**Auto Point Satellite Antenna Controller**

# User Manual


CE

HYPERLINK

v8.3.0 - Rev 1.3.0, June 19, 2023, 2023

# Contents

# Introduction

## About this Manual

The purpose of this manual is to assist with set up and operation of the Hyperlink NXT series of satellite antennas, and more specifically the features of the NXT controller.

This manual will give an overview of the initial set-up at the beginning, and more in-depth information will follow further into the manual. If at any time assistance is needed, please contact our customer support via phone or email:


**Hyperlink Customer Support**

**Phone: 888 – 875 – 2523**

**Email: support@hyperlinkinc.com**


For more information on the NXT products and services, please visit our website @

**www.hyperlinkinc.com**

# Installation and First Time Controller Setup

## Connecting the Controller to the Antenna

*Here is the rear panel of the NXT controller, shown before connections.*



Here is the rear panel of the NXT controller, shown after the antenna is connected.

Connect the antenna and LAN as shown. From left to right:

- Attach the Rx co-ax from the antenna LNB to the Rx in.
- Rx out on the controller connects to the modem Rx in port.
- Tx from the antenna BUC will be connected directly to the modem.
- Eth. 1 connects to the LAN router, any LAN port.
- USB, Eth. 2, and Serial are currently not used.
- The 4 pin GPS connector from the antenna is connected to the GPS port.
- The 12 pin motor/sensor connector is attached to the Motors/ Sensors port.
- Connect a ground wire to the GND terminal if the controller is installed in a structure with an earth ground.
- Connect the power supply cable to the Power In port on the far right of the controller.
- Connect the power supply AC supply cable to a socket that is easily accessible.
- Power switches on both the power supply and the front of the controller must be turned on.

**! WARNING !**

Grounding the controller chassis to earth ground is a necessary step when the controller is installed in a structure that has an earth ground, such as a well site shack. Chassis grounding with the ground screw is not necessary when installed in a vehicle. Ground wiring must be copper, 18 AWG or larger.

## Connecting to the Web Interface

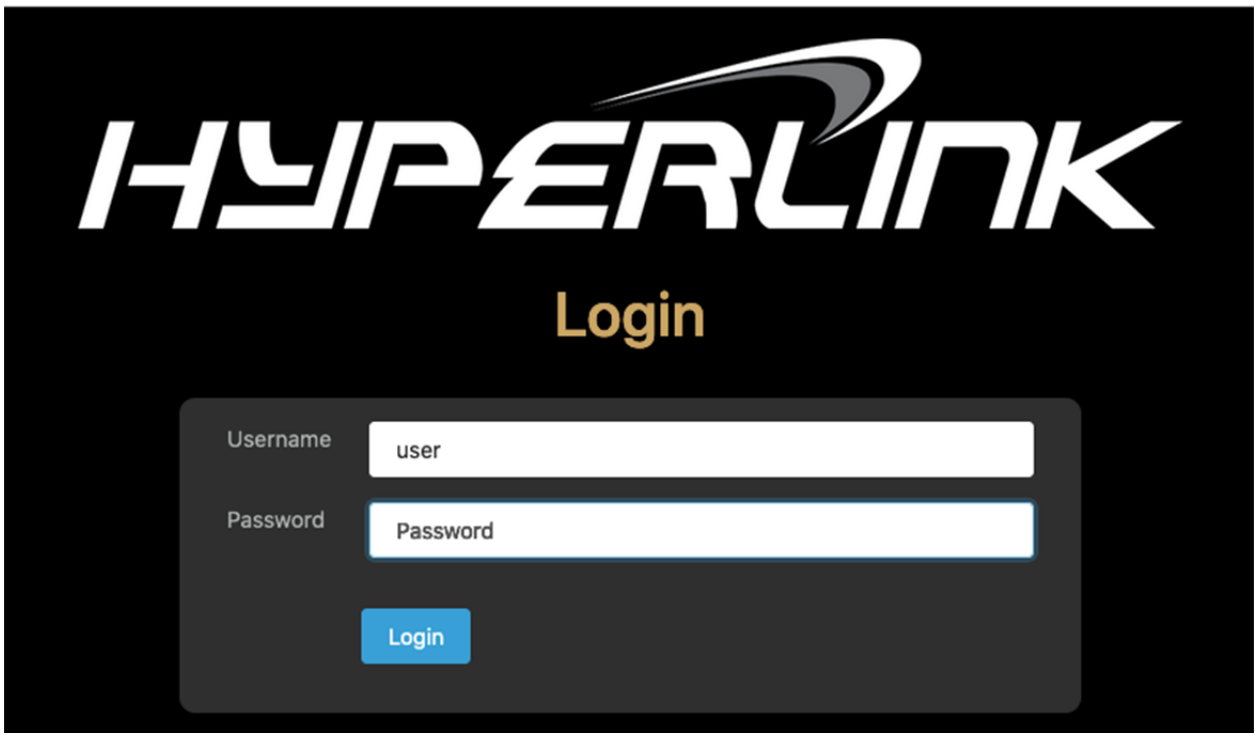
The Controller's LCD screen will display the controller's SSID, along with the IP addresses assigned to the LAN ports. Use a smartphone, or a laptop, to connect to this wireless network. As soon as you connect, most laptops and smartphones will pop up the controller's web interface. If yours does not, open a web browser and navigate to http://hyperlink.controller.IP.address. This should take you to the controller's login page.

## User Account Setup

On the Login Screen, login as:

Username: user

Password: 1234




## Initial Controller Setup Routine

After you power on the controller for the first time and connect to its Web Interface (see "Connecting to Web Interface" section), go to "Admin Menu".

Settings Password: 1234

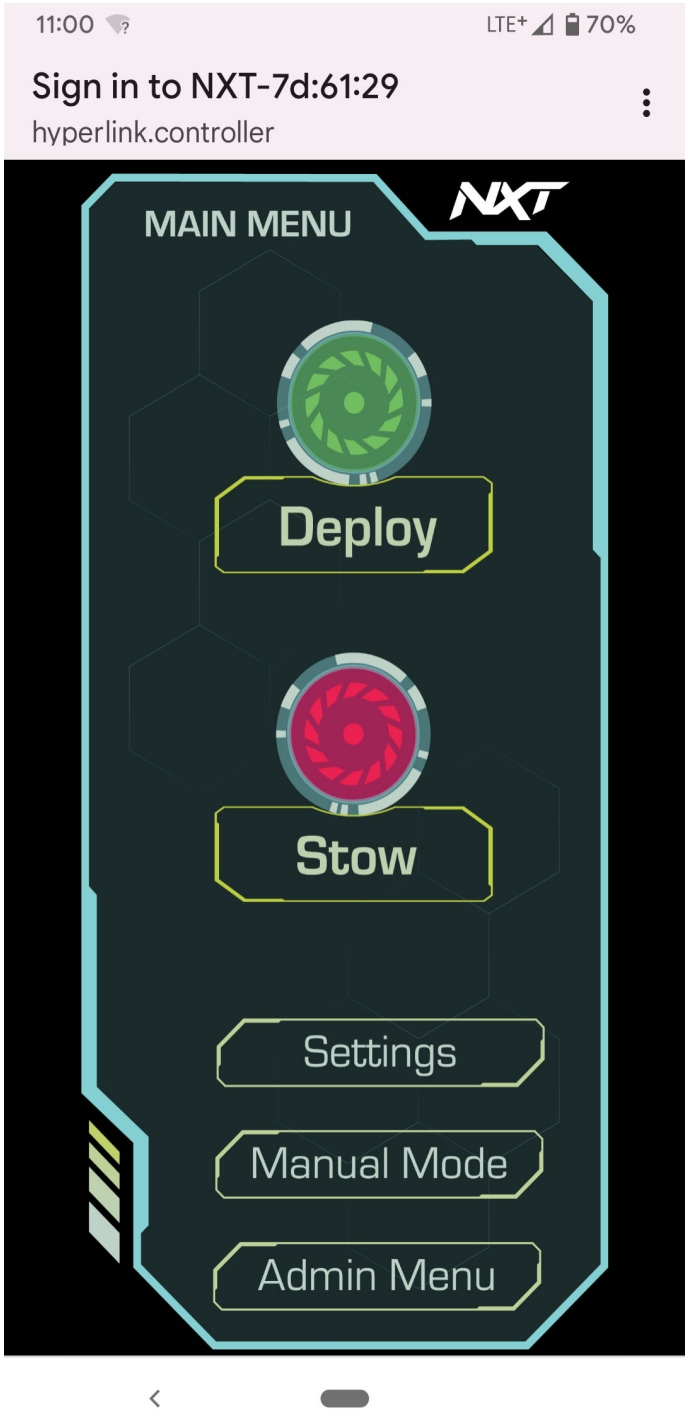
Here, you will need to configure the following Admin Menu settings:

- Controller Settings -> Mount Profile
- Controller Settings -> Modem Profile
- Satellite Settings
- Modem Settings
- Network Settings (optional)

Please see the Admin Menu section of this manual for additional information.

# Controller Interface

## Main Menu




### Deploy

Start the find satellite routine. The controller software will check the stow position, and will automatically call the Stow Routine if needed. Once the mount is confirmed to be in the stow position, the motor positioning counts will reset. See the Find Satellite routine below for full instructions. Pressing the Green Deploy / Repeak / Resume button on the controller box will toggle the find satellite routine.

### Stow

Start the Stow Mount routine. The controller will begin by moving the Elevation to 90 degrees, then move the Azimuth to stow position, then move the Crosspole to stow position, and then move the Elevation to stow position. Any motor errors will pause the routine (see Motor Stopped Menu below). For the Platform configuration, the Platform will lower after the Crosspole is moved into Stow position. Pressing the Red Stop / Stow Resume button on the controller box will toggle the Stow routine.

### Settings

Load the Settings Menu. See the Settings Menu below for more information

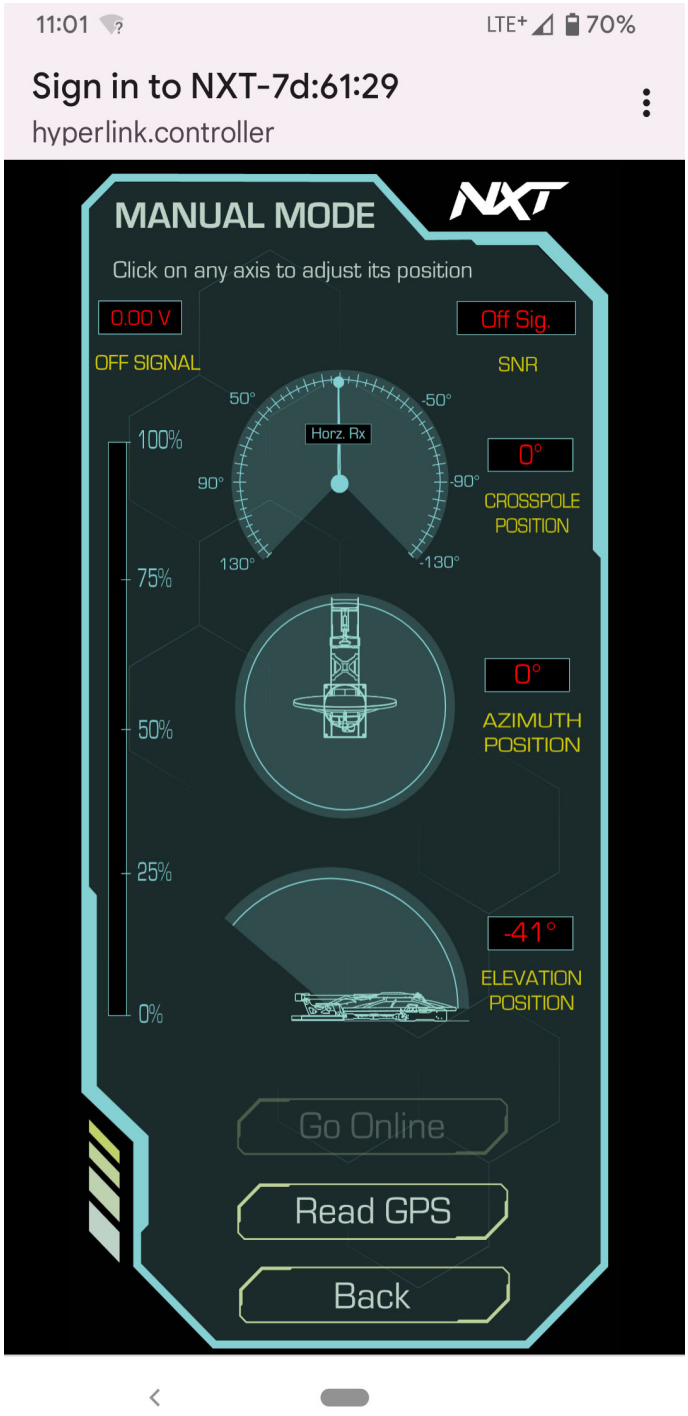
### Manual Controls

Load the Manual Controls menu for dish movement. See the Manual Menu below for full instructions. Make sure that the user has a visual of the mount to avoid any collisions while the mount is moving.

### Admin Menu

Load the Admin Menu. The Admin Password must be entered in order to proceed. See the Admin Menu below for more information.

## Manual Controls




This screen allows the user to manually move the mount around. This can be used to: Manually set the mount in for pointing, move the mount for maintenance or calibration, testing, or storage. The TX Disable command will be set to the modem when this menu loads.

**NOTE:** That there are no motor safeties while in manual mode, so the user should exercise caution to prevent damage to the mount or any surrounding objects.

Press on a motor's image to load its control buttons. Press on a direction button to nudge the motor in that direction. Press and hold to power on the motor, moving it in that direction until the button is released. Press Back to return to the Manual Controls menu.

### Back

Return to the previous menu screen.

### Read GPS

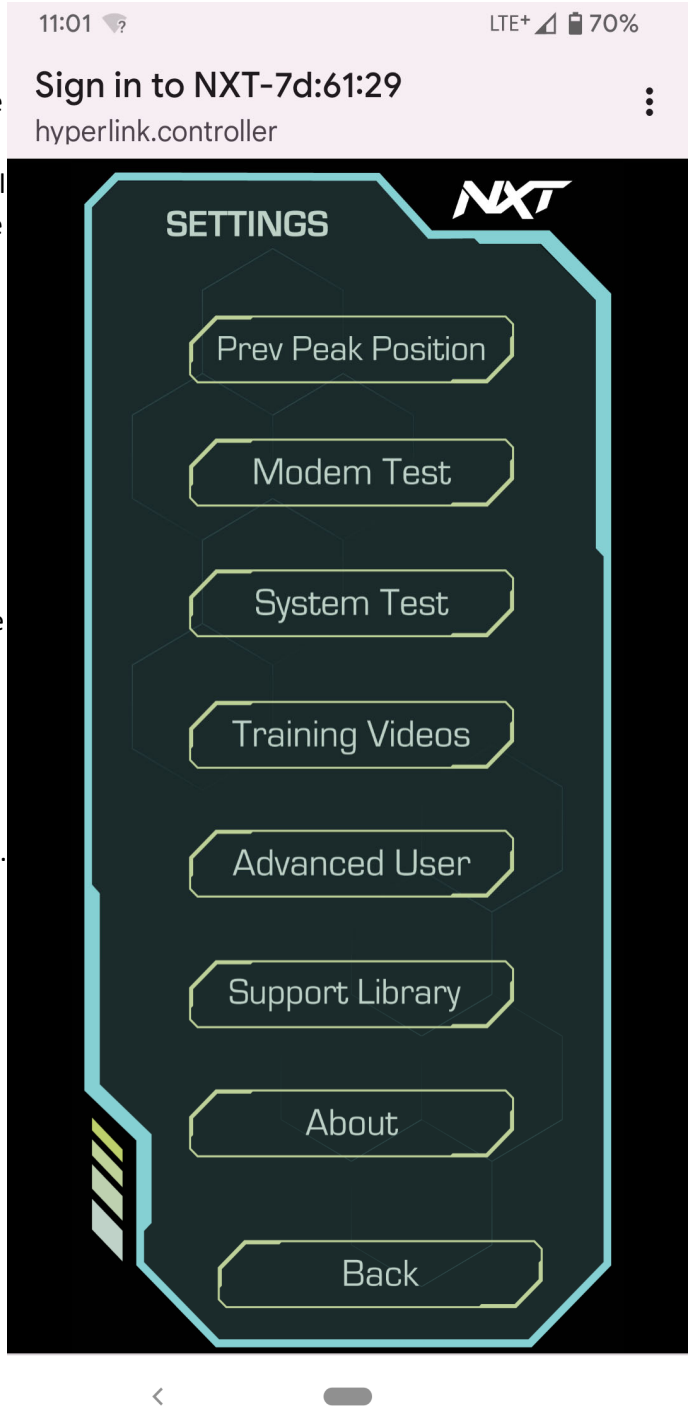
Retrieve the GPS coordinates for the current location. The results are displayed on the screen along with the Elevation and Crosspole deploy angles for the satellite for your current location. The GPS will be re-initialized if the module wasn't detected at startup.

### Go Online

Checks the modem for an RX Lock; used if the user was successful in finding the satellite manually or if the mount was already deployed. If an RX Lock is confirmed, the Deployed Menu will load and the user can then Repeak the satellite as normal (see Deployed Menu below). The option will be greyed out if the modem isn't available, or if it's returning a no RX lock condition.

## Settings Menu

### Previous Peak Position
This routine will move the mount to the last spot that it was deployed at. Assuming that the mount hasn't moved to a different location since it was last deployed, the mount will travel to the exact coordinate position for each of the three motors. Use the Go Online routine in Manual Controls to return to the Satellite Deployed screen. Do note that moving or relocating the mount after its previous deployment will invalidate the saved position of the previous satellite peak, resulting in the mount pointing in an arbitrary location.




### Modem Test
Perform a modem communication test. If there are any communication errors, the controller will report on what kind of error occurred for troubleshooting purposes.

### System Test
Perform a test of all of the system components. If any errors are encountered, they will be listed after the test. All systems must pass in order to run the Find Satellite routine.

### Advanced User
Load the Advanced User Sub-Menu. See the Advanced User Menu below for more information.

### Training Videos
View a collection of videos covering the operation and maintenance of the NXT system.

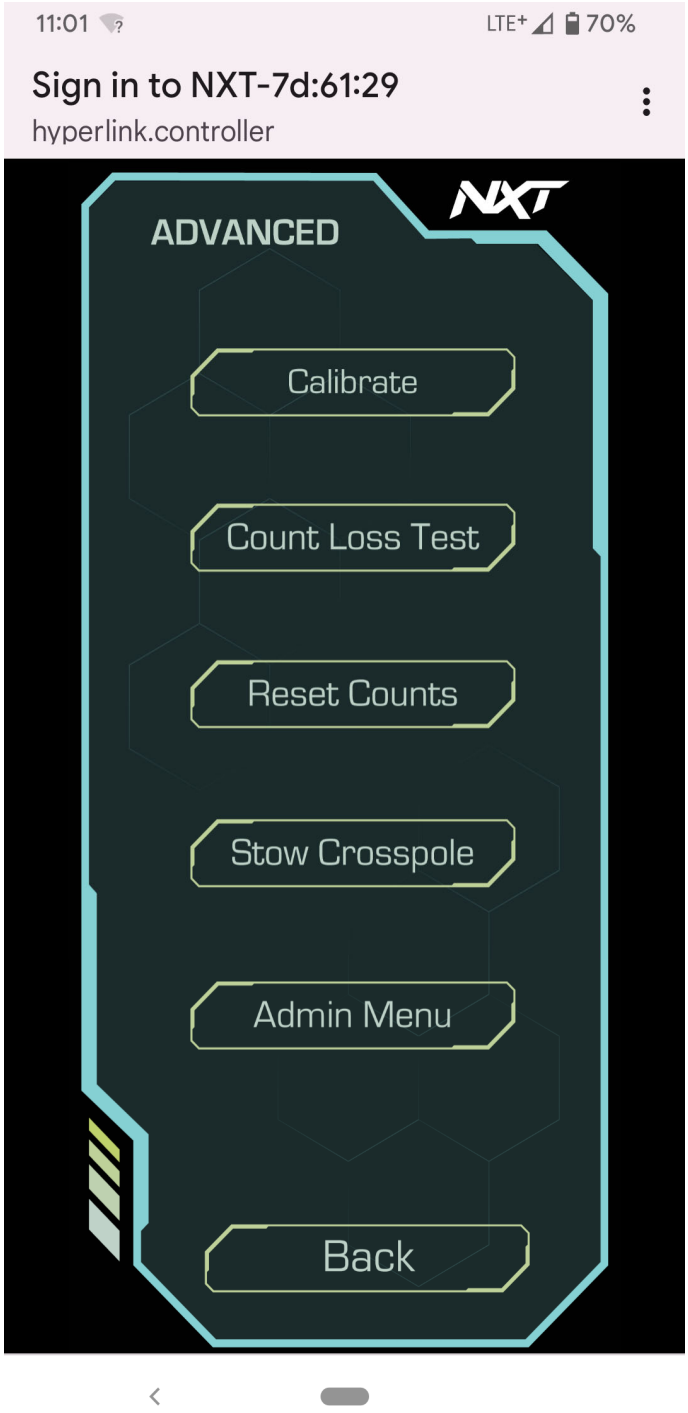
### Support Library
View a collection of documents and diagrams covering the operation and maintenance of the NXT system.

### About
Lists all of the mount calibration values for the current Mount Profile

## Advanced User Menu

### Calibrate

Load the Dish Calibration routine. Instructions for setting up the mount for your hardware configuration will be listed as well as a link to the Manual Menu to move the mount into position. **See detailed information on calibration under Troubleshooting section.**




### Count Loss Test

This test will perform a quick nudging test with all three motors to check for any count loss. Since the mount will be moving, please make sure that there is enough space around the mount before starting the test. Once the test is finished and the mount has returned to the stow position, the results will be displayed onscreen.

### Reset Counts

In the event that the motor coordinate values do not align with the mount's positioning, use Manual Controls to manually move the mount into the stow position, then select Reset Coordinates to set all the motor coordinate values to match the mount's stow position.

### Stow Crosspole

In the event that the crosspole counts do not line up with its position, this routine will move the crosspole to its lower limit, reset its count, and finally move it to the crosspole stow position. The elevation inclinometer will move to the 90 degree position first.

## Admin Menu

### Controller Options

#### *Wireless Network Name*

Set a custom name for the controller. A default controller name based on the controller's MAC address will be generated automatically. This name will also serve as the controller's SSID.

#### *User Password*

Change the user login password. Leave the field blank to retain the current password.

### *Settings Password*
Change the settings password. Leave the field blank to retain the current password.

### *Mount Profile*
Select the Mount Profile that will be used with the controller from the list of available profiles. Do note that changing the Mount Profile after calibration will result in the calibration getting reset.

### *Modem Profile*
Select the Modem Profile that will be used with the controller from the list of available profiles. The selection made here will affect which menu options are available under Modem Options.

### *Signal Threshold*
Set the voltage threshold value for the analog satellite scans. Leave it at its default value, unless instructed to modify it from your satellite provider's NOC.

### *Minimum Clearance Angle*
This degree value is the lowest elevation angle that the mount will move to during the Find Satellite routine. Set this to a higher value if there are any permanent obstacles nearby that the mount needs to stay clear of. Leave this as default unless your equipment provider indicates that a custom value is required. Do note that this degree value is calculated without of the reflector offset applied.

### *[Motor] Stall Sensitivity*
Set a sensitivity percentile value for each installed motor. The lower the value, the less sensitive the motor stall checks will be, and the less likely that the motor will trigger a stall error.

### *Factory Reset*
Pressing this button will initiate a factory reset on the controller, which will clear out the admin menu settings, and mount calibration results. A warning prompt will appear before the reset will occur. A factory reset cannot be undone.

## Satellite Options

### *Current Profile*
Display's the currently selected satellite profile. Clicking on the Change Satellite Profile button will allow the user to select a different satellite profile. To configure a new satellite profile, select an available profile slot, press the Save button, and then use the preceding Satellite Settings menu to modify the profile's satellite values.

### *Target Satellite*
Enter the longitude degree value as a positive number for the satellite used by the modem

### *Dominant Satellite*
If a satellite offset is required to find the Target Satellite, then enter it here a positive longitude degree value. If a satellite offset isn't required, then copy the Target Satellite value here.

### *Hemisphere*
Select which hemisphere the Target Satellite is positioned in (East or West).

### *RX Polarity*
Select which receive polarity the modem's satellite service is using (Horizontal or Vertical)

### *Opposite Polarity Search*
Toggle this option ON only if the Target Satellite cannot be detected via RF scan on the RX Polarity, but can be detected on the opposite polarity.

### *Incline Satellite NOC Tuning Offset*
Enabling the toggle will allow the user to save a nudging adjustment delta after NOC tuning. When enabled, the prompt to save the offset delta will appear when exiting the NOC tuning screen. It is recommended to leave this setting to Toggle OFF unless advised to enable it from the satellite service provider.

### *Incline Satellite Fine-Tuning Mode*
Enable this toggle will loosen up the fine-tuning threshold values to help compensate for fluctuating receive data. It is recommended to leave this setting to Toggle OFF unless advised to enable it from the satellite service provider.

### *Satellite Name*
Set a custom name for this satellite profile. A default name using the satellite parameters will generated automatically.

## Modem Options

### *iDirect Modem Options*

#### Wait Delay
Set the time to wait for a receive lock, in seconds.

#### IP Address
Enter the modem's IP address. Do note that the controller requires ping access to the modem via the local area network.

#### Password
Enter the modem's admin password. For the iDirect iQ Series of modems, this is the modem's root password, and may be different from the admin password used for the modem's web interface.

### *Newtec Modem Options*

#### Wait Delay
Set the time to wait for a receive lock, in seconds.

#### Timeout Delay
Set the timeout delay for OpenAMIP communication. The default Timeout Delay is 30 seconds.

#### WAN Port

Set the WAN Port number to use for OpenAMIP communication. The Newtec modem needs to be configured to use this port, along with controller's IP address, or a router's IP address for port forwarding setups. Default WAN Port number is 9000.

### Network Settings

#### Transparent Mode

Bridges the two LAN ports on the controller together, and assigning the IP address to LAN1 to LAN2 through the controller.

#### Network Mode

Select either DHCP (default), or Static IP for LAN1. If Static IP is selected, the options for assigning IP addresses for the controller will appear.

## Embedded LCD Menu

When the NXT controller is on the main menu, the controller's front LCD will display the SSID for Wi-Fi connections, as well as the IP address assigned to the LAN interface. From here, press the ENTER button on the front of the controller to load the controller's embedded menu. Use the DOWN and UP buttons to navigate the menu options, and the BACK button to return to the previous screen.

### Information

Displays the software version number and date, as well as the IP and MAC addresses for all network interfaces.

### Manual Controls

Loads the embedded manual controls. Use the DOWN and UP buttons to select a motor to move, followed by the ENTER button. With the motor selected, pressing the UP button will move the motor in the positive degree direction, and the DOWN button in the negative degree direction. Press and release a direction button to nudge the motor, and press and hold to drive the motor in that direction.

### Send Command

Select from the list of command to send to the controller, which will initialize the selected routine. See the Settings Menu for the web interface for more information. The following commands are available in the embedded menu:

- Calibration
- Count Loss Test
- Stow Crosspole
- Reset Coordinates
- Previous Peak

### Admin Menu

Load the embedded admin menu. The menu structure and layout is the same as the admin menu for the web interface. To enter a new value in the embedded admin menu, use the UP and DOWN buttons to

change the left most digit / character, and the ENTER button to move one space to the right. Once the last digit / character have been reached, the new value will be saved in temporary memory, and the previous menu will load. To commit the changes to system memory, select the Save & Exit option at the bottom of the embedded admin menu's main menu.

## Mount Calibration Routine

Please read these instructions thoroughly prior to running the calibration routine.

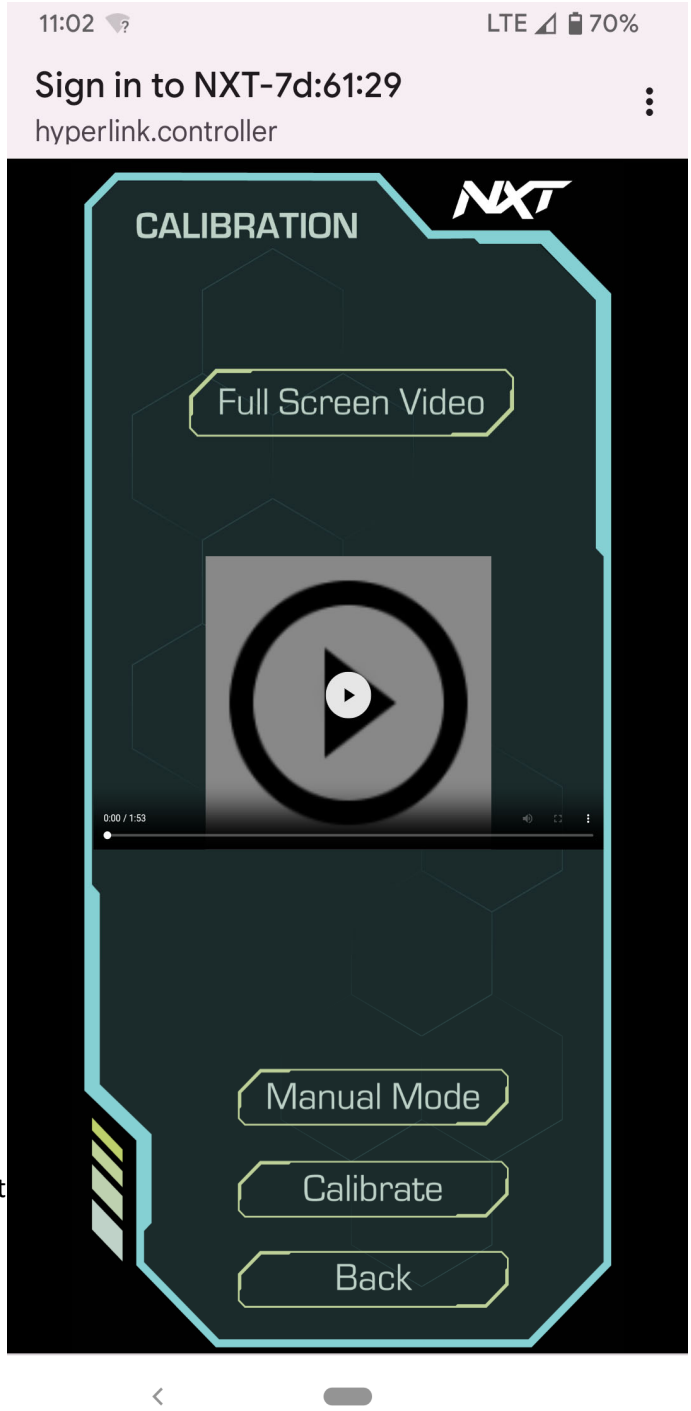
The three steps needed for calibration are as follow: level the base of the mount, level the back of the dish to 90 degrees, and level the crosspole at its center position in the Horizontal position.

### Level the Base

Start by moving the elevation up to approximately 90 degrees. Then place a level on the base of the mount so that the ends of the level are pointing to the front and back of the mount (see the picture below). **NOTE:** that the side with the Crosspole arm is the front of the mount. Prop up either end until the base is level. Repeat for both sides of the mount. Leveling the other orientation (level is pointing to the left and right side of the mount) isn't required for calibration.

### Level the Dish to 90 Degrees

Once the base of the mount is leveled, place the level on the back of the mount in line with the reflector and move the elevation until it is level. On the back of the mount where the frame is attached to the reflector, there is a flat spot (usually between the two screws that mounts the reflector in place) that can be used to level the elevation (see picture below). Elevation nudging (pressing and releasing the move button on the controller quickly) can be



used for precise elevation movement.

## Level the Crosspole

Once the base and the elevation are leveled, move the crosspole so that its physical orientation matches its configuration (Horizontal or Vertical). For mounts with the extended range reed-counter crosspole, treat the mount as Horizontal regardless of the polarization setting in the controller. Use crosspole nudging to get the crosspole as close to center as possible. Use can use the crosspole basket (particularly the front cover with the yellow warning sticker) as a guide to balance the crosspole.

Level the base front to back


Level the dish to 90 degrees


Level the Crosspole

### Run the Calibration Routine

Once the mount is ready, press Back to return to the Calibration Screen and press Calibrate to begin. It is recommended that the user watch the mount during the Calibration Routine in case of clearance issues or a problem occurs. It's important that the mount remain balanced and level throughout the routine. The Calibration Routine can be paused at any time be pressing any key on the keypad (see Motor Stopped Menu below). Any issues detected during the Calibration Routine will cause the process to abort.

First the Crosspole will be moved CW, then CCW, then moved to Stow position (center for Horizontal and CW to the Upper Limit for Vertical). The orientation is based on facing the crosspole with the reflector in the background. Next the azimuth will attempt to move CW to Stow in case it wasn't there already. Next the Elevation will move all the way down (stow position), then all the way up to the upper limit. Next the Azimuth will move CCW to the upper limit (approximately 370 degrees), and then rotate back to Stow position. Next the Stow Routine will call.

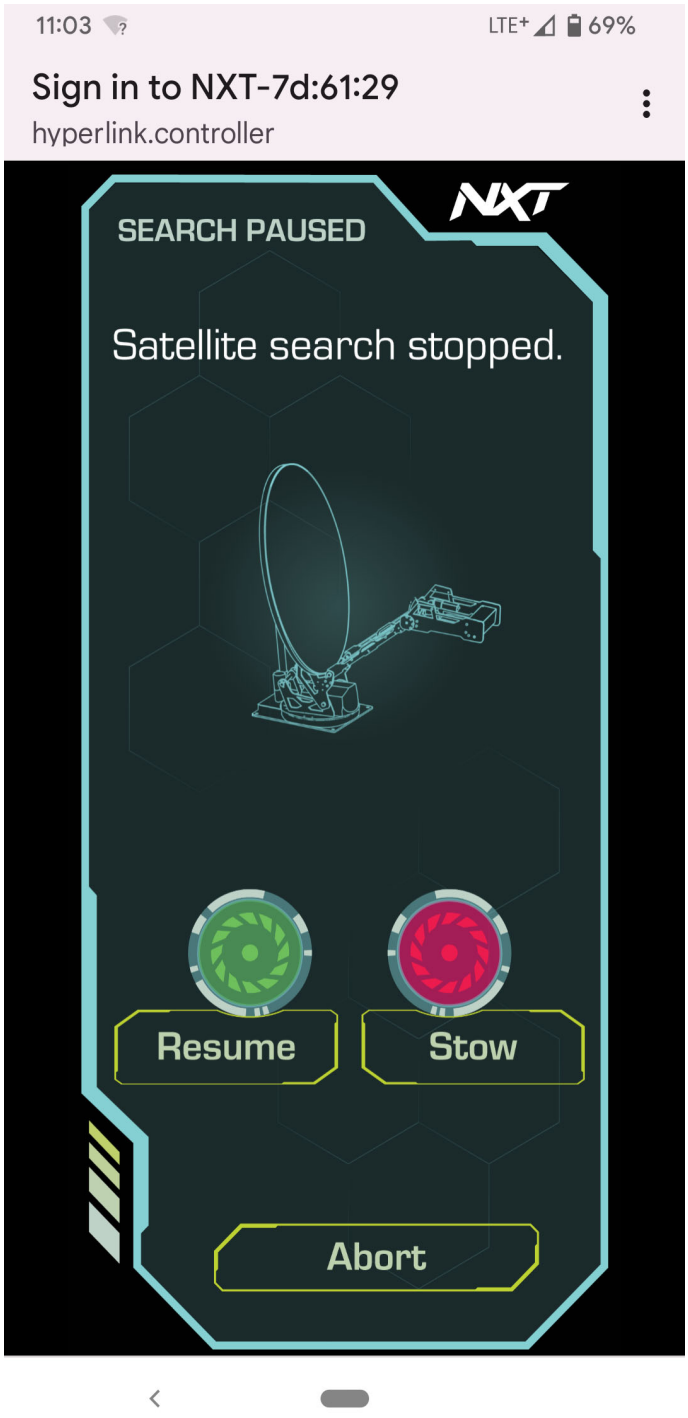
## Find Satellite Routine

Deploys the mount and searches for the satellite. Before the GPS coordinates are checked, the controller will perform another system check. Calibration Status, applicable Inclinometers, and modem communication will be verified. Any problems will be displayed on the screen along with a prompt for the user to either continue the deployment or abort. If the elevation Inclinometer fails its test, the controller will switch the Elevation Self-Leveling feature off during the satellite search. If the GPS fails its test, then the option to enter the GPS coordinates manually will be made available.

Do note that the controller's wireless access point will be taken down while the satellite search is underway. The controller's wireless access point will turn back on when the satellite search is completed, or is an error is encountered. To see the controller's SSID when the stopped, press the ENTER button on the controller to display the networking information on the LCD display.

## System Stopped Menu

This menu screen will load if the ongoing controller routine was interrupted. This will happen if the user pressed the pause button, or a system error was encountered. The motor that was moving last, or the controller module was being accessed, will be displayed, along with a brief description of the condition that caused to motor to stop.




### Resume

This will resume the previous system routine operation. If the system stopped because of a system error, be sure to check that any obstructions are cleared, and the error condition has been corrected before resuming the routine. Pressing the green Deploy / Repeak / Resume button on the controller box will also resume the previous system routine.

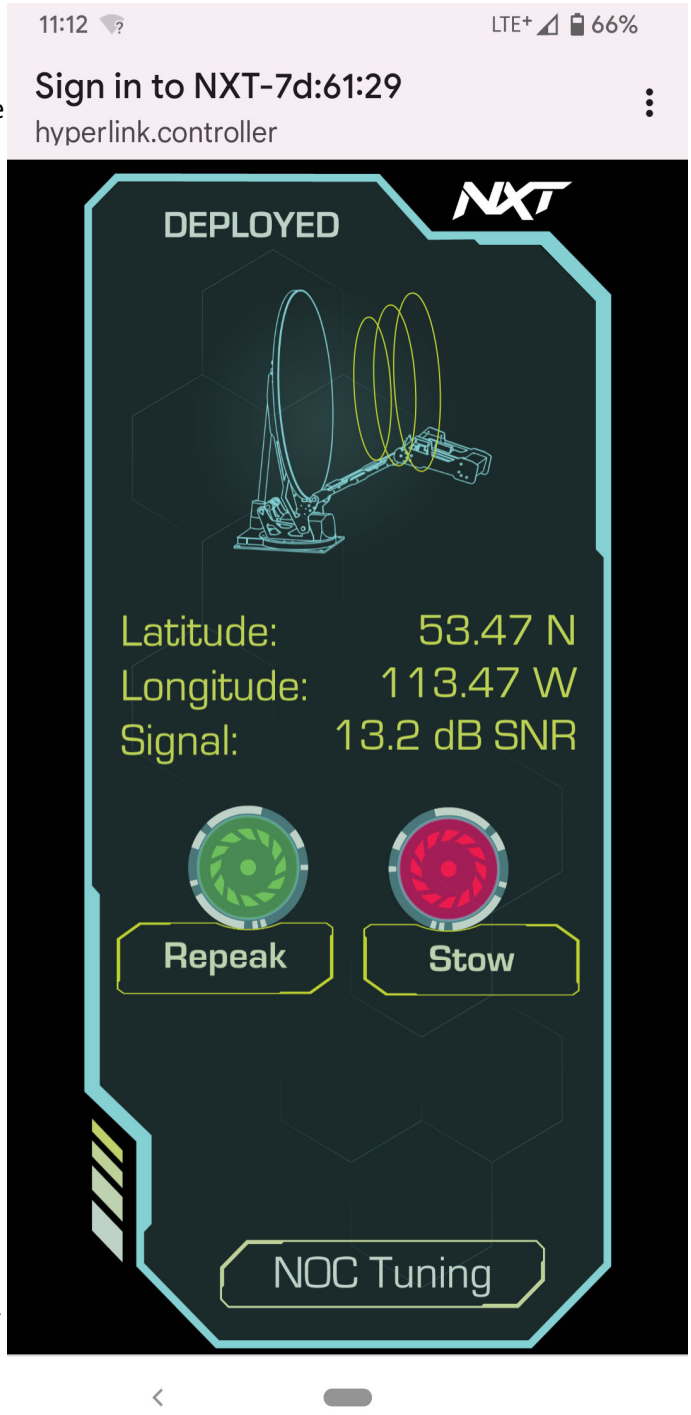
### Stow

This will call the Stow Mount Routine, aborting the previous controller routine. If the system was stopped in the middle of the Stow Mount Routine, the routine will restart from the beginning. See the Stow Mount section under the Main Menu portion of this manual for a full description of the stow routine. Pressing the Red Stop / Stow Resume button on the controller box will also toggle the Stow routine.

### Abort

This will abort the current controller operation, and will return to the main menu.

## Satellite Deployed Screen




Once an RX Lock is confirmed and the mount is finished the Fine-Tuning routine, the Mount Deployed Menu will load. Verifying the satellite from the Manual Menu will also load this menu, skipping the Fine-Tuning routine. The GPS Latitude and Longitude, current modem Signal Strength, and which pass number the satellite was found on will be displayed on the screen. The Signal Strength value will refresh automatically on a 15 second interval.

### Repeak

This will cause the mount to move off the satellite and attempt to re-acquire an RX Lock. First the TX Disable command will be sent to the modem, then the mount will move a few degrees away from the satellite, and the satellite search will begin anew. Use this if the satellite signal has weakened and needs to be corrected. Pressing the Green Deploy / Repeak / Resume button on the controller box will also toggle the Repeak Satellite routine.

### Stow

Calls the Stow Mount Routine (see the main menu section above). Pressing the Red Stop / Stow Resume button on the controller box will toggle the Stow Mont routine.

### NOC Tuning

Load the NOC Tuning variant of the Manual Controls Menu. The Admin Password is required to proceed. Note that the Transmitter will remain ON while the NOC Tuning controls are loaded, and only motor nudges are permitted. Press Re-Verify to check for a satellite lock and return to the Satellite Deployed Screen. Press Main to return to the Main Menu, disabling the Transmitter in the process.

## Main Menu

Return to the Main Menu, disconnecting the transmitter in the process. You can return to the Deployed screen via the Go Online button in the Manual Controls menu.

# ! CAUTION !

Failure to operate this equipment properly may result in damaged equipment or personal injury.

Not for use in areas where children are present.

When servicing the antenna, always disconnect power to the controller, or disconnect the motor wiring connector.

Virgin Technologies O/A Hyperlink shall in no event be liable for any special, indirect, or consequential damages whatsoever and neither assumes nor authorizes any person to assume for it any other obligation or liability.

The information in this manual may change without notice.

## Specifications

Model name: NXT Antenna Controller
Model number: NXT2022

### Environmental

The controller is for indoor use only.
0° to 40°C ambient temperature
Non-condensing humidity.

### Electrical

Controller power input: 48 VDC, 7A.
External power supply input: 120-240V, 420W, 50-60 Hz
External power supply output: 48 VDC, 7A

Earth grounding terminal: #8 machine screw nut.
Earth ground wiring must be copper, 18 AWG or larger.

Motor wiring between the controller and the antenna must be 16 AWG or larger.

### Physical

Enclosure size: 284mm wide, 148mm deep, 45mm high
Rack mount: Optional 1U rack mount brackets available.

CE

## Office Contact / Shipping Address

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