Smart Construction Edge 2 User Manual

Product name：Edge computer for construction worksite

Model Name : SC Edge2

Model No.: SCED-2Gx (1,2)

Firmware Version: **v6.9.2**

Update date 2024/08/22.

How to use EdgeBox

Document Ver.1.0.3

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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 require 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, Mintato-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 an ignition or an injury.

⚠ WARNING

Always wear a hard hat during the work.

If you dropped 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 hot place (beside the fire, heater, inside a vehicle with a high temperature) with the battery in it.

The batteries may damage and resulting 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 get wet, it may cause a short circuit and resulting an ignition or an injury.

⚠ WARNING

When using the product in rain, please make sure that all doors including the covers of ports, battery rid, water-proof USB cap is securely installed.

If any rain comes inside, it may cause a short circuit and resulting 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 resulting an ignition or an electrical shock.

⚠ WARNING

DO NOT put any foreign objects to the SD card slot, the SIM card slot, the USB slot or the ethernet port.

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

⚠ WARNING

Wearers of a pacemaker or a defibrillator should not approach to the product.

Its electric wave may have a negative effect to its operation.

⚠ CAUTION

The main unit should place a stable, flat place.

If it was placed at unstable place, it may be dropped and cause a damagre 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 to 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 a cloth while charging.

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

NOTICE

If the main unit interferes with 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 hot place (beside the fire, heater, inside a vehicle with a high temperature) with the battery in the product.
The batteries may damage and resulting 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 a heat generation, an explosion, or an ignition.

⚠ WARNING

DO NOT let the battery get wet.
Wetting with 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 an 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 resulting 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 other power cable 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. In particular, when winding the cord around the AC adapter, wind it loosely rather than tightly wrap 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

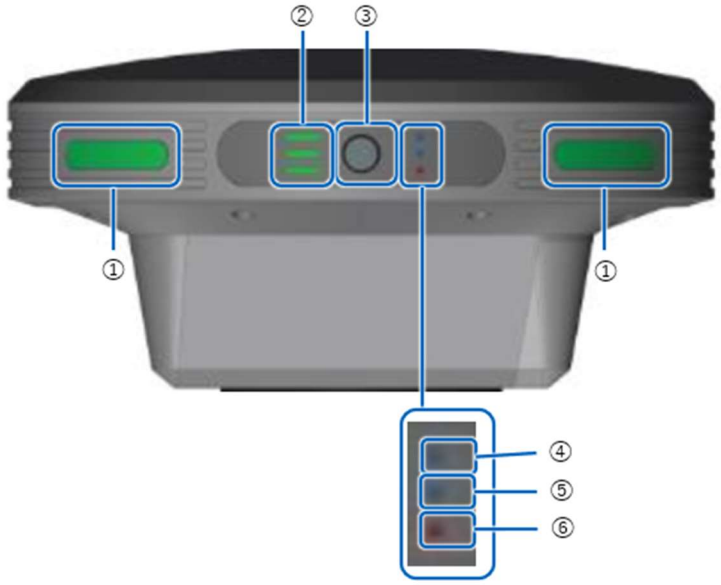
Make sure the SD card is oriented and insert it straight.
If you force it, it may damage the SD card or this product. Also, if you accidentally insert it and cannot take it out, please contact your Komatsu distributer. If you insert tweezers and try to forcibly remove them, there is a risk of a short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

BEFORE USING

Name of each part

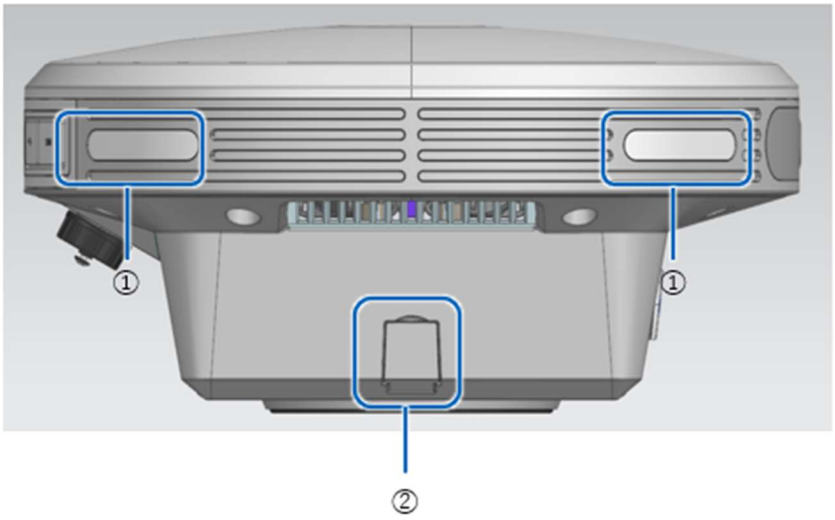
EDGEBOX BODY PART NAME

front of the body



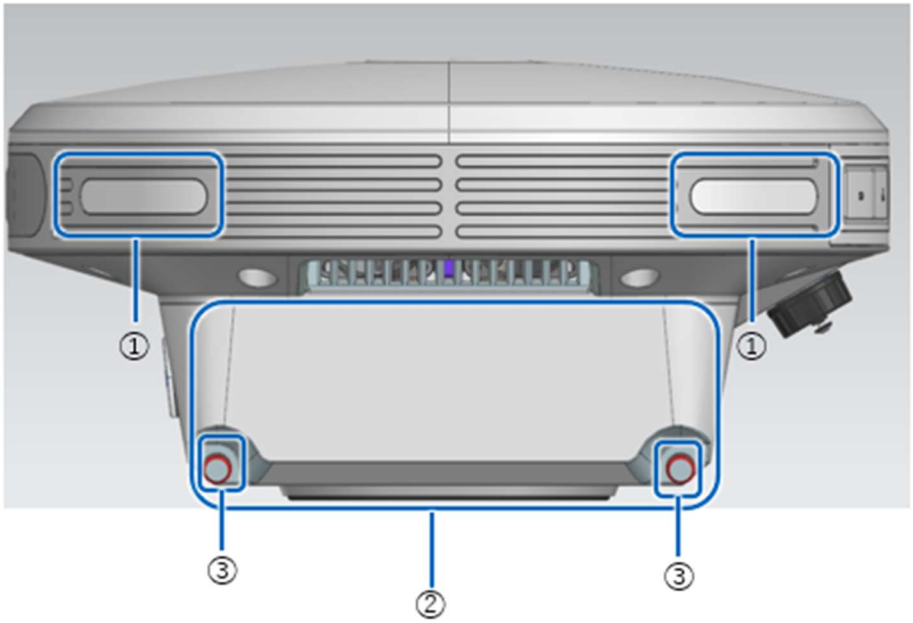
① Status LED
② battery indicator
③ power button
④ GNSS Receive Status LED
⑤ PPK Logging Status LED
⑥ Error/Sub-microcomputer Update LED

Body Right Side



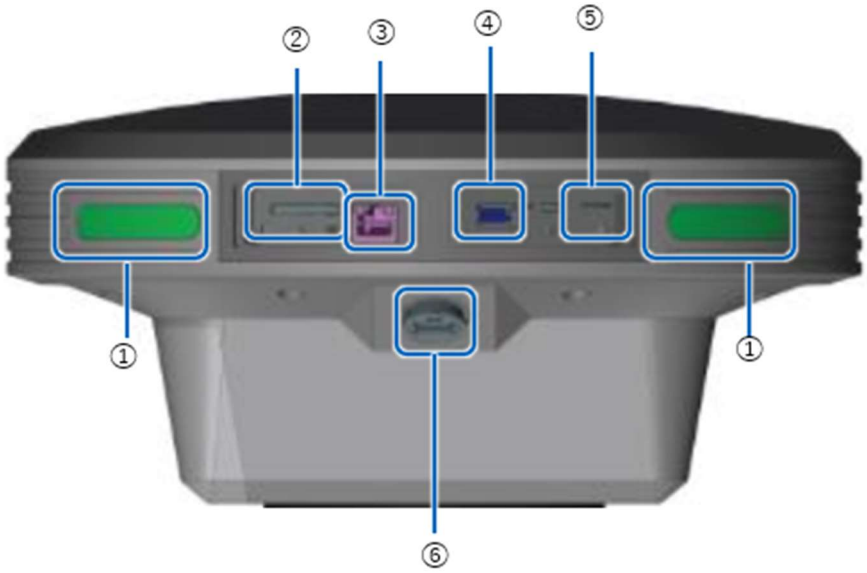
① Status LED
② AC Adapter Inlet

Body Left Side



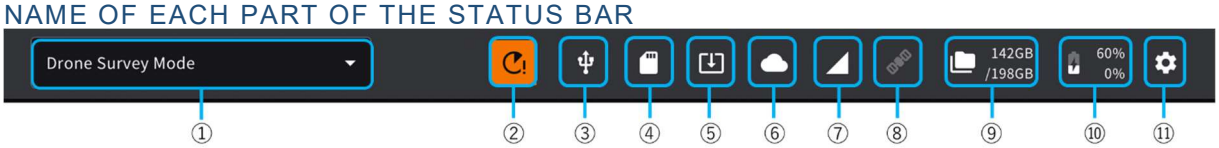
① Status LED
② Battery Inlet (Inside Lid)
③ battery lid screw

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.

⑪ Settings icon

Tap to open the Settings dialog.

Tips

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

System Configuration :

Main unit :

iPad :

」

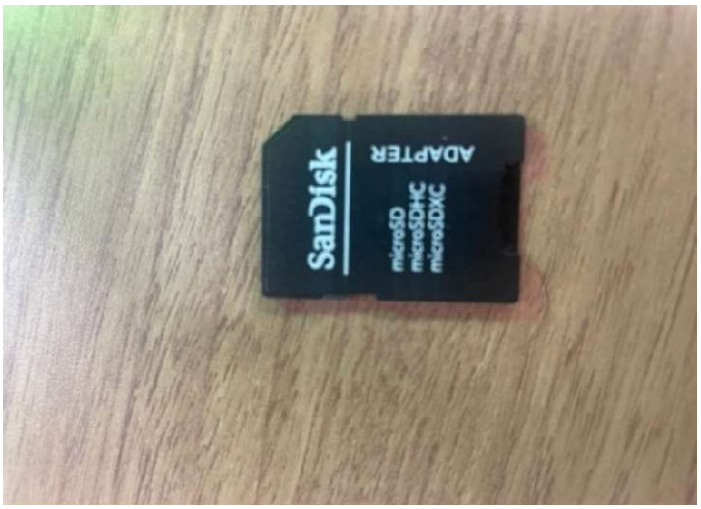
Batteries :
2 for each set

AC adopter and Power cable :

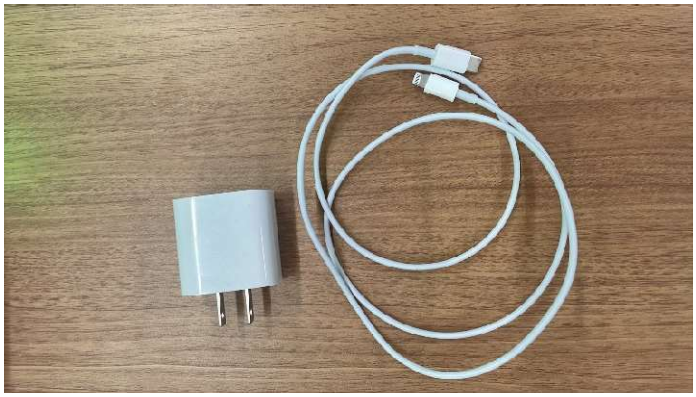
Water-proof USB-Serial conversion cable :

Serial Female-Female cable :

SD card adaptor :



iPad Charger :

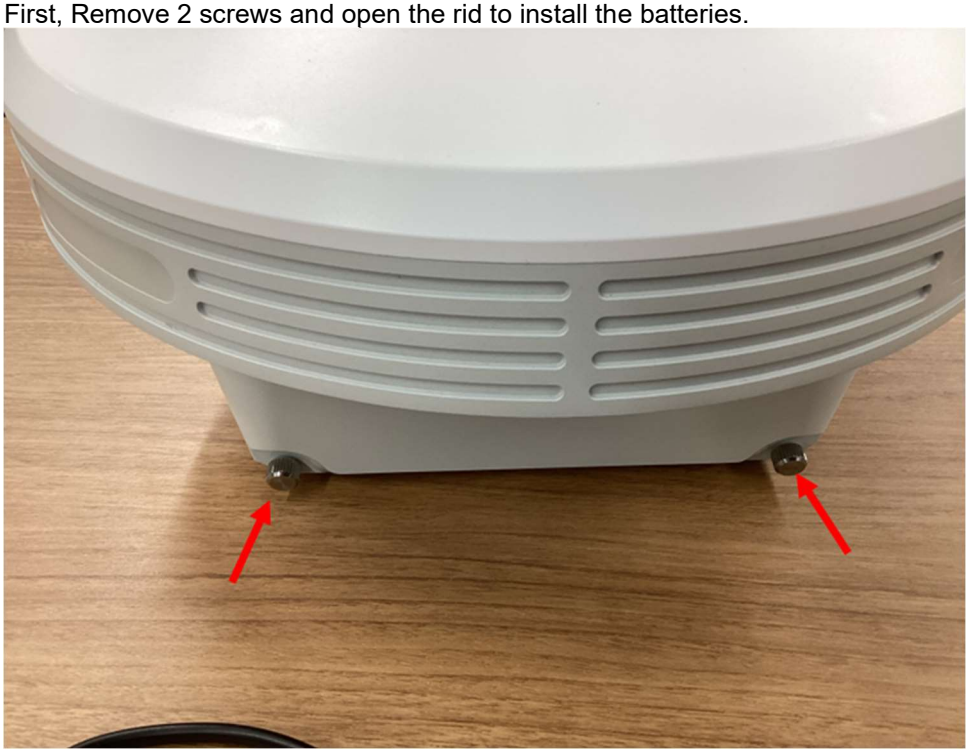


USB Extender :

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 rid to install the batteries.

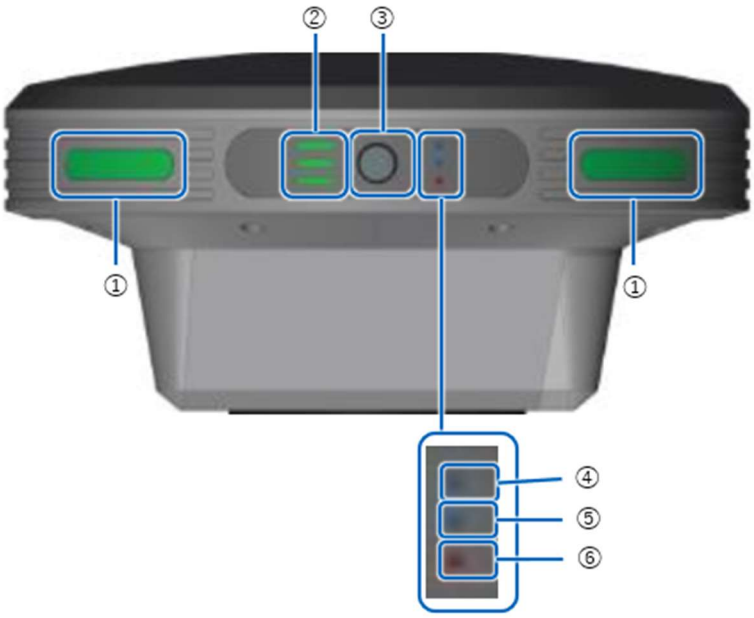


2. Slide the batteries into the slot.

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

Turn on EdgeBox

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 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)

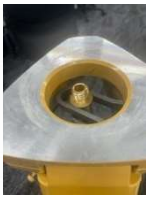
Verify that the Status LED turns green and connect the tablet (iPad as a default option) to the EdgeBox via Wi-Fi.

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 pas rd (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

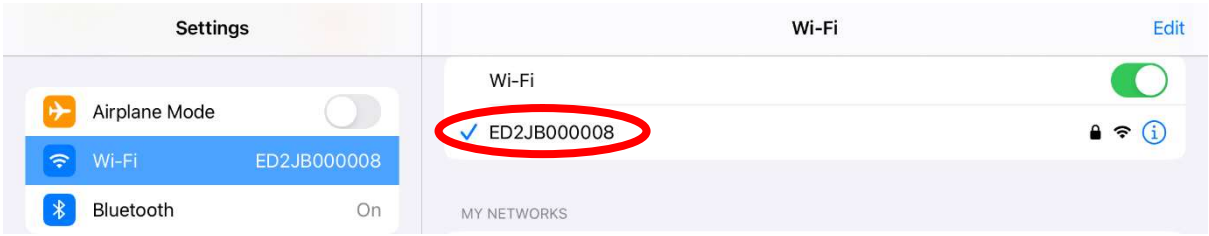
1. Prepare tripod with 5/8 in. screw on the top. Top of the tripod must be flat.

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.

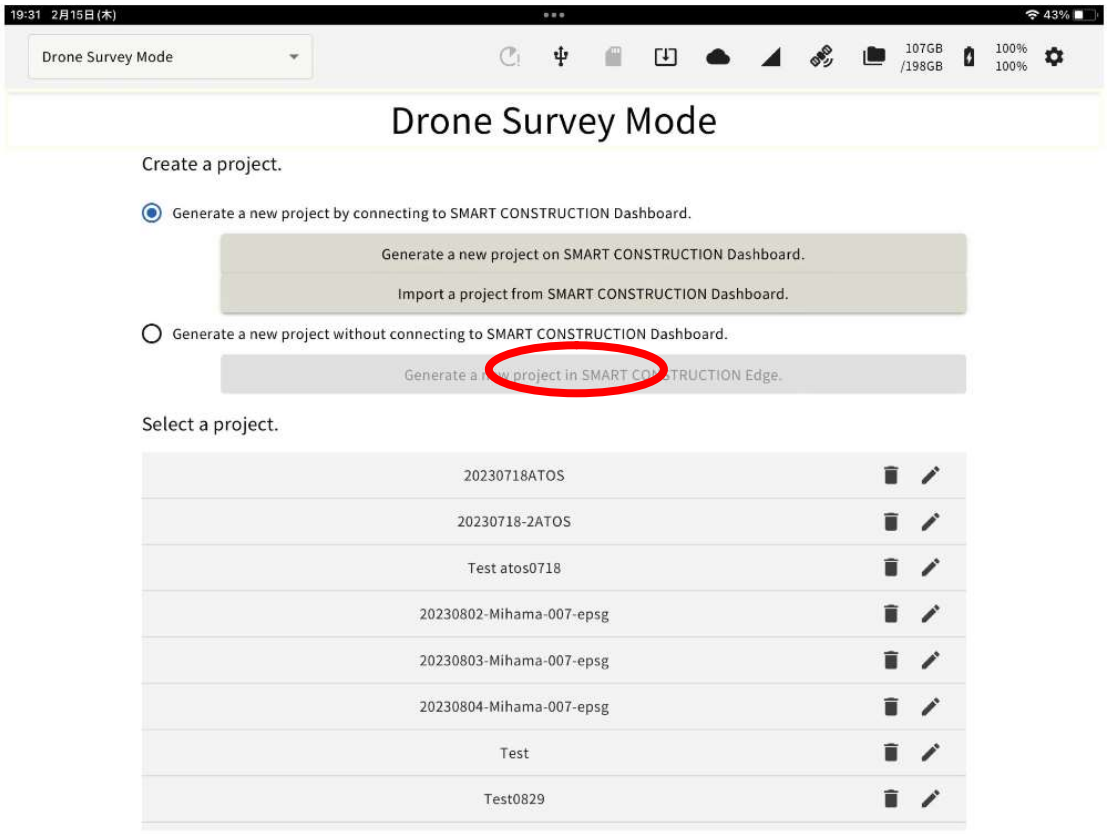


4. If your tablet's Wi-Fi auto-connect destination is set to the EdgeBox, it will automatically connect to the unit.
5. Launch the tablet app.
   Tap the tablet app icon that you added to your home screen to launch it.

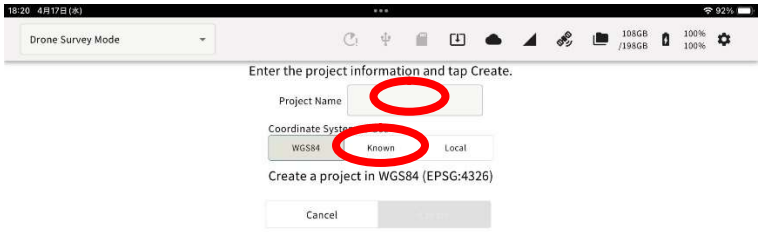
Create a project

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 will show the candidates.
   If you are not going to use Geoid Hight, To select WGS 84, tap the (WGS84) icon.
4. Tap “Create”.

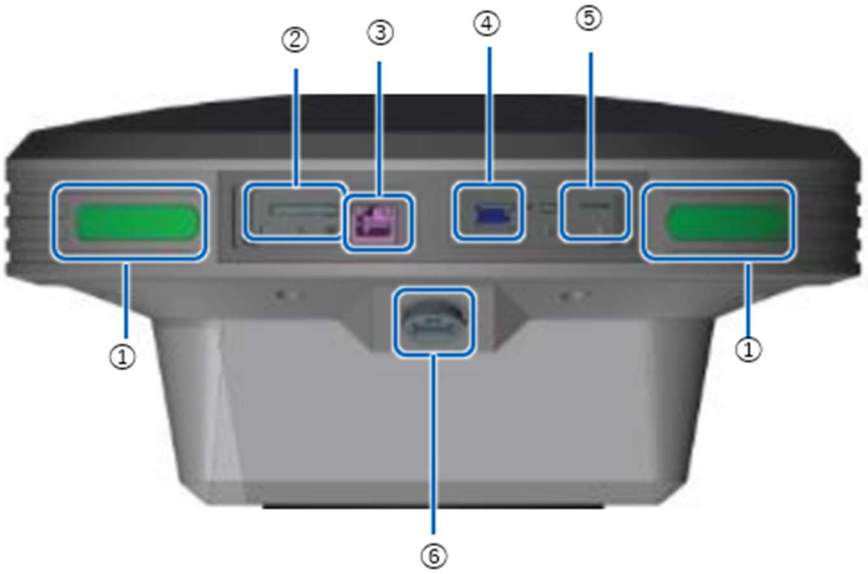
CREATE IN LOCAL COORDINATE SYSTEM (USING LOCALIZATION FILE)

If you have a localization file from a rover, you can also create a project using the localization file.

Localization file should be in CSV format and saved in the root directly of the USB memory.

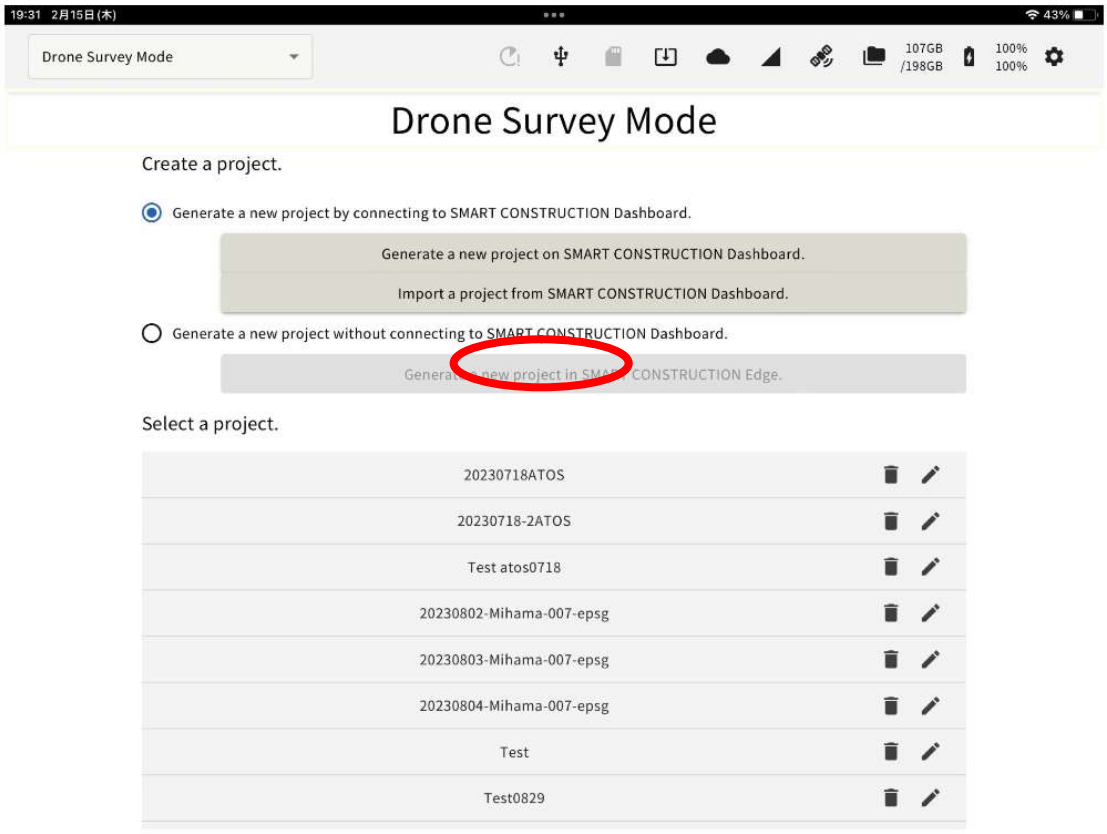
For more information on the format of localization files, see P.21.

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

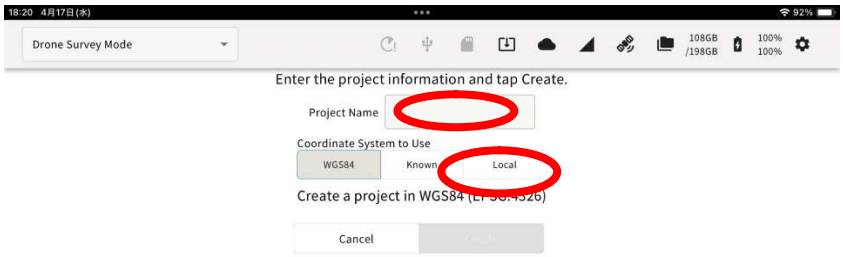


① Status LED
② SD card slot
③ Ether cable port
④ USB slot（USB3.0）
⑤ SIM card slot
⑥ Water-proof USB slot（USB2.0）: cannot use this slot for USB memory

2. Tap “Create a new project”



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

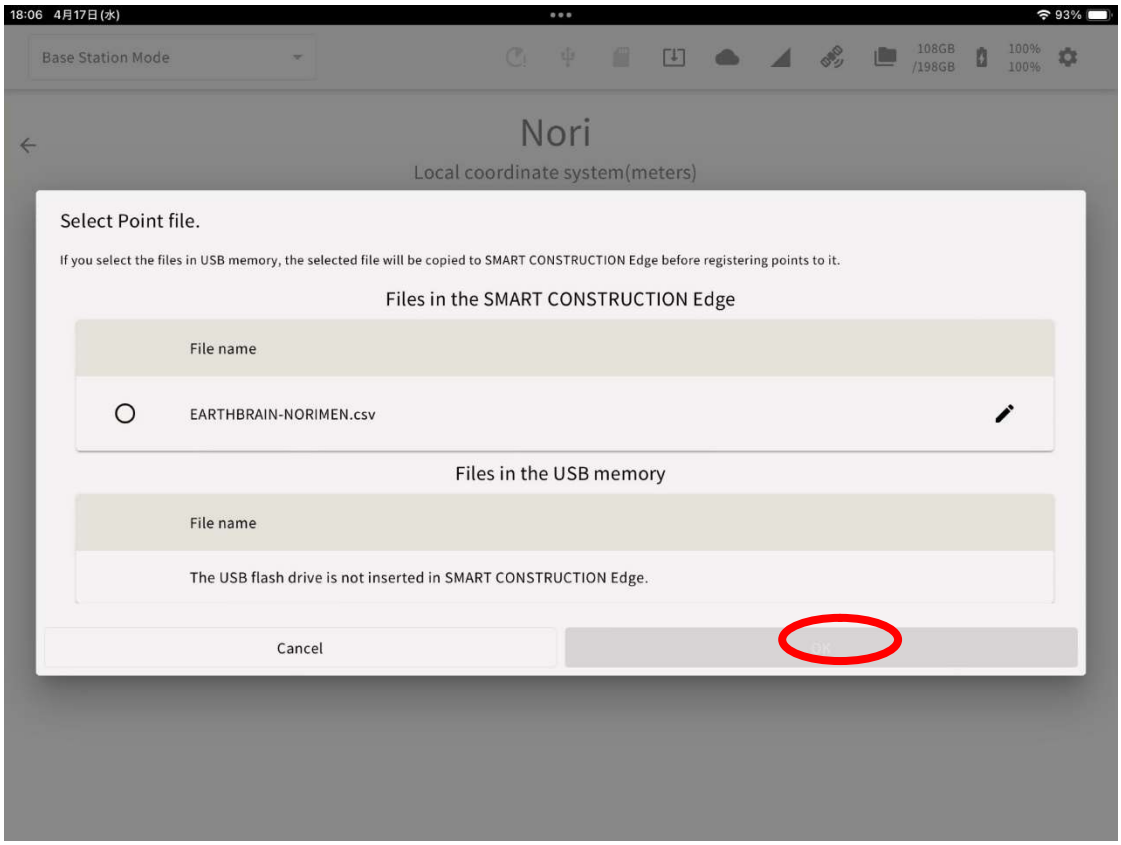


4. Tap “Import Localization File” to specify the file for localization.

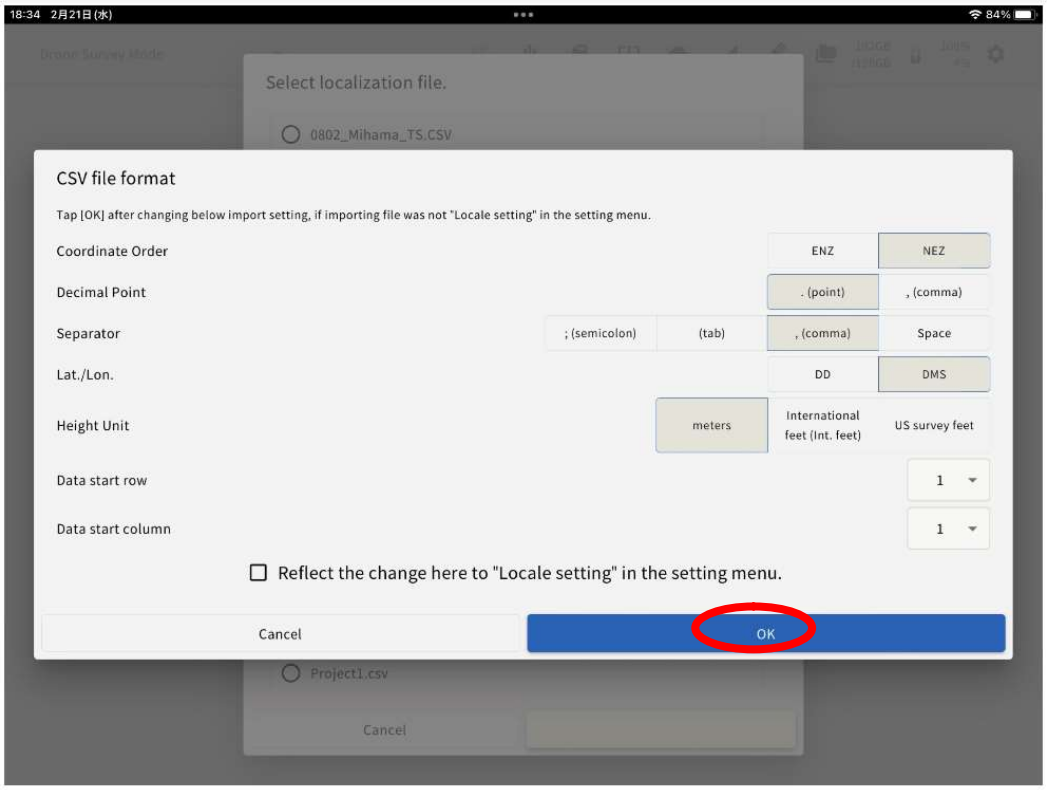
5. Files are saved once loaded to the edge and

Files can be selected from USB or from within the Edge's memory.

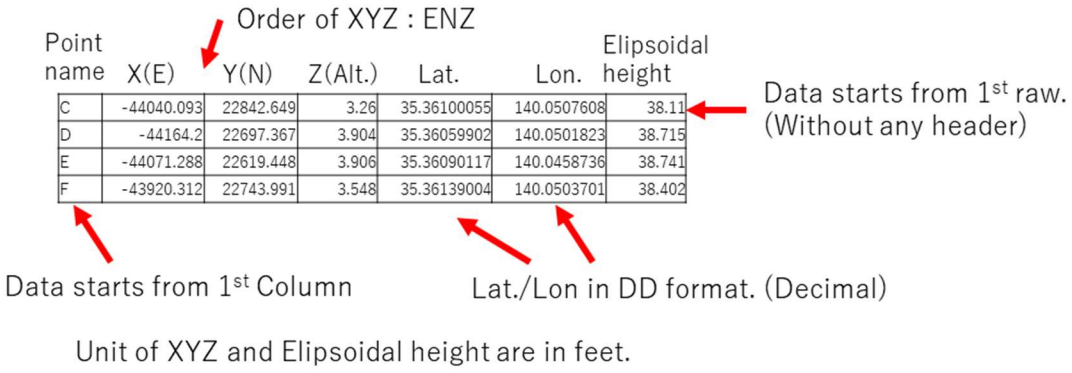
Tap ‘’OK’’ after selecting a file.



5. Please prepare the localization file in advance. Set the file format parameter according to the file and tap “OK”.

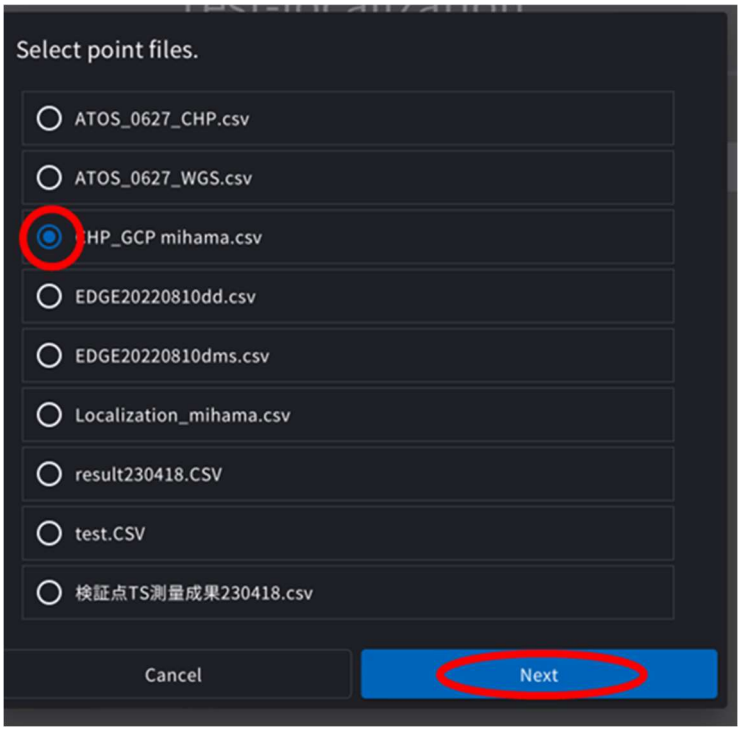


Example of the format above

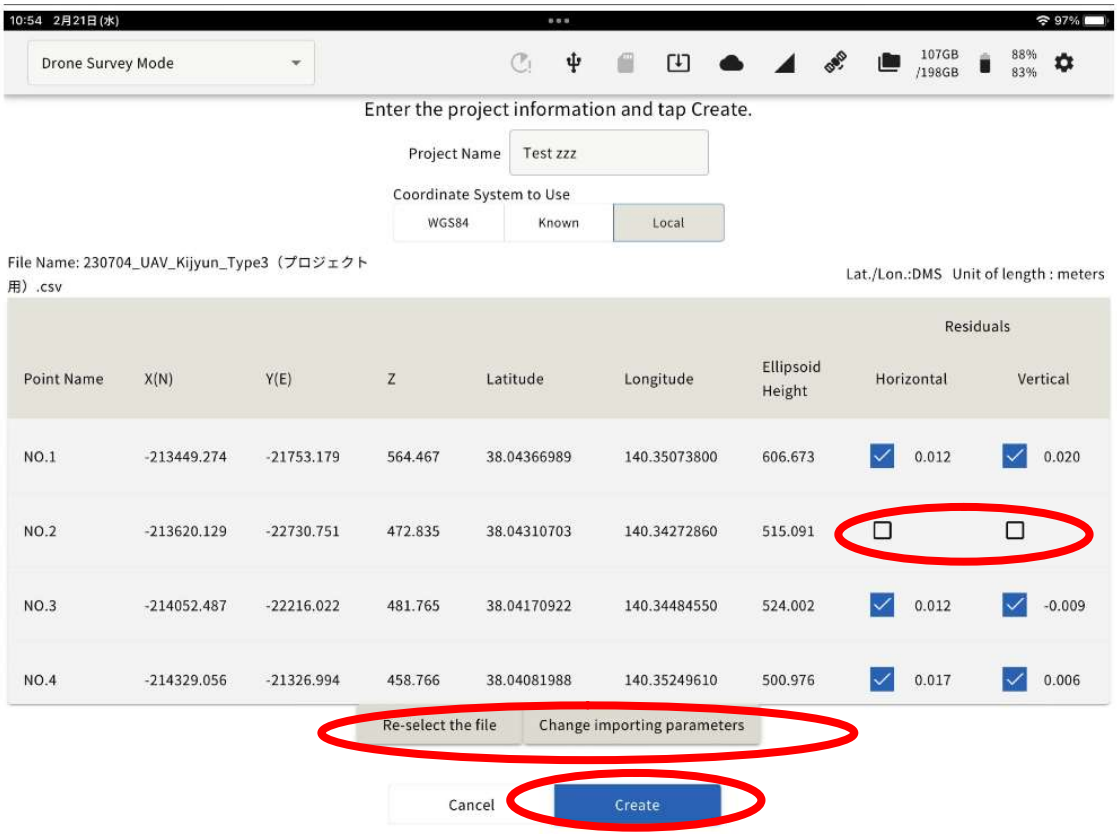


Unit of XYZ and Elipsoidal height are in feet.

6. Select the file and tap “Next”.



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

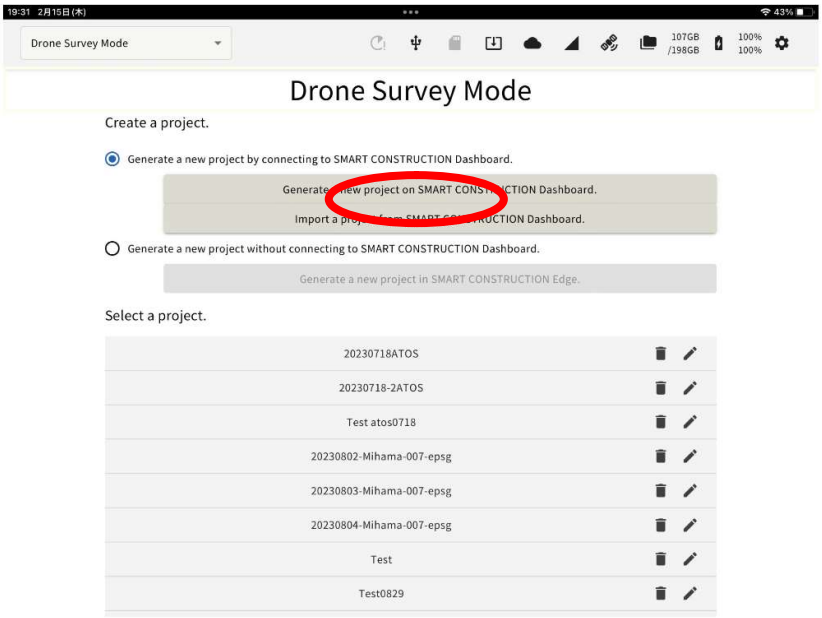


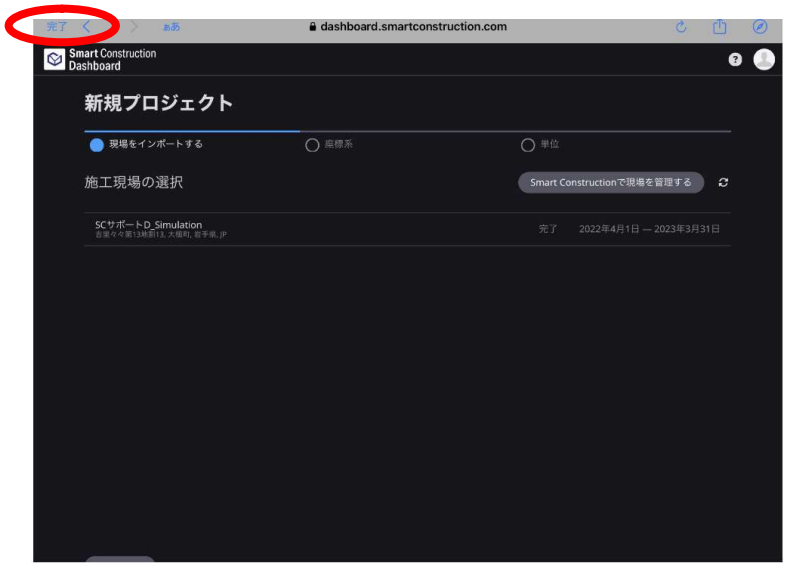
CREATE A NEW PROJECT BY CONNECTING TO SMART CONSTRUCTION

1. (Generate a new project by connecting to SMART CONSTRUCTION Dashboard) Tap to go to the Dashboard screen and can create new site it from the EDGE2 app.

After creating the site, tap the completion icon in the upper left.

*Localization files for GC3 and TP3 should be placed directly under the IPAD folder.

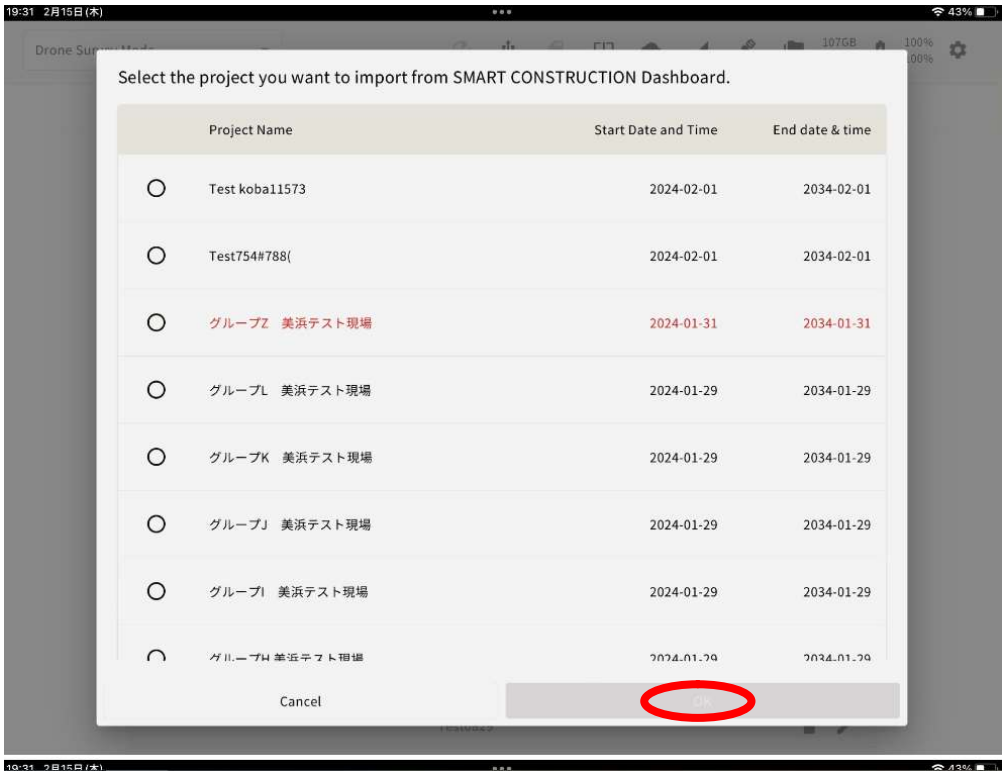




2. (Import a project from SMART CONSTRUCTION Dashboard)

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

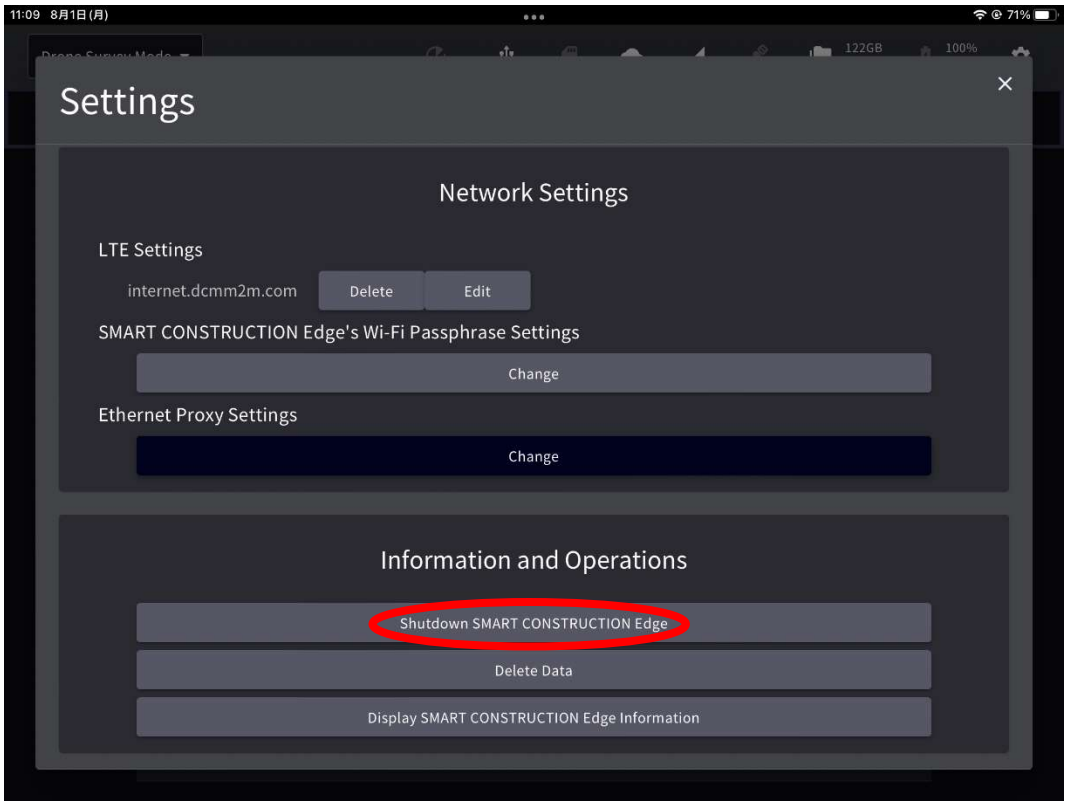
By tapping any site and pressing OK, you can create a project using the same coordinate code as Dashboard.

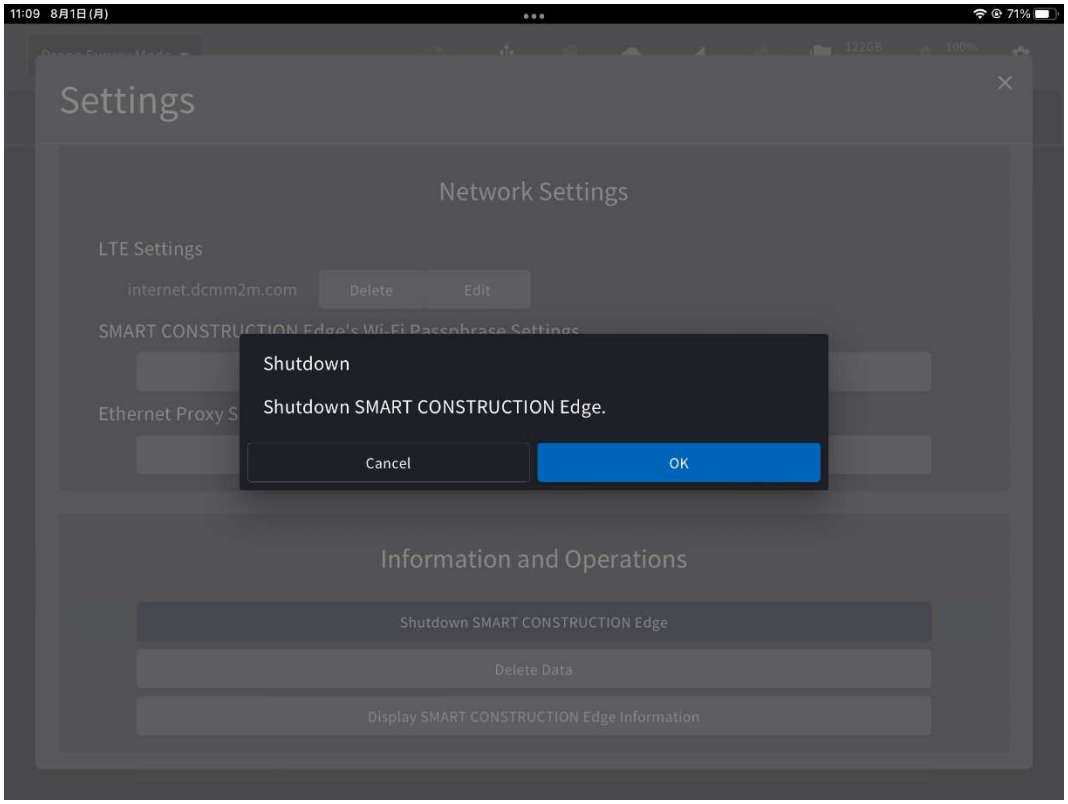


Turn Power Off

> ⚠ 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 resulting 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 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

Shut 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 the EdgeBox location using Network RTK, you must configure APN settings and Network RTK account settings.

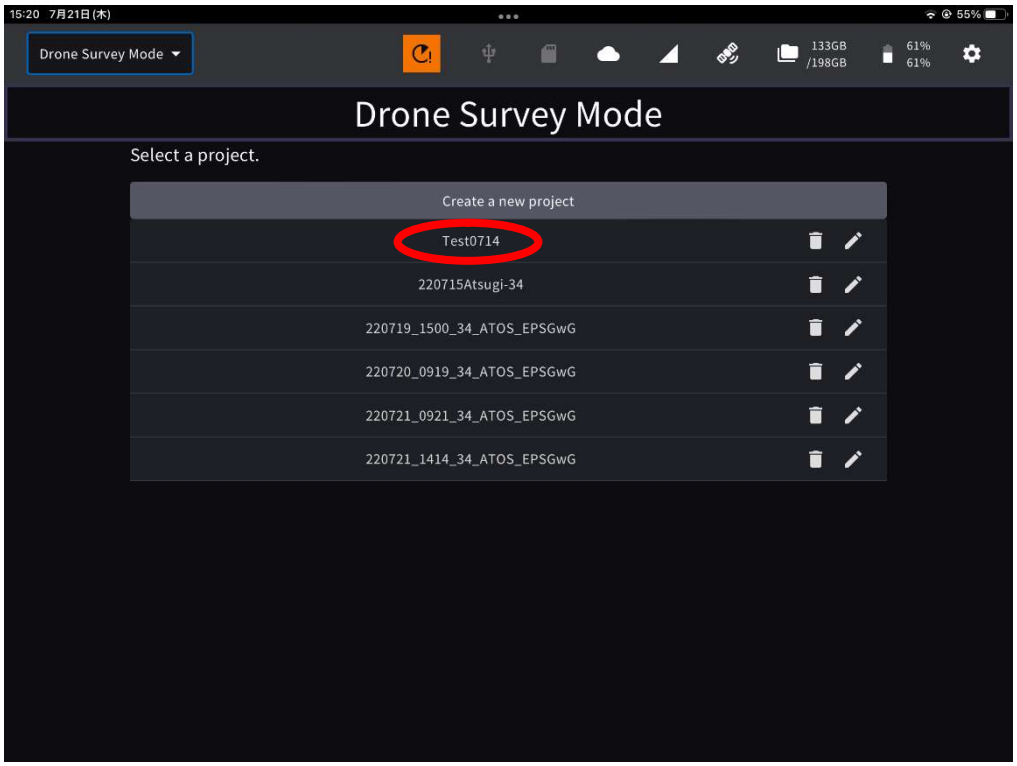
For details, please refer below.

> 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.

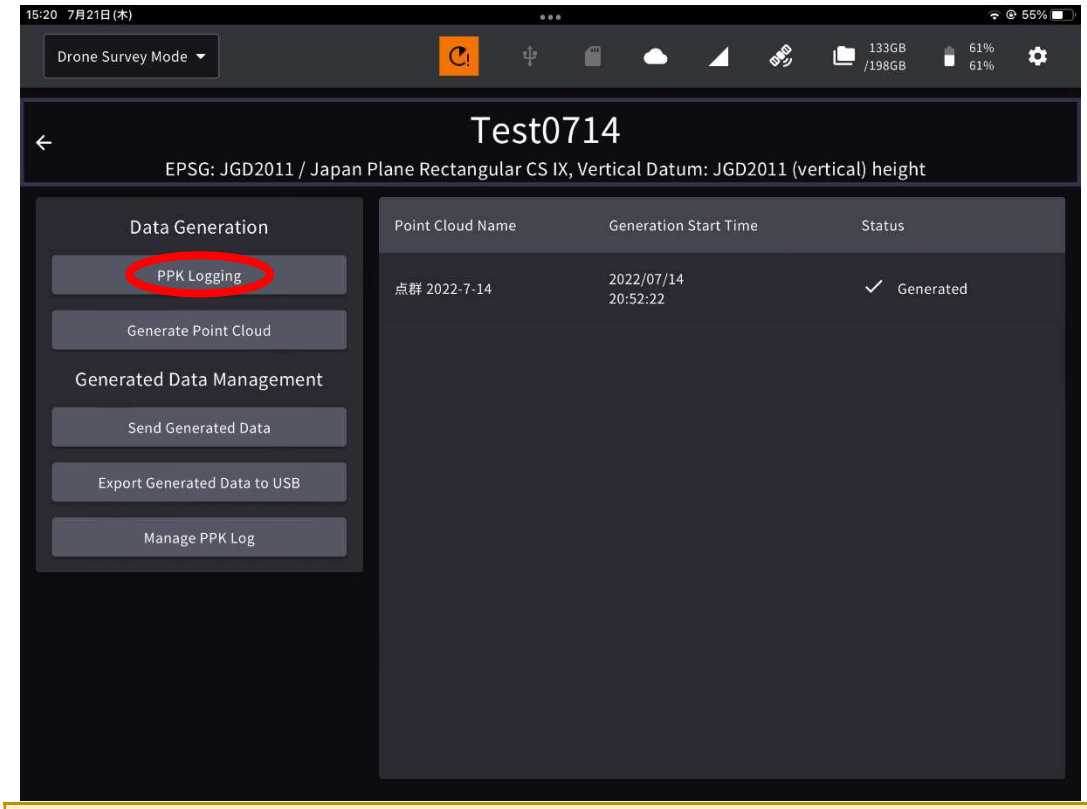
> ⚠ CAUTION
> The main unit should place a stable, flat place.
> If it was placed at unstable place, it may be dropped and cause a damagre or a breakage.

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. For details, please see from P.18.



3. Tap “PPK Loggin”

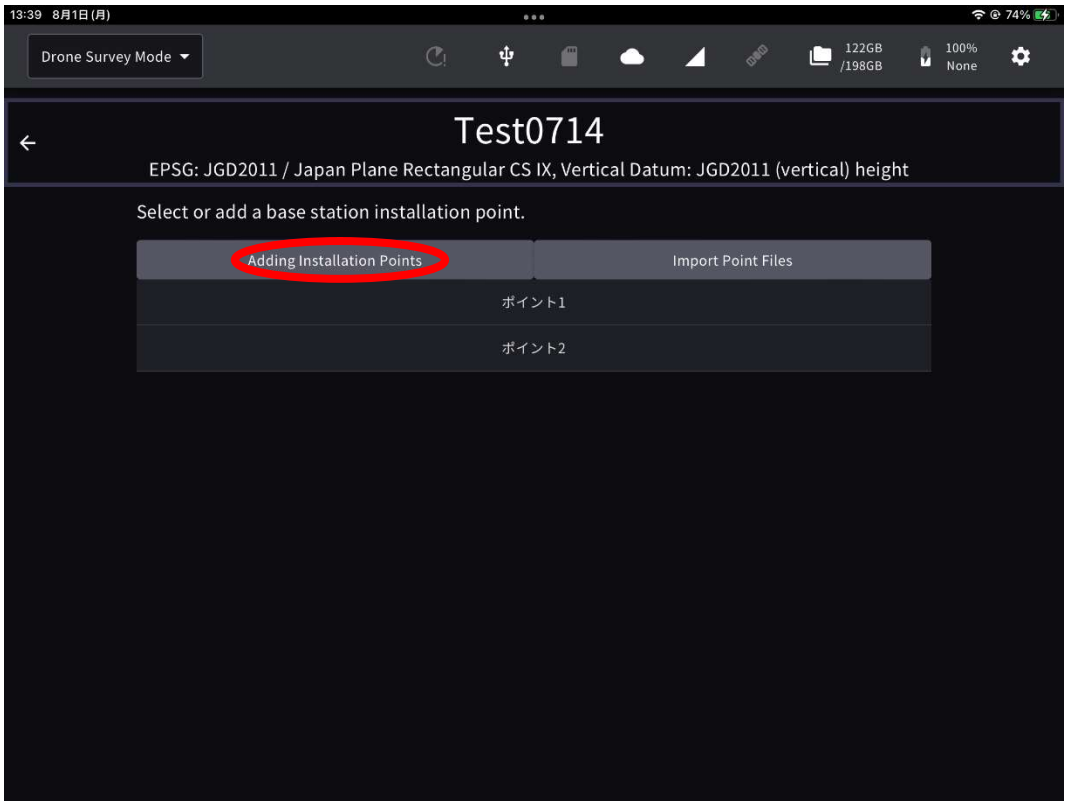
The points you have previously set up or have used for localization will appear as a point list.



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.)

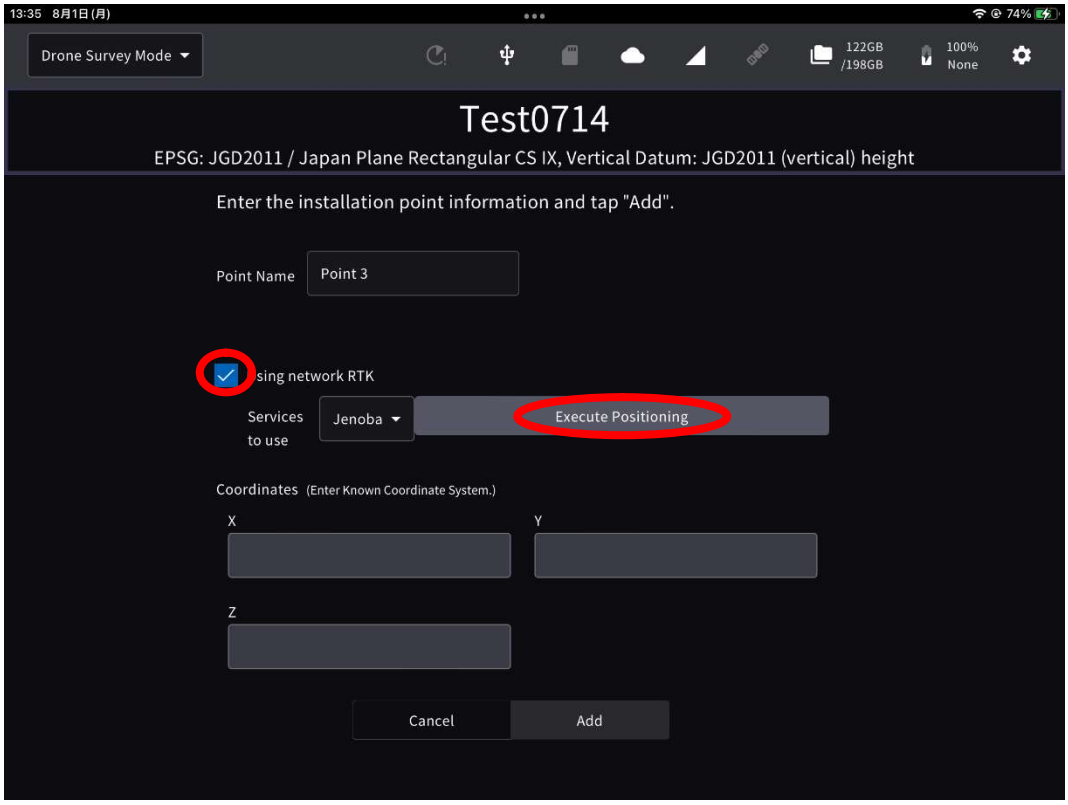
4. Tap “Adding Installation Points” or you can import with a CSV file (Go to next chapter.)



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.



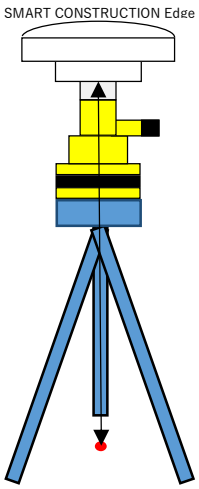
8. Confirm that coordinates are entered in the coordinates field, then tap "Add"
9.

IMPORT FROM A CSV FILE

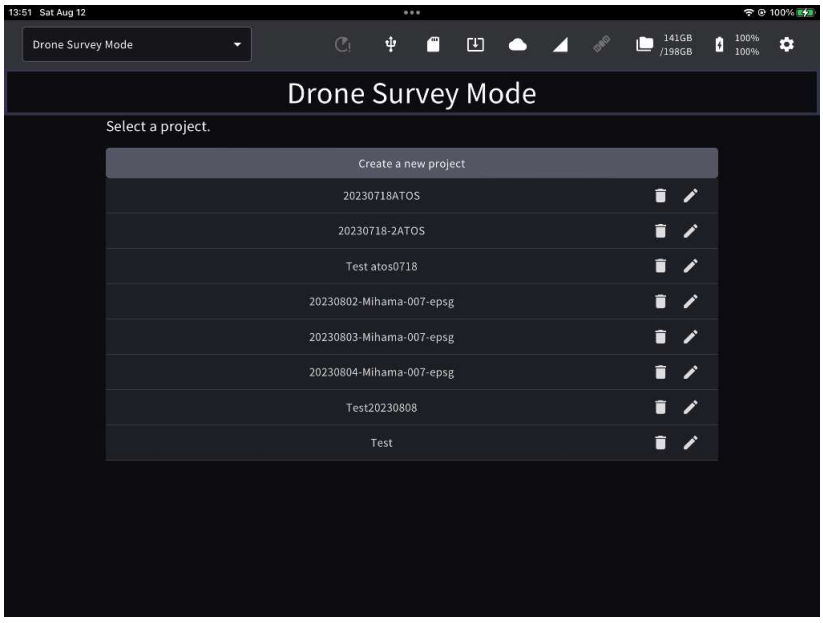
1. Align the Edge Box horizontally above the surveyed base point using the levelling device on the top of the tripod.

> **⚠ WARNING**
> Always wear a hard hat during the work.
> If you dropped 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”

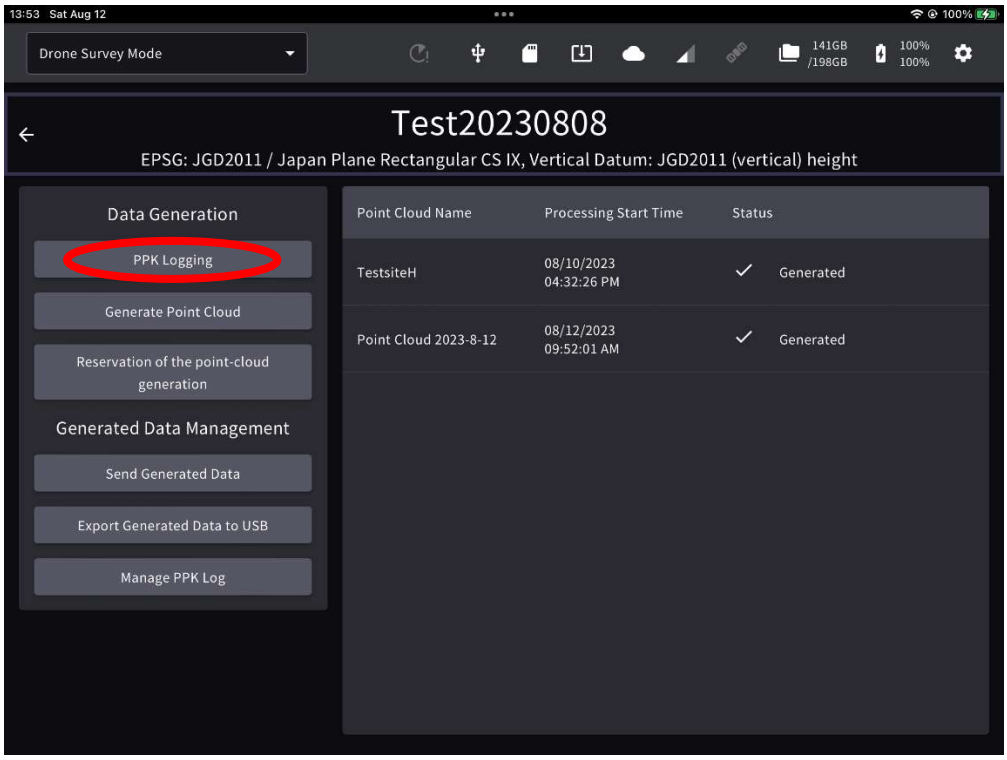


4. Launch the tablet app and select a project of the work site to survey.
   If the project is not listed, create a new project. For details, please see p.18



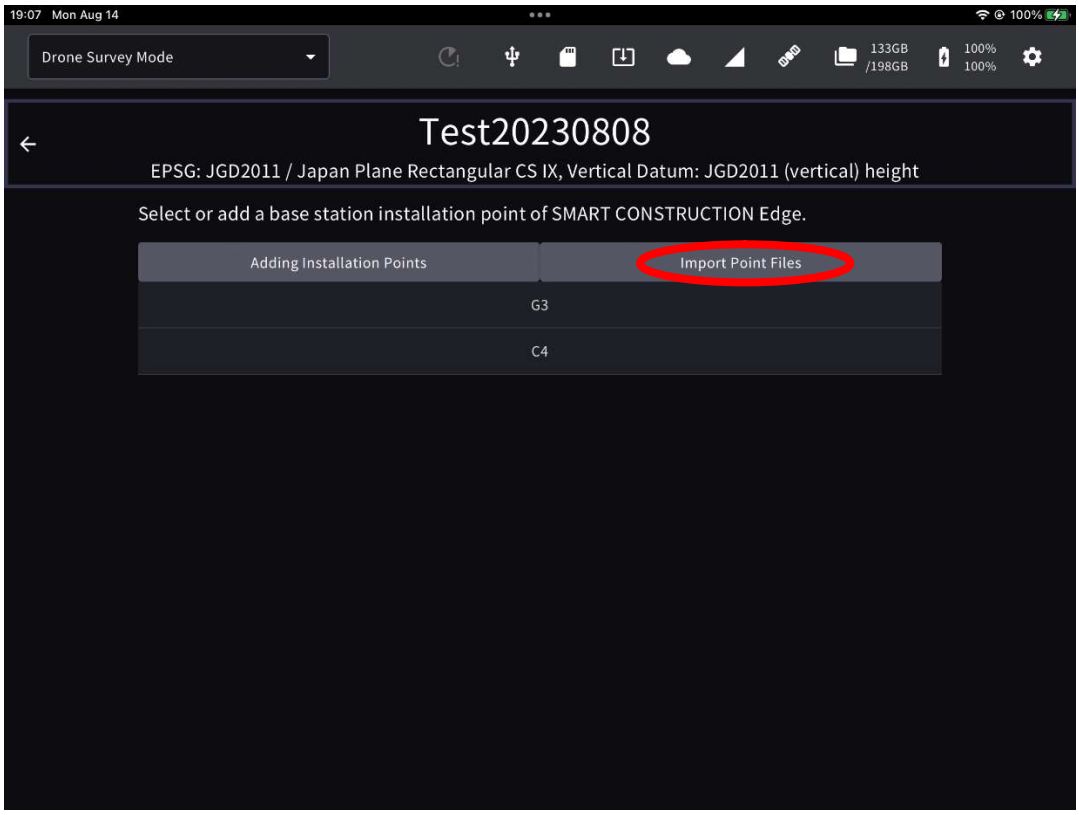
.

5. Tap “PPK Logging”



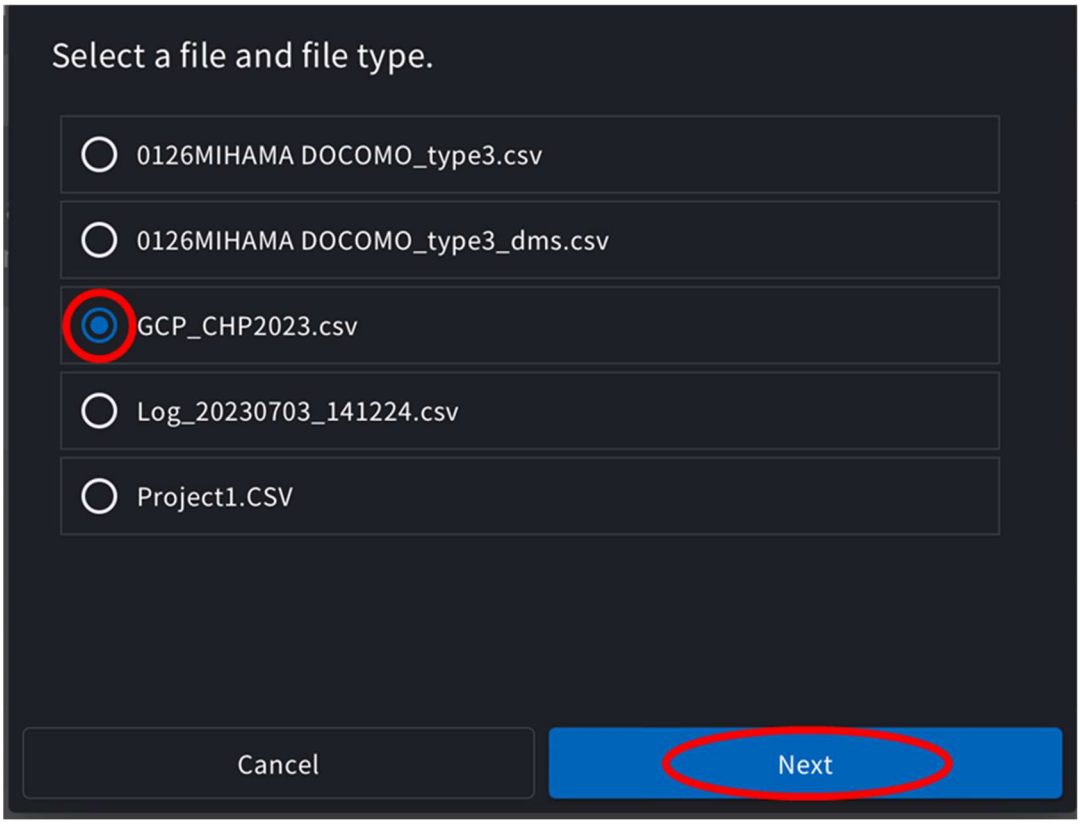
The points you have previously set up or have used for localization will appear as a point list.

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

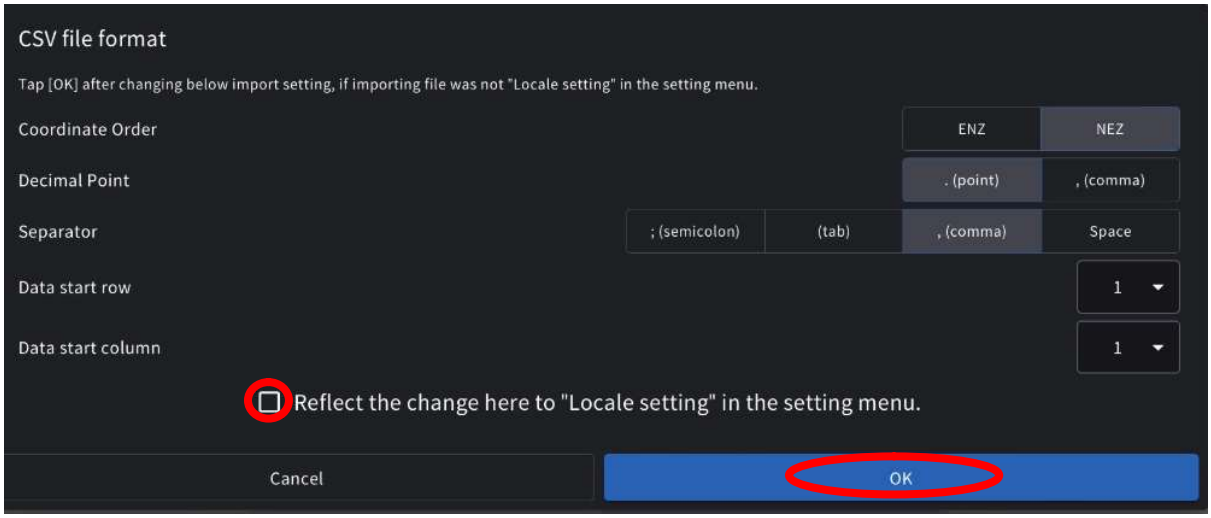


Please prepare the point file in advance.

Select the control point file

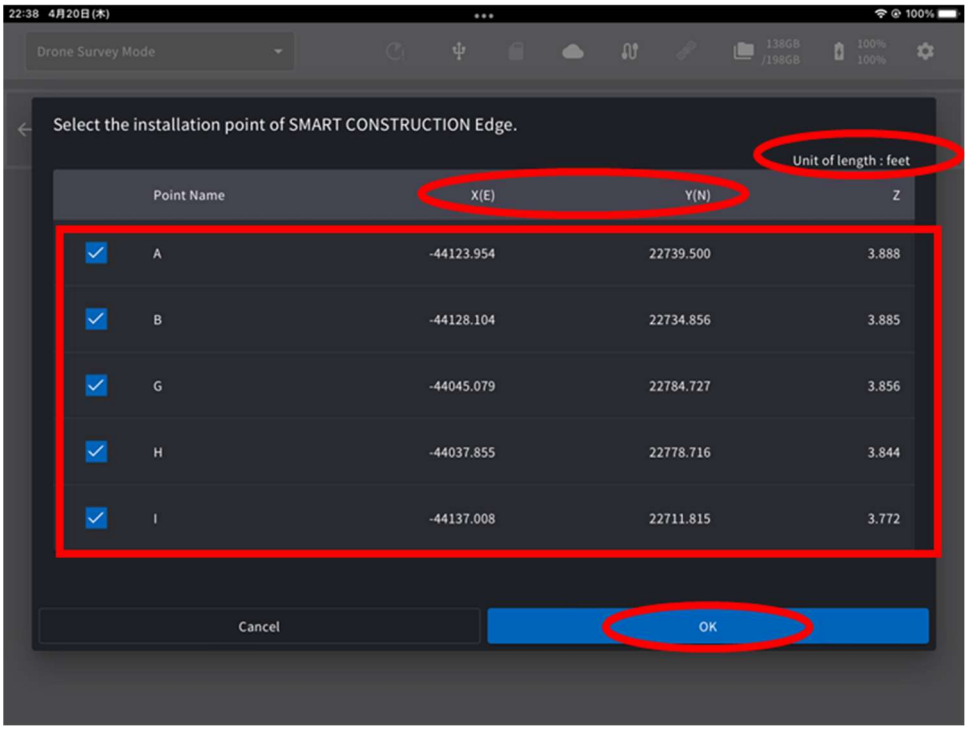


Set the file format parameter according to the file and tap “OK”.



If you tap ”Reflect the change here ti ”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”.

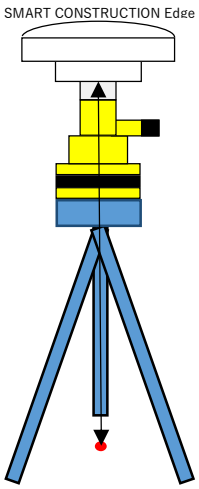


INPUT MANUALLY

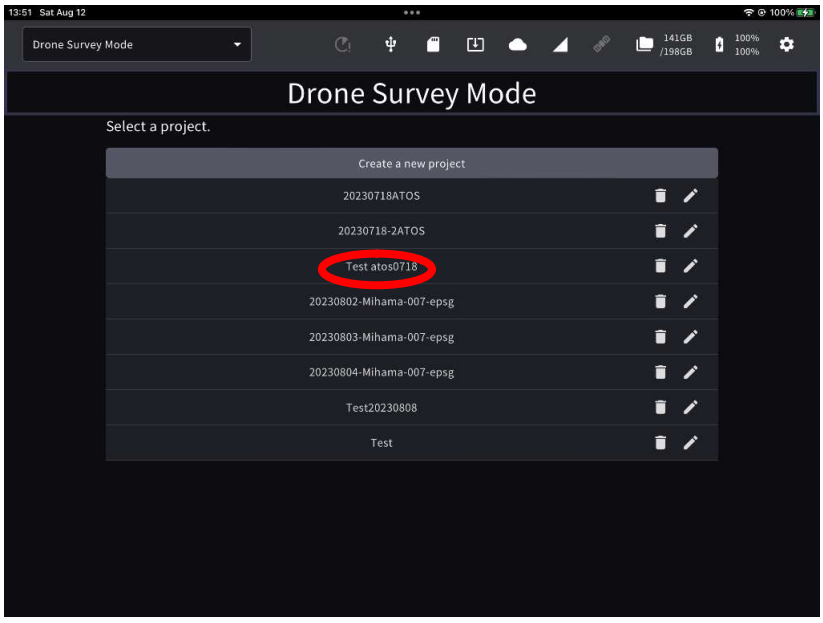
1. Align the Edge Box horizontally above the surveyed base point using the levelling device on the top of the tripod.

> **⚠ WARNING**
> Always wear a hard hat during the work.
> If you dropped 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”

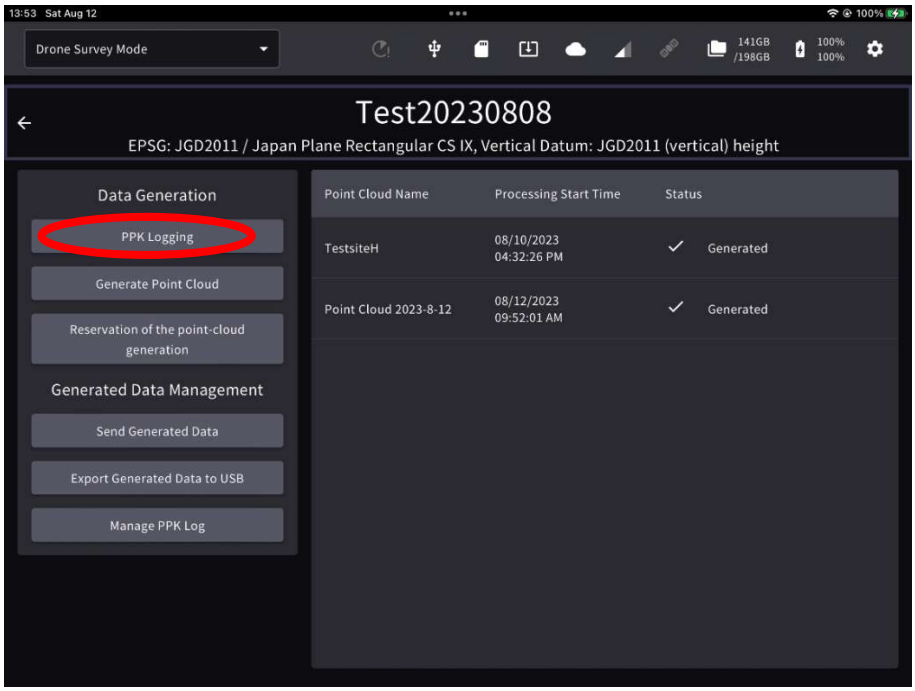


4. Launch the tablet app and select a project of the work site to survey.
If the project is not listed, create a new project. For details, please see p.18



.

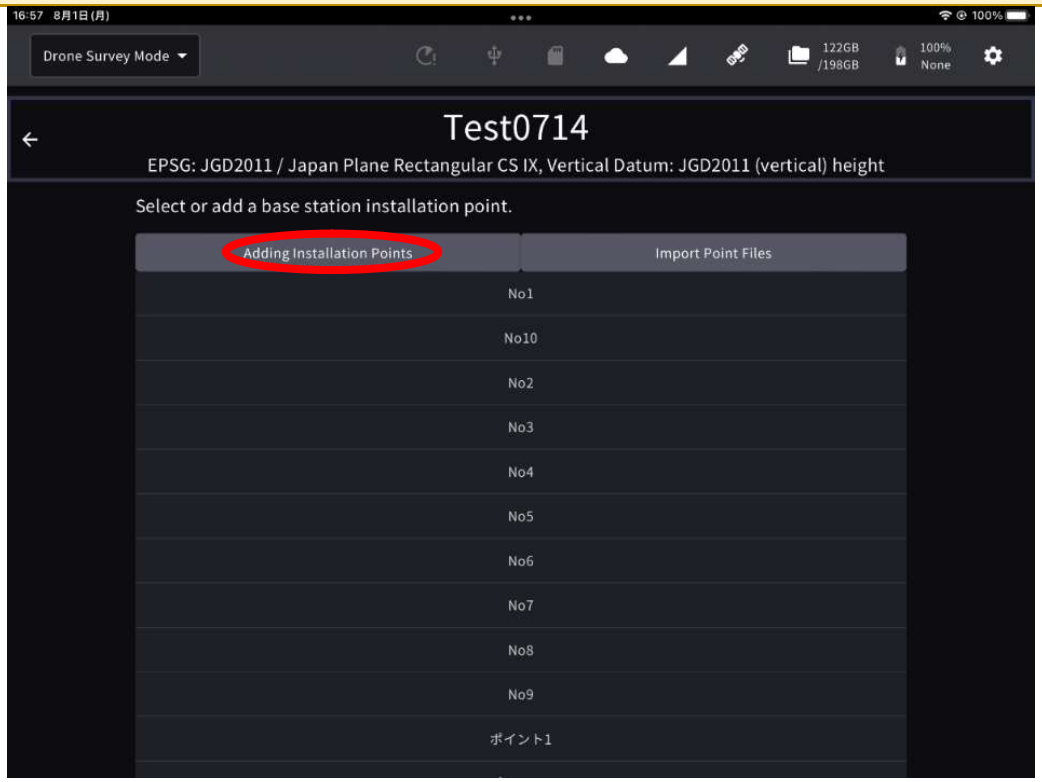
5. Tap “PPK Logging”



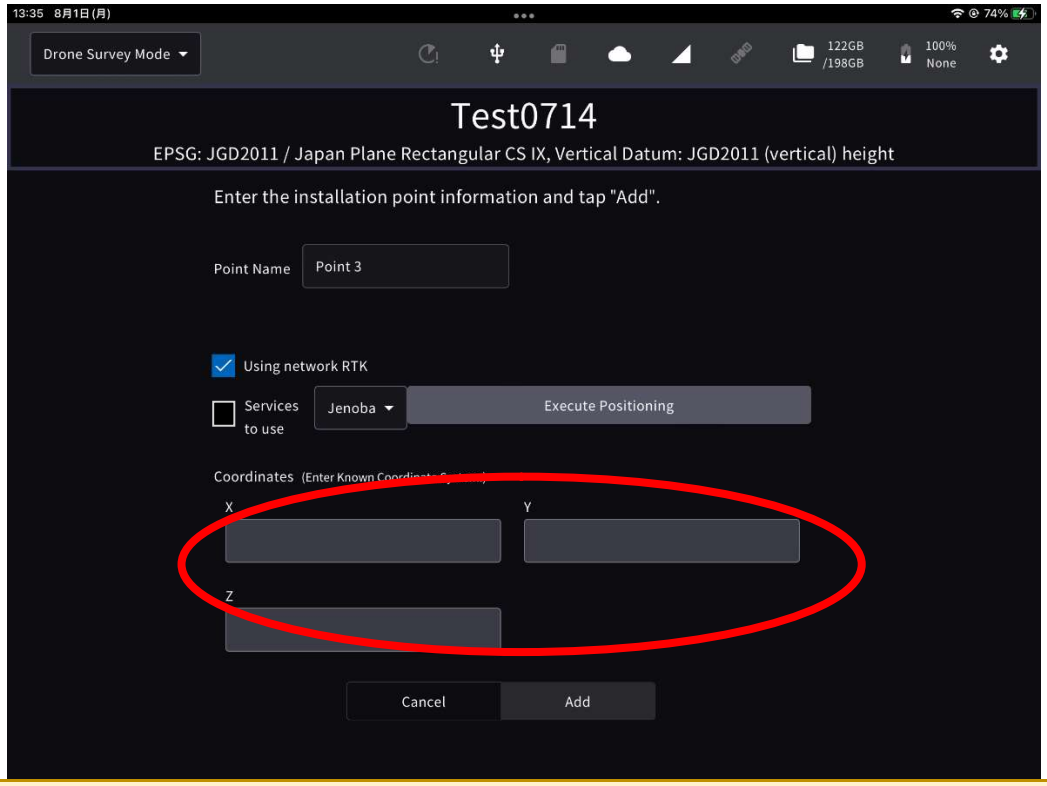
6. Tap “Adding Installation Points”.

   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 point 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”.

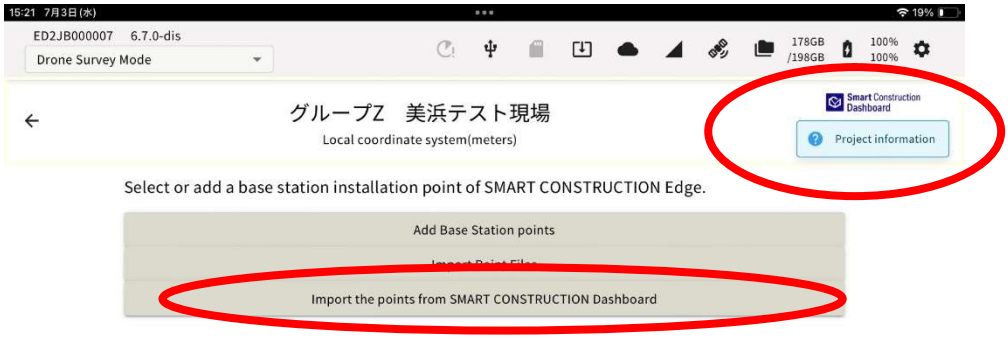


Tips

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

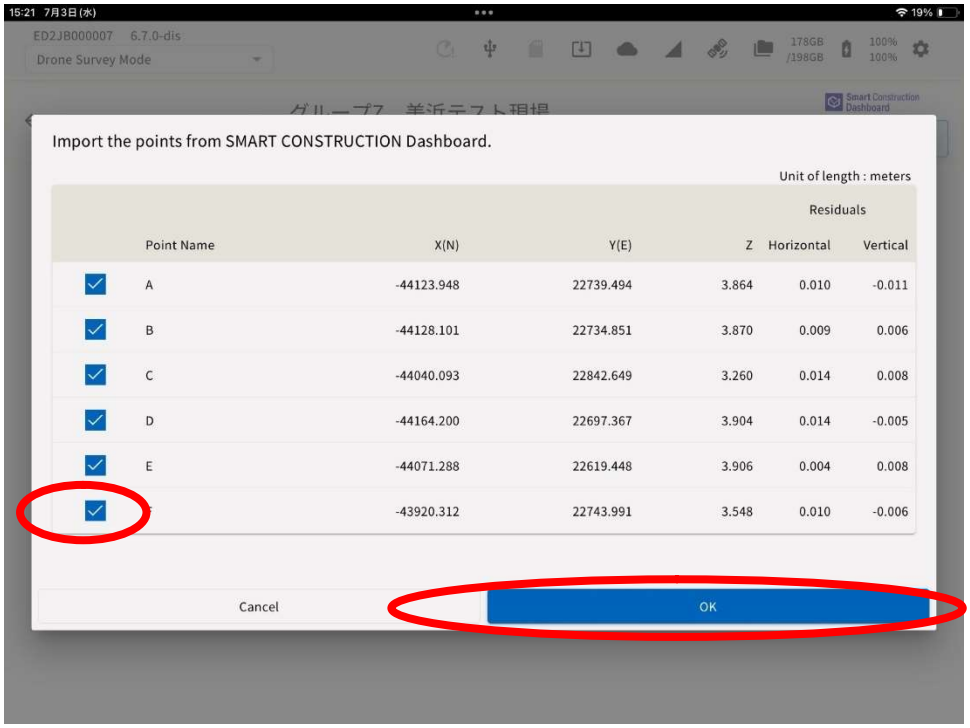
· INHERIT POINTS FROM DASHBOARD

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



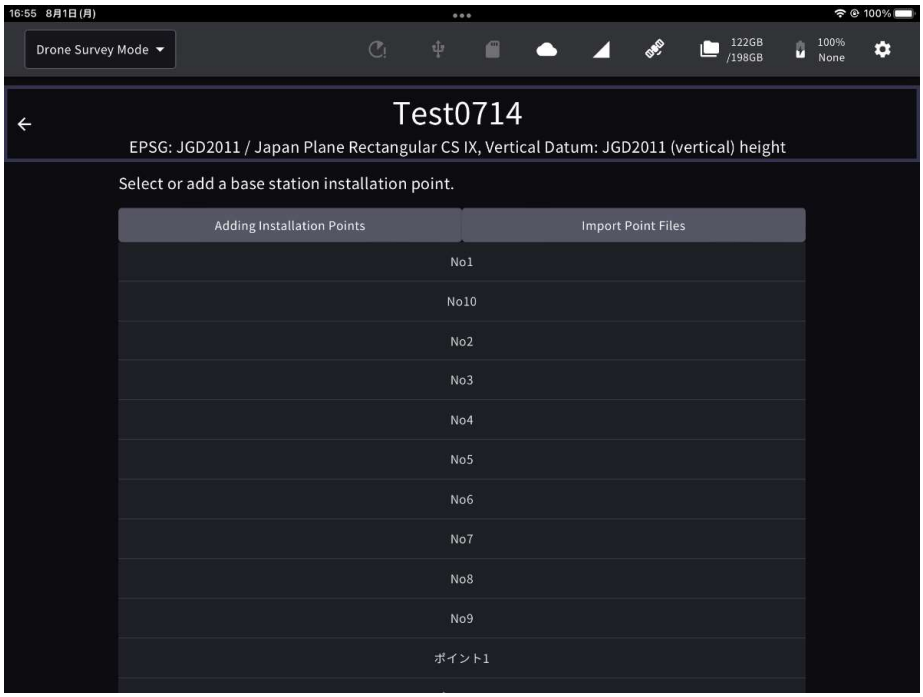
※The dashboard icon is displayed for projects linked to the dashboard,
and tapping the ''project information'' icon to view the GC3 information that has been loaded.

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

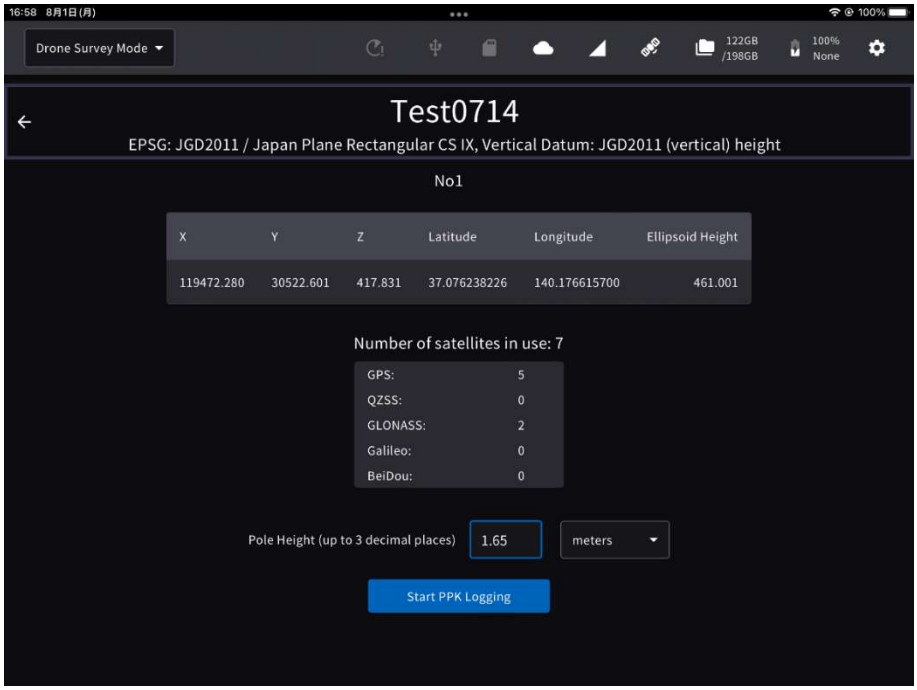


Start PPK logging

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.



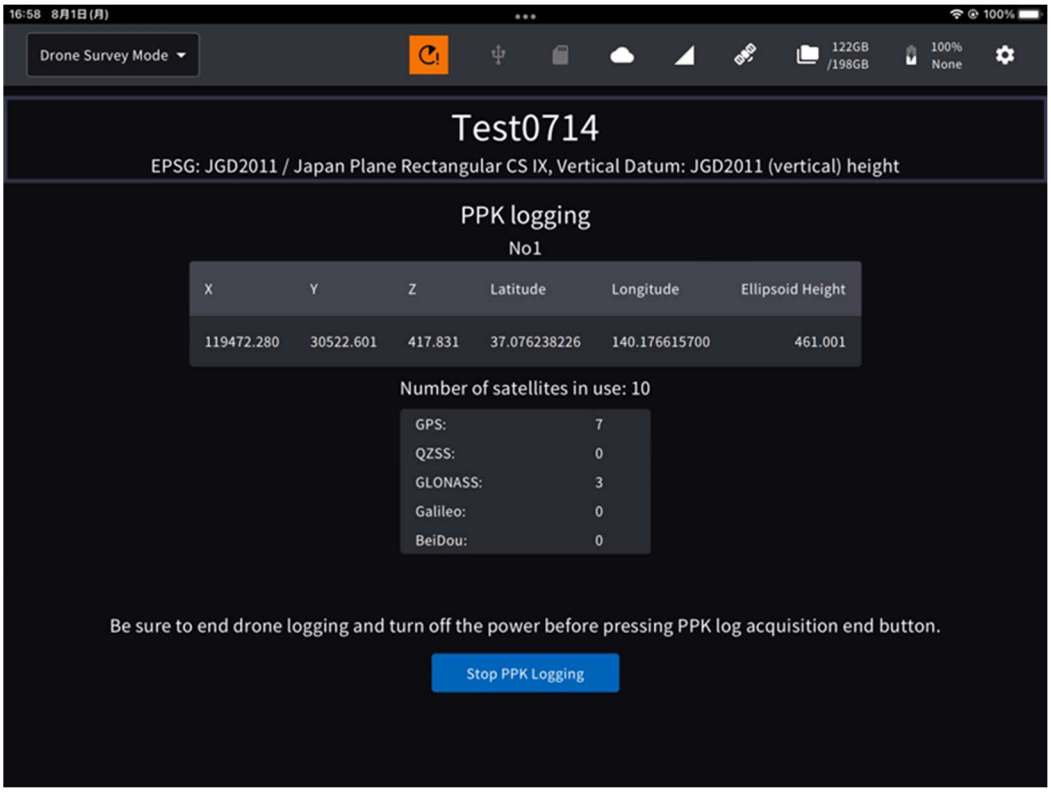
If you have set points manually or imported from a localization file, you need to enter a pole height in advance.

> 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.

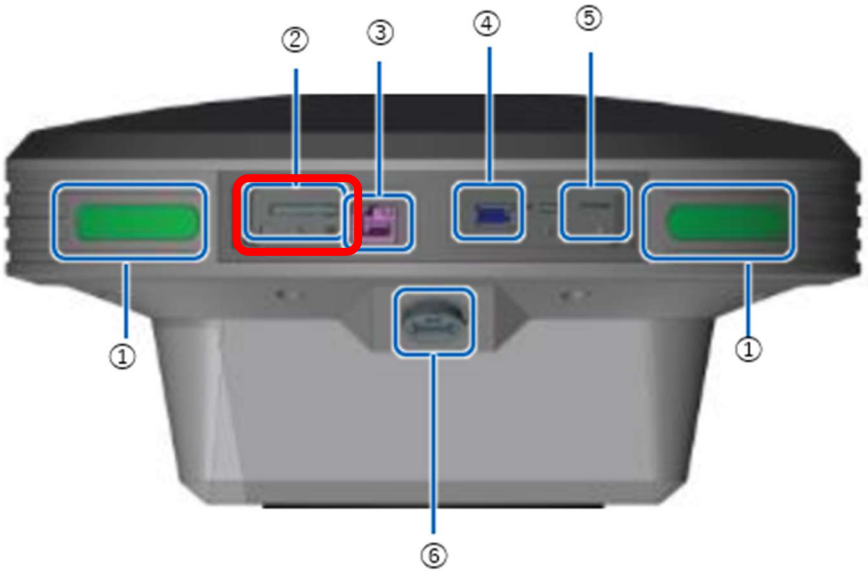
1. Tap the "PPK Logging Complete" button.



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.

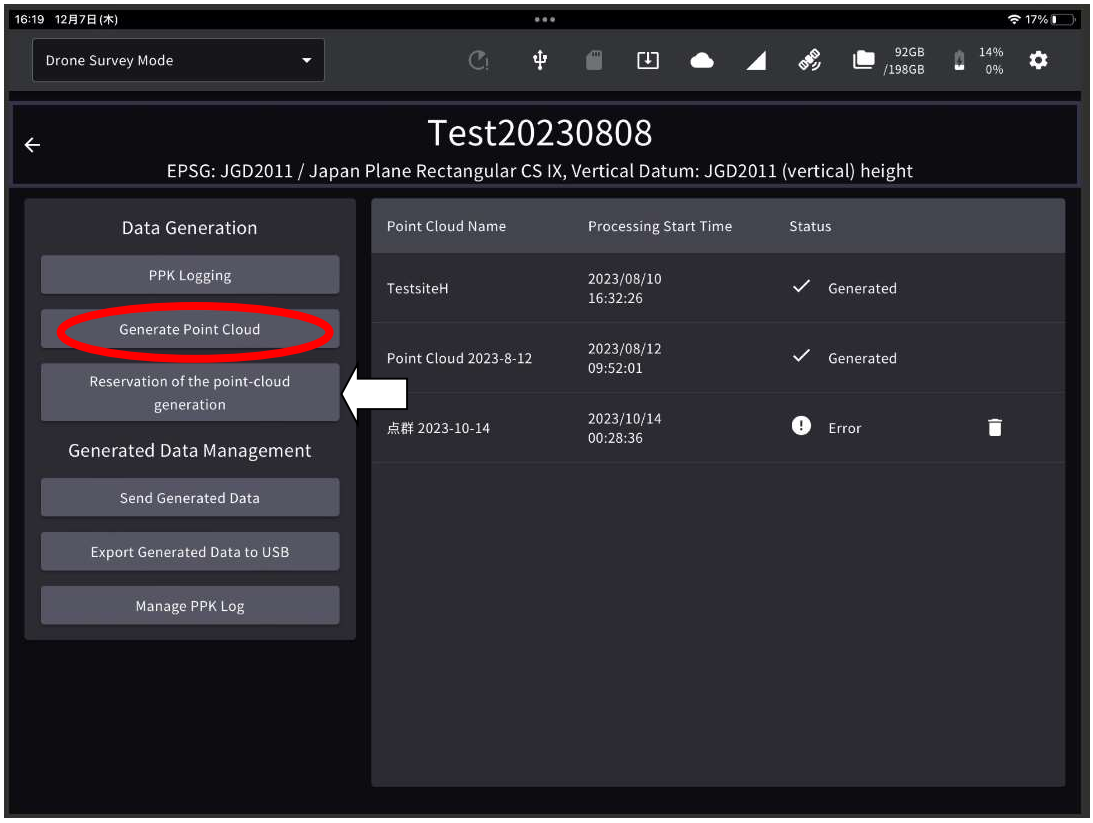


① Status LED
② SD card slot
③ Ether cable port
④ USB slot（USB3.0）
⑤ SIM card slot
⑥ Water-proof USB slot（USB2.0）

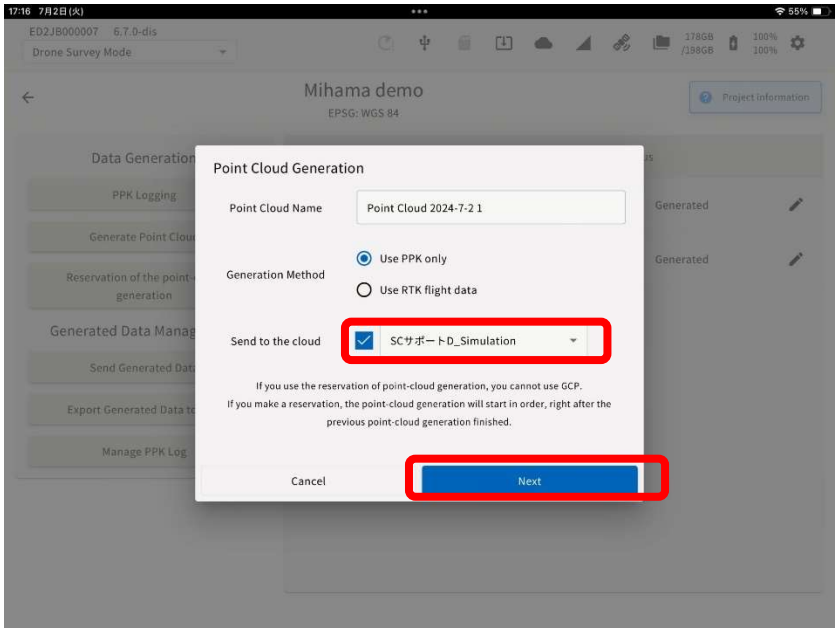
NOTICE

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

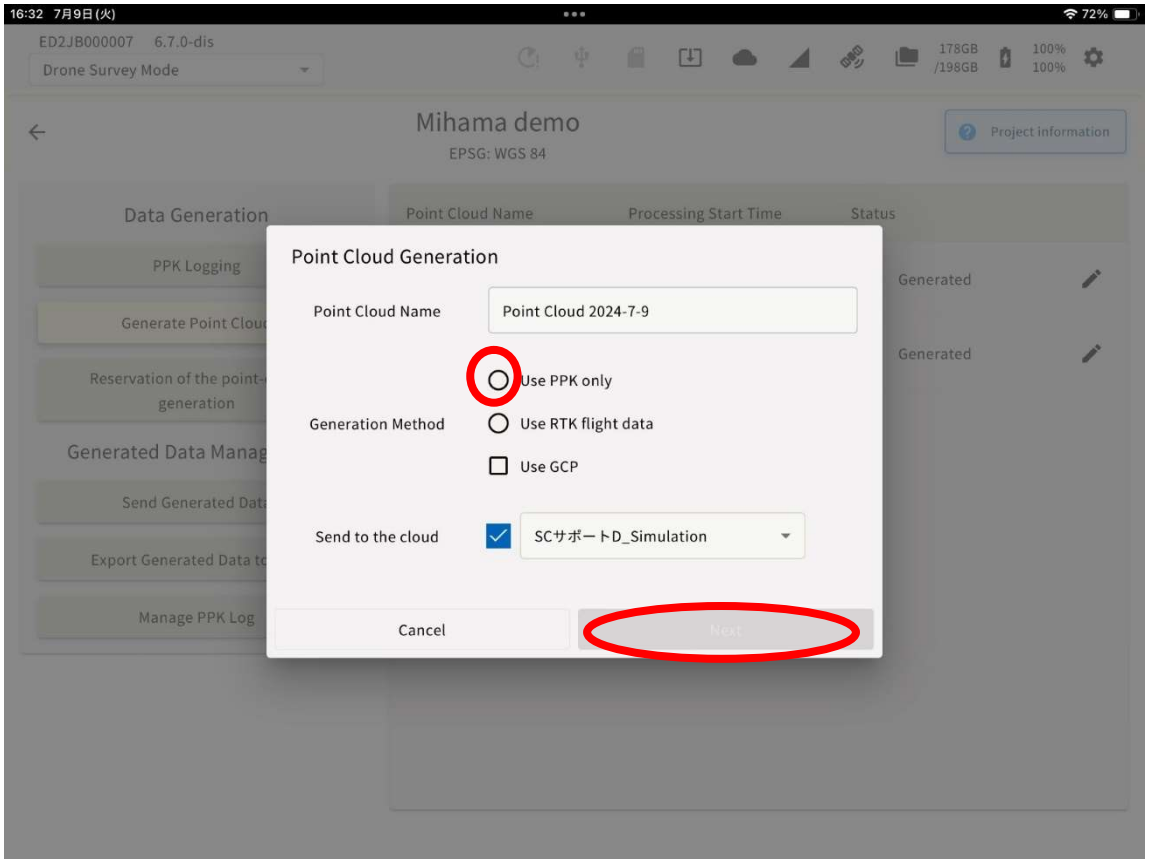


Tips　Reservation of the point Cloud can automated processing from PPK to Upload-to-Dashboard without manual intervention.
''Reservation of the point Cloud '' is not available GCP processing.



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

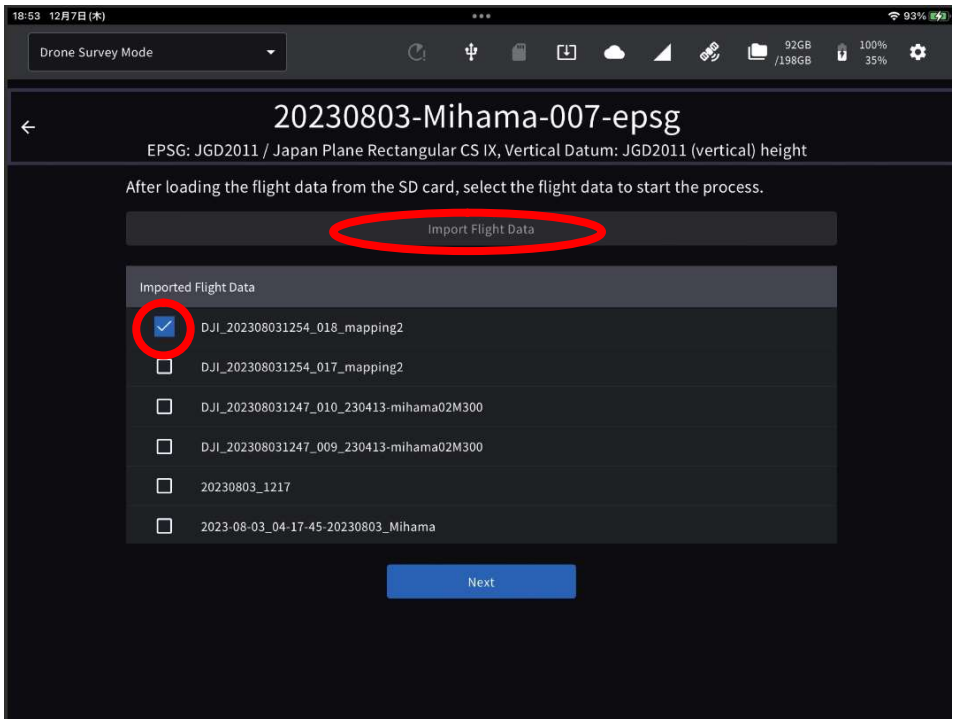
4. Enter the point cloud name and press OK.
   Make sure that “Use PPK Only” is selected.



You can also improve the point cloud accuracy by using GCPs. Please see P.42.
Using RTK flight data will be the same except the PPK data processing process.

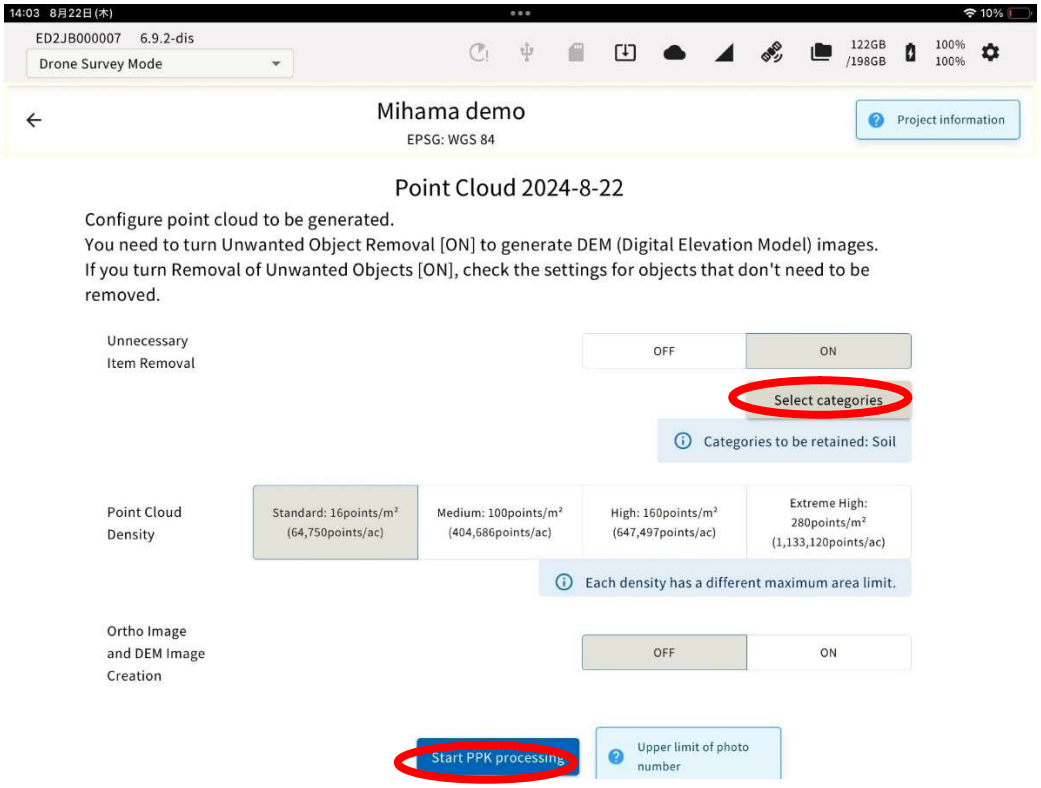
※If you want to automatically upload the point cloud, check (Send to cloud) and select the upload destination.

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.

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



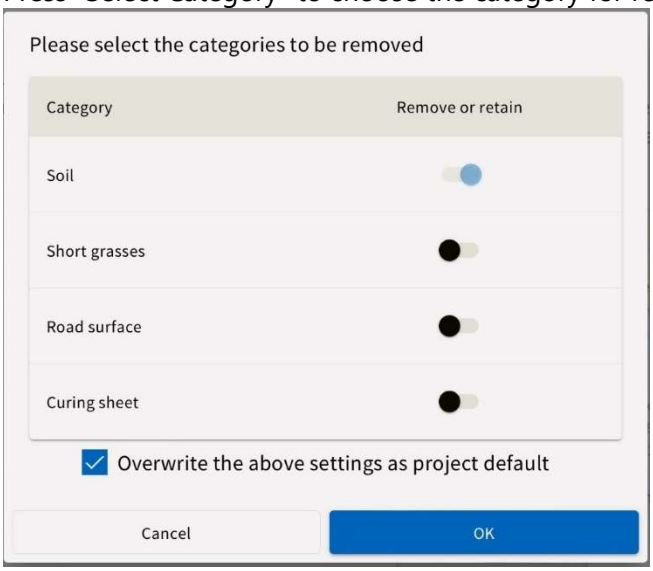
We will show the details of the setting items from next page.

※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.

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

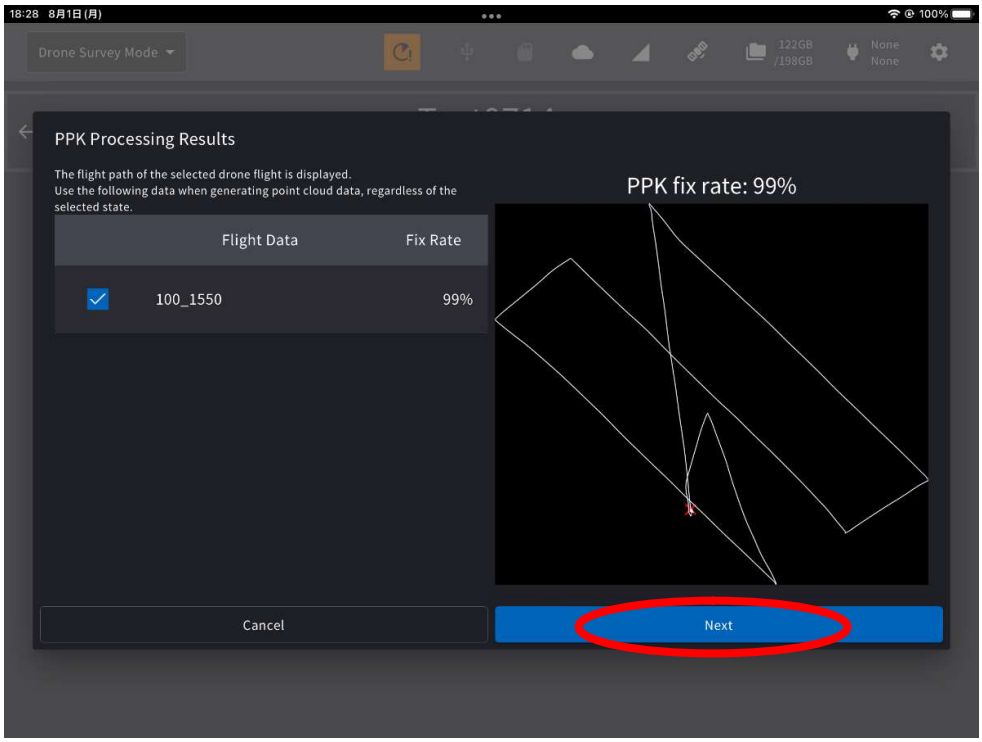
Ortho and DEM image generation:

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

Tips

If you do not turn on 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.

8. 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.

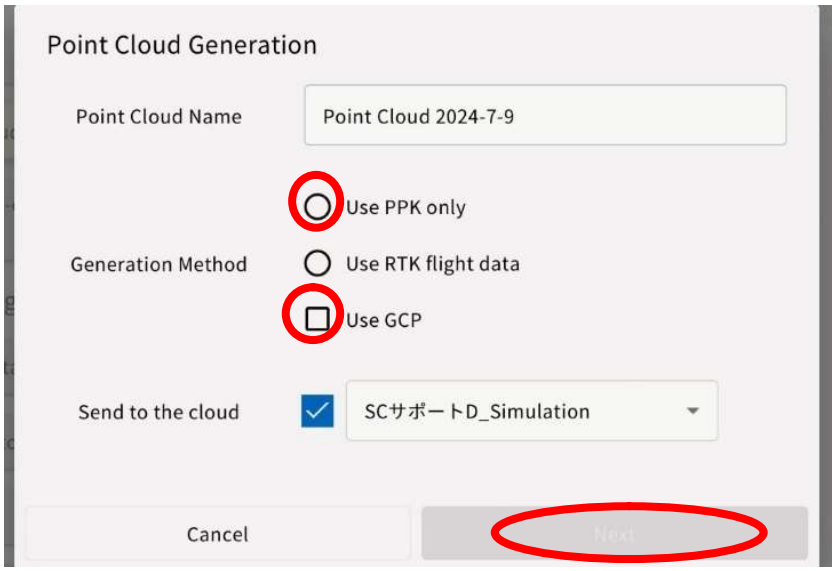
Tips
To generate a Digital Elevation Model (DEM), both the Unwanted Object Analysis and Ortho Image Generation settings must be both ON.

⚠ WARNING
If you turn off SMART CONSTRUCTION Edge during the processes below, the data could be corrupted or the system doesn't work properly any more.
Please turn off after these processes are done.
・Point cloud generation
・PPK logging
・Point cloud uploading
・Data exporting

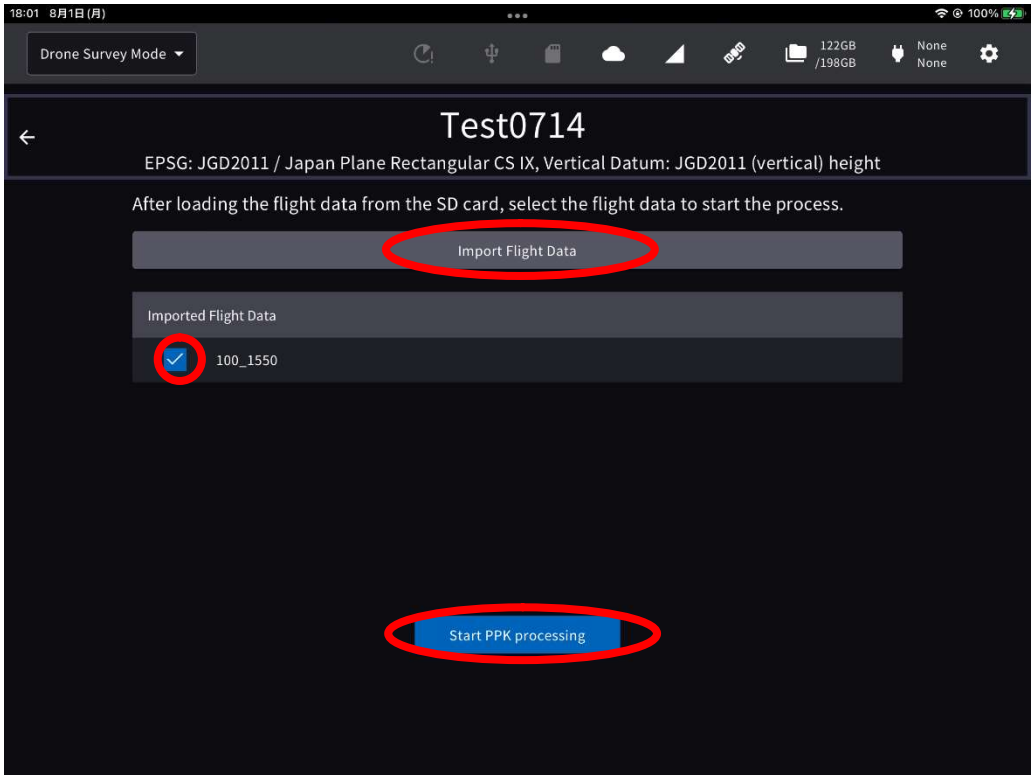
WHEN WE USE GCPS TO IMPROVE THE ACCURACY

You can create more accurate point clouds using GCP in conjunction with PPK. Please prepare the drone image with GCPs and coordinate information of GCP.

1. Select "Use PPK and GCP" in step 4 (p.38) of "Generating Point Clouds".

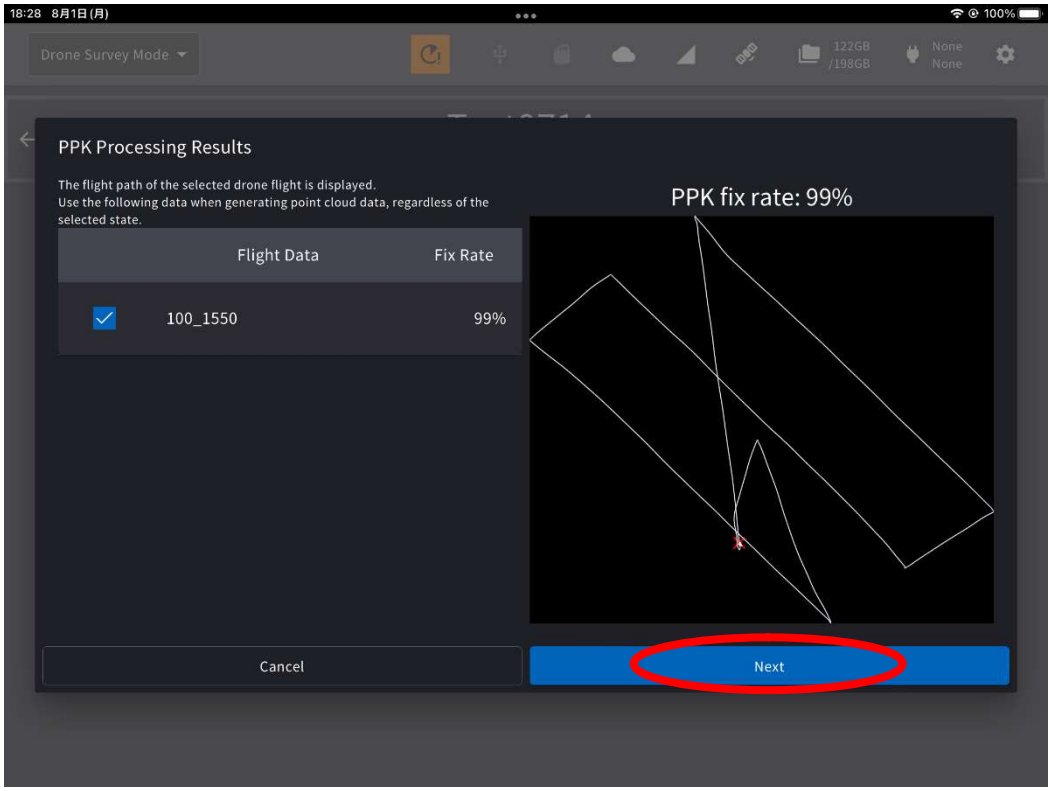


2. Tap the "Import Flight Data" button and select the drone data to upload to the EdgeBox from the displayed dialog.



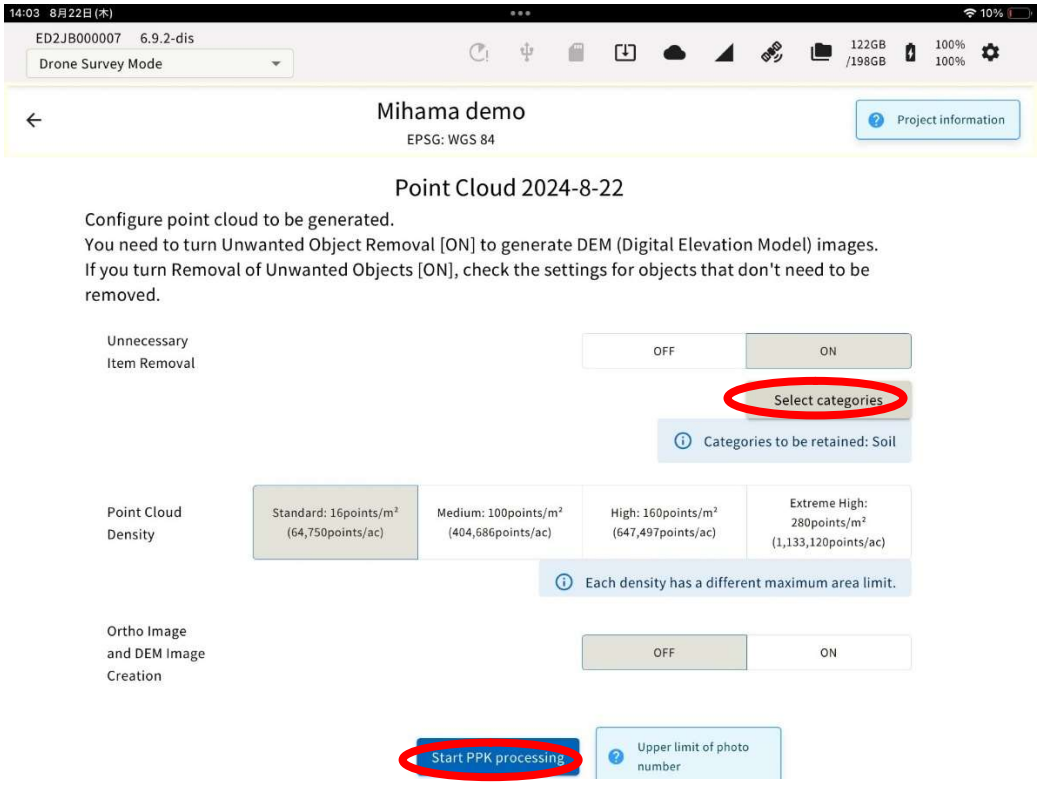
3. The imported data will be listed. You can also select and multiple imported data.
4. Check the flight data to generate point cloud from the imported data list, and tap "PPK processing start" button.
   ※If you want to automatically upload the point cloud, check (Send to cloud) and select the upload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



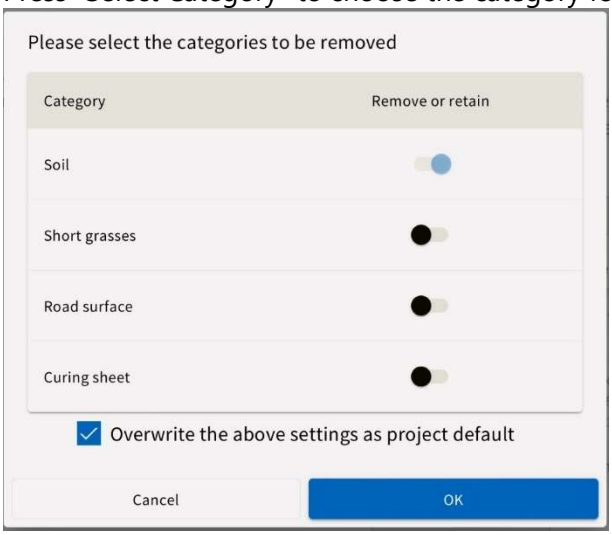
We will show the details of the setting items from next page.

7. ※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

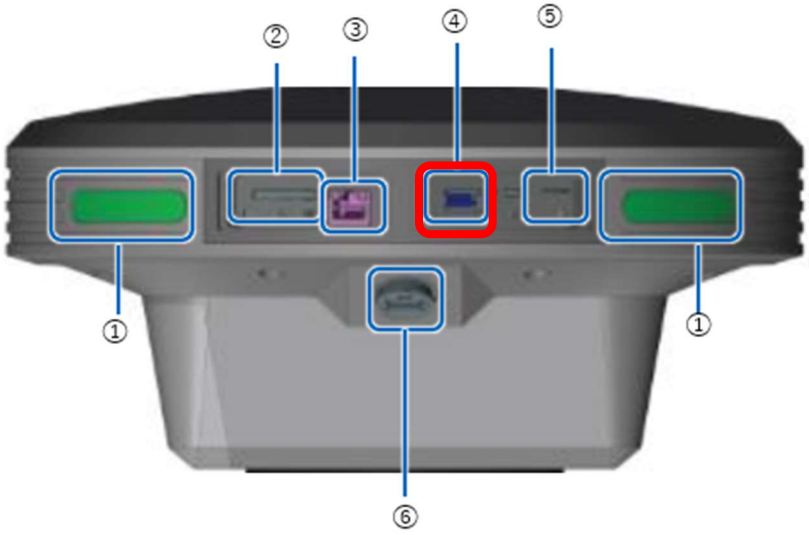
Ortho and DEM image generation:

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

Tips

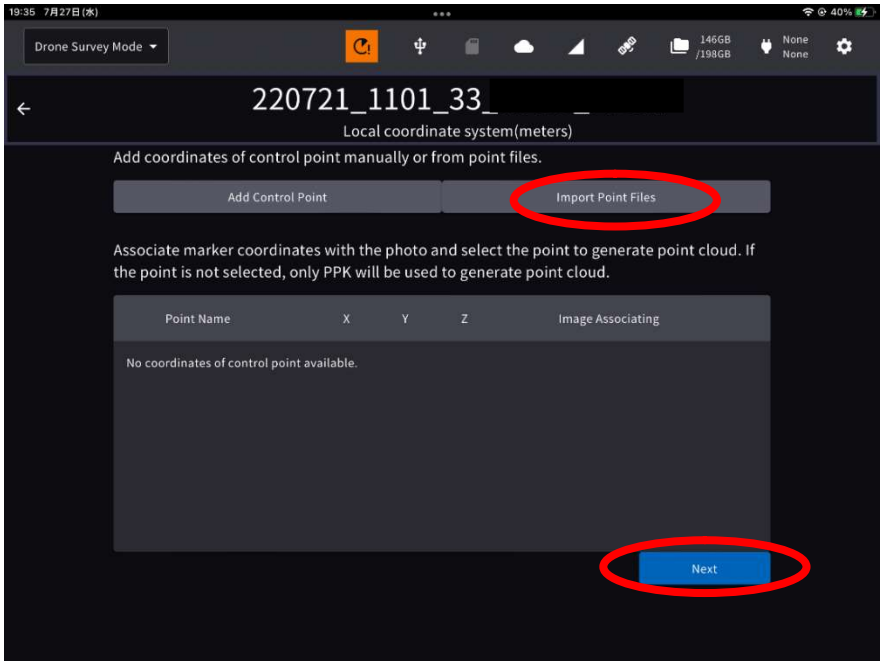
If you do not turn on ortho generation, you will not be able to output an image showing the verification point positions on the ortho, which is the 3D accuracy check report material.

8. Insert the USB memory with GCP coordinates file (.csv) in the USB slot of SMART CONSTRUCTION Edge. Please refer the file format here.
   Insert the USB memory into the USB slot (inside the waterproof lid) ④ of the EdgeBox



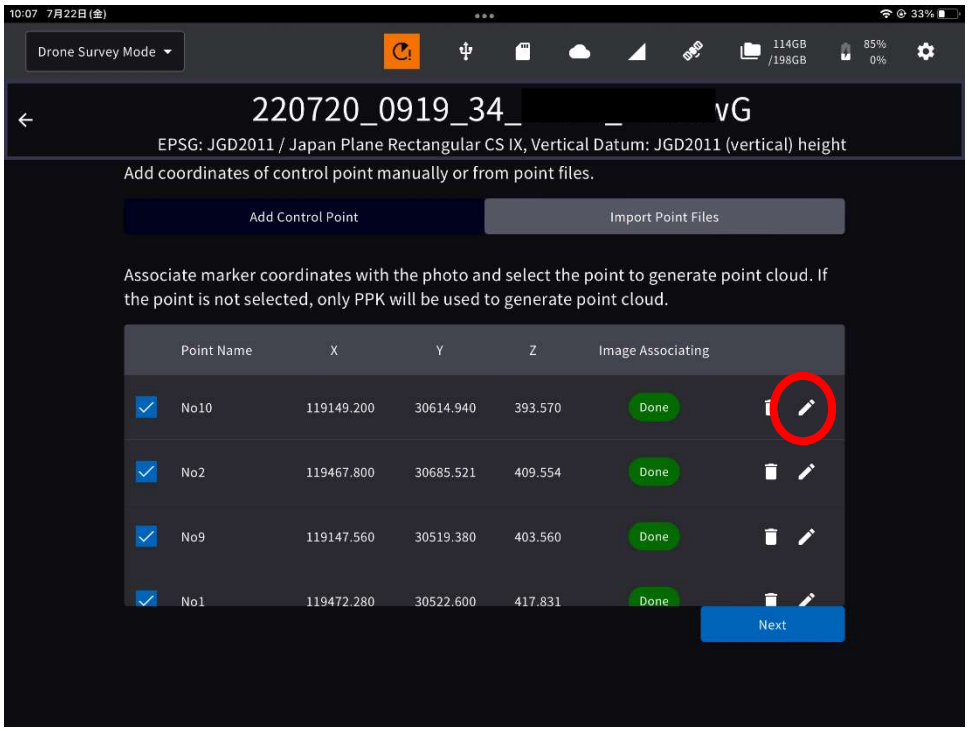
① Status LED
② SD card slot
③ Ether cable port
④ USB slot（USB3.0）
⑤ SIM card slot
⑥ Water-proof USB slot（USB2.0）: cannot use this slot for USB memory

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

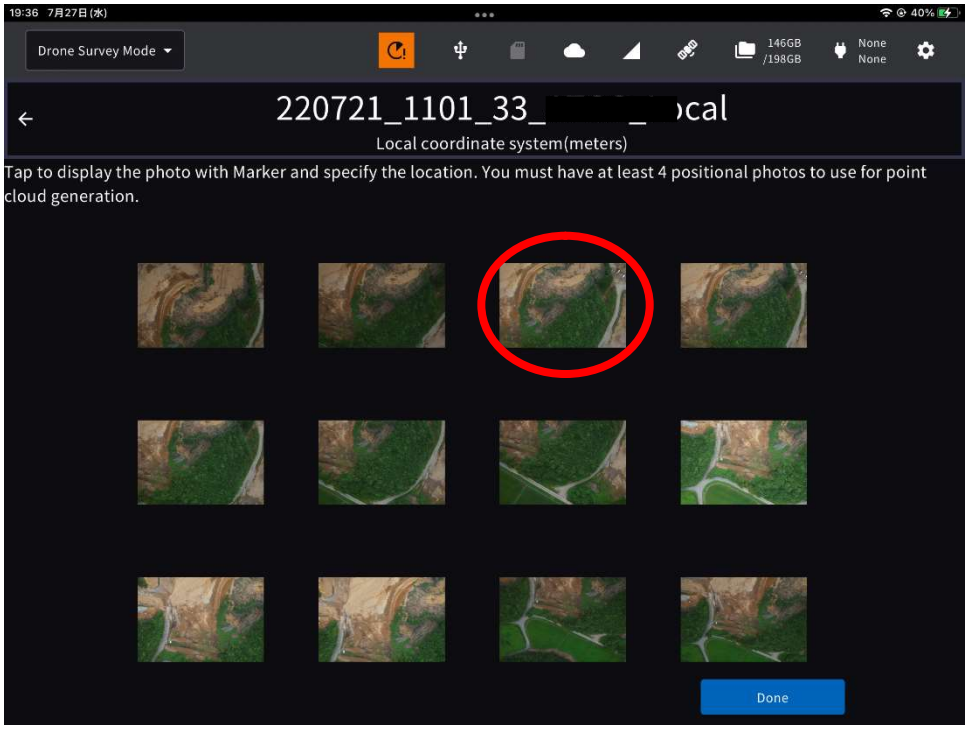


10. Set the file format parameter according to the file and tap “OK”.

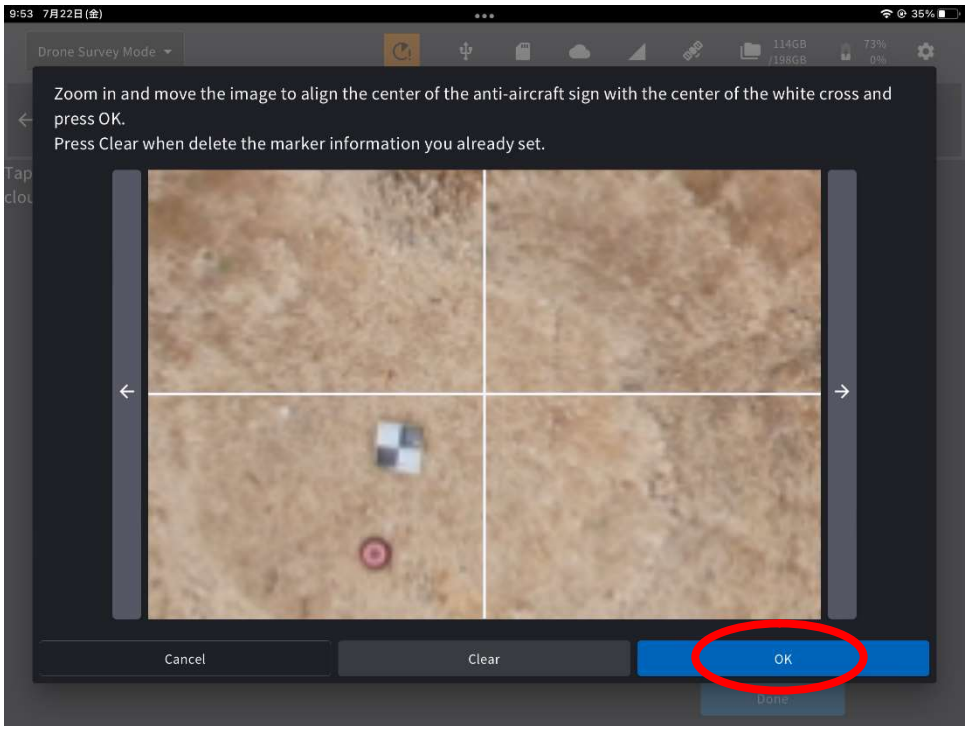
11. Tap edit button  of each GCP to display a thumbnail of the image that may have the selected GCP in the image.

12. 

13. Tap the thumbnail of the image, align the center of the cross mark to the center of GCP in the image, and tap "OK"

14. 

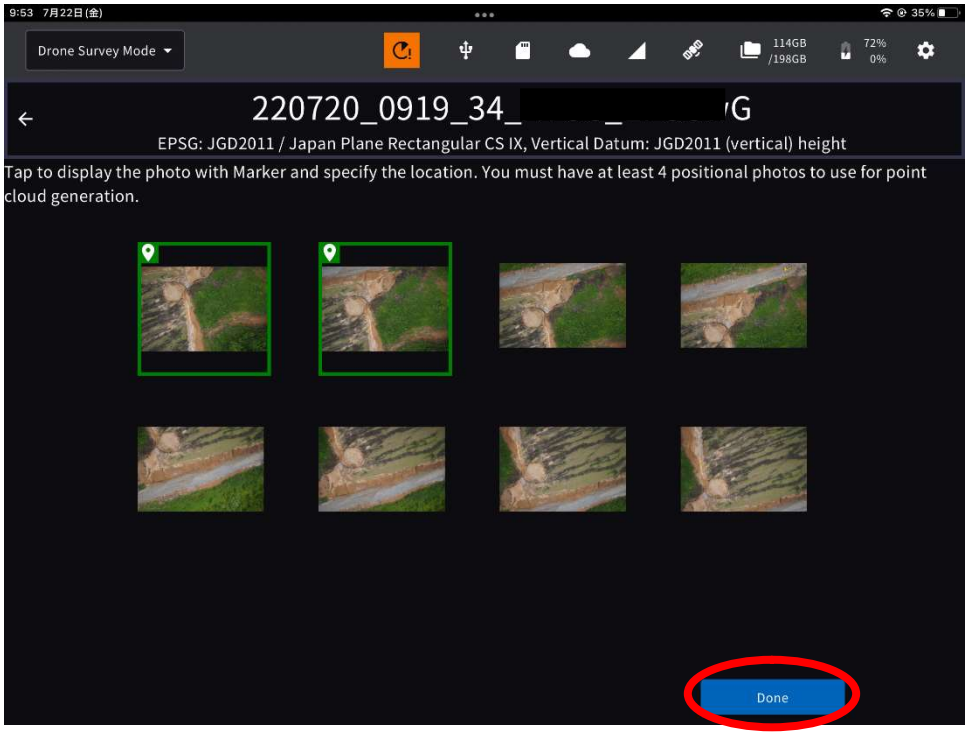
You can zoom in and out by pinching in and out, move the displayed portion by swiping.



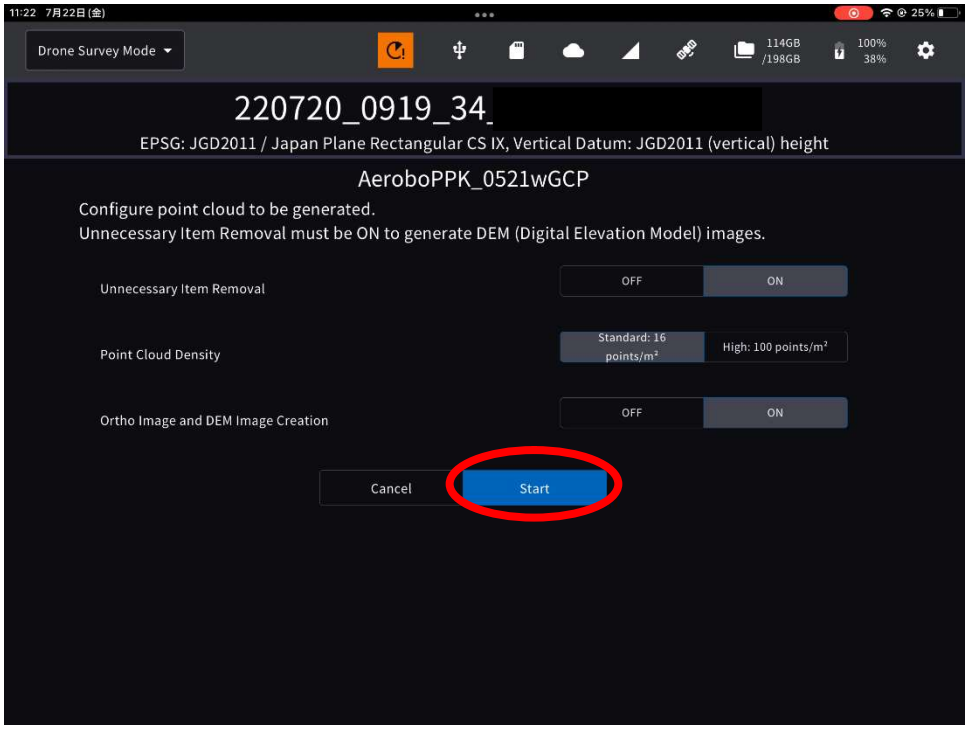
More than four images are required to align a GCP.

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.

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

16. 

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

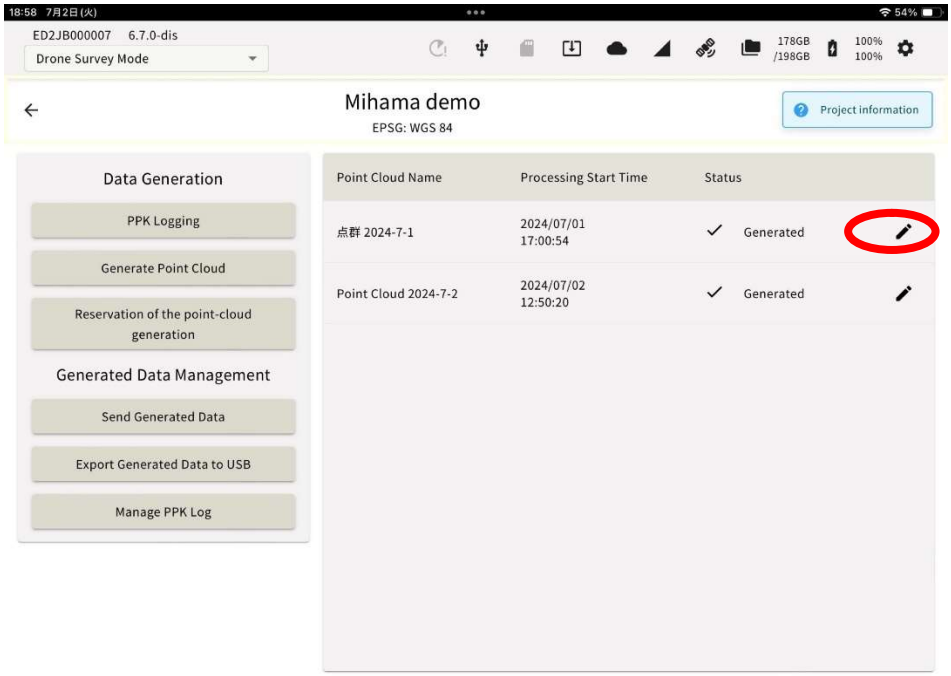


18. The point cloud viewer screen shows up and the point cloud generation process starts. During this process, it is possible to switch to another window and perform the other work. You can check the generated point cloud by selecting it from the list on the project top screen.

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

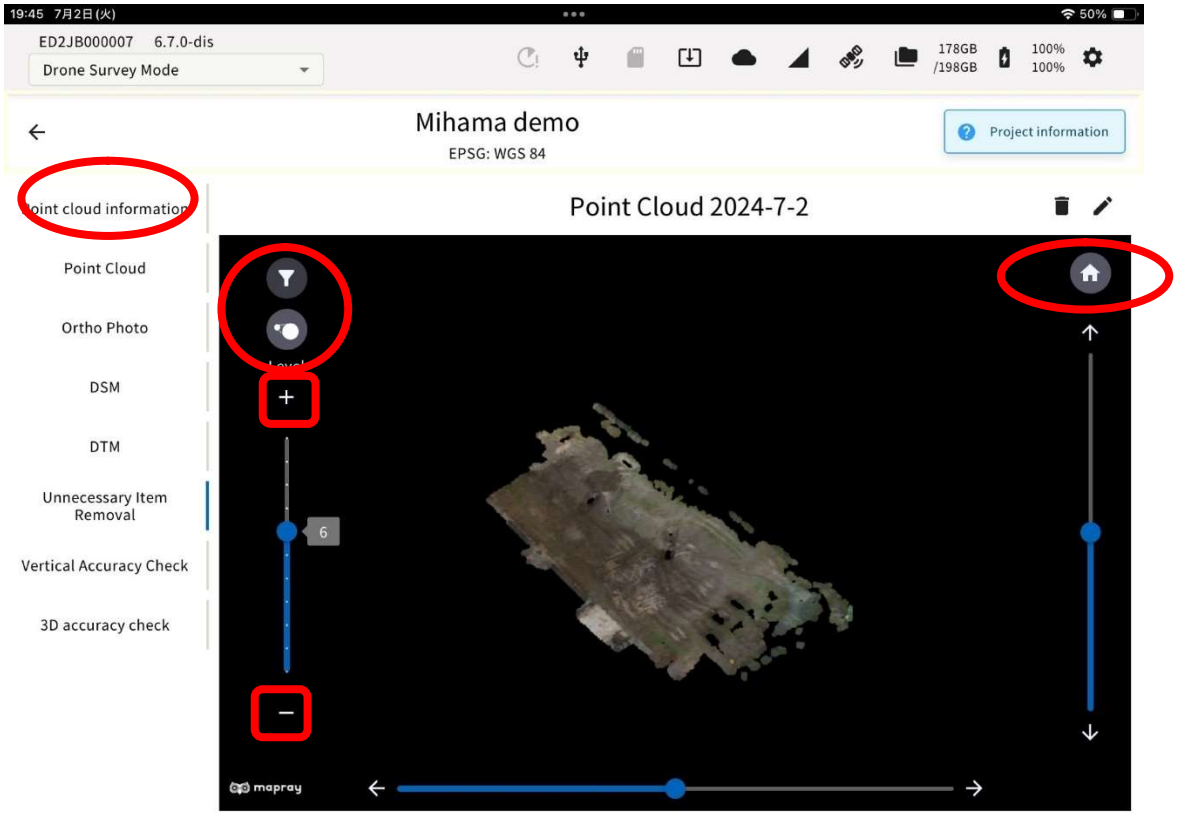
View the generated point cloud

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.

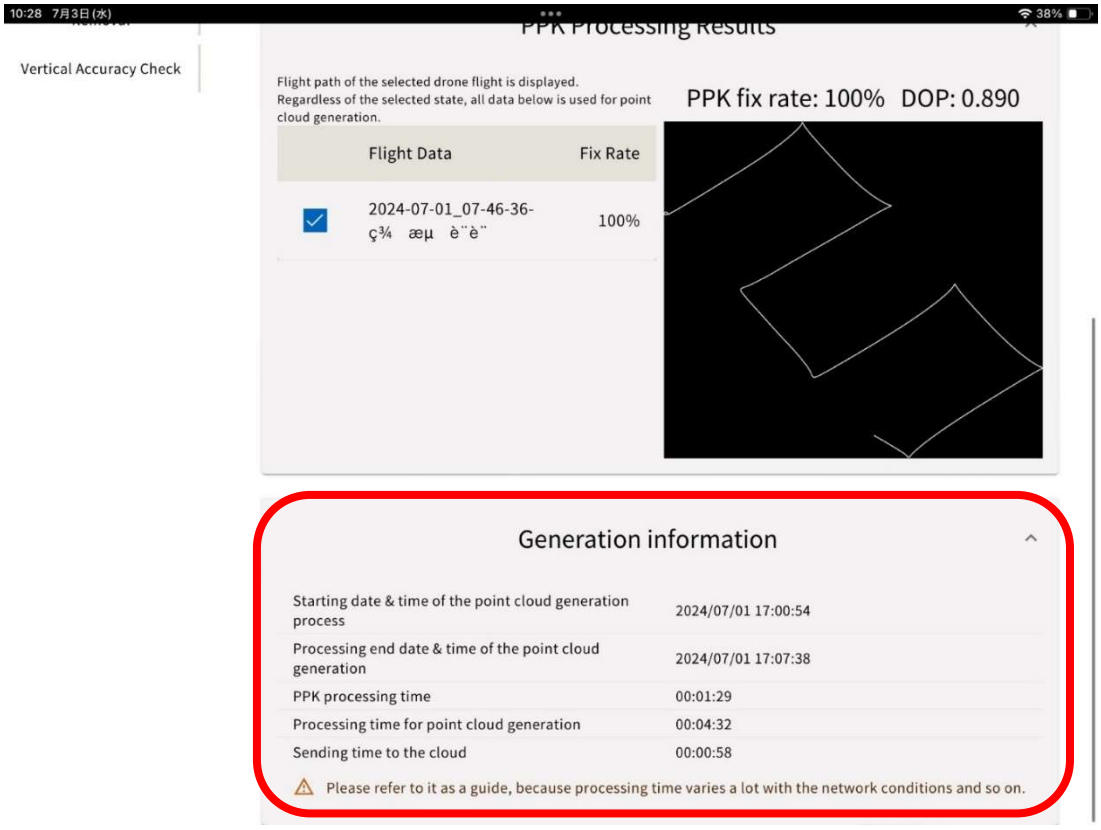


Press the pen icon at the right end of the point you can change cloud name display.

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

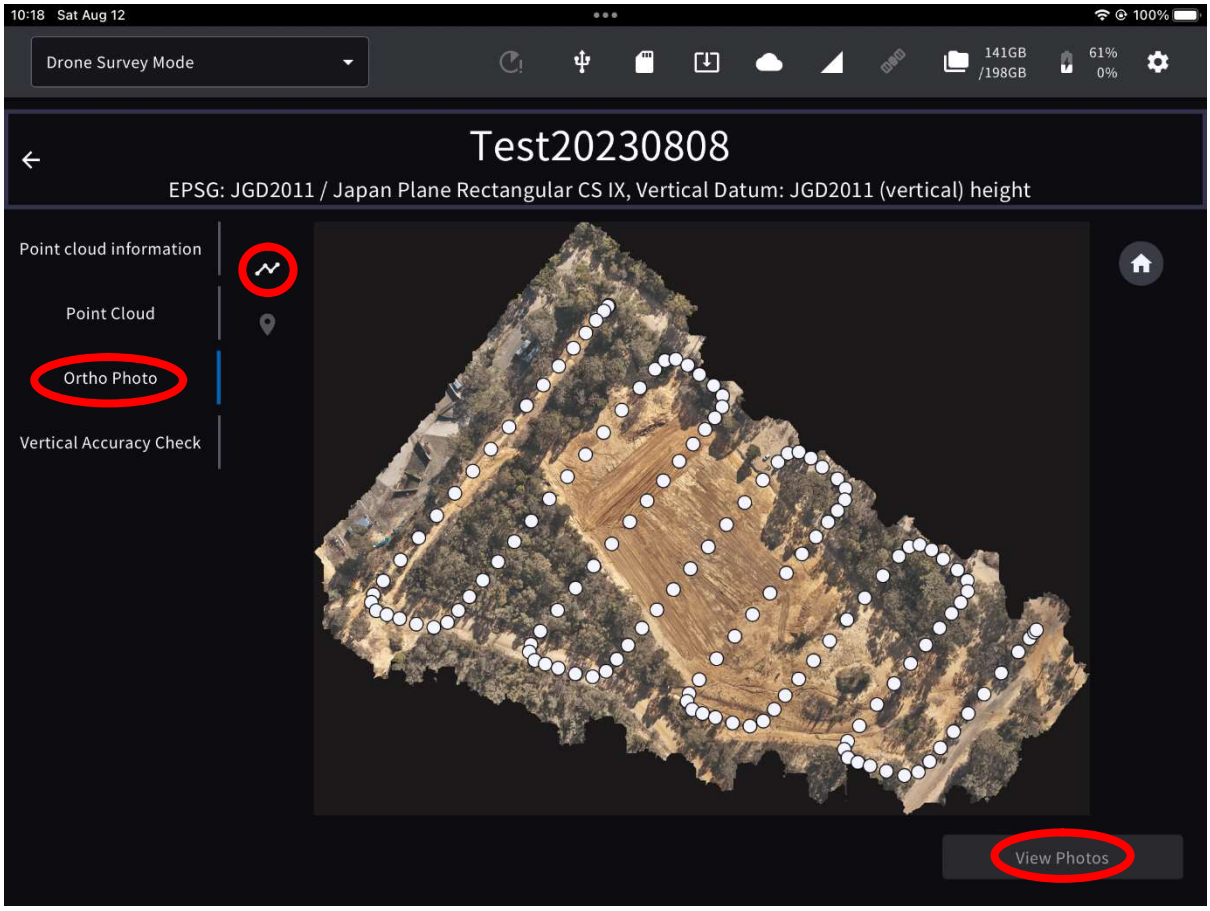
Vertical/Horizontal Rotation: The slider in the Viewer Area is displayed vertically and horizontally. You can also use the arrow buttons to fine-tune

・ 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 Likeliness" score, and you can change the filtering strength.

TO CHANGE THE STRENGTH OF POINT CLOUD JUNK REMOVAL

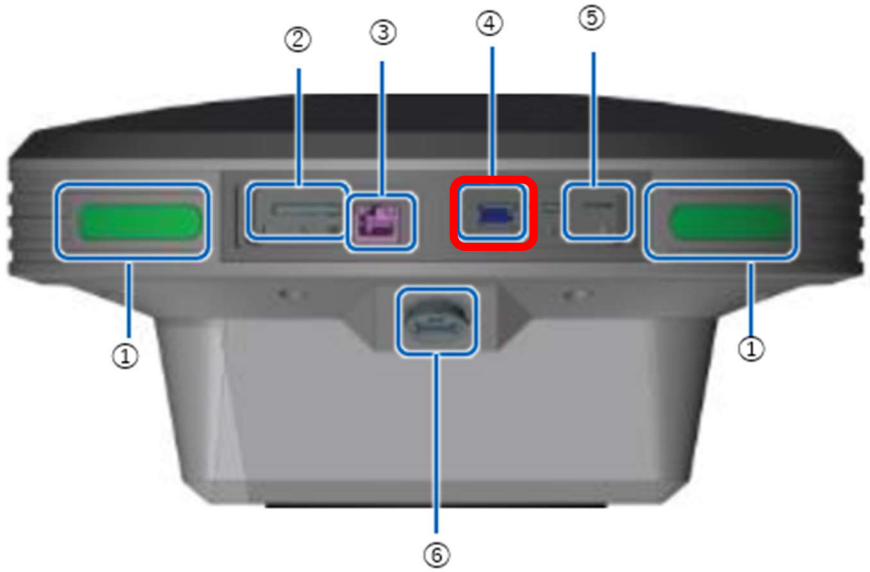
1. Tap “Unnecessary object Removal” in the Point Cloud Viewer screen
2. Tap the icon in the upper left corner of the viewer and use the slider to adjust the strength of the unwanted object removal.

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. Please see P.52 for the CSV format.

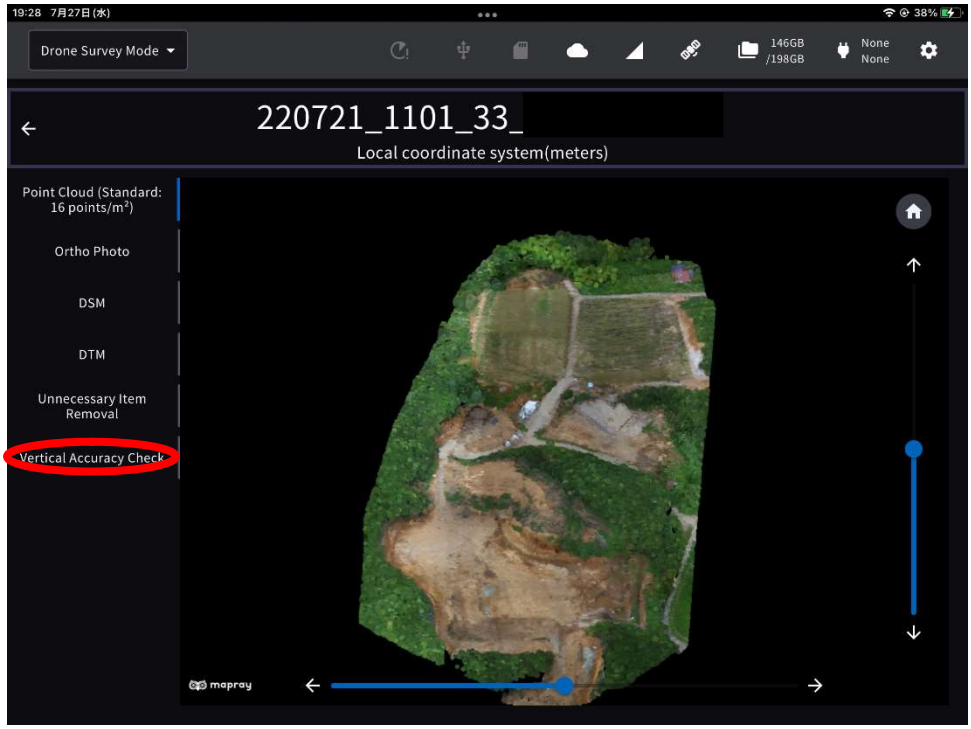
1. Insert USB memory into USB slot ④ on EdgeBox

   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 use for USB memory.

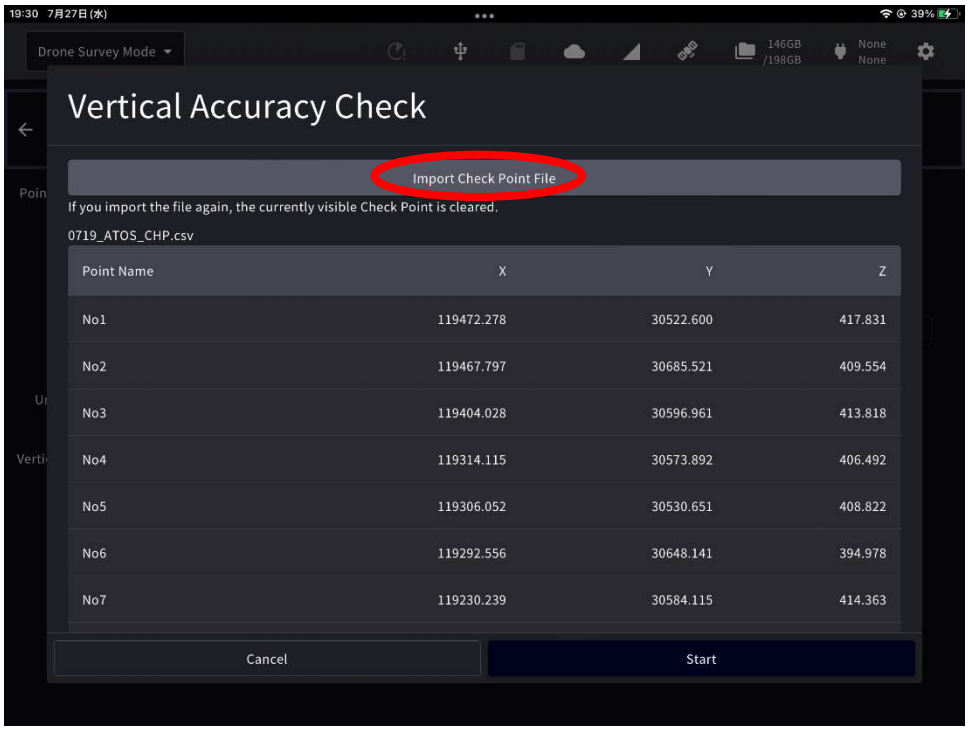


① Status LED
② SD card slot
③ Ether cable port
④ USB slot（USB3.0）
⑤ SIM card slot
⑥ Water-proof USB slot（USB2.0）: cannot use this slot for USB memory

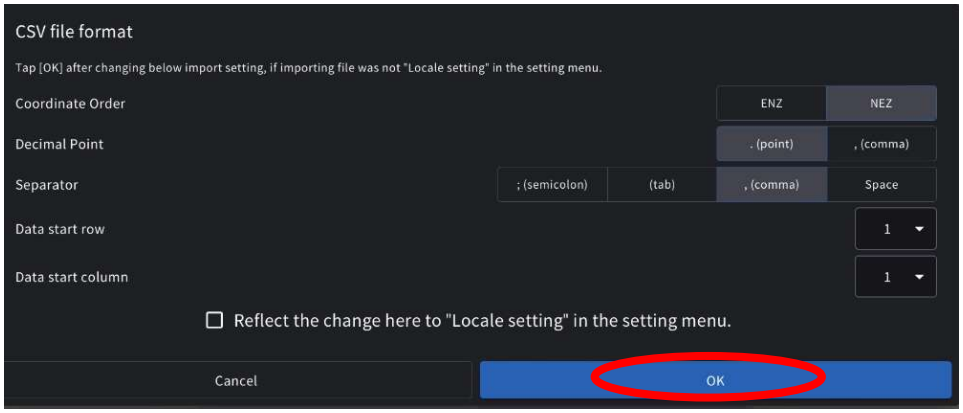
2. Tap “Vertical Accuracy Check” in the Point Cloud Viewer screen.



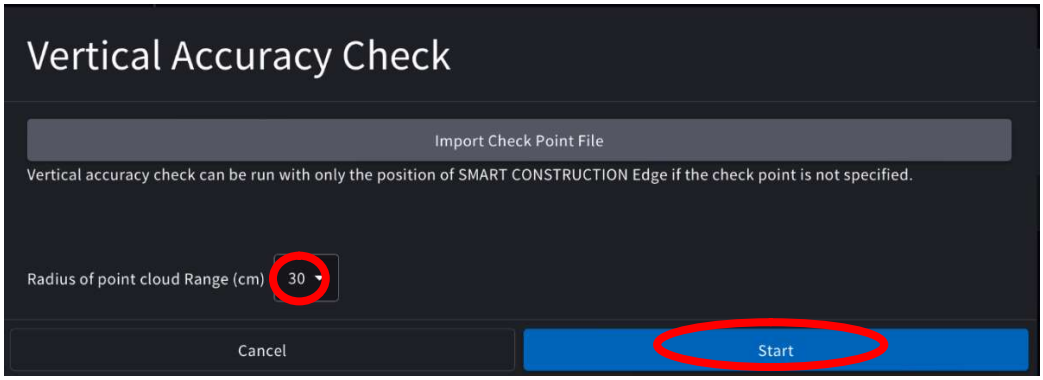
3. Tap the “Import check point file” button and select the check point coordinate file to use for validation in the dialog that appears.



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

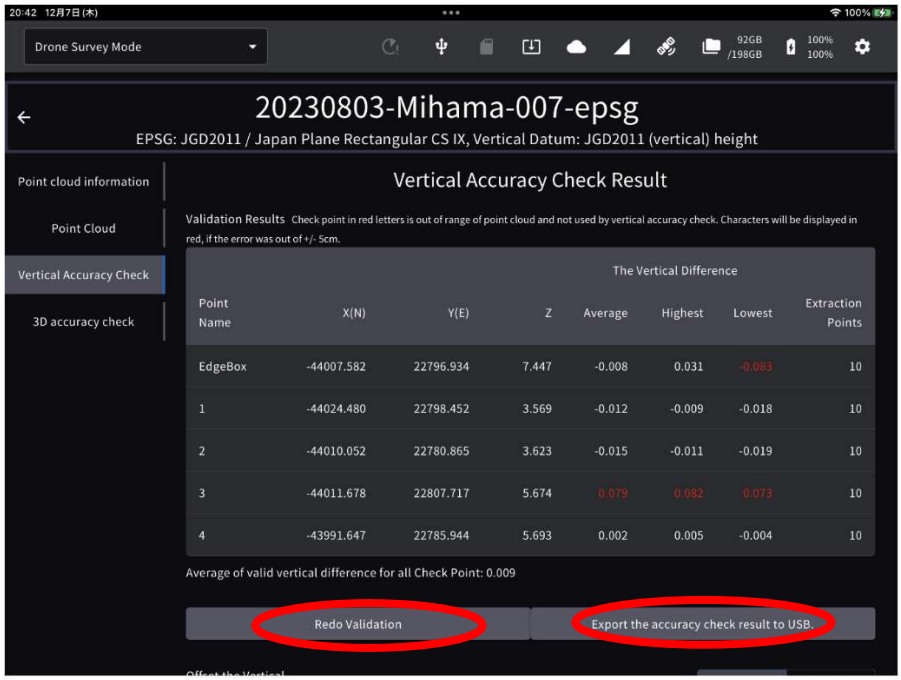


5. Specify a range of point cloud around the check points to use for vertical accuracy check and tap “Start”.



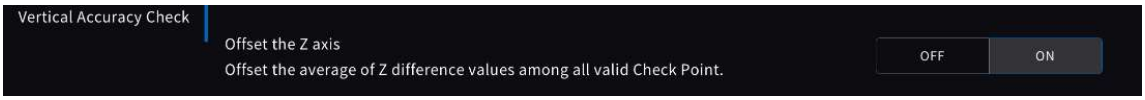
The results shown in the screen.

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.

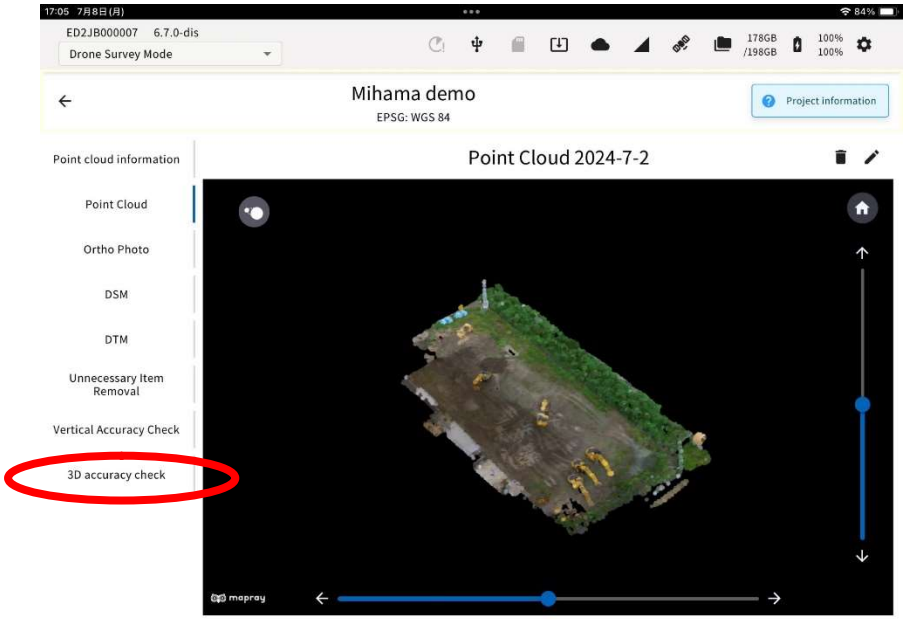
> Tips

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.

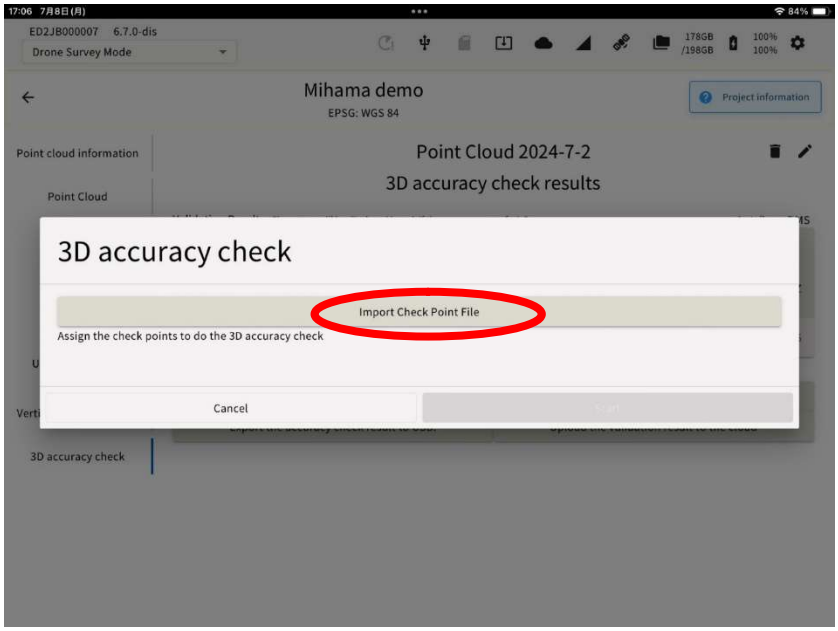
3D accuracy check

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

1. Tap ‘’3D accuracy check’’

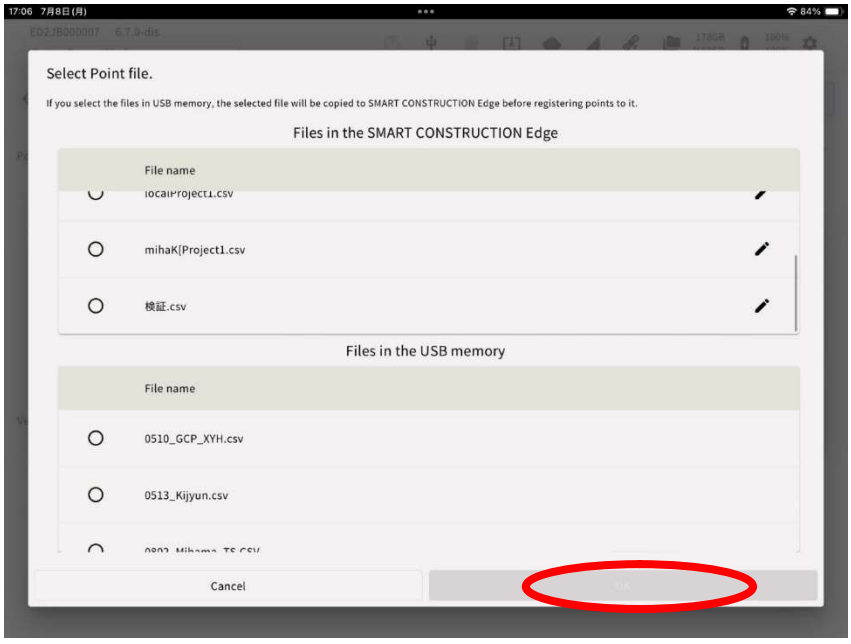


2.Tap ‘’Import Check point File’’



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

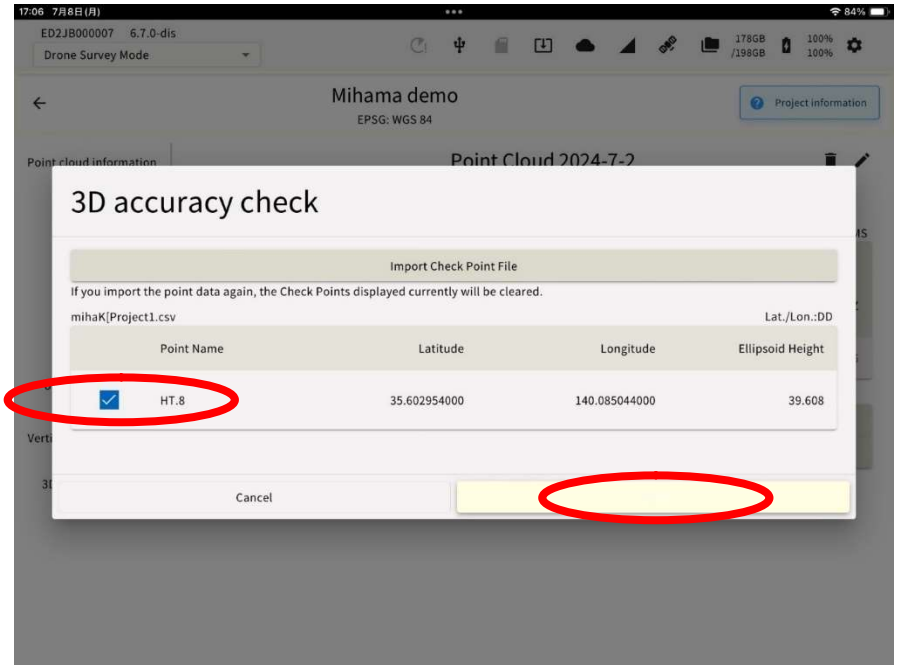
Tap ‘’OK’’ after selecting a file.

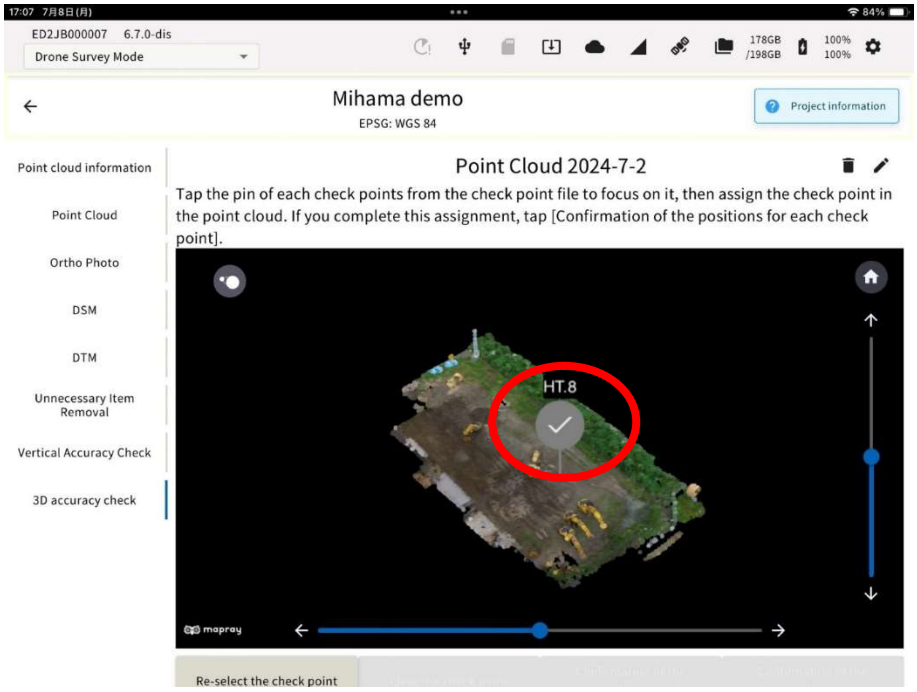


If a point cloud is not generated at the verification point location, the verification point will be displayed in red. 4.

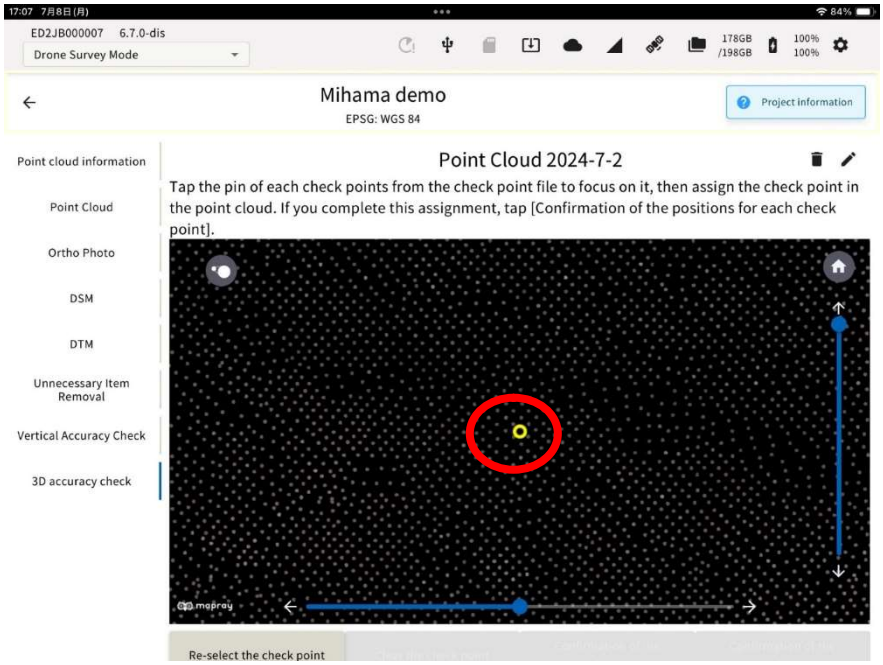
4. Confirm the verification point and tap "Start".

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.

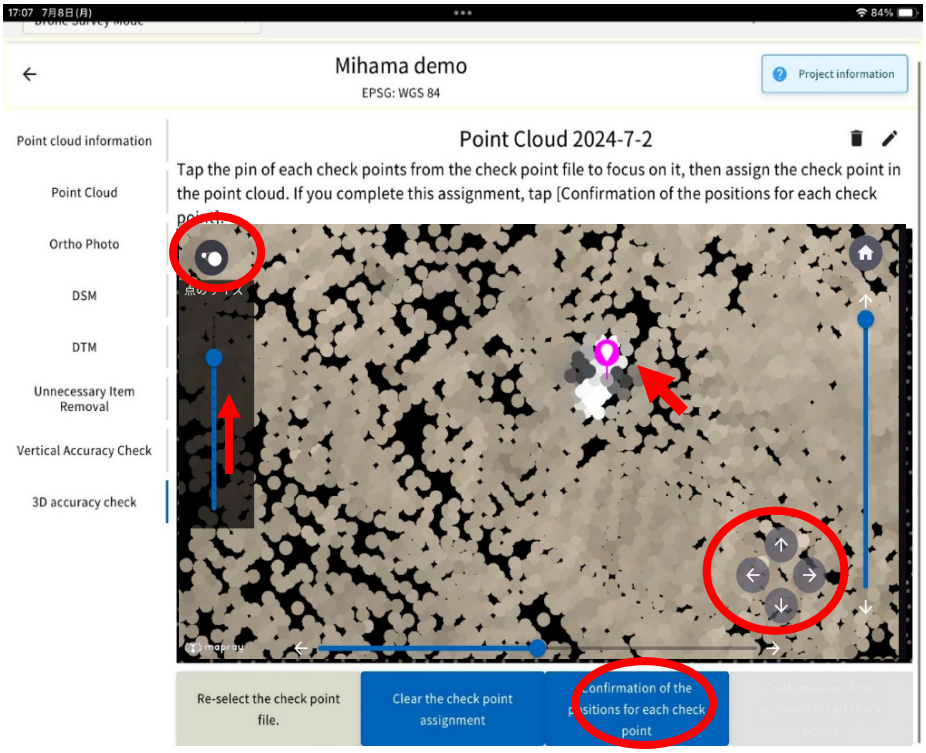




6. The coordinates of the validation point are indicated by yellow pins.



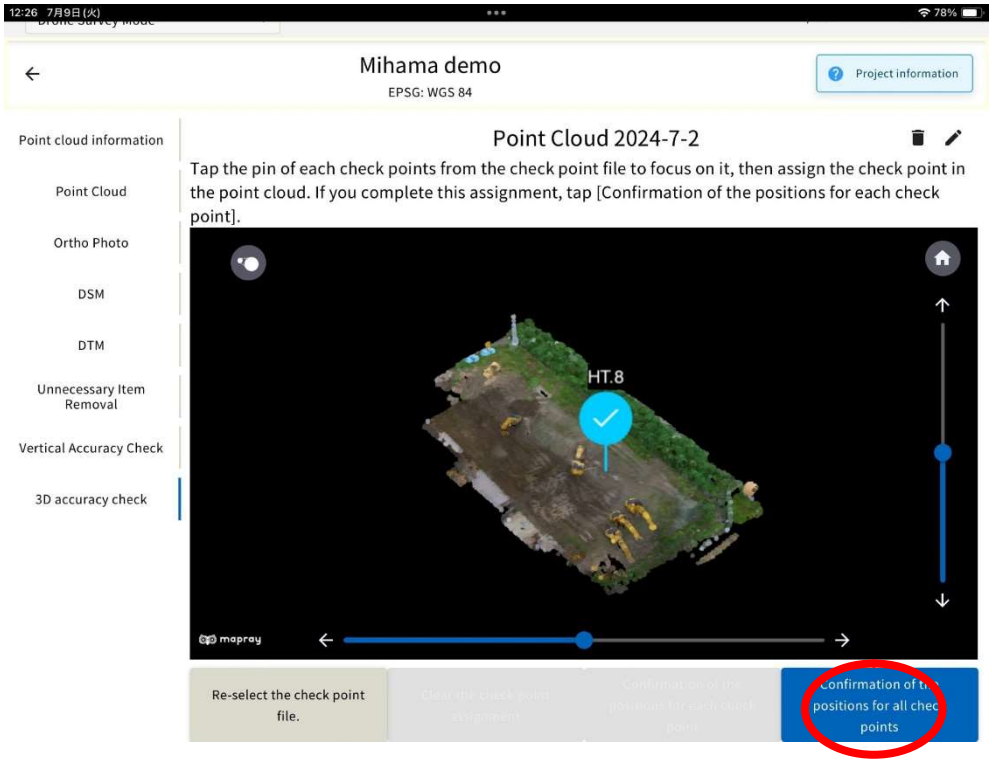
7. The position of the pink pin can also be fine-tuned with the cursor in the lower right corner. After placing it at the center of the verification point on the point cloud, tap "Confirmation of the positions for each check point" icon.



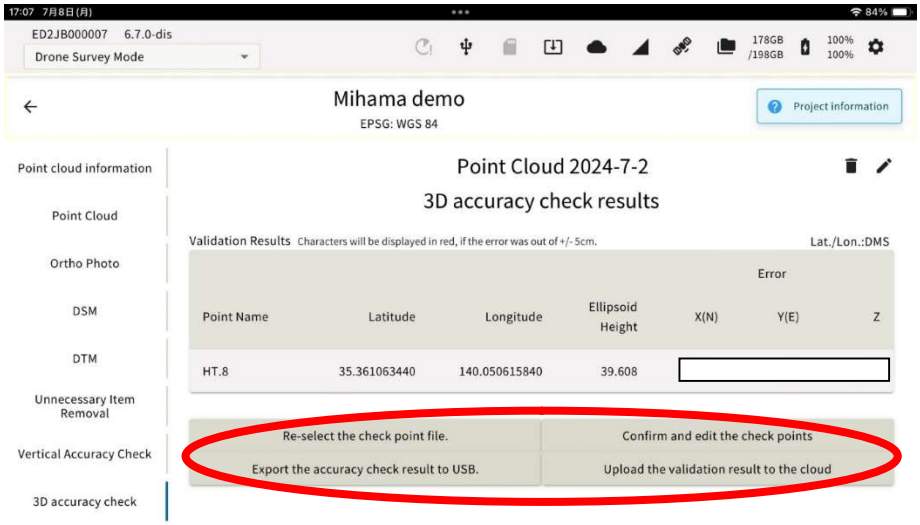
8.The pins of the validation points for which positions are specified turn light blue.

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

Tap ‘’ Confirmation of the positions for all check points’’



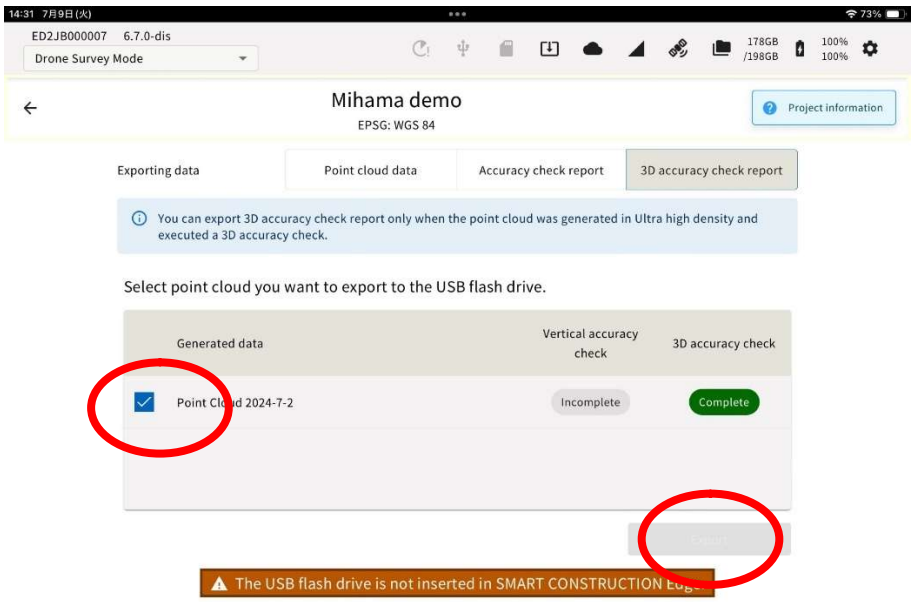
Tap the following icons you can available Re-verification and output of 3D accuracy report to USB/upload report to Dashboard .



・USB exporting

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

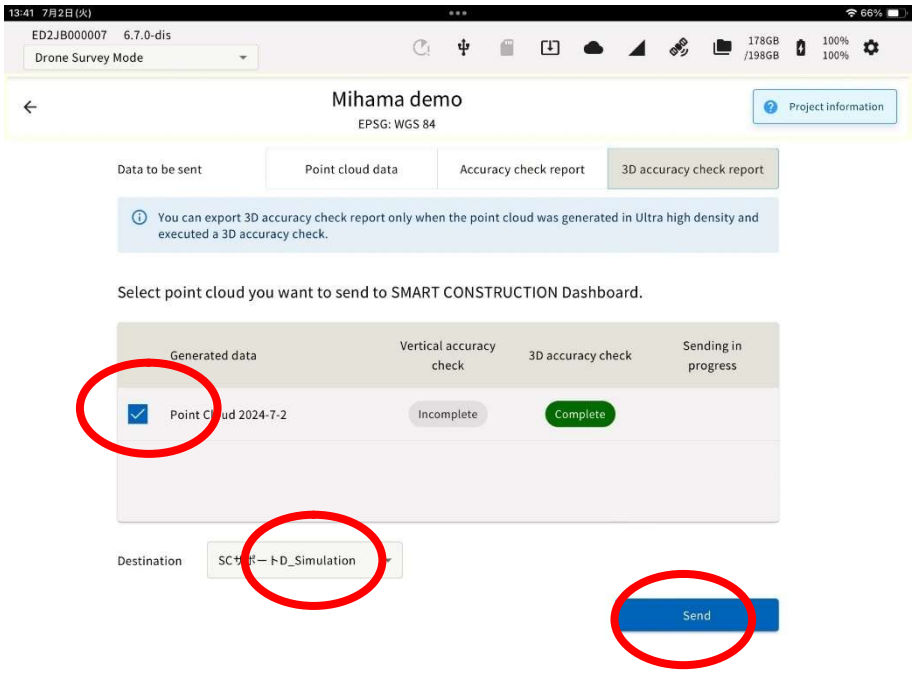
Select the data you want and tap Export to save the report to your USB.



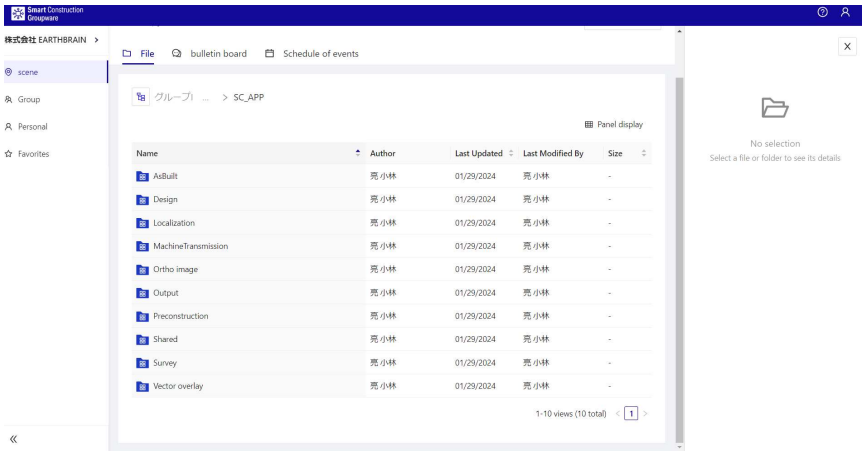
・Upload 3D accuracy report to Dashboard.

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

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



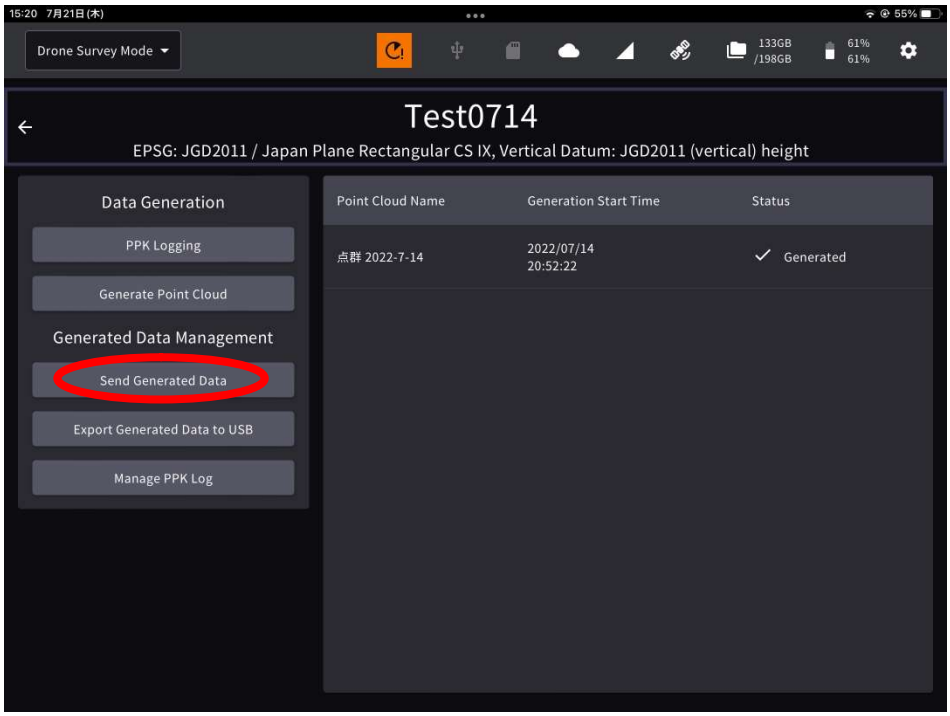
Groupware→In the SC_APP folder→It will be saved in the SCEDGE folder



Sending Point Clouds to a SMART CONSTRUCTION Dashboard

Before sending 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.

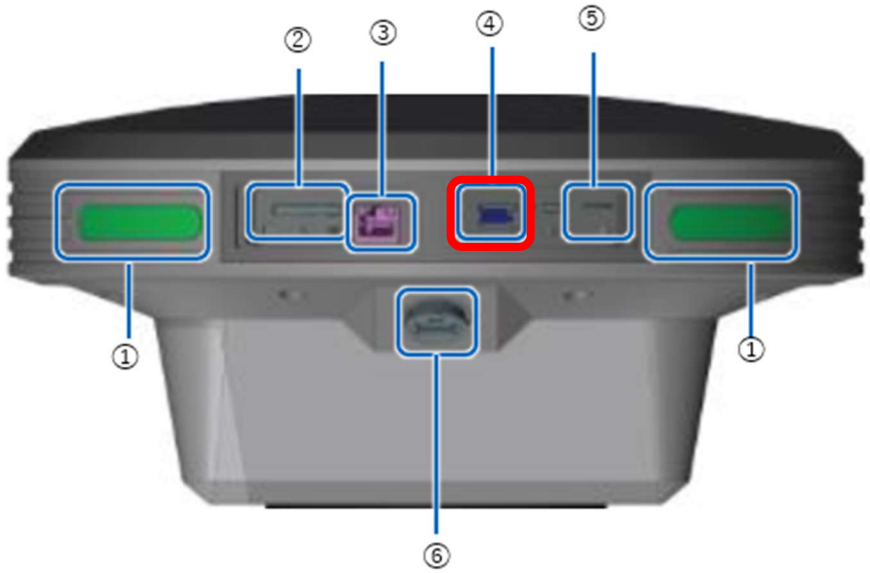
> Tips
> You can check the status of your message after it has been sent by tapping the icon on the status bar. You can also check the progress and cancel the submission on this screen.

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

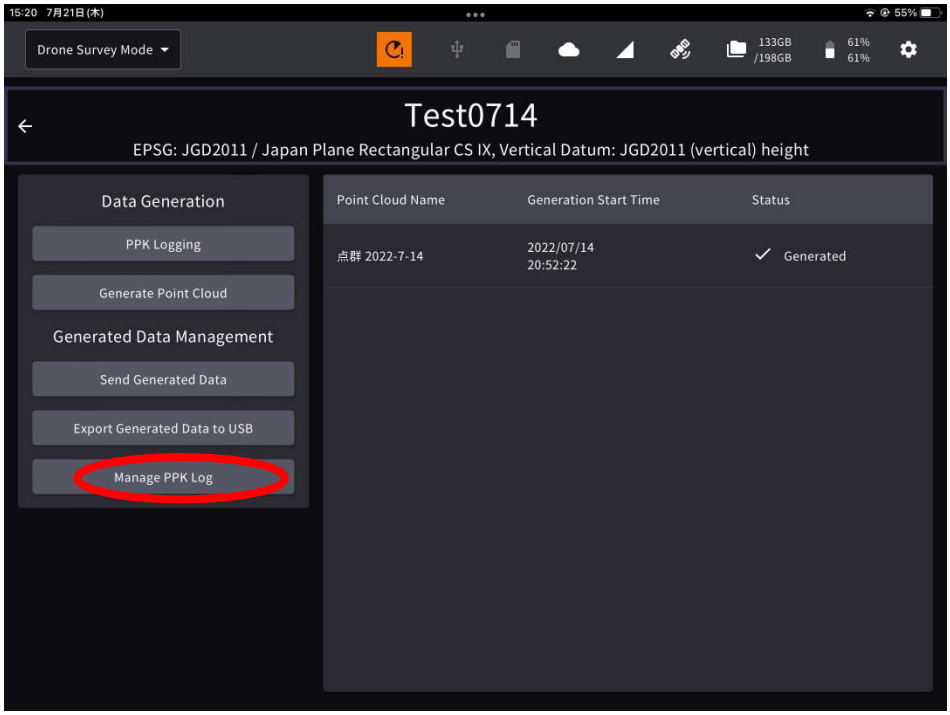
   Insert the USB memory into the USB3.0 port in the waterproof lid. The USB2.0 port outside the waterproof cover is for communication with the radio and cannot use for USB memory.



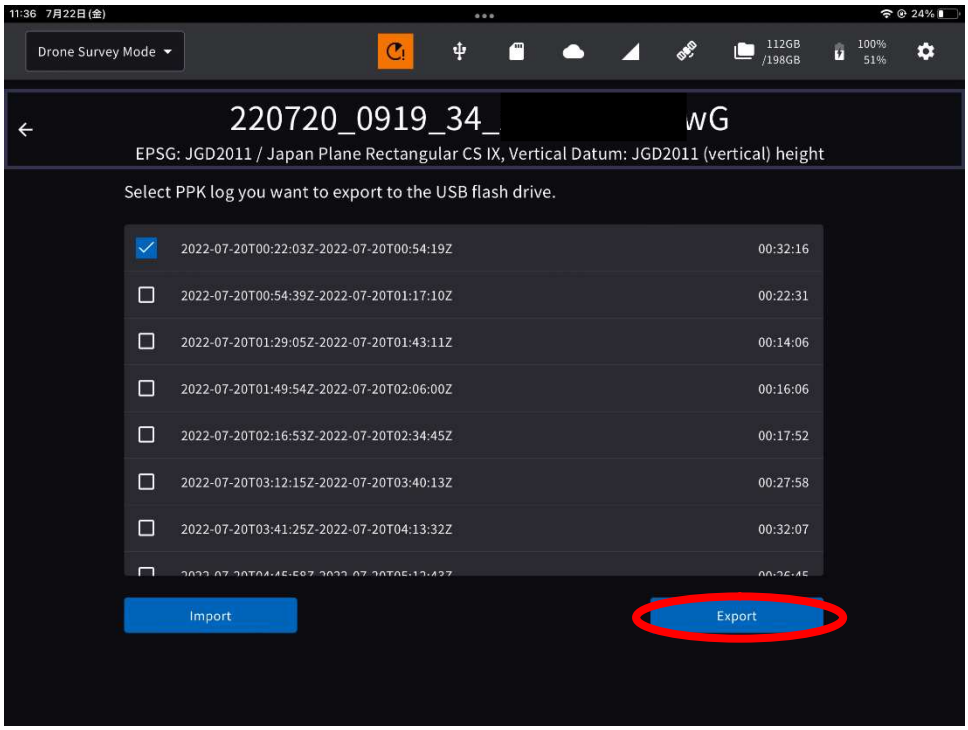
① Status LED
② SD card slot
③ Ether cable port
④ USB slot（USB3.0）
⑤ SIM card slot
⑥ Water-proof USB slot（USB2.0）: cannot use this slot for USB memory

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 export is complete.

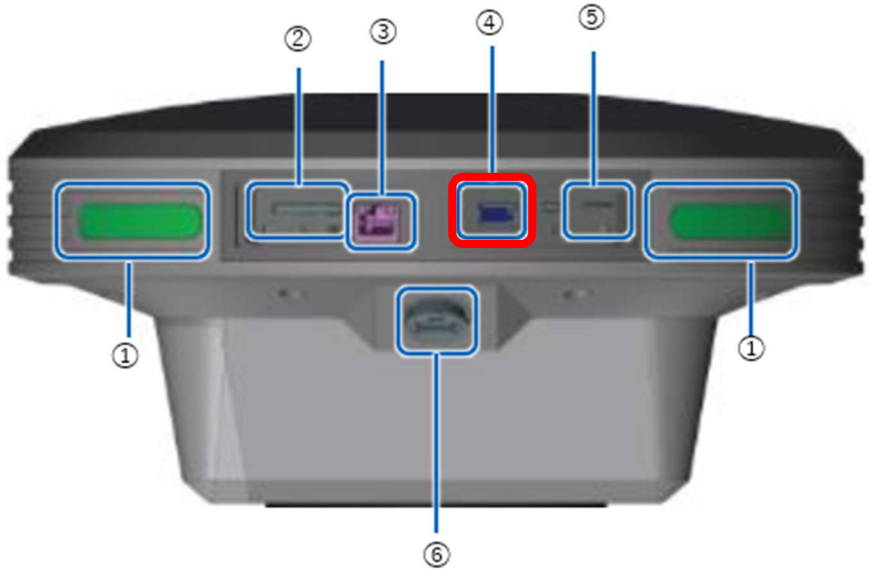
6. Remove the USB memory

   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

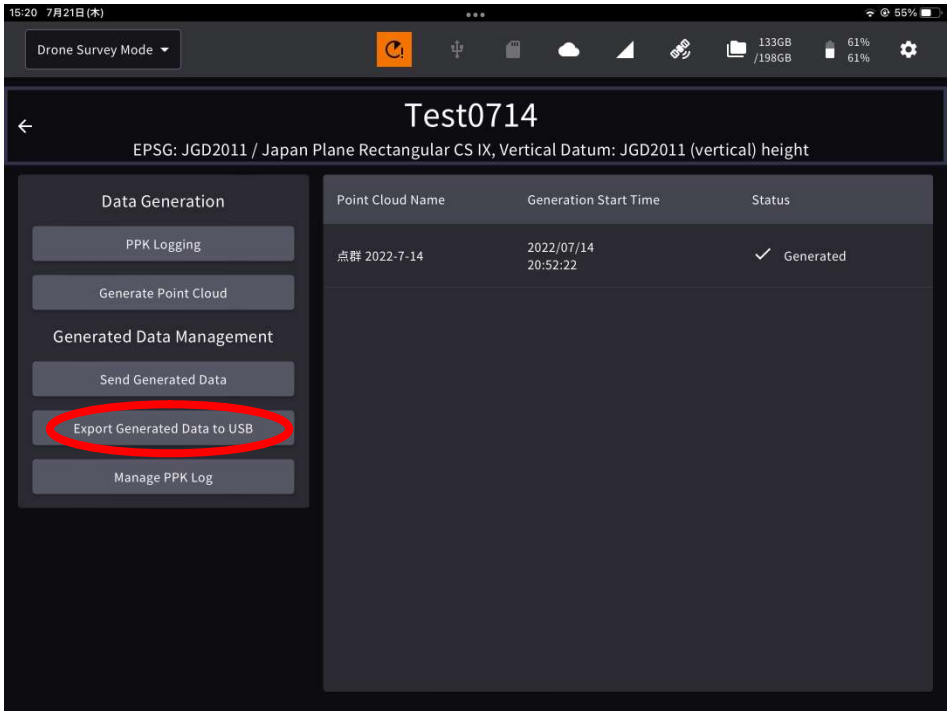
   Insert the USB memory into the USB3.0 port in the waterproof lid. The USB2.0 port outside the waterproof cover is for communication with the radio and cannot use for USB memory.



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

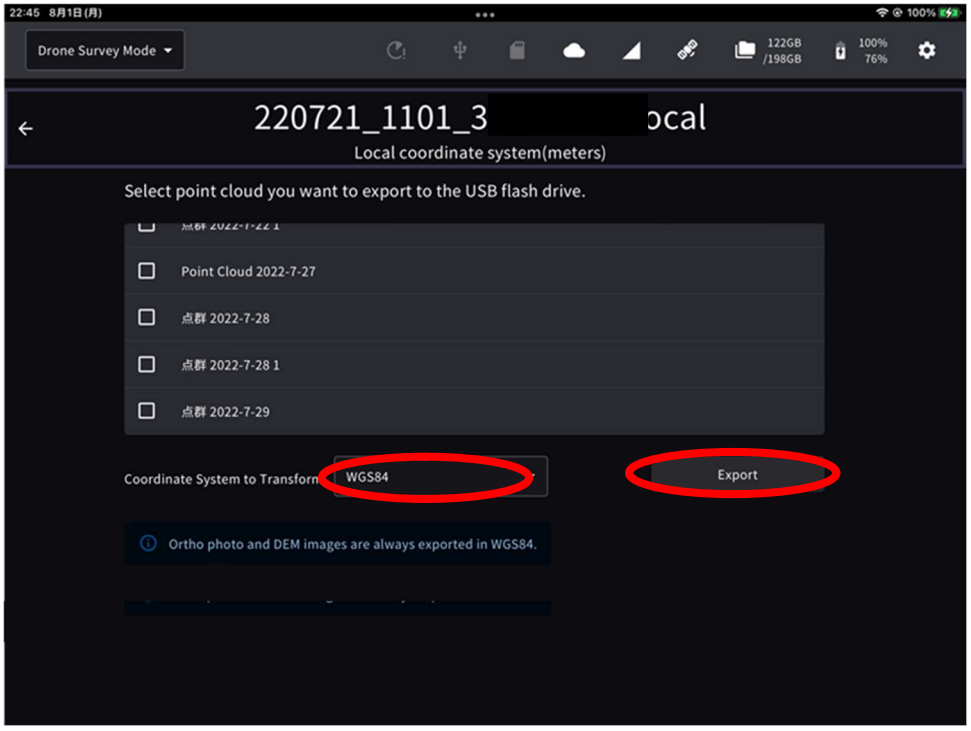
3. Tap “Export Generated Data to USB”



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

4. Tap the check box of the point cloud to export to USB 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.

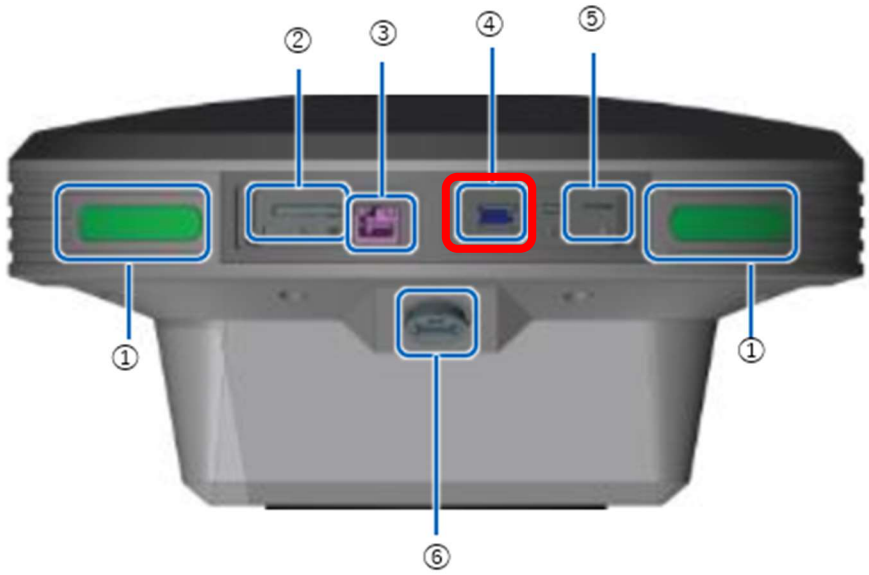
A dialog appears when the export to the USB memory completed.

Tips
For projects with local coordinate systems, only point cloud data is set up to correspond to the coordinate system. Ortho and DEM images are output in WGS84.

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.

Load GNSS logs

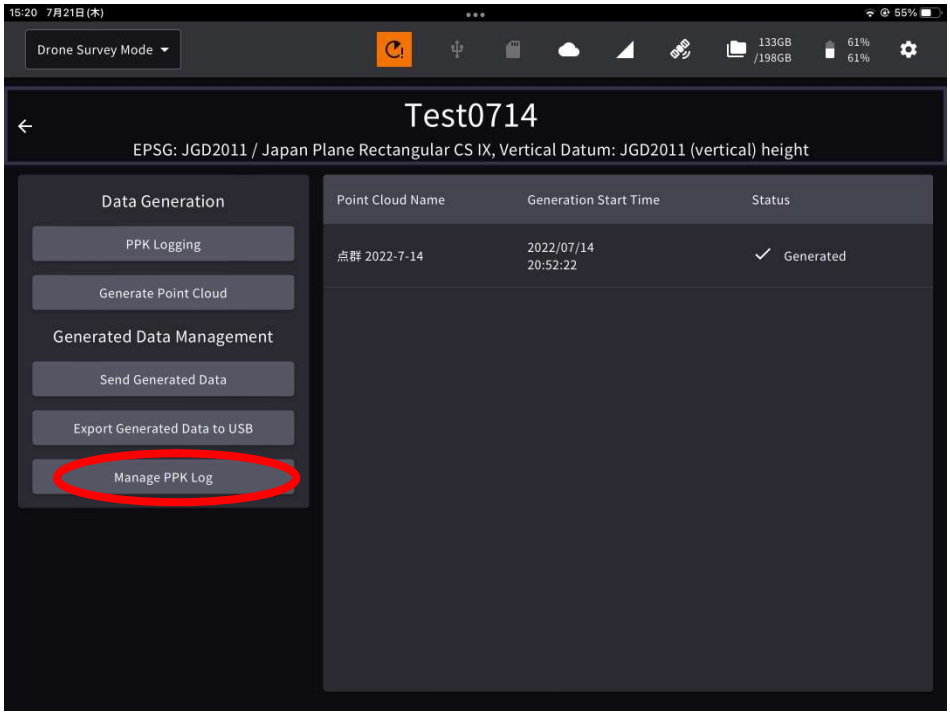
1. You can load GNSS logs from one EdgeBox to another.
2. Insert a USB memory containing data from a EdgeBox
   Insert the USB memory into the USB3.0 port in the waterproof lid. The USB2.0 port outside the waterproof cover is for communication with the radio and cannot use for USB memory.



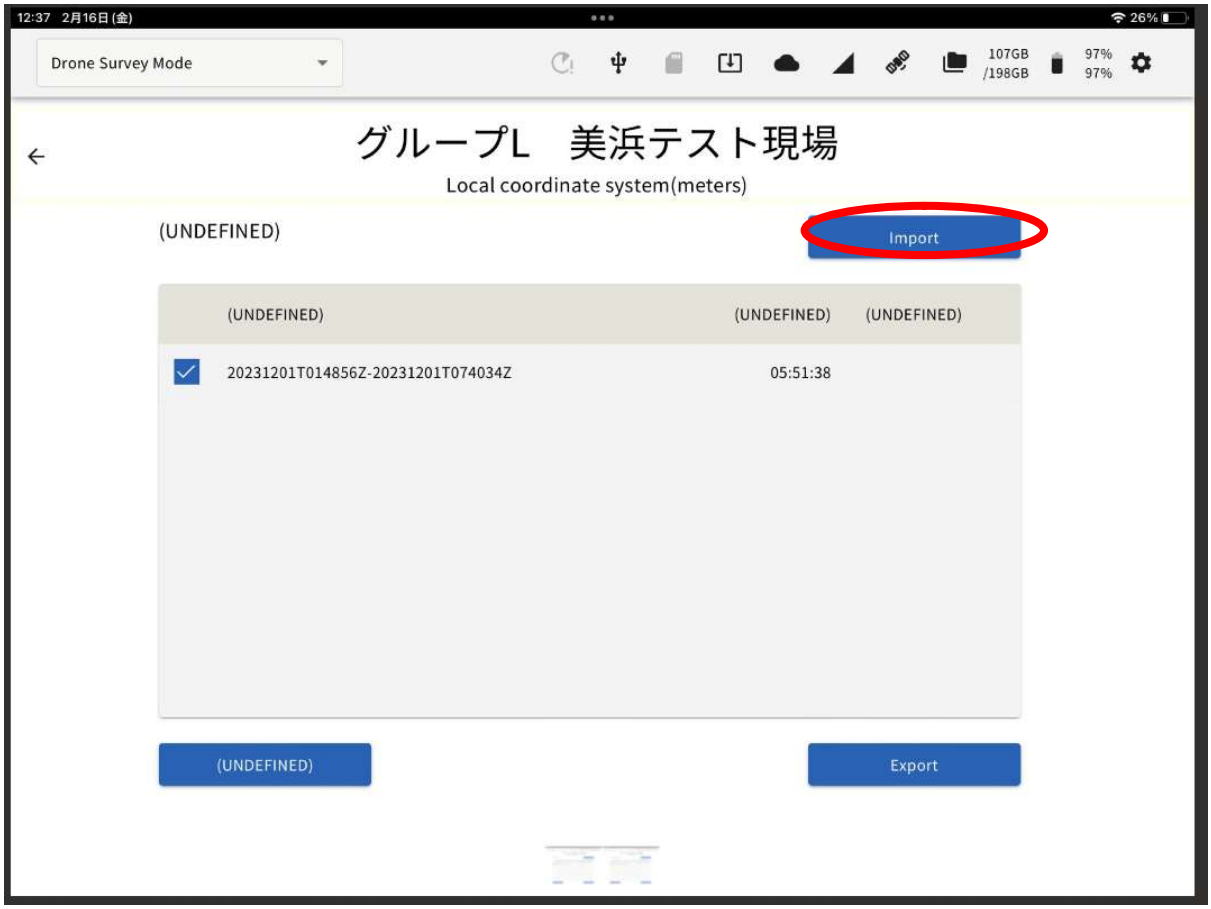
① Status LED
② SD card slot
③ Ether cable port
④ **USB slot（USB3.0）**
⑤ SIM card slot
⑥ Water-proof USB slot（USB2.0）: cannot use this for USB memory

3. Select a project to import logs from.

4. Tap “Manage PPK Log“

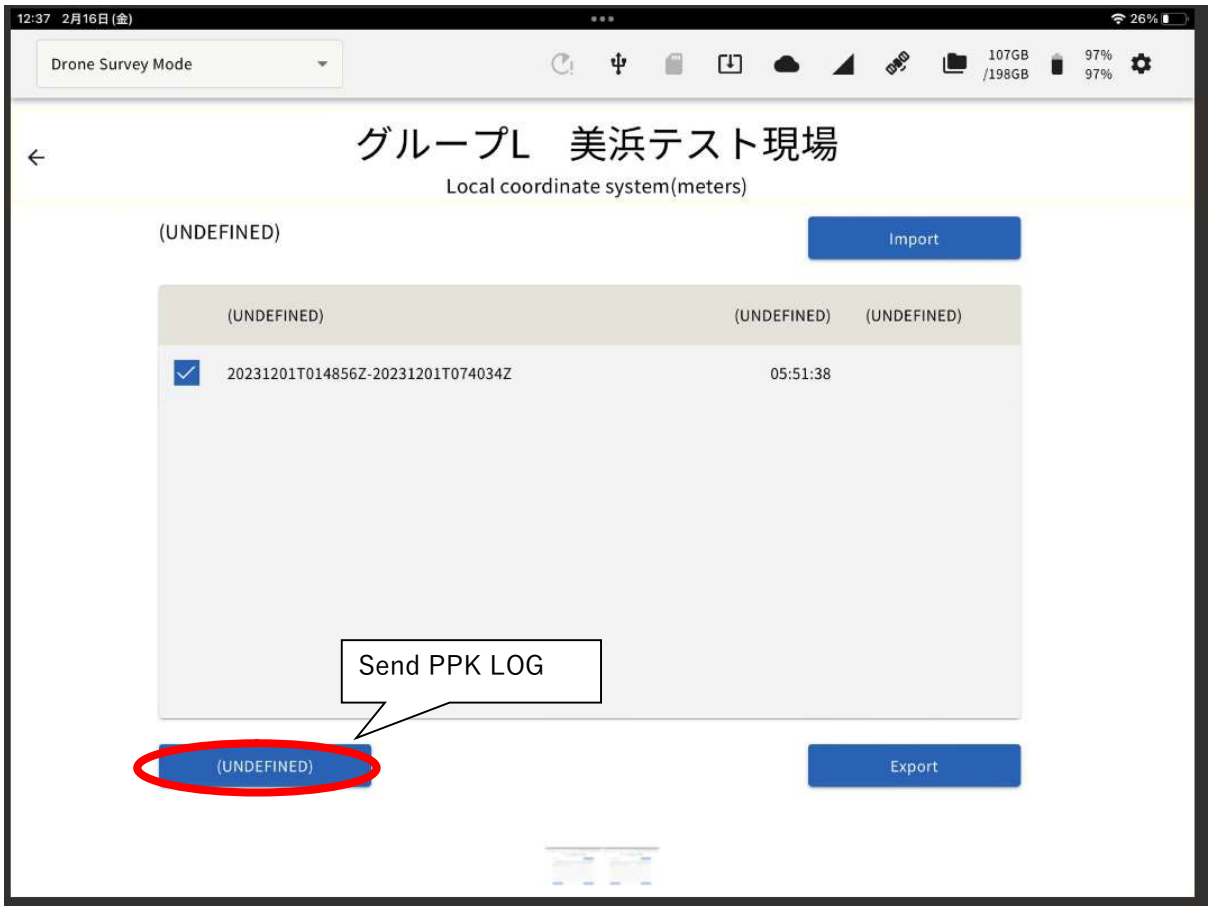


5.
6. Tap “Import“.



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

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 the 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

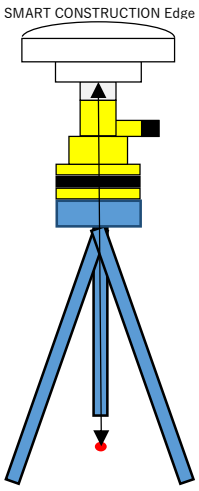
> ⚠ CAUTION
> The main unit should place a stable, flat place.
> If it was placed at unstable place, it may be dropped and cause a damagre or a breakage.

IMPORT FROM A CSV FILE

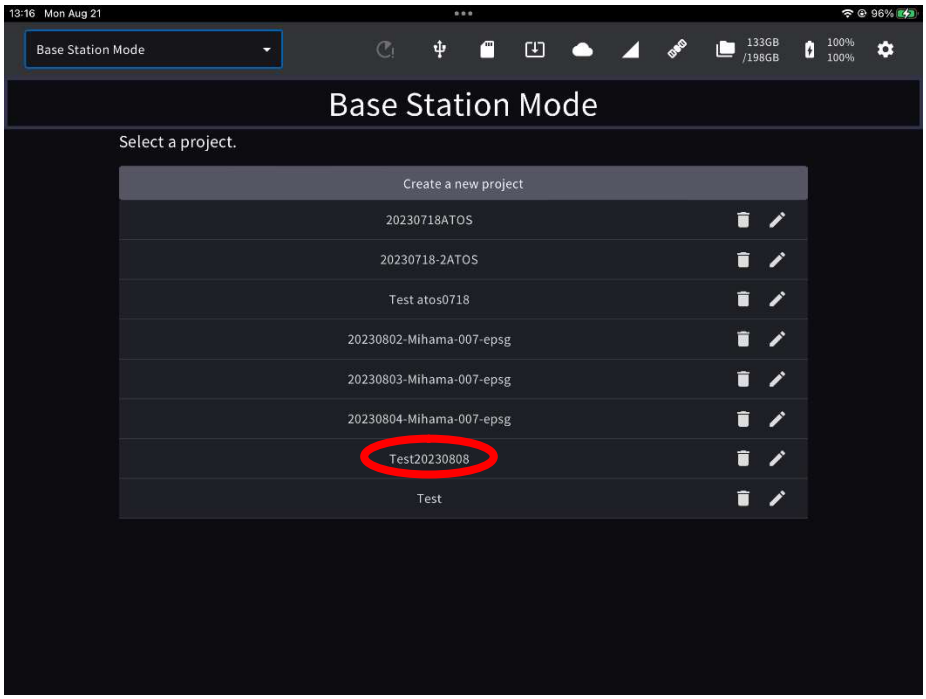
1. Align the Edge Box horizontally above the surveyed base point using the levelling device on the top of the tripod.

> ⚠ WARNING
> Always wear a hard hat during the work.
> If you dropped 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”



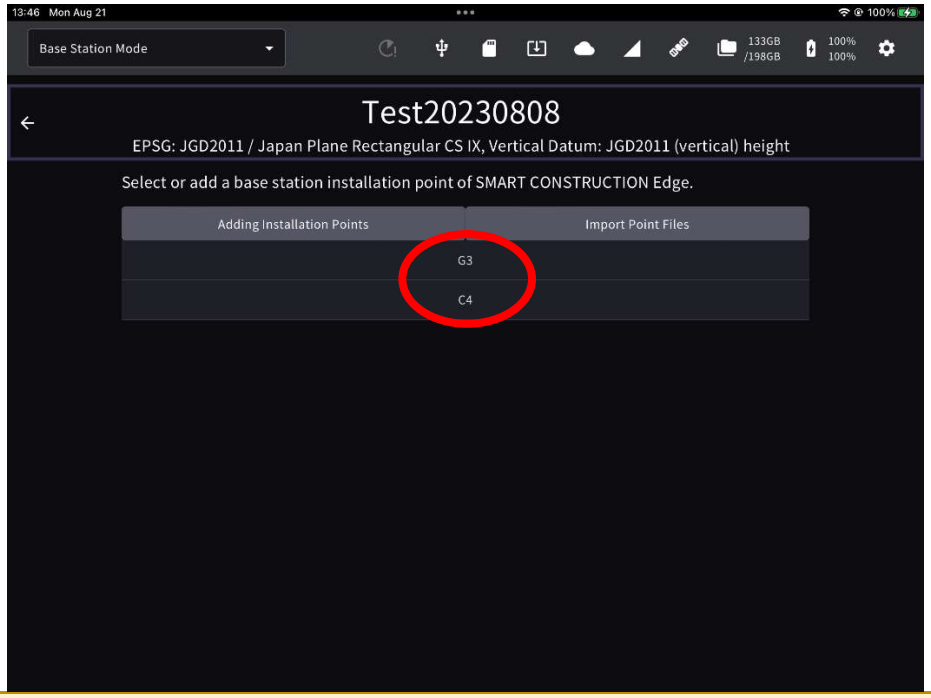
4. Launch the tablet app and select a project of the work site to broadcast.



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

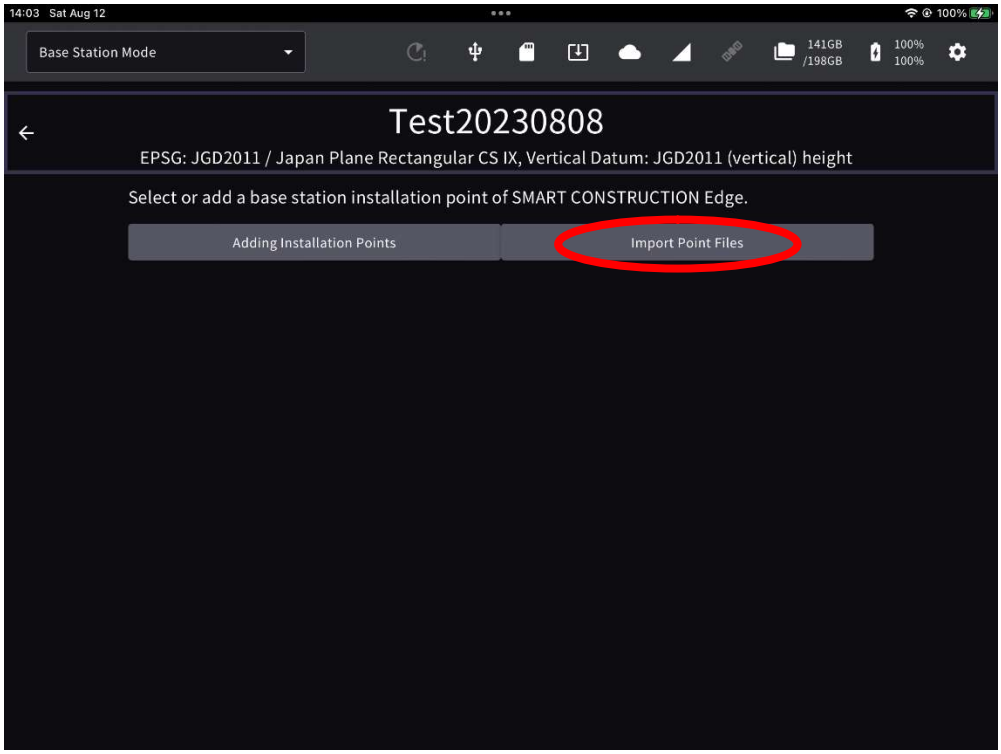
> Tips
> Projects and points added in the drone survey mode are also listed.

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

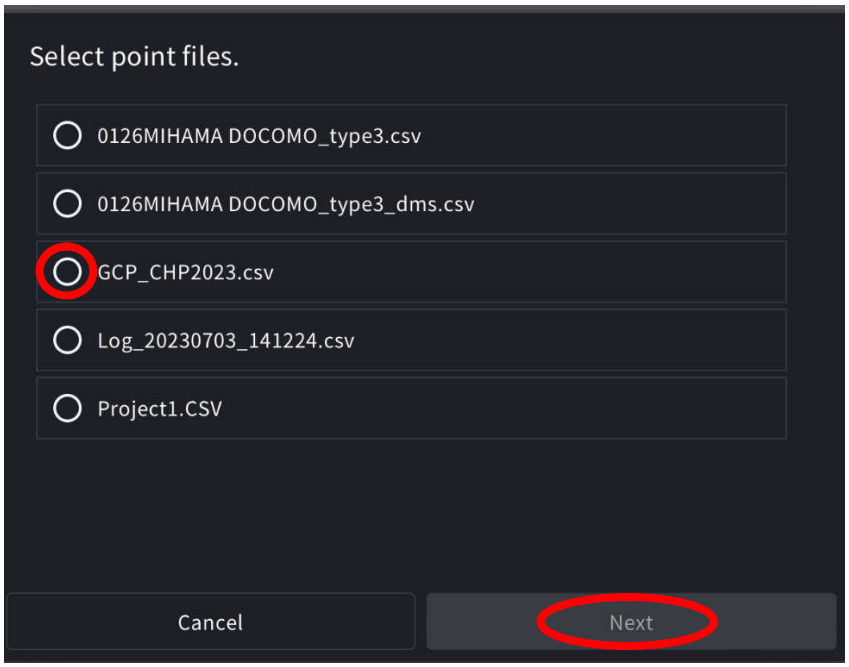


> Tips
> If you set the EdgeBox on one of these points, you can just tap it to select it. (If not, go to 5.)

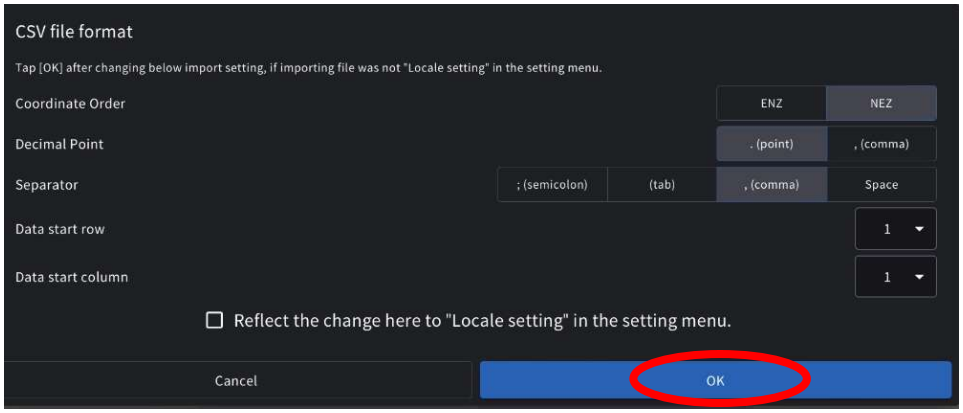
6. Tap "Import Point Files" to open the file.



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



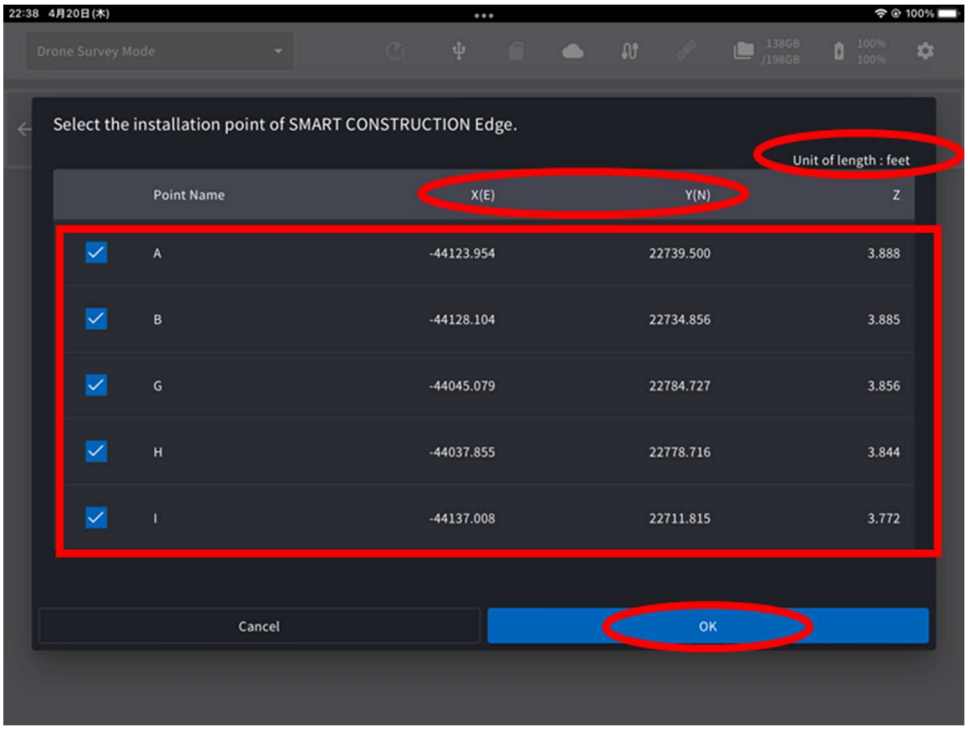
Please select the parameters of your point file.



Please prepare the point file in advance.

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

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

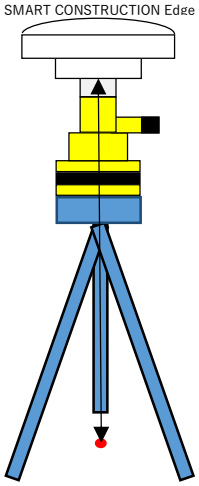


INPUT MANUALLY

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

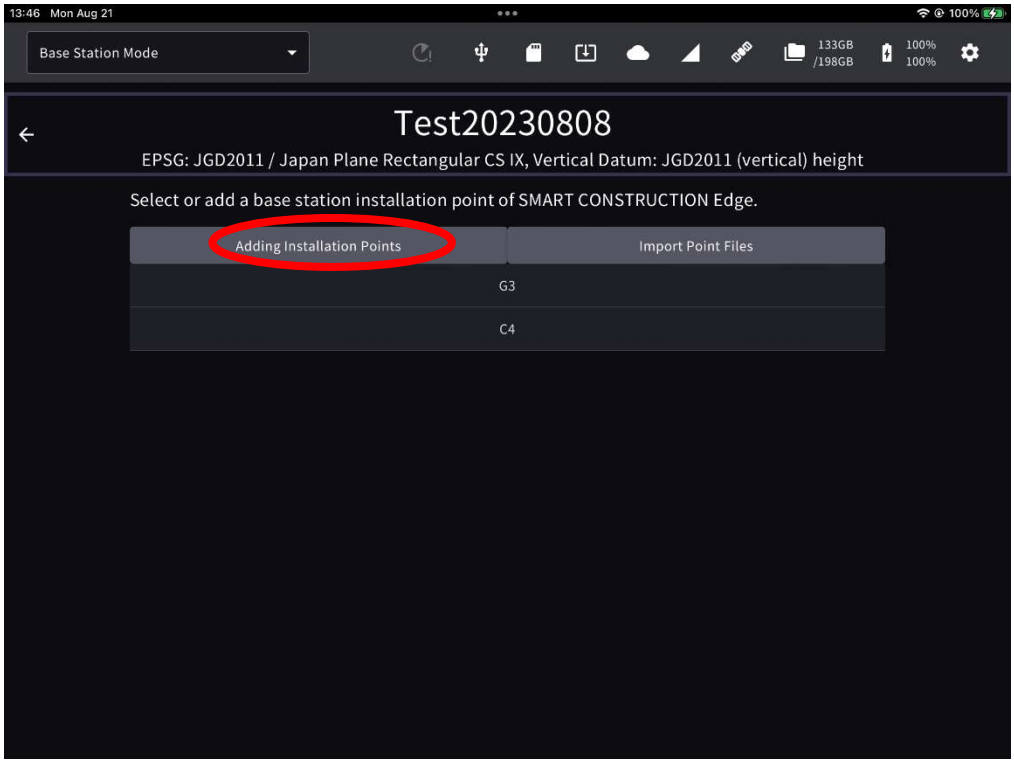
2. Measure the height from the base point to the bottom of the EdgeBox
   Enter this height as the “pole height” later.



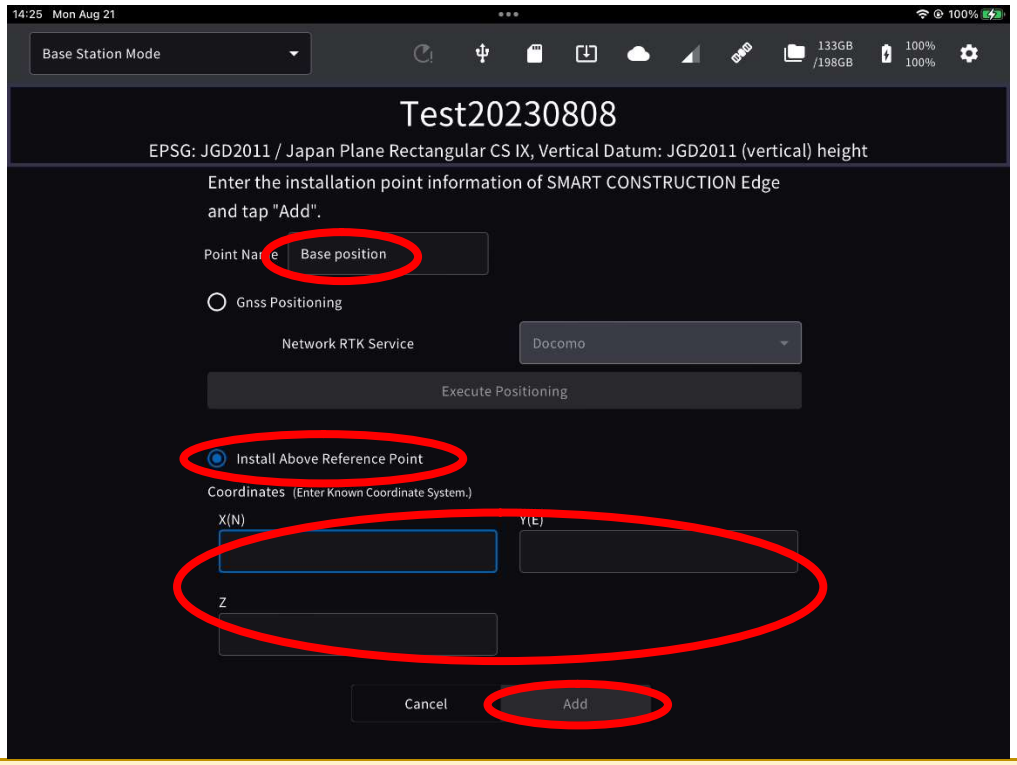
3. Launch the tablet app and select a project of the work site to Broadcast.
   If the project was not listed, create a new project. For details, please see p.18.

> 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

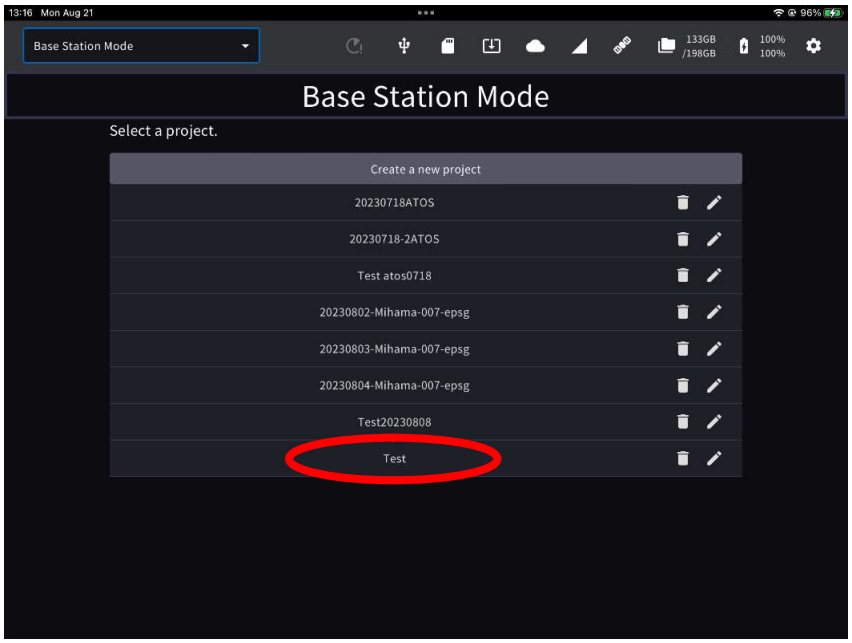
Important!
RTK correction data distribution from points added using Network RTK is not recommended because it is less accurate.

Tips
To use Network RTK, 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.

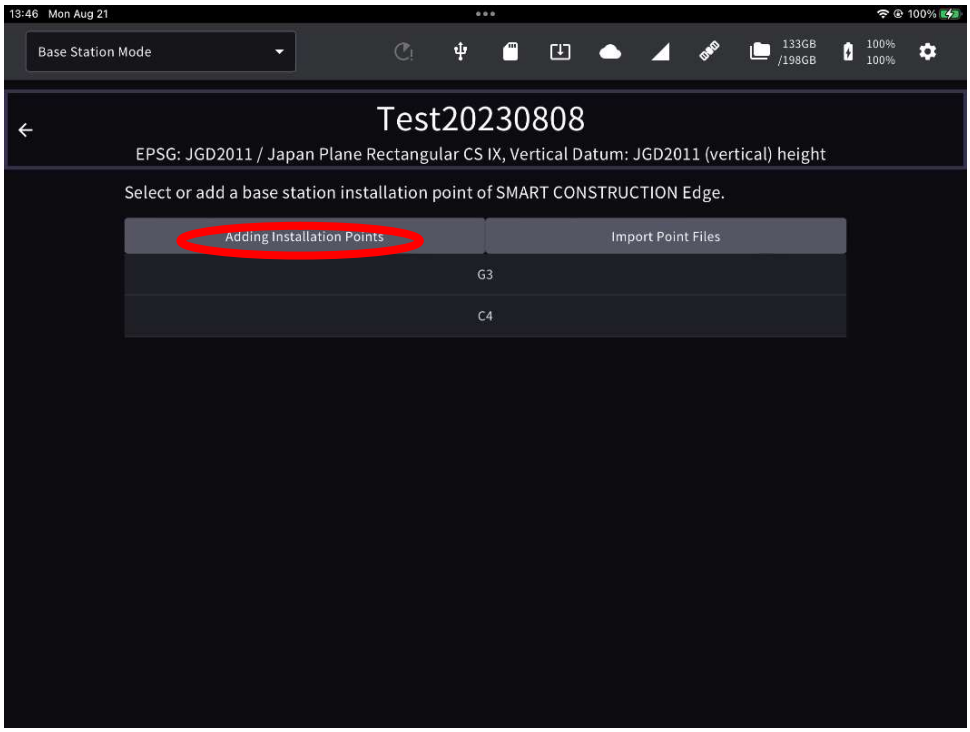
⚠ CAUTION
The main unit should place a stable, flat place.
If it was placed at unstable place, it may be dropped and cause a damagre or a breakage.

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

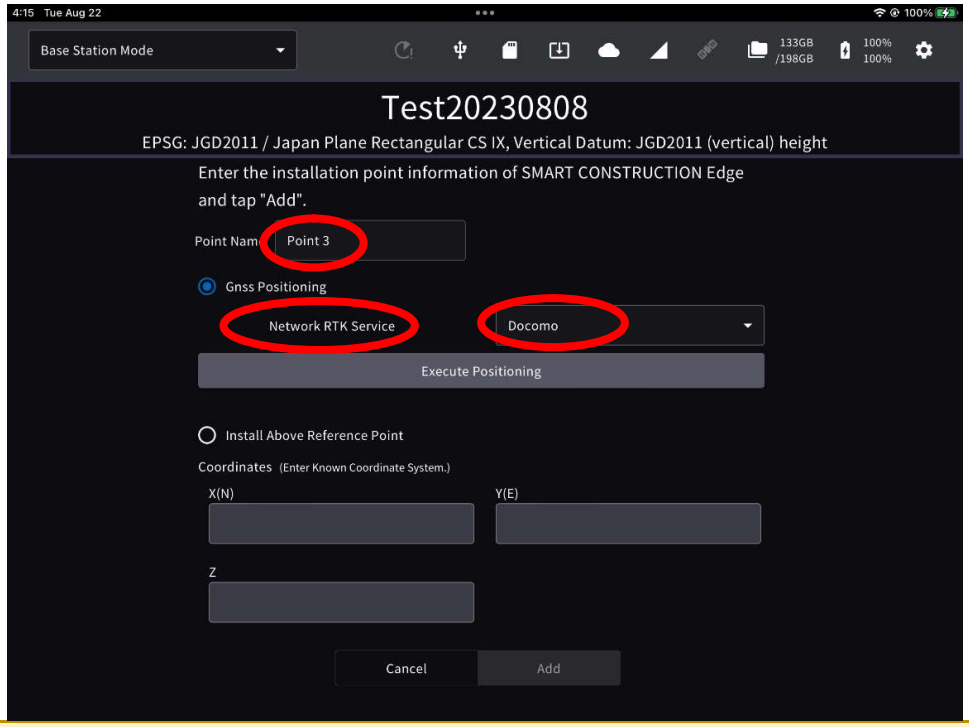


If the project is not listed, create a new project. Please see P.18.

3. Tap "Adding Installation point" to open the file.
   A list of the points that you have set in the past will displayed.

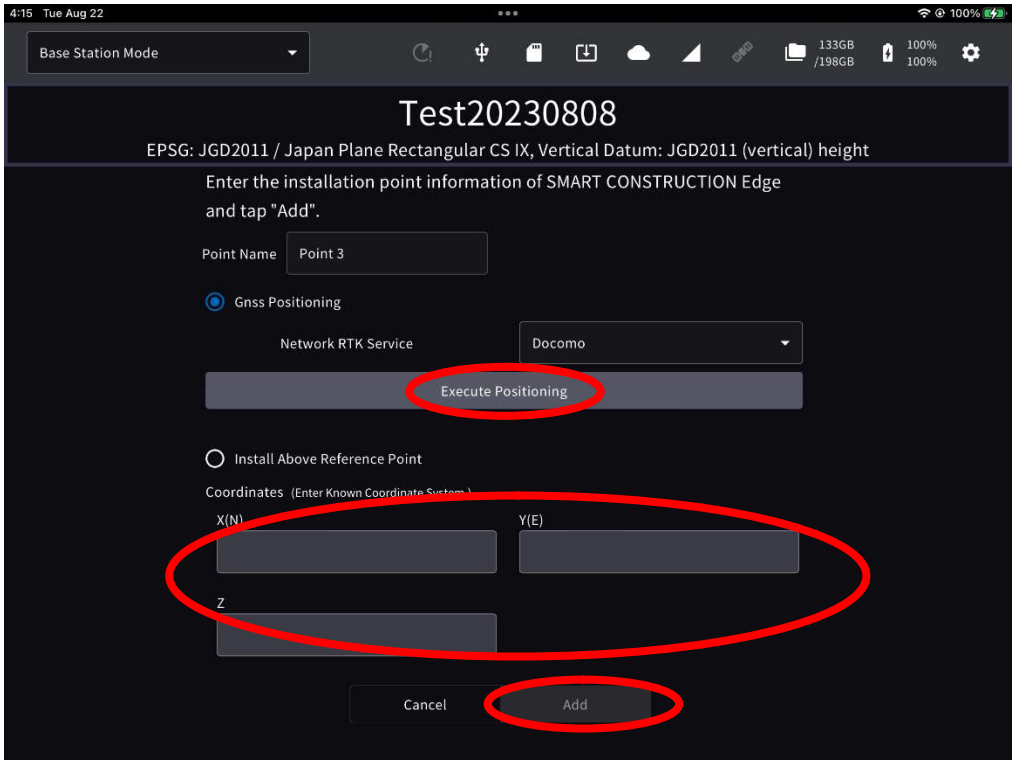


4. Tap “GNSS positioning” . Enter the point name and select the “network RTK service” from the drop-down menu.



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,81 to add the service.

5. Tap “Execute positioning” to start network RTK Positioning.

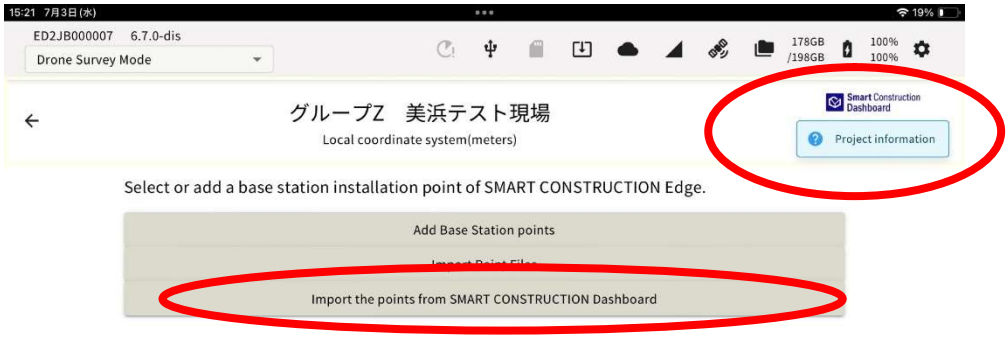


When the positioning was completed, coordinates are automatically entered to the fields.

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

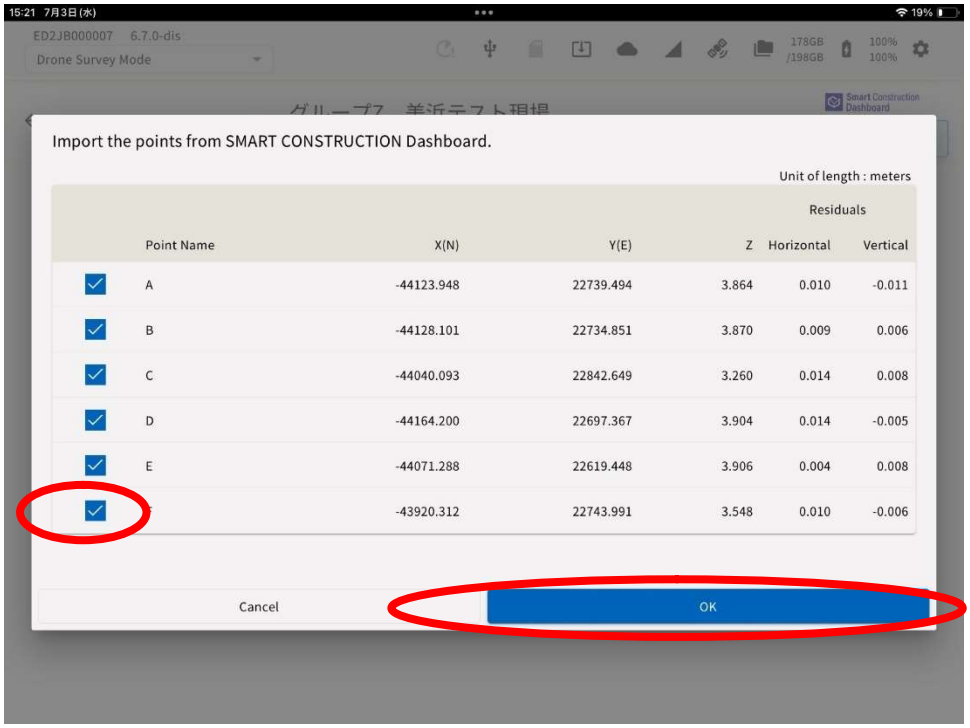
· INHERIT POINTS FROM DASHBOARD

If the project is linked to the Dashboard site, the coordinate 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 point and press OK.



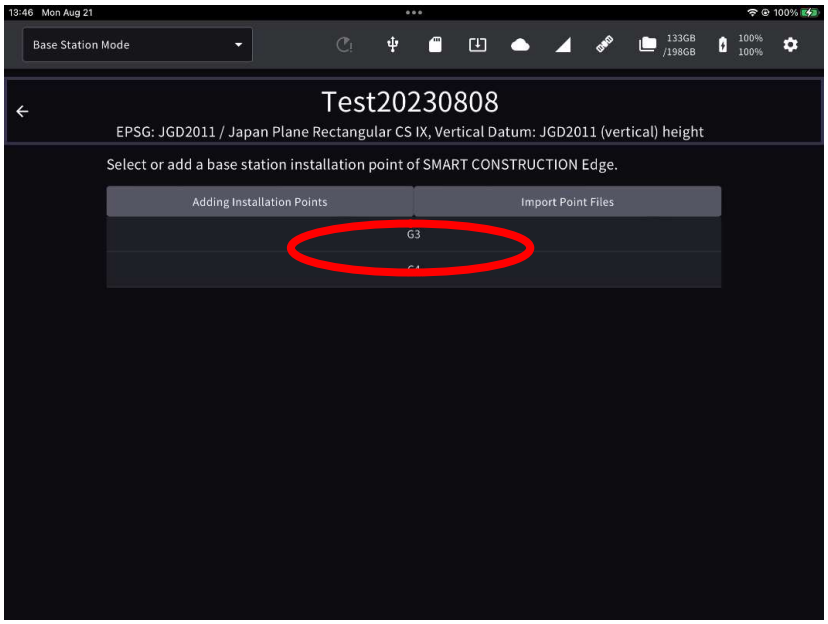
Broadcast RTK Correction Data

USING NTRIP SERVER

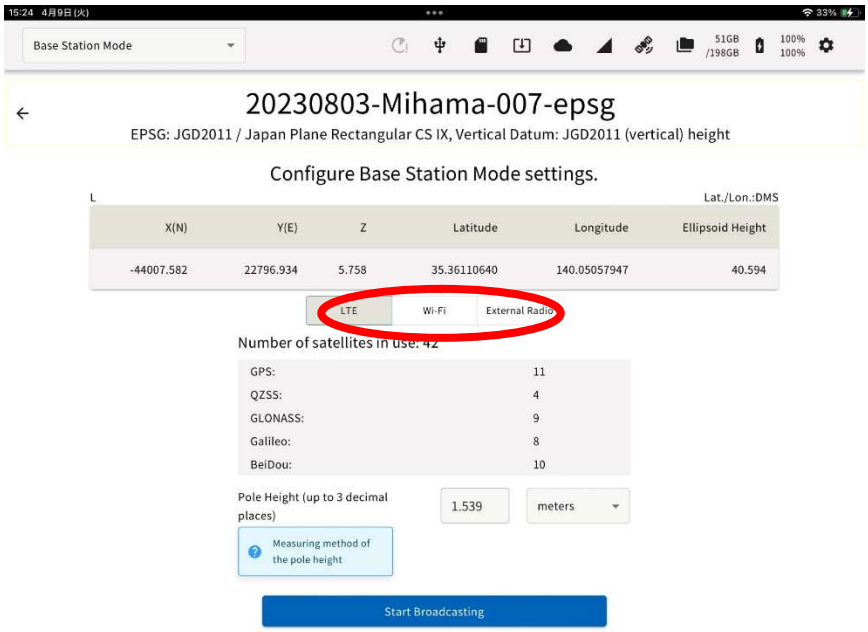
It is possible to broadcast correction data by connecting ICT construction machines and GNSS rovers which can be connected, and EdgeBox via Ntrip server.

> Tips
> To Broadcast RTK compensation data via Ntrip server, you must have LTE contract and APN setup in advance. Akso require the LTE connection in the field.

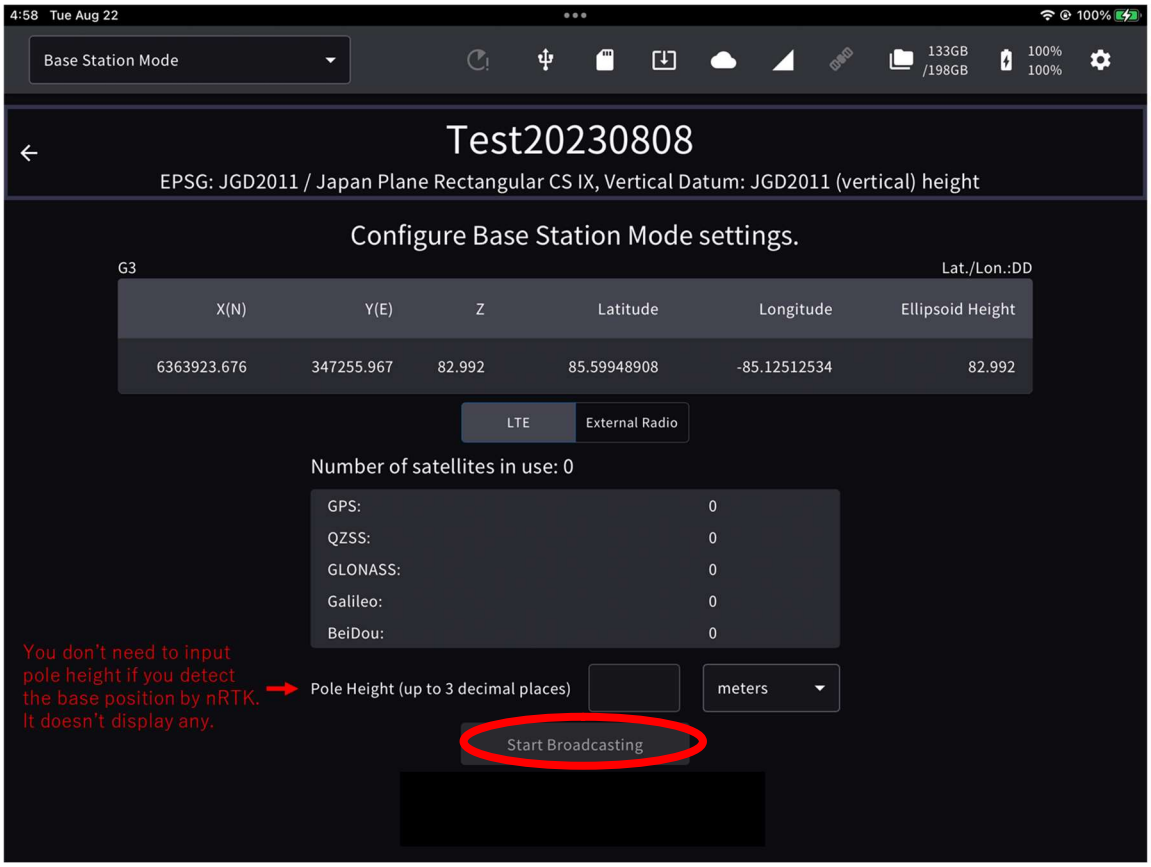
1. Select the base position from the list.



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



2. Make sure “LTE” 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 measure the antenna height.

3. Configure the NTRIP setting of receiver (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

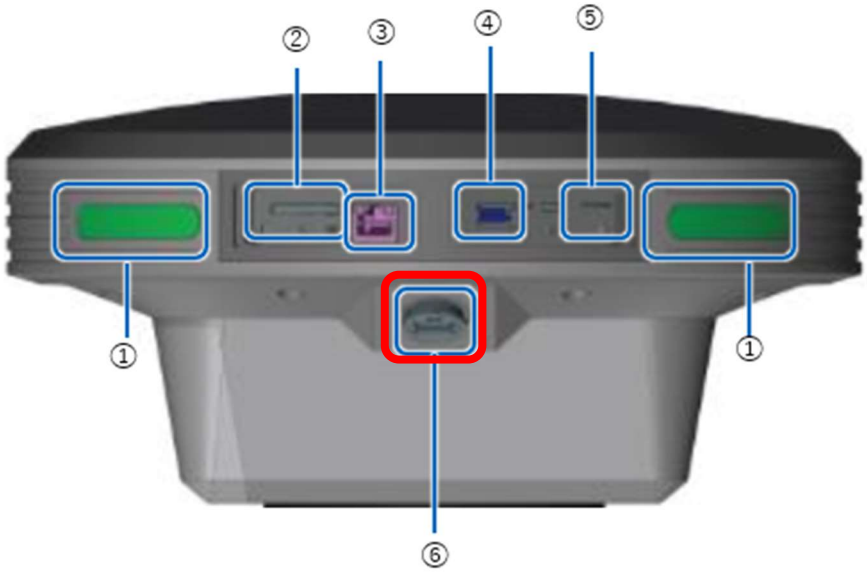
   ★★

> 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.

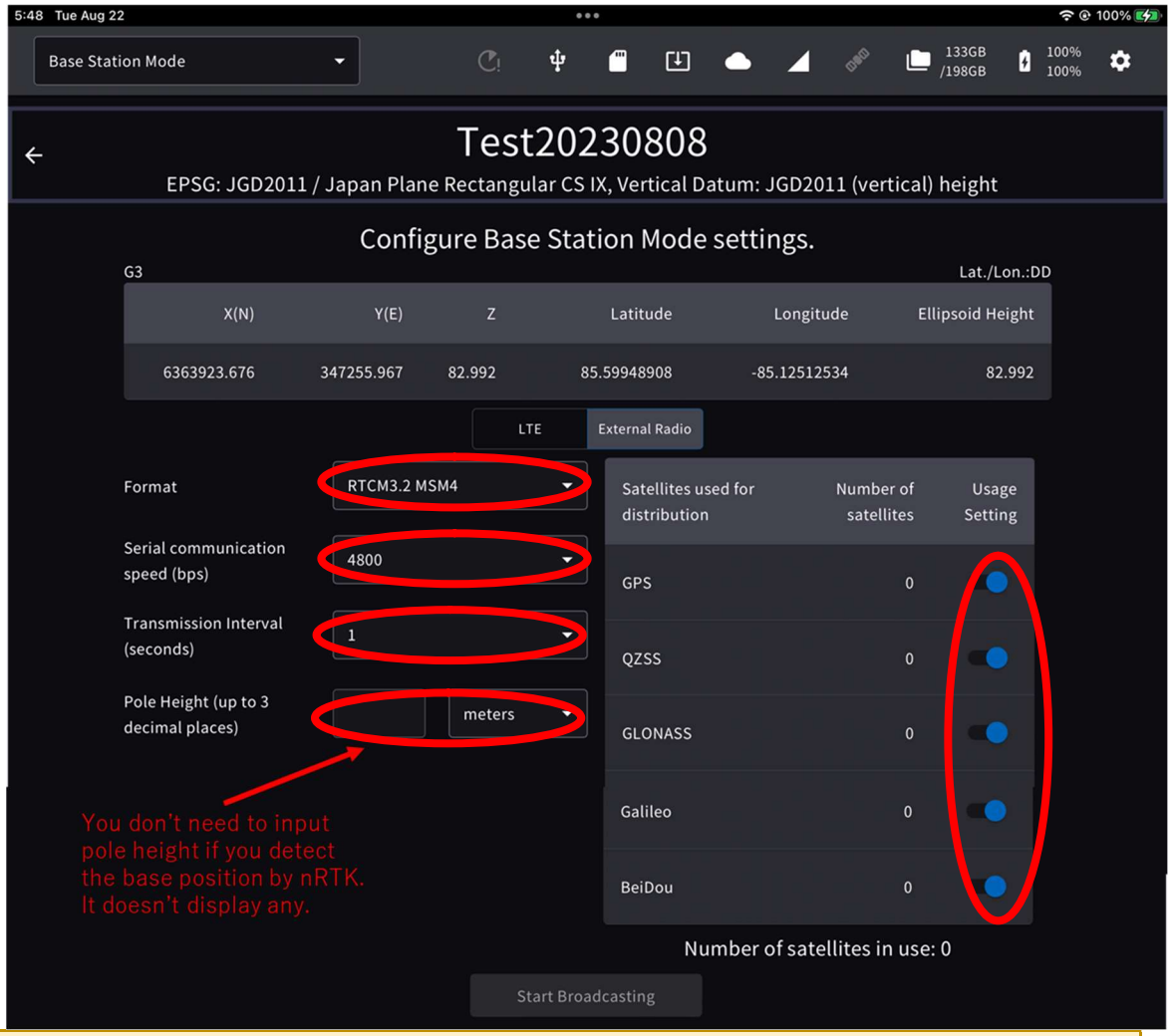
1. Connect the external radio to the EdgeBox using the Conversion Cable. (attached USB-Serial conversion cable)



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.

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



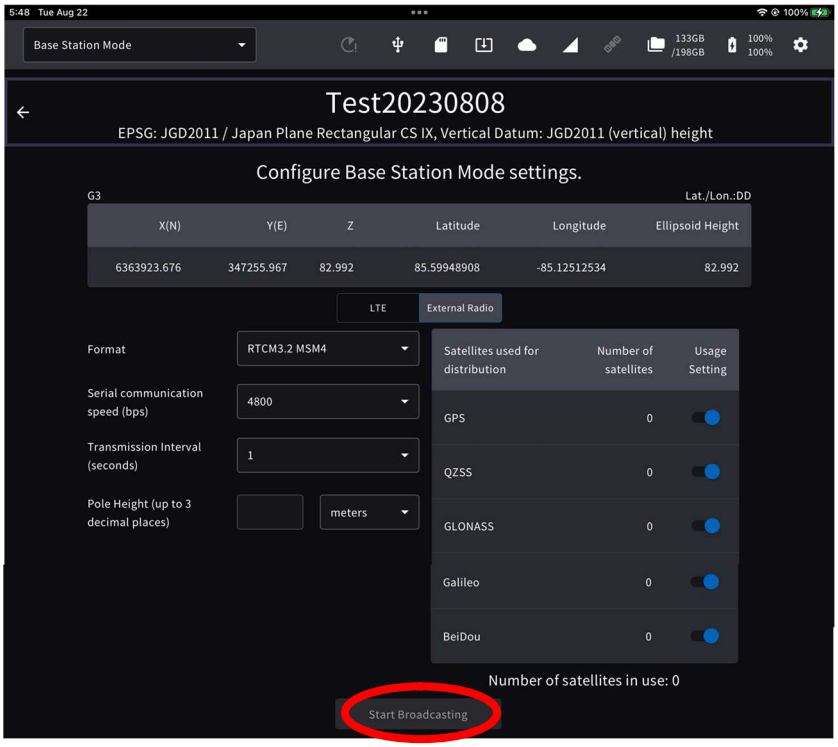
Tips

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 in the "Active constellations" setting in the settings screen on the upper right of the tablet application. Please see P.80

Also, the Active constellations cannot be none.

4. Tap “Start Broadcasting”

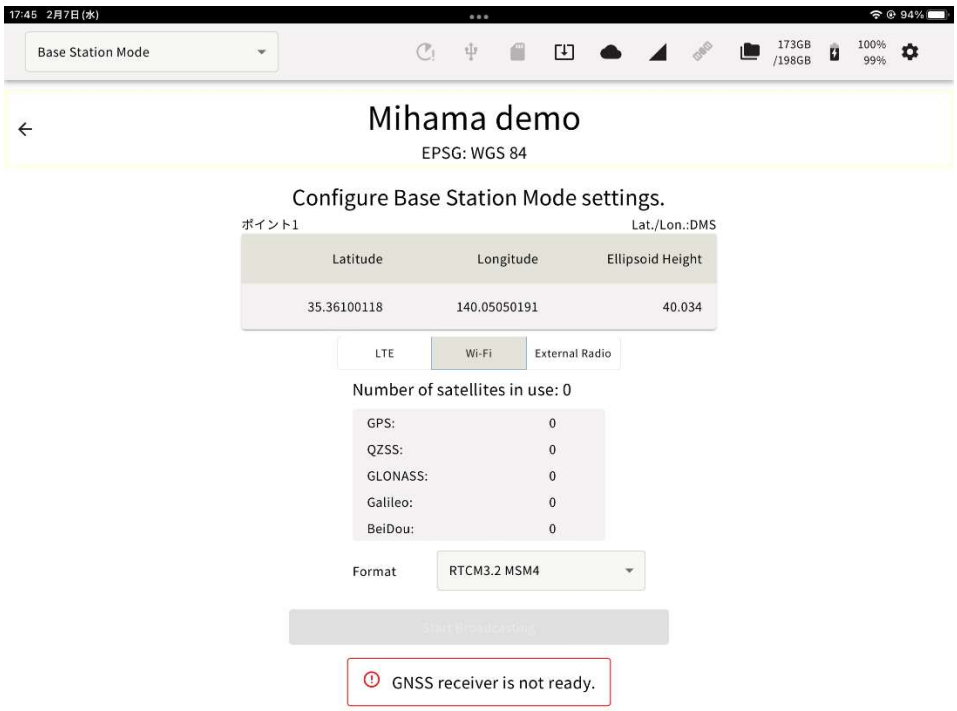


When you want to stop broadcasting, tap “Done”

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

5. Configure the NTRIP setting of receiver (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

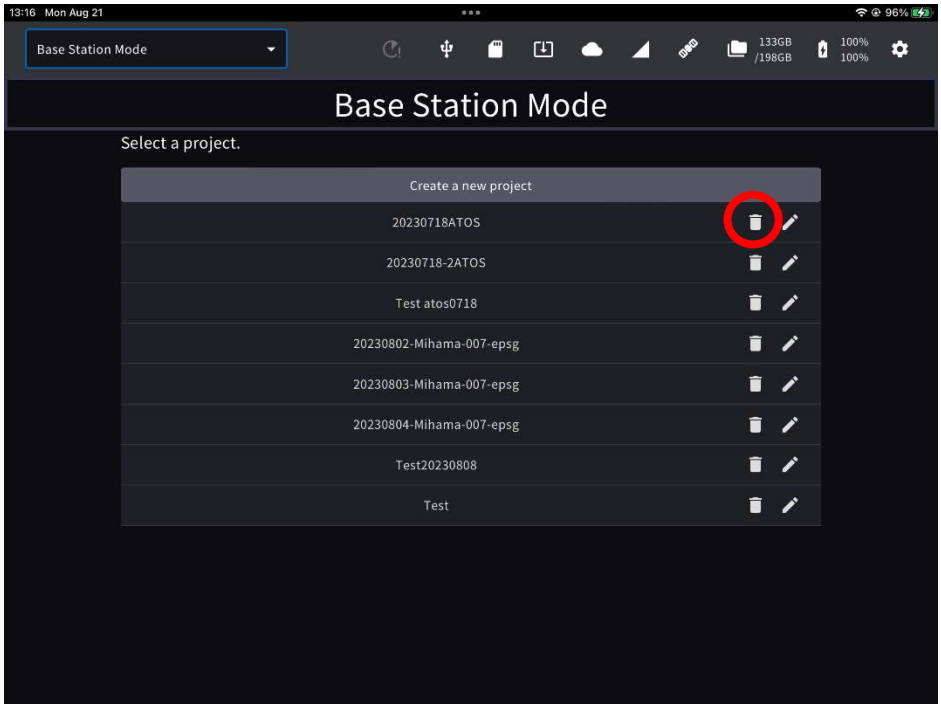
Setting up reference points, broadcast, setting pole heights, etc., are the same as other procedure.

DELETE DATA

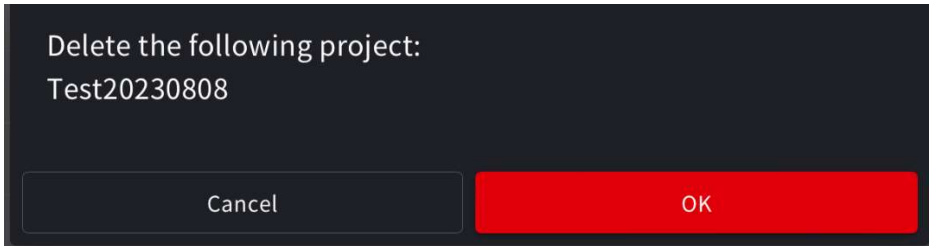
Data in EdgeBox can be deleted in two ways:

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.

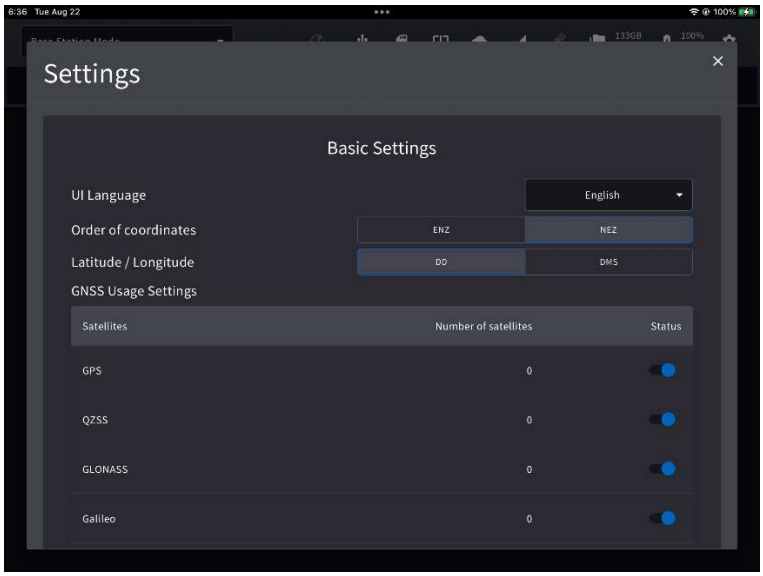


3. Tap "OK" in the confirmation dialog.

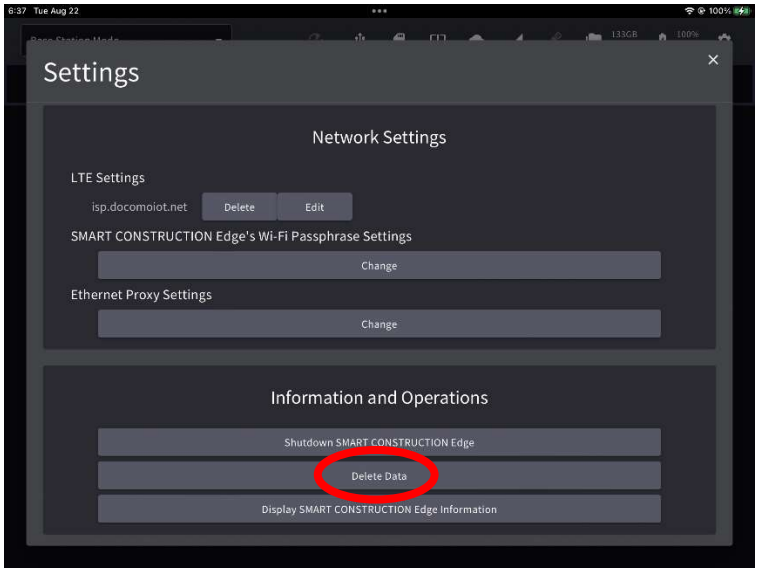
> Tips
> When you delete data in this way, all data associated with the project are deleted.

Select and delete data

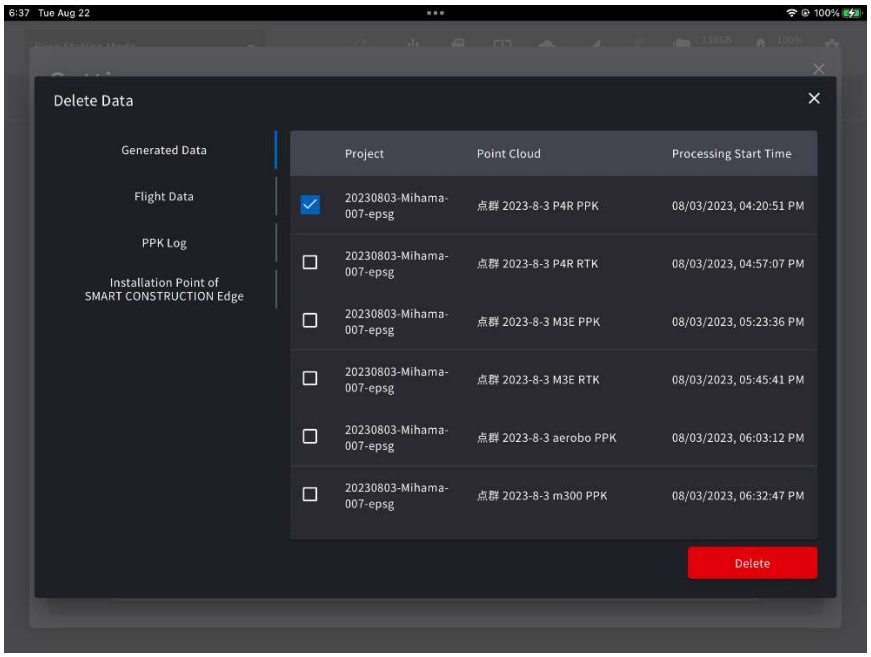
1. Tap the Settings icon in the upper-right portion of the tablet app.
   Go down to the bottom of the page.



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

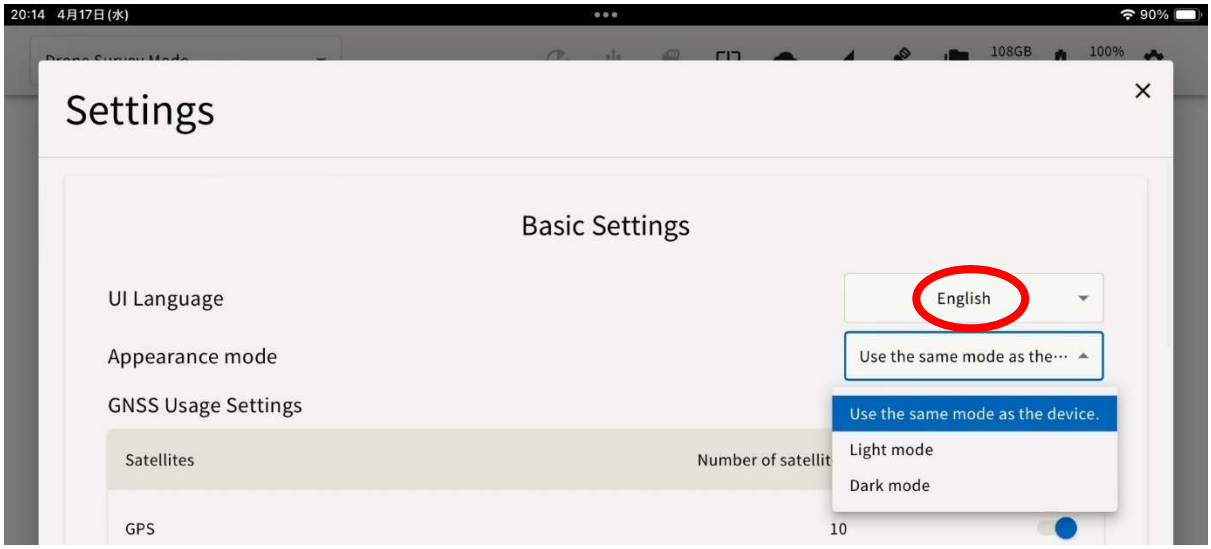
Tips
In the left-hand tab, you can select the type of data to delete:
・ Generated data
・ Imported flight data
・ Captured PPK logs
- Base station position data

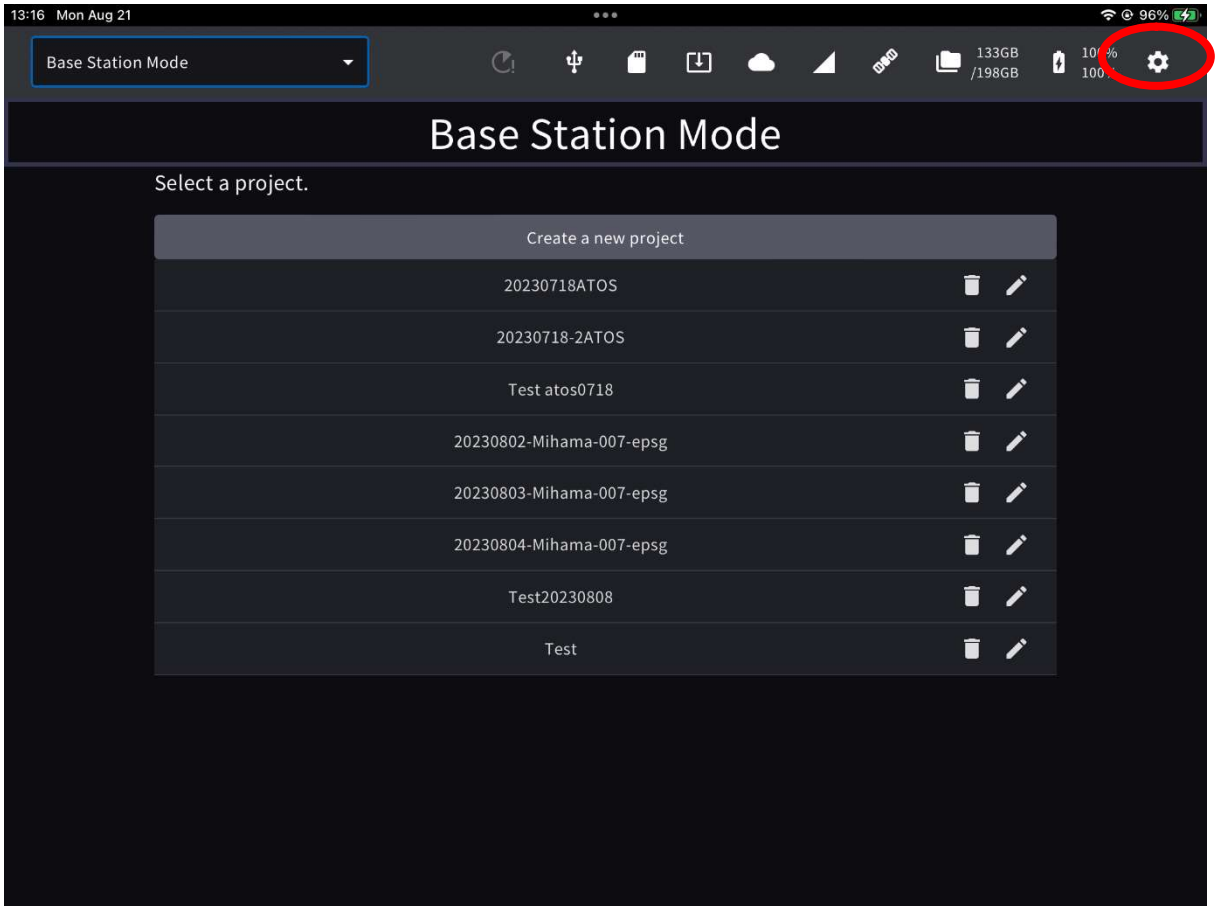
BASIC SETTING

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

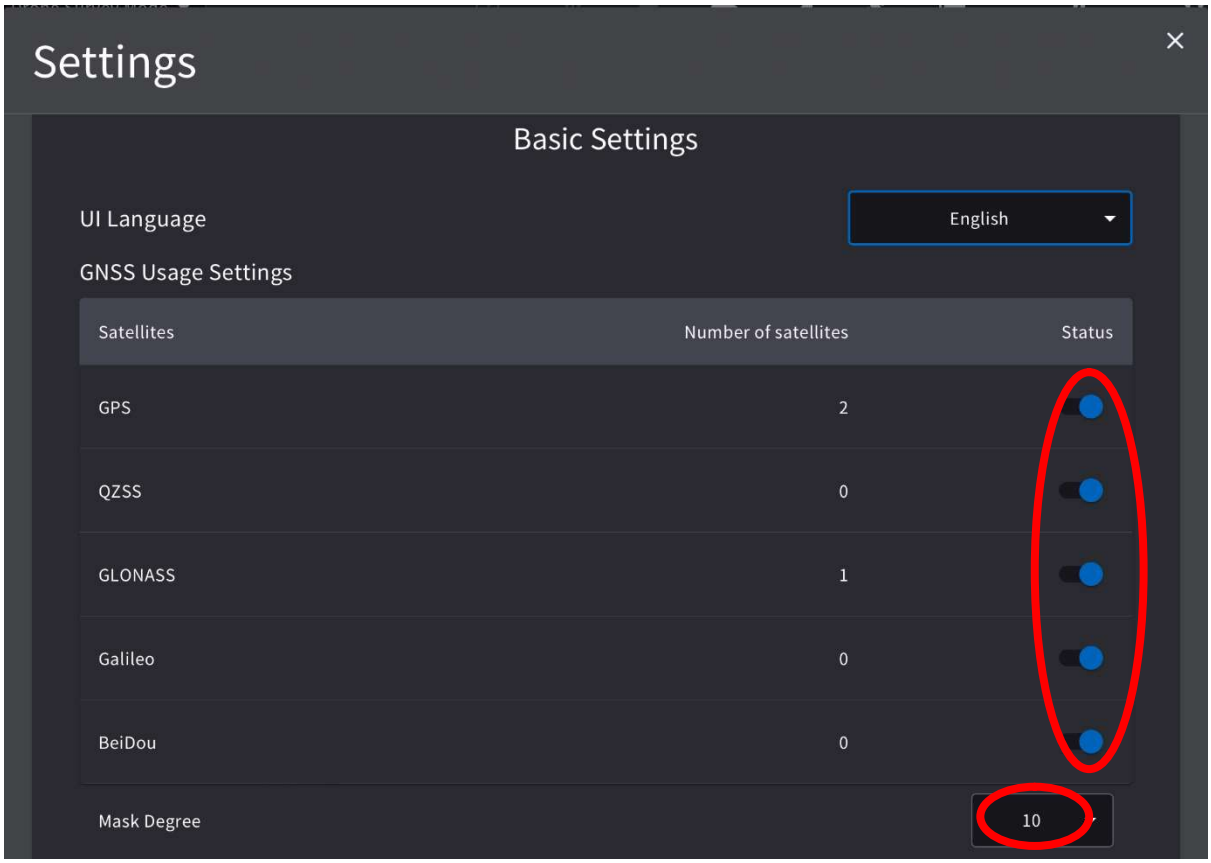
You can switch between languages by selecting from the drop-down list. Language settings are saved for each tablet app. And also possible to change the color of the UI display.





GNSS Settings

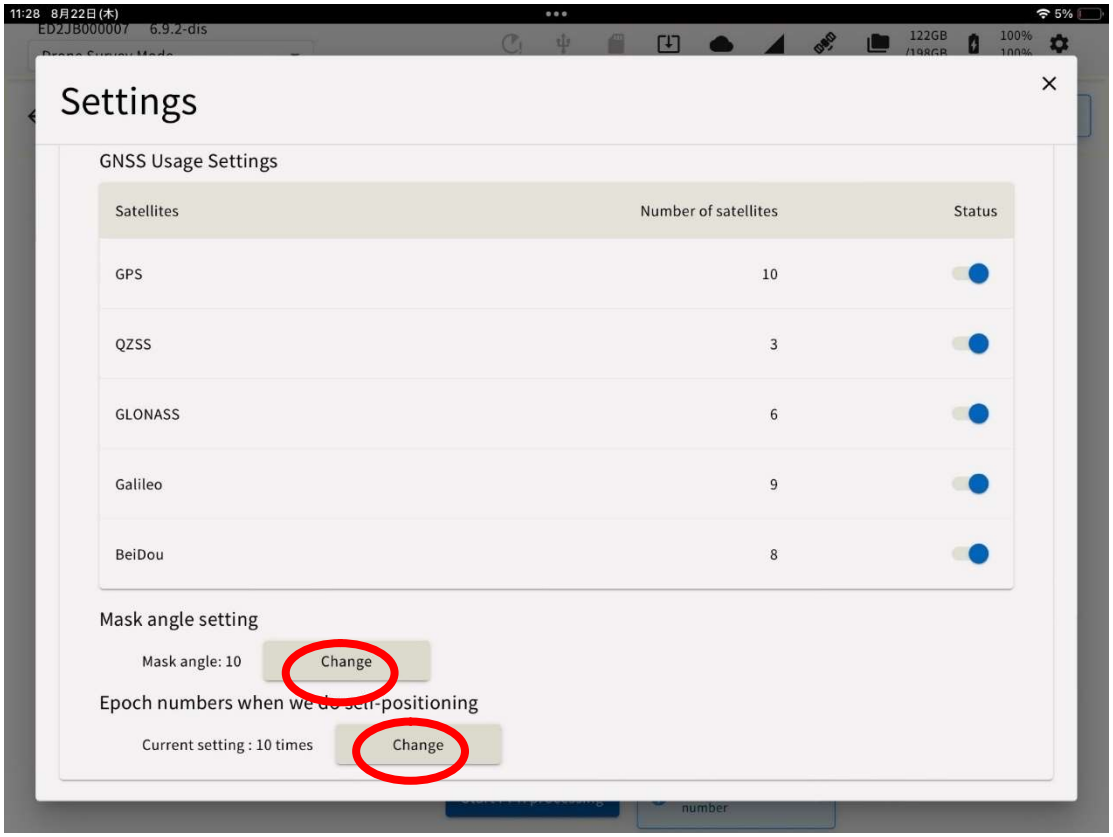
You can set the consteration used by EdgeBox and the mask angle of the satellite acquisition.



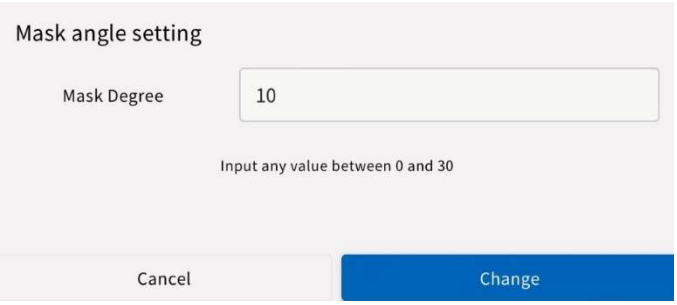
> Tips
> Changing the mask angle changes the position accuracy using the EdgeBox.

Setting GNSS epoch number and Mask angle setting

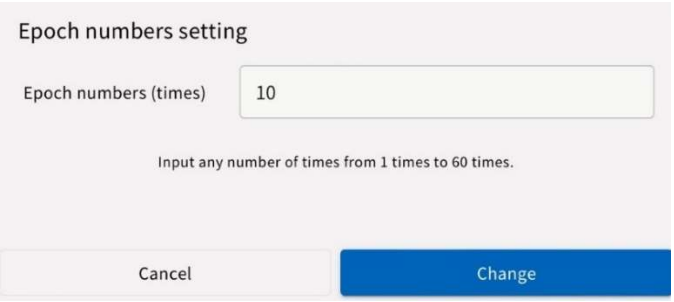
In the setting menu will adjust epoch number here when self-positioning.



Can be set between 0 and 30.



Can be set between 1 and 60

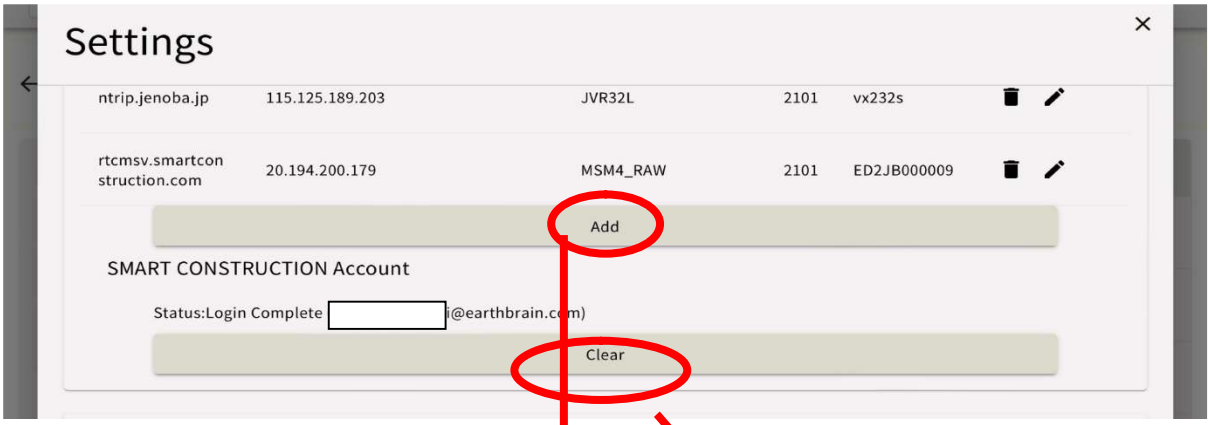


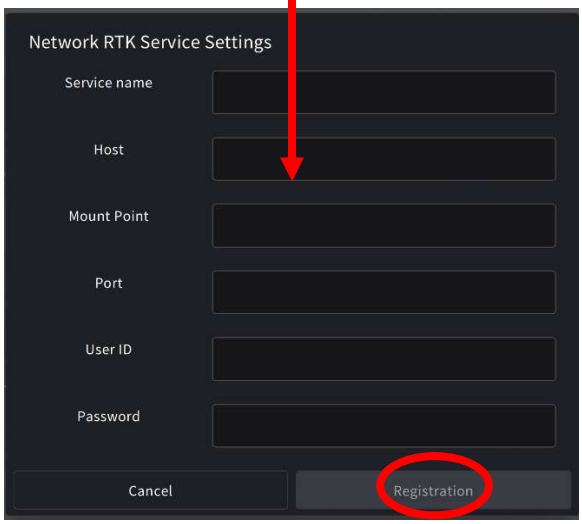
Interwork (Linked) Service Settings

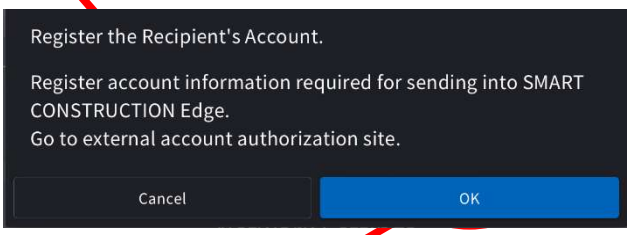
You can configure network RTK service setting. Normally, Host, Mount Point, Port, User ID and Password. Password will be hidden.

SMART CONSTRUCTION Account Settings are ID and password.

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

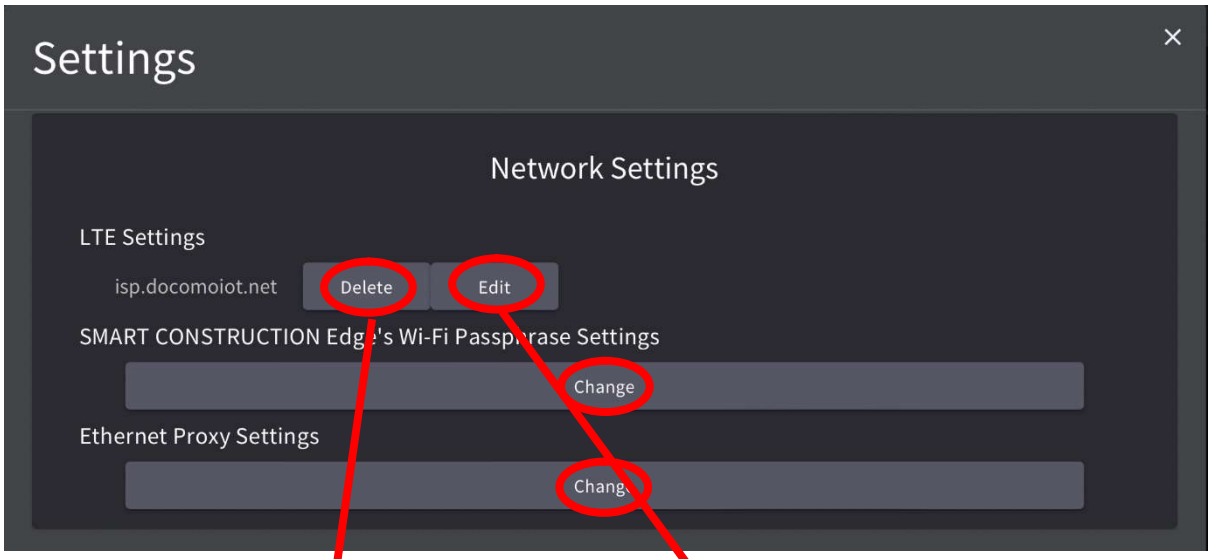




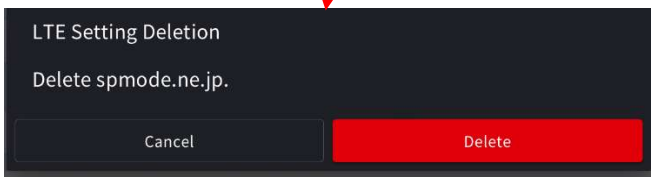


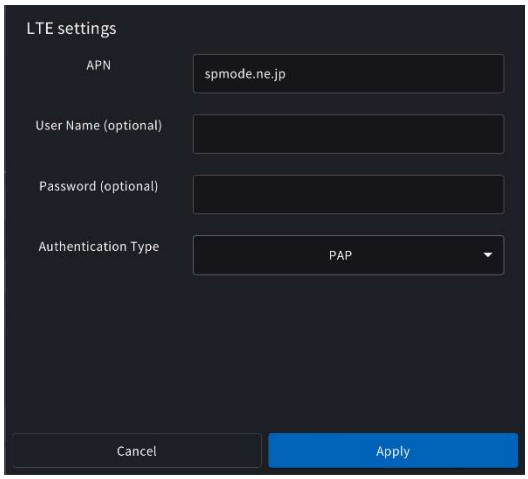
Network Settings

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.

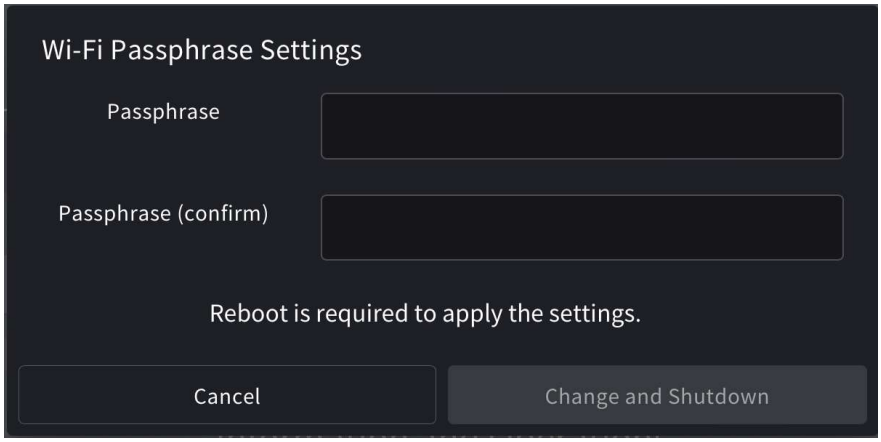


LTE Setting :

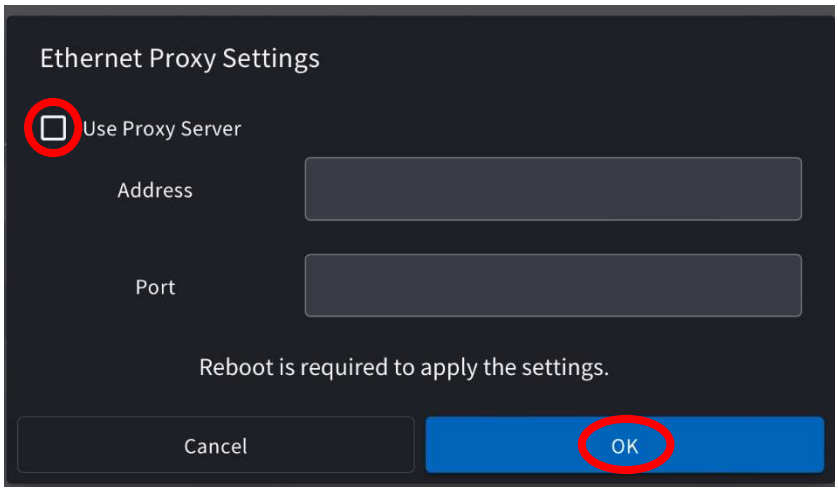




WiFi Passphrase Settings : (Default : edge2-ap)



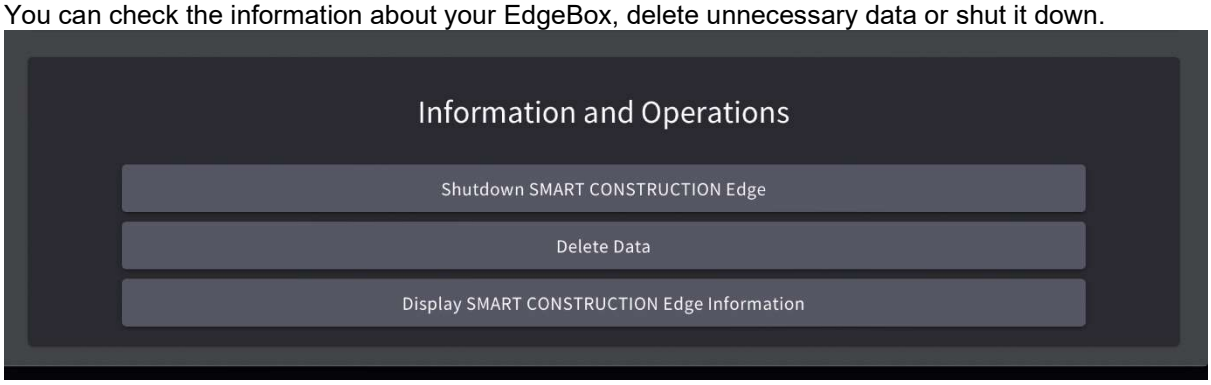
Ethernet Proxy settings :



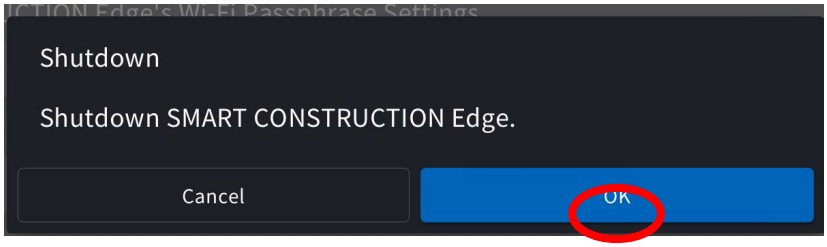
Tips
After changing the Wi-Fi passward and the Proxy settings, the EdgeBox must be restarted. After shutting down, press and hold the power button for about 4 seconds to start.

EdgeBox Information and Operations

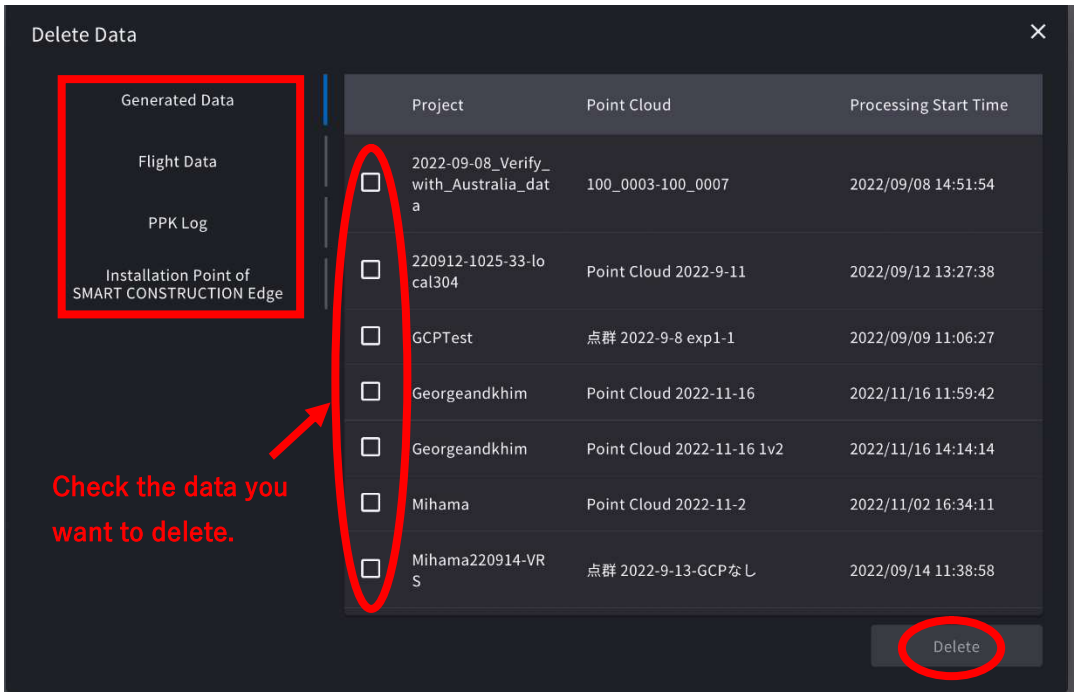
You can check the information about your EdgeBox, delete unnecessary data or shut it down.



Shutdown SMART CONSTRUCTION Edge :



Delete data : Please also see P.76



Edge device information :

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.

Specification

Items		Specification	Remarks
Temperature Range	Operating	-20℃～50℃	
	Charging	0℃～45℃	
	Storage	-20℃～50℃	
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	