![GroundWorx logo]

GX-1A SOIL SENSOR INSTALLAION MANUAL
Effective September 19, 2023

Before starting the installation:

1) Download the GroundWorx Mobile App
   - For iPhones, download at
     https://apps.apple.com/us/app/groundworx/id1528583100
   - For Android Smartphones, download at
     https://play.google.com/store/apps/details?id=com.mygroundworx.app
   - Or search for "GroundWorx" in the App Store.

2) Login into the GroundWorx Mobile App
   - Check your email for login credentials. The "*GroundWorx Login Credentials"* email will include your username and temporary password for logging into the mobile app.
   - You will also receive a "*New Facility available"* email granting permission to your facility (company, course, farm, sports complex, campus, etc.).
   - GroundWorx recommends downloading and logging into the mobile app (from your home, office, etc.) prior to starting the onsite Sensor installation.

3) Acquire tools for digging the hole:
   - GroundWorx recommends using the following tools:
     - 7" Hexagon Turf Plugger
     - 6" Earth Auger. GroundWorx recommends the "Seymour General Purpose Post Hole Auger, 6-Inch Spread, High Carbon Steel Blade" which can be purchased at Plumbersstock.com
     - Alternative Tools: Post Hole Digger or Shovel
   - Pea Gravel: You will need approximately 1" of Pea Gravel per hole.

4) Build a plan to complete the entire installation in one day:
   Once proficient in this process, average installation per Sensor will be approximately 10 minutes!

Summary of Installation Steps:

Step	Title of Step	High-Level Summary
1	Location & Activation	Stand at the installation location. Remove the sticker with magnet to activate.
2	Verify Cellular Connection	Using the Mobile App, verify that the Sensor has a cellular connection.
3	Provisioning	Provision the Sensor following the detailed steps in the Mobile App.
4	Dig the Hole	Using the recommended tools to dig a smooth cylindrical hole.
5	Adjust Depth of Sensor Prongs	Position the Sensor prongs at desired position.
6	Position the Sensor	Place the Sensor in the hole and press probes into the sidewall. Backfill.
7	Complete the Installation	Using the Mobile App, confirm that the Sensor is reporting measurements.

Follow the detailed installation steps below and repeat at each Sensor location !

1) Location & Activation

a. While onsite at your facility, stand at the exact location where you will be installing the Sensor.
b. Take note of the Serial Number (S/N), which is the name of the Sensor (i.e., G1A0002030). You will need the S/N for future steps in this installation process (Figure 1).
c. Locate the power sticker on the side of the Sensor (Figure 1). The sticker is attached to a magnet.
d. Remove the sticker, which will separate the magnet from the Sensor. When you remove the magnet, the Sensor powers on. Place the sticker and magnet in a pocket or away from the Sensor (Figure 2).
e. You will now see a small green LED light that will blink every 2-3 seconds.
f. Ensure that the magnet is not within close proximity of the Sensor.
    GroundWorx recommends that you save the magnet for possible use in the future.
g. Hold the Sensor upwards with the top pointing towards the sky for **20 seconds** (Figure 3)
h. After **20 seconds**, place the Sensor on the ground by setting it on its side. Ensure that it is in close proximity to where the hole will be dug (Figure 4).
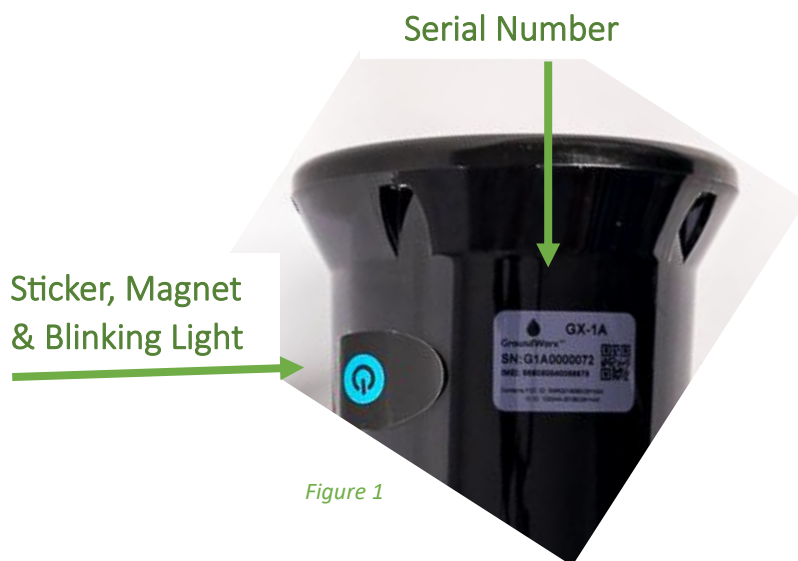
Serial Number

Sticker, Magnet
& Blinking Light

Figure 1

Figure 2

Figure 3

Figure 4

2) Verify Cellular Connection

  a. Open the GroundWorx mobile app.
  b. If you are not logged in, enter your username and password to login.
  c. Ensure you have the "Current Facility" selected. Your Current Facility is in the upper right-hand corner of the mobile app home screen. (Figure 5)
     i. To select a different Facility, tap the Hamburger icon to display options screen. (Figure 5)
     ii. Tap the down arrow key next to the current Facility name. (Figure 6)
     iii. Select the correct facility and then tap the "x" to cancel out of the options screen. (Figure 6)
     iv. The correct Facility is now displayed in the right-hand corner of the home screen (Figure 5)
  d. Tap the "Sensors" icon on the bottom of the screen. (Figure 5)
  e. Find the Sensor Name from the list (review step 1b on the Sensor's name, i.e., G1A0002030).
  f. If the Sensor status is "Inventory" (Figure 7), wait for approximately **1 minute** and refresh the screen by swiping down. The Sensor status will update to "Ready" (Figure 8). If the Sensor does NOT update to "Ready," stop the installation. Skip to the Troubleshooting section of this Install Manual.
  g. When the Sensor status is "Ready" (Figure 8), verify the signal strength as follows:
     i. If the signal strength is between -65 and-98 dBm (Figure 9), proceed to Provisioning.
     ii. If the Sensor signal strength is above-99 dBm (Figure 9), skip to the Troubleshooting section of this Installation Manual.
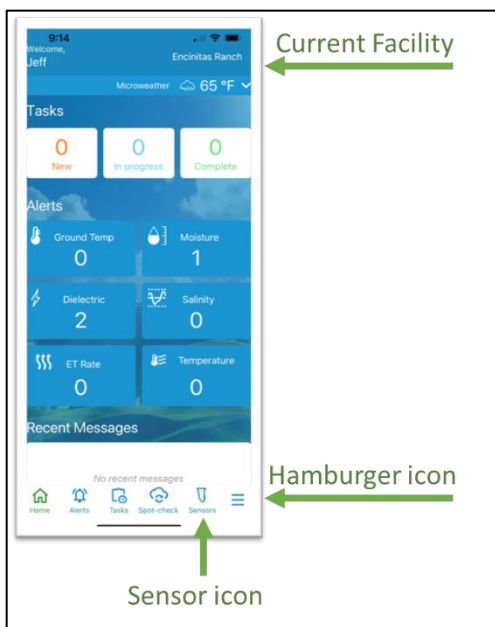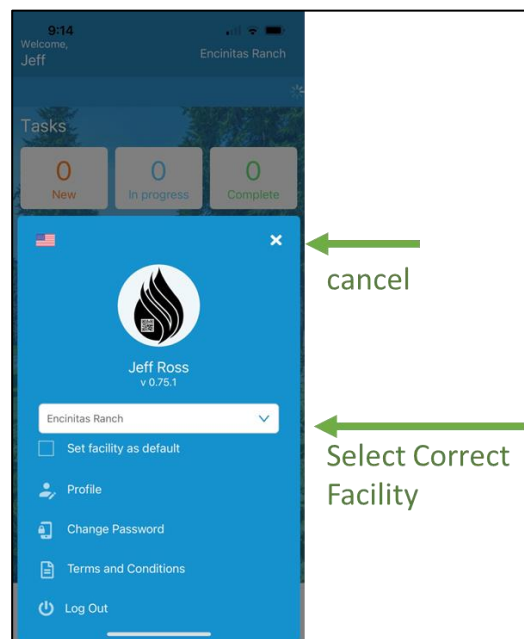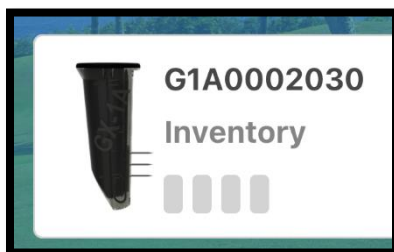

Current Facility

Hamburger icon

Sensor icon

Figure 5

cancel

Select Correct Facility

Figure 6

-65 and-98 dBm

G1A0002030

Inventory

Figure 7

G1A0002030
A few seconds ago

Ready

-73 dBm

Figure 8

G1A0002030
A few seconds ago

Ready

-73 dBm

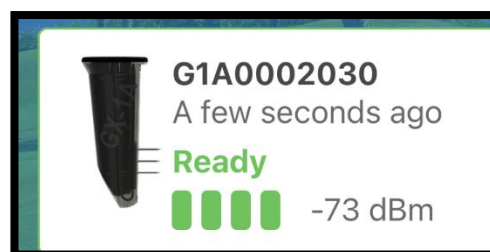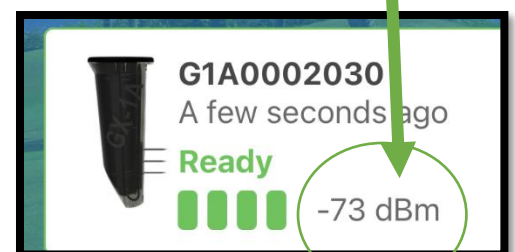*Figure 9*

3) Provisioning

a. Open the GroundWorx mobile app.
b. Tap the "Sensors" icon on the bottom of the screen. (Figure 5)
c. Find the Sensor Name from the list.
d. Select the Sensor that you are installing (Figure 10) by tapping on the right arrow.
e. The mobile app will then walk you through the remaining installation process which is consistent with the rest of the steps in this Installation Manual.
f. On the 1st Provisioning screen, select "Let's Get Started" (Figure 11) and on the following screen, select "Begin" (Figure 12).
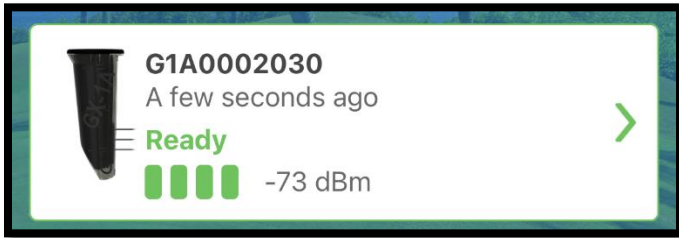
Figure 10

Figure 11
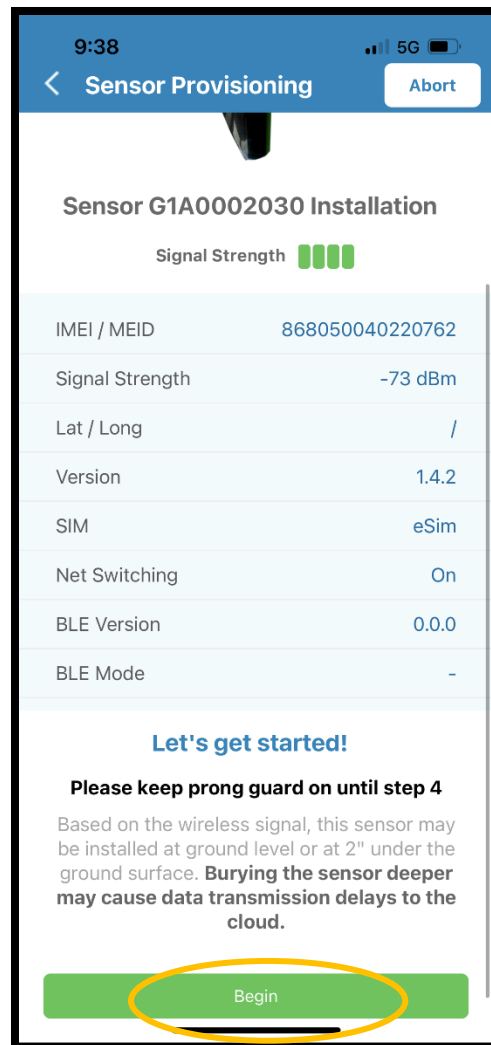
Figure 12

g. On the next Provisioning screen, collect information on the Sensor using the drop-down lists. Items marked with "*" are required fields (Figure 13). Collected information includes the hole number, location, approximate distance to green, type of grass and soil. When complete, tap the Next button.

h. On the next Provisioning screen, ensure that GX-1A is the selected model and tap the Next button. (Figure 14)

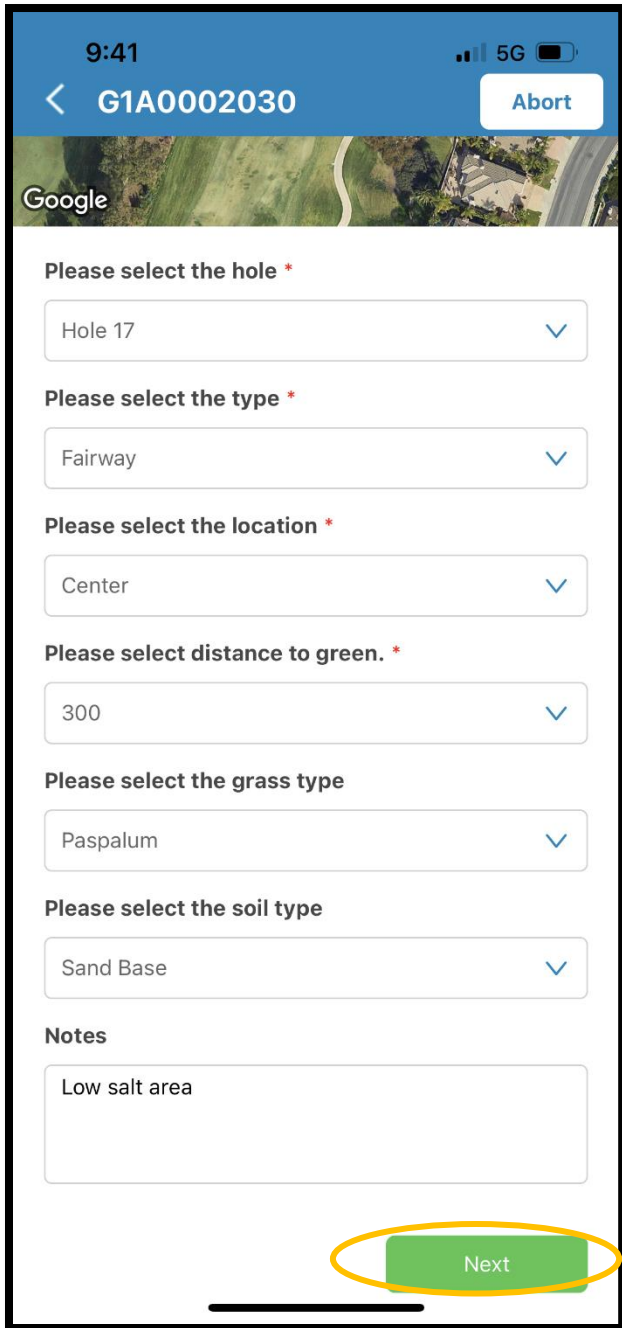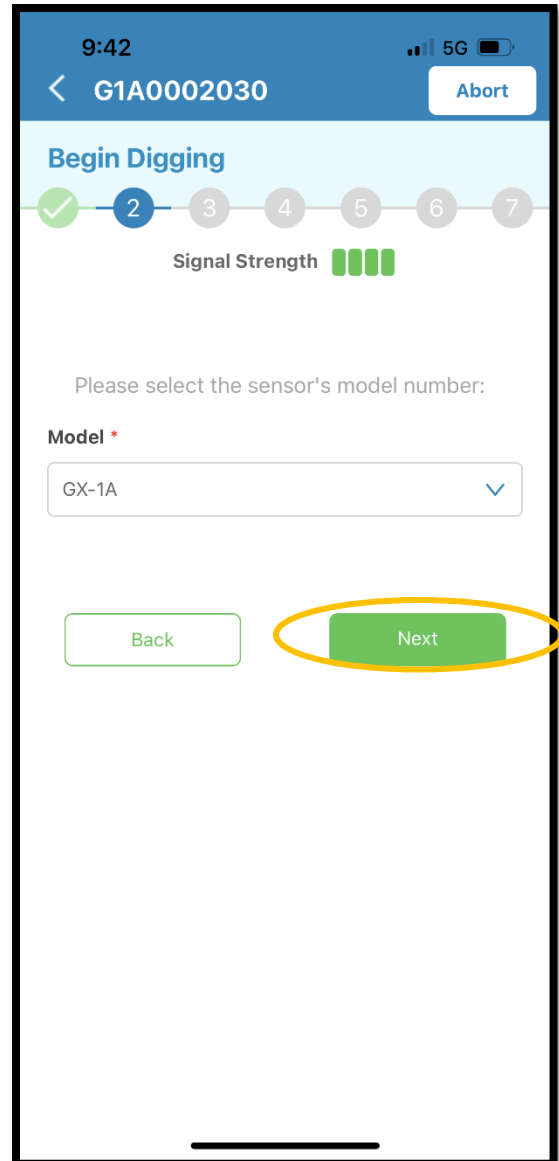i. Secure your smartphone for now and proceed to Dig the Hole.

Figure 13

Figure 14

4) Dig the Hole

a. Remove the Turf with the 7" Hexagon Turf Plugger. (Figure 15)
b. Dig the hole to 12.5" deep with the 6" Earth Auger. (Figure 16). Dig a smooth cylindrical hole.
c. Smooth the sides and bottom of the hole (Figure 17).
d. Apply 1" of Pea Gravel to the bottom of the hole. Pea Gravel helps with drainage.
e. Proceed to the next step of Adjusting the Depth of the Sensor Prongs.

Figure 15

Figure 16

Figure 17

5) Adjust Depth of Sensor Prongs

a. Push down on the Sensor's prongs using the ratchet motion. The position is based on your turf type and root zone. Set in the desired position (Figure 18).
GroundWorx recommendation: Warm season grasses can be set at 3" to 6" and cool season grasses with a shallower root zone between 2 1/2" and 4".

b. Open the GroundWorx mobile app. On this provisioning screen, select the Middle prong depth by using the slider at the bottom of the screen. The Middle prong depth should match the position (measured in inches) that you set on the Sensor. (Figure 19).
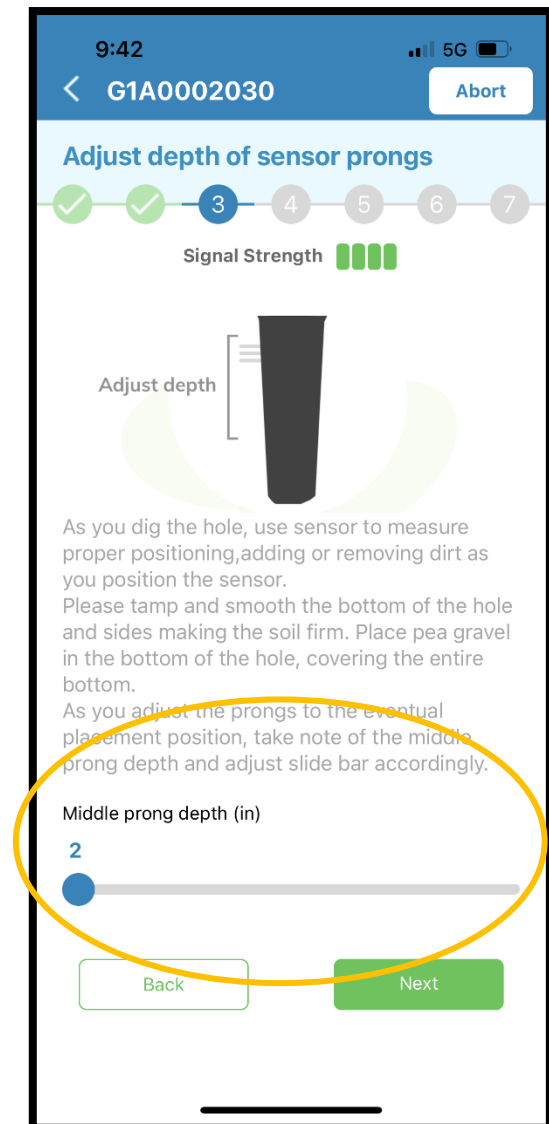
c. Tap the Next button.

Figure 18

Figure 19

6) Position the Sensor

    a. Remove the prong guard. GroundWorx recommends that you save the prong guard for potential future use (Figure 20).

    b. You can install the Sensor at ground level. Ground level is preferred.
        or
        You can install the Sensor underground.
          i. Underground installation should not exceed 6".
         ii. If installing underground, please record the depth below ground using the slide bar on the next provisioning screen (Figure 19).
       iii. Cover with turf.

    c. For Ground level installation, place the Sensor in the hole and press Sensor probes into the sidewall's undisturbed soil (Figure 21) and (Figure 22).
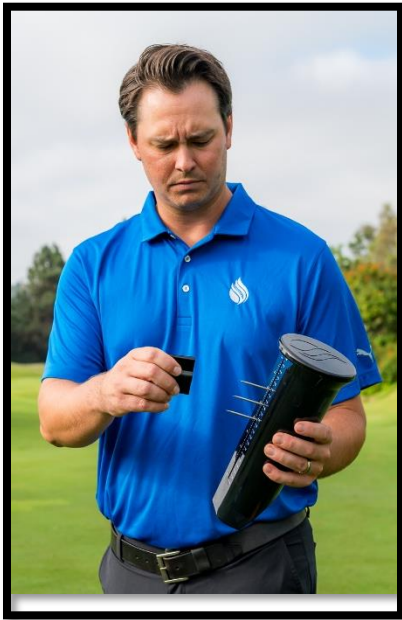

Figure 20

Figure 21

Figure 22

d. Complete the backfill making sure the Sensor stays firmly inserted in the hole wall. Compact as you backfill (Figure 23).

Figure 23

e. Return to the Mobile App and complete the remaining provisioning screen by selecting "Next" on each screen.
   i. Position the Sensor--- this was completed in Step 6c (Figure 23).
   ii. Adjust the Depth -- for Ground Level installation, the depth would be zero inches (Figure 24). For Underground installation, select the depth (Figure 26). Reminder, the depth should not exceed 6 inches.
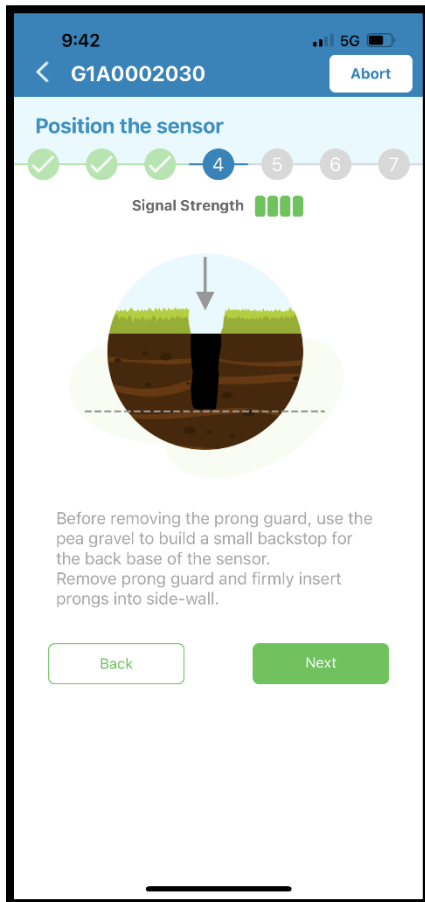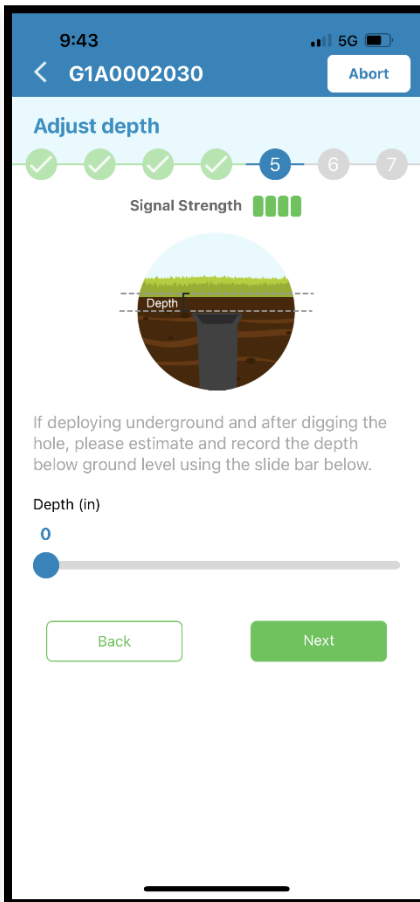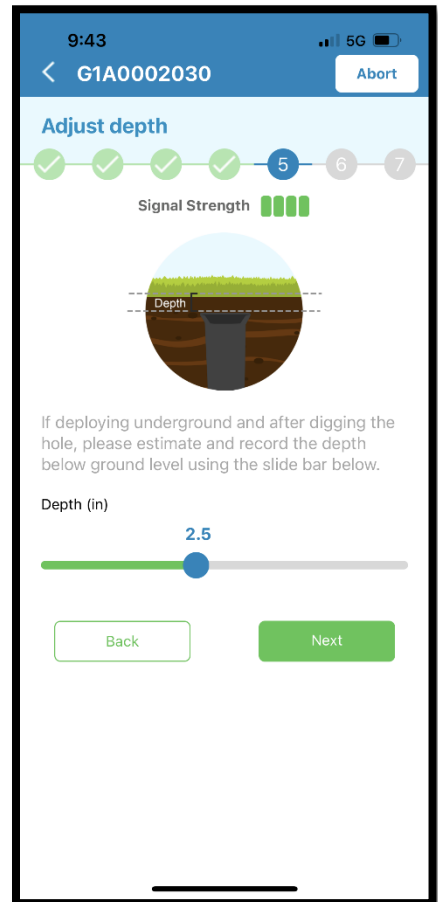

Figure 24

Figure 25

Figure 26

7) Complete the Installation

a. To Complete the installation, tab Complete Installation on the bottom of the provisioning screen (Figure 27) and then select "Exit" on the final provisioning screen (Figure 28).

b. From the Home screen, select the Sensors icon and then select the Sensor that you just installed by tapping on the right arrow (Figure 29).
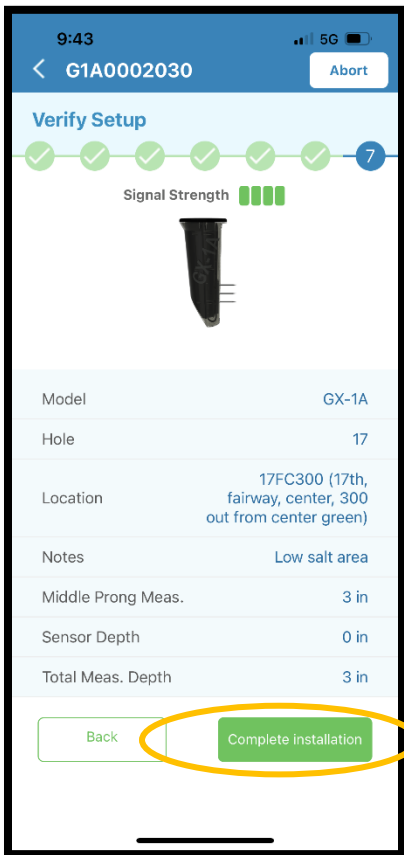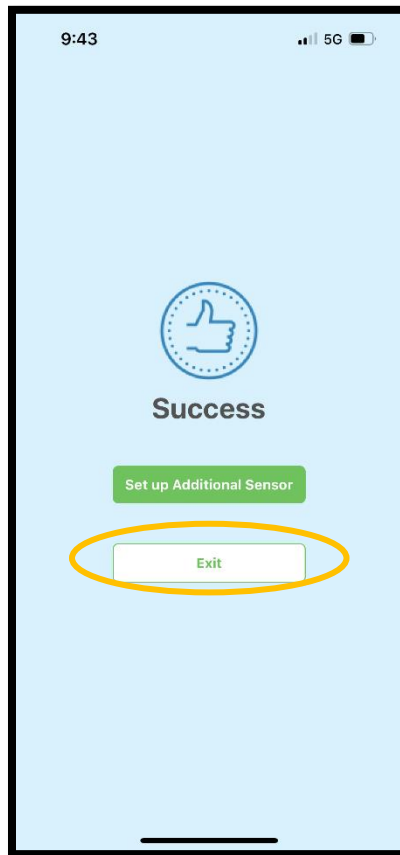

Figure 27

Figure 28

Figure 29

c. Tap the Data Icon in the upper right-hand corner. (Figure 30)

    i. You should see Sensor reading for Temperature, Salinity, Dielectric, and Moisture. The Sensor started reporting measures as soon as you positioned the Sensor in the ground.

    ii. If readings are not taking place after 10 minutes, skip to the Troubleshooting section of this Installation Manual.

Figure 30

Installation Troubleshooting

Verify Cellular Connection: Remedies

1) If the Sensor does not appear on the "Ready" screen after 1 minute, stop the installation.
   a. Place the magnet back on the Sensor.
   b. Open the GroundWorx mobile app.
   c. Select the Sensor.
   d. Select "Abort" button to reset the Sensor back to "Inventory." (Figure 31)
   e. Enter your GroundWorx Password to confirm "Abort. (Figure 32)
   f. Move the Sensor to a different location.
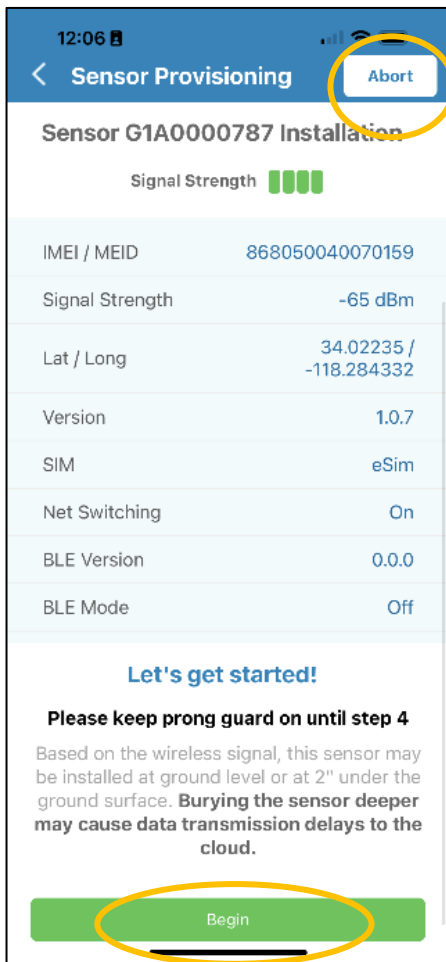   g. Follow same process starting with the Location & Activation step.

Figure 31

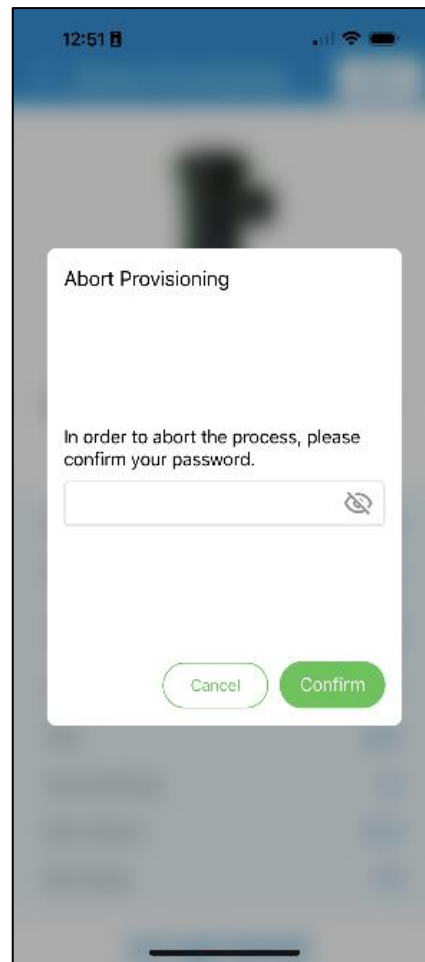*Figure 32*

2) If the Sensor signal strength is above-99 dBm (Figure 9),
   a. Place the magnet back on the Sensor.
   b. Open the GroundWorx mobile app.
   c. Select the Sensor. Select "Abort" button to reset the Sensor back to "Inventory." (Figure 31)
   d. Input your Password to confirm "Abort. (Figure 32)
   e. Move the Sensor to a different location.
   f. Follow same process starting with Location & Activation

Complete the Installation: Remedies

1) If readings are not taking place, please contact your GroundWorx representative for support or call +1 858.758.0758

If you require additional installation assistance:

- Contact your GroundWorx representative, call +1 858.758.0758, or Email GroundWorx at support@mygroundworx.com