to fine-tune


- Reset: Tap the icon  to reset the Viewer Area operation to the initial conditions

※Tap the trash icon to delete data from the viewer screen

DRONE FLIGHT PATH DISPLAY (ONLY WHEN ORTHO IMAGE WAS GENERATED)

1. Tap "Ortho Image" in the Point Cloud Viewer screen
2. Tap the icon  in the upper left corner of the viewer




Displays the flight path of the drone. Tap , then tap the "View Photo" button to show the image taken at that point.

UNWANTED OBJECT REMOVAL FROM THE POINT CLOUD

EdgeBox's Unwanted Object Removal feature uses a proprietary algorithm to calculate the "Unwanted Object Likelihood" score, and you can change the filtering strength.

TO CHANGE THE STRENGTH OF POINT CLOUD JUNK REMOVAL

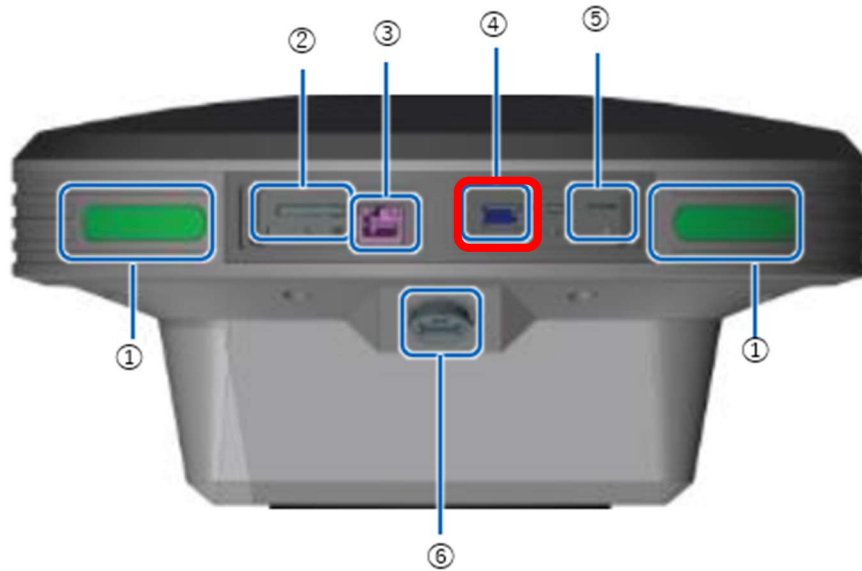
1. Tap "Unnecessary object Removal" in the Point Cloud Viewer screen
2. Tap the icon  in the upper left corner of the viewer and use the slider to adjust the strength of the unwanted object removal.

POINT CLOUD ACCURACY VALIDATION

To verify the accuracy of a point cloud, you need coordinates of the points you want to verify. Place the CSV file which contains coordinates of check points included in the measurement area directly under the root folder of the USB memory in advance. for the CSV format.

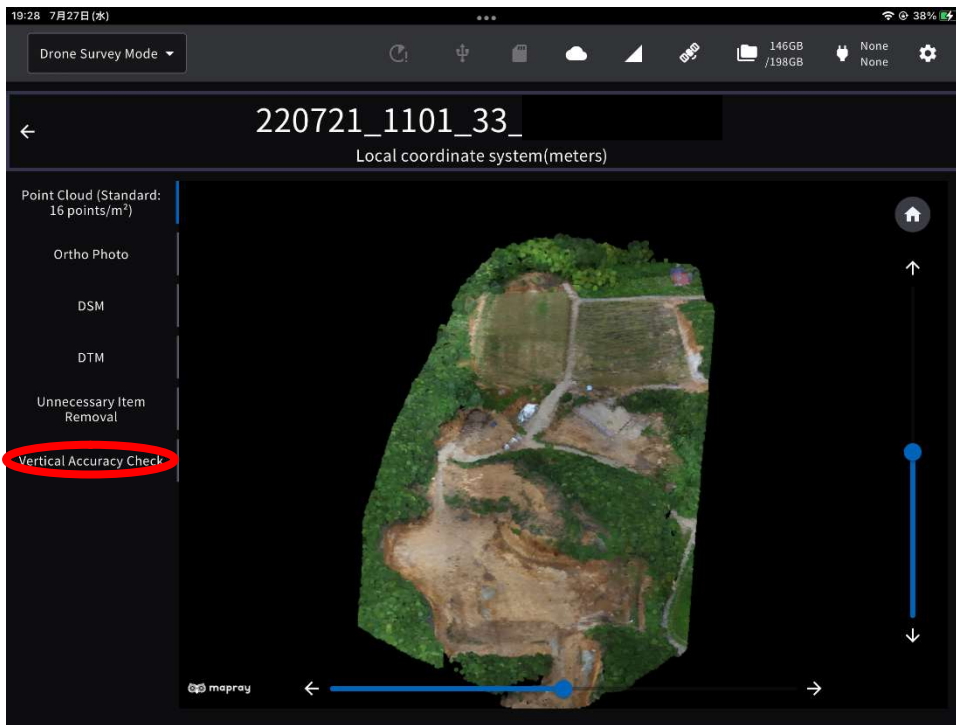
1. Insert USB memory into USB slot ④ on EdgeBox

Insert the USB memory into the USB3.0 port in the waterproof lid. The USB2.0 port outside the waterproof cover is for communication with the radio and cannot be used for USB memory.

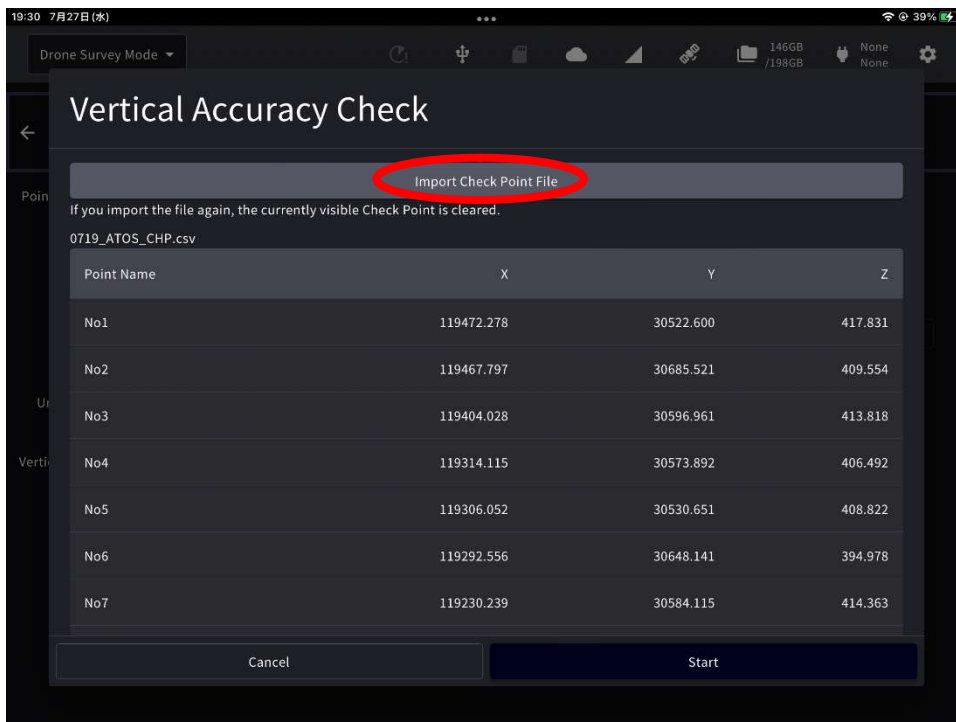


- ① Status LED
- ② SD card slot
- ③ Ether cable port
- ④ **USB slot (USB3.0)**
- ⑤ SIM card slot
- ⑥ Water-proof USB slot (USB2.0) : cannot use this slot for USB memory

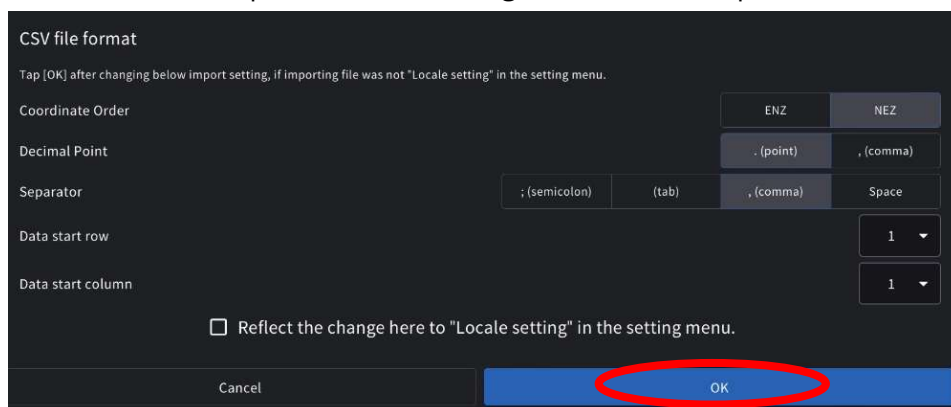
2. Tap “Vertical Accuracy Check” in the Point Cloud Viewer screen.



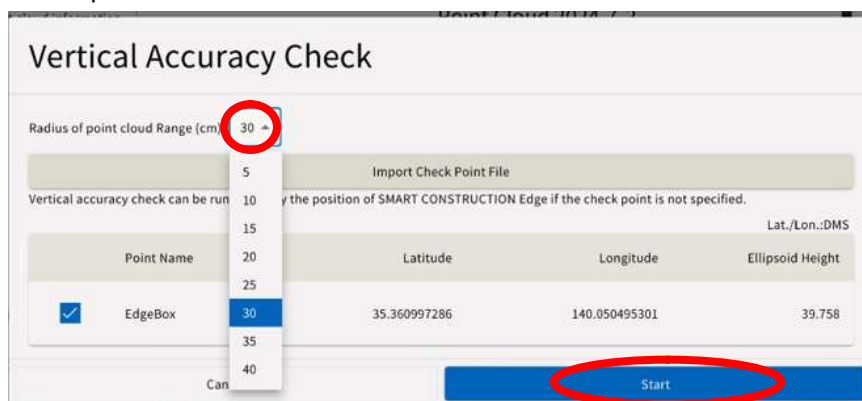
3. Tap the “Import check point file” button and select the check point coordinate file to use for validation in the dialog that appears.



- Set the file format parameter according to the file and tap “OK”.

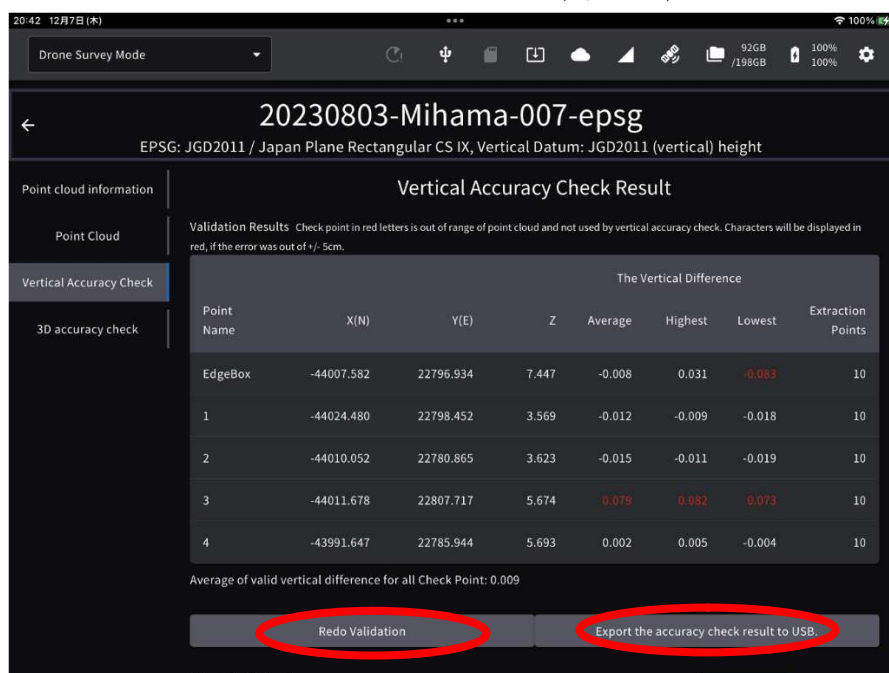


- Specify a range of point cloud around the check points to use for vertical accuracy check and tap “Start”.



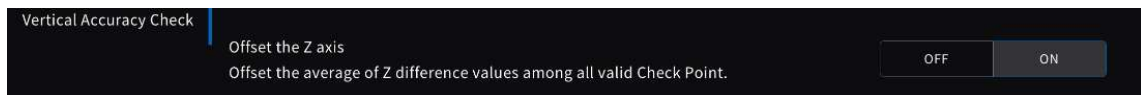
The results are shown in the screen.

Red character shows the out of tolerance. (+/-5cm)



You can redo or export the result to USB.

6. You can also correct (offset) the error in the Z axis. To offset the Z axis, turn on Error Correction in Z Axis.



Offset settings are applied when the generated point cloud is exported to the outside.

Important!

Validation cannot be performed if all check points are outside the point cloud range. Also, the error correction function in the Z-axis direction is not available when the validation is not performed.

Tips

Once you have verified it, you can reload it by reading the CSV again. When you revalidate, the validation results and the Z offset value are updated based on the most recent results.

Tips

Vertical accuracy Check simultaneously outputs camera calibration data together. This CSV reports the results of camera distortion correction and is mainly used in the Japanese market.

Tips

When using the EDGE2 vertex as a verification point, the edge must be visible in the photo for both PPK and RTK processing.

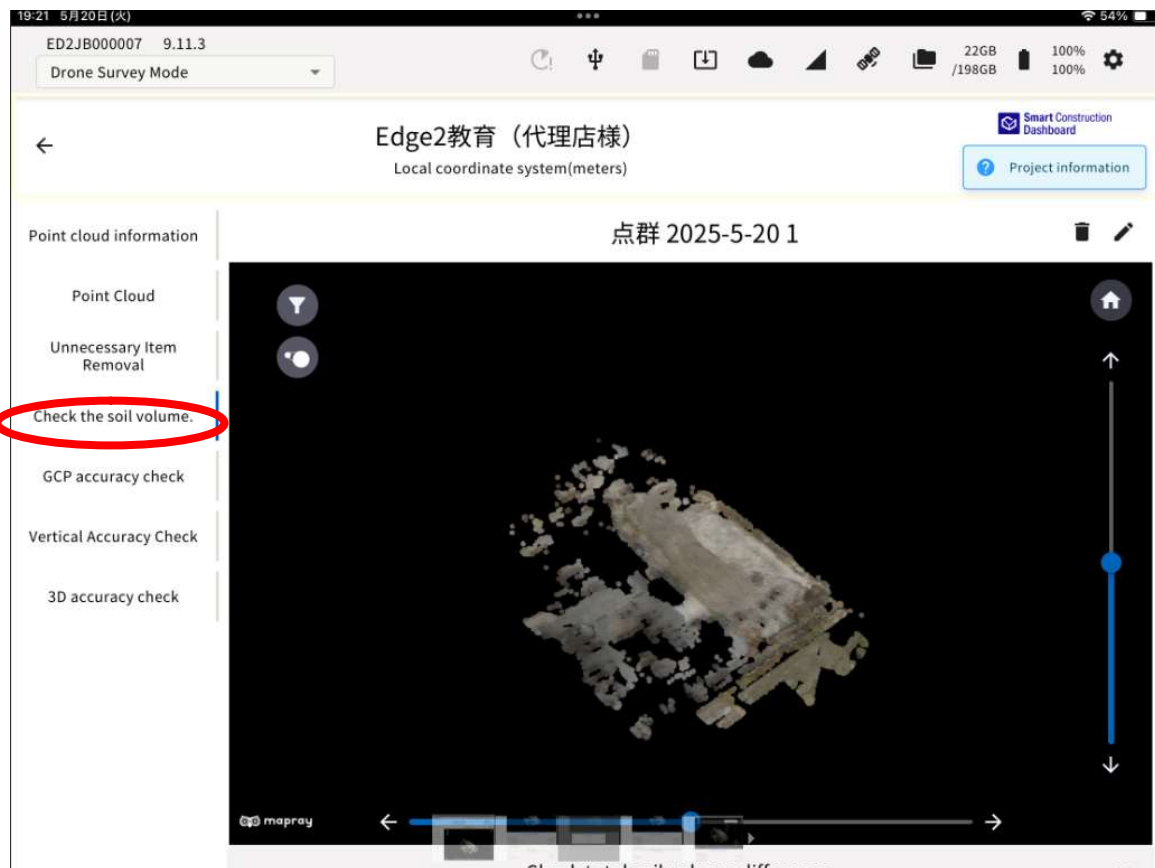
Tips

In the case of RTK processing, this function is enabled when the EDGE2 is placed at a known point and correction data is sent to the drone in fixed station mode.

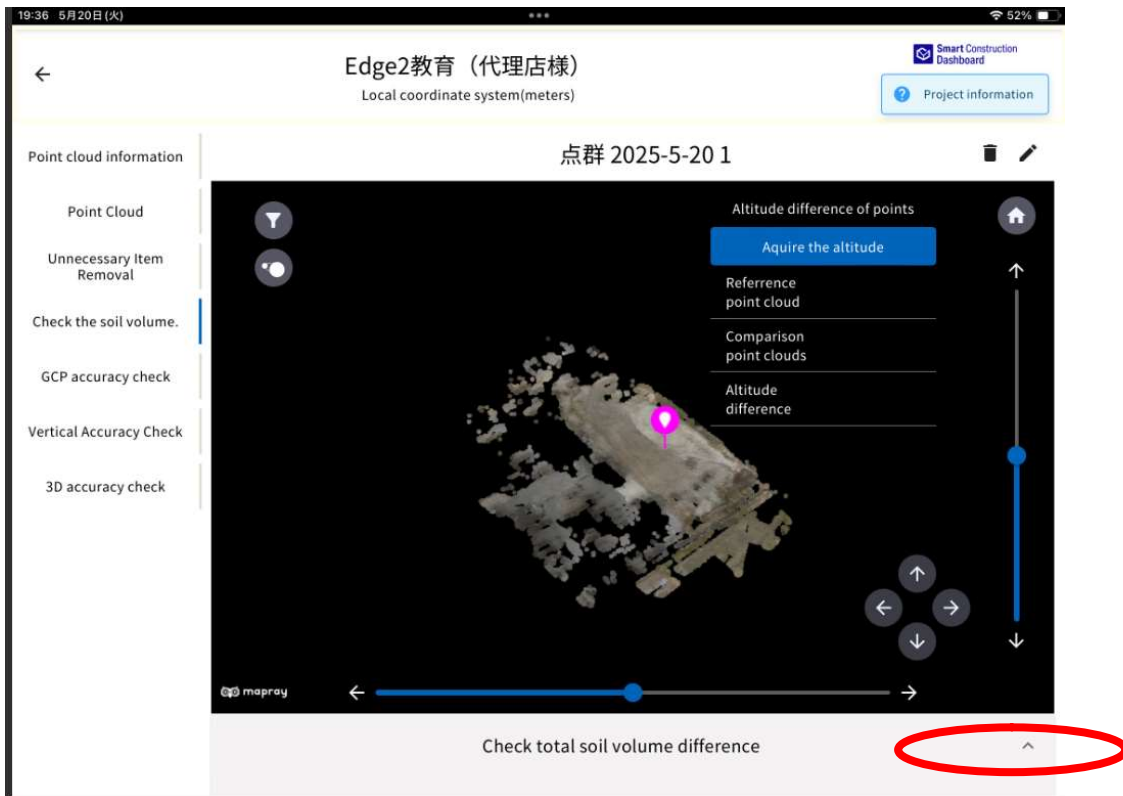
Calculate cut and fill volumes from generated point clouds

Added a function to calculate cut and fill volumes from generated point clouds. Added operations related to volume calculation to the point cloud display screen (e.g., a "Volume Check" button). The volume calculation computes the total excavation (cut volume), embankment (fill volume), and their difference, and displays the result in the Edge2 app. The volume difference at tapped locations on the point cloud is also calculated separately and displayed in the Edge2 app.

1. Tap "Check the soil volume"

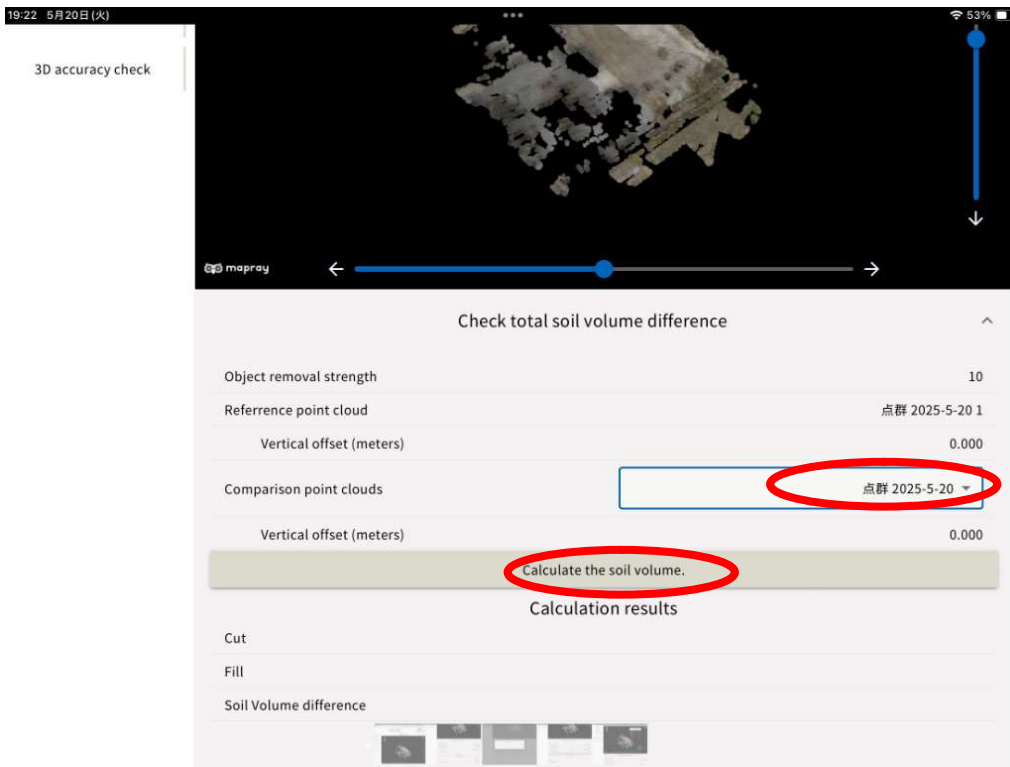


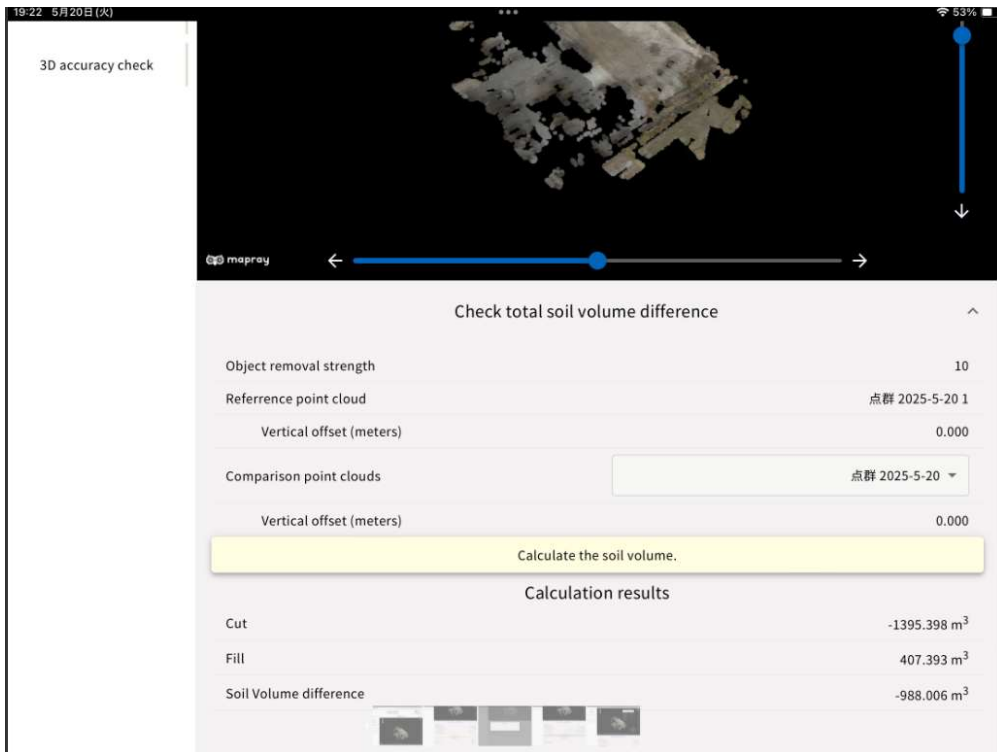
2. Open the accordion and scroll the screen



3. Select the point cloud for comparison and press “Calculate the soil Volume”.

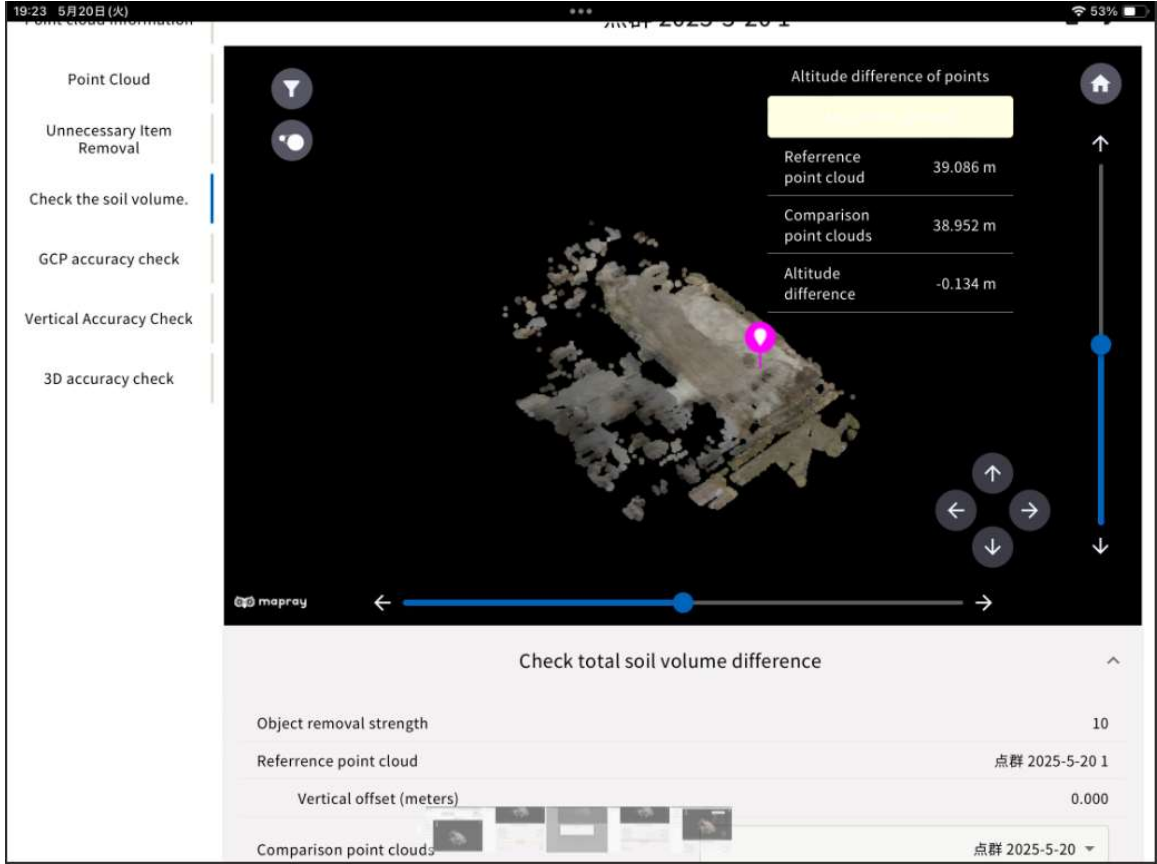
The results are displayed.





4. Select the point you want to check (a pin will appear), and press “Acquire the altitude”.





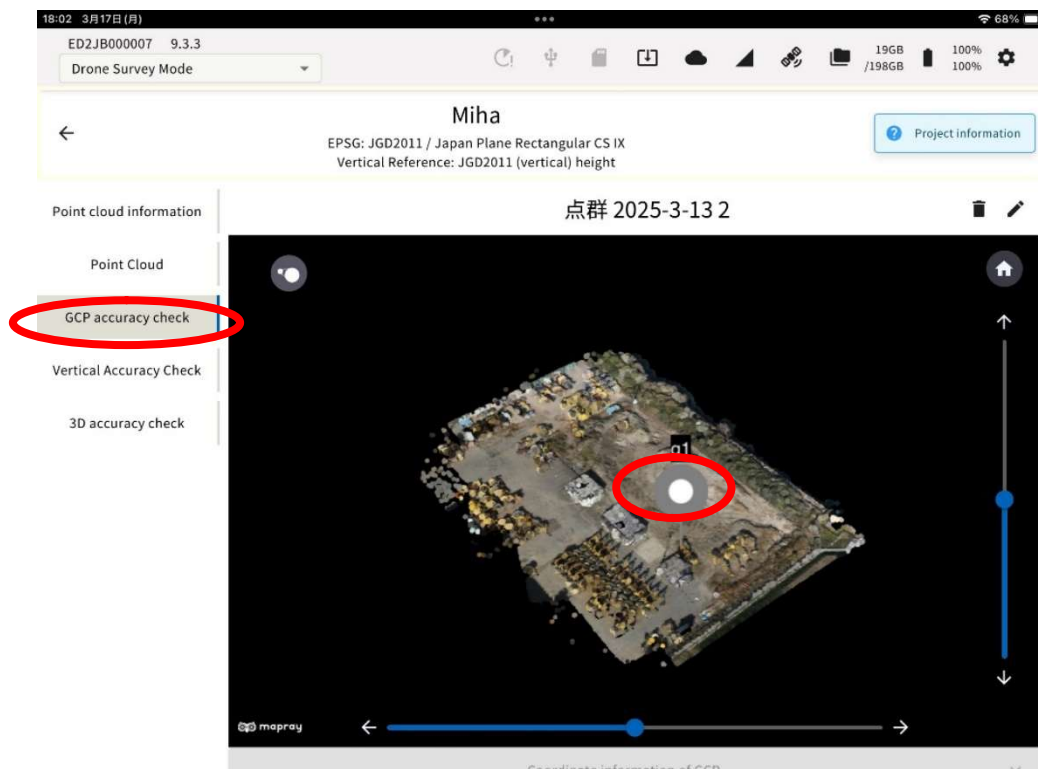
GCP accuracy check

If GCPs are used for SFM processing, the center accuracy of the selected GCPs can be checked after processing

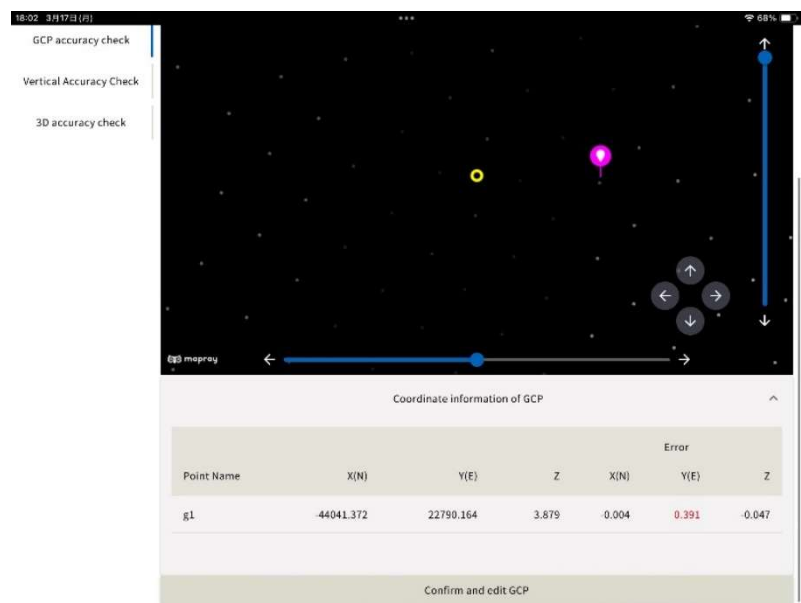
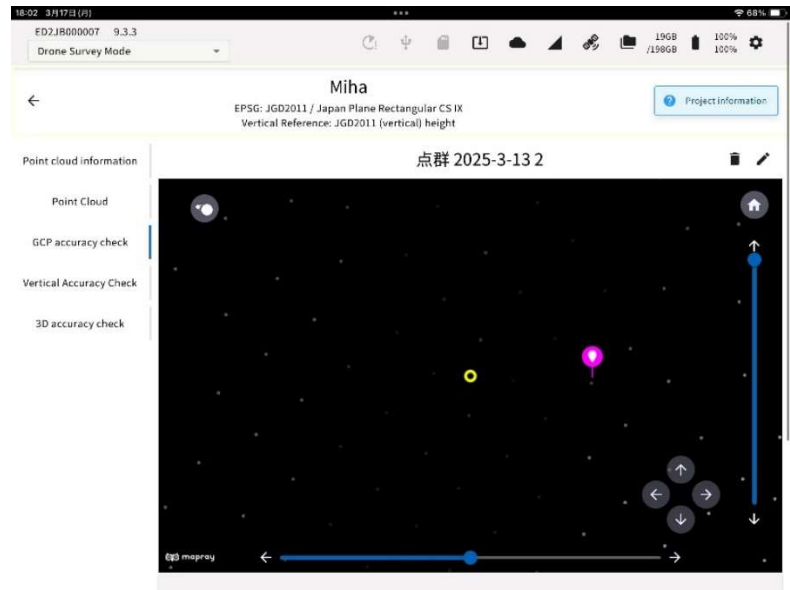
When GCP is used for processing

A GCP accuracy check item has been added after processing

Selecting GCP on the screen will transition the screen



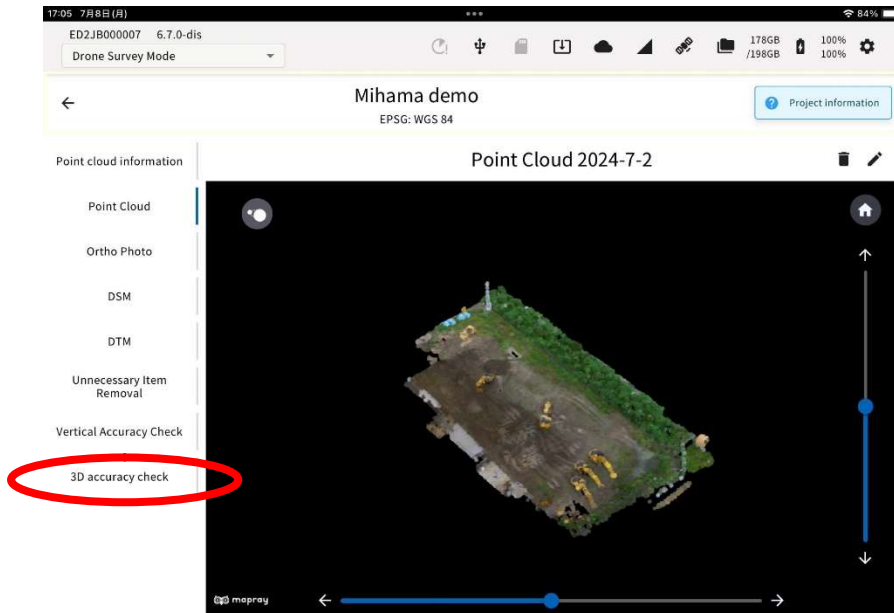
Select a point that you think is the center of the GCP and scroll down the screen to display the residual between the GCP center and the coordinates.



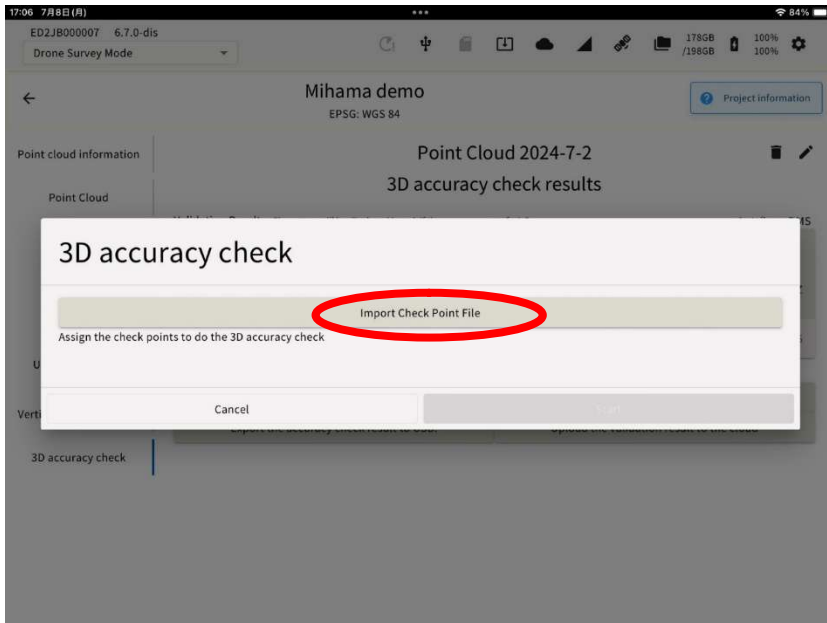
3D accuracy check

3D accuracy check can verify XYZ accuracy by checking the coordinates center of the verification points put on-site.

1. Tap '3D accuracy check''

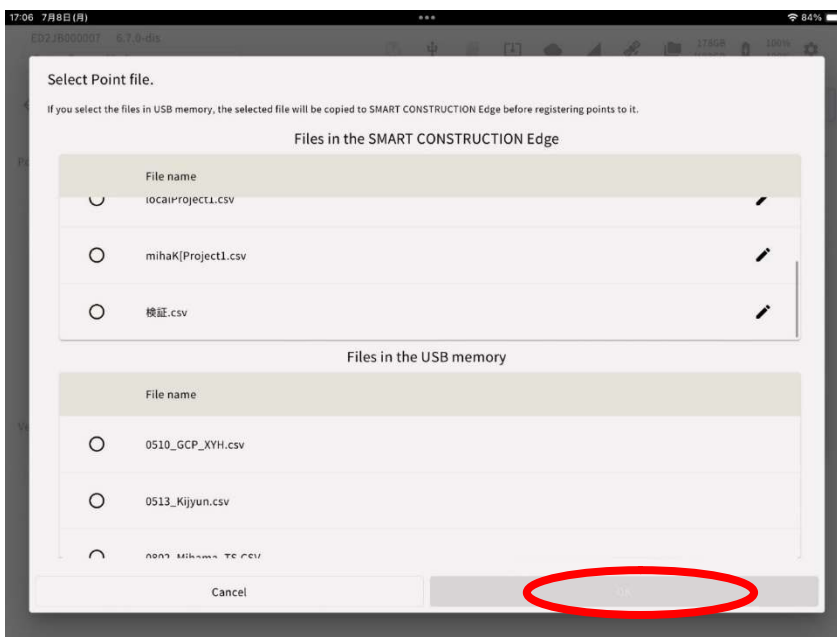


2. Tap 'Import Check point File'



3. Files are saved once loaded to the edge and
Files can be selected from USB or from within the Edge's memory.

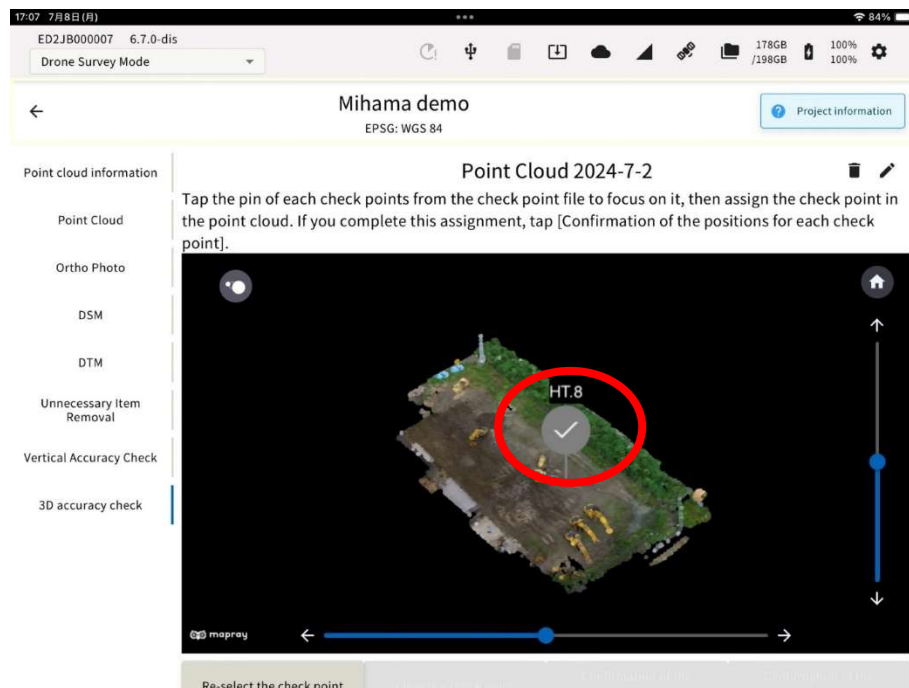
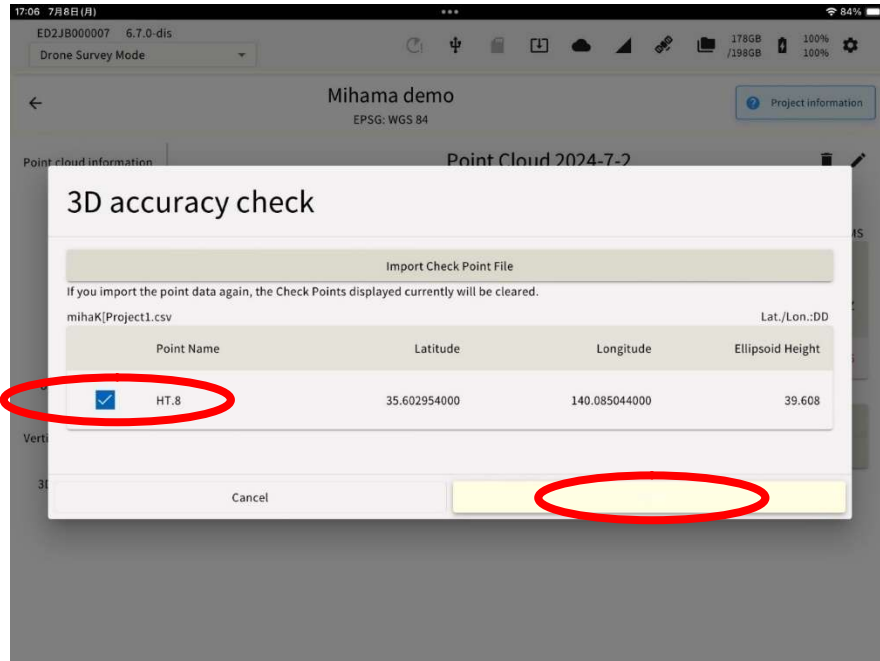
Tap 'OK' after selecting a file.



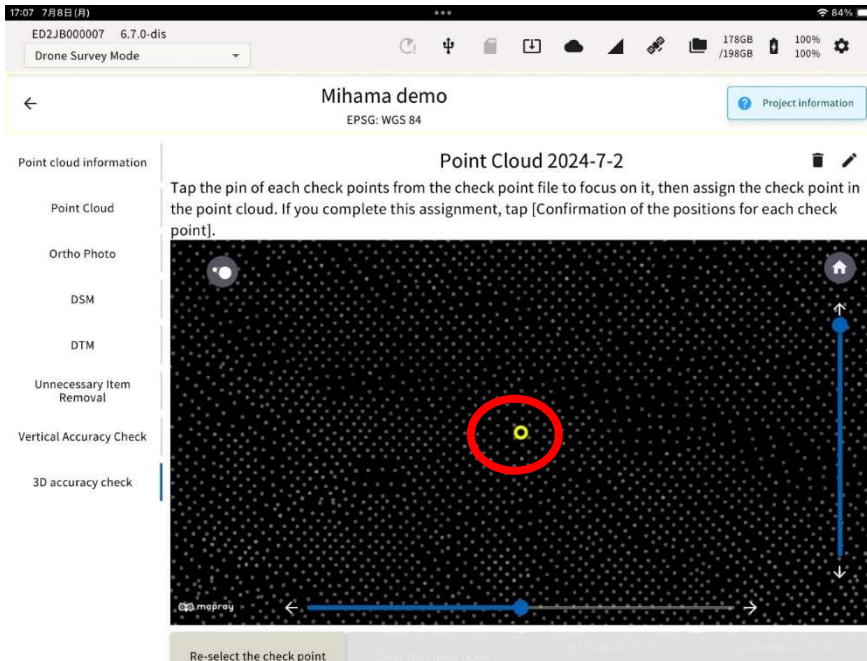
If a point cloud is not generated at the verification point location, the verification point will be displayed in red. 4.

4. Confirm the verification point and tap "Start".

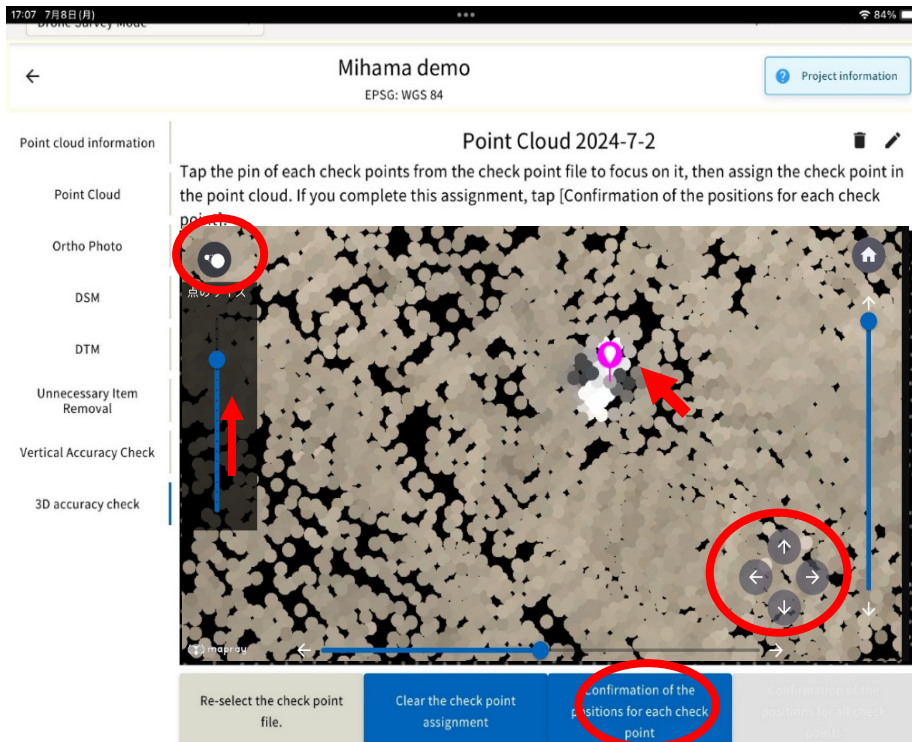
5. The verification point locations are indicated by gray pins. Tap one by one to focus on it and specify center of verification point location on the point cloud.



6. The coordinates of the validation point are indicated by yellow pins.



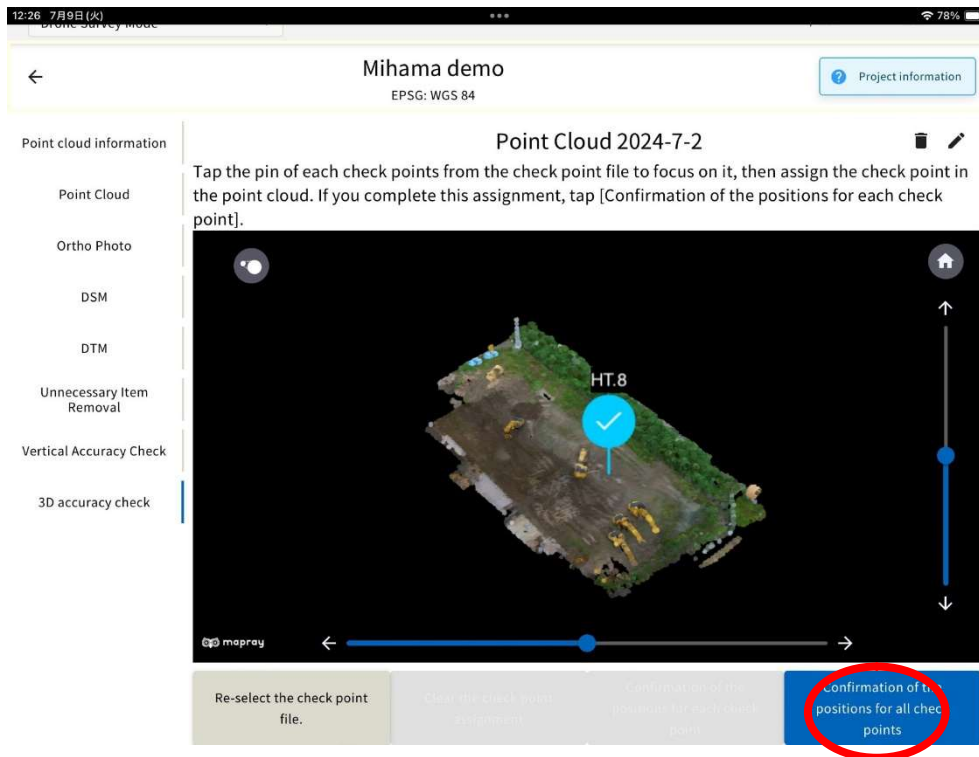
7. The position of the pink pin can also be fine-tuned with the cursor in the lower right corner. After placing it at the center of the verification point on the point cloud, tap "Confirmation of the positions for each check point" icon.



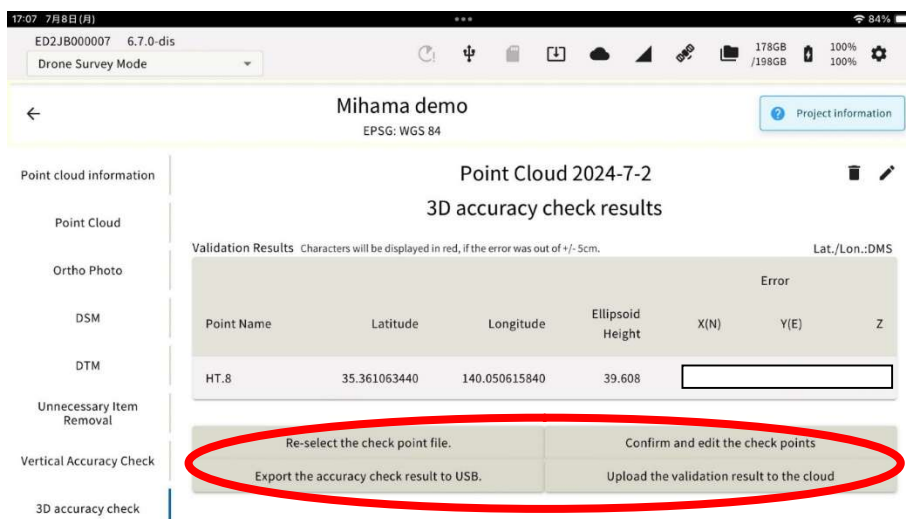
8. The pins of the validation points for which positions are specified turn light blue.

‘If there are unused validation points, leave them unassigned’

Tap ‘Confirmation of the positions for all check points’



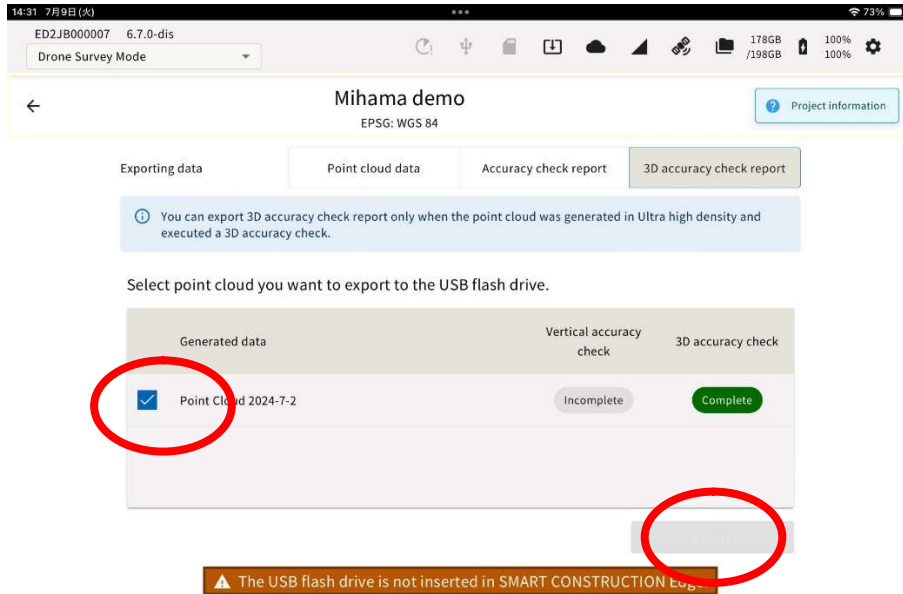
Tap the following icons you can available Re-verification and output of 3D accuracy report to USB/upload report to Dashboard.



- USB exporting

If you tap 'Export the accuracy, check result to USB' Go to the following screen.

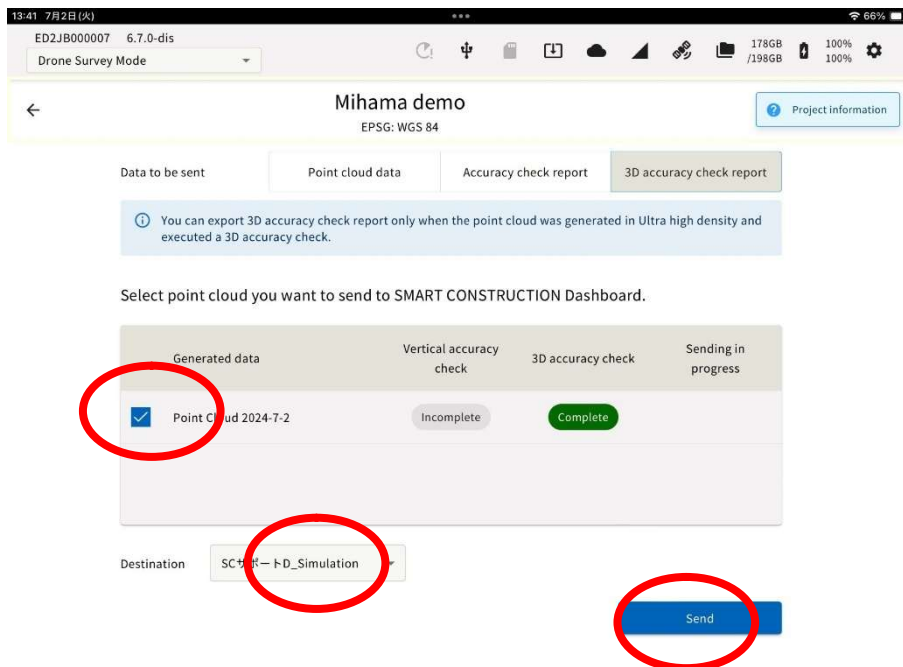
Select the data you want and tap Export to save the report to your USB.

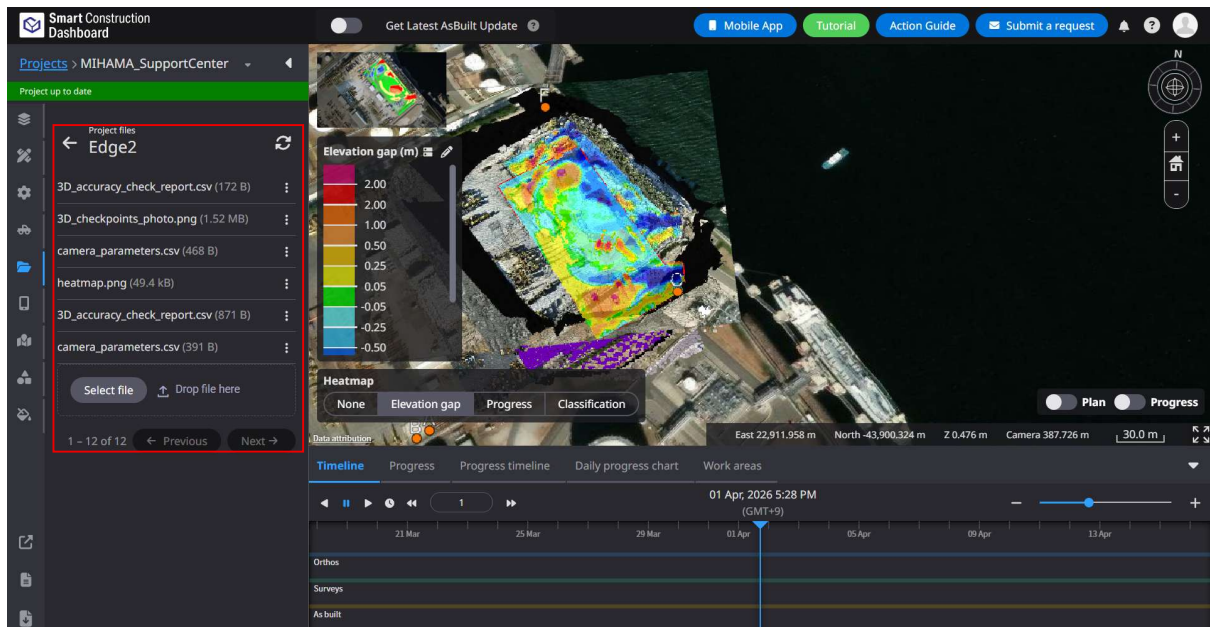
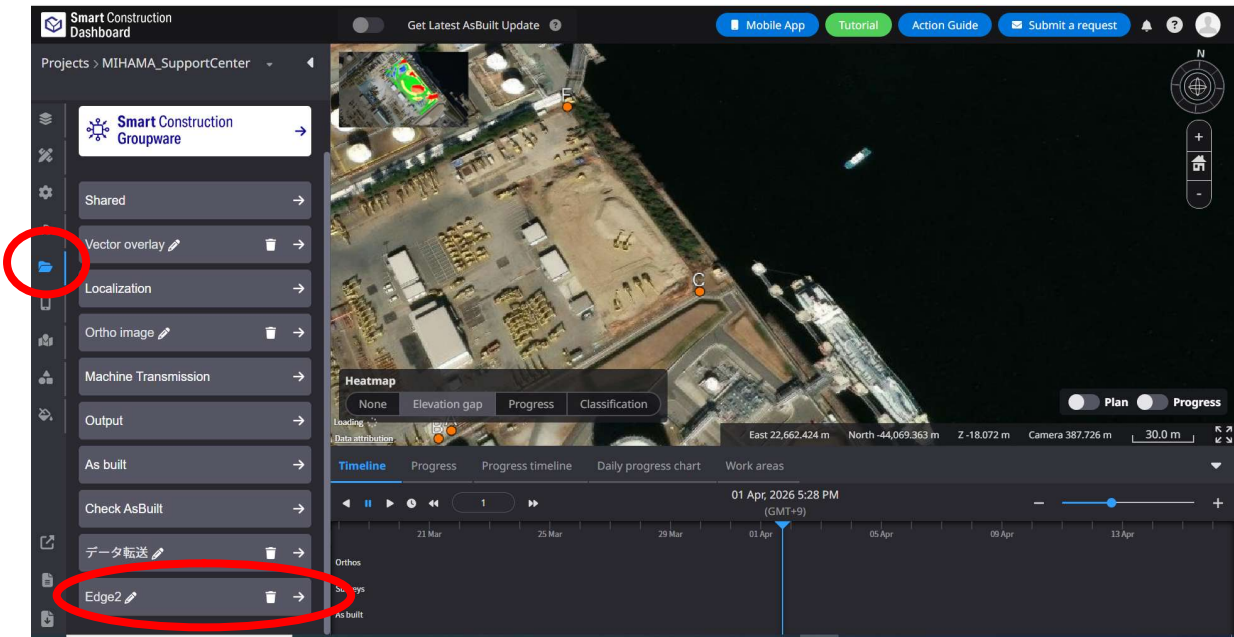


- Upload 3D accuracy report to Dashboard.

If you tap " Upload the validation result to the cloud" Go to the following screen.

Select the data and upload the site you want, and tap send to save the report to your Dashboard site






The file will be saved in the folder above.

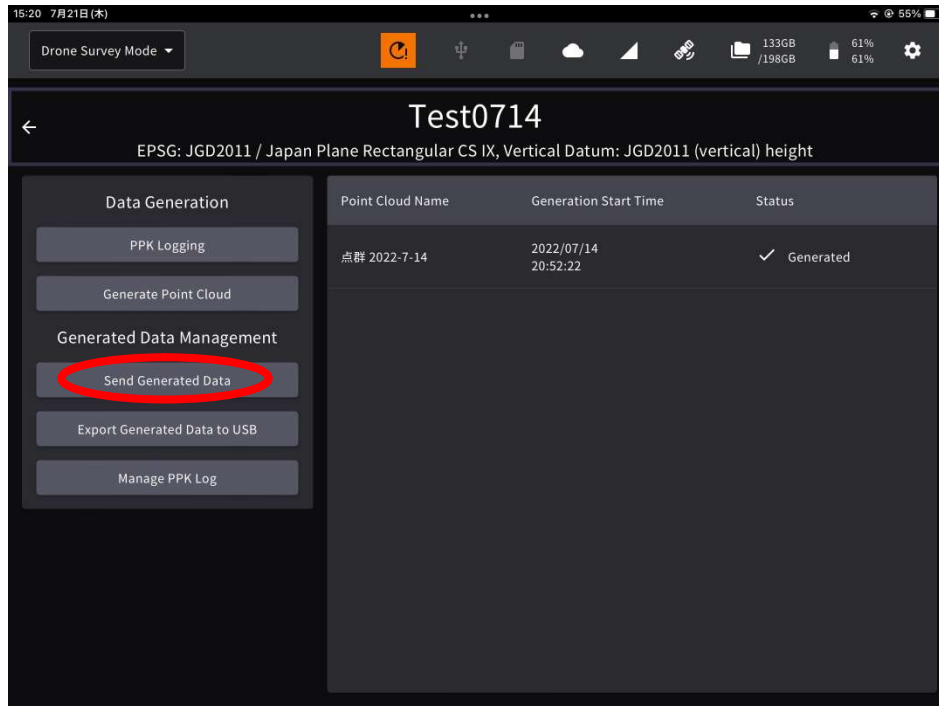
Sending Point Clouds to a SMART CONSTRUCTION Dashboard

Before sending it to the SMART CONSTRUCTION Dashboard, set the destination from the settings screen.

For details, please click [here](#).


1. Launch the tablet app  and select the project which contains the point cloud you want to send to the SMART CONSTRUCTION dashboard.
2. Tap “Upload Generated Data”.

Displays a list of point clouds generated in the selected project.



3. Tap the check box of the point cloud to send.
You can also select multiple point clouds.
4. Select the destination and tap “Send”.
The SMART CONSTRUCTION dashboard work site list appears.
If you can't find the right destination, check your account logging in.

Tips

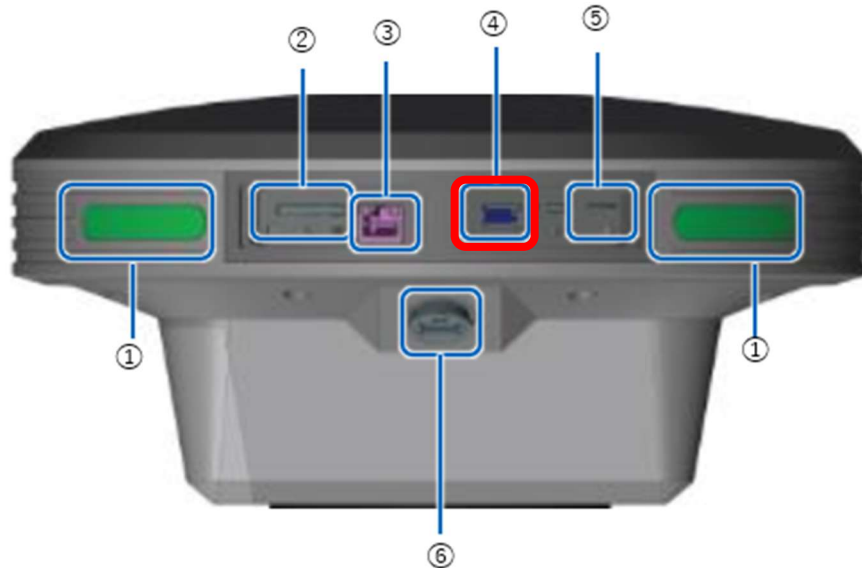
You can check the status of your message after it has been sent by tapping the  icon on the status bar. You can also check the progress and cancel the submission on this screen.

EXPORT GNSS LOGS TO USB MEMORY

To perform PPK on other systems, etc., you will need to export the GNSS log from EdgeBox.

1. Insert USB memory into EdgeBox

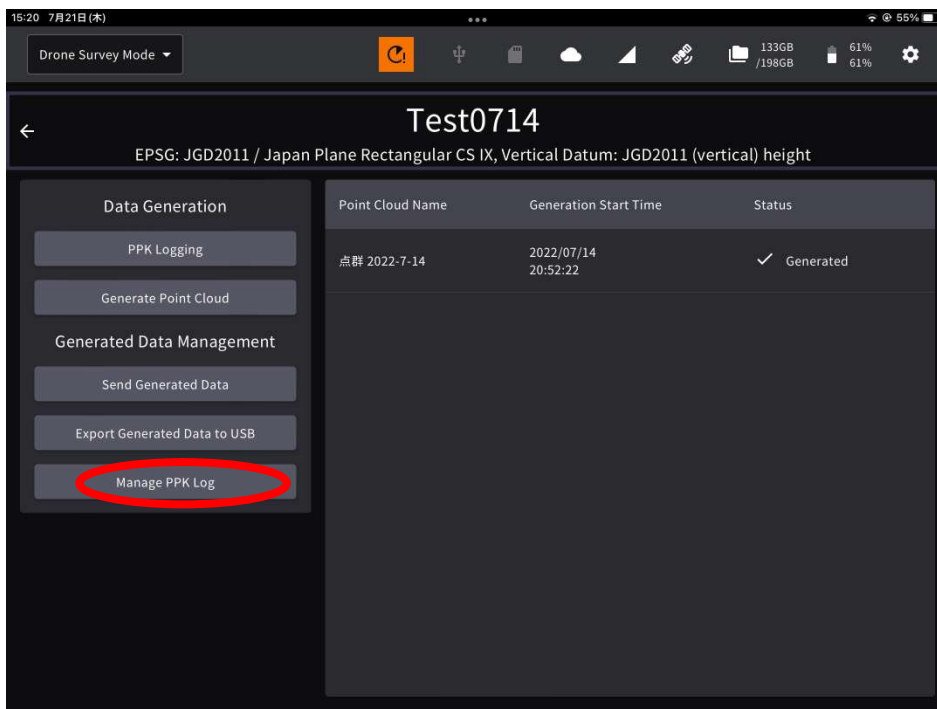
Insert the USB memory into the USB3.0 port in the waterproof lid. The USB2.0 port outside the waterproof cover is for communication with the radio and cannot be used for USB memory.



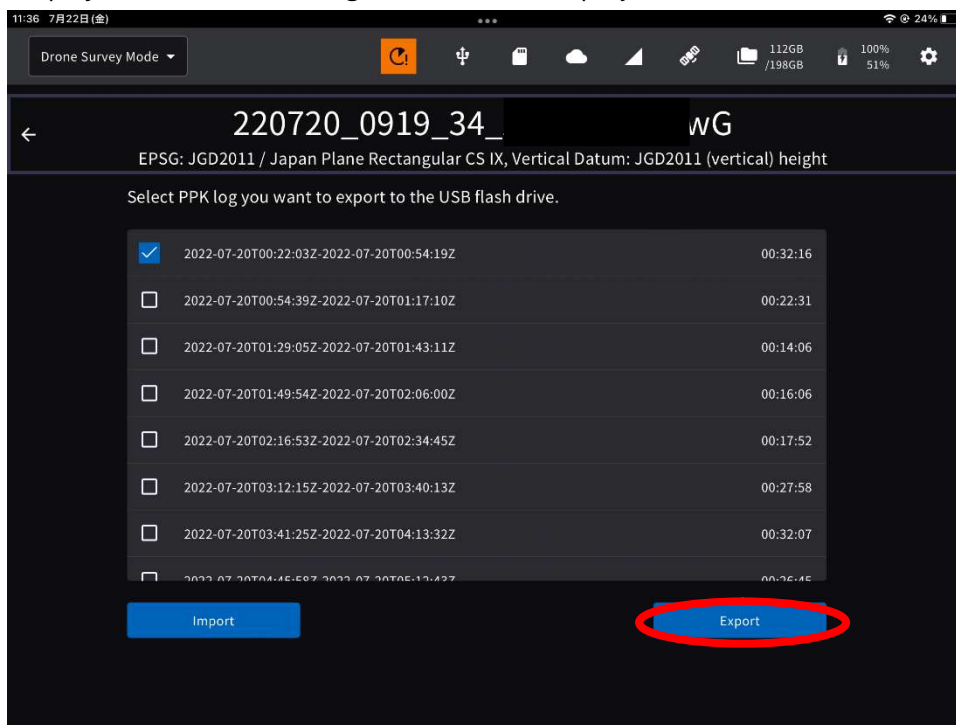
- ① Status LED
- ② SD card slot
- ③ Ether cable port
- ④ **USB slot (USB3.0)**
- ⑤ SIM card slot
- ⑥ Water-proof USB slot (USB2.0) : cannot use this slot for USB memory

2. Launch the tablet app and select the project from which you want to export GNSS logs to USB memory

3. Tap “Manage PPK Log”



4. Displays the list of GNSS logs for the selected project.




5. To export to USB memory, tap the check box of the GNSS log to check it, and then tap Export

You can also select multiple logs.

A dialog appears when the exports are complete.

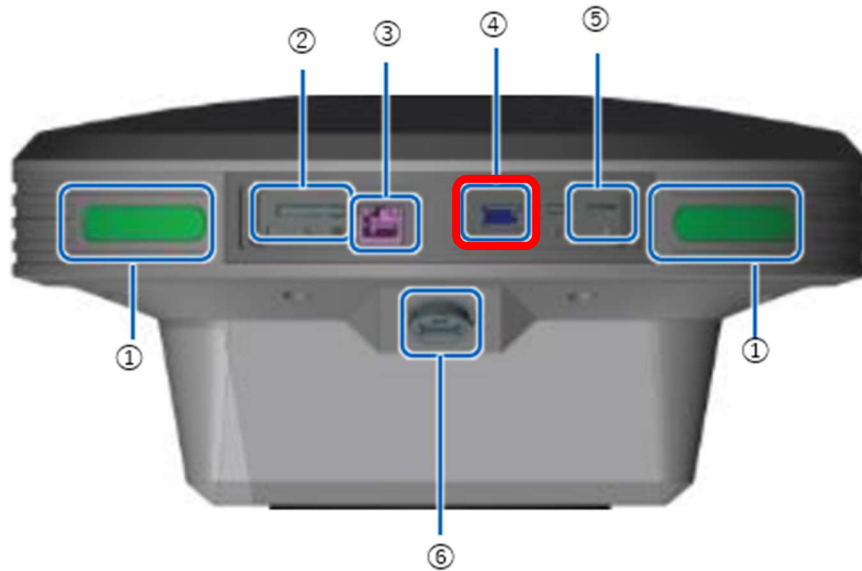
6. Remove the USB memory

Tap the USB icon  on the status bar to see the message that the USB memory can be safely removed and then unplug the USB memory.

EXPORTING POINT CLOUD DATA TO USB MEMORY

1. Insert USB memory into EdgeBox

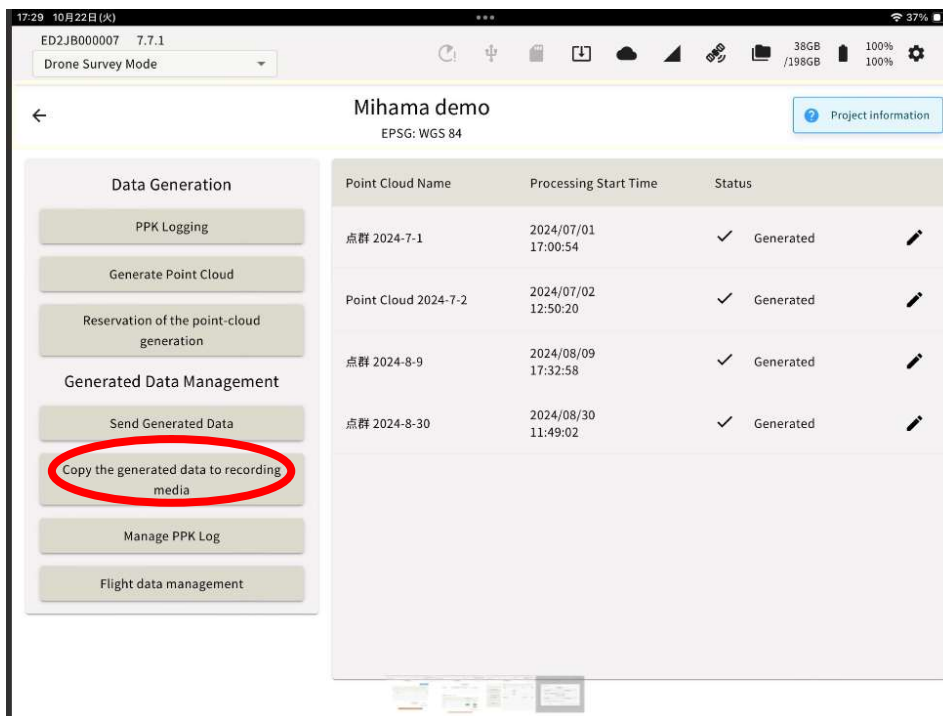
Insert the USB memory into the USB3.0 port in the waterproof lid. The USB2.0 port outside the waterproof cover is for communication with the radio and cannot be used for USB memory.



- ① Status LED
- ② SD card slot
- ③ Ether cable port
- ④ **USB slot (USB3.0)**
- ⑤ SIM card slot
- ⑥ Water-proof USB slot (USB2.0) : Cannot use this slot for USB memory

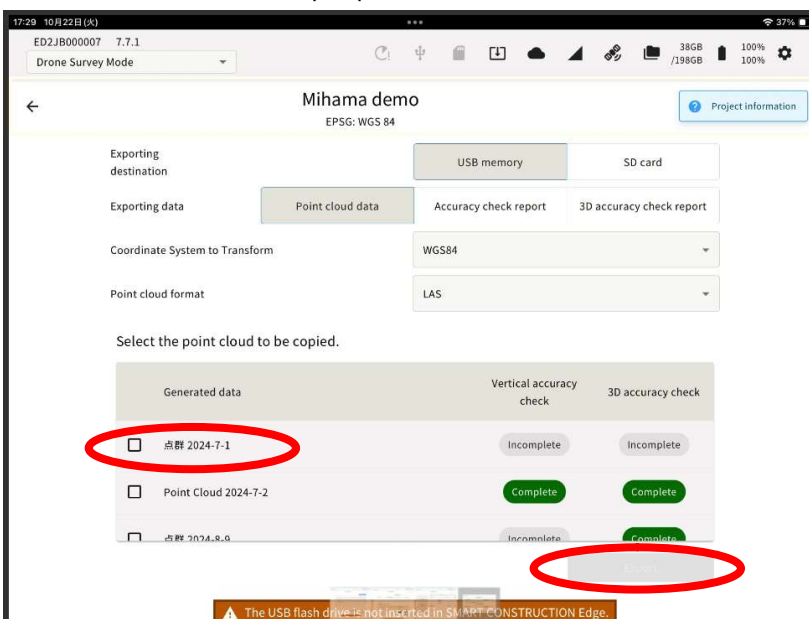
2. Launch the tablet app and select the project that contains the point cloud data to export to USB memory

3. Tap “Export Generated Data to USB/SD”



Displays a list of point clouds generated in the selected project.

4. Tap the check box of the point cloud to export USB/SD memory. You can also select multiple point clouds.



5. Select a point cloud coordinate system and tap “Export”.


You can select the coordinate system which you have selected when you created the project, or WGS84 coordinate system.

A dialog appears when the export to the USB memory is completed.

Tips

If an ortho has been generated, (.tfw file) will be automatically output.

6. Remove the USB/SD memory

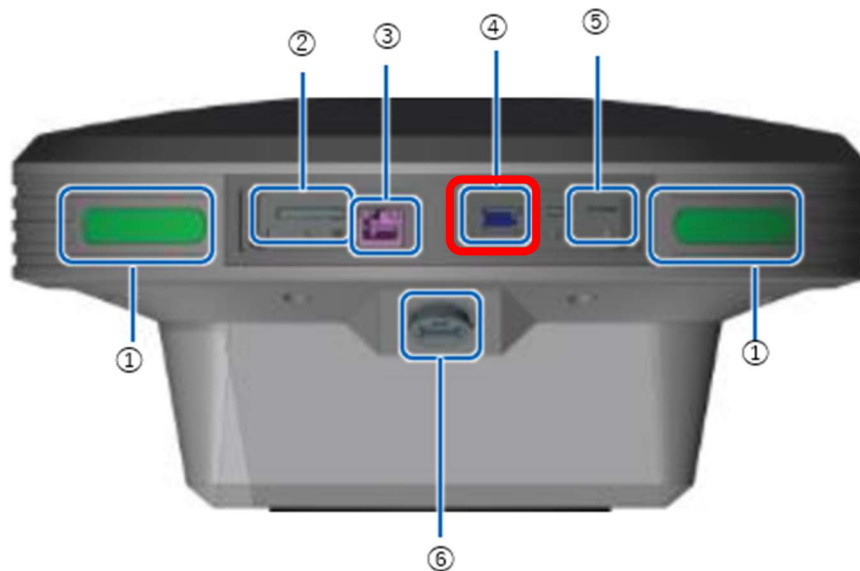
Tap the USB/SD icon  on the status bar to see the message that the USB/SD memory can be safely removed and then unplug the USB/SD memory.

Load GNSS logs

1. You can load GNSS logs from one EdgeBox to another.

2. Insert a USB memory containing data from a EdgeBox

Insert the USB memory into the USB3.0 port in the waterproof lid. The USB2.0 port outside the waterproof cover is for communication with the radio and cannot be used for USB memory.



① Status LED

② SD card slot

③ Ether cable port

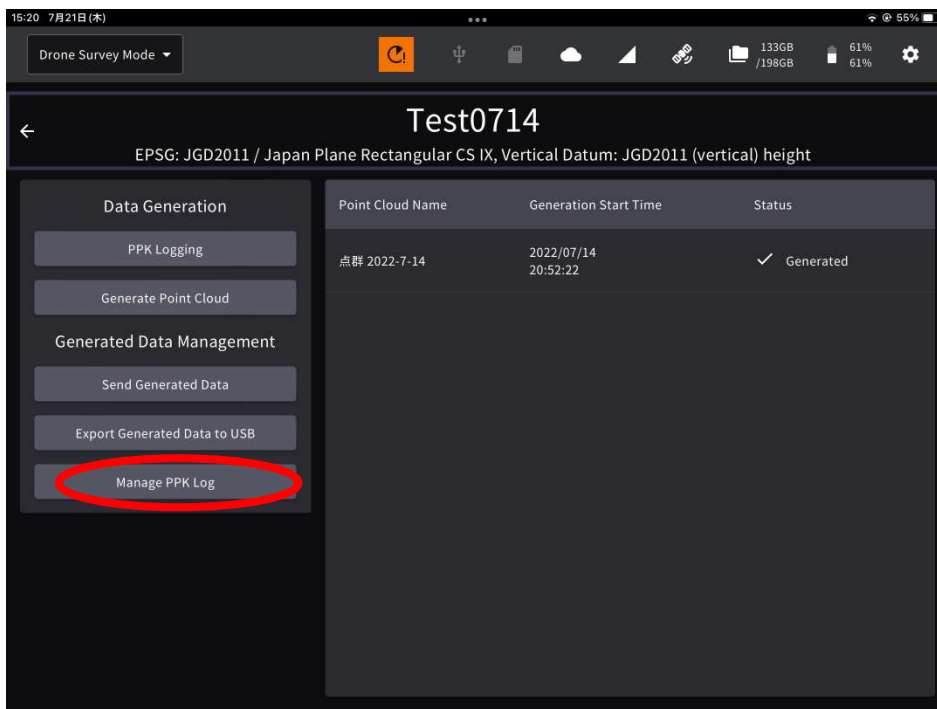
④ **USB slot (USB3.0)**

⑤ SIM card slot

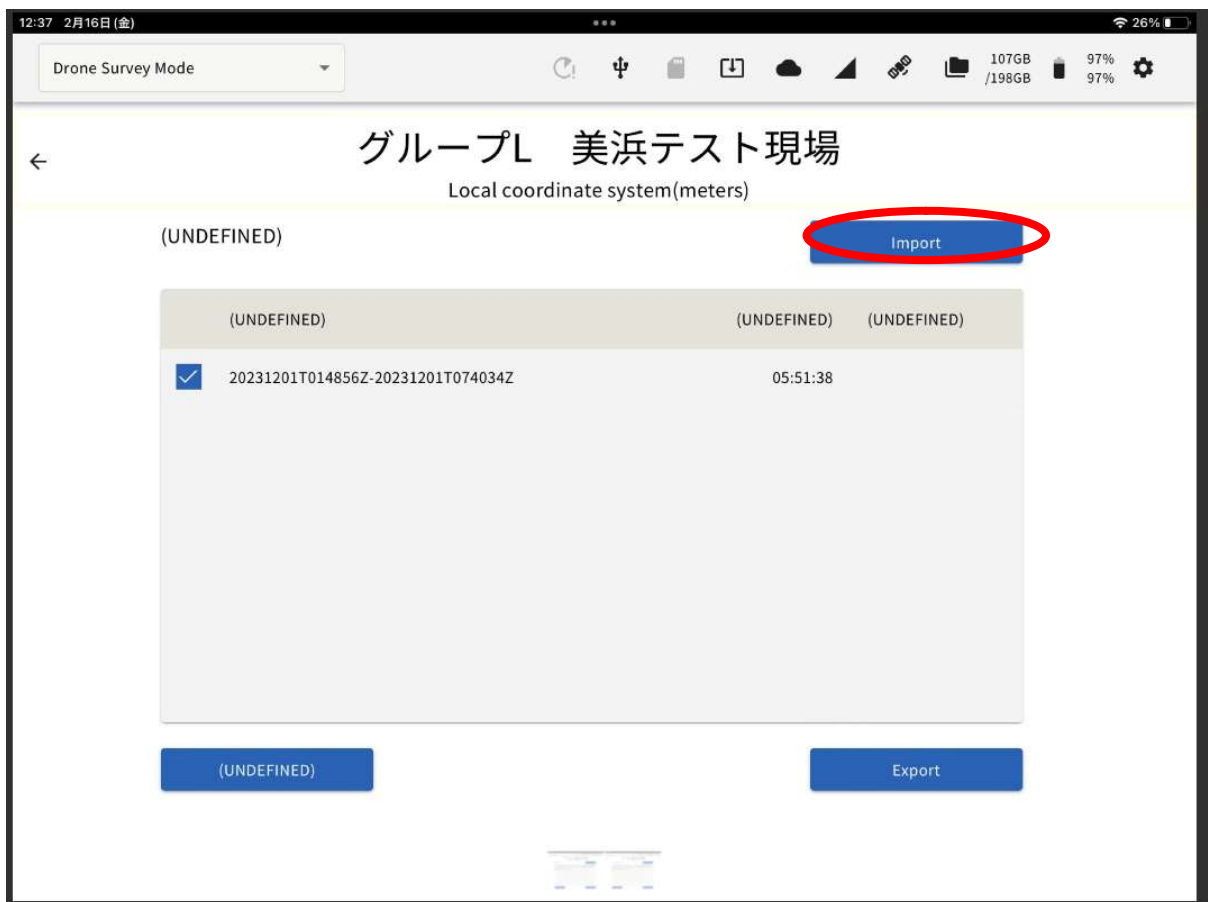
⑥ Water-proof USB slot (USB2.0) : cannot use this for USB memory

3. Select a project to import logs from.

4. Tap “Manage PPK Log “



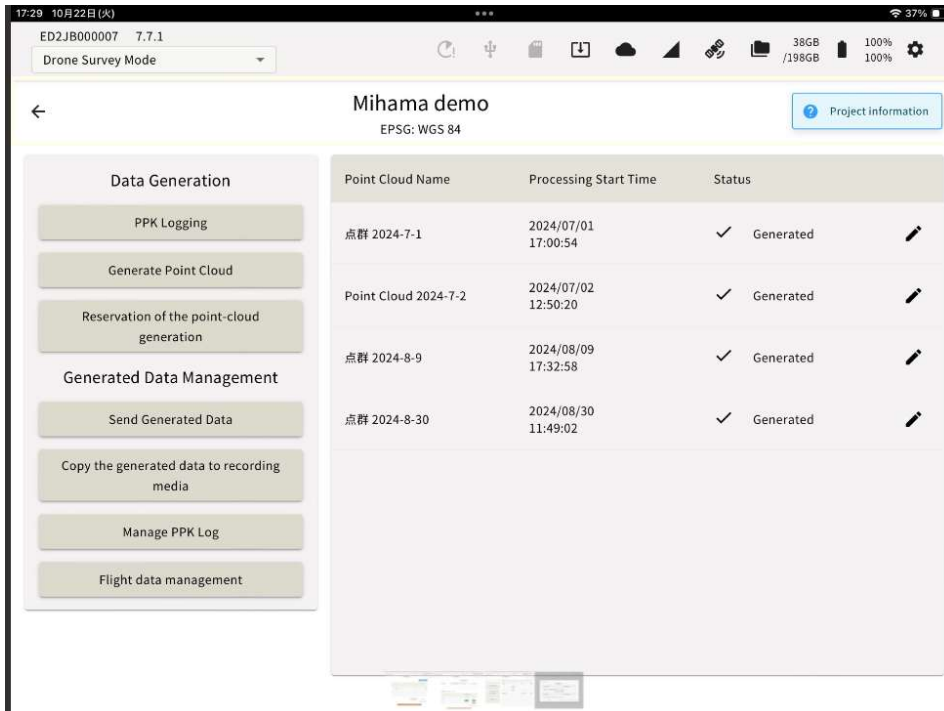
5. Tap “Import “.



7. The GNSS log in the USB memory will be loaded.

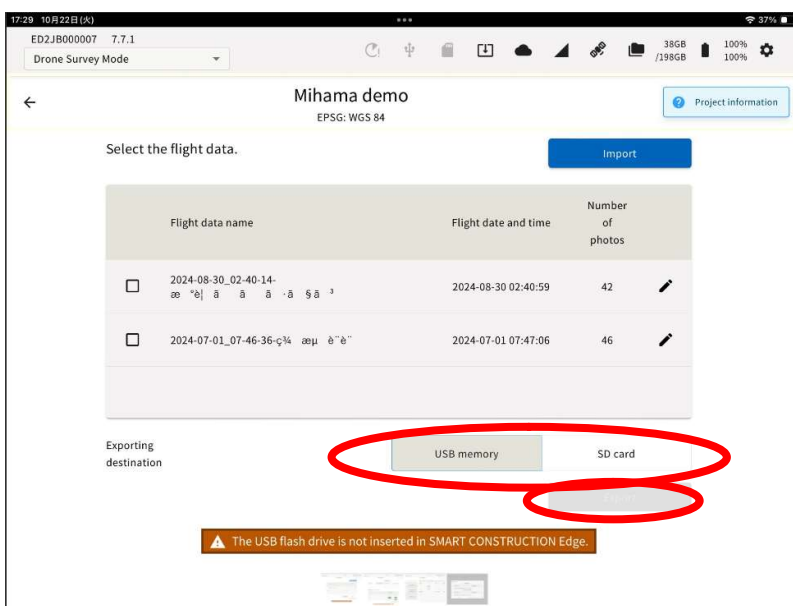
Exporting drone flight data

Export flight data from drones that are imported into Edge2.

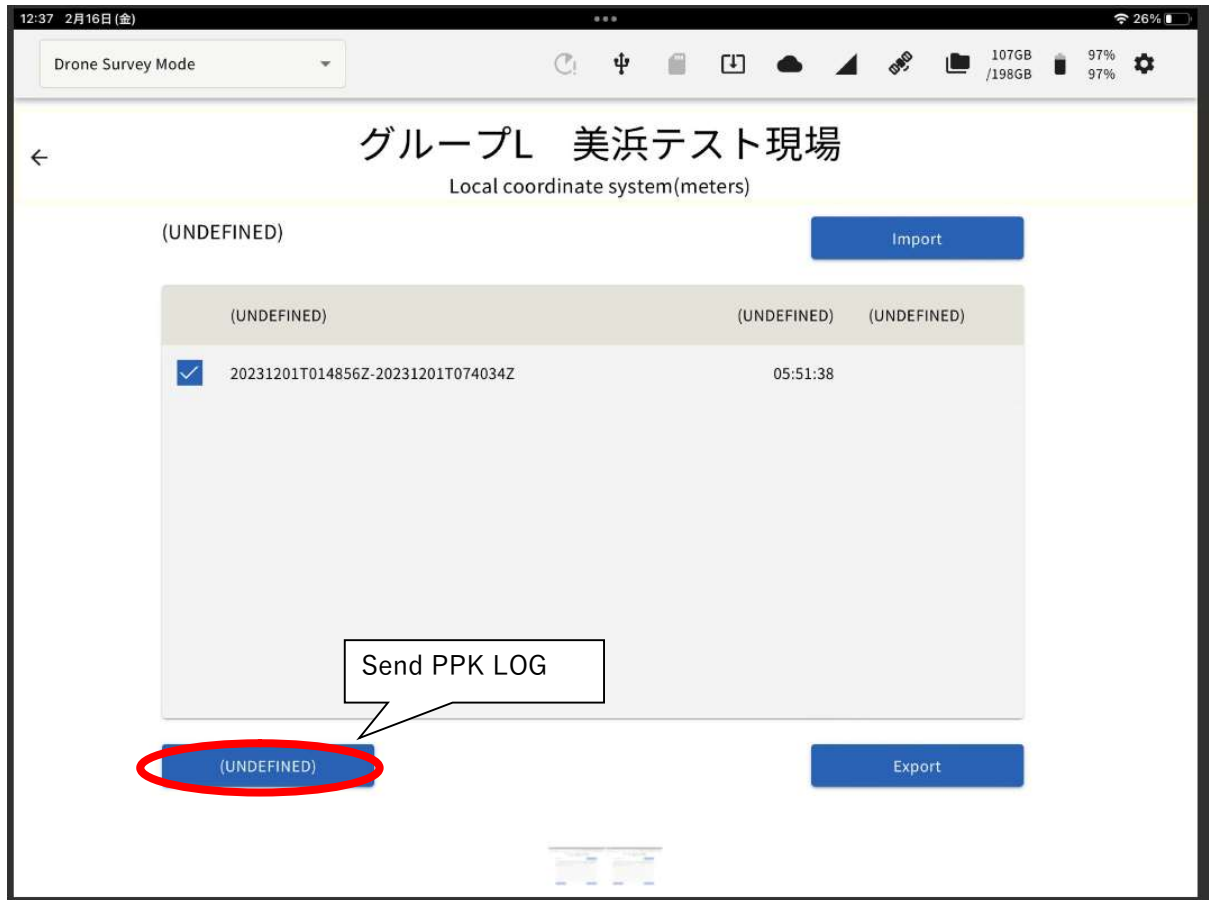


1. the flight data can be imported/exported by the following items for each project.

2. To export, select the data, choose USB or SD, and tap the export icon.



Send GNSS logs to SMARTCONSTRUCTION Dashboard (Cloud SFM)



Customers who subscribe to Cloud SFM for SFM processing at large sites can use this function to upload PPK logs.

To process PPK SFM using Cloud SFM, tap the corresponding PPKLOG and then tap (Send to Cloud).

RTK CORRECTION DATA BROADCASTING FUNCTION

To Broadcast RTK compensation information, you need to switch the app to base station mode. Tap the drop-down list at the top left of the screen and select "RTK Correction Data Distribution".

Tips

Once you switch mode, it starts in the same mode even if you restart the app. If you want to change to the drone survey mode, you can switch from the drop-down list at the top left corner of the screen.

Set the location of EdgeBox

⚠ CAUTION

The main unit should place a stable, flat place.

If it was placed at unstable place, it may be dropped and cause a damage or a breakage.

IMPORT FROM A CSV FILE

1. Align the Edge Box horizontally above the surveyed base point using the levelling device on the top of the tripod.

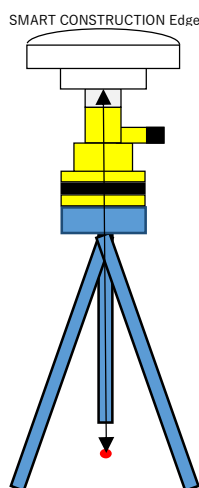



⚠ WARNING

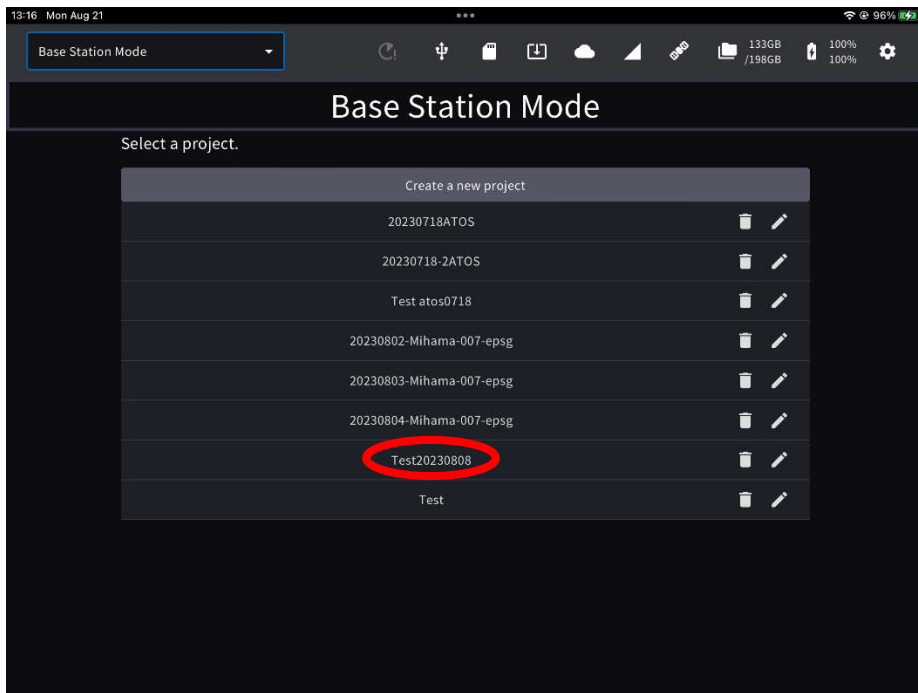
Always wear a hard hat during work.

If you drop the product from the top of the tripod by mistake and hit your head, it may cause an injury.

2. Measure the height from the base point to the bottom of the EdgeBox
3. Enter this height as the "pole height"



4. Launch the tablet app  and select a project of the work site to broadcast.

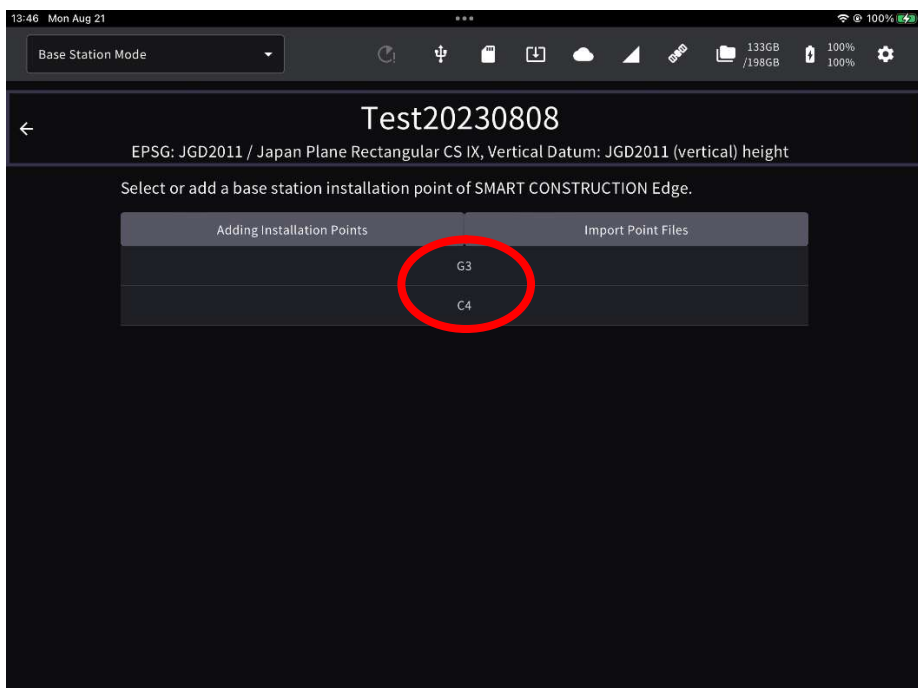


If the project is not listed, create a new project. For details, please see p.18.

Tips

Projects and points added in the drone survey mode are also listed.

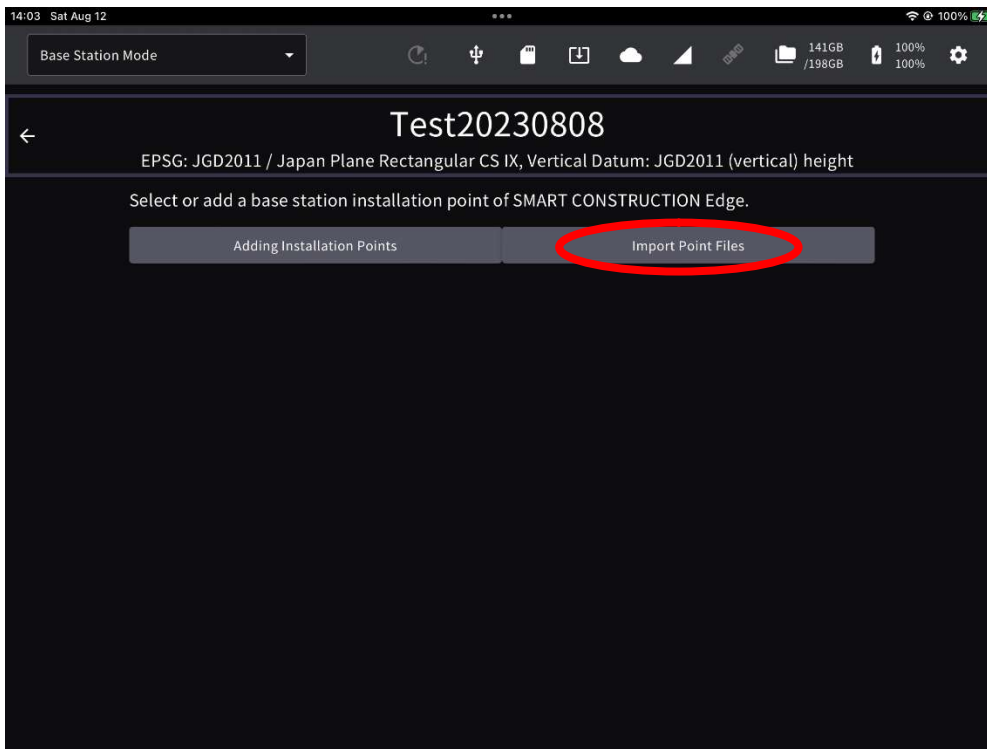
5. The points you have previously set up or have used for localization will appear as a point list.



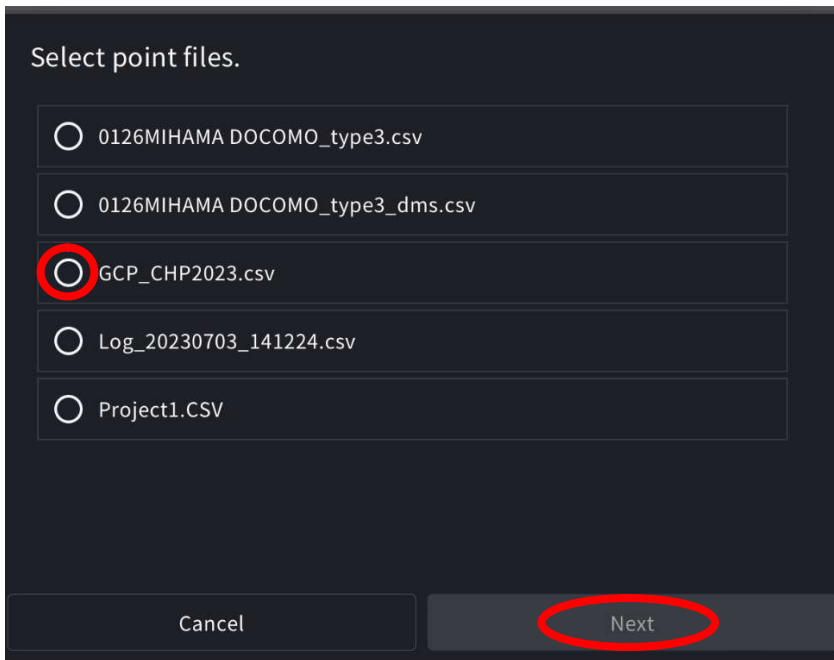
Tips

If you set the EdgeBox on one of these points, you can just tap it to select it. (If not, go to 5.)

6. Tap "Import Point Files" to open the file.



7. Select the control point file you want to use and tap "Next".



Please select the parameters of your point file.

CSV file format

Tap [OK] after changing below import setting, if importing file was not "Locale setting" in the setting menu.

Coordinate Order: ENZ, NEZ

Decimal Point: . (point), , (comma)

Separator: ; (semicolon), (tab), , (comma), Space

Data start row: 1

Data start column: 1

Reflect the change here to "Locale setting" in the setting menu.

Cancel OK

Please prepare the point file in advance.

Set the file format parameter according to the file and tap "OK".

- The contents of the imported localization file are displayed on the screen. Confirm the values are correct and aligned correctly, then tap "OK".

Select the installation point of SMART CONSTRUCTION Edge.

Unit of length : feet

Point Name	X(E)	Y(N)	Z
<input checked="" type="checkbox"/> A	-44123.954	22739.500	3.888
<input checked="" type="checkbox"/> B	-44128.104	22734.856	3.885
<input checked="" type="checkbox"/> G	-44045.079	22784.727	3.856
<input checked="" type="checkbox"/> H	-44037.855	22778.716	3.844
<input checked="" type="checkbox"/> I	-44137.008	22711.815	3.772

Cancel OK

INPUT MANUALLY

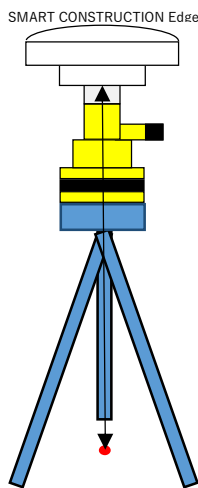
1. Align the Edge Box horizontally above the surveyed base point using the levelling device on the top of the tripod.




WARNING

Always wear a hard hat during work.
If you drop the product from the top of the tripod by mistake and hit your head, it may cause an injury.

2. Measure the height from the base point to the bottom of the EdgeBox
Enter this height as the “pole height” later.

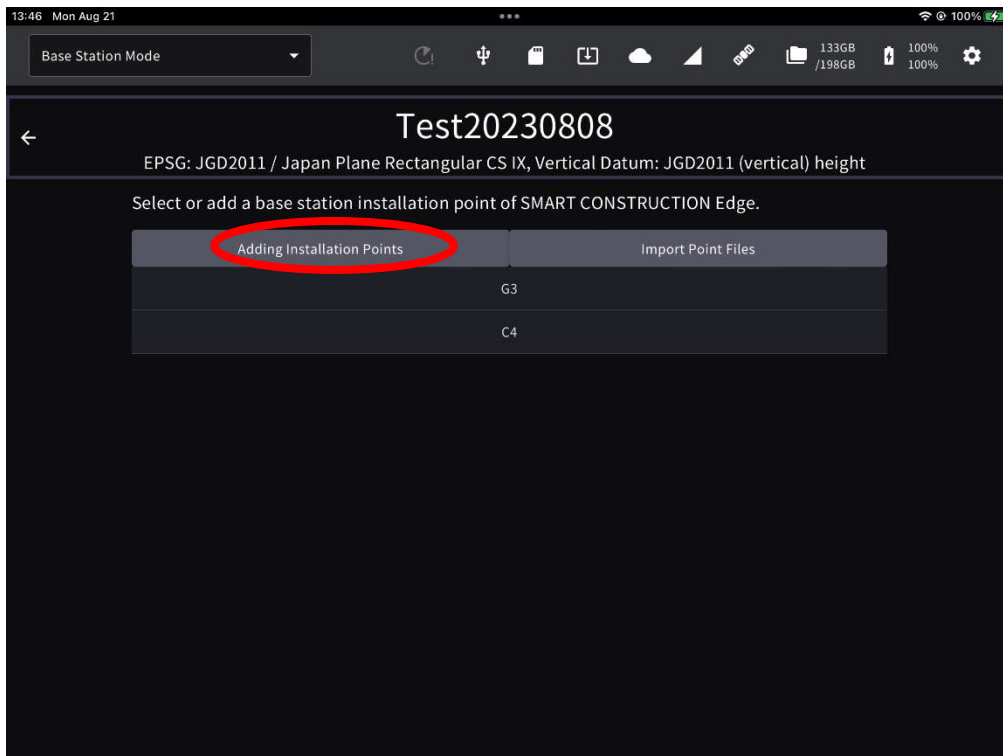


3. Launch the tablet app  and select a project of the work site to Broadcast.
If the project was not listed, create a new project. For details,

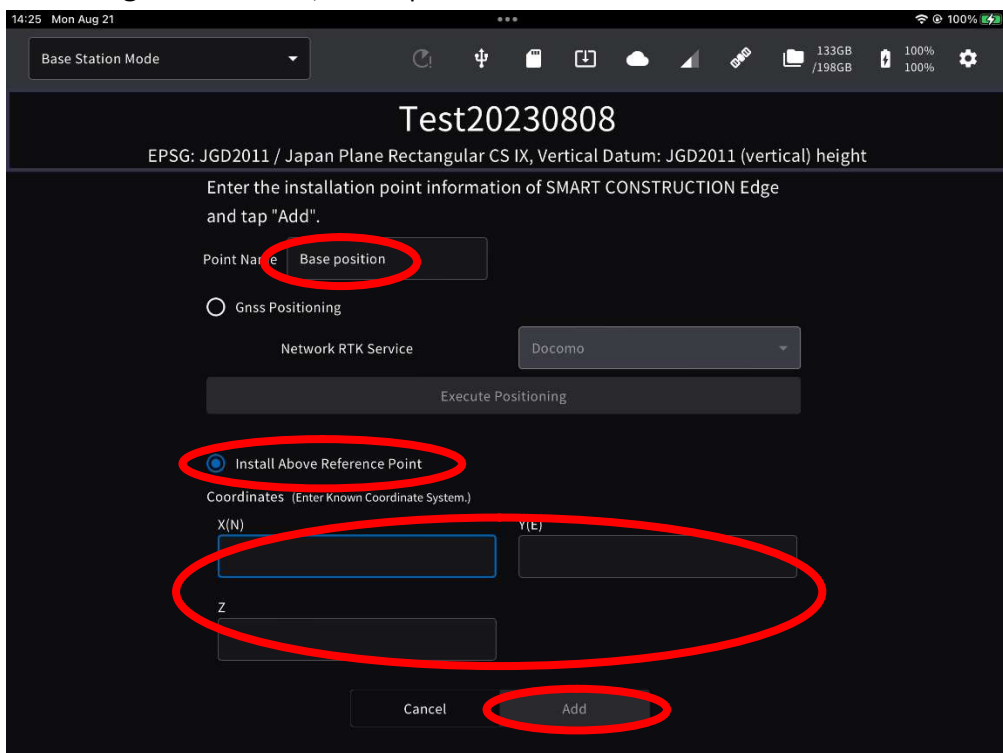
Tips

Projects and points added in the drone survey mode are also listed.

4. Tap "Adding Installation point" to open the file.



5. Tap "Install above reference point". Enter the point name, pole height, and coordinates of the EdgeBox location, and tap "Add"



Tips
The coordinates you enter must be in the same coordinate system when you created the project.

INPUT USING NETWORK RTK

Important!

RTK correction data distribution from points added using Network RTK is not recommended because it is less accurate.

Tips

To use Network RTK, an LTE contract and a Network RTK Service contract were required.

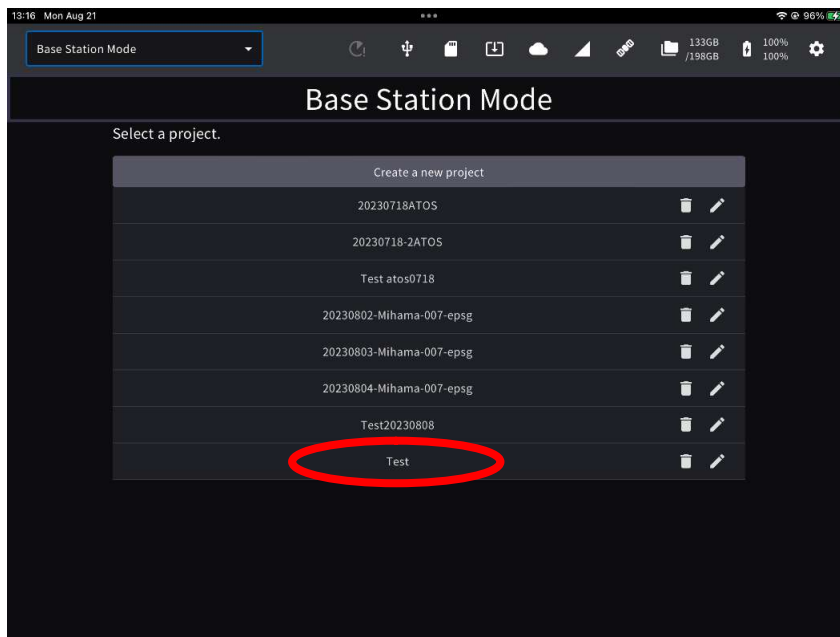
1. Place EdgeBox anywhere in the site with a tripod at a wide, open sky.

⚠ CAUTION

The main unit should be in a stable, flat place.

If it was placed at unstable place, it may be dropped and cause a damage or a breakage.

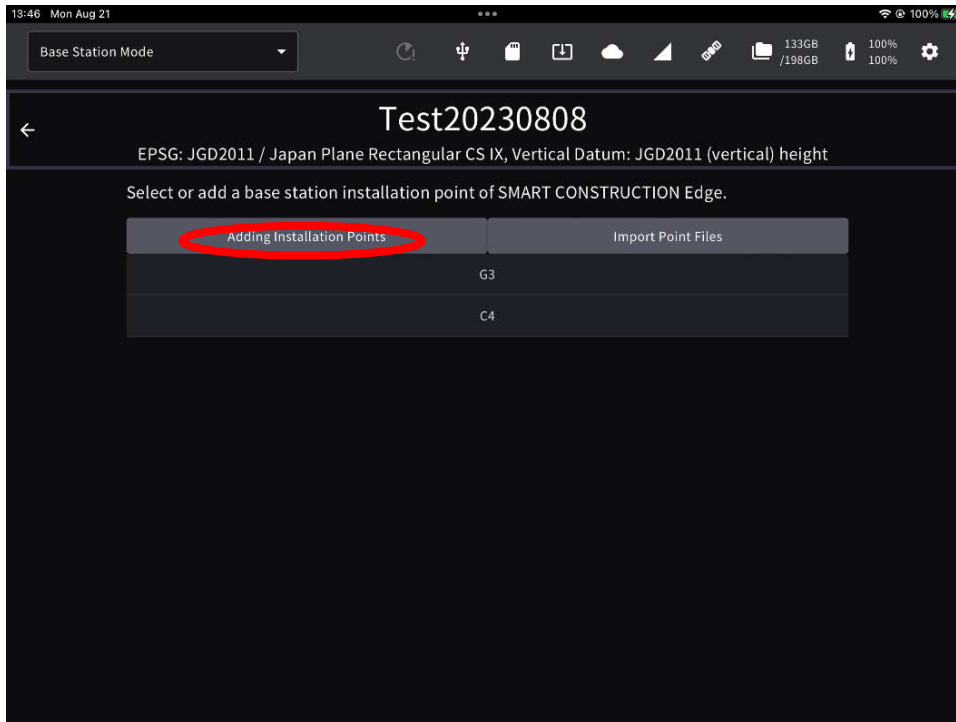
2. Launch the tablet app  and select a project to broadcast.



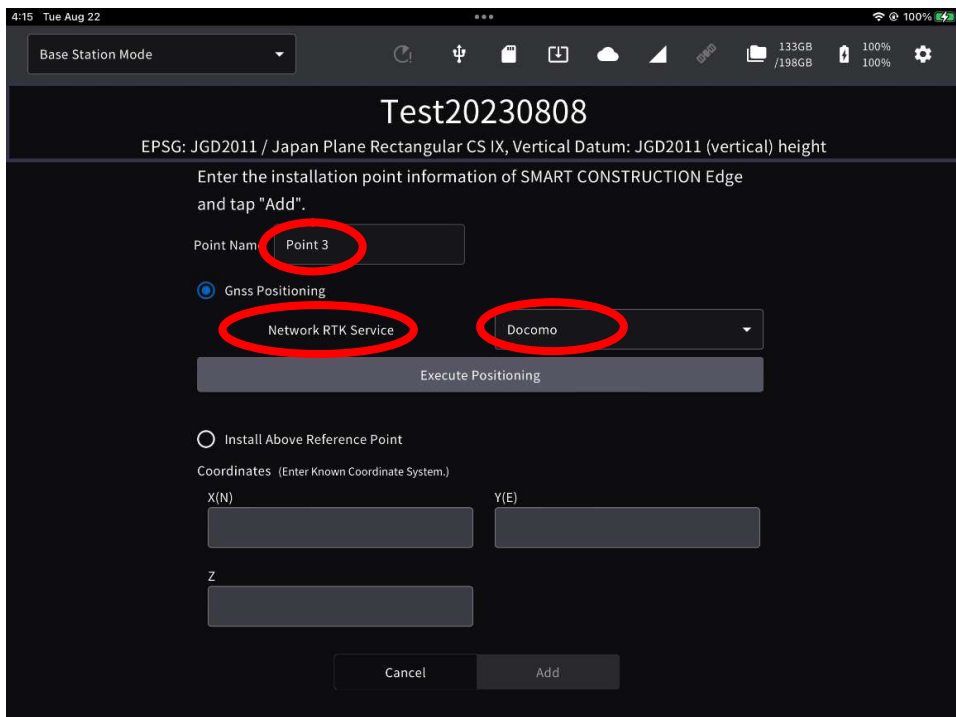
If the project is not listed, create a new project. Please see P.18.

3. Tap "Adding Installation point" to open the file.

A list of the points that you have set in the past will be displayed.



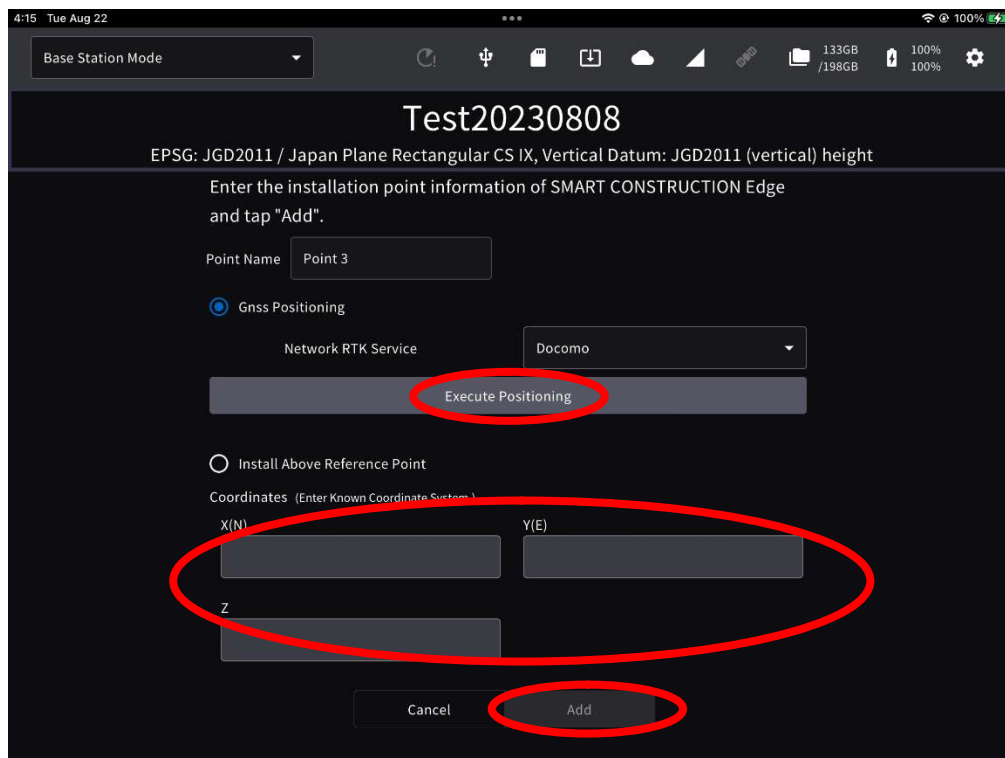
4. Tap "GNSS positioning". Enter the point name and select the "network RTK service" from the drop-down menu.



Tips

- Projects and points added in the drone survey mode are also listed.
- If your network RTK service was not on the list, please see P,106 to add the service.

5. Tap "Execute positioning" to start network RTK Positioning.

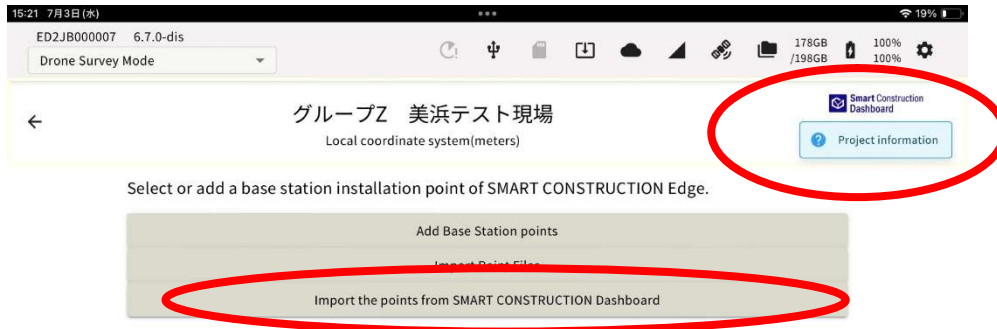


When the positioning was completed, coordinates are automatically entered to the fields.

6. Confirm the coordinates were entered in the fields, and tap "Add"

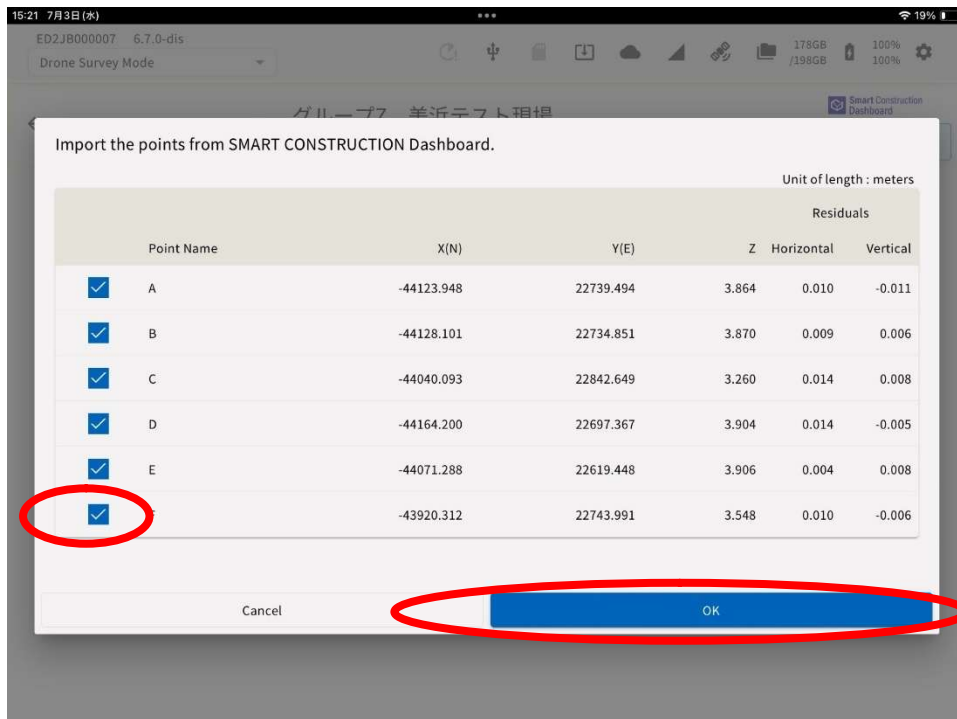
· INHERIT POINTS FROM DASHBOARD

If the project is linked to the Dashboard site, the coordinated data registered on the Dashboard can be inherited.



※The dashboard icon is displayed for projects linked to the dashboard, and tapping the 'project information' icon to view the GC3 information that has been loaded.

1. A list of points registered on the Dashboard is displayed. Select control points and press OK.



Broadcast RTK Correction Data

USING NTRIP SERVER

It is possible to broadcast correction data by connecting ICT construction machines and GNSS rovers which can be connected, and EdgeBox via Ntrip server.

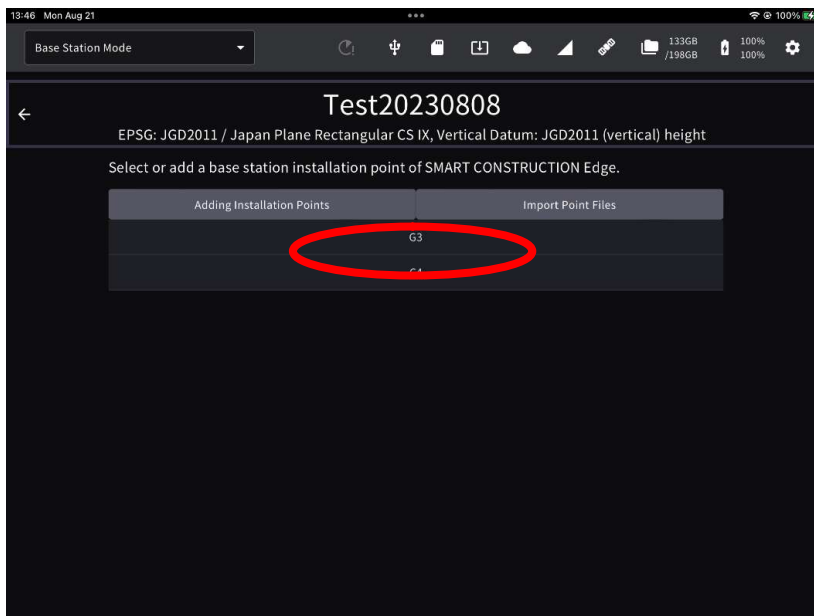
Tips

To broadcast RTK correction data via an Ntrip server, an LTE contract and APN configuration are required in advance.

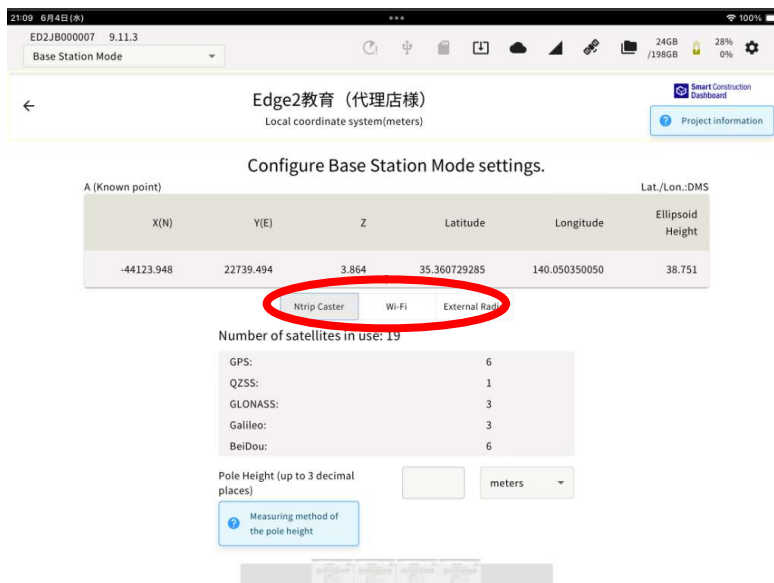
An LTE connection is also necessary at the job site.

However, if you connect to the internet using a Wi-Fi dongle, it is possible to broadcast RTK data even without a SIM card.

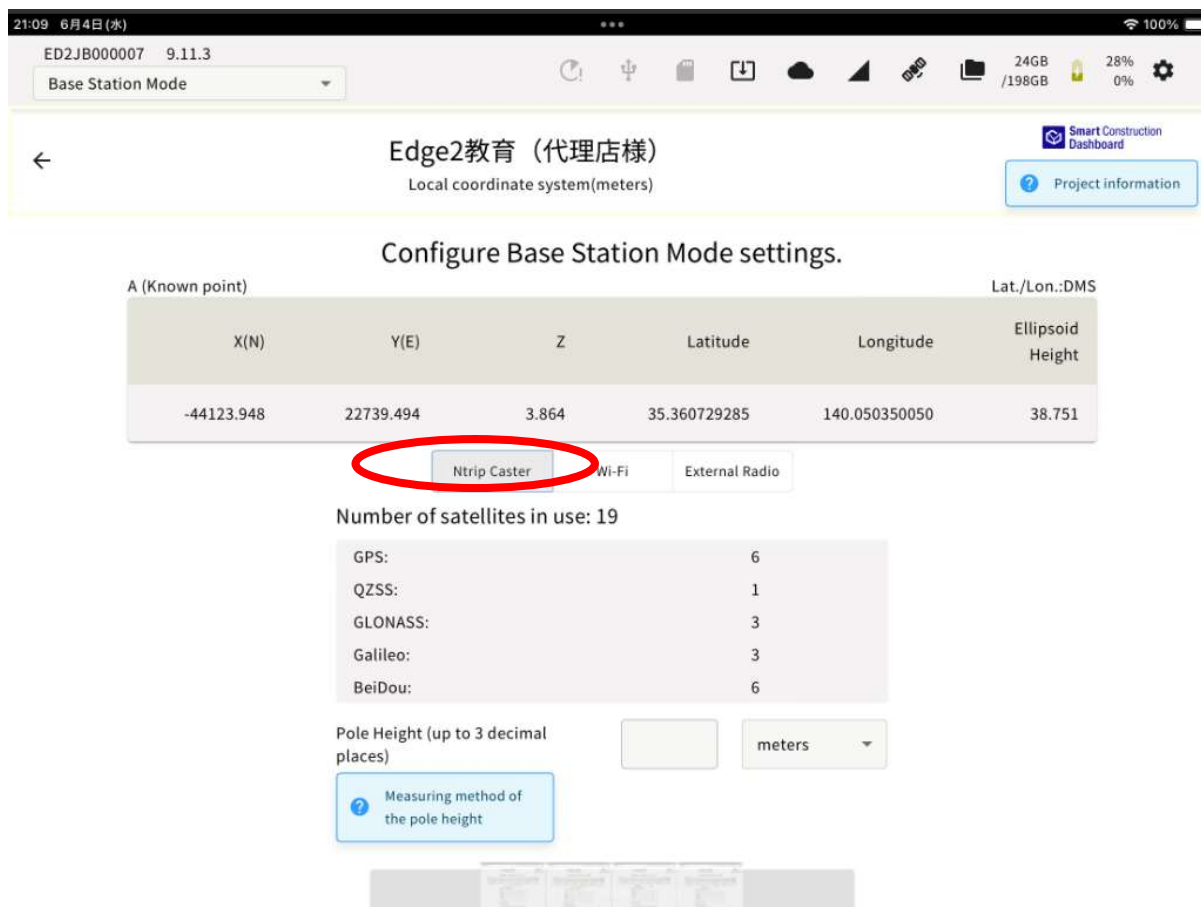
1. Select the base position from the list.



※RTK broadcasts can be simultaneously distributed by setting each method (LTE,WI-FI, External Radio) and starting the distribution.



2. Make sure “Ntrip Caster” is selected, enter the pole height, and tap “Start Broadcasting”



When you want to stop broadcasting, tap “Done”

Tips
 You don't need to input Pole Height If you selected to use Network RTK positioning, because it directly measures the antenna height.

3. Configure the NTRIP setting of receivers (rover) side.

When using LTE to broadcast RTK compensation data, set the following information for the receiver side.

★★

Host: rtcmsv.smartconstruction.com

Port: 2101

(If there was no “Port” input,
 please make the host URL: rtcmsv.smartconstruction.com/2101)

Mount: (See below Tips)

Username: EdgeBox Serial Number (Example: EB2A100XXXX)

Password: SC21

★★

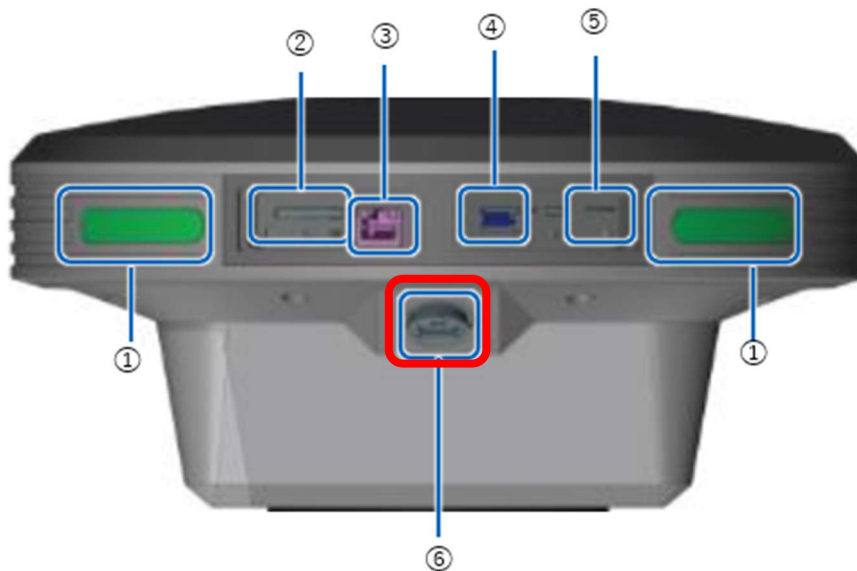
Tips
 For [Mount], enter one of the mount points shown below for the satellites used by the receiver.
 MSMx(4,5,7): RTCM3.2 with GPS, GLONASS, Galileo and BeiDou
 RTCM30: RTCM3.0 with GPS and GLONASS

USE AN EXTERNAL RADIO

⚠ WARNING

DO NOT connect to an external radio with other USB-Serial conversion cable than the attached. it may cause a short circuit and resulting an ignition or an electrical shock.

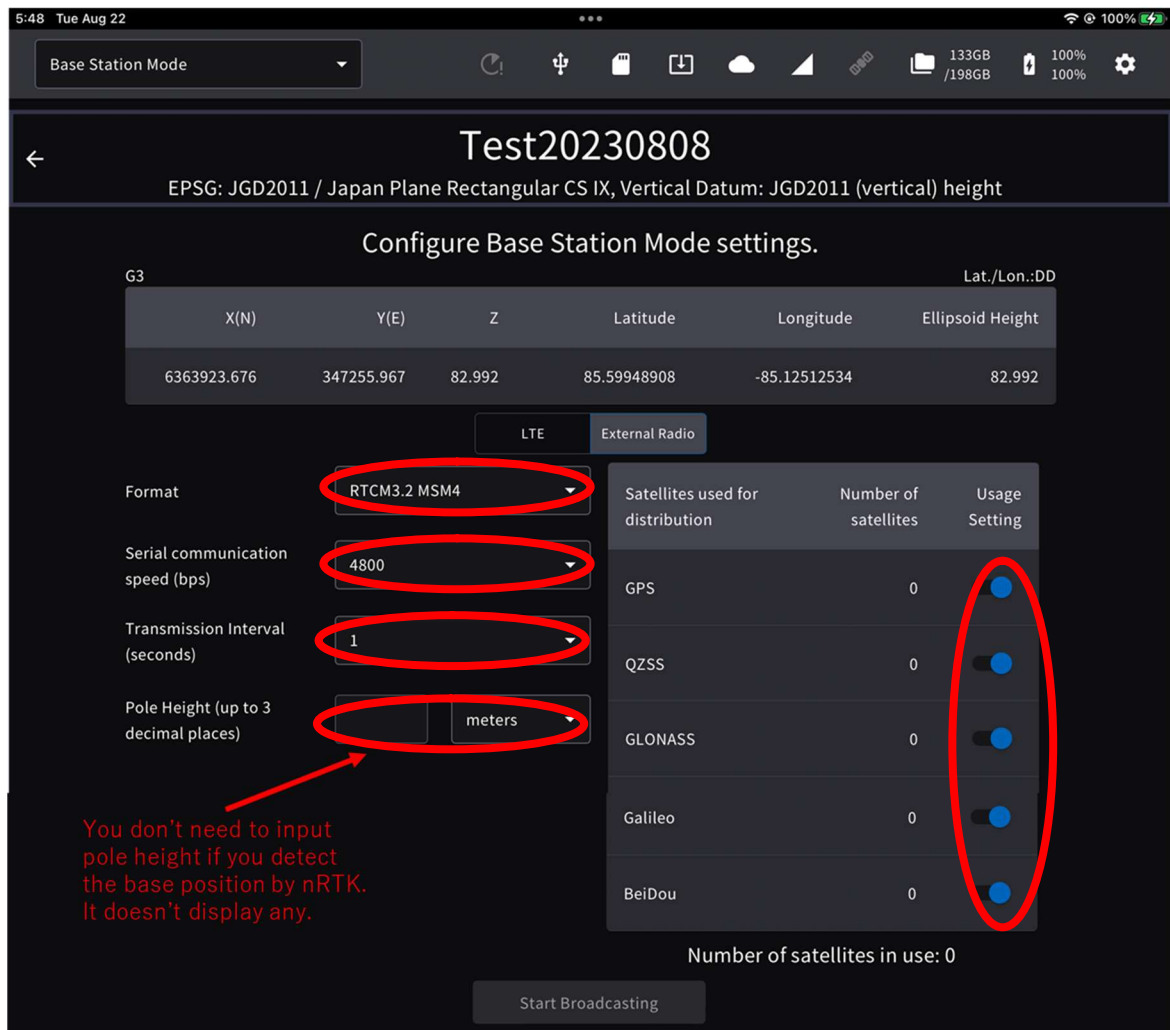
1. Connect the external radio to the EdgeBox using the Conversion Cable. (attached USB-Serial conversion cable)



- ① Status LED
- ② SD card slot
- ③ Ether Cable Terminal
- ④ USB Slot (USB3.0): cannot use this slot for RTK correction broadcasting
- ⑤ SIM CARD SLOT
- ⑥ **Waterproof USB Slot (USB2.0)**

2. Select a point from the list.

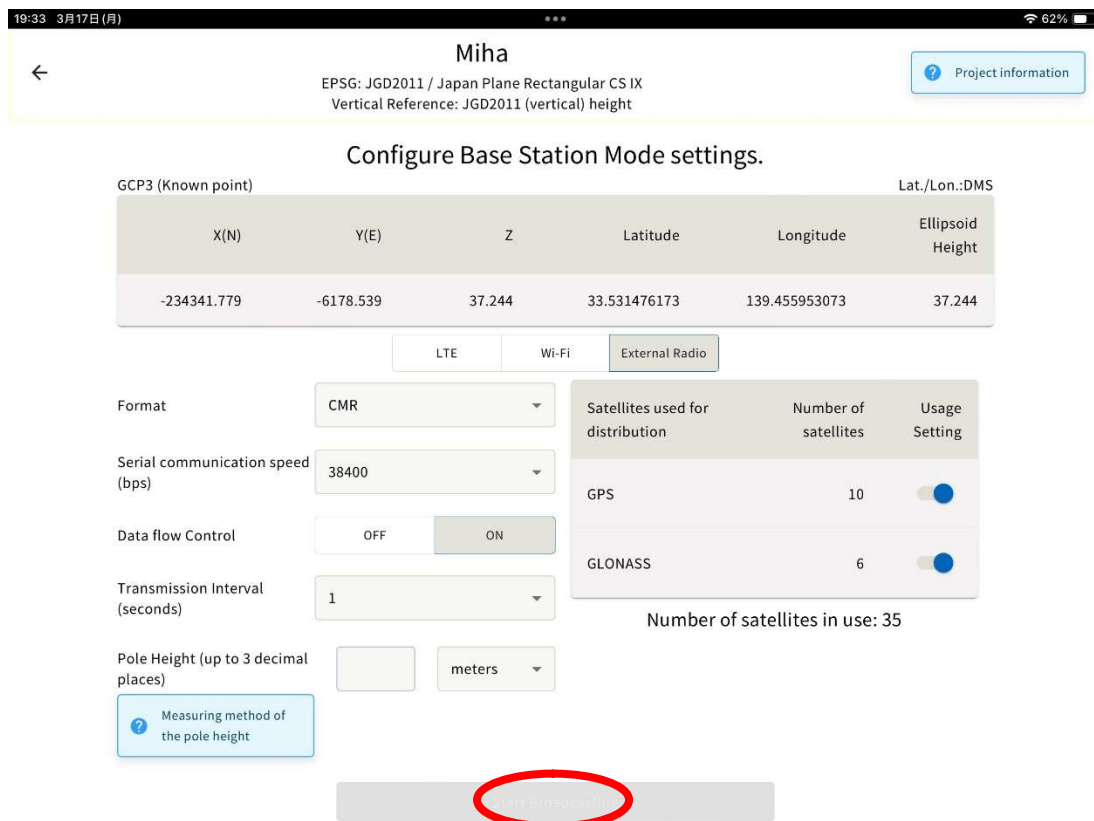
- Input the Format, Serial communication rate, Transmission Interval, Pole Height, and Satellites used for distribution. (Constellations used for broadcast)



Tips

The serial communication speed and transmission interval must be set according to the external radio connected. Please refer to the instruction manual of your external radio for the setting values. You can select the constellations to broadcast from the satellites by turning on the "Active constellations" setting in the settings screen on the upper right of the tablet application. Also, the Active constellations cannot be none.

4. Tap “Start Broadcasting”

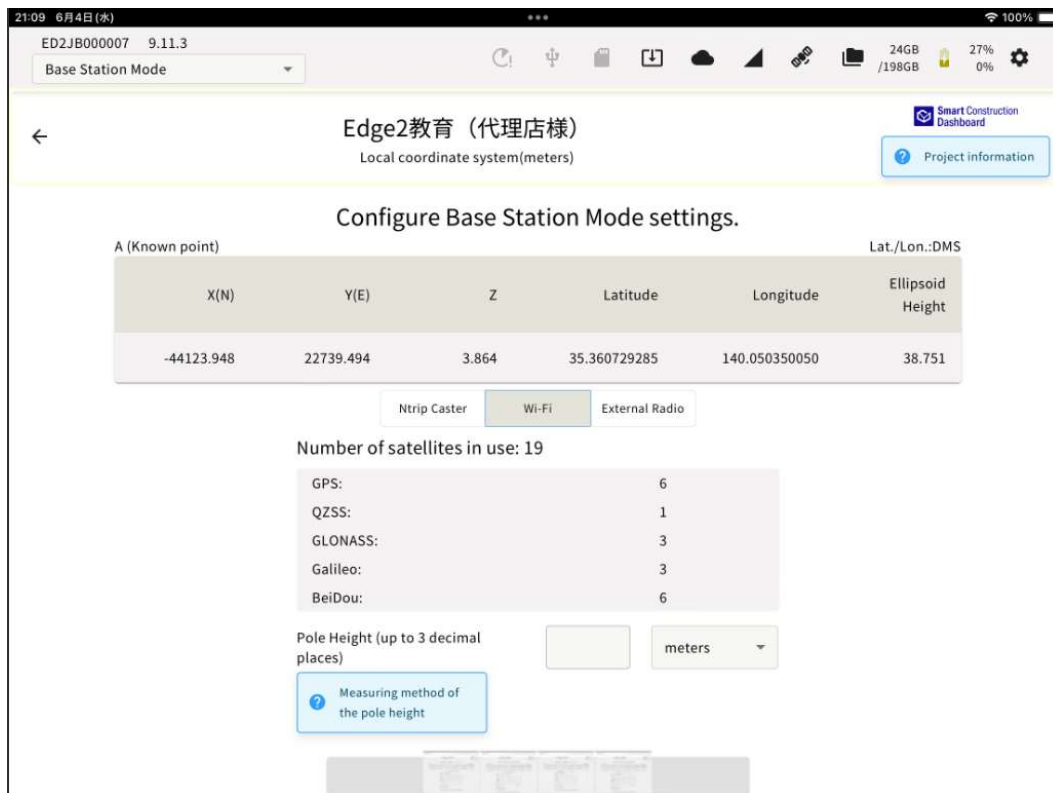


When you want to stop broadcasting, tap “Done”

Tips
 You don't need to input Pole Height If you select to use Network RTK positioning, because it directly measures the antenna height.

- Configure the NTRIP setting of receivers (rover) side.
 Please follow the instruction of the receiver (rover) manual.
 Make sure to set the same channels on both receiver and EdgeBox.

USE WI-FI BROADCAST



If the mobile station side (construction equipment, drone, GNSS rover) can receive compensation data from WIFI, compensation data via WIFI at the EDGE2 is available.

The mobile station side should connect to the EDGE2 SSID (ED2JB000000) pass default (edge2-ap)

Supported formats: CMR, RTCM3.2, MSM7, MSM4, MSM3, RTCM3.0

Setting up reference points, broadcast, setting pole heights, etc., are the same as other procedures.

URL: scedge.local

Port: 2101

ID: EDGE2

PW: EDGE2

Mount Point:

RTCM3_0

RTCM3_2_MSM4

RTCM3_2_MSM7

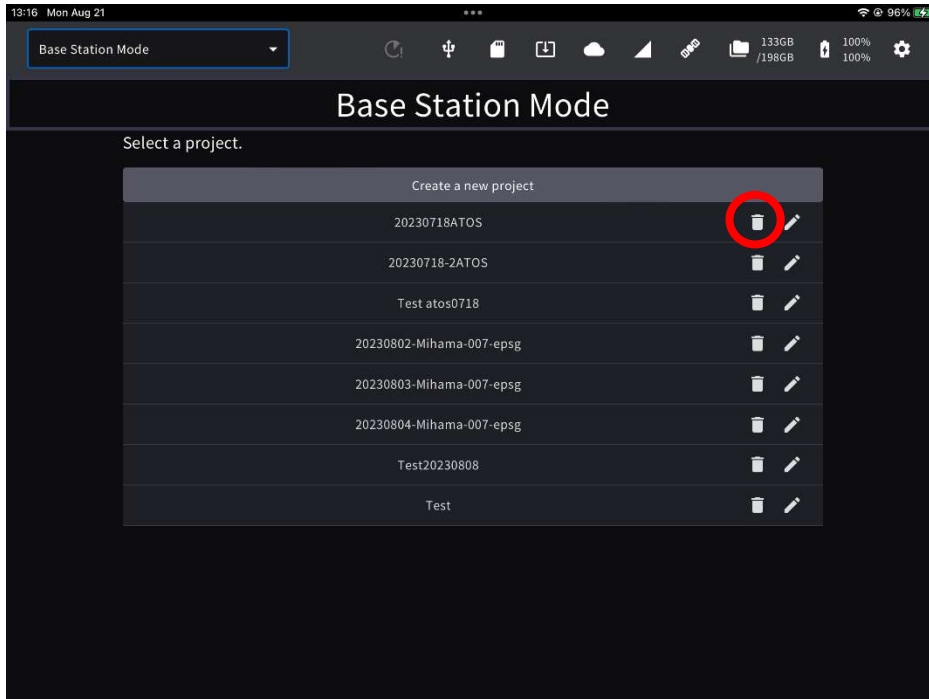
CMR

DELETE DATA

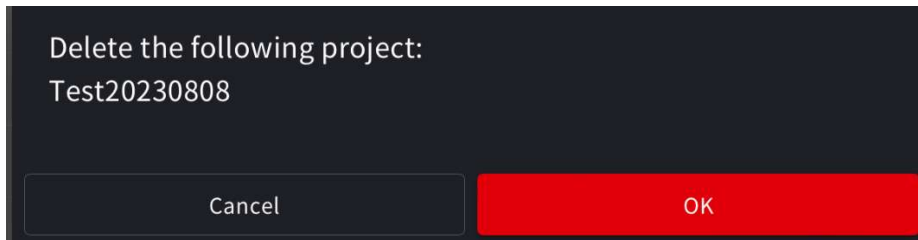
Data in EdgeBox can be deleted in two ways:

Delete a project and its contents together

1. Launch the tablet app  and view the project list.



2. Tap the “Delete” icon at the right end of the project list.




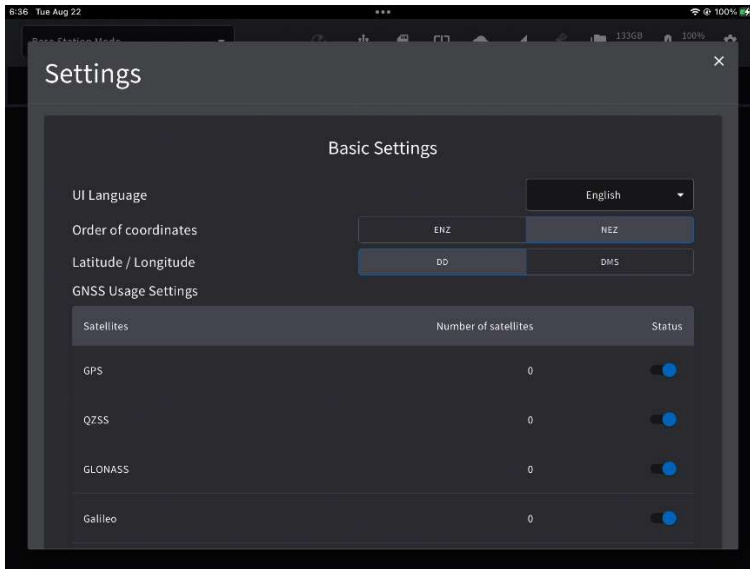
3. Tap "OK" in the confirmation dialog.

Tips

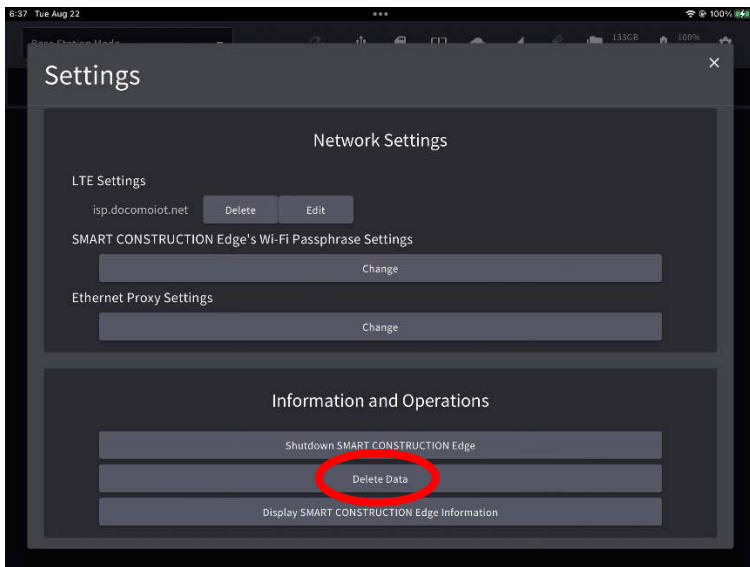
When you delete data in this way, all data associated with the project are deleted.

Select and delete data

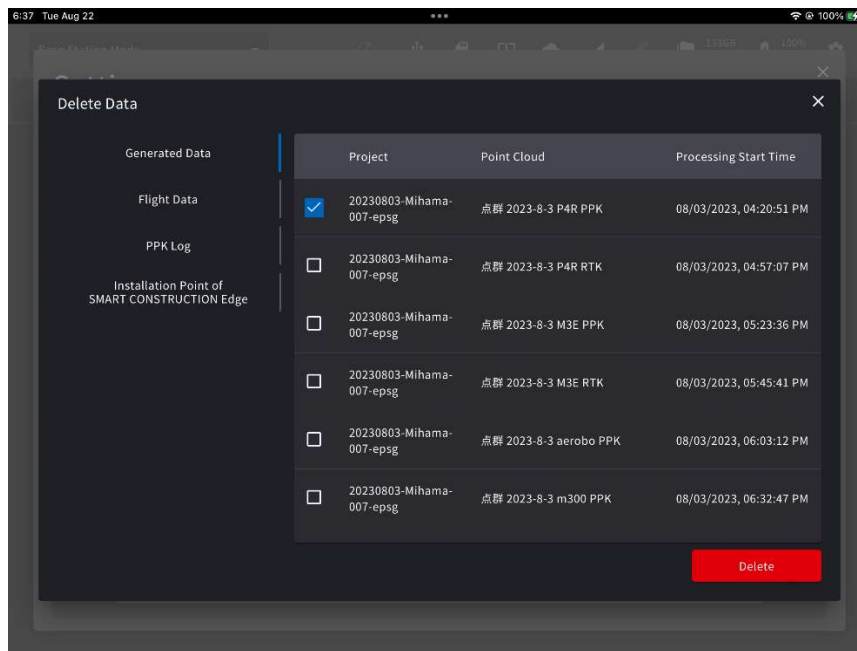
1. Tap the Settings icon  in the upper-right portion of the tablet app.
Go down to the bottom of the page.



2. Tap "Delete Data".



3. From the Delete Data dialog, select the data you want to delete and tap the “Delete” button.



Tips


You cannot delete the generated data while displaying the point cloud. Please go to a different screen before the deletion

Tips

In the left-hand tab, you can select the type of data to delete:

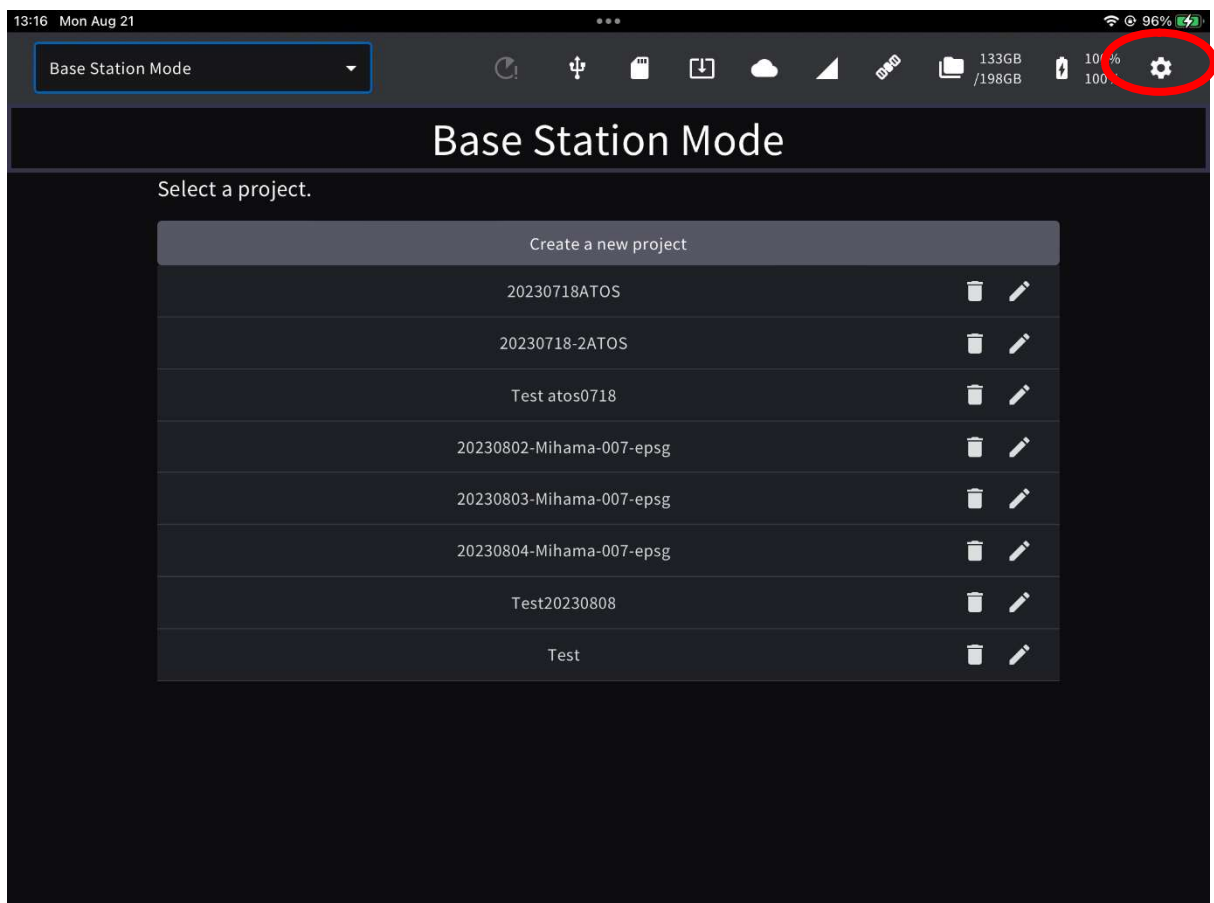
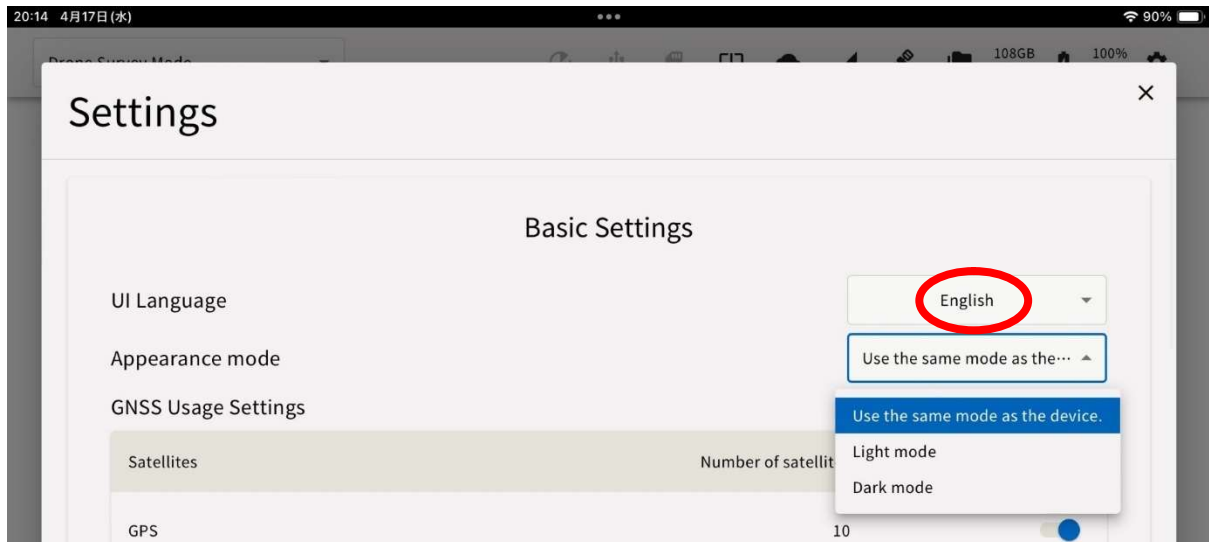
- Generated data
- Imported flight data
- Captured PPK logs
- Base station position data

BASIC SETTING

Tap the “Settings” icon  in the upper-right portion of the tablet app to change your EdgeBox settings or to perform specific EdgeBox actions.

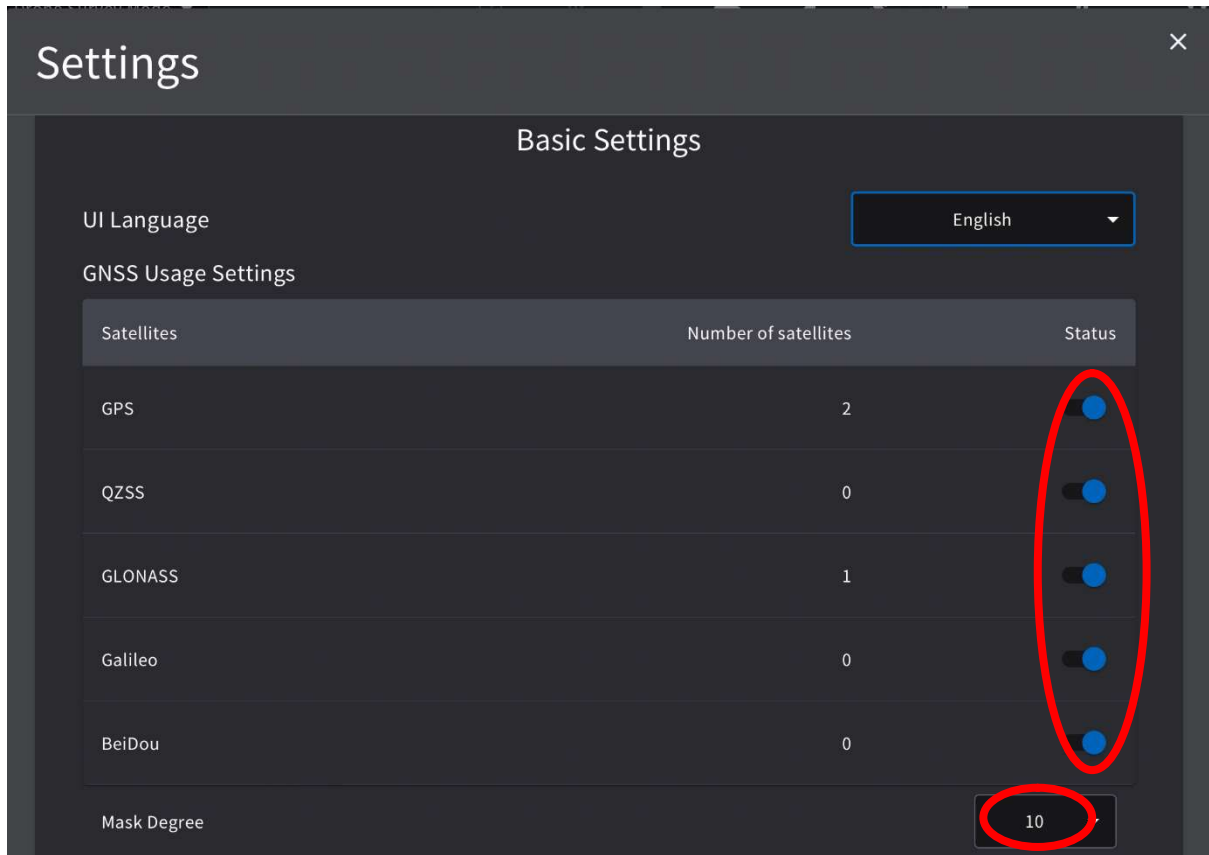
Language setting

You can switch between languages by selecting from the drop-down list. Language settings are saved for each tablet app. And also possible to change the color of the UI display.



GNSS Settings

You can set the constellation used by EdgeBox and the mask angle of the satellite acquisition.



Tips

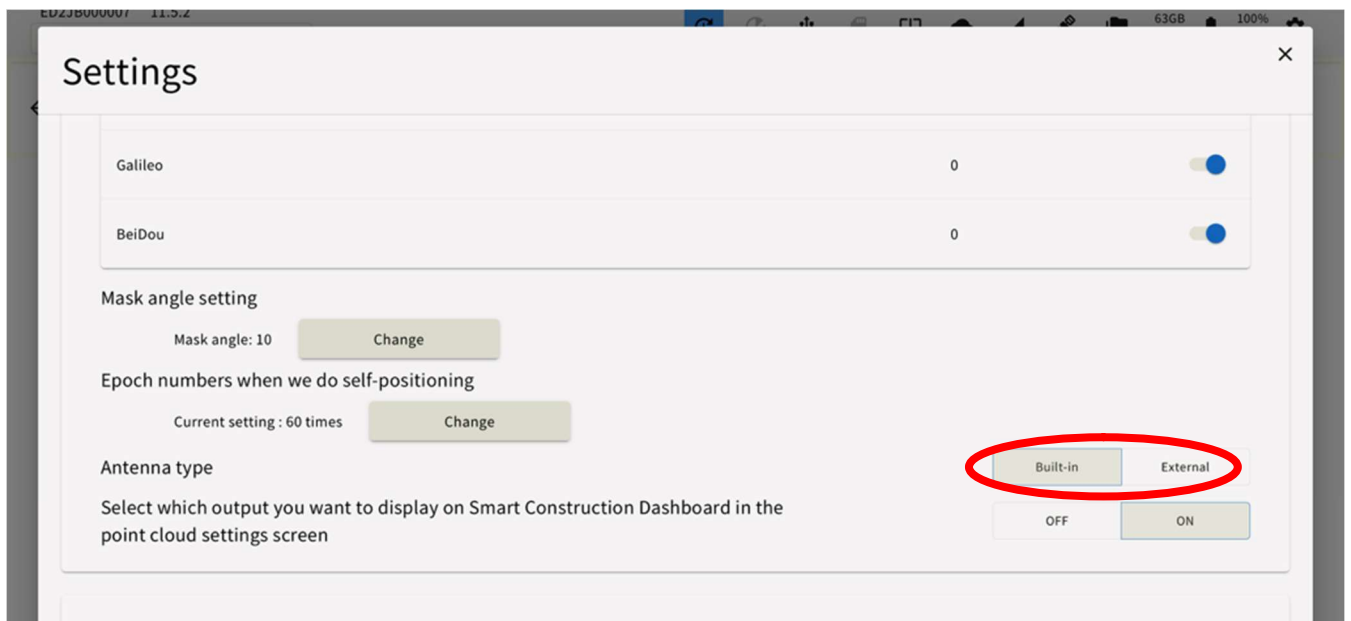
Changing the mask angle changes the position accuracy using the EdgeBox.

Support for External GNSS Antenna

V11 onward, it is now possible to use Edge 2 in Japan by connecting an optional external antenna. For more details, please contact an authorized Earth Brain product distributor.

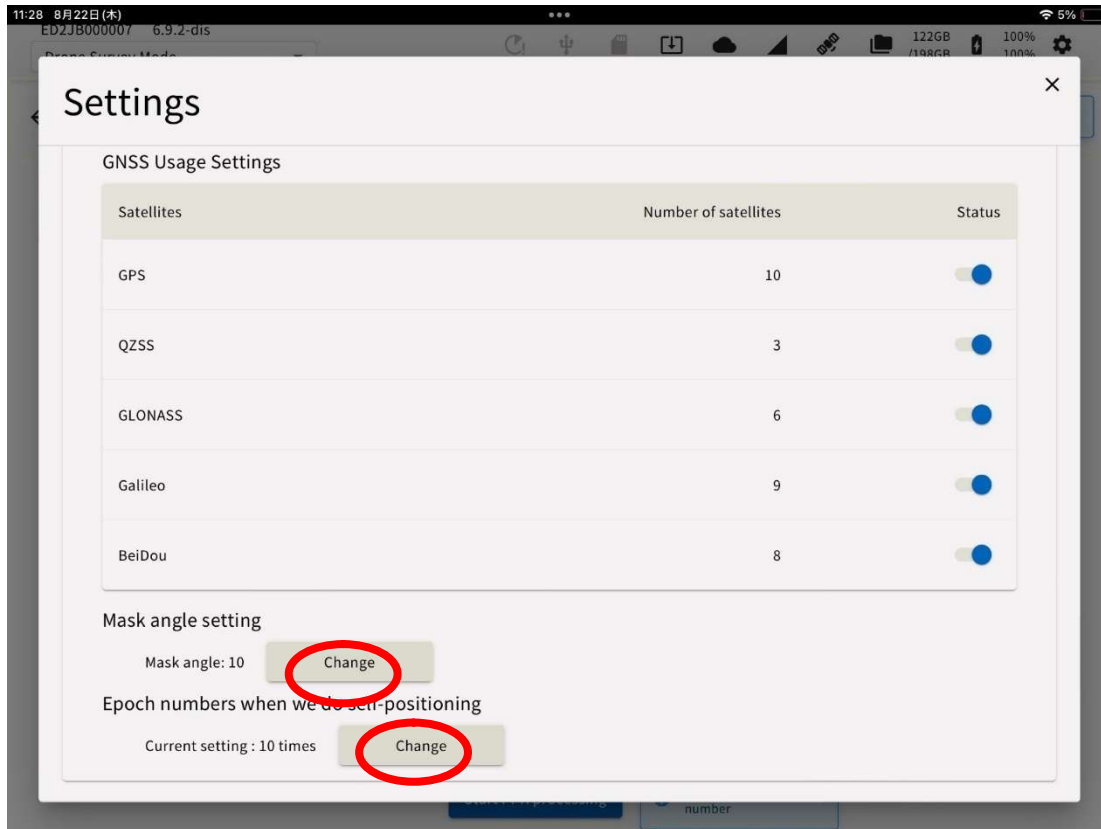


1. If you are using an external antenna, please select **“External.”**
If you are not using an external antenna, please do not change this setting.



Setting GNSS epoch number and Mask angle setting

In the setting menu will adjust epoch number here when self-positioning.



Can be set between 0 and 30.

Mask angle setting

Mask Degree

Input any value between 0 and 30

Can be set between 1 and 60

Epoch numbers setting

Epoch numbers (times)

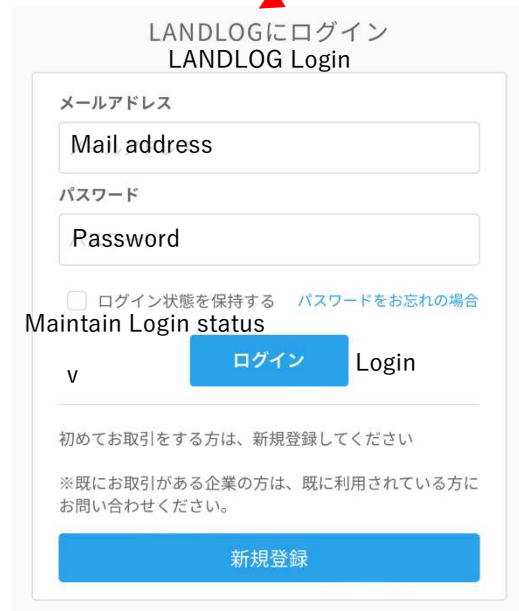
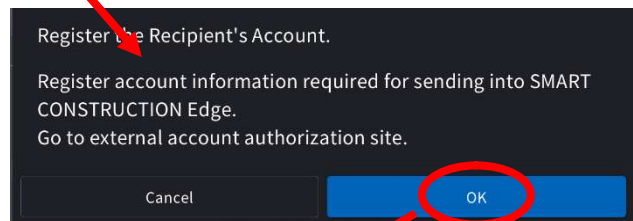
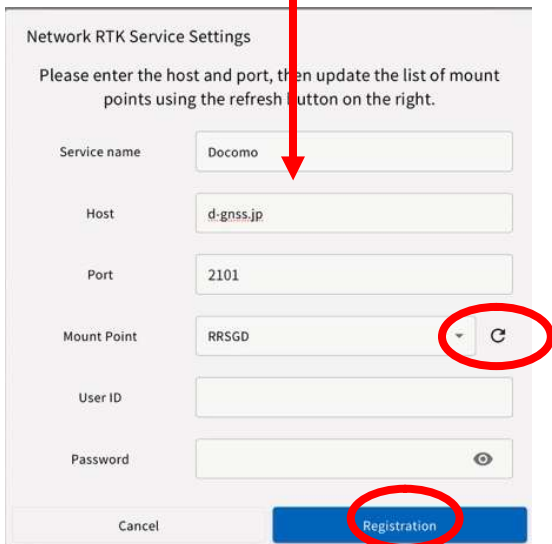
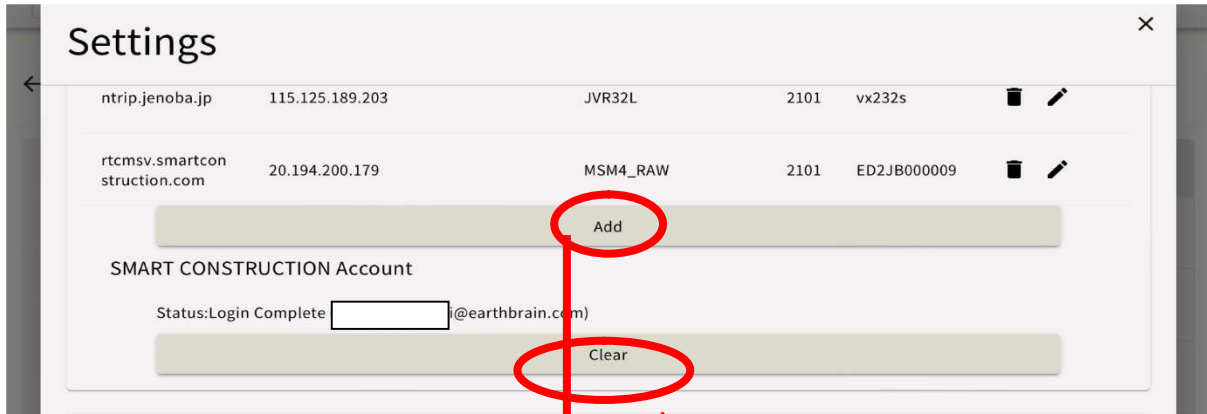
Input any number of times from 1 times to 60 times.

Interwork (Linked) Service Settings

You can configure network RTK service setting. Normally, Host, Mount Point, Port, User ID and Password. The password will be hidden.

SMART CONSTRUCTION Account Settings are ID and password.

※When you log in to your account, you will see your login ID.

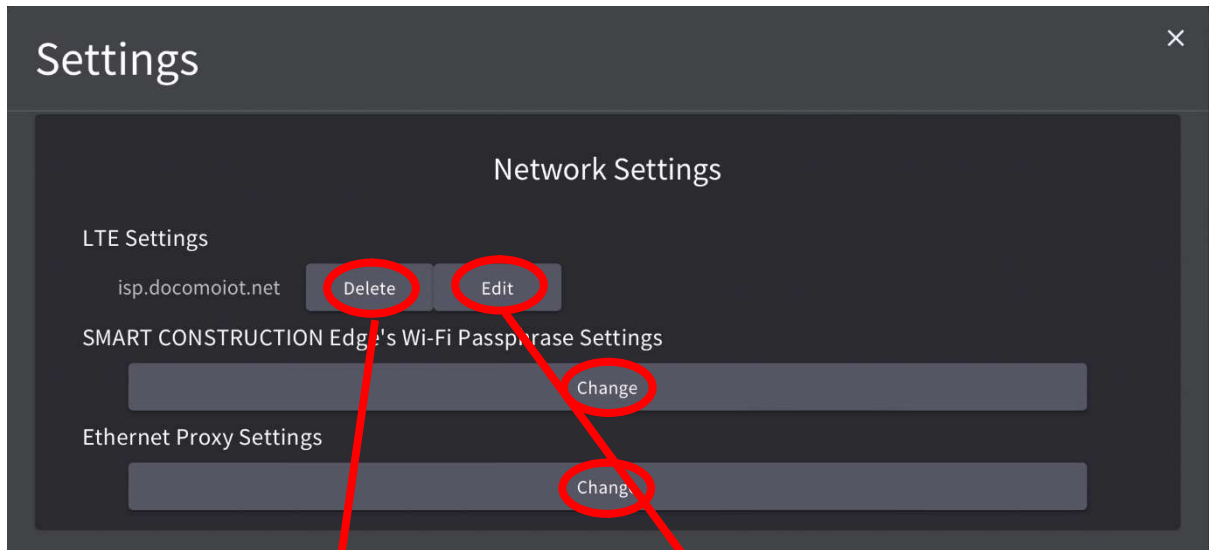


Tap the download icon above to display the list of mount points.

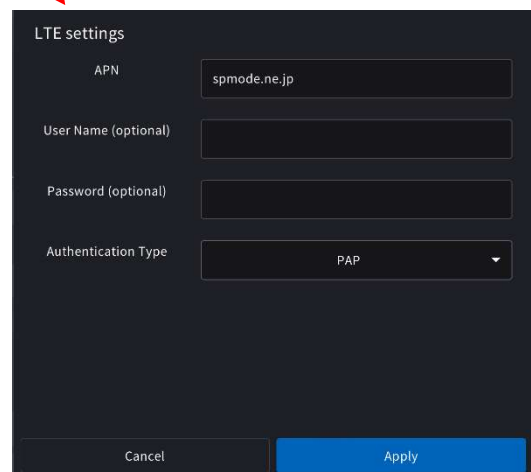
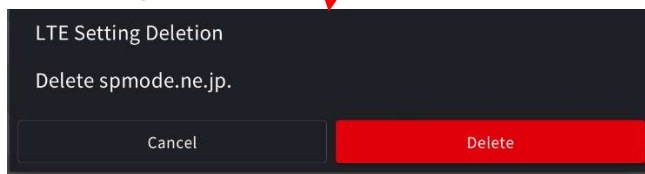


Network Settings

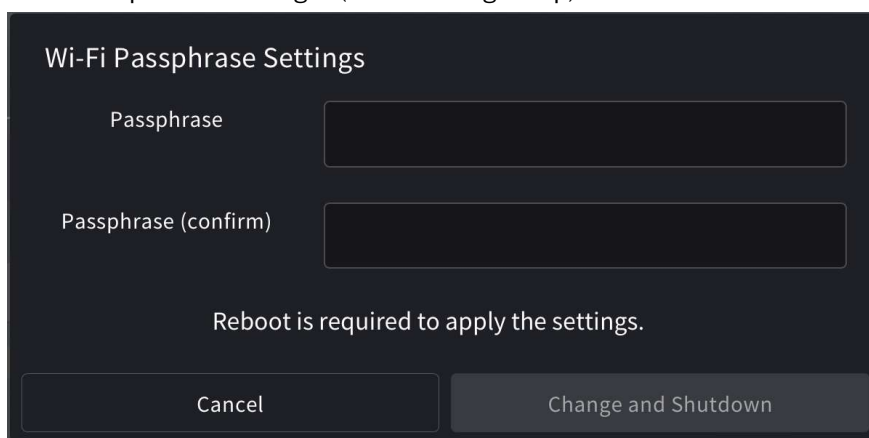
You can configure APN, change the password when you connect Wi-Fi to EdgeBox, and configure proxy server when you connect to a wired LAN with a proxy server.



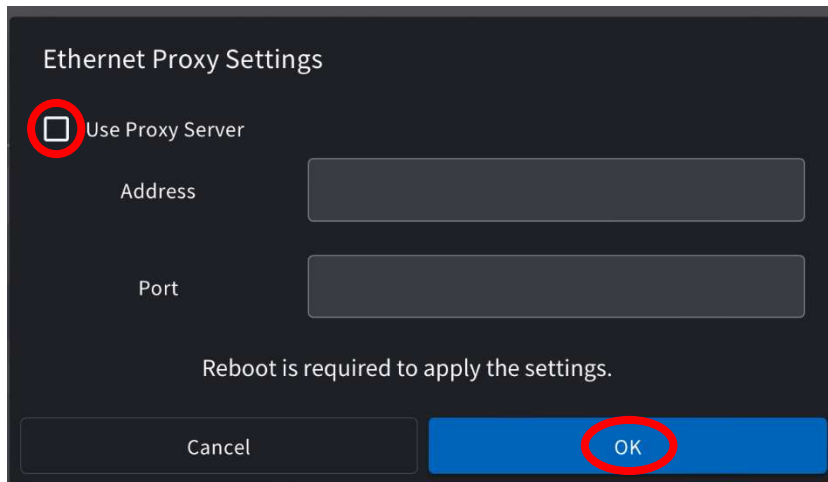
LTE Setting:



WiFi Passphrase Settings: (Default: edge2-ap)



Ethernet Proxy settings:



Tips

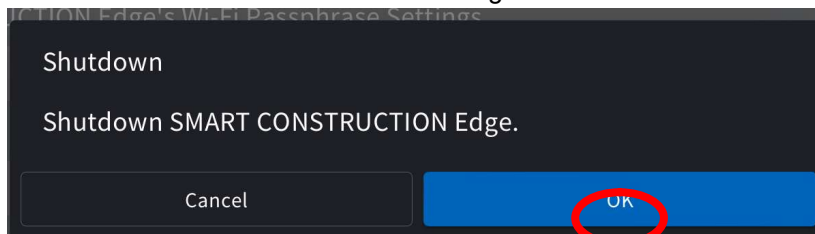
After changing the Wi-Fi password and the Proxy settings, the EdgeBox must be restarted. After shutting down, press and hold the power button for about 4 seconds to start.

EdgeBox Information and Operations

You can check the information about your EdgeBox, delete unnecessary data or shut it down/restart.



Shutdown SMART CONSTRUCTION Edge:



Delete data:

Delete Data

Generated Data

Flight Data

PPK Log

Installation Point of SMART CONSTRUCTION Edge

Project	Point Cloud	Processing Start Time
<input type="checkbox"/> 2022-09-08_Verify_with_Australia_data	100_0003-100_0007	2022/09/08 14:51:54
<input type="checkbox"/> 220912-1025-33-local304	Point Cloud 2022-9-11	2022/09/12 13:27:38
<input type="checkbox"/> GCPTest	点群 2022-9-8 exp1-1	2022/09/09 11:06:27
<input type="checkbox"/> Georgeandkhim	Point Cloud 2022-11-16	2022/11/16 11:59:42
<input type="checkbox"/> Georgeandkhim	Point Cloud 2022-11-16 1v2	2022/11/16 14:14:14
<input type="checkbox"/> Mihama	Point Cloud 2022-11-2	2022/11/02 16:34:11
<input type="checkbox"/> Mihama220914-VR S	点群 2022-9-13-GCPなし	2022/09/14 11:38:58

Check the data you want to delete.

Delete

Edge device information:

SMART CONSTRUCTION Edge Device Information

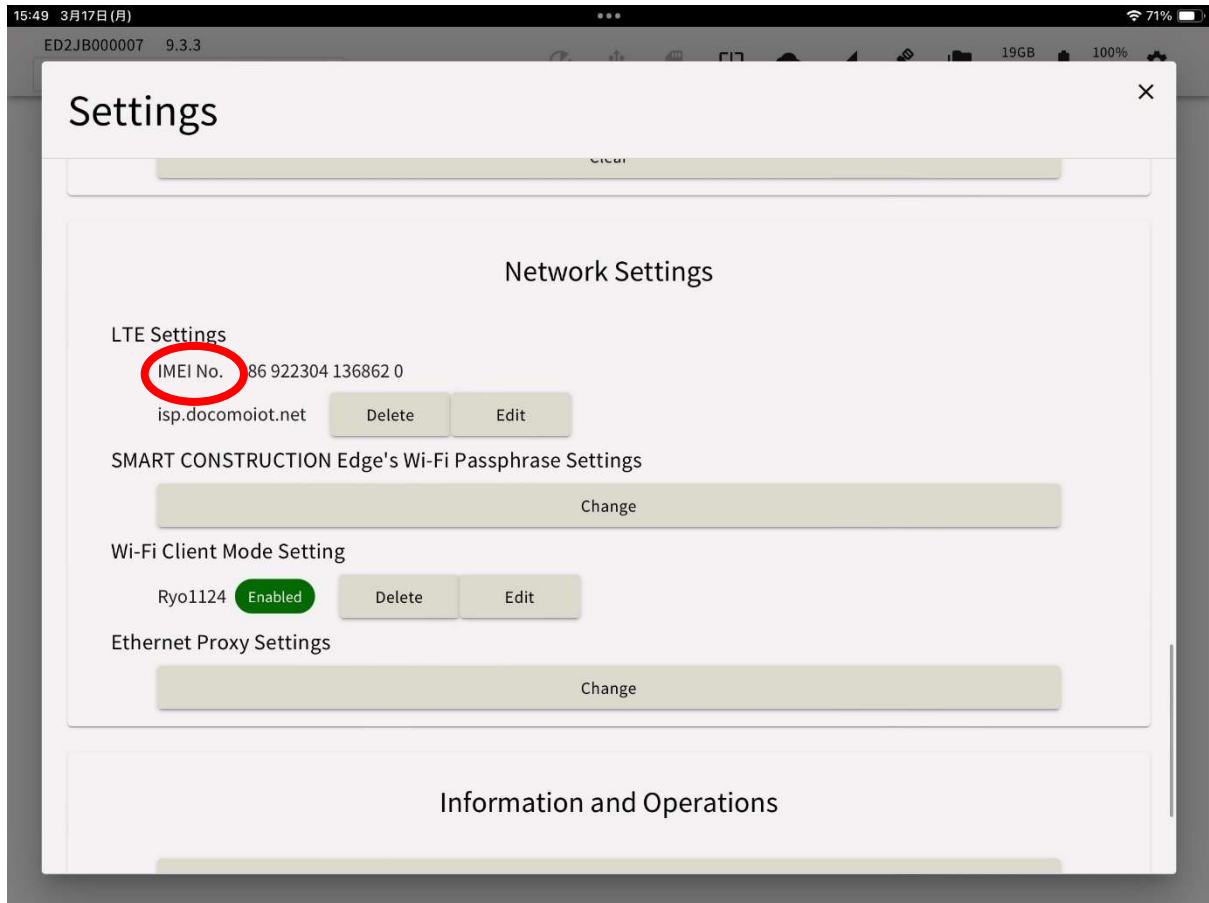
SMART CONSTRUCTION Edge Storage Usage 59 GB/198 GB (29%)
Remaining 138 GB

Version 1.15.2

Close

IMEI number display

IMEI number is displayed in the settings menu on Network settings.



WiFi dongle setup

From version 9 onwards, all internet communication functions can be used with a WiFi dongle without a SIM card.

※The recommended dongle model numbers as follows:

■ Archer T2U Nano (Highly recommended as internet communication is fast)



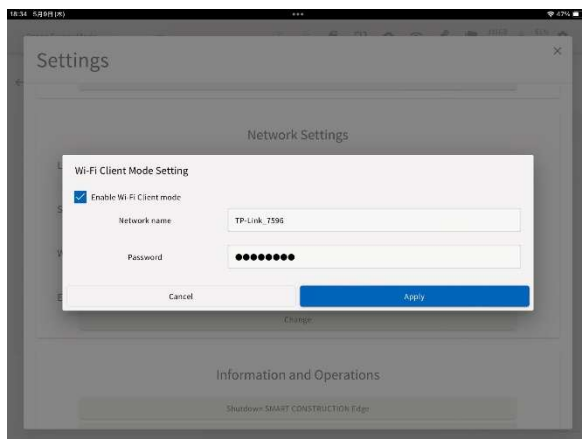
<https://www.tp-link.com/jp/home-networking/adapter/archer-t2u-nano/>

■ TL-WN725N

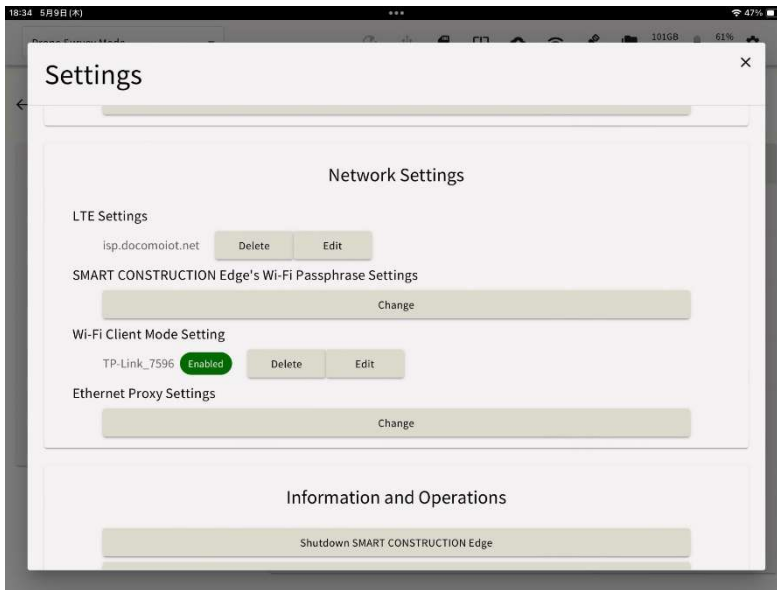


<https://www.tp-link.com/jp/home-networking/adapter/tl-wn725n/>

1. Tap the Add WI-FI Client Mode Settings icon in the Edge2 Settings menu and enter the SSID and password.



2. Confirm that the settings have been enabled



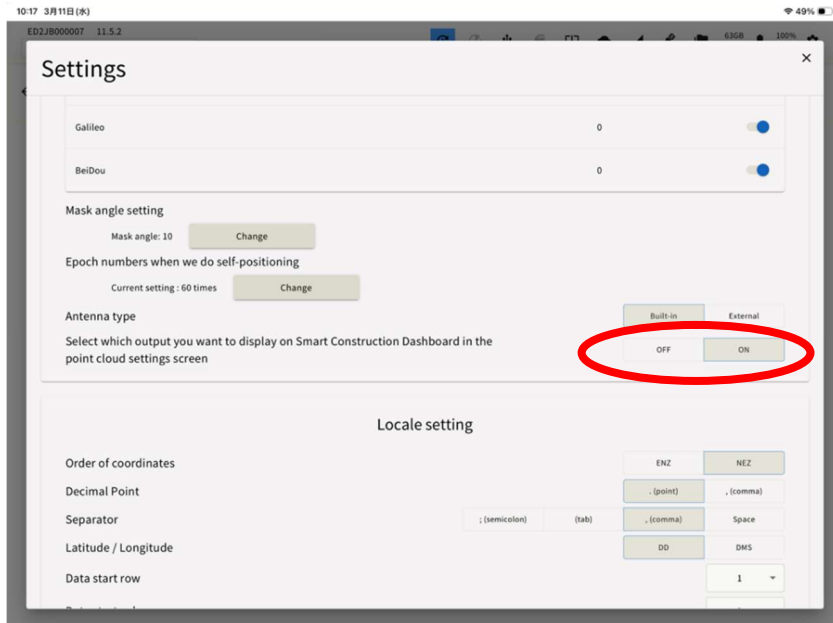
3. Insert the WIFI dongle into Edge 2 and wait for 30sec, after that make sure internet connection.

If you are having problems with your internet connection, please restart Edge 2.



Automatic upload and automatic registration setting to SC Dashboard

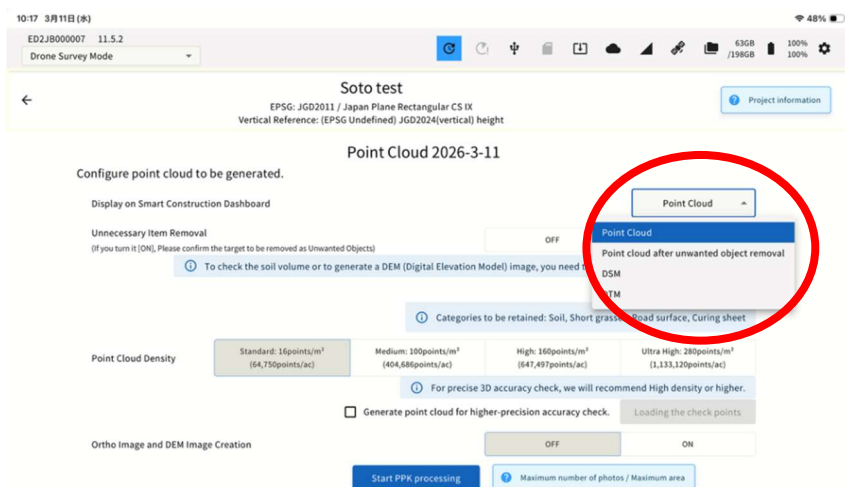
1. In the settings screen, when “Select which output you want to display on Smart Construction Dashboard in the point cloud settings screen” is set to ON, you can select the “priority registration Target.” If it is set to OFF, it will not be displayed.



↓ When the setting is turned **ON**, you can select the data to be prioritized for registration from the following four options:

- Point Cloud
- Point Cloud (Object Removed)
- DSM
- DTM

Separate from these four options, orthophoto registration and upload will be performed automatically once the orthophoto is generated.



Specification

Items		Specification	Remarks
Temperature Range	Operating	-20°C~50°C	
	Charging	0°C~45°C	
	Storage	-20°C~50°C	
Input voltage		19.5V DC	
Power consumption	Standard	13.3W	When broadcasting RTK correction data via LTE modem
	Maximum	87.5W	When generating a point cloud while charging the batteries.
Electrostatic resistance		±8kV	
Operating hours		Approx. 12 hours	When broadcasting RTK correction data via LTE modem
Charging hours		Approx. 5 hours	Charging with EdgeBox and attached power cable.
Dust-/Water-proof performance*		IP65 or equivalent	Tested by a third party

⚠ CAUTION

* Smart Construction Edge has a certain dust- / water-proof performance, but was not applicable for full submergence, high-pressure cleaning, some liquid, such as, detergent, seawater, beverages, and so on. And Power cable including AC adapter are not water-proofed.]

Hardware specification

Items		Specification	Remarks
External dimensions	Width x depth x height	300 x 300 x 150 [mm]	
Body weight	Including battery	Approx 4.0 kg	
	Excluding battery	Approx 2.7 kg	
Total weight	Including carry case and accessories	Approx 8.3kg	
Housing material	Top cover	AES	
	Main frame	Magnesium die casting	
	Bottom case	Magnesium die casting	
External I/F	USB connector	USB3.1 x1	
		USB2.0 x1	Waterproof connector
	SD card slot	UHS- I SDR104	Standard size
	SIM card slot	Nano SIM	
	LAN port		
SoM	Jetson Xavier NX		
	GPU	384 コア NVIDIA Volta, 48 Tensor core	
	CPU	6 コア NVIDIA Carmel ARM v8.2 64bit,6MB L2+4MB L3	
	RAM	16GB 128bit LPDDR4x 59.7GB/Sec	
	EMMC	16GB	
Storage	SSD	256GB	
Network	Wired LAN	10/100/1000 BASE-T	
	Wireless LAN	2.4GHz 802.11b/g/n	
	LTE	LTE-FDD : B1/B2/B3/B4/B5/B7/B8/B12/B13/ B18/B19/B20/B25/B26/B28 LTE-TDD : B38/B39/B40/B41 WCDMA : B1/B2/B4/B5/B6/B8/B19 GSM : 850/900/1800/1900	Overseas SIM free
GNSS	GPS	L1C/A, L2C	
	QZSS	L1C/A, L2C	
	GLONASS	L1OF, L20F	
	Galileo	E1B/C, E5b	
	BeiDou	B1I, B2I	