GeoNex GNSS Rover User Manual

Version 1.0

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1. Before you start

Dear Customer,

Thank you for choosing the GeoNex Land Surveying System. Before using this device, please take a moment to read the following important notes:

This user manual is intended specifically for the GeoNex system. If your actual experience differs from the scenarios described in this guide, always follow the actual device behavior or updated instructions provided by the development team.

Please review all safety instructions, precautions, and usage recommendations before operating the device. Misuse may lead to inaccurate readings or potential hardware damage. The development team assumes no liability for damage or data loss caused by improper handling.

This guide and the GeoNex system may be updated without prior notice. We reserve the right to enhance the hardware or software features and update the documentation accordingly. Always refer to the latest version of the manual for accurate information.

1.1 Precautions for Safe Operation

For your safety and the safety of others, please read and follow these precautions before using your Geonex GNSS device.

1.1.1 Warning

i. Do not disassemble or open the device yourself. Only authorized Geonex distributors or technicians should perform repairs or modifications.
ii. Do not cover the charger while charging.
iii. Do not use a wet charger, damaged power cable, socket, or plug, and avoid using any power cable not recommended by Geonex. This can lead to fire or electric shock.
iv. Do not place the device near liquid, open flames, or in high-temperature environments. This can cause explosions.
v. Keep the device away from severe electrostatic discharge, which can cause performance issues such as automatic opening or closing.

1.1.2 Caution

i. Secure the device firmly on a stable pole during use.
ii. Use only original accessories to prevent accidental damage.
iii. When transporting, minimize vibration to protect the equipment.
iv. Do not touch the device with wet hands to avoid electric shock.
v. Do not stand or sit on the carrying case, and do not turn it over, to prevent device damage.

2. Introduction

GeoNex is an efficient, affordable, and user-friendly land surveying system designed to simplify and modernize traditional surveying methods. By integrating GNSS-based positioning, real-time kinematic (RTK) base corrections, and MPU-based tilt compensation, GeoNex provides high-accuracy coordinate data with minimal manual effort.

1.1 Overview

This User Manual serves as a comprehensive guide for operating and maintaining the GeoNex Land Surveying System. It provides detailed instructions on hardware setup, software functionalities, operational workflows, troubleshooting, and safety practices. The manual aims to help users achieve high-precision land surveying with minimal technical background, while maximizing the efficiency and accuracy of their work.

3. Getting Started

This section provides a step-by-step walkthrough for using the GeoNex Land Surveying System, from powering on the devices to ending a session. The process covers initializing both the Base Station and the Rover Unit, connecting to the network, receiving corrections, and viewing coordinates.

3.1 Appearance

3.2 Power On and off

Power On: Press the power button to turn on the device. When the device powers on, the power indicator light will turn on.

Power Off: Release the power button to turn off the device.

3.3 Charge the Battery

The GeoNex device is equipped with a Type-C charging port that supports up to 18W PD fast charging.

Charging Time: It takes approximately 4 hours to fully charge the battery.

Charging Indicators:

- Red light: The battery is charging.
- Blue light: The battery is fully charged.

How to Charge: Connect one end of the Type-C data cable to the device and the other end to the charger. Plug the charger into a power outlet.

3.4 Wi-Fi Setup

The Geonex device can operate as a WiFi hotspot, allowing a PC, smartphone, or tablet to connect for configuration and management.

Connecting to the Device and Configuring WiFi

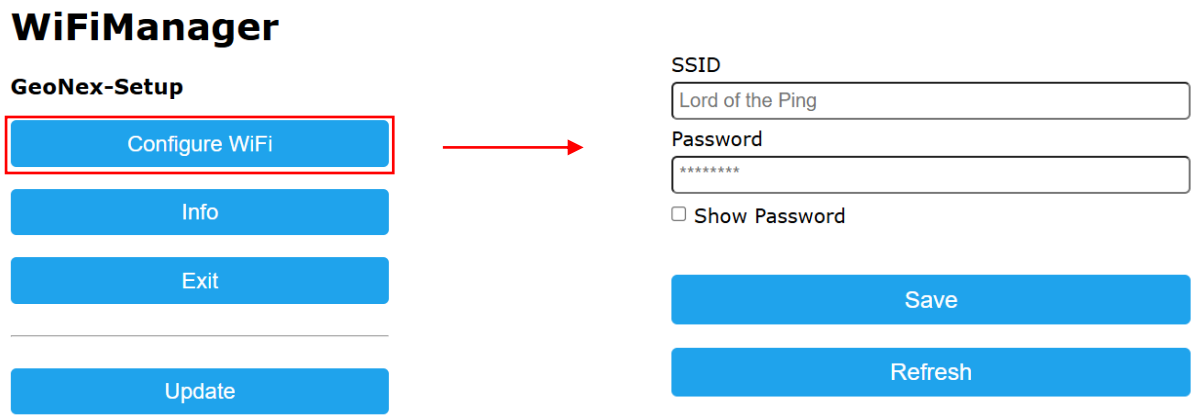
Connect to the Hotspot: On your PC or mobile device, search for available WiFi networks. The hotspot will appear as either Geonex Rover or Geonex Base.

Enter the password: geonex.

Access the Web UI:

- After connecting to the hotspot, open any web browser.
- The device's configuration interface will automatically open. If not Enter the IP address: 192.168.4.1.

Configure WiFi Connectivity: In the web interface, go to the WiFi Configuration section. Follow the on-screen instructions to connect your Geonex device to your preferred WiFi network.



4. GeoNex Web

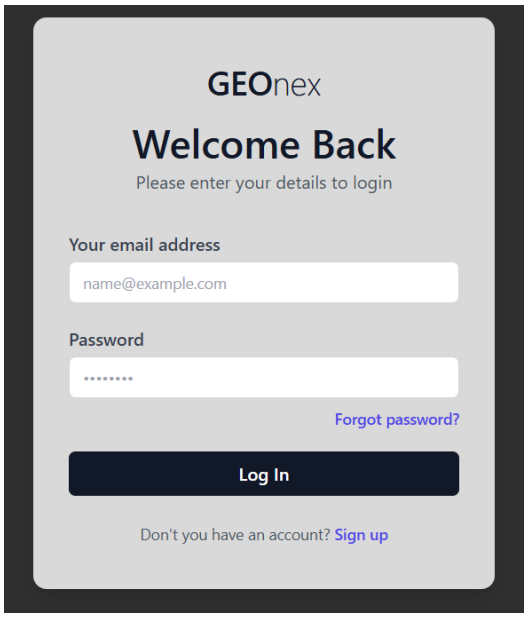
The GeoNex Web Application allows users to monitor, configure, and control both the rover and the base station in real time. This user-friendly interface is accessible such as a laptop, tablet, or smartphone.

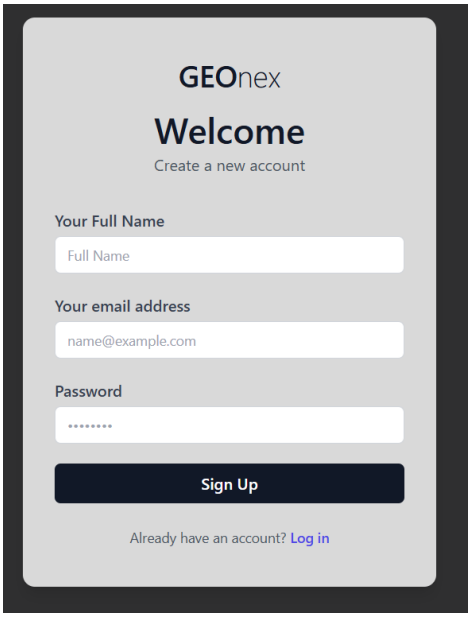
4.1 Creating an Account

1. Click **“Sign Up”** on the homepage.
2. Enter your:
    - Name
    - Email
    - Password
3. Click **Register**.
4. An activation email may be sent.

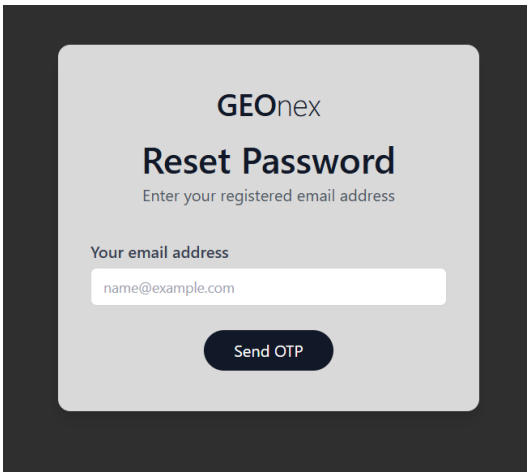
4.2 Logging In

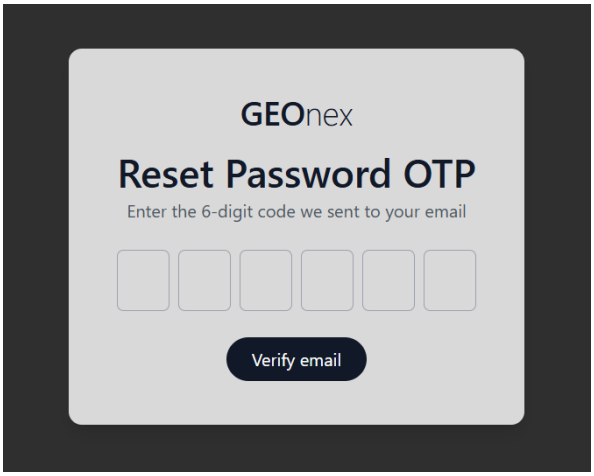
1. Enter your registered email and password.
2. Click **“Login”**.
3. You’ll be redirected to the **dashboard**.





Note: In case you forgot your password you can select "Forgot password?" option. Then enter the email you have logged in before and a OTP will be sent to your email.



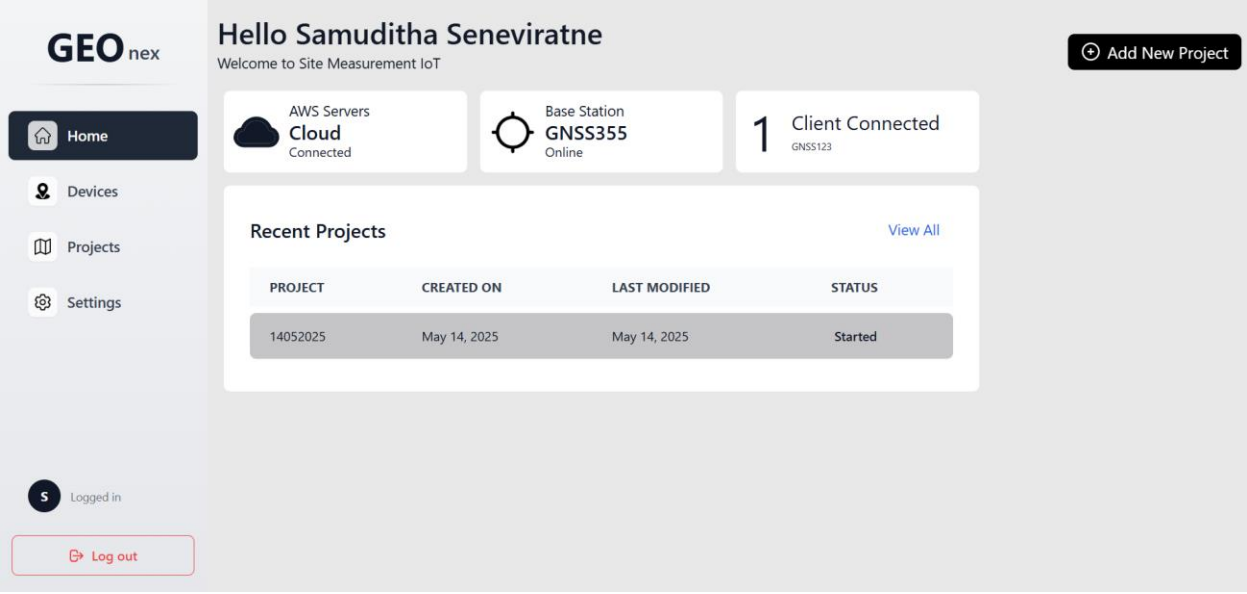


4.2 Once logged in,

Below are brief descriptions for each main page of the Geonex controller web interface, designed to help users quickly understand the purpose and key features of every section.

4.2.1 Home Dashboard

Once logged in, the dashboard provides the following information:



Status Cards:

- **AWS Servers (Cloud):** Shows connection status to cloud services.
- **Base Station:** Indicates if the base station is online.
- **Clients Connected:** Displays the number of active client devices.

Recent Projects: Lists your latest projects with creation and modification dates, and current status.

Use the **Add New Project** button to start a new project.

4.2.2 Devices Page

On the Devices page, you can manage all hardware linked to your Geonex system. This section displays a map of registered and connected devices, shows real-time alerts, and provides details such as device name, type, code, battery status, and signal strength. You can also register new devices from this page.

- **Device Map:**
  - Visual representation of connected base stations and rover devices.
  - Shows the number of connected rovers and base stations.
- **Alerts:**
  - Displays real-time system alerts and notifications.
  - “All Clear!” means no current alerts.
- **Registered Devices:**
  - Table listing all devices registered to your account, including device name, type, code, and registration date.
- **Connected Devices:**
  - Shows currently connected devices with ID, type, battery status, signal strength, and online/offline status.
  - Use the **Register New Device** button to add more devices.

4.2.3. Projects Page

The Projects page is where you organize and oversee all your land surveying projects. It lists each project with its unique ID, creation and modification dates, and current status. You can easily add new projects or remove ones you no longer need.

- View all created projects in a table format.
- Each entry shows project ID, creation date, last modified date, and status.
- Use the trash icon to delete a project or the **Add New Project** button to create a new one.

4.2.4 Settings Page

The Settings page allows you to tailor the Geonex system to your preferences. Here, you can adjust measurement and coordinate units, configure network and device settings, set map display options, and manage your account information. This section ensures your device operates according to your specific requirements.

1 System Settings

- **Distance Unit:** Choose your preferred measurement unit (e.g., centimeters).
- **Coordinates Unit:** Select between degrees or other coordinate formats.
- **Base Station Coordinates:** Set coordinates manually or use AUTO mode.

2 Device Settings

- **Sampling Interval:** Set how often data is sampled from devices.
- **RTK Correction Source:** Choose the source for Real-Time Kinematic (RTK) corrections (e.g., BASE).
- **NTRIP Credentials:** Enter credentials for NTRIP caster if needed (URL, username, password).
- **Firmware Update:** Click **Check Updates** to search for new firmware versions.

4 Map Settings

- **Accuracy Circles:** Toggle display of accuracy circles on the map.
- **Provider:** Choose the map provider (e.g., OpenStreetMap).
- **Theme:** Select between light or dark map themes.

5 Account Settings

- **Email:** Displays the registered account email.
- **Notifications:** You can Toggle notification settings On or off according to your preference.
- **Change Password:** Use these buttons to update your password o.

4.2.5. Logging Out

Use the **Log out** button at the bottom left of the interface or in the Account section of Settings to securely end your session.

5. Technical Indicator

Item	Specification	Remarks
Hardware system	ESP32s	
Channel	72 channels	
GNSS	GPS, GLONASS, GALILEO	Other conselation support in future
Data format	NMEA-0183	
Correction I/O Protocol	RTCM 2.X, RTCM 3.X	
Data update frequency	1Hz	
Recapture Time	<1s	
Cold Boot	<120s	
POSITIONING ACCURACY	Single (RMS): Horizontal: ±1.5m	
	DGNSS (RMS): Horizontal: ±0.2m	
	RTK (RMS): Horizontal: ±(8mm+1ppm) vertical: ±(15mm+1ppm)	
Tilt compensation (accuracy within 60°)	<2cm	

SYSTEM		
WIFI	Supported	
Network	LTE FDD: B1/B3/B5/B8	
Storage	2GB cloud Space	
Power Indicator	Show power status	
Satellite Indicator	Show satellite status	
Mqtt Indicator	Show Data connectiveity status	
BATTERY		
Work time	3.7V, 1200mAh	The static working mode supports more than 24 hours under full power and adaptively switches to standby when charging current is low
Charge	MTK-PE+1.1/2.0/9V2A, USB PD 12V/1.25A, 5V/3A	
Work Temperature	-20°C–+60°C	