



NuSite

USER

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NuSeis System

GEOPHYSICAL TECHNOLOGY INC | WWW.GEOPHYSICALTECHNOLOGY.COM



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Chapter 1 Introduction

PRELIMINARY

Overview

- **NuSite** is part of **NuSuite**, the **NuSeis** software package.

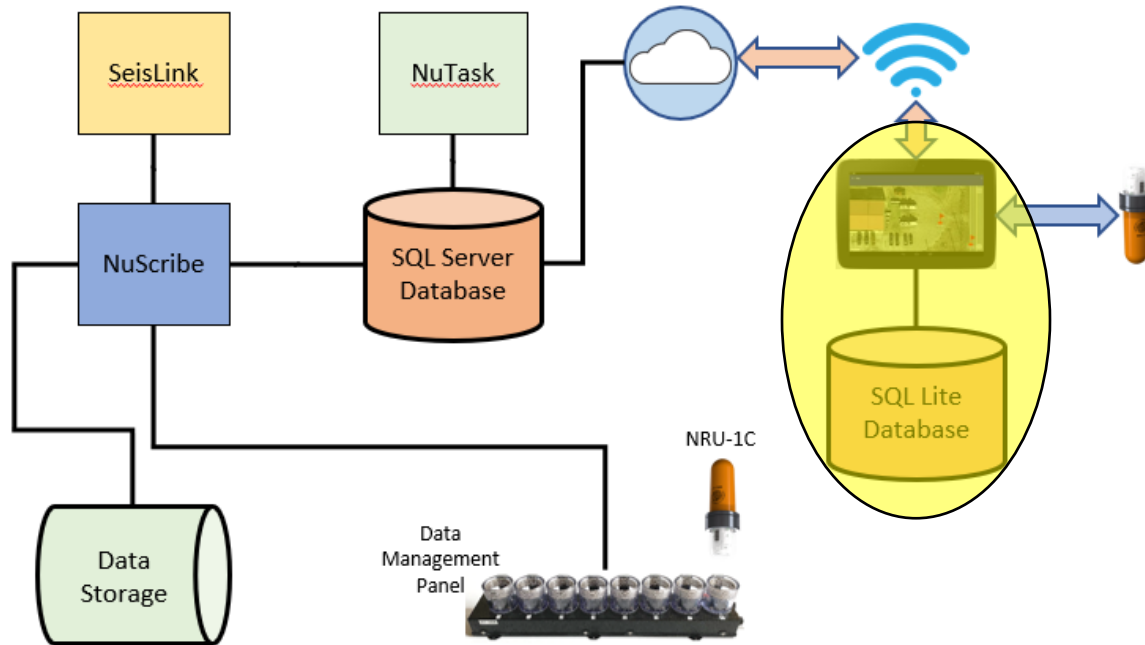


Figure 1

- Figure 1 above shows the NuSite software package as it is used in the overall NuSeis system.
- NuSite communicates wirelessly over BlueTooth with the NRU recording devices to collect information for charge percentage, voltage, memory, GPS, test results, recording status, error messages, tilt, and more. NuSite transfers this data to NuCentre over WiFi for a comprehensive QC of all deployed NRUs.
- NuSite is an Android based application that will operate on most Android devices, i.e. cell phones, tablets, or laptops. Minimum required Android version is 7.0.
- The NuSite application operates with a SQL Lite Server that must be synched to the NuScribe SQL Server Database via NuWeb.
- Communication in the field with the NRU-1C is transparent, and happens automatically when within range of the NRU-1C BLE Bluetooth, collecting NRU-1C status automatically
- NuSite is used to deploy and un-deploy NRU-1C nodes in addition to troubleshooting.

Handling

- ❖ While the construction of the NuSeis field equipment is extremely rugged and robust, some of the equipment still contains electronic circuitry that could possibly be damaged by heavy physical shock and abuse.
- ❖ Handling of all NuSeis equipment should be done in accordance with precautions and instructions described in the NuSeis Manuals.
- ❖ NRUs should be handled with care. Avoid dropping or throwing the nodes to cause a heavy shock to be translated into the internal electronics. Use the prescribed transportation and handling methods, never transport the NRUs loose in a vehicle or box/bag that will allow the NRU to slam together during transport.
- ❖ During field operations, NRUs should always be transported in the provided NuSeis Bags, which are designed to protect the NRU during transport in a vehicle over rough terrain and/or by hand carry during man portable operations.

PLEASE NOTE

- ⇒ **Any misuse or mishandling of any NuSeis equipment will void the manufacturer warranty and any required repairs will be at the buyer's cost.**
- ⇒ **No warranty shall apply in the event products are used outside their normal operating or handling conditions, or in case of:**
 - **lightning, fire, misuse, defective maintenance, negligence, fault**
 - **repairs that are not certified or completed by GTI**
 - **alteration or modifications by the customer or a third party**
 - **integration of components, sub-assemblies or assemblies non-certified by GTI into the products**
 - **connections to equipment or power / voltage sources non-approved by GTI.**
- ⇒ **Only GTI or GTI-certified personnel should open or repair NuSeis equipment.**

Chapter 2 User – Getting Started



GPS

- When using the NuSite devices for navigation and deployment, the inherent inaccuracy of the mobile device GPS must be taken into consideration.
- Depending on the number of satellites in clear view of the device, and other environmental considerations, the position accuracy of the device can be off 3 to 10 meters.
- If there is a requirement for higher accuracy from the NuSite device, i.e. stakeless receiver layout, there are several ways to improve the accuracy of the NuSite device GPS.

Software

- Running a GPS, or Survey application in the background has been found to increase the accuracy of the device GPS. This is not needed if using an External GPS Device.
- GTI does not endorse or encourage the use of any one application.
- It should also be noted that this will only bring the GPS accuracy down to ~5 meters.
- Locus GPS Free, one example of a Survey app, has been found to work well.
- Prior to starting the NuSite app, start the GPS application and make sure it is set to run in the background, even when minimized.
- Once the application has a GPS position, minimize it and open NuSite. Operate normally with NuSite.
 - If GPS location services stop in NuSite, shutdown both applications, then restart both applications

External GPS Device - recommended

- Android devices have the capability to allow an external GPS device to be connected by using the what is referred to as Mock Locations.
- There are many GPS devices available that have Bluetooth capability. Trimble R1, Dual XGPS, Juniper Geode, Garmin Glo.....The accuracy required will dictate the device that is used. Most of these devices will give sub-meter accuracy, but if sub-centimeter accuracy is needed, a higher end RTK capable device may be needed.
- Please see [Appendix B](#) for instructions to connect your particular GPS device to NuSite.

Getting Started

- On a new device, ensure that the Display Settings, Screen Timeout is set as high as possible.
- It is suggested to lock the screen rotation so that the screen will not rotate when the device is in motion. Lock the screen in the preferred portrait or landscape position so that it will not rotate as the tablet moves.
- On some devices it may be necessary to set the Display Size to the smallest setting to fit the NuSite app to the screen properly.
- When the NuSite application is opened for the first time 3 alerts need to be acknowledged.

- The first is to grant NuSite access to photos, media, and files on the device. Answer Yes.
- The 2nd is to grant NuSite access to the device's location (GPS). If location access is not allowed, NuSite will not operate. Answer Yes.
- The 3rd alert is to Ignore the battery optimizations. This will let NuSite stay connected when in the background. Must answer Yes.
- The Synchronize Users routine should be run to synch the users that have been defined earlier in the NuScribe User definitions.
 - The Password field must be blank to run the Synchronize User routine. If a password is entered, the Synchronize User button changes to Login.
 - The NuSite device should be connected to the same Wi-Fi network as the NuScribe computer.
 - Tap on the Synchronize User bar. This will bring up a NuWeb IP Address pop up window. The IP Address will default to 192.168.137.1/NuWeb, if this is the first time NuSite has been used after install, or if data has been cleared from the app. This IP is the same as Windows uses for it's WiFi Hotspot application. If a user plans to use the Windows WiFi hotspot, it's recommended to download and use HotSpot Lite which does not require an active internet connection. If connected to a WiFi router, the IP Address will have to be changed to correspond to the IP address of the NuScribe computer. For example, 192.168.1.10/NuWeb.
 - If unsure of the IP address of the NuScribe computer, open a Command Prompt window on the computer.
 - Type in *ipconfig* and Enter.
 - A list of the computer network devices and IP addressing will display.
 - Take note of the Wireless LAN IP address, this is the one needed for NuWeb.

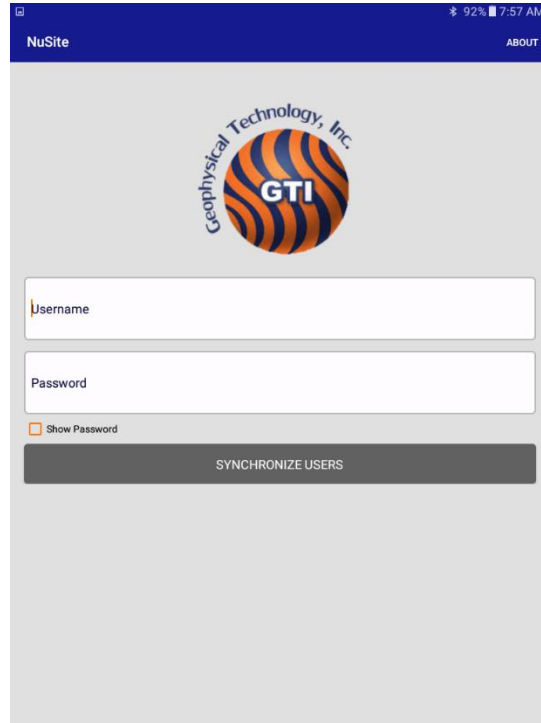


Figure 2

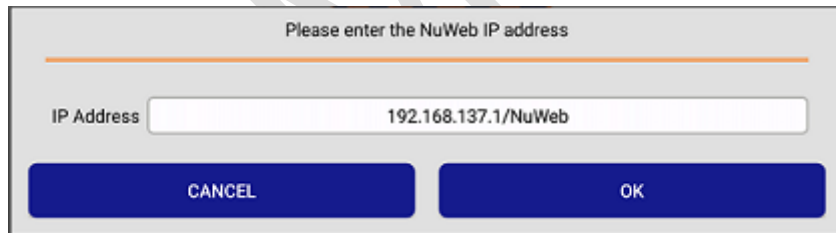


Figure 3

- Tapping in the IP Address field will open a NuWeb IP Address pop up window. Type in the IP address of the NuScribe computer. Then tap OK.



Figure 4

- The display will change back to the IP Address window with the new address that was entered, followed by /NuWeb which is automatically added by the NuSite software. Click on the OK bar.

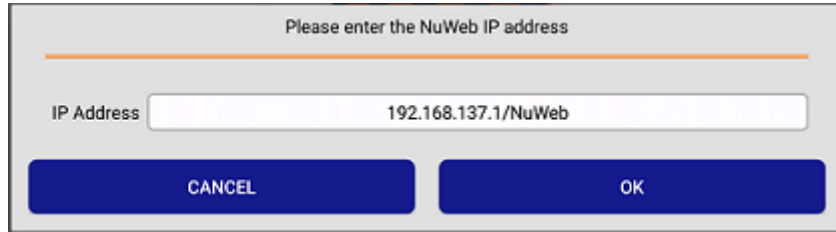
A screenshot of a software dialog box titled "Please enter the NuWeb IP address". It features a text input field containing "192.168.137.1/NuWeb". Below the input field are two buttons: "CANCEL" on the left and "OK" on the right.

Figure 5

- This will open the Synchronizing User Profiles display. A rolling orange progress circle and a percentage of complete will be displayed. Once 100% has been reached, click on the OK bar.

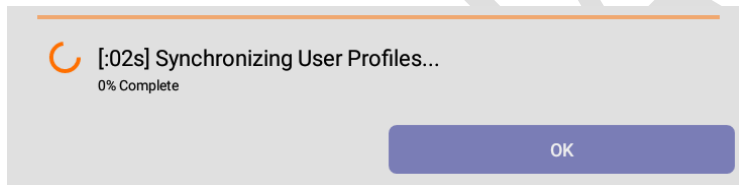


Figure 6

- Now the Username and Password can be entered. Each device should be assigned to a single user, and each user should be assigned a unique username and password.
 - Logging into NuSite with a unique username enables tracking of work done as assigned to individuals. For instance, if questions arise about a receiver station, the person that worked on the receiver in question will be known.
- Once logged in you should see the following Home display.

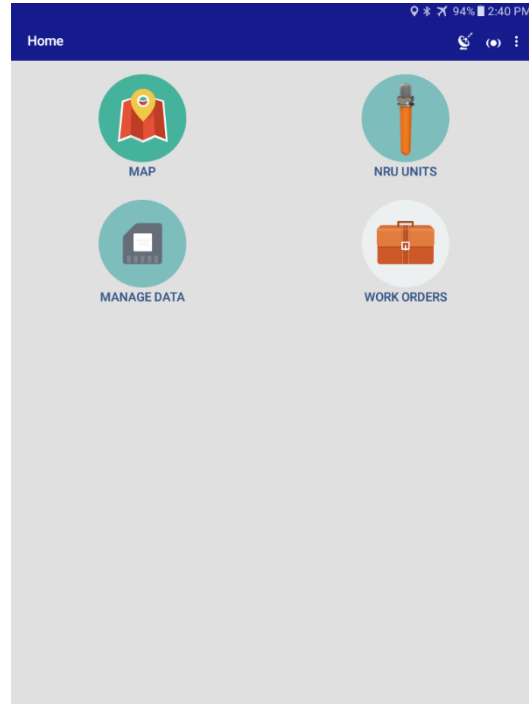


Figure 7

- **Note:** Important information about the NuSite installation and the device in use, can be found by tapping ABOUT in the upper right hand of the top toolbar in the Login screen as seen in Figure 9 below.
- **Important operational considerations for the use of NuSite.**
 - When Bluetooth is turned on, the NuSite device will pick up scans of ALL NRUs, those deployed on line, in low power mode in pickups, and in low power mode or testing in camp.
 - Recording all scans can be confusing at times. For example, if the last scan was recorded when a pickup was parked next to a receiver station, or at the in country warehouse.
 - Recording all scans can also be useful. NRUs that are missing may be found through NuSite scans of NRUs in camp, either on charge, being tested, or left in the back seat of a pickup.
 - Users will need to decide how they prefer to use NuSite.
 - Keep the screen time out as short as possible in order to help save battery power, so the screen is not on when the device is not in use.
 - Power off the device when not in use.
 - Ensure Bluetooth is off if powering off the device before leaving the line at the end of the day
 - Putting the device into Airplane mode, then manually turning on Wi-Fi and Bluetooth, will also help save power by disabling unneeded services.

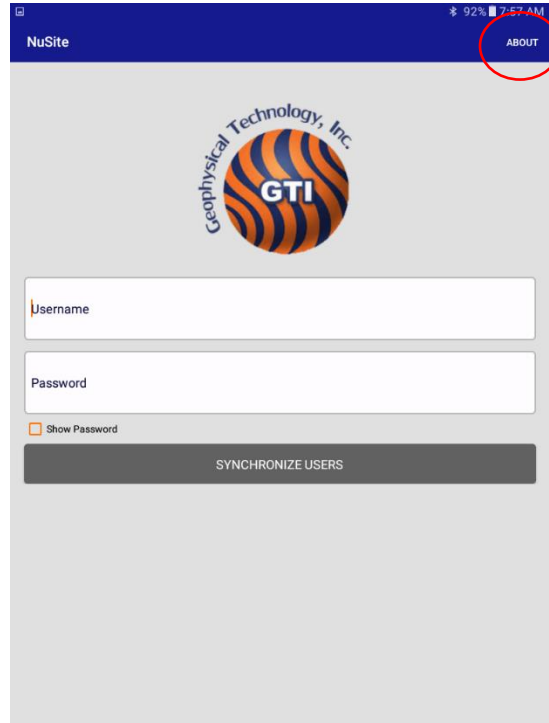


Figure 8

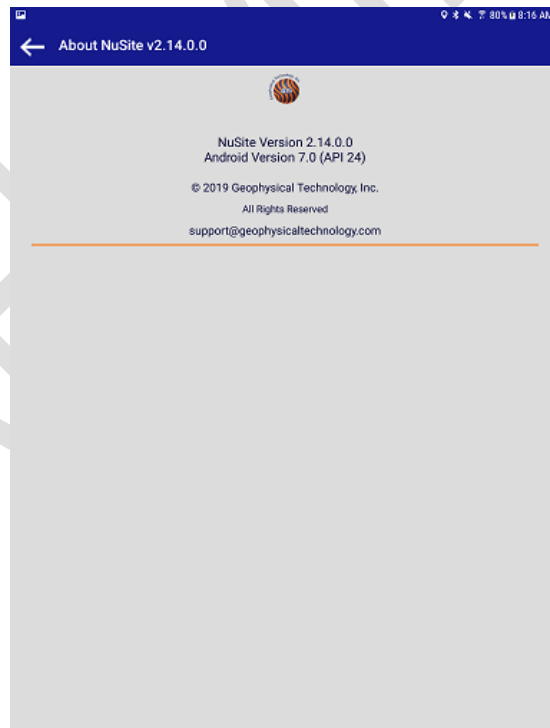


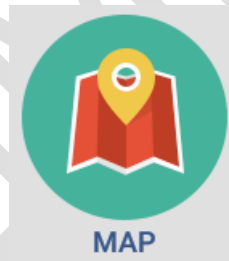
Figure 9

- The banner bar at the top of NuSite has status indicators and tools.

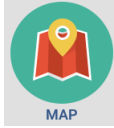


PRELIMINARY

Chapter 3 User – Map



Map Screen Overview



- Tapping on the Map Icon **MAP** on the Home screen will open the Map display screen.

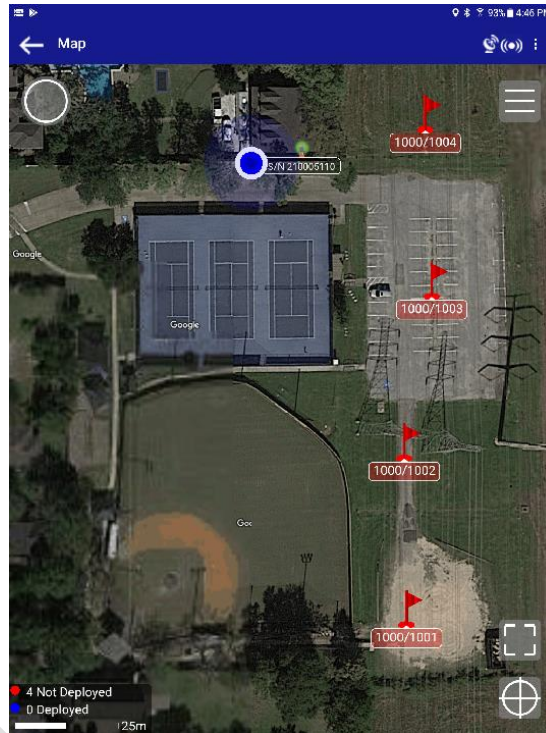


Figure 10

- Tapping on the back arrow in the left of the top tool bar will return NuSite to the home page.
- The map display can zoom out by using the normal touch screen method of pinching in with 2 fingers. Zoom in by un-pinching 2 fingers. The bar at the bottom of the screen shows the zoom level in meters as defined by the length of the bar.
- The legend is situated in the bottom left of the screen.

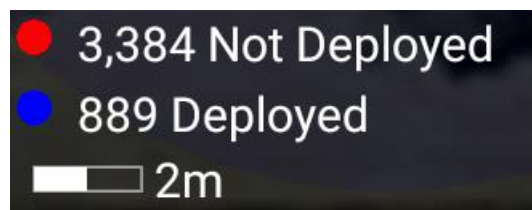


Figure 11

- The bar at the bottom indicates the zoom level in number of meters as defined by the length of the bar.

- **Red** is defined as receiver points that currently do not have a NRU node designated deployed at the point within the database of the device.
 - **Blue** is defined as receiver points that have had an NRU node designated as deployed at the point within the database of the device.
- The screen can be automatically zoomed using the 2 zoom tools.

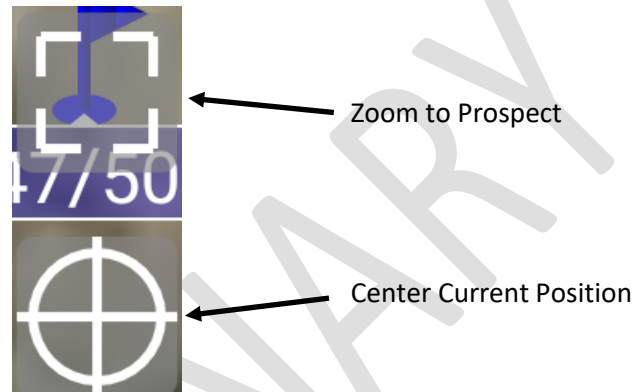


Figure 12

- Tapping the dashed box symbol will cause the screen to zoom to the extent of the prospect that is currently defined by the receivers that were loaded to the NuSite database via synchronizing with the NuScribe database.
- Tapping on the bullseye symbol will turn it green and cause the screen to center on the current position of the NuSite device.
 - If the bullseye is **green**, the current position will track in the middle of the screen. Tapping the symbol again will turn off the green color, which turns off centering.
 - The screen will center at the current zoom level. Zooming in or out when centering is turned on, will automatically turn off centering. The centering bullseye will have to be tapped again to turn centering back on.
 - Dragging the screen anywhere will also turn off centering.

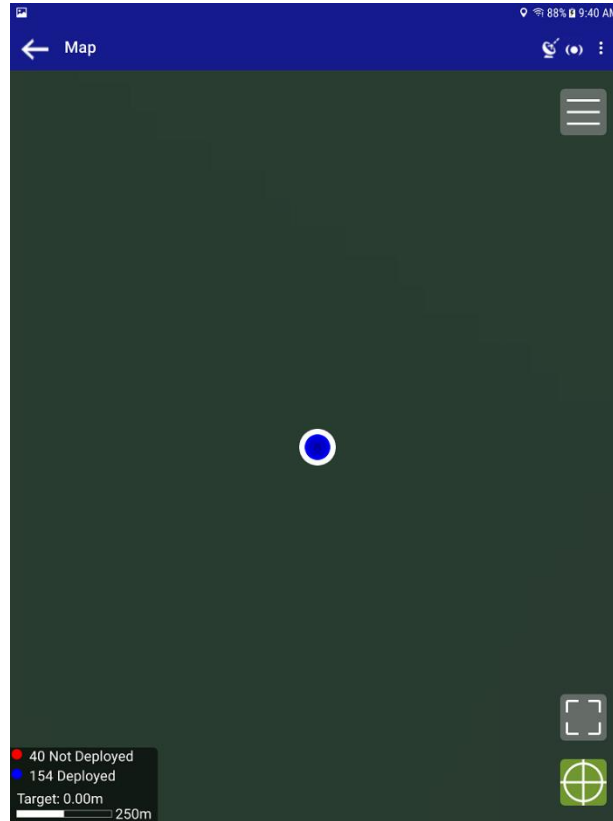



Figure 13

- Tapping on the menu callup icon  will bring up the Map Options window. The options that are chosen in the Options may depend on the size of screen of the device in use.

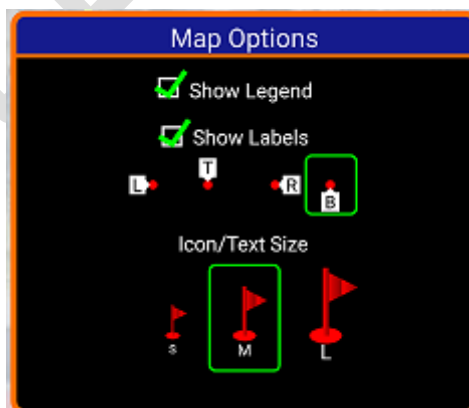


Figure 14

- Ticking and unticking the Show Legend box will toggle the legend box in the Map screen on and off.

- Ticking and unticking the Show Labels box will toggle the receiver point labels on and off on the Map screen.
- Below the Show Labels tick box are 4 choices for changing the position of the receiver point labels. Left, Top, Right, or Bottom. Tapping on the choice will shift a box over it, indicating which position choice is currently active.



Figure 15

- The Receiver Flag Size can be picked by tapping on the S, M or L choices. A box will shift over the choice that is currently active.

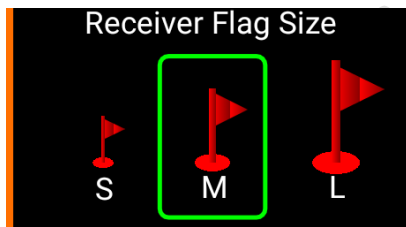


Figure 16

- There are 3 navigation control icons that are used if the user does a long tap on any position on the map (Manual Waypoint), or if a Work Order is installed and has been started. See the section on [Work Orders](#) for more details. If the Work Order has not been started or there has not been a long tap on the map, the navigation icons will not be visible.



Figure 17

- The green circle indicates that the navigation is enabled. Tapping on the circle will turn off the navigation feature and the circle will be blank (without a color fill).



- When navigation is enabled and the circle is green, there are 2 arrow icons beside it. These are used to step through the receiver points that are contained within the Work Order.

- There will be an arrow drawn from the current position of the NuSite device, to the first receiver included in the Work Order.



Figure 18

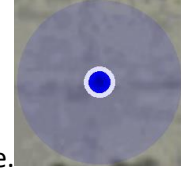
- Tapping on the right arrow will advance the navigation to the next incremental receiver point in the work order.



Figure 19

- Tapping on the left arrow will cause the navigation to shift to the next lower receiver point from the currently chosen point. For instance, in the above screenshot in Figure 19 navigation is pointing to receiver point 1002. Tapping on the left arrow will cause the navigation to shift to receiver point 1001. Note, the arrows are deactivated when using a manual waypoint via long tap.
 - There is also a bearing arrow that is used to indicate the direction of movement of the NuSite device.
 - This bearing icon will only be accurate when the NuSite device is moving in a steady constant motion.
 - If the NuSite device is still, not moving, this arrow will tend to point in an intermittent direction.
 - The orientation of the screen in relation to the direction of movement also needs to be kept in mind when using the bearing icon to navigate with.

Map Screen Use

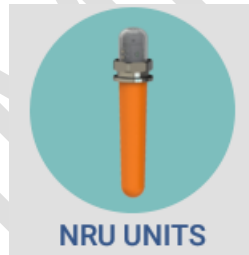


- Current position of the device is displayed as a blue dot surrounded by white.
- To navigate to a receiver point and corresponding NRU node:
 - Select a map zoom level that displays both the receiver point to navigate to, and the current position dot.
 - Make sure the centering bullseye icon is lit **green**.
 - Move towards the targeted receiver point, adjusting zoom appropriately, until the NRU node icon appears on the screen at the targeted receiver point.
 - **Note: Never perform adjustments or allow distraction by the NuSite device when operating a motor vehicle or ATV. If zoom adjustment needs to be made, always stop the vehicle in a safe place and manner prior to adjusting the NuSite device.**
 - **When walking with a NuSite device, take care not to allow attention to the screen to cause a trip or fall.**
- Once the targeted receiver point has been reached and the corresponding NRU node is visible on the screen, tapping on the NRU-1C symbol will open the NRU details screen for that NRU. See the [NRU Unit Details](#) section for more information.


Map Layer Images

- Map layer images are loaded onto NuSite via synchronization with NuScribe. Only images that have been loaded onto NuScribe will be visible on NuSite.
- If no extra images have been loaded onto NuScribe, then the only map layer that will be loaded to NuSite will be the low resolution world view.
- During synchronization with NuScribe, the last task in the synchronization is the map layer images.
- See the NuScribe manual Map View [Layers](#) section for information on loading map image layers to NuScribe.

Chapter 4 User – NRU Units



NRU Units List Page

- Clicking on the NRU Units icon  in the home page will open the NRU Units List Page.

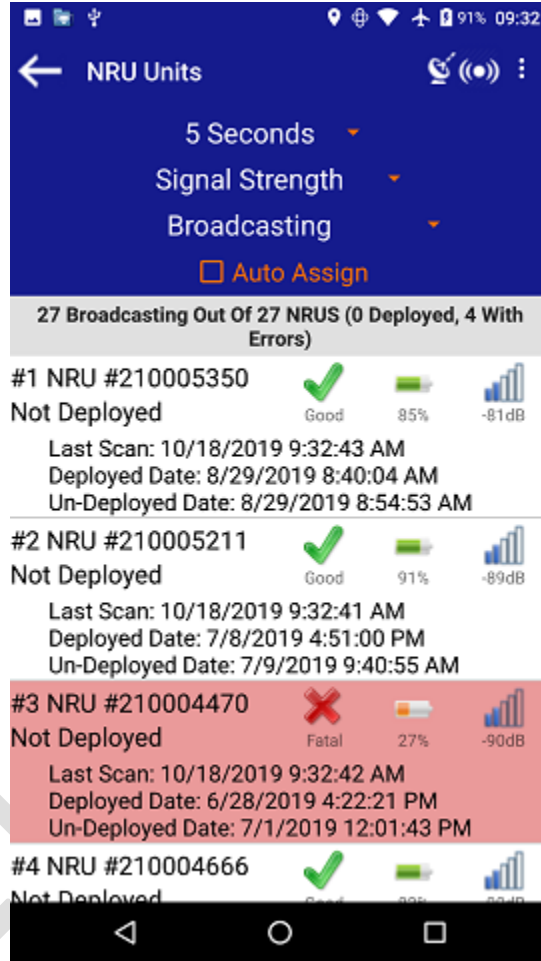


Figure 20

NRU Units List Page Overview

- The grey bar below the top tool bar shows the number of broadcasting NRUs that NuSite is currently receiving broadcasts from. In brackets is the number of NRU that NuSite has received broadcasts from that are deployed, followed by the number broadcasting errors.



Figure 21

- Each NRU listed in the List Page has a quick view of certain status items.

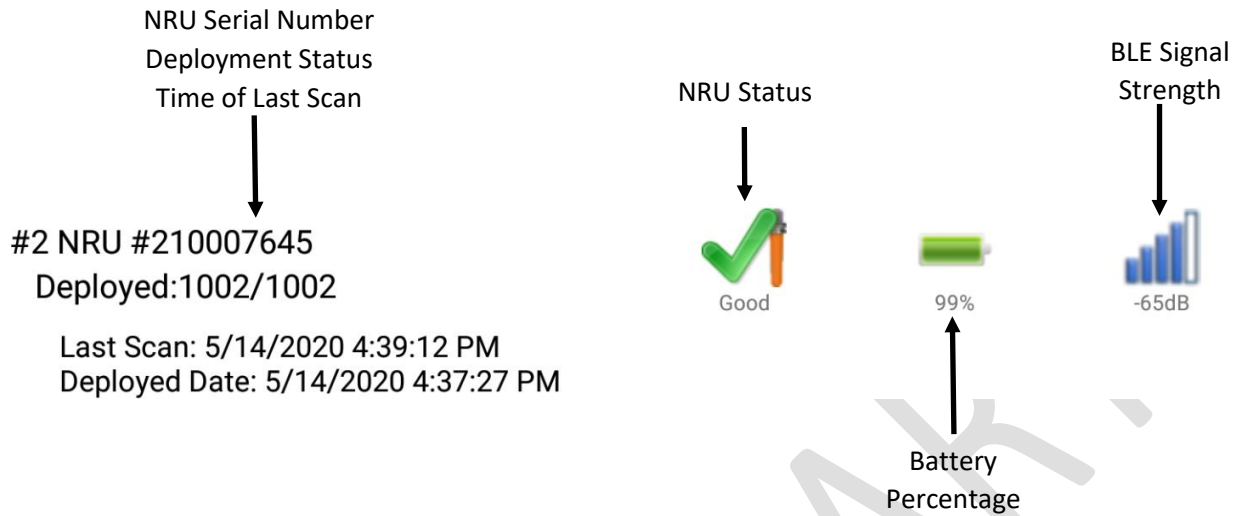


Figure 22

NRU Units List Page Display Settings

- In the top tool bar there are 3 different menu drop down selections that control how the list page is displayed. Depending on the Android device in use, and the available screen space, these will be arranged left to right, or top to bottom. The selection on the left / top is for the Refresh Rate of the list. The selection in the middle is for the Sort Order. The selection on the right / bottom is for the Display Category.

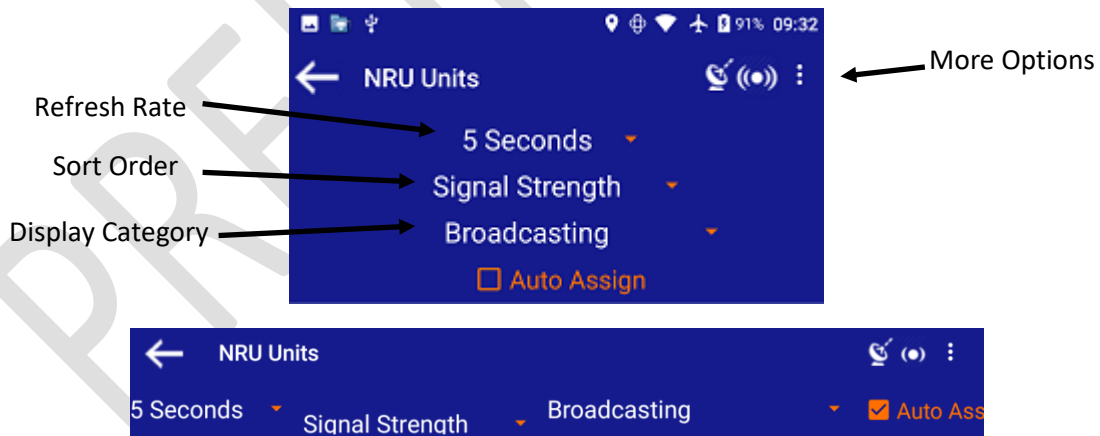


Figure 23

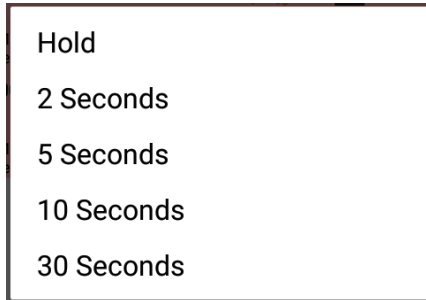


Figure 24

- Hold - will cause the list display to stop refreshing after the time of the last selection has expired, i.e. if 5 seconds was the last selection, after 5 seconds the list will stop refreshing and hold the current listing.
 - 2 Seconds – will cause the page to refresh the listing at that rate. (Recommended)
 - 5 Seconds – will cause the page to refresh the listing at that rate.
 - 10 Seconds – will cause the page to refresh the listing at that rate.
 - 30 Seconds – will cause the page to refresh the listing at that rate.
- Tapping the current Sort Order choice in the tool bar will call up the Sort Order drop down menu.

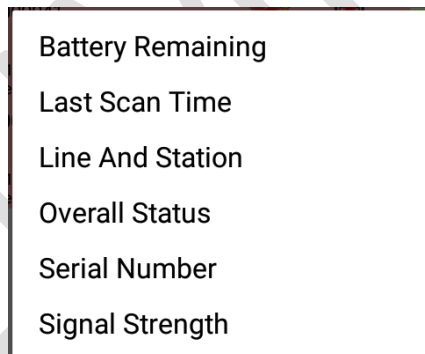


Figure 25

- Battery Remaining – will cause the list to sort by percentage of battery remaining in ascending order.
 - Last Scan Time – will cause the list to sort by scan time with the most recent at the top.
 - Line And Station – the list will sort by line and station number in ascending order.
 - Overall Status – will cause the list to sort by status, with Fatal first, then Warning, and finally Good units.
 - Serial Number – the list will sort by NRU serial number in ascending order.
 - Signal Strength – the list will sort by the Bluetooth signal strength of each NRU in descending order. (Recommended)
- Tapping Display Category will bring up the Display Category drop down menu.

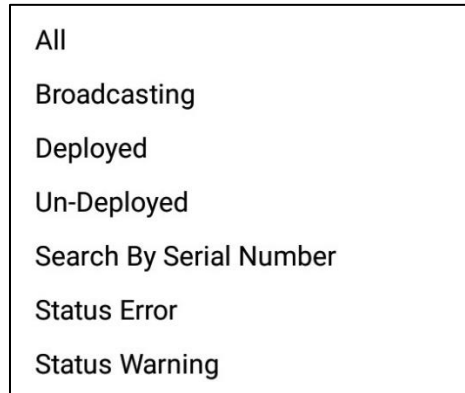


Figure 26

- All – will display all NRU broadcast scans that were received within the last 30 minutes.
- Broadcasting – will display all NRUs that are currently broadcasting within range of the NuSite device.
- Deployed – will display all broadcasting NRUs that have a deployed status.
- Un-Deployed – will display all broadcasting NRUs that have an un-deployed status.
- Search by Serial Number – will open a dialog popup window that will allow searching for a NRU serial number amongst the broadcasting NRUs within range of the NuSite device. Very useful for finding a NRU when there are many NRUs transmitting in the vicinity of the NuSite device.
 - The entire serial number does not have to be typed in, just the last 4 digits.
 - Tapping on OK will display all of the NRUs that currently transmitting status, that contain those 4 digits.
 - For example, typing in 0347 will cause all NRUs with 0347 in the serial number, in that order, to display. 210000347, 210003471, or 210034711 will all be displayed if they are in receiving range of the NuSite device.

Figure 27

- Status Error – will display all broadcasting NRUs with a detected error in status
- Status Warning – will display all broadcasting NRUs with a detected warning in status
- Auto Assign – ticking this box on will enable the Auto Assign function. This allows NuSite to automatically assign a deployed NRU to a receiver point with no user interaction. If the box is unticked, the user must enter the receiver line and station manually, see the [Assign Deployment](#) section. Sound should be enabled when using Auto Assign, as there is audio feedback when the NRU is assigned to a station.

NRU Unit Details Page

- Tapping on any NRU in the List Page will change to the NRU Unit Details page of that NRU.

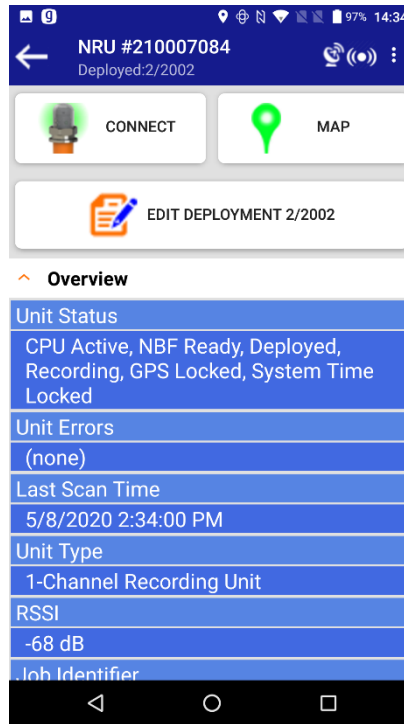


Figure 28

NRU Unit Details Page Overview

- In the top tool bar, the NRU serial number will be shown as well as the Deployment status as of the last scan of status, including assigned line and station number. In the example above in figure 28, NRU #210007084 was deployed at line 2 station 2002.
- Below the toolbar will be 2 or 3 choices depending on several variables – Connect, Map\Not On Map, and Edit Deployment.
 - Connect – when an NRU is tapped in the list view, Connect will be shown in the details page.
 - Tapping on Connect will open the NRU Management screen for the NRU. See the [NRU Management](#) section for more details.
 - Map\Not On Map – if the NRU that has been tapped on in the List page was in a deployed state and had a good GPS position, Map will be shown. If the NRU was in an un-deployed state, or did not have a GPS position, then Not On Map will be shown.
 - Tapping on Map will change the display to the Map page, zoomed to the NRU position.
 - Tapping on Not on Map will pop up a No Location On Map error message.

- Assign Deployment/Edit Deployment – if the NRU is in a deployed state and is currently within BLE range of the NuSite device this button will be visible.
 - If the NRU is undeployed, the Assign/Edit Deployment button will not be visible.
 - If the NRU is deployed but has not yet received a GPS position, the Assign/Edit Deployment button will be greyed out.
 - The button will read Assign Deployment if the NuSite database does not have a valid station assignment for the NRU.
 - The button will read Edit Deployment if there is a valid station assignment in the NuSite database for the NRU, and show the line and station that it is assigned to.
 - See the [Assign Deployment](#) section for instructions on assigning or editing a deployment manually.
 - See the [Auto Assign Selected](#) section in Appendix C for instructions on using the Auto Assign function.
 - If the NRU is assigned to a station in the NuSite database, the Edit Deployment button will be shown with the assigned line and station number.

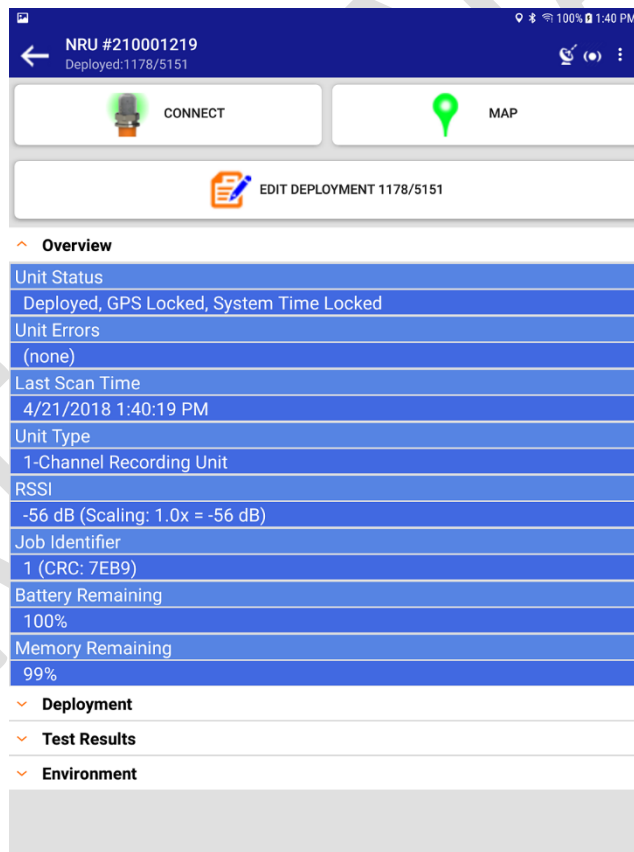


Figure 29

- The rest of the Details page is broken down into 4 drop-down sections. Overview, Deployment, Test Results, and Environment.

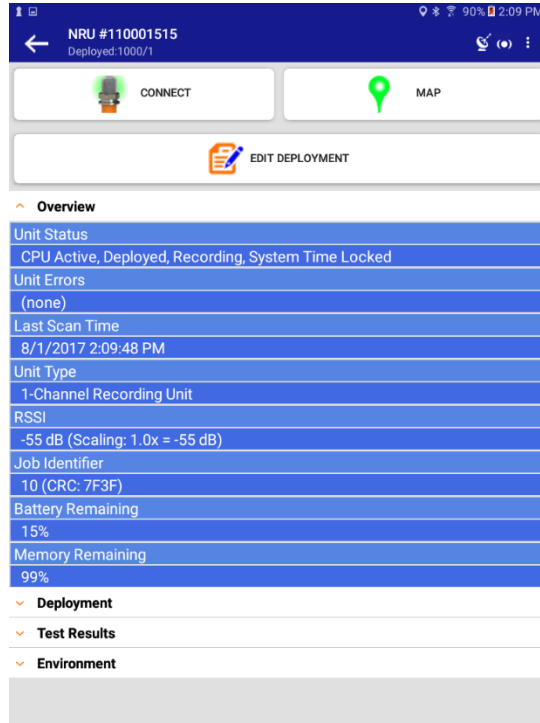


Figure 30

- Overview – This section is automatically open when the Details page is first opened.
 - Unit Status – displays current status of the NRU. It is very important to pay attention to this field to understand NRU status and state.
 - CPU status
 - When bumping an NRU that is set to Auto-Deploy, a bump cannot be done until CPU status is Inactive. When the CPU is Active a bump will not take effect.
 - When a deployed unit is undeployed, the CPU will remain active for up to 60 seconds before switching to low power mode.
 - Deployment status
 - Recording status
 - System Time status
 - Unit Errors – lists any internal errors detected. If an error is detected, it will show in this field and the line will turn red. The Overview bar will also turn red and show the number of errors in the Overview field.

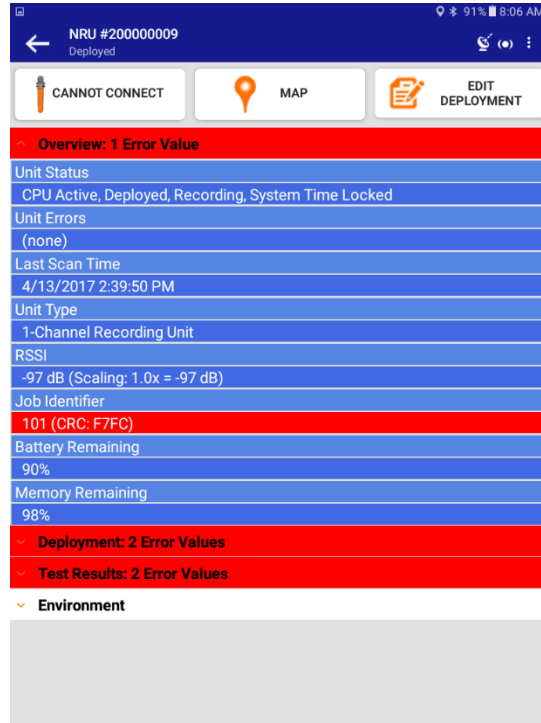


Figure 31

- Last Scan Time – time of last scan in the NuSite database. Attention should be paid to this field to see if the unit status is updating. If the Last Scan Time is not updating, then no new scans are being received by the NuSite device.
 - Unit Type – type of NRU recording unit
 - RSSI – signal level of BLE if the NRU is broadcasting and in range of the NuSite device.
 - Job Identifier – job number and CRC of internal settings. This is used to ensure that the NRU has been programmed with the correct settings for the current project. If the job number and CRC read from the unit are different from what was defined, this field will turn red and the Overview bar at the top will turn red and show the number of error values detected in the Overview field.
 - This field will only flag red if a Work Order has been synchronized to the NuSite device from NuScribe.
 - If no Work Order has been synchronized, the field will remain white and not flag an incorrect Job Identifier as there is no cross check without a Work Order.
 - Battery Remaining – shows the percentage of battery life remaining.
 - Memory Remaining – indicates the total percentage of internal memory left for recording data.
- Deployment – tapping on the Deployment bar will open the deployment details field for the NRU

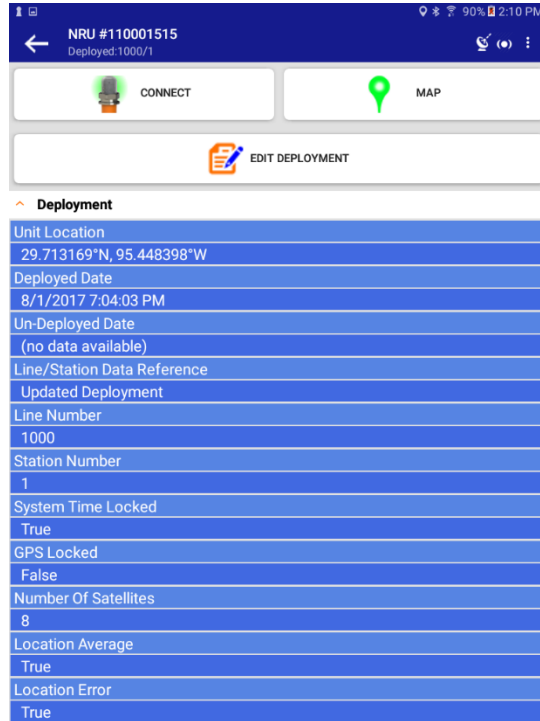


Figure 32

- Unit Location – shows the last GPS position of the NRU that was received by the NuSite device if it is in range of the NRU, or the last position of the NRU that is present in the NuSite database
- Deploy ID – an identifier key that is used to differentiate deployments of the NRU after the NuSite database has been synchronized into the NuSuite database.
- Deployed Date – date and time of the last deployment present in the NuSite database for the NRU, if that NRU is presently deployed.
- Un-Deployed Date – date and time that is present in the NuSite database for when the NRU was un-deployed, if that NRU is presently un-deployed.
- Line/Station Data Reference – shows the source of the line and station number assignment.
- Line Number – line number present in the NuSite database that the NRU is deployed on, if that NRU is in a deployed state.
- Station Number – station number present in the NuSite database that the NRU is deployed on, if that NRU is in a deployed state.
- System Time Locked – will show True or False. If the NRU is currently in BLE range of the NuSite device this will show the current state of the system time that the NRU is broadcasting. If the NRU is no longer in range of the NuSite device this will show the last status of the system clock that is present in the NuSite database. True indicates a system time lock, false indicates the NRU does

not have a system time lock. The NRU must have System Time Lock to start recording.

- GPS Locked – will show True or False. If the NRU is currently in BLE range of the NuSite device this will show the current state of the GPS that the NRU is broadcasting. If the NRU is no longer in range of the NuSite device this will show the last status of the GPS that is present in the NuSite database. True indicates a GPS lock, false indicates the NRU does not have GPS lock.
 - A NRU that is recording can show False in the GPS Locked field when the GPS is coasting. The NRU has a position fix, system clock is good, and it is recording, the GPS is turned off to reduce battery consumption.
 - The GPS will turn back on at intervals to check the system clock and acquire a position fix again. The GPS Locked field will toggle to True.
 - False in this field does not indicate an issue as long as the System Clock is True, and the unit has a GPS position.
- Number of Satellites - if the NRU is currently in BLE range of the NuSite device this will show the current number of GPS satellites that the NRU is receiving good positioning data from. If the NRU is no longer in range of the NuSite device this will show the last status of number of GPS satellites that is present in the NuSite database.
- Location Average – will show True or False. If the NRU is currently in BLE range of the NuSite device this will show if the NRU currently has enough positioning data to average its position. If the NRU is no longer in range of the NuSite device this will show the last status in the NuSite database that the NRU broadcasted for if it had enough positioning data to average its position.
- Location Error – will indicate any errors with the GPS or positioning of the NRU by True if no error, or False if there is an error. If the NRU is currently in BLE range of the NuSite device this will show if the NRU has any location error or not. If the NRU is no longer in range of the NuSite device this will show the last status in the NuSite database that the NRU broadcasted for if it had a location error or not. If there is an error, this field will turn red and the Deployment bar will turn red and indicate the number of errors present in the field.
- Test Results – tapping on the Test Results bar will drop down the tests results details. This field will only be populated if the NRU is in a Deployed state. An Un-deployed NRU will show no tests result.

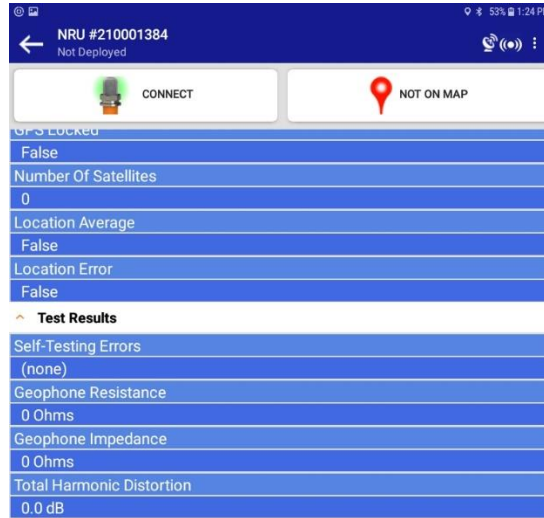


Figure 33

- Self-Testing Errors – if any errors are detected during the NRU power-on testing, they will be listed here. If no errors are detected the field will show (none). If errors are detected the error will be listed and the field will turn red. The Test Results bar will turn red and indicate the number of errors present in the Test Results field.
- Geophone Resistance – indicates the resistance of either the internal geophone element or external geophone string if the unit is one with an external geophone connector (KCK), during the last power up test. The Geophone Resistance is taken during the geophone tests during power up. If the Geophone Resistance falls outside the defined parameters set in the NuScribe parameter setup, this field will turn red and the Test Results bar will be red and indicate the number of errors detected in the Test Results field.
- Geophone Impedance – indicates the impedance of either the internal geophone element or external geophone string, if the unit is one with an external geophone connector (KCK), during the last power up test. The Geophone Impedance is taken during the geophone tests. If the Geophone Impedance falls outside the defined parameters set in the NuScribe parameter setup, this field will turn red and the Test Results bar will be red and indicate the number of errors detected in the Test Results field.
- Total Harmonic Distortion – indicates the harmonic distortion level detected during the last set of internal tests that were run. If the Distortion level falls outside the defined parameters set in the NuScribe parameter setup, this field will turn red and the Test Results bar will be red and indicated the number of errors detected in the Tests Results field.

- Tapping on the Environment Bar will drop down the Environment field details. These fields will only be populated if the NRU is in a deployed state. Only Battery Voltage will be populated if the NRU is in an Un-deployed state.

^ Environment	
Spread Noise	0 μ V
Battery Voltage	3.80V
Temperature	27.8°C
Tilt Angle	177 deg

Figure 34

- Spread Noise – the amount of average noise detected on the geophone element/string during geophone tests. If the noise level exceeds the threshold set in the parameter setup, this field will turn **red** and the Environment Bar will turn **red** and indicate the number of errors in the Environment field.
- Battery Voltage – indicates the voltage of the internal battery of the NRU. If the Battery Voltage is below 3.6 volts, the Battery Voltage field will turn **yellow** as a warning and the Environment Bar will turn **yellow** and indicate the number of warnings in the Environment field.
- Temperature – gives the internal temperature of the NRU in degrees Celsius.
- Tilt Angle – indicates the angle of the NRU as measured by the onboard accelerometer. The measurement is done at intervals and updated in the BLE status broadcast.
 - ≥ 165 degrees is good. 180 degrees indicates perfect straight up and down measurement.
 - 164-160 will show a warning and the Title Angle field will turn **yellow** as a warning and the Environment Bar will turn **yellow** and indicate the number of warnings in the Environment field.
 - < 160 will show an error, this field will turn **red** and the Environment Bar will turn **red** and indicate the number of errors in the Environment field.

NRU Management Page

- In the NRU Details Page, if the NRU is in BLE range of the NuSite device, tapping on Connect will open the NRU Management page. In this page, Deployment or Un-deployment can be done. Or the unit can be put into Shutdown mode.
- **Please note that in the current NuSite software, as reflected in the manual screenshots, Shutdown is referred to as “Shelf”. This will be changed to “Shutdown” within NuSite in future releases.**

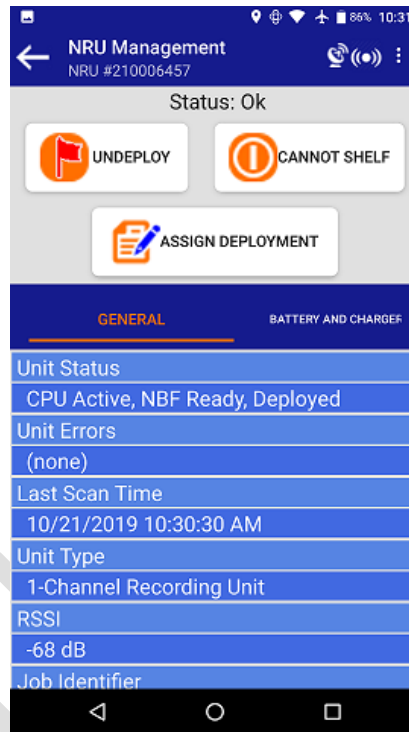


Figure 35

NRU Management Page Overview

- In the top banner bar left hand corner, under the NRU Management heading will be the NRU serial number.
- The grey bar will show the connection status. If BLE communications have been established correctly, the message **Status: Ok** should be shown. If a connection fails to be made or drops out **Disconnected Status Ok** will be seen
- If the NRU fails to connect, go back to the NRU Details page, then tap on Connect again to retry the connection.

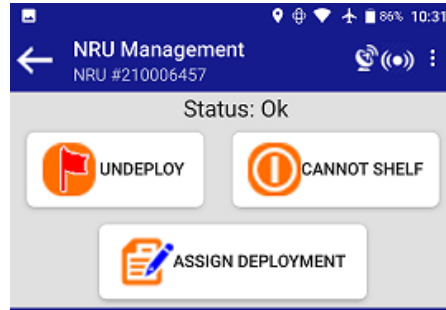


Figure 36

- Below the connection status will be either Deploy or Un-deploy depending on the current state of the connected NRU, and Shutdown NRU or Cannot Shutdown, depending on the current state of the connected NRU.
- Below Deploy and Shutdown is Assign Deployment or Edit Deployment depending on whether or not the NRU has an assigned deployment within the NuSite database.



Figure 37

- General – this is the same as the Overview field in the [NRU Details](#) page.
- Battery and Charger – this is an extended version of the Environment field from the NRU Details page. This page is for engineering information and will be phased out in future releases.

GENERAL	BATTERY AND CHARGER
Unit Status	
Charging, CPU Active	
Unit Errors	
(none)	
Last Scan Time	
3/27/2018 2:02:00 PM	
Unit Type	
1-Channel Recording Unit	
RSSI	
-75 dB (Scaling: 1.0x = -75 dB)	
Job Identifier	
10 (CRC: 9A65)	
Battery Remaining	
99%	
Memory Remaining	
99%	

Figure 38

- Engineering -Only Field: Raw Data (20 Bytes) – currently present to be used for Engineering purposes, not useful to the user.
- Charger Status – status of the charger circuit expressed in hexadecimal format.
- Charger Fault Status – should show 0x0 in hexadecimal format if no faults. If a fault is occurring, that status would be shown in hexadecimal format and the line would turn red.
- Charger Enabled – charger enabled status would be shown as either True or False.
- State of Charge – expressed in a percentage, with 100% indicating full charge of battery.
- Remaining Capacity – value in milliamp hours, shows battery remaining capacity. If the capacity is below a threshold set in the parameters, this line will be yellow as a warning.
- Voltage – battery voltage shown in millivolts.
- Average Current – expressed in milliamps, average charge current for battery charging.
- Instantaneous Current – expressed in milliamps, battery charging current at the time of the scan from the NRU.
- Internal Temperature – internal temperature of the NRU listed in degrees Celsius.
- Cycle Count – not implemented.

Deploy/Un-deploy

- If the NRU that is connected to the NuSite device is in an Un-Deployed state, the Deploy button will be show in the grey bar.

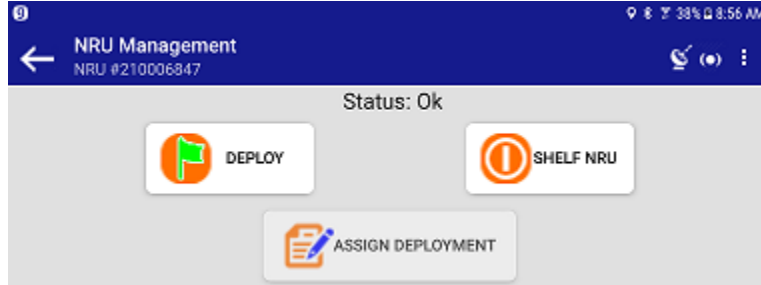


Figure 39

- Tapping on Deploy will send a Deploy command to the NRU, which will flash green if successful or red if there is an issue and the NRU did not deploy properly.
- After tapping on Deploy, the screen will shift back to the NRU Details page and the BLE connection to the NRU will be dropped. If required, tap on Connect again in the Details page to reconnect to the NRU.
- If undeploying with the NuSite device, connect to the NRU. Wait for the blue LEDs to light and the Connected message to read on the NRU Management Page screen. Tap on Undeploy and the NRU yellow LEDs will flash 5 times indicating that the NRU has undeployed successfully

Assign Deployment

- Can be done from either the NRU Details page or the NRU Management Page when connected.
- Assign Deployment – tapping this will open up an assign deployment window.

Figure 40

- If the NuSite device has been synched to the NuScribe database, and receiver information is present in the NuSite database, the Line and Station fields will automatically populate with the nearest receiver point. If there are no nearby receiver points or the wrong numbers have populated the fields, the Line and Station can be manually typed in by tapping on the Line and entering the desired number, then tapping on Station and entering the desired number.
 - If an external GPS is connected to the device, the positioning information will display below the Station box.
 - If there is no external GPS or the NuSite device has lost Bluetooth connection to the GPS, instead of positioning information the positions will be filled with the name of the field, i.e. Ext Lat
- Tap Assign to assign the NRU to that line and station or tap Cancel to cancel the operation, or Update Deployment if editing a deployment.

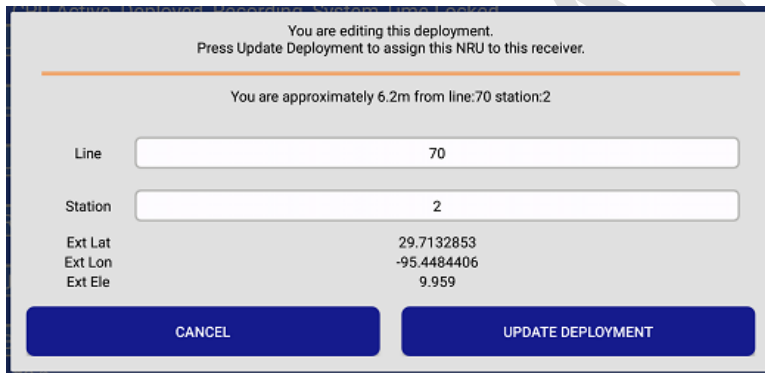


Figure 41

- If there is a conflict, the conflict would be listed above, and the dialog box would show CANCEL or DEPLOY OVERRIDE. Tap CANCEL to cancel the deployment or DEPLOY OVERRIDE to override the conflict and finish the deployment of the NRU. When replacing a NRU at a receiver point for whatever troubleshooting reason, a conflict would be seen.
- If the NRU that the NuSite device is connected to is in a Deployed state, Un-Deploy will be shown in the grey bar.

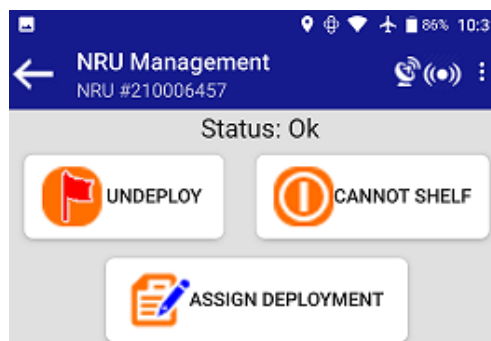


Figure 42

- Tapping on Un-Deploy will cause the NRU to switch to an un-deployed state.

Shutdown/Cannot Shutdown

- If the NRU that is connected to the NuSite device is in an Un-Deployed state, Shutdown Unit will be shown in the grey bar.

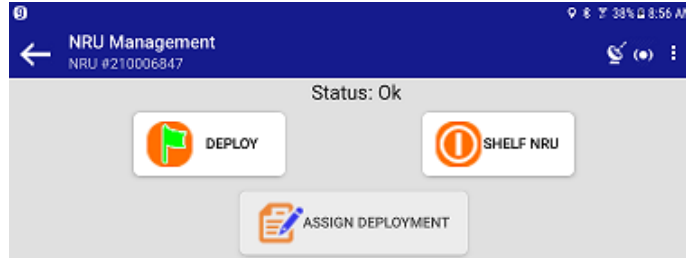
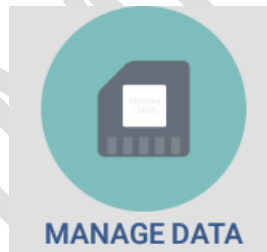



Figure 43

- Tapping on Shutdown NRU will cause the NRU to shut down completely, power off.
 - The NRU LEDs will turn on solid orange. First all 4, then 2. Once all LEDs are off the NRU is shut down.
 - To turn the NRU back on it must be bumped, see the Bumping section of the Field Equipment Manual for details.
- If the NRU that is connected to the NuSite device is in a Deployed state, Cannot Shutdown will be shown in the grey bar.
 - In order to shut down a NRU that is Deployed
 - You must Undeploy, then the button will turn from Cannot Shutdown to Shutdown, and the NRU can be shutdown using that button.

Chapter 5 User – Manage Data



Manage Data Overview

- Tapping on the Manage Data icon  in the Home page will open the Manage Data page.

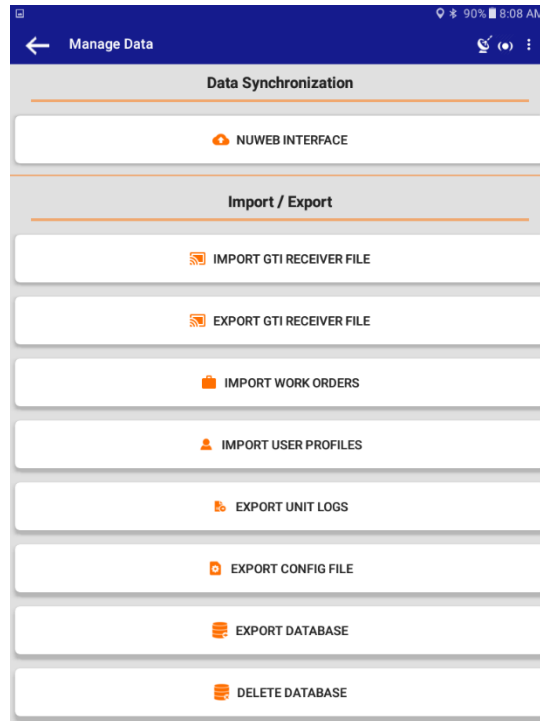


Figure 44

- The Manage Data page is broken into 2 sections, Data Synchronization and Import/Export.

Data Synchronization

- Make sure that the NuSite device has its Wi-Fi turned on and is connected to the same Wi-Fi network as the NuScribe computer.
- To test the connection, in a web browser on the NuSite device, in the address bar, type in the IP address of the NuScribe computer followed by /NuWeb. For example, 10.0.1.4/NuWeb. A NuWeb web page should display in the browser indicating a good connection. Close the browser.
- Tapping on NuWeb Interface will open the NuWeb Data Transfer window. This is the utility that is used to synchronize the NuSite database with the NuScribe database.

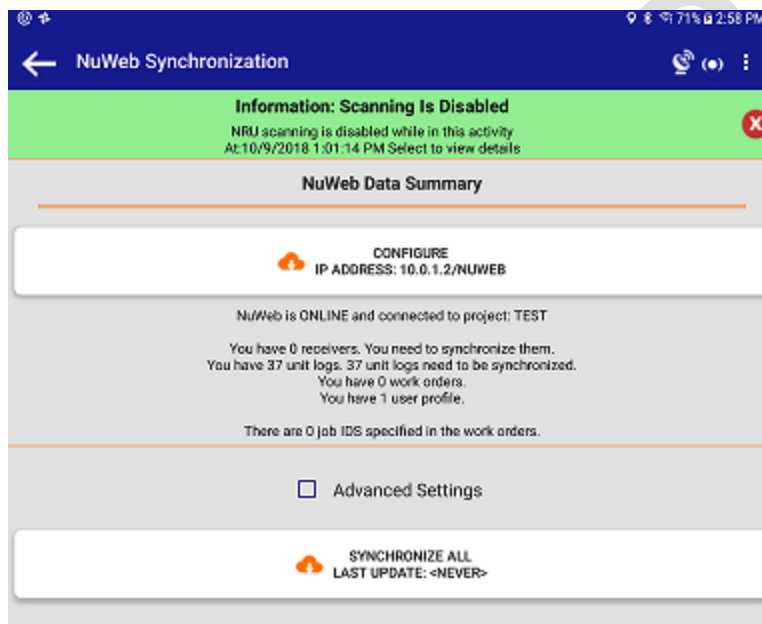


Figure 45

- There will be a green information bar across the top of the screen stating that “Scanning is Disabled”. This indicates that scanning has been turned off until Synchronization has been finished so that no unwanted NRU broadcasts are picked up by the device and synchronized into the NuScribe database by accident.
- If the NuSite device has previously synchronized users as detailed in the [Getting Started](#) section, the IP Address will be correctly filled in. If there is no IP Address present, tap on Configure IP Address.
 - This will open the NuWeb IP Address pop up window, and the IP Address of the NuScribe computer can be typed in, /NuWeb will be automatically filled in and only the IP Address can be typed in.
 - Tap on OK to confirm the address.
- Below Configure are details of the NuSite database.
 - The number of receivers that are currently in the database.

- The number of total unit logs that are present in the database and how many are not synchronized with the NuScribe database.
- Number of work orders.
- Number of user profiles from the last user synchronization of the device.
- Synchronize All will show the date and time of the last synchronization with the NuScribe database. Tapping on Synchronize All will initiate a complete synchronization.
 - If this is the first synchronization since the software was installed or updated, Last Update will show <Never>

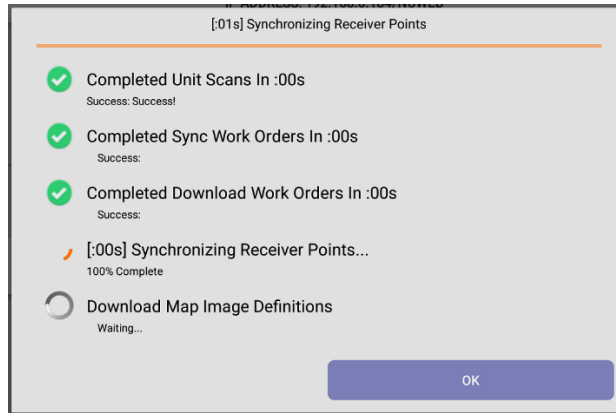


Figure 46

- There are 5 categories of information that are synchronized between the NuSite database and the NuScribe database.
 - Work Orders – synchronizes Work Orders that were setup in NuScribe.
 - User Profiles – synchronizes user profiles that are setup in NuScribe.
 - Unit Scans – unit scans that are present in the NuSite database are synchronized to the NuScribe database.
 - Receiver Points – synchronizes receiver point information from the NuScribe database to the NuSite database.
 - Map Image Definitions – adds map layer images that have been loaded into NuScribe.
- Each category is synchronized in order. The spinning ring will turn orange indicating the category is currently syncing. The other categories will show waiting and the ring will be grey.
- Successful synchronization will have the orange ring turn into a green checkmark for good synchronization or a red circle with a white x indication a synchronization failure, usually followed by an error message.

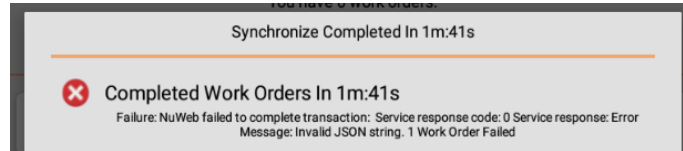


Figure 47

- Once all 4 categories show a good synchronization, tap on OK to return to the NuWeb Data Transfer page.

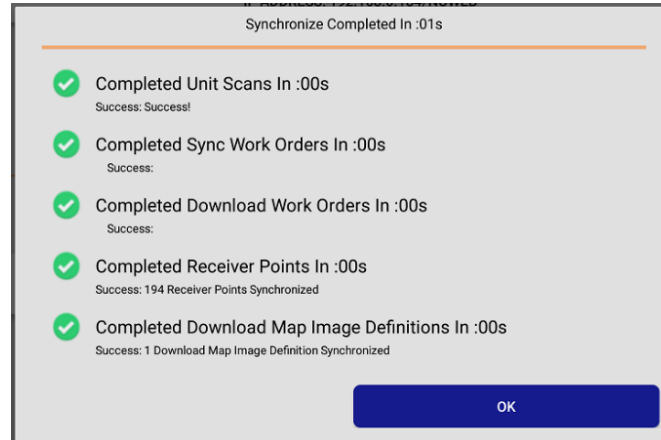


Figure 48

- Tapping on Advanced Settings will tick the Advanced Settings box.
 - This opens a open to Set Sync From Date
 - Tapping on that box opens a calendar view
 - Navigate to the required data, tap on the date so it is highlighted, then tap on Ok.
 - This will cause the database to synchronize only from that picked date up to the present.
- To return to the Manage Data page, tap the back arrow in the left of the top banner

Import/Export

- Import/Export allows the importing and exporting of data to and from the NuSite database.
 - Import GTI Receiver File – not yet implemented
 - Export GTI Receiver File – not yet implemented
 - Import Work Orders – not yet fully implemented
 - Import User Profiles – not yet implemented
 - Export Unit Logs – will export unit logs present in the NuSite database to a .csv or .xml format file. The file is stored in the Device Storage/Thales directory.
 - Export Config File – will export a .xml format file of certain configuration items. The file is stored in the Device Storage/Thales directory.

- Export Database – saves a backup copy of the NuSite database. The file is saved to the Device Storage/Thales directory. Only 1 copy of the database will be stored, subsequent export will overwrite the file.
 - The database file can be copied off of the NuSite device.

PRELIMINARY

Chapter 6 User – Work Orders



Summary

- Work Orders are created on NuScribe in the Work Orders view. See the [NuScribe manual Appendix A](#) for instructions for setting up Work Orders.
- Work Orders are synchronized to the NuSite devices via NuWeb. See the [Data Synchronization](#) section for more information on synchronization.
- It is not necessary to have a Work Order to carry out NuSite operations, but if the navigation feature of NuSite is required, then the Work Order feature needs to be used.
 - At least 1 Work Order has to be setup on NuScribe and synchronized to the NuSite devices in use, in order to pass the Job ID, CRC and KCK Unit flag to the NuSite devices. If not, NuSite will not flag incorrect Job ID or CRCs, and will incorrectly flag tilt on KCK units.
- The use of Work Orders for assigning jobs to certain users, allows for tracking of how fast and complete the work was done.
- Work Orders can be associated to certain NuSite usernames that are setup on NuScribe and synchronized via NuWeb to the NuSite devices in use.

Work Orders List

- Clicking on the Work Orders icon in the Home page will open the Work Orders list.

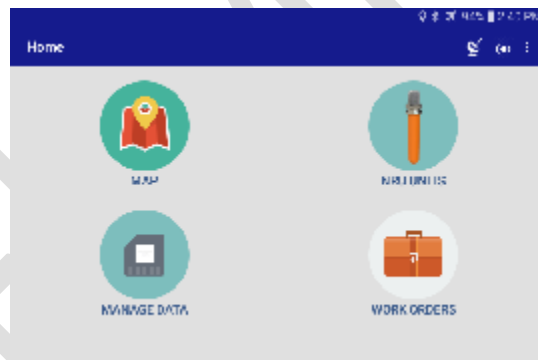


Figure 49



Figure 50

- In the example screenshot in Figure 51 above, there are 2 Work Orders listed that were synchronized to the device.
- In the grey bar at the top of the work orders, is listed the total number of Work Orders, and in brackets the total number for the NuSite user. In this case the user logged in as user1.
- Each Work Order is highlighted with a different color to differentiate them.
- The Work Orders are listed with information about each work order
 - Priority – priority level assigned when the Work Order was setup in NuScribe
 - Created by – indicates it was synchronized to the database
 - Assigned To – the user assigned to that work order when it was created in NuScribe
 - Type – deploy or undeploy (layout or pickup), assigned when the work order was created in NuScribe
 - Issued – the date and time the work order was created in NuScribe
 - Started At – date and time the work order is started in NuSite
 - Completed At – date and time the work order is completed in NuSite
 - Creator Comments – comments entered on NuScribe when creating the Work Order. Usually short instructions
 - Locations – summary of the receiver line(s) and stations that are covered by the work order.
- Tapping on the left pointing arrow in the blue menu bar at the top of the screen will take the user back to the Home page.
- Tapping on any of the work orders will open the Work Order control page.

Work Order Control

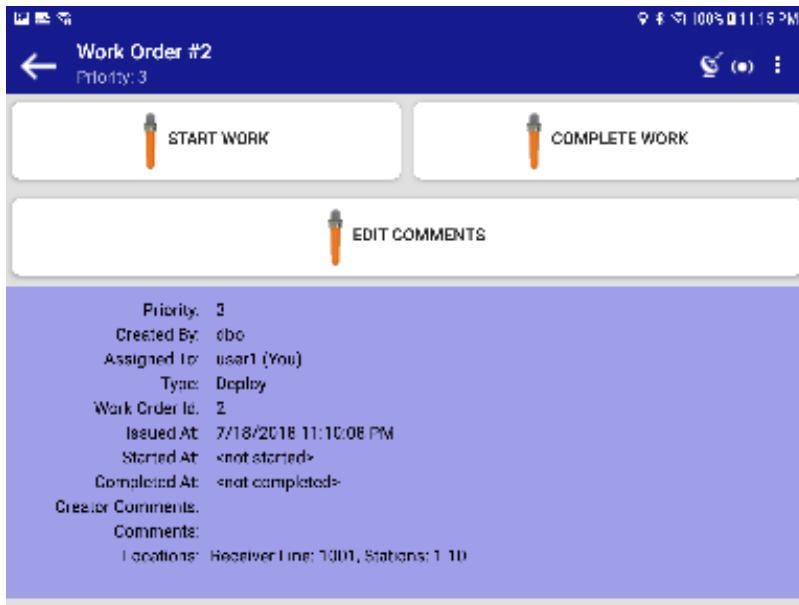


Figure 51

- Start Work – tapping on the Start Work button will start the Work Order and the Started At date and time will change from <not started> to a date and time. This will also start the navigation feature in the Map screen

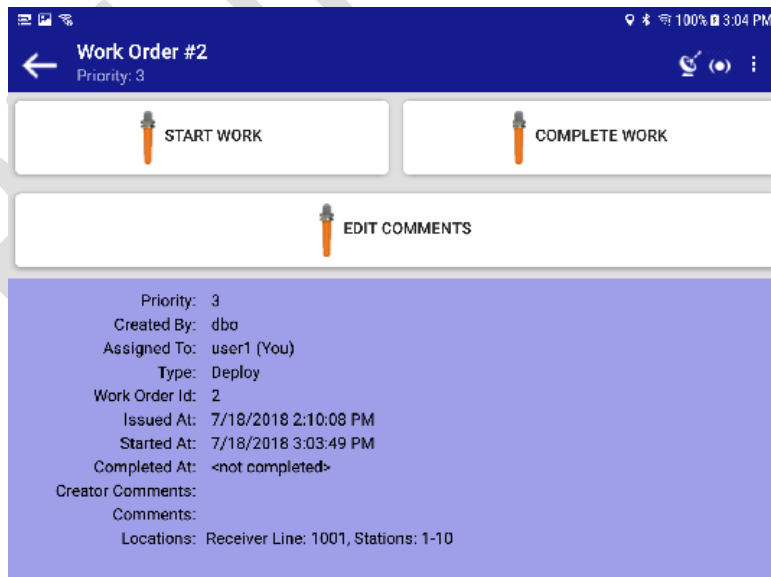


Figure 52

- Complete Work – tapping on Complete Work will cause the Work Order to stop and a date and time will be recorded in the Completed At field. This will also stop the navigation feature in the Map screen.
- Edit Comments – used to add user comments to the Work Order, which will be uploaded to NuScribe the next time the NuSite device is synchronized.

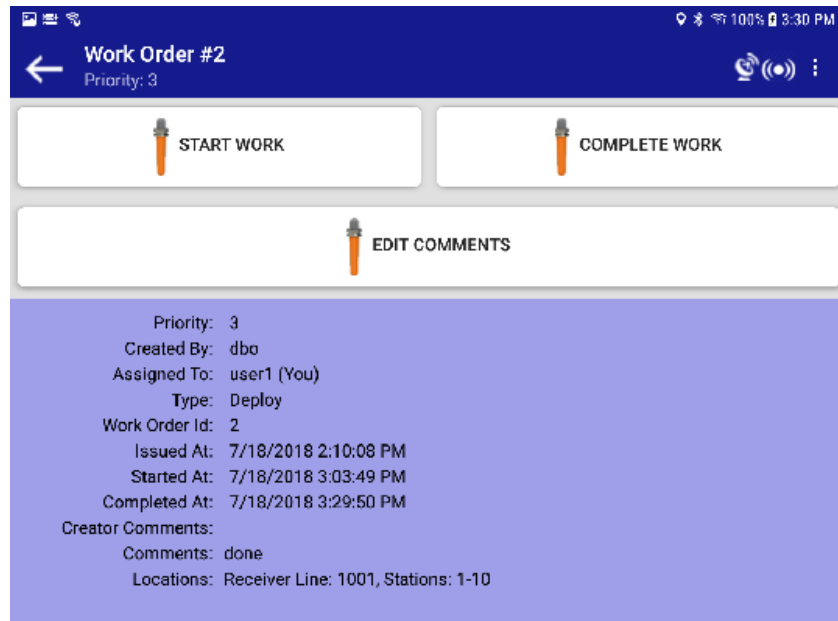


Figure 53

- Tapping on the left arrow in the blue menu bar will take the user back to the Work Order list.
- If another work order is required to be started, tap on it to go to the control page for that work order.

Chapter 7 User – More Options

PRELIMINARY

More Options Overview

- In the top banner bar of all the NuSite application screens, on the right side is an icon of 3 vertical dots. This is the More Options menu call up icon. Tapping on the icon will bring up a list of menu selections.



Figure 54

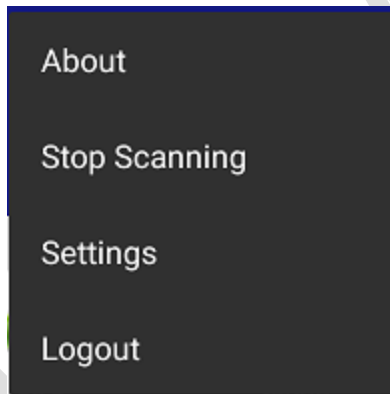


Figure 55

- Some of the options in the More Options menu will change depending on which NuSite screen the user is in when tapping in the More Options icon.
 - **NOTE: Some options in the More Options menu are only accessible if the user is logged in with an engineering username. Normal users do not need to access some of the menu items and great care should be taken when using some menu items as improper use may result in abnormal operations and/or loss of data.**
 - About – tapping on About will call up a page with information about the NuSite device and the NuSite software installation. Also includes release notes for NuSite.
 - Stop/Start Scanning – can be used to stop scanning in order to prevent scanning in unwanted NRU status. Remember to tap Start Scanning again in order to start collecting NRU status again.
 - Settings – not normally used.
 - Logout – will log the user out of NuSite and return to the login page.

Appendix A – Typical Operations

PRELIMINARY

Deploying a NRU with NuSite

1. The NuSite device database should have been synchronized with the NuScribe database prior to starting operations in the morning. See the section on [Data Synchronization](#).
2. Log into NuSite using the proper username and password that were assigned to the user at the beginning of the project.
3. If Work Orders are in use, open the Work Order page and tap on the Work Order for that day's work.
4. Use the Map page to find the first receiver station that deployment operation is to start at. Navigate to the receiver point using the Map page.
 - a. The NRU that is at the receiver station typically should have been planted on the point previously and should be powered on and in a deployed state.
 - b. If Auto Deploy is in use and the NRU does not show as deployed, the NRU will need to be bumped again or deployed with NuSite.
 - c. If the NRU is not powered on, still in shelf mode, it will need to be bumped on. See the Field Equipment manual Bumping section for bumping a NRU.
5. When the NuSite device is within range of the NRU on the receiver point, it will be visible on the Map screen near by the preplot receiver flag.
6. Double check that the receiver point is the correct number and that the NRU number is correct.
7. Tap on the NRU in the Map screen and the display will change to the NRU Details screen.
8. If the NRU is already on and deployed, tap on Assign Deployment to enter the line number and station.
 - a. If the NRU is on but undeployed tap on Connect and wait for the Connected message to display. The screen will change to the NRU Management screen. If the connection is good the NRU will display solid blue LEDs.
 - i. If the connection fails, retry.
 - ii. If the connection fails again. Exit the Detail page back to the Map. Try tapping on the NRU again and retry the connection.
 - b. Tap on Deploy in the NRU Management screen and ensure that the NRU LEDs flash green 5 times to indicate a valid deployment. NuSite will return to the NRU Details page.
9. Tap Assign Deployment and double check the Line and Station number are correct. Then tap on Assign to finish the deployment.
10. The NuSite screen will return to the NRU Details.
11. In the NRU Details screen, ensure that the Unit Status field has a message indicating **CPU Active, Deployed, Recording, System Time Locked**. This message indicates that the deployment was successful, that the NRU has time lock and is recording. It is very important to make sure this message is seen before leaving the NRU location.
12. Now Un-Deploy should be visible in the NRU Management screen.
13. Tap either the back arrow or Map to return to the Map display. The NRU LEDs will turn off indicating that the connection is turned off, but the NRU will still be broadcasting status which the NuSite device will receive.
14. In the Map page the navigation should have advanced to the next receiver station. Continue to the next receiver station to deploy the next NRU.

15. At the end of day if Work Orders are in use, and a Work Order was started for the day, go to the Work Orders page, tap on the work order being used and then tap on Stop.
16. At the end of the workday, the NuSite device database must be synchronized to the NuScribe database.
17. For details on the Auto-Deploy method of deployment, see the Field Equipment Manual Page 17
 - It is recommended that all NuSite devices be synchronized at the end of the workday and again prior to starting operations in the morning. Regardless of the time of synchronization, all devices must be synched twice to make sure they all have the same information.

Un-Deploying a NRU with NuSite

1. The NuSite device database should have been synchronized with the NuScribe database prior to starting operations in the morning. See the section on [Data Synchronization](#).
2. Log into NuSite using the proper username and password that were assigned to the user at the beginning of the project.
3. Use the Map page to find the first receiver station that un-deployment operation is to start at. Navigate to the receiver point using the Map page.
4. When the NuSite device is within range of the NRU on the receiver point, it will be visible on the Map screen by the receiver flag. It is advised to always have the NRU in visual sight when carrying out the rest of the operation.
5. Double check that the receiver point is the correct number and that the NRU number is correct.
6. Tap on the NRU in the Map screen and the display will change to the NRU Details screen.
7. Tap on Connect and wait for the Connected message to display. The screen will change to the NRU Management screen. If the connection is good the NRU will display solid blue LEDs.
 - a. If the connection fails, retry.
 - b. If the connection fails again. Exit the Detail page back to the Map. Try tapping on the NRU again and retry the connection.
8. Tap on Un-Deploy in the NRU Management screen. The NRU yellow LEDs will flash 5 times indicating valid un-deployment.
9. The NuSite screen will return to the NRU Details.
10. Deploy should be visible in the NRU Management screen.
11. Tap the back arrow or Map to return to the Map page. The NRU LEDs will turn off indicating that the connection is turned off, but the NRU will still be broadcasting status which the NuSite device will receive. The NRU can now be picked up for roll forward or data downloading.
12. Continue to the next receiver station to un-deploy the next NRU.
13. At the end of the workday, the NuSite device database must be synchronized to the NuScribe database.
 - It is recommended that all NuSite devices be synchronized at the end of the workday and again prior to starting operations in the morning. Regardless of the time of synchronization, all devices must be synched twice to make sure they all have the same information.
14. For details on alternative methods to undeploy the NRU, see the Field Equipment Manual Undeploy Section.

Appendix B – External GPS Startup Guide

Juniper Geode

Downloading Geode App

For NuSite to function properly with external Geode GPS on an Android device you will first need to download the Geode Connect App from Google Play Store. This will allow you to initially set up your connection to the Geode device. Click the install button to start the procedure. When the install is finished launch the program, the system will then ask for permission to access your filesystem and access your device location, click allow to both of these procedures.



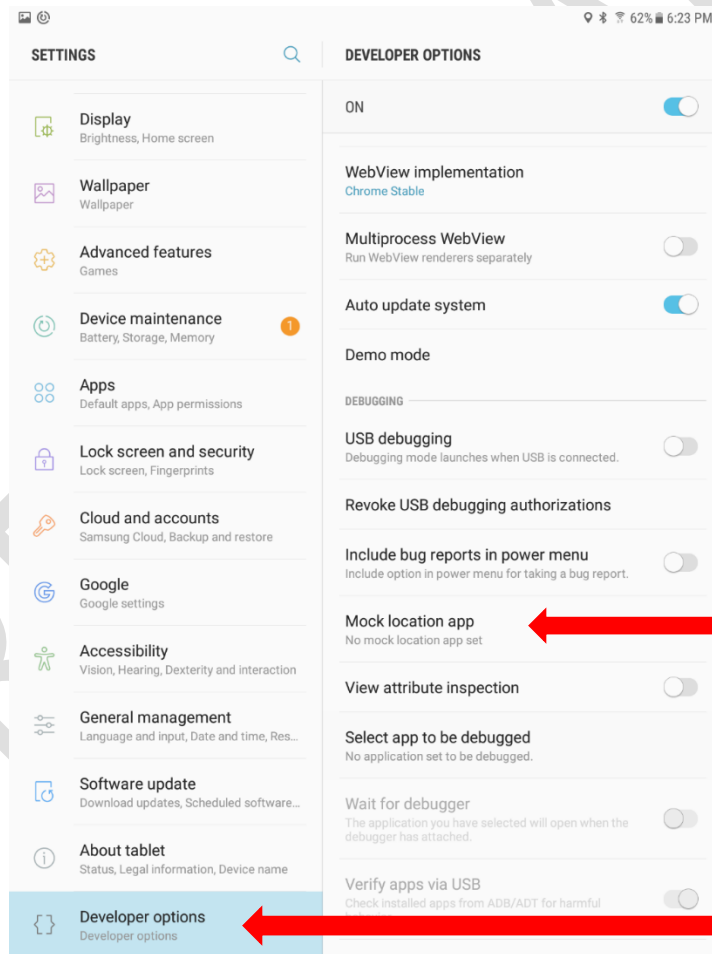
On the bottom of your geode there will be a Serial Number, in this case SN: 200978, this will be your device name in Geode Connect.



Setting up Mock Location

After installing the Geode Connect app, open the Android Settings and scroll to the bottom of the setting menu.

- If the Developers options is not visible, it will need to be enabled.
- Tap on About tablet. In the right hand window the Build Number should be visible.
- Tap on the Build Number 7 times. During tapping, you should see a message giving a tap countdown to enabling Developer options. Once the options are enabled you should see a message stating Developer options enabled.
- Scroll down to the bottom of Settings and Developer options will now be displayed at the bottom of the page.



As seen here no Mock Location app has been set. You will need to set this to Geode Connect. Click on Mock Location App and tap on the Geode Connect choice, this will allow you to use the Mock Location function, and you will see an improvement in GPS performance though NuSite.

Select application

No apps.



Geode Connect
com.juniper.geode2a

First Time Connection to the Geode

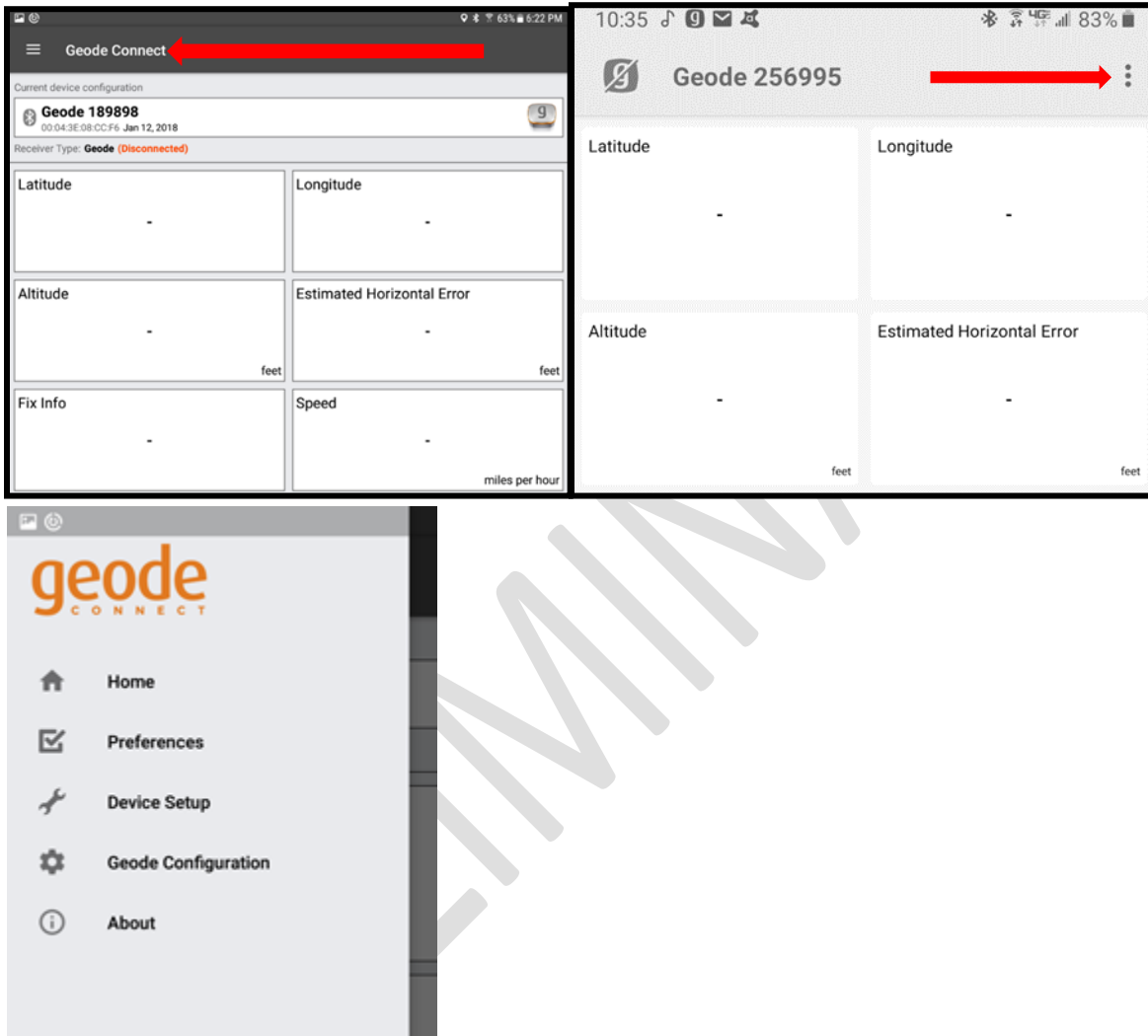
- Turn on the Geode by pressing the power button.
- Open the Android Settings Connection Bluetooth window.
- The Geode will show up in the available devices list as GEODE xxxxx (xxxxx = Geode Serial Number)
- Tap on that device and the Android device will pair to the Geode. The Geode should now be listed in the list of Paired Devices. If not paired, Geode Connect will give an error when trying to connect to the Geode.
- You will need to use your device name for the next step as you will be connecting to your Geode through Geode Connect. It is preferable to do this next step outside as the Geode will attempt to search for a GPS signal. If it cannot find the GPS signal the Geode may restart in its attempt to search, which could disconnect you from the unit. The best practice would be to wait until the unit has steady GPS contact which would be indicated by the orange light next to the satellite icon on the front of the Geode.
- You will need to use the drop-down menu to search for your device to connect to the unit (indicated by red arrow in the figure below).



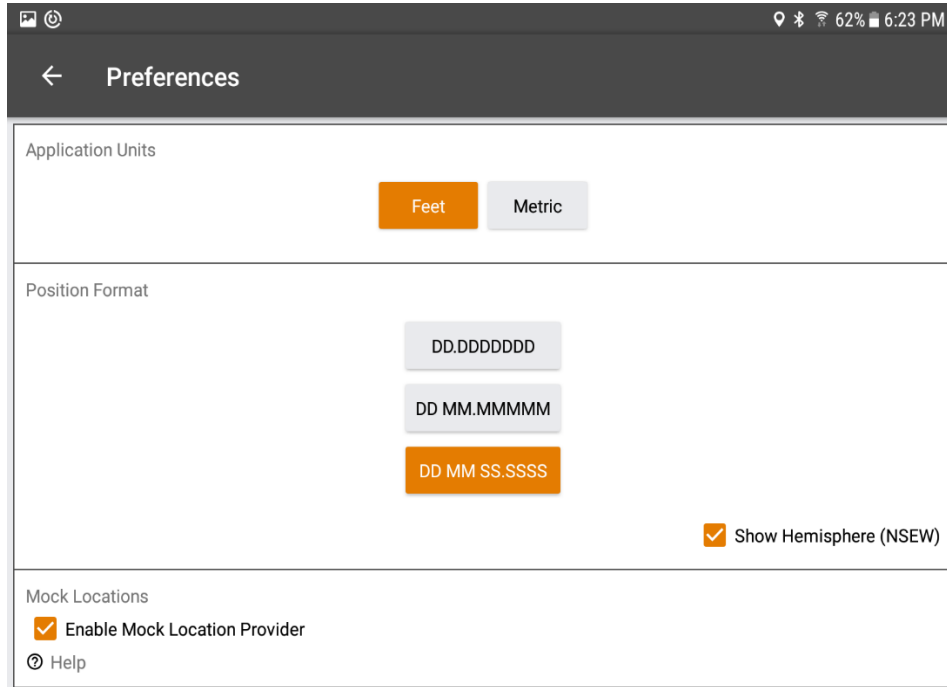
- In this case the device, 189898, would be the first choice in the menu. Select this button and the app should begin connecting to your geode.



- After connecting to your device, you will need to press the three bars in the upper left corner of the screen, or the 3 dots in the upper right, depending on the version of Geode Connect or Android.

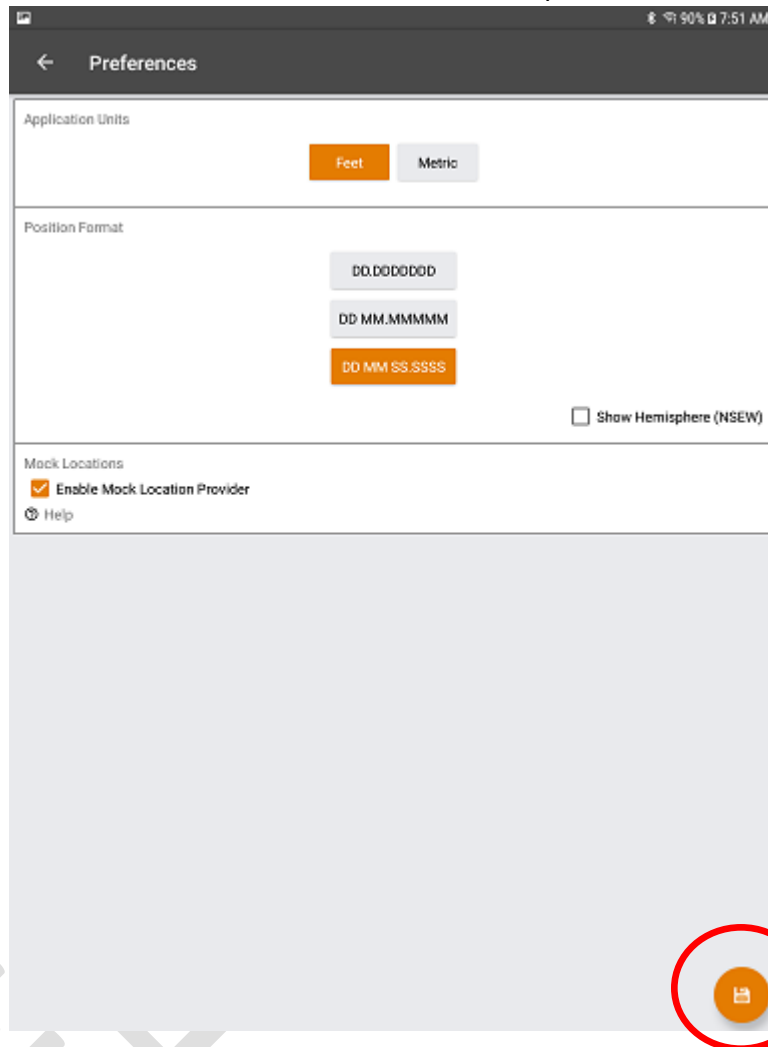


- This will take you to the screen where you can select Enable Mock Location Provider. Note you will not be allowed to save this feature unless you change your setting on the android device in the Developer options Tab. If this is your first time setting up Geode Connect you should be prompted to change this device setting after you select Enable Mock Location Provider.



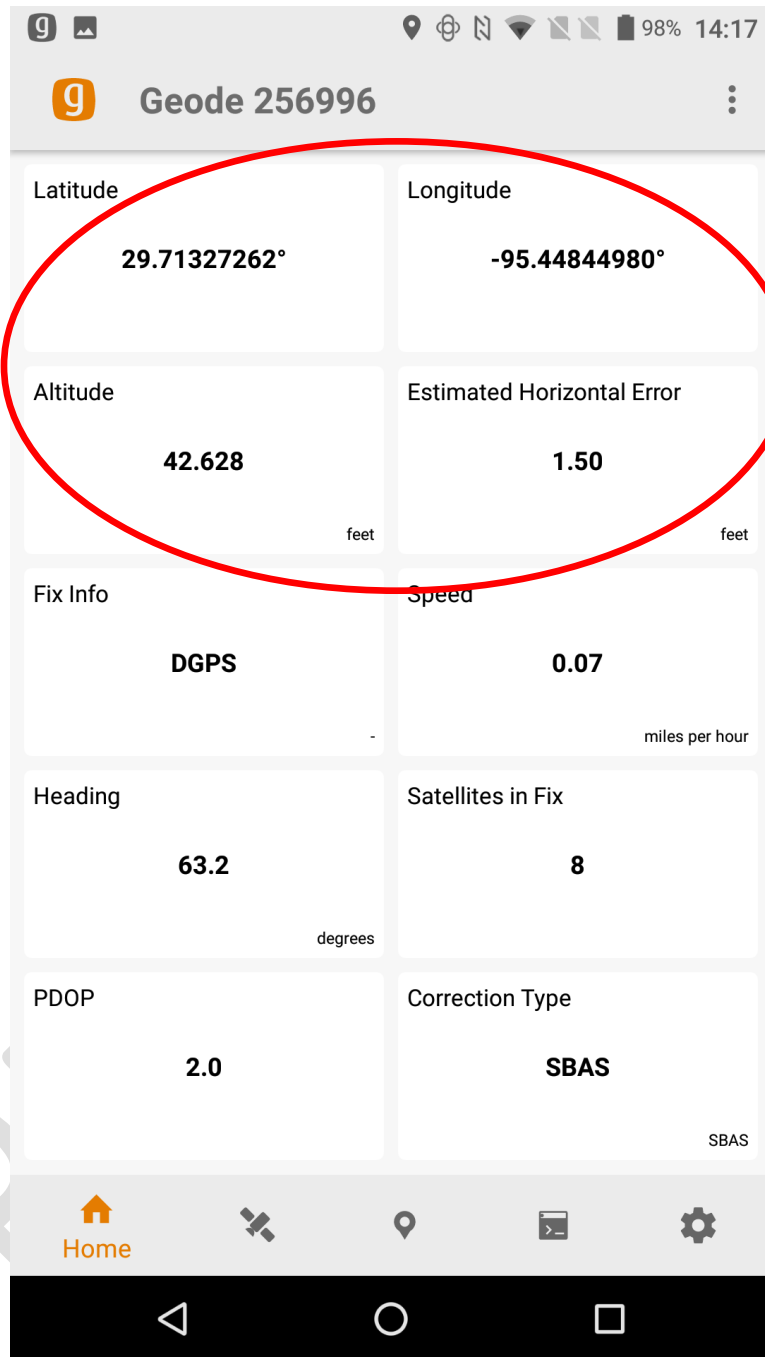
- If the Geode Connect program has been installed for the first time, the Enable Mock Location Provider may show as ticked for enabled but is not actually enabled yet.
 - Changing the Position Format setting from it's current setting to either of the other settings will not affect the coordinates passed through to NuSite, but will activate the Save icon. These formats only affect the position as displayed on the Geode Connect application.
 - When settings are changed in this screen, be sure to save the changes by tapping on the Save icon at the bottom right off the screen as seen circled in the screenshot below. If a setting has been changed the icon will be orange, if not it will be greyed out. By changing the Position Format setting and saving the

preferences, this forces the Enable Mock Location provider to actually set as



enabled.

- If the settings are saved correctly, you will see the fields in the main screen populated with Latitude, Longitude, Altitude, etc...



Operation – At Each Line / Station

When starting normal operations with the NuSite tablet, follow these steps.

1. Power on the tablet, if any apps were left open when it was powered off, close all the apps especially the GPS app and NuSite.
2. Power on the GPS and let it acquire satellites, as indicated by the LED.
3. Make sure the NuSite device shows that the GPS device is connected via Bluetooth pairing by checking the Bluetooth page in Settings, you should see the serial number of the GPS in the Paired Devices list.
 - a. If multiple GPS devices are being used with multiple NuSite devices, make sure that only the device being used with this NuSite device is paired to it.
 - b. If more than one GPS device is paired to this NuSite device, you may be connecting to the wrong device by accident if the other paired device is in range.
4. Check in the Developer Options Mock Location App, to make sure it shows the correct GPS app
5. Open the GPS app
6. You should see positioning data in the app.
7. If applicable to the app check for the Enable Mock Location Provider being enabled. Minimize the app, make sure you do not close it.
8. Open NuSite and login.
9. Check that the mock location is being received in NuSite by:
 - a. Opening the NRU Units window and tapping on a NRU that is deployed.
 - b. Tap on Edit Deployment
 - c. The Deployment Window should show an Ext Lat, Ext Lon and Ext Ele. (Be careful not to update the deployment if this is a NRU already recording on the line).
 - d. If no mock locations are shown, use the steps in the Notes section below.

In NuSite you choose either “Edit Deployment” / “Deploy” to assign a line and station for a particular NRU. At the instant you select “Edit Deployment” / “Deploy” the external Bluetooth GPS device location is captured, if available. See Figure 1. For best results place the antenna of your Bluetooth GPS device directly above the NRU before selecting “Edit Deployment” / “Deploy”.

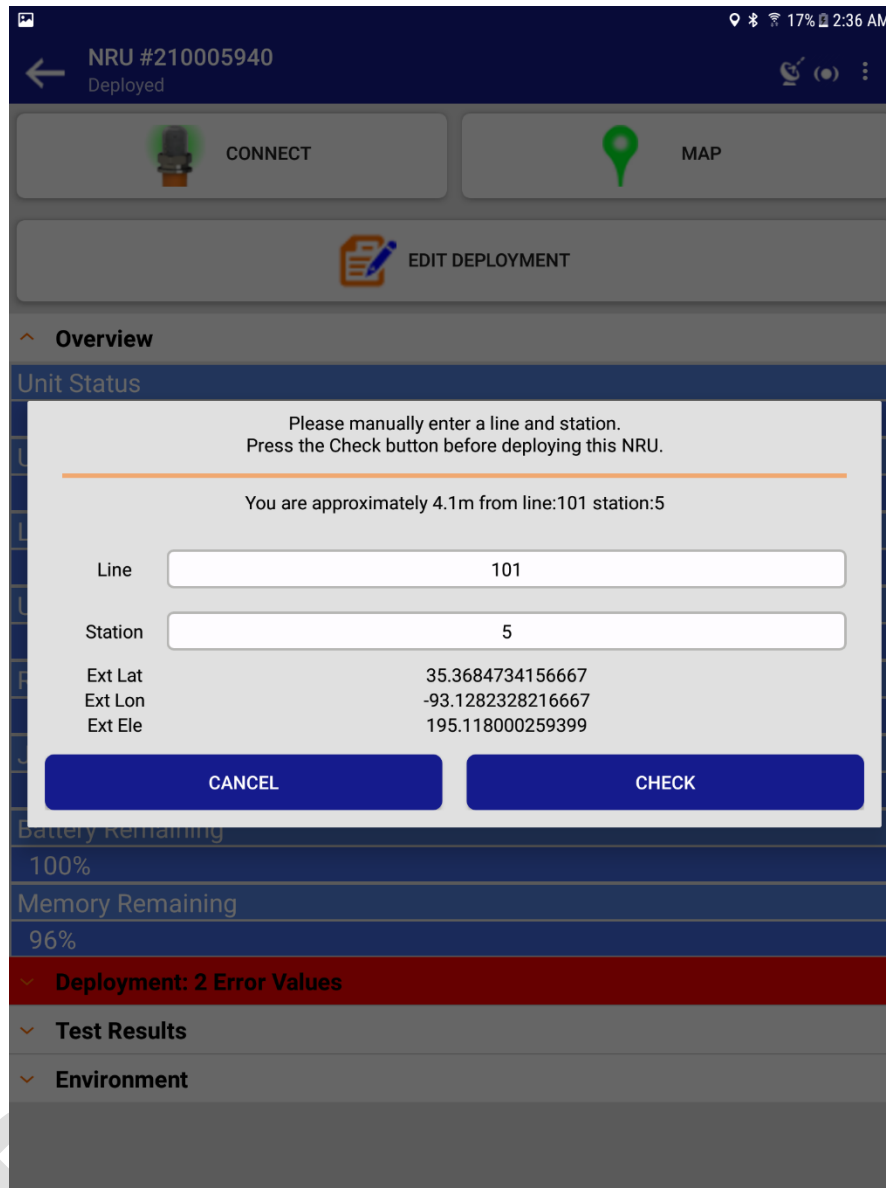


Figure 56 Example of Capturing External Bluetooth GPS Location

If no mock location is available, then no capture is performed when line and station are entered into NuSite. See Figure 2. You may continue using NuSite to assign line and station without an external Bluetooth GPS device, however if your operating procedure requires the accuracy of the external Bluetooth GPS device then select “Cancel”, check battery levels, check the Bluetooth connection, and/or use the steps in this document to troubleshoot.

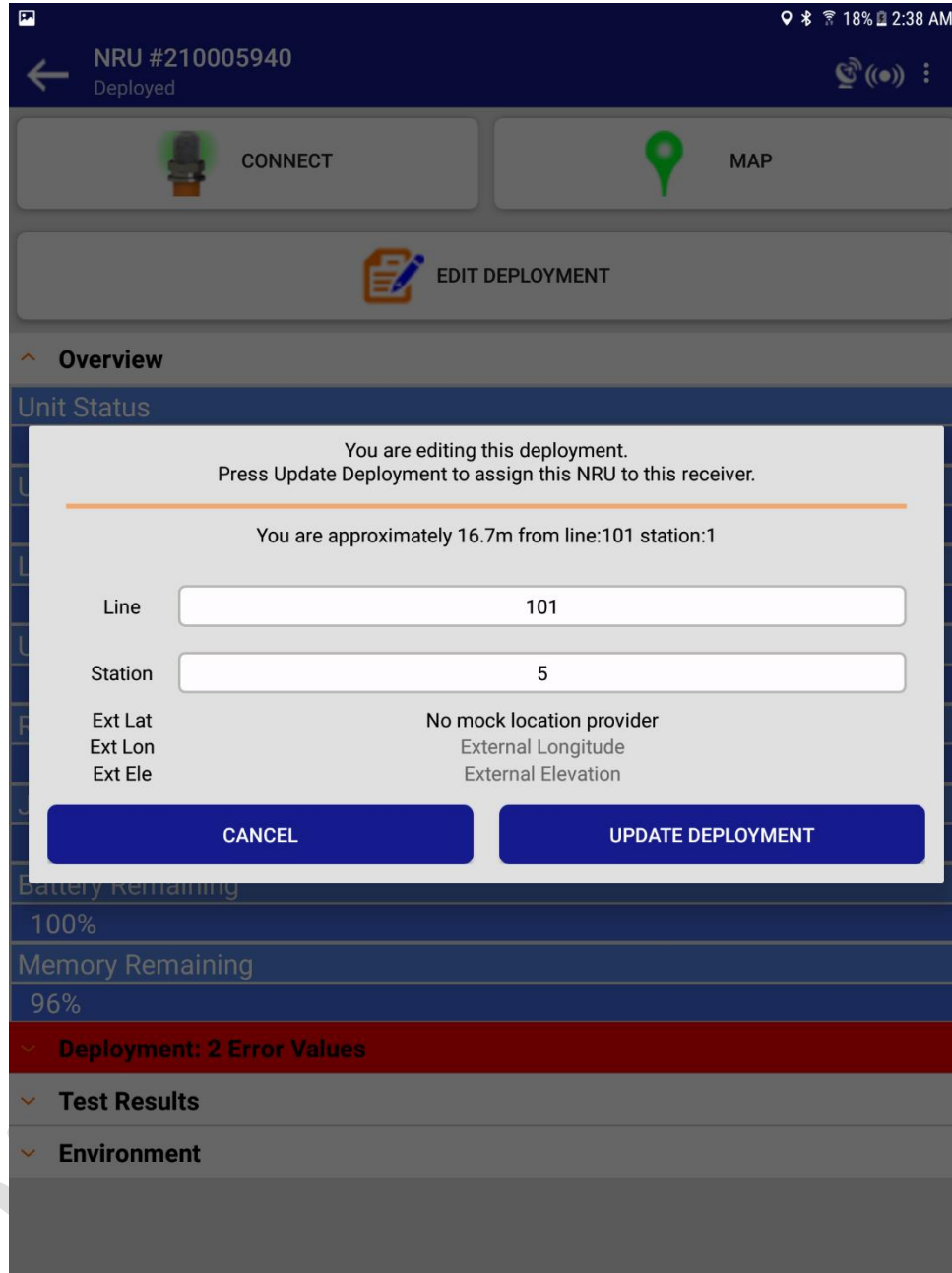


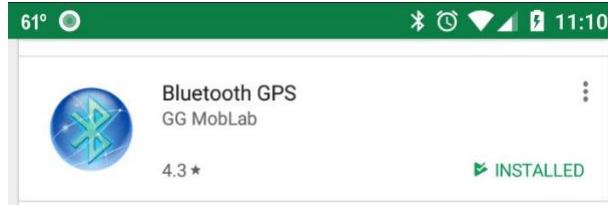
Figure 57 Example of not Capturing External Bluetooth GPS Location

Troubleshooting

If you have followed all the steps accurately and are still having trouble with NuSite finding the mock location return to Settings/Developer Options/Mock Location app. Here you will select no

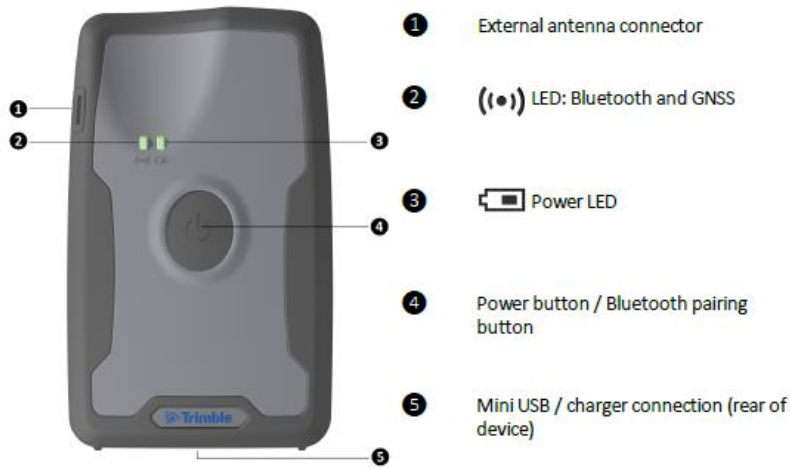
apps. Go back to the same settings and select Geode Connect again you should see a pop-up that indicates “Location Services Enabled”. Sometimes the android system becomes stale and needs this manual refresh.

If you were using the 3rd party app “Bluetooth GPS”, this will now be obsolete for use with NuSite and a Geode GPS. You can uninstall this app under settings/apps.



If you have other GPS apps on your device, going through this process will disable those apps. Geode Connect will be used in all apps for external GPS location purposes. As long as you are in Bluetooth range of the Geode your android device will assume your location to be the location of the Geode. Turn off the Geode when not in use to regain the functionality of your internal GPS.

Trimble PG200



Downloading Trimble App



GNSS Status

Trimble Inc.

Tools

INSTALL

For NuSite to function properly with external Trimble GPS on an android device you will first need to download the Trimble GNSS Status App from Google Play Store. This will allow you to initially set up your connection to the Trimble device. Click the install button to start the procedure. When the install is finished launch the program, the system will then ask for permission to access your filesystem and access your device location, click allow to both of these procedures.

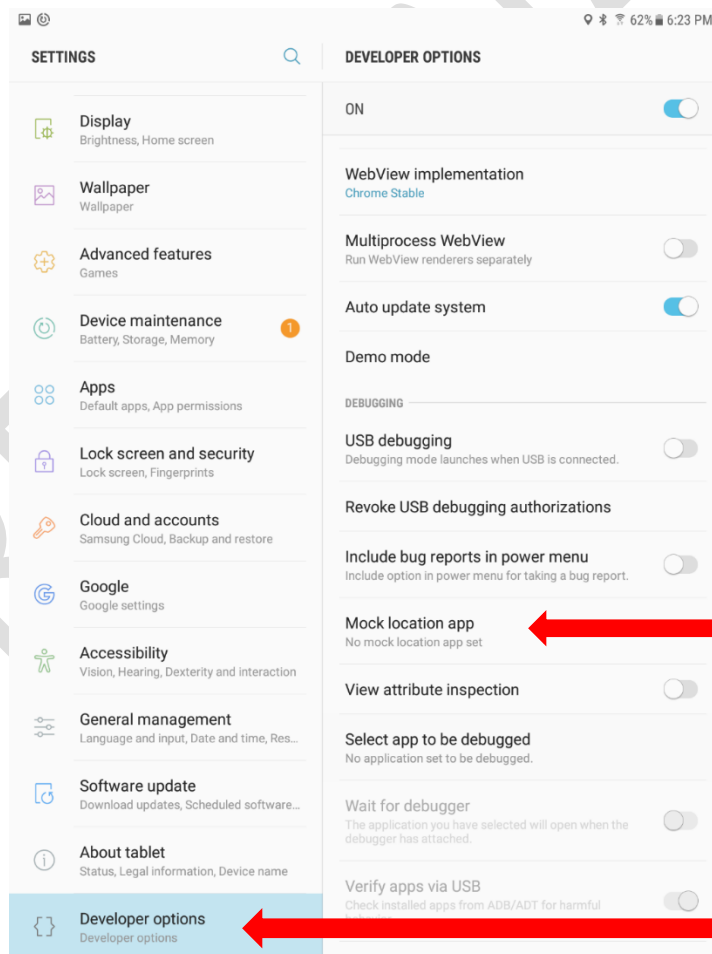


On the back of your Trimble there will be a serial number. The last 5 digits are used when identifying the device within the GNSS Status software. In this case 50403.

Setting Mock Location Provider

After installing the GNSS Status app, open the Android Settings and scroll to the bottom of the setting menu.

- If Developers options is not visible, it will need to be enabled.
- Tap on About tablet. In the right hand window the Build Number should be visible.
- Tap on the Build Number 7 times. During tapping, you should see a message giving a tap countdown to enabling Developer options. Once the options are enabled you should see a message stating Developer options enabled.
- Scroll down to the bottom of the Settings and Developer options will now be displayed at the bottom of the page.



As seen here no Mock Location app has been set. You will need to set this to GNSS Status. Click on Mock Location App and tap on the GNSS Status choice, this will allow you to use the Mock Location function, and you will see an improvement in GPS performance though NuSite.

Select application




No apps.

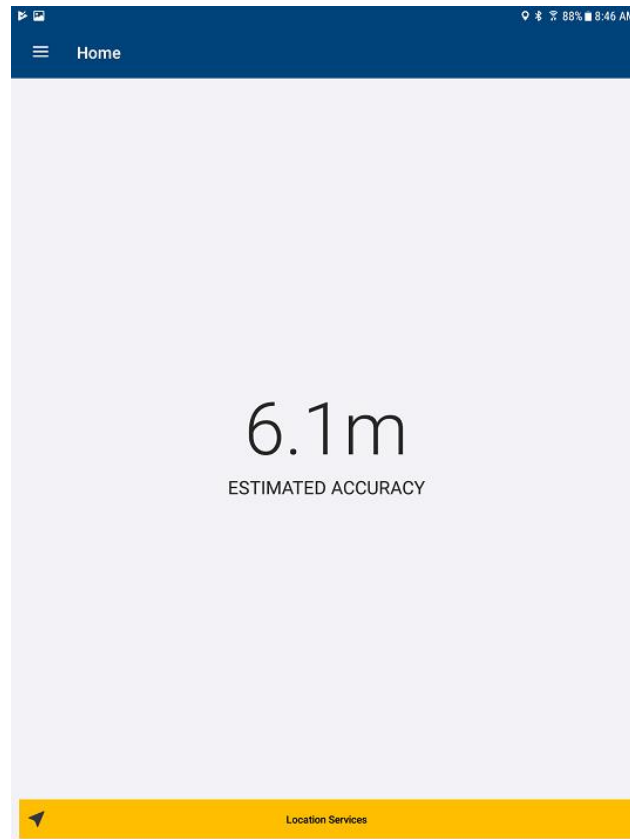


GNSS Status
com.trimble.mcs.gnssstatus

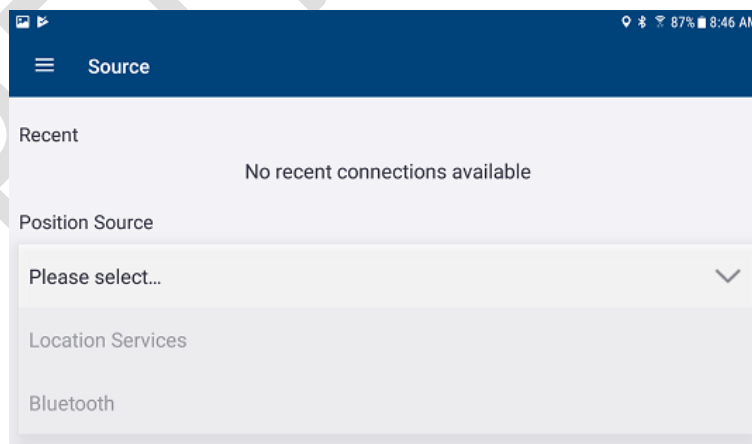
First Time Connection to the Trimble

The Bluetooth pairing needs to be made to the Trimble with the Android NuSite device. Prior to starting the GNSS Status app.

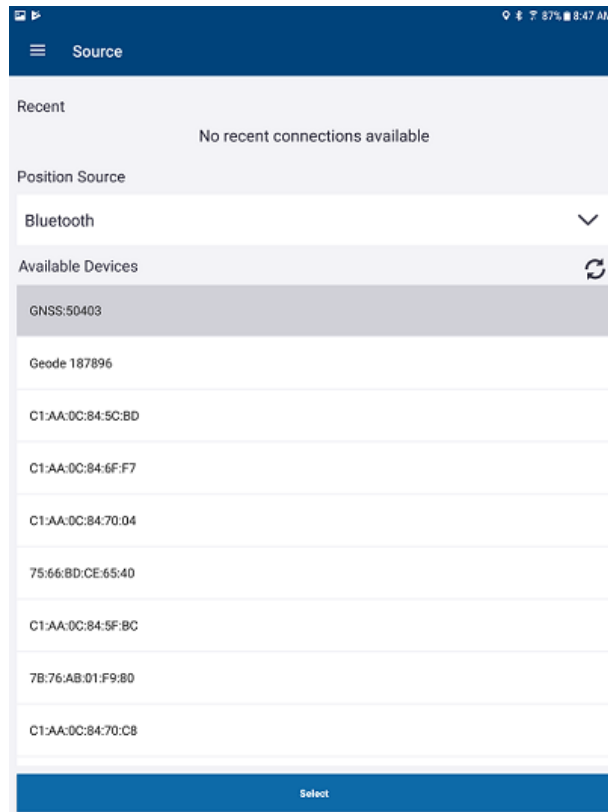
- Turn on the Trimble by pressing and holding the power button. For initial pairing of Bluetooth continue holding the power button until both LEDs turn red, the  LED will start blinking blue, release the power button when the  LED starts blinking. That indicates the device is ready to pair over Bluetooth.
- Open the Android Settings Connection Bluetooth window.
- The Trimble will show up in the available devices list as GNSS:xxxxx (xxxxx=last 5 digits of the device serial number)
- Tap on that device and the Android will pair to the Trimble. The Trimble should now be listed in the list of Paired Devices.
- Open the GNSS Status app.  The app will open to the Home page
- At the bottom of the Home page is a yellow bar that indicates the source of GPS data. By default after initial install it will show Location Services indicating the app is using the Android device on board GPS.



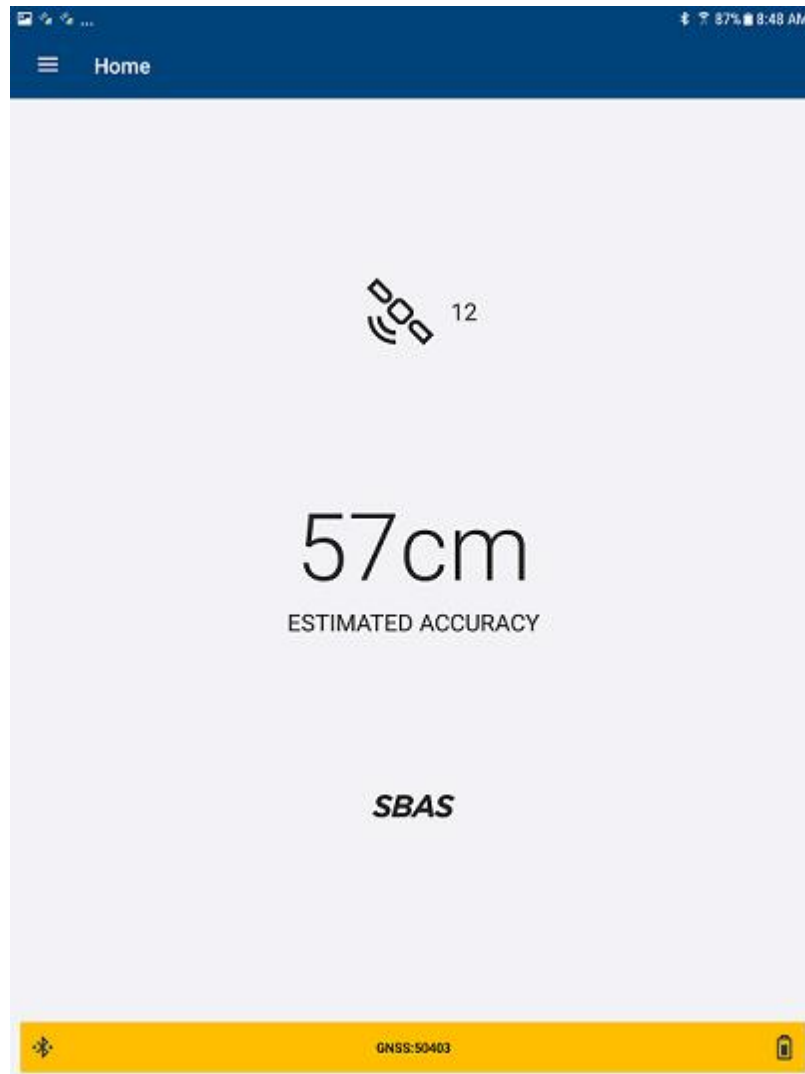
- Tap on the yellow bar and it will open the Source page. Alternatively tap on the menu icon in the upper left corner of the home page, then tap on Source.
 - In the Source Page will be a Position Source drop down box. Tap on that box and a dropdown selection will show.



- Tap on the Bluetooth selection.
- The Available Devices selection box will open. Tap on the GNSS:xxxxx device. So that it is highlighted, then tap on the blue Select bar at the bottom of the page.



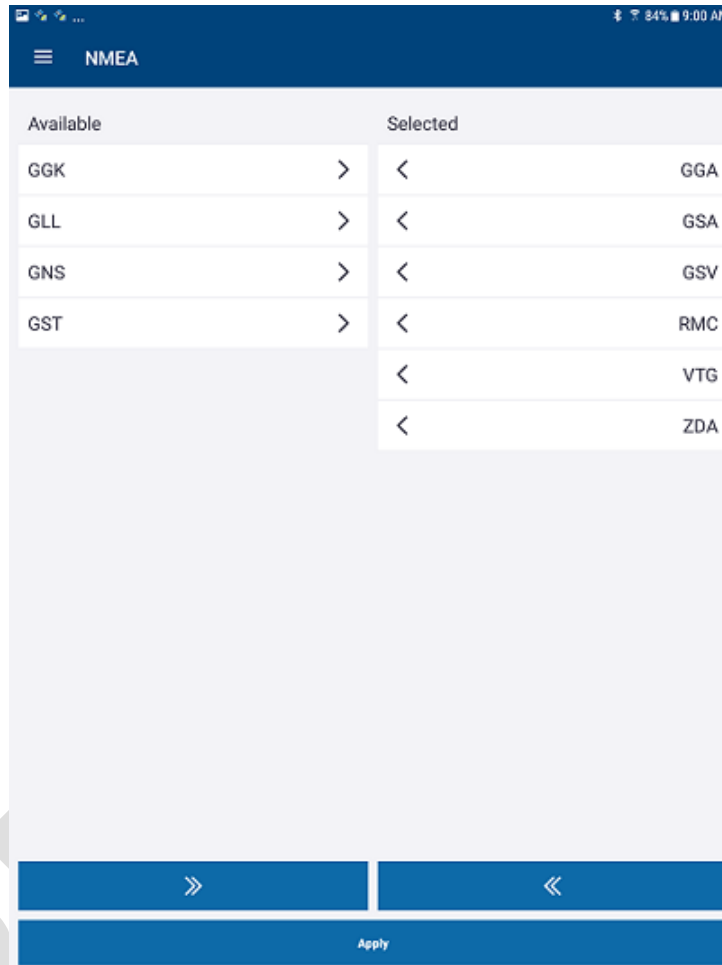
- The screen will return to the Home page and the name of the Trimble device should show in the Yellow bar at the bottom of the page
- The Home screen will show the number of satellites, an estimated position accuracy, and the status of the position correction.



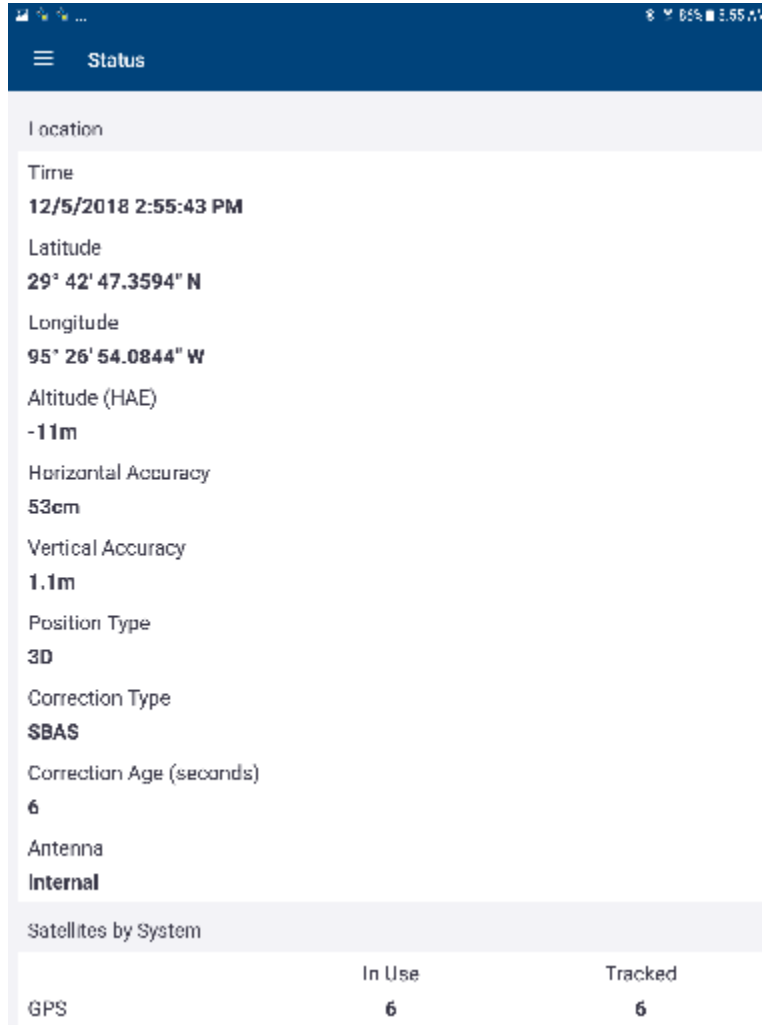
- In order to turn on SBAS corrections, tap on the Menu icon in the upper left hand corner of the Home screen. In the menu tap on Corrections
 - Tap on the Primary dropdown menu and tap on SBAS
 - Return to the Home menu and wait for SBAS to show below the estimated accuracy. This may take a few seconds or longer when the Trimble has just been powered on.



- Next tap on the Menu icon and in the menu tap on the NMEA selection
 - By default when the Trimble device has first been paired with the NuSite device, all of the NMEA outputs will be off.
 - In the NMEA page all of the NMEA words will be listed on the left in the Available list.
 - Move them over to the right, into the Selected list by tapping on each word required.



- Make the selections as shown in the figure above then click on the blue Apply bar at the bottom of the screen
- This will open the Select Port page
- Click on Bluetooth SPP1
- This will return you to the NMEA page and a Selection Saved message will appear.
- If the user wants to see a more detailed status of the Trimble, tap on the Menu icon and select Status
 - The status page will show location information, number of satellites, accuracy, and other information



- The app can now be minimized. The app should be left operating in the back ground while using the Trimble with NuSite for external GPS.

Operation – At Each Line / Station

- This procedure is the same no matter what external GPS has been connected to the NuSite device.
- See the [Operation – At Each Line / Station](#) section in the previous chapter for instructions.

Troubleshooting

- If there are problems with the external GPS positions showing in NuSite, power off both the Trimble and the NuSite device.
- Power the devices back up and reconnect as described previously.
- Check that the external positions are showing in NuSite and not turning off and on.
- Make sure no other GPS apps are turned on, if necessary, do a Force Stop of the non-GNSS Status app in Settings or uninstall the app.

If you have followed all the steps accurately and are still having trouble with NuSite finding the mock location return to Settings/Developer Options/Mock Location app. Here you will select no apps. Go back to the same settings and select GNSS Status again you should see a pop-up that indicates "Location Services Enabled". Sometimes the android system becomes stale and needs this manual refresh

Appendix C – Auto Assign

PRELIMINARY

Using Auto Assign Selected

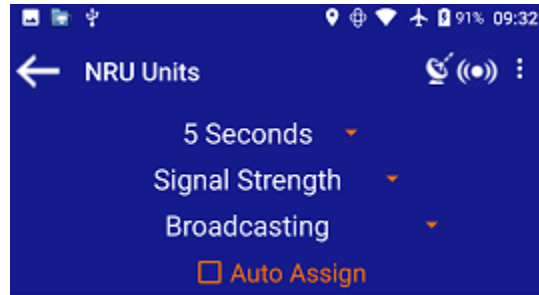


Figure 58

- There are certain requirements that need to be fulfilled before the Auto Assign Selected can be utilized properly.
 - Tick the Auto Assign Selected box on.
 - Select the NRU from the list, that is at the station you are approaching on the line.
 - NuSite has to have received a current location update from the NuSite device.
 - Selected NRU must be deployed and not already assigned in the NuSite database.
 - Nearest receiver point is not assigned in the NuSite database.
- In order for the Auto Assign Selected option to work consistently, the accuracy of the NuSite device GPS has to be taken into account as well as the receiver point spacing.
 - Auto Assignment will only happen when the NuSite device is within $\frac{1}{2}$ the distance of the receiver spacing to the receiver point that the NRU is being Auto Assigned to.
 - Receiver spacing is 25 meters, the NuSite device position must be within ≤ 12.4 meters of the receiver point.
 - If a tight receiver spacing of 5 meters is being used and the NuSite device GPS accuracy is 1-5 meters, then Auto Assign Selected may not operate efficiently. An accurate external GPS would need to be used in this case or only use manual assignment.
- There are two options for AutoAssign
 - Assign station within first 30 seconds after NRU is deployed
 - Assign station to NRU after it has passed self-tests and started recording
- Immediate AutoAssign
 1. Use the NuSite Map to navigate to the unassigned receiver station, making sure the external GPS accuracy is good.
 2. Use the MDT to create a hole for the NRU, bump the NRU, and insert into the hole.
 3. NuSite should automatically assign the station to the NRU after the green LEDs have flashed 5 times on the NRU.
 4. Move to the next station after confirming station assignment is correct.
- Deployed/Recording AutoAssign

1. Use the NuSite Map page to navigate to the first unassigned receiver point. The NRU that is to be assigned to that receiver point should be visible on the Map screen.
2. Tap on that NRU.
3. The screen will switch to the NRU Details page.
4. If the NuSite device GPS is less than $\frac{1}{2}$ the receiver spacing from the unassigned receiver point, you will see the Deploy button change to Edit Deployment and display the assigned line and station number.
5. Check that the assigned line and station look correct.
6. Use the back arrow at the top of the screen to return to the Map screen.
7. Start navigating to the next unassigned receiver point.

PRELIMINARY

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PRELIMINARY