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# NAVIK 200 GNSS RECEIVER

## User Guide

**Version – 1.0**
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**@ APOGEE GNSS PVT. LTD. (APGL)**

# Contents

# 1 Introduction

The **NAVIK 200 GNSS Receiver User Guide** is aimed to help you get familiar with the NAVIK 200 Receiver and start your project efficiently. We highly recommend you to read this manual before start surveying.

## 1.1 About the Receiver

NAVIK 200 GNSS Receiver can be used in static, post processed kinematic (PPK)/rapid static and RTK mode with all available GNSS constellations. NAVIK 200 Receiver has a compact size and strong anti-interference ability, making it possible to work even in different GPS environments. It is an ideal RTK/GNSS product for surveyors.

## 1.2 NAVIK 200 Receiver Parts List

This section provides the overall NAVIK 200 receiver parts list, including standard supply kit and customized kits based on your requirements.

### 1.2.1 Basic Supply Kit

NAVIK 200 GNSS Receiver Basic Supply kit contains one receiver and related accessories.

| | |
|---|---|
| 1. GNSS Receiver |  |
| 2. RF Antenna |  |
| 3. Data Collector & Tablet |   |
| 4. Download Cable |  |
| 5. Adapter |  |

| | |
|---|---|
| 6. Survey Pole |  |

## 2 Setting Up the Receiver

This chapter provides general information on the setup, power supply, and connection of the NAVIK 200 receiver.

### 2.1 Front Panel

The receiver's front panel has six indicator LEDs, and a Power button. The indicator LEDs show the Status of Battery, Satellite Tracking, Differential Data, Communication (Radio/ GSM), Bluetooth, and Data Logging.


### 2.2 Bottom Panel

The receiver's bottom panel contains a serial port (LEMO connector), a UHF radio antenna connector, a SIM card slot, and a threaded insert.

## 2.3 Power Supply

The receiver is equipped with an internal LI-ion battery pack with a high capacity of 6800 mAh. Its operating time depends on user behaviour and also environmental conditions. Please obey the following instructions when charging your device:

- Charge the device completely before using it for the first time.
- At room temperature, Fully charging takes approximately 5-6 hours.
- Recharge the device at least once a month if it is to be stored for a long time.

The receiver is connected to an external power supply through the

cable provided.

## 2.4 Pole-Mounted Setup

Mounting of receiver on a range pole is as per the figure shown below:

- Screw the receiver onto the range pole.
- Mount the controller bracket to the pole.
- Put the controller into the bracket.

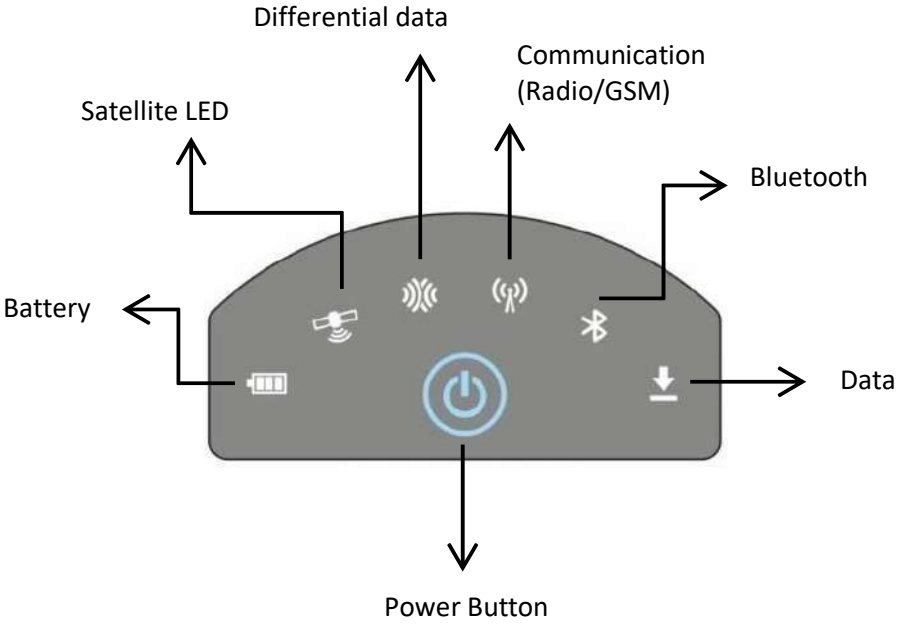
# 3 General Operations

This chapter introduces all controls for the general operation, including button functions and all LED behavior on the front panel.

## 3.1 Button Functions

**Power Button:** Press the power button for about 2 seconds to turn on the receiver; to turn off the receiver, long press the power button (2 seconds). The receiver will go into power off mode. During this time, the receiver will beep 5-6 times and the pattern will be displayed on LEDs. This process will take about 30 seconds.

**LED Behavior:** The LEDs on the front panel indicate the receiver's working status. Generally, a lit or slowly flashing LED indicates normal operation, and an unlit LED indicates that no operation is occurring. The following figure defines each possible LED state:




| LED | States | Indicates |
|---|---|---|
| Battery LED | Battery Low | Blinks five times every second |
| | Normal Operation | OFF |
| | Charging | Blinks every second |
| | Full Charge | Remains in a solid state |
| Satellite | Tracking | Blinks five times every second |

| | | |
|---|---|---|
| | No Tracking | Remains in a solid state |
| Differential Data | Transceiving Data | Blinks once per second |
| Communication (Radio/GSM) | Radio | Blinks every second |
| | GSM/4G | Blinks, depending on the data transceiving frequency |
| | Wi Fi | Blinks every second |
| | RS 232 | Blinks every second |
| | If not configured | Off |
| Bluetooth | Connected | Remains in a solid state |
| | Disconnected | Blinks every second |
| Data | Static | Solid until data log stops |
| | PPK | Solid until device is restarted |
| Power | Long press of the key, turning on/off the NAVIK 200 Receiver | |

## 4 Real-Time Kinematic Survey (RTK)

This chapter introduces how to conduct RTK Surveys with the Geo Master app, including software installation, starting a new project,

receiver connection, and RTK working modes (Radio and GPRS).

## 4.1 Installation of GEO Master Application

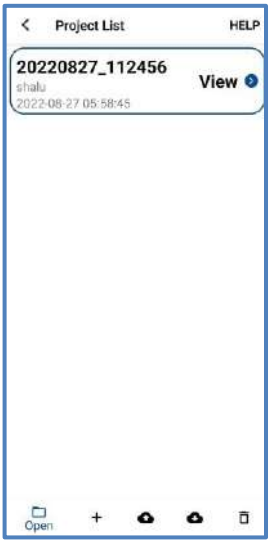
We can download the GEO Master app from the download center tab of the company section of the website www.apogeegnss.com. In this tab, from the app heading, you can download the latest version of the Geo Master app.

## 4.2 Connect Bluetooth to the Device

To build the Bluetooth connection between your GEO Master App and GNSS Receiver, it is mandatory to turn on the Bluetooth and location of your data collector.
Click Connection Type -> select Bluetooth Device -> click Connect to connect the data collector to the device.


## 4.3 Start a New Project

Click Select to go into the Project interface to create or select a project. For detailed information,
Click + icon ->write down project name -> select datum from the predefined section inside the datum store -> make the code list -> select elevation -> enter operator name and comment (comment is optional).


## 4.4 Start Base Station by GEO Master

Firstly, build Bluetooth connection between the NAVIK 200 receiver and your controller. Secondly, modify parameters including correction format, antenna type and communication protocols.
We can set up two types of bases. The first is Auto base, and the second is manual base:



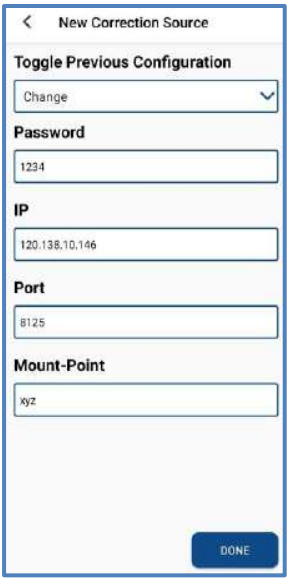
### 4.4.1 Auto Base Setup

After setting up communication -> setting up Antenna Height -> setting up auto base -> setting up corrections (such as RTK by internet, Wi-Fi, and radio)



**Set up corrections -> RTK by Internet**


Correction
RTK By Radio
RTK By Internet
RTK By Wifi
SET UP DATA SOURCE
DONE

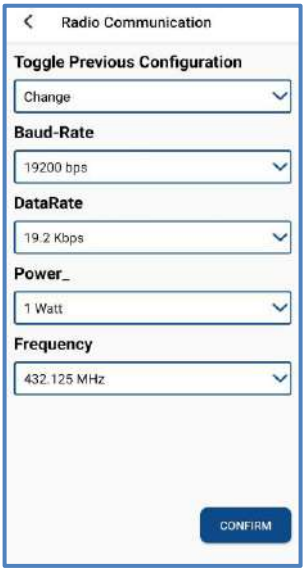

New Correction Source
Toggle Previous Configuration
Change
Password
1234
IP
120.138.10.146
Port
8125
Mount-Point
xyz
DONE


Correction
RTK By Radio
RTK By Internet
RTK By Wifi
SET UP DATA SOURCE
Password : 1234
Toggle Previous Configuration : 1
Mount-Point : xyz
Port : 8125
IP : 120.138.10.146
DONE

## Set up corrections -> RTK by Wi-Fi



## Set up corrections -> RTK by Radio


## 4.4.2 Manual Base Setup

Set up Manual Base -> set parameters by UTM or Degree values -> Set up Correction format by Internet, Wi-Fi, and Radio as in Auto Base.



Now set up correction formats like in auto base to start the base station manually.

## 4.5 Start Rover Station by Geo Master

- GEO Master connects via Bluetooth to the NAVIK 200 receiver.
- Set the same protocol and frequency as the Base receiver.
- The current status on the bottom will change from Single to Fixed.

Set up communication -> Set up corrections (RTK by Internet, Wi-Fi, and Radio) -> set Antenna Height -> Set up basic Parameters



Now set up correction formats, antenna height, and basic parameters like in a GNSS base station.

## 5 Internal GSM

In Internal GSM mode, you need to set the data link as Internal GSM, Server, IP Port.



# 6 Basic Survey Functions

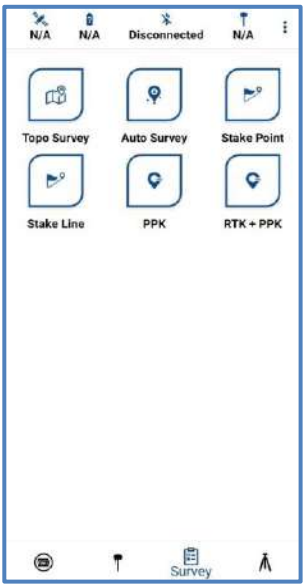
This section describes the basic survey functions of Geo Master, including point measurement, Topo survey, Auto survey, Static, PPK, staking, site calibration, and importing & exporting measured points.

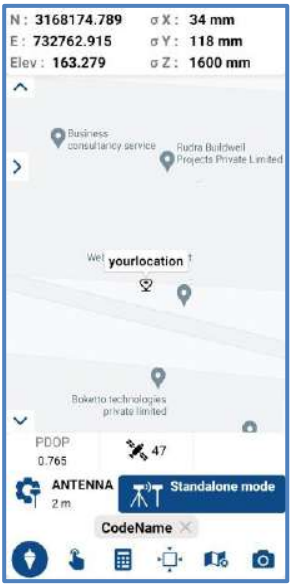
## 6.1 Topo Survey

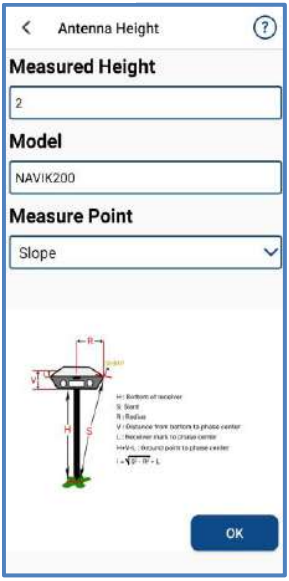
First, make a codelist before starting the TOPO Survey. To collect survey points, a codelist is mandatory.



- Click on Topo Survey-> enter point name-
- You can quickly change the antenna height in the survey interface.
- Click to change the map view.
- Measure the slant height upto the red-colored ring on the receiver housing.
- Measure the vertical height upto the bottom panel of the receiver housing.


N/A
N/A
Disconnected
N/A
Topo Survey
Auto Survey
Stake Point
Stake Line
PPK
RTK + PPK
Survey


N : 3168174.789
E : 732762.915
Elev : 163.279
σ X : 34 mm
σ Y : 118 mm
σ Z : 1600 mm
Business consultancy service
Rudra Buildwell Projects Private Limited
yourlocation
Boketto technologies private limited
PDOP
0.765
47
ANTENNA
2 m
Standalone mode
CodeName

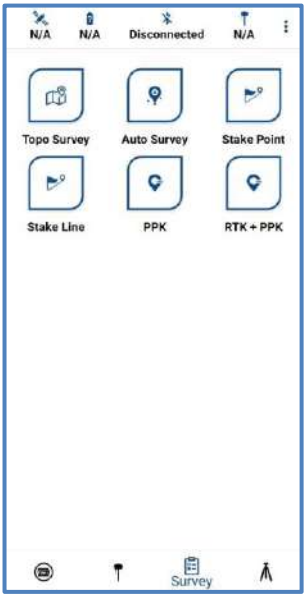

Antenna Height
Measured Height
2
Model
NAVIK200
Measure Point
Slope
OK

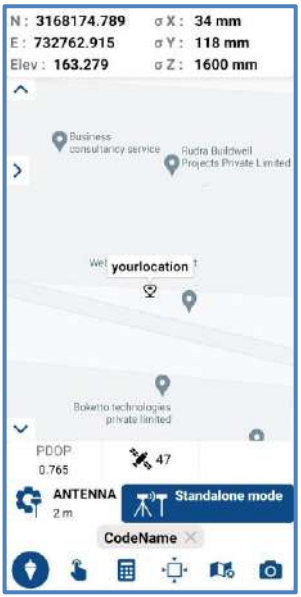


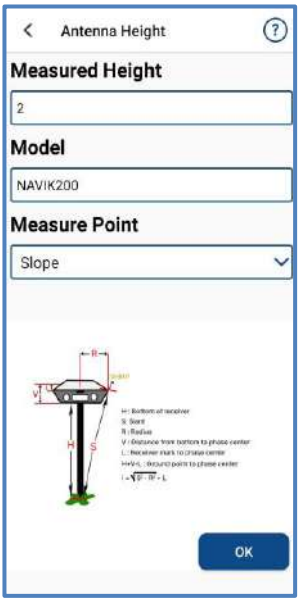
## 6.2 Auto Survey

First make a codelist before starting an AUTO Survey like TOPO Survey. Auto survey supports automatic and continuous survey according to Time or Distance.

- Click on Auto Survey-> enter point name -
- You can quickly change the antenna height in the survey interface.
- Click to change the map view.
- Measure the slant height upto the red-colored ring on the receiver housing.
- Measure the vertical height upto the bottom panel of the receiver housing.


N/A
N/A
Disconnected
N/A
Topo Survey
Auto Survey
Stake Point
Stake Line
PPK
RTK + PPK
Survey

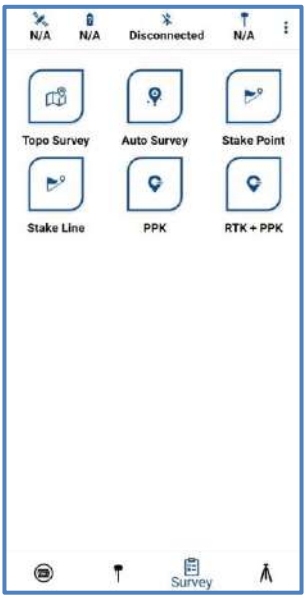

N : 3168174.789
E : 732762.915
Elev : 163.279
σ X : 34 mm
σ Y : 118 mm
σ Z : 1600 mm
Business consultancy service
Rudra Buildwell Projects Private Limited
yourlocation
Bokwto technologies private limited
PDOP
0.765
47
ANTENNA
2 m
Standalone mode
CodeName

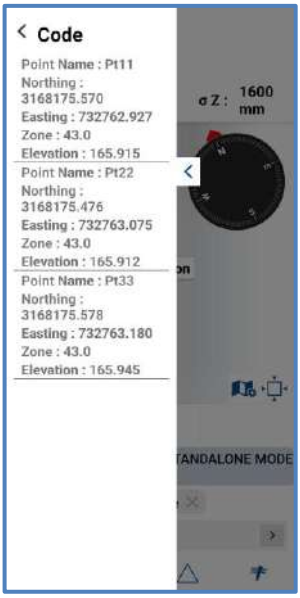

Antenna Height
Measured Height
2
Model
NAVIK200
Measure Point
Slope
OK

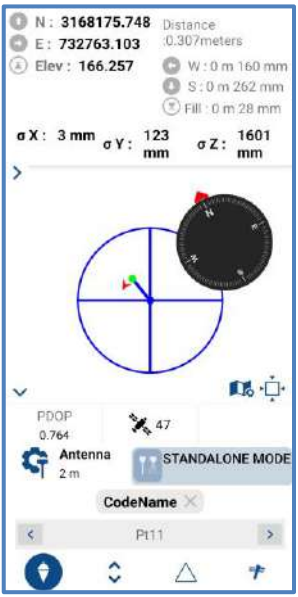


## 6.3 Stake Points

Go into the Stake point interface, click to choose a point, and tap Stake. GEO Master provides a navigation map when staking points. If you are close enough to the target point, it will alarm you based on the alarm range you set.


N/A
N/A
Disconnected
N/A
Topo Survey
Auto Survey
Stake Point
Stake Line
PPK
RTK + PPK
Survey

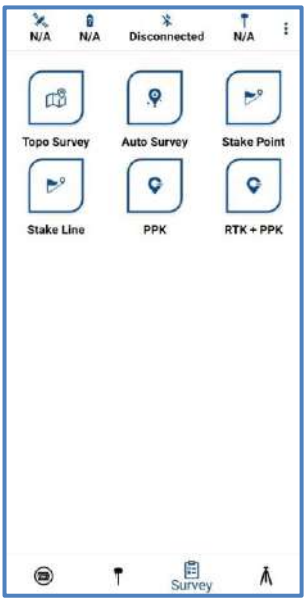

Code
Point Name : Pt11
Northing : 3168175.570
Easting : 732762.927
Zone : 43.0
Elevation : 165.915
Point Name : Pt22
Northing : 3168175.476
Easting : 732763.075
Zone : 43.0
Elevation : 165.912
Point Name : Pt33
Northing : 3168175.578
Easting : 732763.180
Zone : 43.0
Elevation : 165.945
σ Z : 1600 mm
TANDALONE MODE

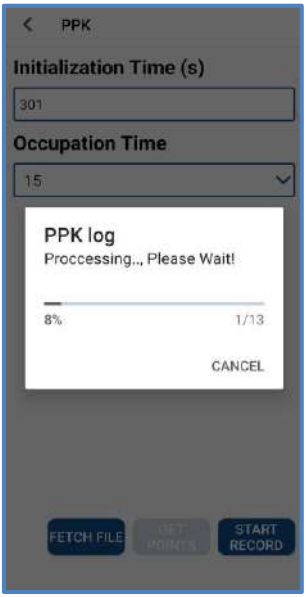

N : 3168175.748
E : 732763.103
Elev : 166.257
Distance :0.307meters
W : 0 m 160 mm
S : 0 m 262 mm
Fill : 0 m 28 mm
σ X : 3 mm
σ Y : 123 mm
σ Z : 1601 mm
PDOP 0.764
47
Antenna 2 m
STANDALONE MODE
CodeName
Pt11

## 6.4 PPK

PPK (post processing kinematic) is the unique function of the GEO master, which is used for post-processing dynamic measurements. It also needs two receivers to work together; one to work as a base to record static data, and another one to work as a rover, as shown below.

Click PPK -> enter initialization time and occupation time -> click Start Record button to begin PPK logging

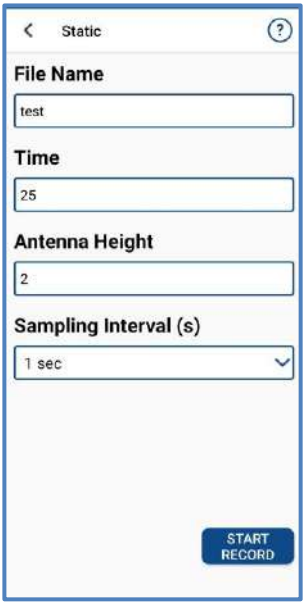


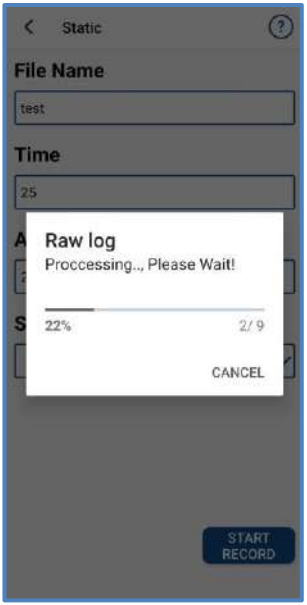




## 6.5 Static

Firstly, click on Static -> enter File name -> enter time to which we want to log data -> start recording Static/Raw Data.

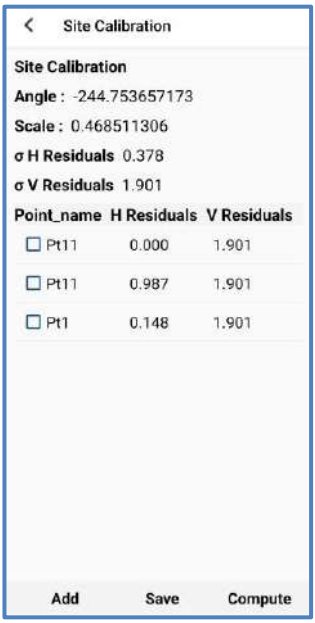

N/A
N/A
Disconnected
N/A
Connection
Rover
Base
Antenna
0183 Output
Device Info
Position Info
Register
Static
H-Terminal
Device


Static
File Name
test
Time
25
Antenna Height
2
Sampling Interval (s)
1 sec
START RECORD


Static
File Name
test
Time
25
Raw log
Proccessing.., Please Wait!
22%
2/ 9
CANCEL
START RECORD

# 7 Site Calibration

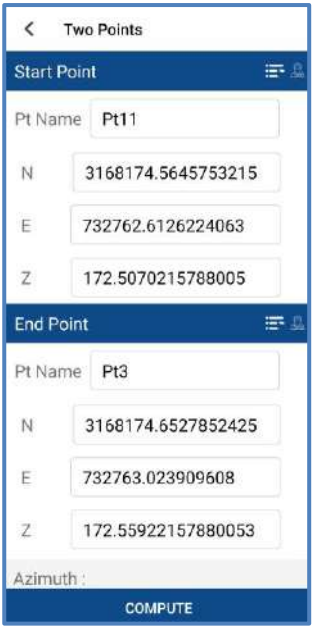
Site calibration is commonly needed once in one project. For this, there should be more than two points and less than eight points.
Select Site Calibration -> click add button -> add at least three points -> Compute and find the result.

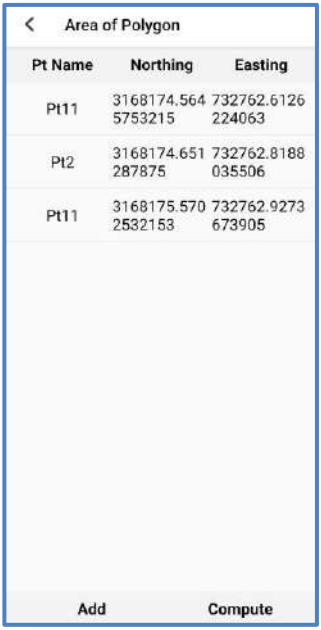




## 8 Area Calculation and COGO

To calculate the distance between two points and the area of a polygon,
Enter two points -> compute distance -> for area, enter at least three points and compute.


N/A
N/A
Disconnected
N/A
Site Calibration
Grid Shift
COGO
FTP
E-mail
Tools


Two Points
Start Point
Pt Name
Pt11
N
3168174.5645753215
E
732762.6126224063
Z
172.5070215788005
End Point
Pt Name
Pt3
N
3168174.6527852425
E
732763.023909608
Z
172.55922157880053
Azimuth :
COMPUTE


Area of Polygon
Pt Name
Northing
Easting
Pt11
3168174.5645753215
732762.6126224063
Pt2
3168174.651287875
732762.8188035506
Pt11
3168175.5702532153
732762.9273673905
Add
Compute

# 9 Data Export/Import

With the import/export functions, you can import and export any survey data, files, and stake points fluently.

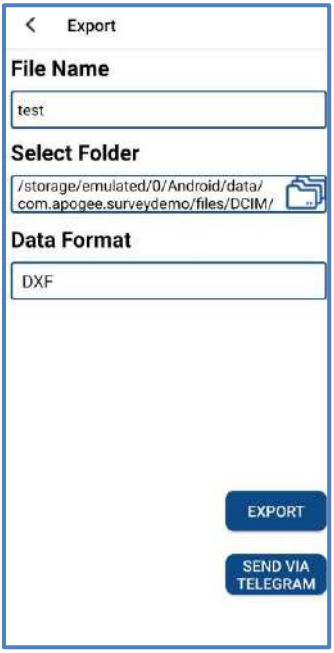
## 9.1 Import

- Click Import in the project interface ->Click Path to add files.
- File format: supports *.csv, *.dxf .


## 9.2 Export

Tap Export to export survey points.

- File format: supports *.csv, *.dxf .
- The default export path is .../...../....


## 10 Internal Radio Mode

The NAVIK 200 GNSS receiver supports transmitting & receiving correction data in internal radio mode. To conduct the RTK survey in internal radio mode requires:

A controller with software installed

An extension bar


Two units of NAVIK 200 GNSS receiver

Two whip antennas

A range pole with bracket

Tripod and Tribrach

**More:** Aim to improve the radius of the work field; we can change the base receiver's Whip Antenna to an External Antenna. And others do not need change.

- NAVIK 200 GNSS Receiver
- External Antenna

## 11 External Radio

The external radio mode can increase the RTK working distance, making it ideal for areas with dense construction or high signal interference. To set up external radio mode requires:

**Base station**

- An external radio
- An external power supply
- A long whip antenna
- Transmission cables
- An NAVIK 200 receiver
- Tripod and tribrach

**Rover**

- An NAVIK 200 receiver
- A Whip Antenna
- A controller with software installed
- range Pole with bracket

## Warning and Caution

An absence of specific alerts does not mean that there are no safety risks involved. A Warning or Caution information is intended to reduce the risk of personal injury and/or equipment damage.

WARNING - A warning alerts you to a potential risk of serious injury to your person and/or damage to the equipment, because of improper operations or wrong settings of the equipment.

**CAUTION** - A caution alerts you to a possible risk of damage to the equipment and/or data loss.

## Warranty Notice

We are not responsible for damages or tempered devices. Apogee GNSS Pvt. Ltd. does not warranty the disassembled devices.

## Copyright Notice



## Technical Assistance

If you have any questions and can't find the answer in this manual,

please contact your local dealer. Alternatively, request technical support either through email or through the website.

## Safety Information

Before using the receiver, please make sure that you have read and understood this user guide, as well as the safety requirements.

- Connect your devices strictly based on this user guide.
- Install the GNSS receiver in a location that minimizes vibration and moisture.
- Avoid falling to the ground or colliding with other items.
- Do not rotate 7-pin LEMO port.
- Do not cover the radio; keep a sound ventilation environment.
- To reduce radiation, please keep away from any radio station.
- Take lighting protection measures when installing antennas.
- Do not use damaged cables.

## Use and Care

The receiver can withstand the treatment that typically occurs in the field. However, the receiver is high-precision electronic equipment and should be treated with reasonable care.

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