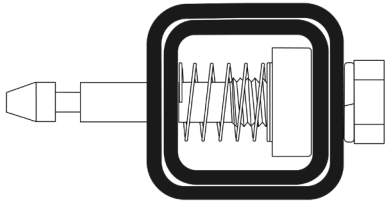
For initial system setup please refer to page 22.

Quick Start Guides

Loading NSD

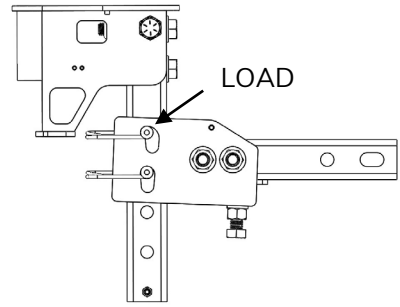
1. Position the vehicle's tow hitch over solid, level ground.

2. Remove the Hitch Adapter from the Chassis Bed and insert the Receiver Tongue into the hitch of vehicle. Secure with the Anti-Rattle Hitch Pin ensuring that the threaded block is on inserted side, refer to page 32.

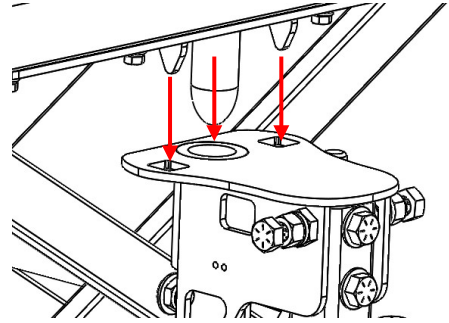


3. Set the Height Adjustment of the Hitch Adapter. Minimum Clearance between the bottom of a mounted NSD and the ground is 12". Refer to page 33.

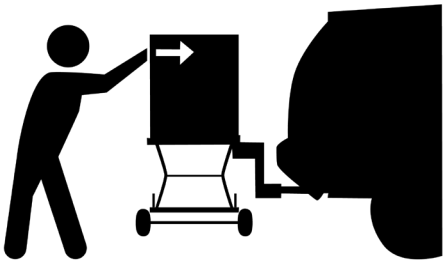
4. Pull the Hitch Adapter's Mounting Box up & away from the vehicle to seat the PitchLok Pins in the LOAD position.



5. Raise the NSD by rotating the Crank Handle CLOCKWISE to elevate the Mounting Pin above the Hitch Adapter. Roll into position with the Mounting Pin above the Mounting Box Receiver Tube.

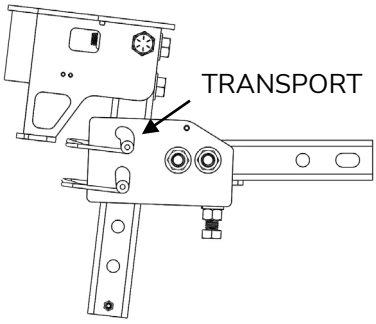


6. Turn the Crank Handle COUNTER-CLOCKWISE to lower the Mounting Pin into the Hitch Adapter until the Mounting Tabs drop and lock into their respective holes.

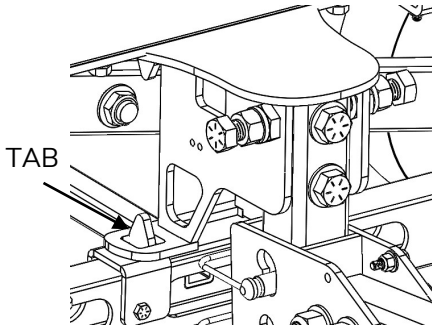


7. Continue lowering until the weight begins to transfer to the vehicle's suspension. STOP turning the handle. Give the Unit a firm push at the top towards the vehicle. The PitchLok Pins will slide down into the TRANSPORT position.

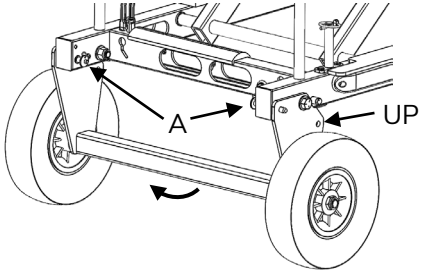
If the unit is too hard to push, crank handle clockwise to decrease load on Hitch Adapter. If the push is not moving pins into Transport position, add more load to Hitch Adapter by cranking counterclockwise.



8. After securing the unit into the TRANSPORT Position, continue raising the Lower Frame until the Mounting Box locks on the tabs of the Lower Frame, then a ¼ to ½ a turn more to add compression securing it to the Hitch Adapter.



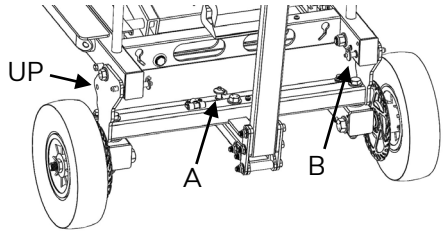
9. Check the NSD ride position. It should be level left-to-right and have a slight pitch towards the vehicle. Adjustment is necessary to the Hitch Adapter if not. Refer to page 31.
10. Connect the Runner's Chassis 4-pin connector to the vehicle's 4-pin receiver and test for proper operation of the Stop, Turn, and Taillights.
11. Remove both Leg Pins (A) from both sides of the Tail Axle assembly.



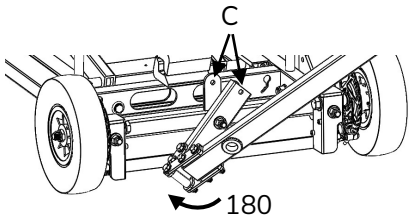
12. Rotate the Tail Axle upwards.
13. Reinsert Leg Pins into the UP position holes.

⚠ Exercise caution to not pinch the Brake Lines.

14. Remove the Steering Lock Pin (A) and both Leg Pins (B).

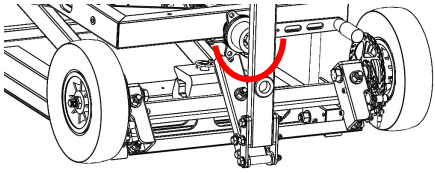


15. Rotate the axle half-way up, then rotate the steering handle counterclockwise 180°.



16. Align the steering link and lock tab holes (C) and insert the steering lock pin (A).
17. Rotate the wheels all the way into the UP position.
18. Reinsert both leg pins (B) into UP position holes.
19. Use the Red Safety Lanyard to secure the handle.

20. Verify NSD chassis lights are

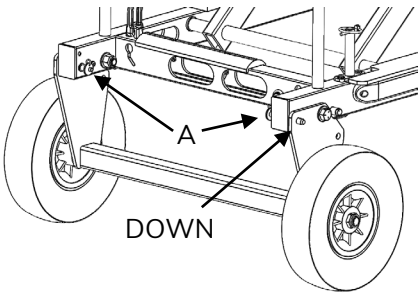


fully functional before traveling.

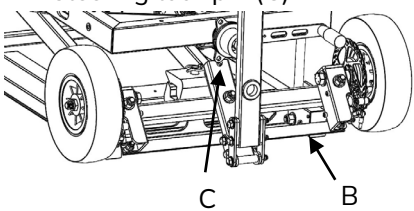
Unloading NSD

1. Position the vehicle (and the mounted NSD) over firm, level ground.
2. Disconnect and stow the 4-pin light connector.
3. Set the NSD's Parking Brake.
4. Remove both leg pins (A) from the UP position holes.

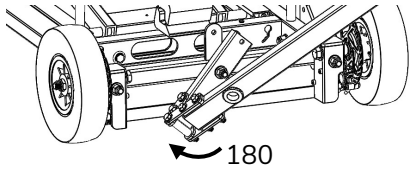
5. Rotate the Tail Axle downwards.
6. Insert both leg pins (A) locking the Tail Axle into the DOWN position holes.



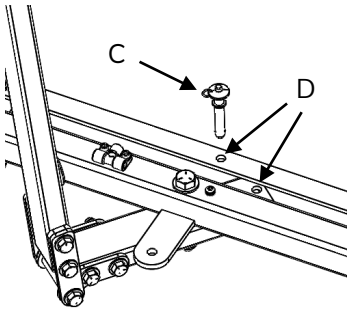
7. Unclip the Red Safety Lanyard securing the Pull Handle.
8. Remove both leg pins (B) and steering lock pin (C).



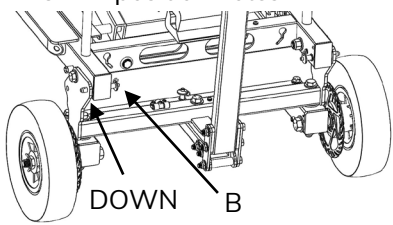
9. Rotate the Steering Axle downwards approximately halfway and then rotate the steering handle clockwise 180°.



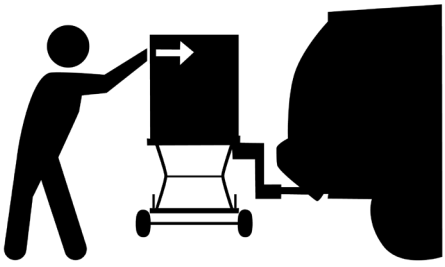
10. Align the steering link and tie rod holes (D) and insert the steering lock pin (C).



11. Insert both leg pins (B) into DOWN position holes.



12. Turn the Crank Handle CLOCKWISE, to lower the wheels, until they meet the ground.
    a. Once the wheels meet the ground, there will be resistance in the Crank Handle as the weight shifts from the vehicle to the NSD.
    b. Continue turning the Crank Handle CLOCKWISE, until the
    c. PitchLok Pins pop loose and the Mounting Pin comes out of the Mounting Box.



⚠ If the PitchLok Pins do not release (typically due to lack of lubrication), push the unit towards the vehicle. Alternate between rotating the Crank Handle and pushing the unit toward vehicle, until the PitchLok Pins release.

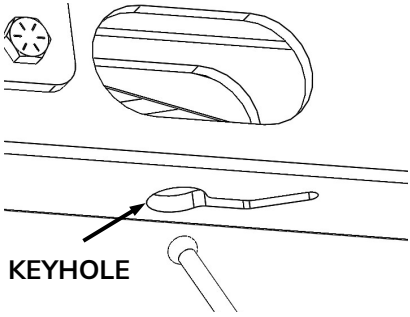
13. Continue elevating until the Mounting Pin is clear of the Mounting Box, unlock the parking brake and move the unit away from the vehicle.
14. If the vehicle needs to leave, remove Hitch Adapter from the vehicle and store it in the bed on the Lower Frame. Refer to page 33.
15. Be sure the unit is clear of any obstruction and then turn the Crank Handle COUNTER-CLOCKWISE to lower the Upper Frame onto the Lower Frame.

⚠ The unit should only be moved with the Upper Frame fully lowered to prevent tipping.

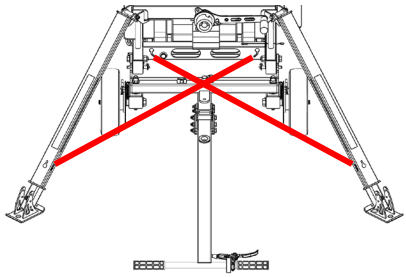
16. Roll the NSD to the desired location for operation.

Stabilizing

1. Remove the orange and red stabilizer cables from storage drawer.
2. Remove Red Safety Lanyards securing stabilizer legs and rotate legs to the ground. Raise chassis with Crank Handle approximately 12”.
3. Anchor orange cable to key slots on the long Lower Frame rails. Orange cable mount keyholes are on the bottom of the Lower Frame below Cable Slot label. Anchor opposite end to slot in stabilizer leg. Repeat for remaining orange cables.

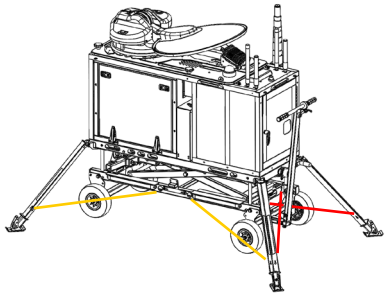


4. Lower chassis Pull Handle to ground before connecting red cables. Anchor red cable to key slot on the lower frame short end rail

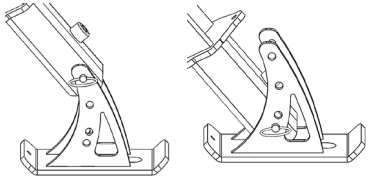


and cross over to opposing leg. Cable mount keyways are on the face of the short rails. Repeat for other red cables.

5. Lower the chassis with Crank Handle by rotating counter-clockwise. This will force weight onto legs and slide them outwards until cables are taught. Ensure feet slide smoothly and are not caught on a rough surface or obstacle. Lower chassis enough to stabilize where the wheels are not bearing any weight.



6. If NSD is not close to level due to uneven ground, reverse process to take weight off the stabilizers and extend leveling feet on the downhill side. Retighten the cables. Refer to page 35.



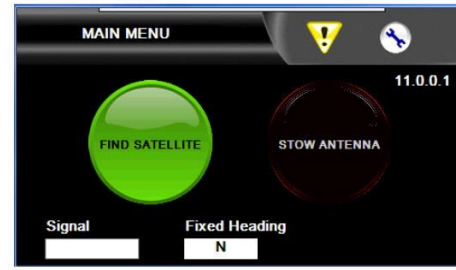
7. Rotate chassis handle upright and secure with Red Safety Lanyard.

Satellite Deployment

1. Transport the NSD to the appropriate location on solid, level ground with a clear view of the Southern sky.
2. Deploy stabilizer legs as shown on Stabilizer Quick Start Guide. Fully stabilize before proceeding with satellite deployment.
3. Turn on the red Master Power switch (see picture – red circle).
4. Wait approximately 3 minutes or after the modem red light turns off, visible from the rear door on the right side. Push the green Winegard Power button, noted by the green circle.

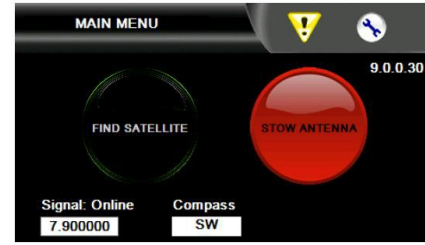
5. Allow the satellite controller to proceed through diagnostic checks until a green “Find Satellite” button appears. During this process, start the generator or connect to shore power (if applicable).

6. Press the green “Find Satellite” button on the satellite controller
7. screen. The satellite signal acquisition system is automatic



from this point.

8. The VSAT antenna will begin moving and search for the satellite. This process can take anywhere from 3 to 8 minutes. When the red “Stow Antenna” button comes on, the unit is pointed to the satellite. When the display message on the bottom left of the screen reads “Signal: Online” the broadband is connected. Allow another minute for the Cradlepoint to verify the connection. The NSD is now connected to the High-Speed Ka-band ViaSat satellite

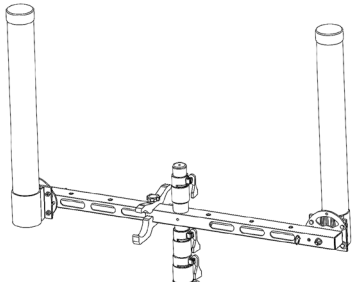


broadband.

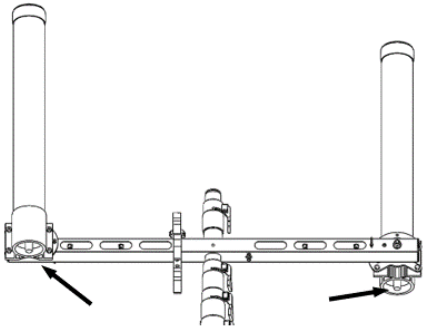
For troubleshooting refer to page 79.

SBO Radio

1. Ensure the NSD is stabilized, powered, and that internet backhaul has been established.
2. Install the LTE antenna mast head onto the mast.



3. Connect the LTE antennas to the Antenna Deck ports marked “Radio 1” with cables supplied in the masthead bag and to bottom of antennas on the mast.
4. Elevate the antennas. Refer to Mast Deployment on page 46.



5. Power the SBO radio.

6. After 5 minutes verify RF LED on the radio is solid green.

Welcome to the NSD community. We thank you for your support and hope you enjoy our excellent products, documentation, and customer service. If there are questions regarding your NSD or the contents of this manual, please call the Rescue 42 toll-free at:

(888) 427-3728

The purpose of this Owner's Manual is to provide explanations and procedures for operating, maintaining, and troubleshooting a NSD.

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STOP!

READ THESE WARNINGS BEFORE USING THE NSD

Failure to follow these instructions or heed these warnings may cause damage to the NSD, the vehicle or other property, cause bodily injury or death, and void the warranty.

Warnings & Safety

- You are responsible for damage to the NSD, other property, injury or death caused by incorrect use of a NSD.
- Vehicle transport of a NSD is limited to a class III (or higher), 2" receiver hitch. Never use a hitch extender or expander with a NSD. A reducer is acceptable (Class V to Class III/IV).
- Never exceed the vehicle and hitch receiver tongue weight specification. You are always responsible for the amount of load you carry.
- Never attempt to load or unload a NSD unless it is on firm level ground.
    - Always set the Runner's Parking Brake prior to loading or unloading the NSD.
- Always make sure that all door latches are fully engaged prior to transporting.
- A NSD will not correctly load and unload unless the PitchLok™ Pins and PitchLok holes are kept lubricated.
- Never transport a NSD on a vehicle unless all Red Safety Lanyards are correctly connected to lock the Pull Handle and Stabilizer Legs in their upright stored position.
- Never transport a NSD on a carrying vehicle with a Hitch Adapter in the NSD's Hitch Adapter Storage Location.
- Never transport a NSD with the PitchLok pins in the "Load" position.
- Never attempt to transport a NSD unless all components are firmly attached. Insufficiently attached items may fall off.
- Never use the lowered doors as a step or seat. Damage to the NSD or injury could occur.
- Use extreme caution when maneuvering NSD on inclines or slopes. Never attempt to roll a NSD on terrain that is too steep or soft to maintain control of the NSD. It may roll away, sink, or tip over.
- Never attempt to move a NSD unless it is completely lowered for stability.

- Never attempt to transport a NSD unless the Lower Frame Tabs are engaged into the Mounting Box slots.
- Always set the parking brake and deploy the wheel chocks before leaving a NSD. In some cases, even these devices may not be enough to prevent the NSD from rolling away. You are always responsible for securing the NSD from unintentional movement.
- Prior to transport, the Four-Pin taillight connector must be connected to the vehicle for correct operation of the NSD safety lights.
- If required by law the vehicle license plate must be relocated to the NSD License Plate Bracket.
- Severe bumps can damage the NSD or the vehicle's hitch. Drive slowly on rough roads and over speed bumps. Stop and make a thorough inspection of the NSD after traveling on rough roads. Correct any problems before resuming travel.
- The carrying vehicle exhaust must not vent onto the NSD or damage may occur.
- Do not drill, weld, or modify any part of a NSD. Never alter or replace a component on the Runner with any part except one supplied by Rescue 42, Inc.
- NSD stabilizer legs must be rotated to the stowed position prior to vehicle transport.
- Use extreme caution when operating a vehicle with a NSD attached. Backing, cornering, bumps, speed, and vehicle control are all areas where you need to be aware that you have an extension off the back of your vehicle and extra load in your hitch. You are always responsible for damage to your NSD or other property caused by incorrect use of a NSD. Review and follow the guidelines for "Vehicle Operations" in this owner's manual.
- Never use a NSD that is damaged in any way.
- Not for use with ATV's, trailers, or towed vehicles.
- NSD may not mount to the back of some vehicles with a rear mounted spare tire or other rearward obstruction.
- Most NSD components are finished to prevent rust. As with any metal equipment, we recommend keeping the unit clean and free of road salt and debris.
- The Thrust Screw and Mounting Pin are not coated with a rust prohibiting coating. These moving parts must be kept well lubricated with grease to ensure smooth operation and prevent corrosion.

- Pins and Bolts should be inspected regularly. Tighten or replace if any parts are loose, bent, or excessively worn.
- It is recommended that the unit be stored indoors when not in use.
- NSD locks are designed to deter vandalism and theft but should not be considered theft proof.
- It is recommended to secure the unit to the vehicle if left unattended using a standard cable locking system as long as it does not interfere with the function and safety of the vehicle.
- **WARNING** Exhaust contains poisonous carbon-monoxide gas that can build up to dangerous levels in enclosed areas. Breathing carbon monoxide can cause unconsciousness or death. Never run the generator in a closed, or even partly closed area where people may be present.
- **Prop 65 WARNING** This product contains chemicals known to the State of California to cause cancer or birth defects or other reproduction harm. For more information visit www.P65Warnings.ca.gov.

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Chico, CA 95927-1242

Revision History

Version	Description	Date
A	Initial release	2024-02-15

Notes

Symbols

Manual Reference

Indicates that the reader should consult the relevant section of this Owner's Manual for information on a particular part, assembly, or procedure.

Indicates warnings that must be followed to avoid damage to the NSD unit or personal injury or death.

System Identifiers

Alternating Current (AC)

Battery

Circuit Breaker

Cooling Control

DC to AC Inverter

Direct Current (DC)

Fuse Box

Lighting

Temperature Control

Definitions

- BDT – Beam Data Table
- COW – Cell on Wheels
- GPIO – General Purpose Input/Output
- ICU – Inverter Charger Unit
- IP – Internet Protocol
- NCM – NetCloud Manager
- NSD – Network System Deployable
- PCM – Power Control Module
- PEP – Power Entry Panel
- SBO – Single Band Outdoor
- SEP – Signal Entry Panel
- SIM – Subscriber Identity Module
- SWGK – Surface Wire Ground Kit
- VSAT – Very-Small-Aperture Terminal

Optional Equipment

This manual includes all optional equipment available for the NSD. Therefore, it also describes equipment that may not be included on all NSDs.

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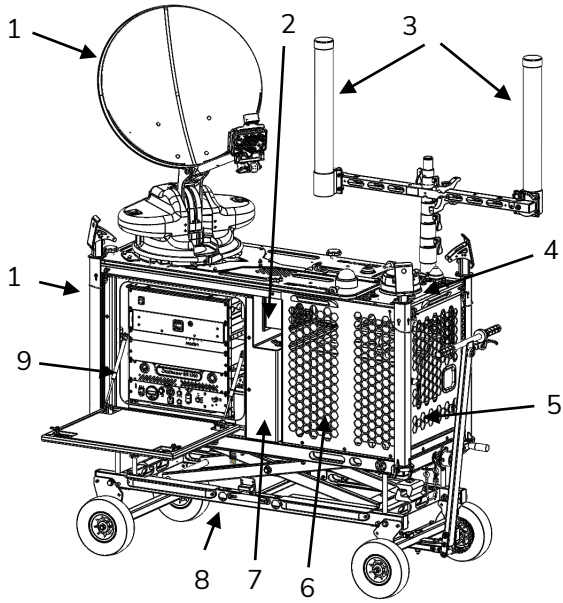
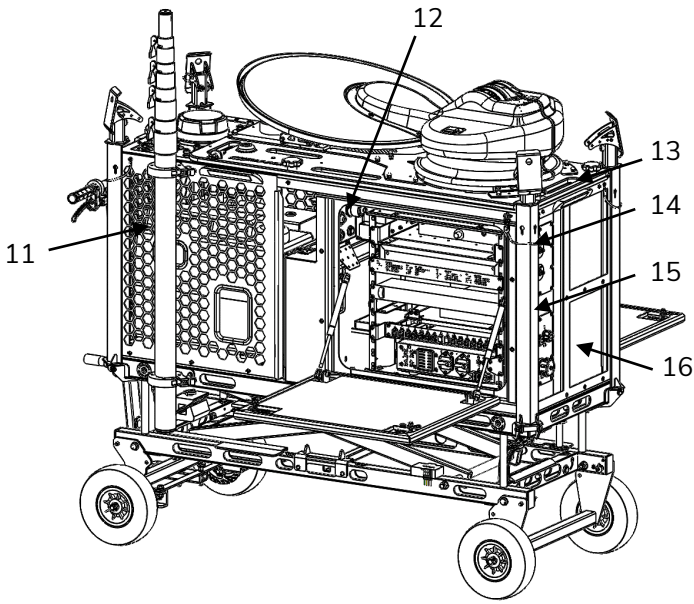
Overview

The NSD is a two-part system; the Runner which is the Scissor Lift System and transport component, and the Pod which contains the communications and power components of the NSD system.

Pod



1. Satellite Terminal (VSAT)
2. Air Conditioner / Heater
3. LTE Antennas
4. Antenna Deck
5. Enclosed Genera-tor & Fuel Tank
6. Exoskeleton
7. ICU Cabinet
8. Runner
9. Pod
10. Stabilizer Leg



11. 5m Telescoping Mast
12. AC Power Entry Panel (PEP)
13. Exterior Scene Lighting (x4)
14. Satellite Signal Entry Panel (SEP)
15. DC Inlet PEP
16. Aux Pod Mount

Pod

The Enclosure is constructed of Powder Coated Aluminum and is NEMA 4X rated. Standard NSD Vinyl Decals are included.

Enclosure Rack: (Top to Bottom)

- LTE Cellular Radio
- Drawer (for storing Accessories)
  - Removable for additional rack space
- ViaSat® Modem
- Winegard Satellite Controller
- Cradlepoint IBR1700 Router
- Power Control Module (PCM)

Exoskeleton

The outer exoskeleton frame supports the VSAT antenna, secures the fuel system, perforated for onboard generator operation, provides space for antenna deck, and protects the enclosure.

Stabilizer Legs

There are four (4) Stabilizer Legs, that must be deployed when the Antenna and/or Mast are in use. The Stabilizer Legs, located at each corner, can quickly and easily be set up by one individual. Refer to page 25.

⚠ In addition to the Stabilizers, the Parking Brake must be locked, and the included Wheel Chocks must be used when deploying a NSD.

Satellite Antenna

The VSAT antenna will, at the push of a button, deploy and lock onto the satellite automatically.

Mast

The attached 5-meter telescoping fiberglass mast is for deploying antennas at an increased height when additional line-of-sight is required. To deploy the mast, refer to page 34.

Power & Signal Entry Panels

The PEPs and SEP on the NSD allow for easy modifications of customized entry and exit ports for a variety of connection types.

Auxiliary Pod Mount

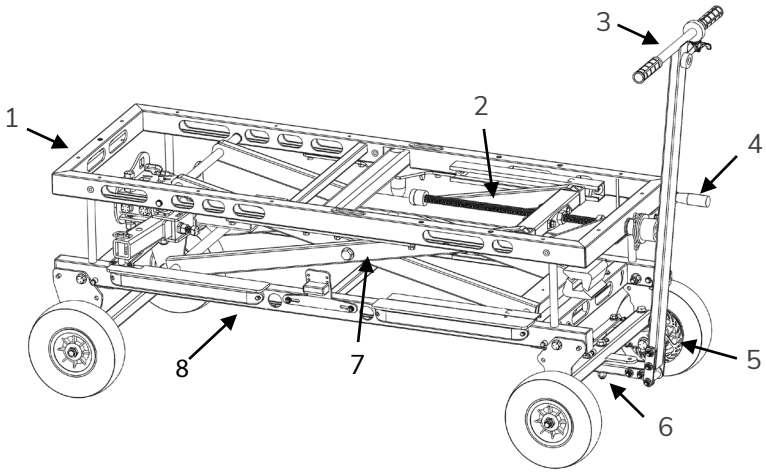
The threaded mount location on the end of the exoskeleton is for future modules to further increase the capabilities of the NSD. Items may include:

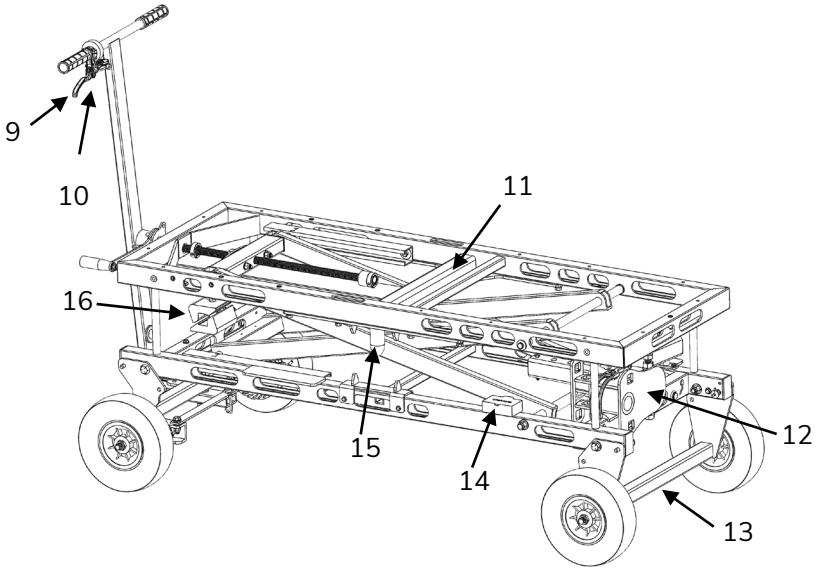
- Macro LTE Radio
- Storage Box
- RoIP Equipment

Serial Number

The Serial Number for each NSD product can be found on the lower crossbar of the Scissor Lift System as viewed from the steering end. The Serial # on the NSD Label is the Primary Serial given by Rescue 42. The NSD Serial must be included in any contact to Rescue 42 regarding the unit.

Runner (Chassis)





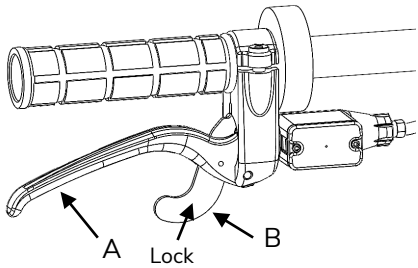
1. Upper Frame
2. Thrust Screw
3. Pull Handle
4. Crank Handle
5. Disc Brakes
6. Steering Axle
7. Scissor Lift System
8. Lower Frame
9. Brake Lever
10. Parking Brake
11. Bridge
12. Hitch Adapter
13. Tail Axle
14. Trailer Light Plug Box
15. Mounting Pin
16. Wheel Chocks

Scissor Lift System

The NSD Chassis is equipped with a Scissor Lift System that can be raised and lowered for transportation or deployment.

Parking Brake & Wheel Chocks

There is a Brake Lever (A) and a Parking Brake Lock (B) on the Pull Handle that will lend assistance in slowing or controlling the NSD but is not guaranteed to fully stop the unit.

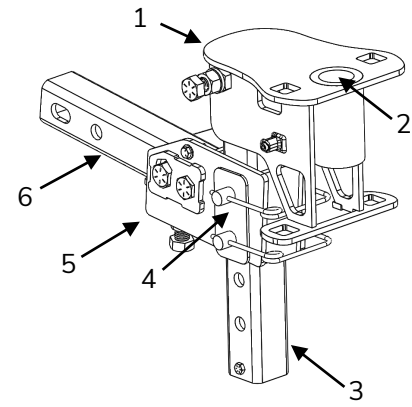


⚠ When the unit is being used in a stationary position, the included Parking Brake and Wheel Chocks must be used to prevent the unit from rolling away.

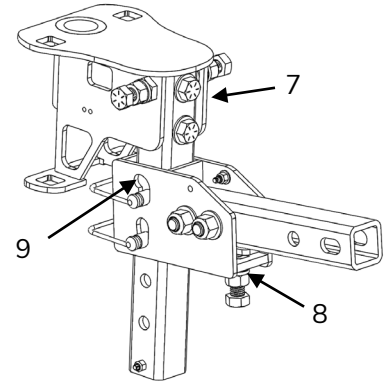
Hitch Adapter

The Hitch Adapter is the device that allows the NSD to quickly couple and uncouple from the carrying vehicle. It comes preset to a common position for transporting.

⚠ Always adjust the Hitch Adapter to the carrying vehicle prior to transit. Failure to do so will result in poor ride quality. Refer to page 15 for adjustment.



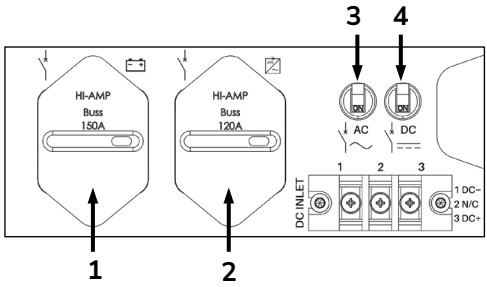
1. Mounting Box
2. Mounting Pin Receiver
3. Height Adjustment Tube
4. PitchLok Pins
5. Pitch Box
6. Receiver Tongue
7. Roll Adjustment Bolts
8. Pitch Adjustment Bolts
9. PitchLok Holes



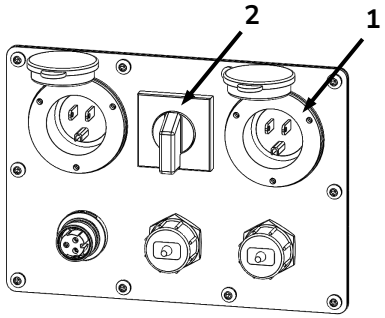
Initial System Setup

The NSD comes with all circuits in an open state. This disconnects the battery, ICU, and all incoming power sources.

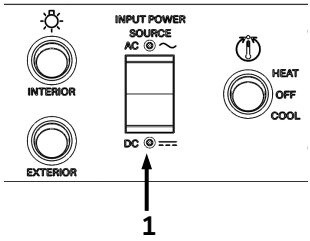
1. Turn on all circuit breakers located on the rear of the PCM. (1 – 4)
   a. For 1 and 2 rotate the yellow lever upwards until clicked into position.
   b. For 3 and 4 flip the toggle switches up.



2. Connect Shore AC power to Shore AC Inlet (1) and rotate Power Inlet Selection Switch to Shore (2).

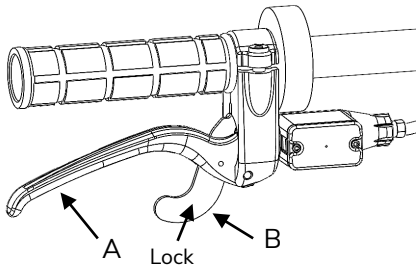


3. Set Source Power Switch to AC on the front of the PCM.



4. Charge unit completely until Battery Monitor synchronizes to the full state (approximately 1 hour).
5. Compensate the compass as necessary per manufacturer specifications.
6. The Cradlepoint router is preconfigured for the NSD. If other networking changes are required consult an IT professional.
7. Perform initial setup on generator. Follow manufacturer specifications. This includes, but not limited to:
   a. Fill with oil
   b. Fill with gasoline
   c. Check for leaks
8. Adjust Hitch Adapter to carrying vehicle prior to first use. Refer to page 31.

Runner
Basic Operation
Brake System
The NSD is equipped with a brake system to control the steering wheels. There is a Brake Lever (A) located on the Pull Handle which can be used manually or locked into place with the small Parking Brake Lock (B). Use the Brake Lever to help control the NSD on inclines or loose foundations.



The Brake Line goes from the Handle down to two Brake Calipers on the steering wheels. Use caution not to pinch the brake lines.

Engage Parking Brake
To engage the Parking Brake, pull the Brake Lever (A) and then slide the Parking Brake Lock (B) in to lock.

Disengage Parking Brake
To disengage the Parking Brake, pull Brake Lever (A) and then slide the Parking Brake Lock (B) back out to unlock.

⚠ A Locked Parking Brake does not guarantee the NSD is fully secured, in position. Always Use the included Wheel Chocks.

Trailer Lights
The NSD is equipped with Running, Turning, and Brake Lights.

A 4-pin trailer connector is stored in a small box on the lower frame, right below the Back Panel. When transporting the NSD it MUST be plugged into the vehicle, so the Trailer Lights operate in conjunction with the Vehicle Lights.

🛈 If the carrying vehicle has a 7-pin trailer connector and not a 4-pin, the Vehicle Charge Harness can be used as an adapter to a 4-pin. Refer to page 52.

Connecting Trailer Lights
1. Open 4-pin Trailer Plug Box.
2. Plug the 4-pin Connector into the vehicle's trailer light adapter.
3. Load NSD onto the Vehicle. Refer to page 25.
4. Verify proper operation of all Running, Turning, and Brake Lights before driving away.

⚠ Inoperative Trailer Lights should be replaced immediately.

Raising & Lowering

Turning the Crank Handle CLOCKWISE will extend the Scissor Legs and is performed when:

- The NSD is on the ground and need to RAISE the Pod
- Unloading the Vehicle-Mounted NSD (Extends the retracted legs to the ground and lifts the NSD out of the Mounting Box.)

Turning the Crank Handle COUNTERCLOCKWISE will retract the Scissor Legs and is performed when:

- The NSD is on the ground and need to LOWER the Pod
- Loading the Vehicle-Mounted NSD (Retracts the legs off the ground and Mounts the NSD into the Mounting Box.)
- ⚠ Caution must be used not to overextend the frame in either direction as it may damage the Thrust Screw and/or Scissor Legs.

Three Lobe Drive

The Crank Handle drive pin can be located into any of the three drive lobes. In some low clearance situations where the Crank Handle cannot rotate completely use these steps to keep full functionality without outside tools.

Using Drive lobes:

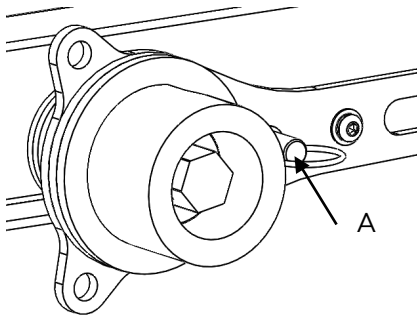
1. Rotate Crank Handle desired direction until obstruction.
2. Remove Lock Pin (A), rotate Crank Handle backwards and re-pin into drive lobe.
3. Repeat steps 1-2 as necessary.

Hex Attachment Point

⚠ Do NOT use any power tools on the hex attachment point!

⚠ Do not pinch the Brake Lines. Exercise Caution throughout procedure below.

The hex attachment point (3/4”), located inside the blue handle bumper of the runner crank drive, can be used alternatively to three drive lobes.



Steps:

1. Remove Crank Handle Lock Pin (A).
2. Use separate tool to raise or lower. For example, a ratchet with ¾” socket and ratchet.
3. Insert Crank Handle Lock Pin (A) capturing a drive lobe.

Loading

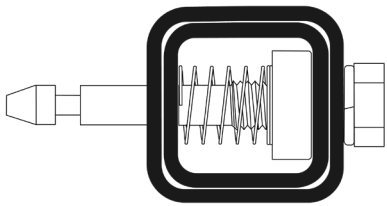
⚠ Read all instructions carefully before attaching the NSD to a vehicle and driving away.

⚠ If transporting the unit with the same vehicle every time, or traveling a far distance mounted to a new vehicle, it is highly recommended to observe the pitch and roll of the mounted unit and make any necessary adjustments BEFORE traveling. See Adjusting the Hitch Adapter on page 31.

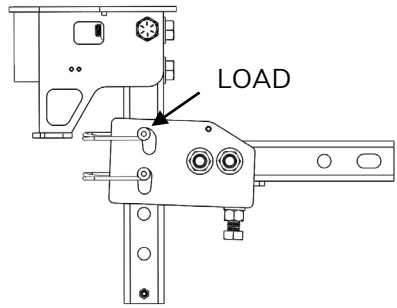
⚠ Mounting the NSD requires the use of a 2" (Class III or greater) vehicle hitch.

⚠ Always rotate the axles into the UP position before vehicle transport.

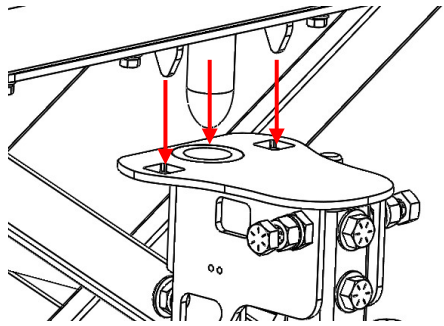
1. Position the vehicle's tow hitch over solid, level ground.
2. Remove the Hitch Adapter from the Chassis Bed and insert the Receiver Tongue into the hitch of vehicle. Secure with the Anti-Rattle Hitch Pin ensuring that the threaded block is on inserted side, refer to page 32.



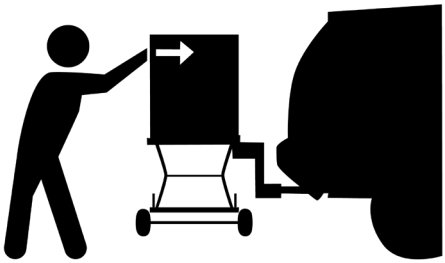
3. Set the Height Adjustment of the Hitch Adapter. Minimum Clearance between the bottom of a mounted NSD and the ground is 12". Refer to page 33.
4. Pull the Hitch Adapter's Mounting Box up & away from the vehicle to seat the PitchLok Pins in the LOAD position.



5. Raise the NSD by rotating the Crank Handle CLOCKWISE to elevate the Mounting Pin above the Hitch Adapter. Roll into position with the Mounting Pin above the Mounting Box Receiver Tube.

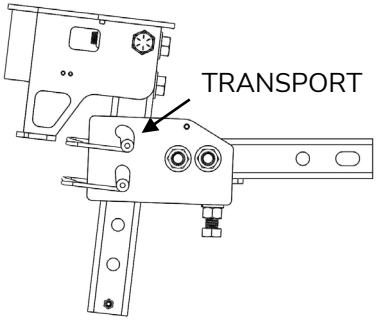


6. Turn the Crank Handle COUNTER-CLOCKWISE to lower the Mounting Pin into the Hitch Adapter until the Mounting Tabs drop and lock into their respective holes.

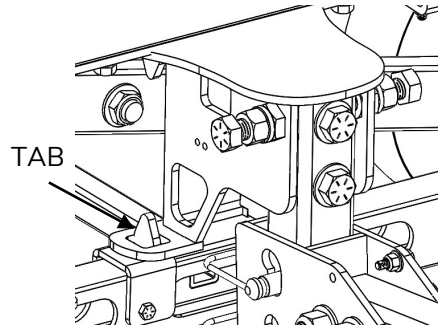


7. Continue lowering until the weight begins to transfer to the vehicle's suspension. STOP turning the handle. Give the Unit a firm push at the top towards the vehicle. The PitchLok Pins will slide down into the TRANSPORT position.

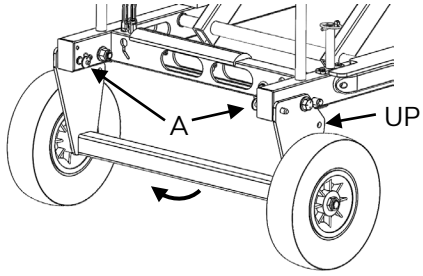
If the unit is too hard to push, crank handle clockwise to decrease load on Hitch Adapter. If the push is not moving pins into Transport position, add more load to Hitch Adapter by cranking counterclockwise.



8. After securing the unit into the TRANSPORT Position, continue raising the Lower Frame until the Mounting Box locks on the tabs of the Lower Frame, then a ¼ to ½ a turn more to add compression securing it to the Hitch Adapter.



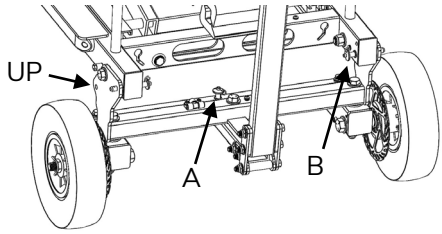
9. Check the NSD ride position. It should be level left-to-right and have a slight pitch towards the vehicle. Adjustment is necessary to the Hitch Adapter if not. Refer to page 31.
10. Connect the Runner's Chassis 4-pin connector to the vehicle's 4-pin receiver and test for proper operation of the Stop, Turn, and Taillights.
11. Remove both Leg Pins (A) from both sides of the Tail Axle assembly.



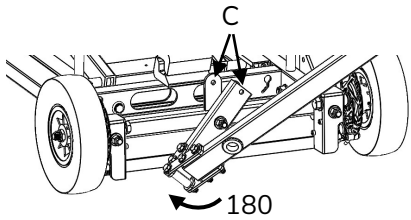
12. Rotate the Tail Axle upwards.
13. Reinsert Leg Pins into the UP position holes.

⚠ Exercise caution to not pinch the Brake Lines.

14. Remove the Steering Lock Pin (A) and both Leg Pins (B).

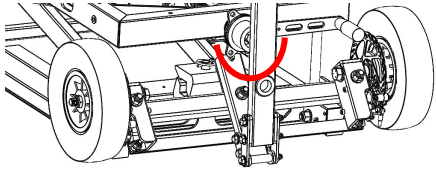


15. Rotate the axle half-way up, then rotate the steering handle counterclockwise 180°.



16. Align the steering link and lock tab holes (C) and insert the steering lock pin (A).
17. Rotate the wheels all the way into the UP position.
18. Reinsert both leg pins (B) into UP position holes.
19. Use the Red Safety Lanyard to secure the handle.

20. Verify NSD chassis lights are fully functional before traveling.



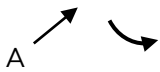
Unloading

A clearance of four to five (4-5) feet on the sides and back of mounted NSD will be necessary during the unloading process. (The NSD may need to be handled from any of the three sides and proper clearance will ensure there are no issues unloading from the vehicle.)

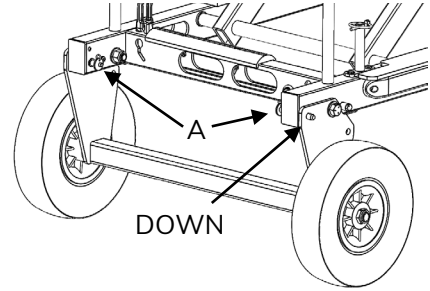
⚠ If firm solid ground is not available, it is acceptable to place a sheet of plywood (or equivalent) below the wheels. This will distribute the weight over a larger surface area and can help in a situation where there is soft or loose ground around a necessary deployment area.

Steps for Unloading

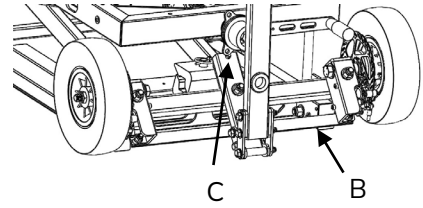
1. Position the vehicle (and the mounted NSD) over firm, level ground.
2. Disconnect and stow the 4-pin light connector.
3. Set the NSD's Parking Brake.
4. Remove both leg pins (A) from the UP position holes.



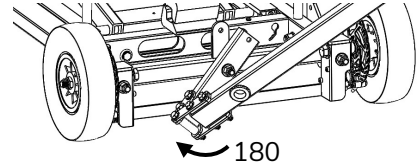
5. Rotate the Tail Axle downwards.
6. Insert both leg pins (A) locking the Tail Axle into the DOWN position holes.



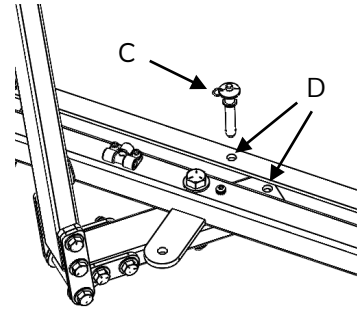
7. Unclip the Red Safety Lanyard securing the Pull Handle.
8. Remove both leg pins (B) and steering lock pin (C).



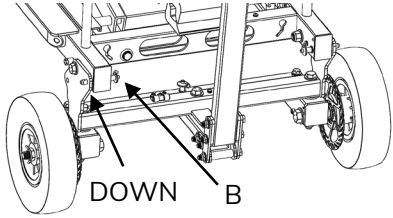
9. Rotate the Steering Axle downwards approximately halfway and then rotate the steering handle clockwise 180°.



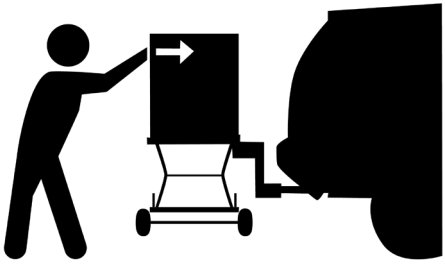
10. Align the steering link and tie rod holes (D) and insert the steering lock pin (C).



11. Insert both leg pins (B) into DOWN position holes.



12. Turn the Crank Handle CLOCKWISE, to lower the wheels, until they meet the ground.
    a. Once the wheels meet the ground, there will be resistance in the Crank Handle as the weight shifts from the vehicle to the NSD.
    b. Continue turning the Crank Handle CLOCKWISE, until the
    c. PitchLok Pins pop loose and the Mounting Pin comes out of the Mounting Box.



⚠ If the PitchLok Pins do not release (typically due to lack of lubrication), push the unit towards the vehicle. Alternate between rotating the Crank Handle and pushing the unit toward vehicle, until the PitchLok Pins release.

13. Continue elevating until the Mounting Pin is clear of the Mounting Box, unlock the parking brake and move the unit away from the vehicle.
14. If the vehicle needs to leave, remove the Hitch Adapter from the vehicle and store it in the bed on the Lower Frame. Refer to page 33.
15. Be sure the unit is clear of any obstruction and then turn the Crank Handle COUNTER-CLOCKWISE to lower the Upper Frame onto the Lower Frame.

⚠ The unit should only be moved with the Upper Frame fully lowered to prevent tipping.

16. Roll the NSD to the desired location for operation.

Transporting on Vehicle

The NSD Chassis has all necessary lighting for transportation:

- Running Lights
- Left and Right Turning Lights
- Brake Lights
- License Plate Illumination Light

The 4-pin Trailer Connector is stored in a small box on the lower frame, right below the Back Panel. When transporting the NSD it MUST be plugged into the vehicle, so the Trailer Lights operate in conjunction with the Vehicle Lights.

⚠ Before driving away, always verify proper operation of all NSD lights.

- All Red Safety Lanyards secured for Stabilizer Legs and Pull Handle
- Satellite stowed
- Mast antennas stowed, if present
- All door latches closed completely

Before Driving

1. Always verify proper connection of the 4-pin Trailer Light Cable and double check all Road Lights are in working order, BEFORE driving away with the NSD attached to the vehicle.
2. Adjust the vehicle side and rear-view mirrors for proper visibility.
3. If the view of the License Plate is obstructed, it must be relocated onto the License Plate bracket, supplied on the NSD.

While Driving

⚠ ALWAYS exercise more caution than normal when driving with a NSD mounted to the vehicle.

⚠ The NSD adds three feet of vehicle length while attached to the back of the vehicle.

- Accelerate and stop slower, to not violently shake the mounted NSD.
- Take turns wider because the tail swing will be larger than normal.
    - Use extreme caution if maneuvering the vehicle in tight spaces.
- To reverse the vehicle, it is recommended to use a spotter.
    - If a spotter is not available, driving in reverse is done at the discretion of the driver.

Transporting on Ground

⚠ Always transport the NSD on the ground in the lowest position.

⚠ Avoid soft terrain such as soil and sand. The NSD is designed to be transported by vehicle over such surfaces.

⚠ Avoid steep inclines and slopes. The brakes are designed to help maneuverability but not fail-safe.

⚠ Always secure handle in upright position with Red Safety Lanyard after transporting to avoid a tripping hazard.

When transporting on the ground, the NSD may be pushed or pulled.

To push the NSD keep one hand on handle with access to brake lever and push on the rigid frame of pod. This gives the best maneuverability. Do not push the NSD with the handle only.

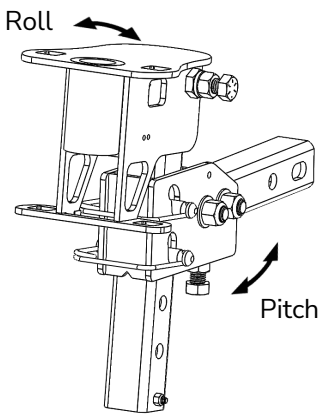
Hitch Adapter

The hitch adapter is the device that allows the NSD to quickly couple and uncouple to the vehicle. It comes preset to a common position for transporting. Further adjustment may be needed for optimal ride quality.

Adjustment

The hitch adapter has room for adjusting pitch, roll, and height. Pitch being the amount of tilt toward or away from the vehicle, and roll being the side-to-side rotation.

If the intended travel is a short distance these adjustments are generally not needed but are recommended if the plan is to drive a long distance.



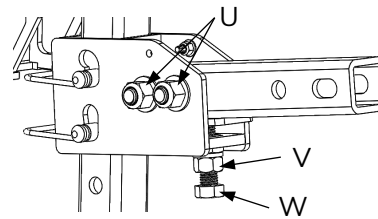
⚠ Always remove the NSD from the vehicle prior to making any adjustments to the Hitch Adapter.

⚠ Check and tighten all Hitch Adapter bolts routinely.

Pitch Adjustment

To adjust the pitch of the NSD (the angle toward or away from the vehicle), mount the unit on the vehicle using the “Loading” directions on page 19. Stand to the side of the vehicle and note the pitch (angle) of the mounted unit.

ⓘ The pitch should be slightly toward the vehicle in Transport position.

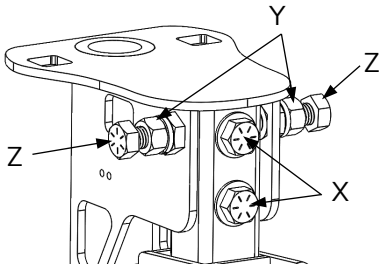


1. Loosen (but do not remove) both Pitch Adjustment Nuts [**U**].
2. Loosen the Vertical Pitch Adjustment Lock Nut [**V**].
3. Set the angle (pitch) by turning the Vertical Pitch Adjustment Bolt (5/8”) [**W**] as necessary.
4. Tighten down the Pitch Adjustment Lock Nut (5/8”) [**V**].
5. Tighten the Pitch Adjustment Nuts (15/16”) [**U**] snug.

Roll Adjustment

To adjust the roll of the NSD (angle side-to-side), mount the unit on the vehicle using the “Loading” directions on page 19. Stand behind the vehicle and observe the angle of the

mounted unit. It should be as level as possible.



1. Slightly Loosen (but do not remove) Mounting Box Bolts [**X**].
2. Loosen both Roll Adjustment Lock Nuts [**Y**].
3. Adjust the angle (roll) left or right by either tightening or loosening the Roll Adjustment Bolts (5/8”) [**Z**] as necessary.
4. Tighten BOTH Roll Adjustment Bolts [**Z**] and then retighten the horizontal Roll Adjustment Lock Nuts [**Y**].
5. Tighten the Mounting Box Bolts [**X**] snug.

Movement Reduction

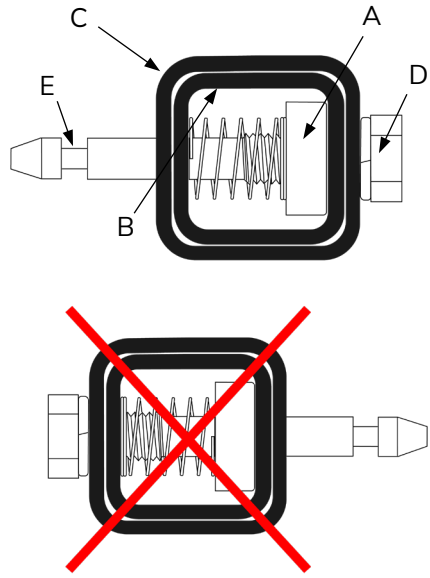
The NSD comes with an anti-rattle hitch pin pre-installed and is meant to reduce the slop in the Hitch Adapter tongue to the Hitch Receiver of the vehicle.

It requires the use of a wrench to install onto the vehicle, included in the Accessory Bag.

⚠ Ensure proper orientation of bolt into internal nut.

Installing Anti-Rattle Hitch Pin

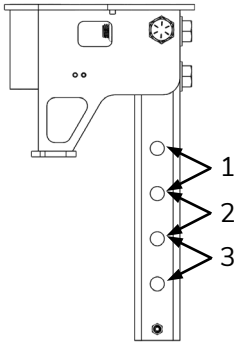
1. Insert the nut and spring (A) into the Hitch Adapter tongue (B).
2. Slide the Hitch Adapter into the Receiver of the vehicle (C).
3. Thread the bolt (D) until tight and secure it with the cotter pin in slot (E).



Height Adjustment

All vehicles will have a slightly different Hitch Height. Adjust the Hitch Adapter Height to the vehicle's hitch height. To calculate the hitch receiver's ground clearance, measure the distance between the ground and inside top edge of the hitch receiver tube as shown.

Use the Chart to determine which PitchLok pin position should be used. This will provide the minimum clearance, but it is strongly recommended to mount the NSD as high off the ground as possible.



#	Clearance
1	24"+
2	20-24"
3	12-20"

⚠ These recommendations may not guarantee that the NSD will have adequate road clearance. Always secure the Wheels into the UP position prior to transport.

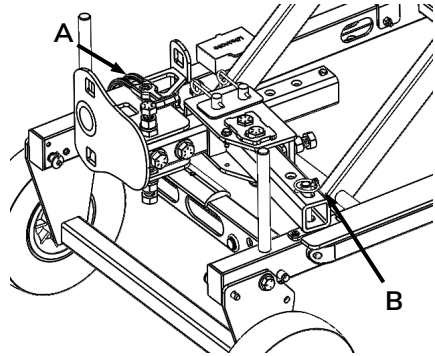
⚠ DO NOT operate the vehicle with the NSD attached if there is not sufficient ground clearance.

EXAMPLE: If the receiver clearance measurement is 21", put the Pitch-Lok pins into position 2 for minimum clearance, but position 3 would allow the NSD to ride higher off the ground.

Storage

The Hitch Adapter can be stored in the Hitch Adapter Bed on top of the Lower Frame.

1. For easiest storing, set height adjustment to its lowest position (1) in the pitch box.
2. Raise the upper frame and arrange Hitch Adapter as shown.
3. Secure hitch adapter with elastic latch (A) and lynch pin (B).

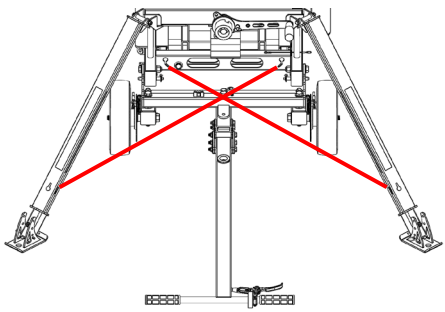


Stabilizers

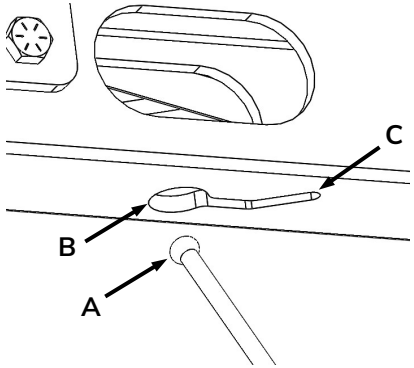
Deploying

Before deploying the Stabilizer Legs, it is recommended to do anything that will rock the unit, such as Connecting Wi-Fi & LTE Antennas, and/or removing the Generator and Auxiliary Fuel Tank. (This will ensure the NSD is properly leveled.)

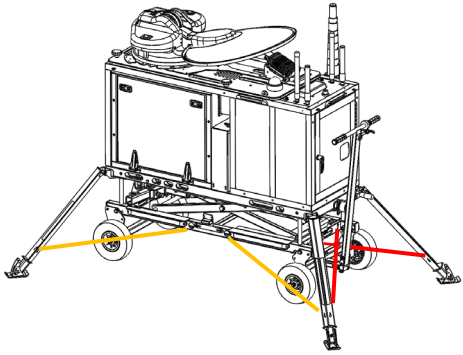
1. Remove the Red Safety Lanyards and Lower each Stabilizer Leg to the ground.
2. Use the Crank Handle to raise the Body ~12” (from fully lowered).
3. Obtain 4 RED and 4 ORANGE Cables from the drawer inside the unit or the Accessory Bag.
4. Lower the Steering Handle to ground and insert one end of a RED Cable to slot on the side of the Lower Frame, slide into Tension Position, and then repeat with other end into the slot on the Stabilizer Leg.
   a. Red cables need to cross each other.



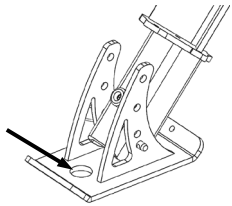
5. Repeat for remaining two (2) RED Cables on opposite end of the deployable.
6. Insert one end of the ORANGE Cable (A) to the slot on the bottom of the Lower Frame (B) and slide into Tension Position (C).



7. Connect the opposite end of Orange Cable into closest wall of Stabilizer leg.
8. Repeat for remaining three (3) ORANGE Cables.
9. Once the Cables are secured on all ends, Lower the Upper Frame cranking counterclockwise until all the Cables are Taut. Check for stability and reposition if necessary. If leveling is required see page 26.
   a. Lift lower frame wheels just off the ground to force load to the widest footprint on stabilizers.



10. Stake down the Stabilizer Feet for additional grip if necessary, using the hole in each foot.



11. Rotate the Steering Handle upwards and secure it with the attached Red Safety Lanyard.

Stowing

1. Remove Feet stakes if present.
2. Raise upper frame cranking clockwise until all cables are slack.
3. Remove all cables and stow back in storage drawer or Accessory Bag.
4. Rotate stabilizers legs to upright stored position and secure each with Red Safety Lanyard.
5. Lower upper frame completely.

Feet Adjustment / Leveling

Each foot can be individually adjusted to account for all types of unlevel terrain.

The Bullseye Level on top of the NSD can show the tilt in two planes at the same time.
To read the level, look at the marked circle in the center and note the position of the bubble. The bubble will always travel to the higher side.

A leveled bullseye will show the bubble in the very center of the smallest marked circle. If the NSD is not level, the bubble will be seen outside the center of the circles. Observe where the bubble rests and then raise the side opposite the bubble to bring the unit closer to level (bubble dead center).

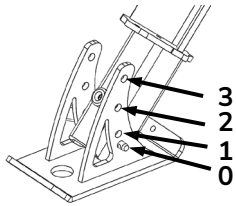
The level has three circles to indicate the degrees away from level.

- Circle 1: 0.5°
- Circle 2: 3.0°
- Circle 3: 5.5°

Steps for Leveling

⚠ Always start leveling with Stabilizer Feet pins in position zero (0). A minimum of one foot pin in position zero required for proper stability.

1. Begin with the Stabilizer Feet pinned to the leg through the very bottom (zero) hole.

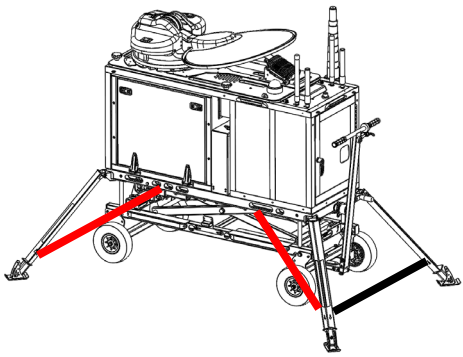


2. Lower all stabilizer legs to ground.
3. Elevate upper frame by rotating Clockwise until all feet are just above the ground.
   a. Ensure legs are fully pivoted in lowest position.
4. Lower NSD by rotating Counter-Clockwise until the first foot touches the ground.
   a. This can happen to multiple feet simultaneously depending on the level of the ground.
5. With remaining feet not contacting ground, remove foot pin and install to closest pin hole that places foot in contact with ground.
   a. Find more level ground to appropriately level the NSD if top hole (3) does not reach the ground.
6. Connect stabilizer cables as directed in deploying page 34.
   Continue to lower the unit until all of the Stabilizers are touching the ground and the wheels are raised slightly off the ground.
7. Once the weight is on the stabilizer legs, recheck the Bullseye Level and verify level.

Skid Loading

The operation of skid loading allows a single person to load or unload a NSD from a pallet or skid.

1. Position NSD with enough room where a pallet can easily slide around the unit.
2. Remove 5m Telescoping Mast if secured in Mast Clamps.
3. Use the Crank Handle to raise the Runner ~12” (from fully lowered).
4. Obtain 4 RED and 2 BLACK Cables from the drawer inside the unit.
5. Connect one end of RED Cable to the slot in the bottom of the Upper Frame and then hook the other end into the slot on the Stabilizer Leg. Repeat for all four corners.
6. Connect one end of BLACK cable to Stabilizer leg slot, and the other end to opposite Stabilizer leg slot. Repeat for other side.



7. Once the Cables are secured on all ends, lower the Upper Frame cranking counterclockwise until all the Cables are taut and wheels are just off the ground.
8. Rotate both sets of wheels to their ground clearance UP position. Refer to steps 11-18 for Loading on page 20.
9. Slide pallet underneath NSD, centered in both directions.
10. Raise the chassis until the Lower Frame rests onto the pallet and no load is on the stabilizer legs.
11. Remove all cables and stow in Storage Drawer.
12. Stow stabilizers legs in upright stored position.
13. Lower the chassis to the fully lowered position.
14. Reinstall 5m Telescoping mast.

Pod

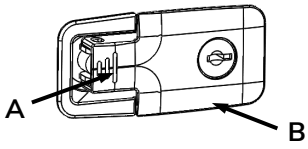
Enclosure & Frame

Overview

The Enclosure of the NSD houses all the electronic equipment. Inside is a vibration damped 19-inch rack mount to which the equipment is securely mounted. It is secured with four lockable latches for a tight seal.

Latches & Locking

The enclosure has both front and rear doors for easy access to all wiring and equipment. There are two lockable latches per door for a secure seal.



Opening Enclosure Latch

1. If locked, unlock with key provided.
2. Press on ribbed section to release latch pressure (A).
3. Use pop-out lever (B) to rotate 90°.

Closing Enclosure Latch

1. Close door.
2. Rotate latch 90° for cam lever to clamp behind sealed wall.
   a. Slight pressure on the door may be needed to compress seal to allow latch to rotate.
3. Close lever.
4. Lock latch.

Power System

Power Control Module

Overview

The PCM is the Rack Mounted Unit at the very bottom of the rack and handles all power inputs and outputs for the NSD.

Acceptable Power Sources

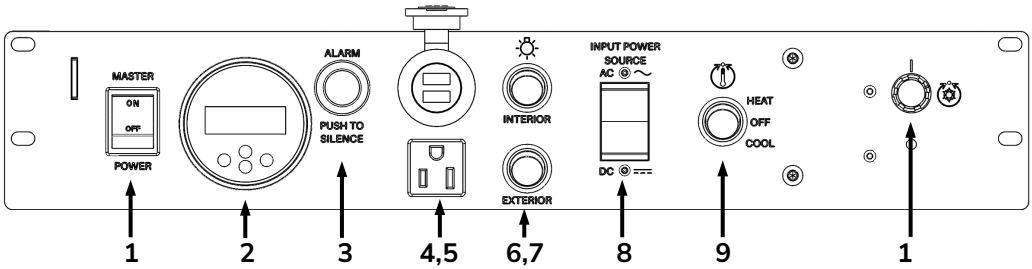
The NSD can handle a multitude of different power sources.

AC – 120V / 15A (1875W)

- Shore power (Standard 120V)
- Generator Power
- Solar Panel(s)

DC – 12-14.6V / 30A (438W)

- Vehicle Charge Harness
- External Batteries
- Solar Panel(s)



Controls

1. Master Power Switch
2. Battery Monitor
3. Alarm Silence Button
4. 5V USB Power Outlet
5. AC Receptacle
   a. For Charging Phone/Laptop
6. Interior Lighting Switch
7. Exterior Lighting Switch
8. Source Power Selector
9. Heat/Cool Switch
10. Cooling Thermostat

Master Power

The Master Power Switch controls power for the entire system. Turning the switch 'On' powers all 12VDC components and enables the inverter/charger unit to power all AC components.

Battery Monitor

The battery monitor gives a complete look at the status of the battery. This includes whether the system is being charged from outside source, operating off internal battery, alarm state conditions, temperature, State of Charge.

Lighting - Interior

Inside the Enclosure, the Rack Mount has an integrated LED Light Strip to illuminate the rack and fold-out door for both front and rear. The Interior Lighting can be switched on with the designated switch located on the front panel.

Lighting - Exterior

Four LED Light Bars are mounted at the top of the NSD Box (one on each

side) and are used to illuminate the unit and immediate surrounding area.

The Exterior Lighting can be switched on with the designated switch located on the front panel.

Circuit Protection

- Fuse Box (A)
- Circuit Breaker Battery (B)
- Circuit Breaker ICU (C)
- DC Input Block (D)
- Circuit Breaker AC Inlet (E)
- Circuit Breaker DC Inlet (F)

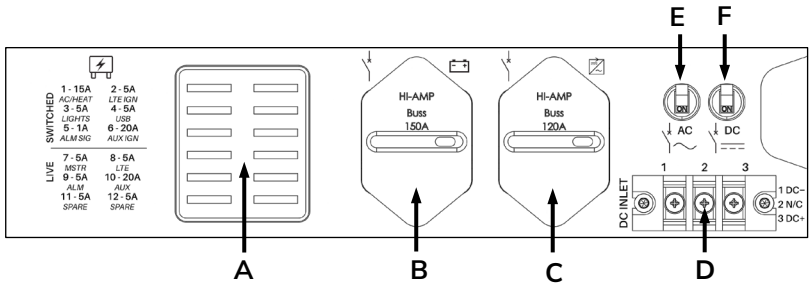
Fuse Box

⚠ Never attempt to repair a blown fuse until the cause has been identified and properly repaired. Never replace a fuse with a substitute of another color or amperage rating, this could lead to a circuit overload, ultimately resulting in a fire within the NSD.

Information on the fuses can be found in the specifications section page **Error! Bookmark not defined.**.

Fuses 1-6 are controlled by the master power switch. Fuses 7-12 are connected to the +12VDC bus bar.

Fuse	Rating	Description
1	15A	Air Con / Heater
2	5A	Cradlepoint IGN
3	5A	LED Lighting
4	5A	USB Outlet
5	1A	Alarm Signal
6	20A	Accy +12V Switched
7	5A	Master Power Ctrl
8	5A	Cradlepoint +12V
9	5A	Alarm Power
10	20A	Accy +12V Battery
11	5A	Spare
12	5A	Spare



High Current Circuit Breakers

The two high current circuit breakers (B & C) protect the battery wiring, and DC wiring to the ICU.

If tripped the yellow swing arm will rotate downward into view. To manually trip the breaker (operate as a switch) press the button fully until yellow trip arm is exposed.

To reset the breaker, rotate yellow trip arm back up into nested position.

Power Inlet Circuit Breakers

The two white handle breakers (E & F) protect the incoming AC and DC sources.

If tripped, the actuator moves positively to the OFF position.

To reset breaker, flip up actuator to ON position.

DC Accessory Port

Located on the right side of the PCM (next to the battery) are all the break-away connections for system wiring. One port (#4) is left open for future DC equipment additions. Required connector and available terminals listed.

Manufacturer: TE Connectivity

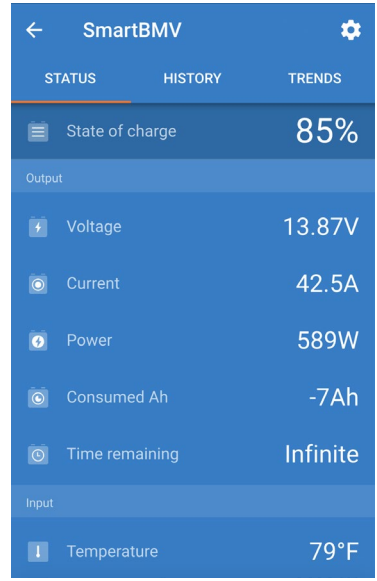
Description	Part #
Connector 1x3 Key D	4-1971773-3
12 AWG Tab	1971780-1
14 AWG Tab	1971782-1
16-19 AWG Tab	1971784-1

Connector Wiring:

Pin	Description
1	+12VDC Switched
2	+12VDC Battery
3	Ground

Battery Monitor

If battery is disconnected from monitor, the battery monitor will need to be resynced by fulling charging the unit before showing correct State of Charge.



The included Battery Monitor is a Victron Energy BMV-712 Smart Unit, which has Bluetooth capabilities and can be accessed remotely via the "VictronConnect" cell-phone app.

GET IT ON Google Play

Download on the App Store

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VictronConnect has a full monitoring system which checks for alarms and errors. As soon as an alarm or error is reported, the alarm/error and its

description are shown on the live data page.

⚠ Alarms and errors are only shown on the device when the app is active. They will not alert from the background.

For full functionality and features refer to the manufacturers User Manual, included with the NSD.

The Battery Monitor default settings have been modified from their factory settings to operate with the battery in the NSD. In the event of settings loss refer to this chart to revert to defaults for the NSD.

Setting	Value
Battery Capacity	52 Ah
Charged Voltage	13.6 V
Tail Current	4.0%
Charged Detection	3 min
Puekert Exponent	1.05%
Charge Efficiency Factor	99%
Current Threshold	0.10A
Time to Go Avg Period	3 min
Relay Mode	DFLT
Auxiliary Input	Temperature Sensor
Low Voltage Alarm & Relay	11.1 On 11.2 Off
High Voltage Alarm & Relay	15.4 On 15.3 Off
High Temp Alarm & Relay	125°F On 124°F Off
State of Charge (SoC) Alarm & Relay	15% On 16% Off

Changing Settings via Bluetooth

Using the VictronConnect app:

1. Pairing procedure using Bluetooth, using the default PIN code 000000
2. Optionally after connecting, the PIN code can be changed by pressing the (i) button in the top right corner of the app.
3. Settings can be modified by selecting the Gear icon in the top right.
4. Settings will sync automatically and can be verified by a green check after the setting is changed.

Resetting Bluetooth PIN Code

In the event the PIN code is changed from the default (000000) and forgotten, follow these steps to reset it.

1. Open Victron Connect app and load the Device List.
2. Click the three-dots menu next to the product and select 'Reset PIN Code'.
3. Enter the PUK code.
   a. This can be found on the product sticker on the rear of the PCM right above the two white lever circuit breakers.

Alarm

The alarm system notifies users audibly and visually that there is a fault condition with the NSD regarding the power system. The Alarm has two controlling inputs:

- AC Power Loss
- Battery monitor alarm state
  - Low/high voltage
  - Low/high temperature
  - State of charge

The Alarm Buzzer is located on the bottom of the Enclosure, the Strobe on top of the antenna deck.

The Alarm is the same for all triggers.

AC Power Loss

The alarm condition for AC Power Loss applies when the Input Power Source switch on the front of the PCM is set to AC and there is no incoming AC power detected. This alerts the user that the NSD has switched to operating from the onboard battery and either Shore or Generator input power is not present.

Be sure to verify the Power Inlet Selection Switch, refer to page 54, is set to correct Incoming AC Power Source (Shore or Generator).

There is no alarm monitor for incoming DC sources.

Silence Button

The Alarm Silence Button located on the front of the PCM next to the battery monitor will snooze the Strobe and Buzzer for three minutes during an alarm state. The button will remain illuminated even if pressed and will only turn off when the alarm condition is removed.

The alarm silence timer resets every time the button is pressed, even when actively silenced.

Cloud Notifications

When an alarm is triggered, a signal is sent to the Cradlepoint router through its GPIO 1 on extender. The router may be programmed to send cloud notifications via email.

⚠ Network connection is required for cloud notifications.

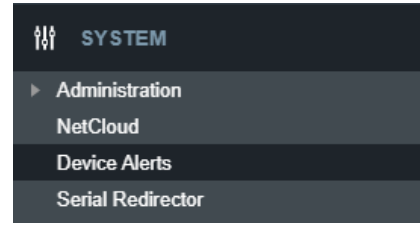
Email to text is available but carrier dependent through an SMS gateway.

Provider	Email Gateway
AT&T	#@txt.att.net
Sprint	#@messaging.sprintpcs.com
T-Mobile	#@tmomail.net
Verizon	#@vtext.com

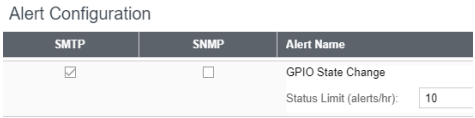
is 10-digit phone number

Email Alert Setup

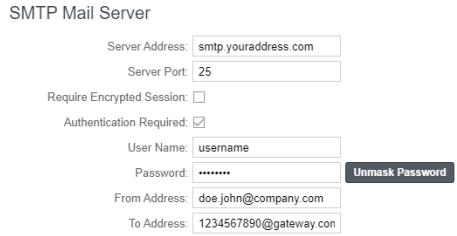
1. Login to Cradlepoint router (page 64).
2. Open System > Device Alerts.



3. Check SMTP box for GPIO State Change.
4. Set the maximum alerts/hr desired.



5. Configure SMTP settings from per the e-mail provider.

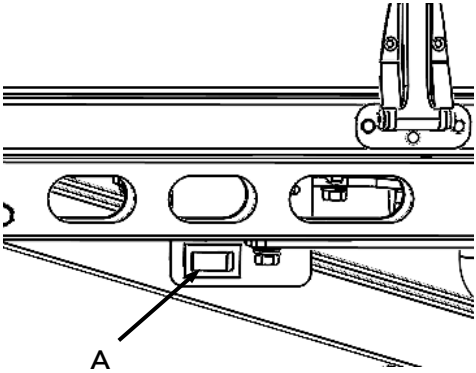


6. Save settings.

Audible Alarm Mute

Located next to the alarm buzzer on the bottom of the enclosure is a silence switch (A). Simply toggle the switch from mute to audible depending on environment.

For optimal response to alarm condition, it is best to leave buzzer in audible state. The strobe will still activate during alarm condition with buzzer muted.



Alarm Override

In the rare event of a known alarm condition, complete deactivation of Strobe & Buzzer can be achieved by removing the fuse from fuse box #9 position (Alarm Power). This should only be executed during situations of operational emergency.

During the override, the Alarm Silence Button will still indicate if alarm condition is present.

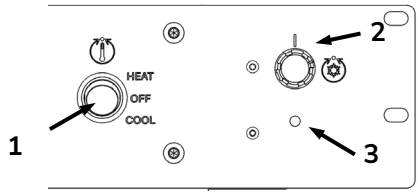
Climate Control

The heater / thermoelectrical air conditioner unit requires outside control based on the ambient environment of the NSD.

When powered the internal fan will always be on circulating air. The external fan will only turn on when the unit is actively cooling.

Controls

All controls are located on the front of the PCM. There is a control switch (1) that has three positions, HEAT, OFF, & COOL, and a thermostat knob (2) to control the set point of the cooling. The number on the knob correlates to temperature in Fahrenheit.



Cooling

The set point chosen on the thermostat should be based on the desired internal temperature of the enclosure. The AC will run until the set

temperature is achieved within the enclosure.

Heating

When the switch is set to 'HEAT', the unit will power a 100W heating element. There is not an adjustable temperature setting for the heater.

Setting

There are many factors that affect setpoints of when to cool or heat. We recommend when the ambient temperature is below 32°F (0°C) to turn on the heater. If the ambient temperature is expected to be above 77°F (25°C), turn on the air conditioner (Cool mode) at a set point of 60°F. This will start to the air conditioner sooner in the day to keep the NSD cooler into the hot time of the day.

The current temperature inside the enclosure can be viewed from the Victron Battery Monitor.

Condensate Drip Line

A condensate drip line from the unit is fed through the bottom of the enclosure. Ensure this line does not get clogged or water build-up will occur inside the unit, possibly splashing sensitive electronic equipment.

Cooling Thermostat Adjustment

If the AC does not turn on when expected, adjustment may be necessary. Right below the Cooling set point knob is an access hole (3) to the adjustment screw.

⚠ Do NOT overtighten adjustment screw or damage may occur.

Step to Adjusting:

1. Using separate thermometer measure ambient temperate.
2. Set cooling set point knob to reading from thermometer.
3. Using small flathead screwdriver press lightly on screw head.
   a. If an audible click is heard rotate clockwise in step 4.
   b. If no audible click is heard rotate counterclockwise in step 4.
4. Do not apply force in on the screw in this step! Rotate screw direction from step 3 until an audible click is heard and promptly stop.

The thermostat is now calibrated to within approximately 5°F.

Mast

Included on the NSD is a non-conductive fiberglass 5-meter mast. It is used to elevate antennas and other light equipment.

⚠ The NSD must be deployed a minimum distance of twice the height of the mast from any overhead lines.

⚠ All Guy Wire connections must be a safe distance away from power lines.

Leveling

⚠ The mast must be deployed with the NSD level.

The bullseye level is used to get the NSD level prior to deploying the mast.

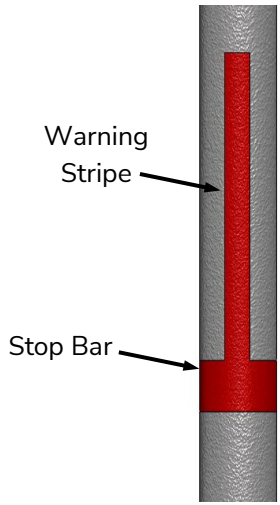
For leveling operations see page 35.

Deploying

⚠ Do NOT overextend mast.

Caution must be used to not overextend the mast. There are warning stripes and a Red Stop Bar on all telescoping mast sections. The warning stripes can be visible while the mast is deployed. They are there to indicate the maximum extended distance is approaching.

1. Make sure the Mast is secured properly. Tighten the two Mast Mounting Clamps.
2. Level & Stabilize the NSD (page 36).
3. Attach the bracket and antenna setup to be deployed on top of the mast.



4. Attach Guy Lines Plate and Guy Lines to the Mast.
5. Undo the top mast Clamp by rotating the lever UP and lift to extend the top pole.
   a. Do NOT overextend. Pay attention to the Warning Stripes and the Red Stop Bar.
6. Pivot the locking lever DOWN to secure the extended section of the mast.
7. Repeat step 5-6 for the rest of the sections, as needed.
8. The Mast should not ever be extended to a point that the Red Ring is showing on the pole. The red Stop Ring must be below the top of the next clamp.

Fiberglass Clamp Adjustment

The quick clamps on the Fiberglass Mast can be adjusted for clamp force.

1. Fully stow mast before proceeding.
2. Open clamp by lifting lever into vertical ‘up’ position.
3. Turn screw using a #3 Phillips screwdriver counterclockwise just before the clamping ears are providing light resistance to the inner tube.
4. Repeat for all clamp sections.

Stowing

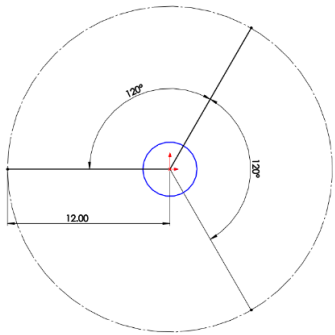
⚠ Securely hold mast tubes before releasing clamp force. Rapid decent can result in injury and/or damaged equipment!

⚠ Do not rely on the clamp tension only when letting down each section.

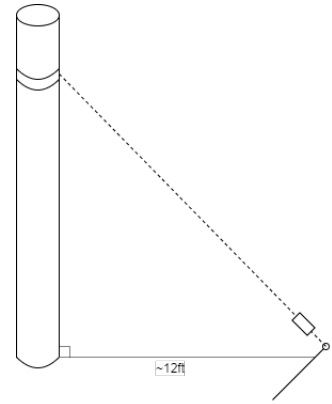
Stowing the mast is the opposite of deploying, starting with the largest diameter and working towards the smallest.

Guying

1. Retrieve the Mast Guy Wire Stakes.
2. Find three spots approximately 12 feet from the Mast. They should be roughly 120° apart.



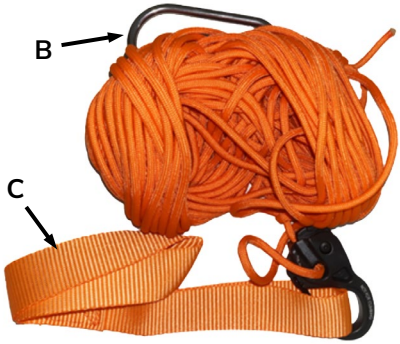
3. Drive the stakes into the ground at a ~45° angle, toward the Mast.



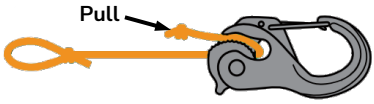
4. Obtain the three Guy Lines from the Accessory Bag.
5. Securely fasten Pear Clips (B) to the three points (A) on the Mast Guy Ring.

6. Slide Mast Guy Ring onto mast. Guy Ring will sit at the base of the smallest diameter tube section.

7. Hook a Tensioner Strap (C) to each Stake using a Lark's Head and hook the Tensioner to the open loop.



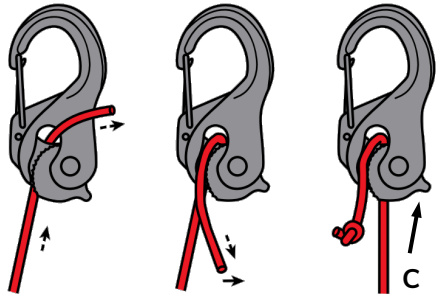
8. Leave the line with enough slack to fully extend the mast.
9. Extend the Mast to desired height (page 46).
10. Tension all three Guy Lines.



Guy Line Tensioners

The guy line tensioners allow a quick and easy solution to guy the mast. They are a single direction pull with a release cam.

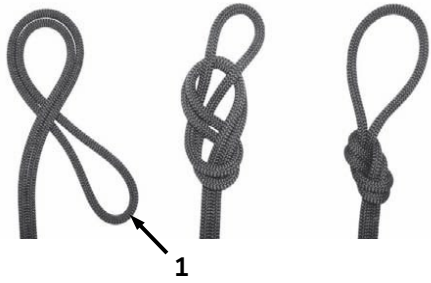
Feed guy line in direction of arrow of the first image. Pull guy line down and into cam lock to tension as in second image.



To release tension, push plunger (C) in the direction of arrow.

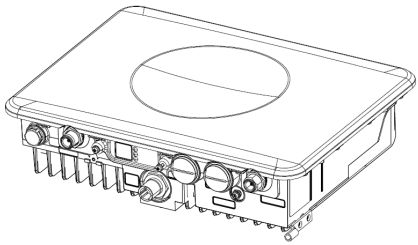
Guy Rope Knot

The recommended knot for guy ropes is the Figure Eight on a Bight, as shown below. Loop Pear Clip through to point (1).



SBO Radio

The NSD is a Cell on Wheels (COW) with the SBO (single band outdoor) radio.



Radio Information

The Nokia SBO (single band outdoor) eNodeB cellular (LTE) radio comes pre-configured, provisioned, and integrated into the network.

Note to the operator:

- Most devices can access the NSD's Wi-Fi signal and place a Wi-Fi call.

Radio Updates

The Nokia SBO requires periodic updates (generally once a year). The SBO will need to be connected to a terrestrial Internet source for the updates. The operator will be notified when an update is available and assisted with the process.

Information Placard

The information placard that covers the front side of the SBO radio has all the information needed for the NSD as well as important phone numbers for support.

Transmitting

Deploying the NSD and transmitting coverage is completed in two steps.

1. Connect and extend radio antennas.
2. Power the radio.

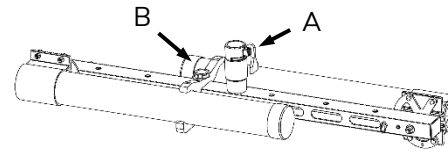
Cellular Antennas

⚠ Check for overhead power lines. Never deploy mast where there is any possibility of contact with a power line.

The antenna bracket kit includes two high gain omni antennas, 2x 16-foot coaxial extensions, and heavy-duty gear ties for mast cable management.

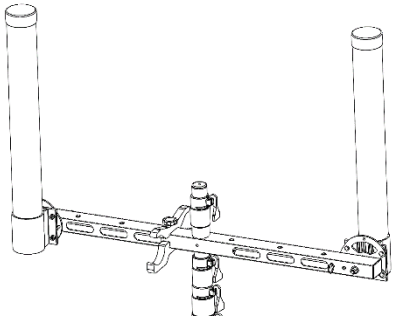
Note: If the mast is to be guyed, install guy ring onto mast before installation of Antenna Bracket.

1. Remove Antenna Bracket and cables from storage bag.
2. Open clamp lever (A) on Antenna Bracket and place onto Mast.

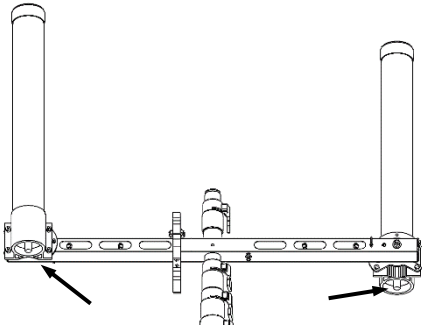


3. Secure Antenna Bracket to Mast about 2 inches from top by closing clamp lever.
4. Loosen Antenna Clamp Screw (B) and rotate storage the support out of the way.

5. Pull pin securing Antenna in stowed position.
6. Rotate Antenna to upright position and re-secure with pin.
7. Repeat for opposing Antenna.



8. Connect extension cables to bottom of Antennas.



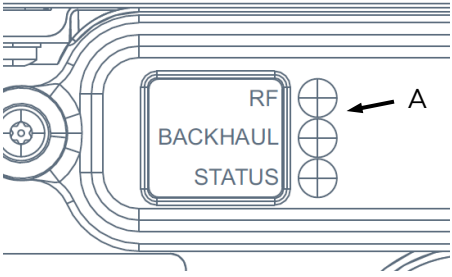
9. Extend mast and secure cables with gear ties during extension to eliminate cable strain on antenna and from the wind.
10. Connect extension cables to ”RADIO 1” ports on antenna deck.

Powering Cellular Radio

⚠ Always connect antennas and raise the mast prior to powering the radio. Failure to heed this warning may result in damage to equipment and RF exposure.

1. Verify the NSD is stabilized, powered, and that internet backhaul has been established.
2. Verify antennas fully connected and deployed.
3. Press green power button to On.

4. After 10 minutes verify the LEDs (A) on the back of the SBO are all solid green.



SBO Light Codes

In the event you do not get 3 green lights follow the troubleshooting section to check for common setup issues on page 81. These generally refer to:

- Coaxial connections not secure
- No backhaul source
- No GPS signal

If the RF LED is solid green the SBO is transmitting coverage but either in a diminished state or with an error code present on the backend.

RF LED

Color	*Description*
OFF	System is booting up
Blinking GREEN	RF Transmission OFF
Solid GREEN	RF Transmission ON

Backhaul LED

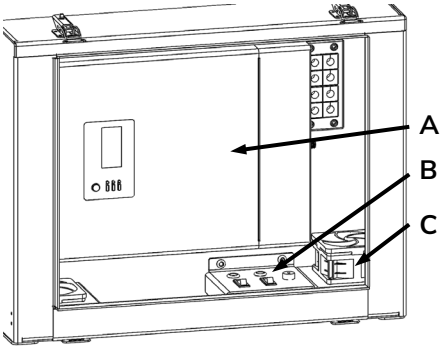
Color	*Description*
OFF	System is booting up
Solid RED	Initializing or fault raised
Solid YELLOW	Fault raised
Blinking RED	Minor or degraded alarm
Solid GREEN	Fully initialized and no faults

Status LED

Color	*Description*
OFF	System is booting up
Solid RED	Initializing or fault raised
Blinking AMBER	Startup sequence
Solid AMBER	Autoconfiguring
Blinking RED	Fault is present
Blinking GREEN	Software download in progress outside of startup
Solid GREEN	Fully initialized and no faults

Inverter/Charger Cabinet

The Inverter Charger Cabinet holds the ICU (A), Fan Control Panel (B), and Cooling Fan (C), and two air filters. This cabinet is NEMA 4X rated and should not need be accessed under normal operation.



Inverter/Charger

The inverter/charger provides up to 1000 watts of continuous utility grade, sine wave power derived from the onboard battery. The built-in transfer switch automatically transfers between inverter power and outside power from commercial to generator sources to ensure power is always available.

Cooling Fan

A cooling exhaust fan is installed to protect the Inverter/Charger from overheating.

The fan is controlled by the two switches near the bottom of the cabinet. One switch is the Exhaust fan ON/OFF and the other switch controls the whether the exhaust fan is auto set by the Thermostat or always ON. [AUTO/ON] & [ON/OFF]

In its default configuration the fan is set to ON and AUTO. This will automatically turn on the fan at a set point of approximately 104°F (40°C) and turn off when below 86°F (30°C).

The circuit breaker next to the switches protects the fan circuit. It is a push to reset type of circuit breaker.

In the event the NSD is stored in a hot location (above 104°F) the fan will turn on even when not powered on.

Inverter/Charger

The Inverter Charger unit comes programmed differently from the factory default settings. In the event of settings loss refer to this chart to appropriately reprogram per manufacture specifications.

Setting	Setting Name	Value
01	Inverter Ignition Control	AtO
02	LBCO Voltage	10.5
03	LBCO Shutdown Delay	300
04	LBCO Recovery Voltage	12.5
05	Power Save Time	25
06	Power Save Mode	dIS
07	Output Frequency	60
08	Output Voltage	120
09	Output Power Limit	1.0
10	Output Power Limit Timer	300

11	Transfer Mode	UPS
12	AC Under Voltage Level	90
13	Inverter Shutdown Recovery	AtO
14	Audible Alarm	bOn
20	Battery Type	USE
22	Absorption Voltage	14.4
23	Float Voltage	13.6
24	Charger Current	50
26	Charger Ignition Control	OFF
28	AC Input Breaker	30

Changing Settings

To change the default value to a different value:

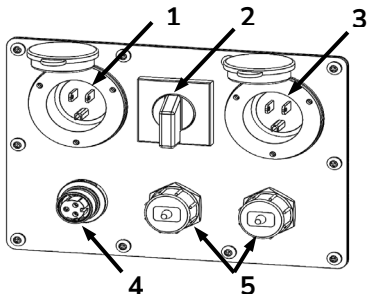
1. Press and hold the OK button for three seconds to enter the feature settings mode.
2. Press the Scroll button to move through the different feature settings.
3. Press the OK button to select a setting number and change its value.
4. Press the Scroll button to change the value until the desired value is reached.
5. Press the OK button to confirm the change.
6. Repeat the previous steps to set other feature settings.
7. Press the ESC button to exit the feature settings mode.

Power Entry Panels

There are three Power Entry Panels mounted on the enclosure that have a variety of power, networking, and signal connections.

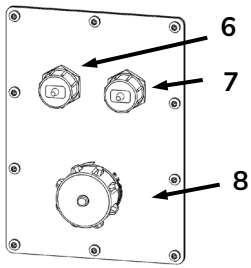
1 - AC Inlet PEP

Located above the Inverter Charger Cabinet, the AC Inlet PEP handles all incoming AC power and all power and signal lines that can be deployed on the mast.



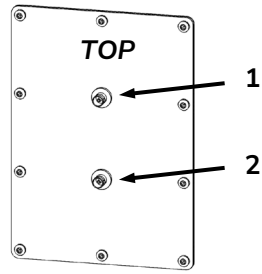
1. Generator Power Inlet
2. Power Inlet Selection Switch
3. Shore Power Inlet
4. AC Outlet
5. External Ethernet (x2)

2 - DC Inlet PEP



6. External Ethernet WAN (A)
7. External Ethernet LAN (B)
8. DC Power Inlet (C)

3 - Satellite PEP (WV750)



1. Terminal Data (DATA) - BLUE
2. Terminal Power (POWER) - RED

Generator & Fuel System

The included generator is used to power the NSD when Shore Power (a Plug-in Outlet) is not available. Become familiarized with the generator and its operation before use.

⚠ Read the included Honda EU2200i Generator Manual before use.

The Auxiliary Fuel Tank holds 6 gallons and is connected to the Generator by a Vacuum Feed Line with Quick Disconnect.

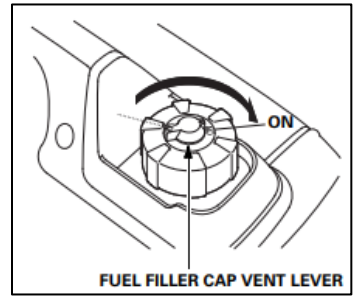
With the Auxiliary Fuel Tank, the Generator is estimated to run for 60 hours under nominal load.

⚠ Disonnect the feed line before refueling the auxiliary tank.

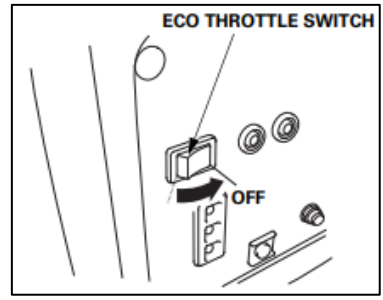
Starting the Generator

The generator can be operated on the NSD for a compact deployment or remotely. The access ports on the exoskeleton give full access to the choke, start switch, and starter grip.

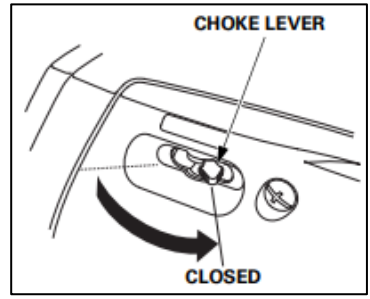
1. Position the generator on a level surface.
2. Make sure the generator has enough fuel and oil before attempting to start.
3. Make sure all appliances are disconnected from the AC receptacle.
4. Turn the fuel filler cap vent lever to the ON position.
   a. This is located on auxiliary fuel tank if using extended run system.



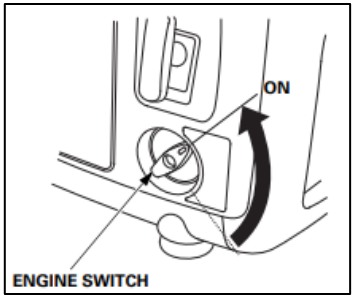
5. Make sure the Eco Throttle switch is in the OFF position, or more time will be required for warm-up.



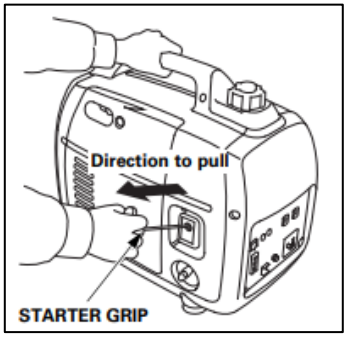
6. To start a cold engine, move the choke lever to the CLOSED position. To restart a warm engine, leave the choke lever in the OPEN position.



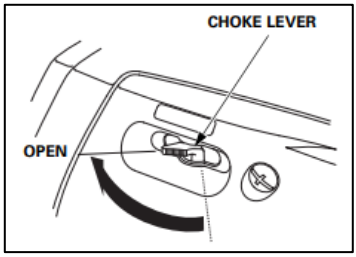
7. Turn the engine switch to the ON Position.



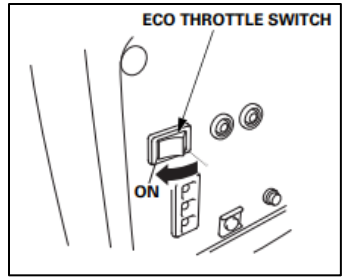
8. Pull the starter grip lightly until there is resistance; then pull briskly.



9. If the choke lever was moved to the CLOSED position to start the engine, gradually move it to the OPEN position as the engine warms up.



10. To save on fuel use the Eco Throttle system. Turn the Eco Throttle switch to the ON position after the engine has warmed up for 2-3 minutes.



Generator Storage

⚠ The generator weighs 46 pounds dry. Use caution when lifting.

The generator securely stows into the locked area of the Exoskeleton next to the Auxiliary Fuel Tank. The tray has four slots that lock around the generator's feet. When the door is closed the generator is locked in place.

The electrical panel on the generator is inaccessible while fully stowed inside the NSD. This is a security feature to prevent unwanted changes to the system.

Stowing the Generator

1. Point electrical ports into the NSD with exhaust pointing towards the door.
2. Lift generator into fuel area.
3. Align four feet with slots on the tray.
4. Slide completely into place.
5. Secure door closed.
   a. If door does not fully close the generator is not completely seated into slots.

Auxiliary Fuel Tank

Storage

The fuel hose is long enough to place the fuel tank on the ground while still connected to the generator.

The fuel tank can mount in either direction.

The auxiliary fuel tank stores in a similar manner as the generator. The rear flange on the fuel tank slides under the rear support bracket.

Refueling

Always remove fuel tank from NSD and place on level ground for filling.

For refueling fuel tank follow the following guidelines:

- Remove fuel filler cap slowly as the tank may be pressurized.
- Fill container no more than 95 percent full to allow for expansion.
- Secure cap on tightly after filling.
- Keep nozzle in contact with rim of the container opening to decrease the chance of static electricity buildup.

Remote Deploy Generator

The NSD comes with a 50-foot extension cable to allow remote operation of the generator. This allows the exhaust fumes and sound of the generator to be minimized.

1. Disconnect short power cable from generator.
2. Remove generator and auxiliary fuel tank from NSD.
3. Move to desired operating location.
4. Use the 50-foot power cable from Accessory Bag to connect generator directly to the Generator AC Inlet (page 54).
    a. Do not connect multiple power cords in series.

Extended Runtime

In extreme circumstances it is possible to extend the runtime of the NSD system well past the expected 60 hours by following this process.

1. Fully deploy NSD.
2. Run system on generator power until battery is fully charged.
3. Stop generator.
4. Run on battery power until ~25% SoC remaining.
5. Start generator to fully charge battery, approximately 1 hour depending on house loads.
6. Repeat steps 3 to 5.

Satellite System

The WV750 antenna is an auto-acquire and auto-stow system and accommodates the TRIA supplied by ViaSat.

The WV750 antenna system consists of a high wind resistant mechanical antenna, Outdoor Unit (ODU) and all wiring and motors required to point the system using the Winegard 2-Way Controller.

⚠ BEFORE USE, READ the included Winegard WV750 Satellite Antenna System Product Manual

⚠ The Satellite Antenna emits a cone of radiation. DO NOT set up anywhere people may walk or work in front of.

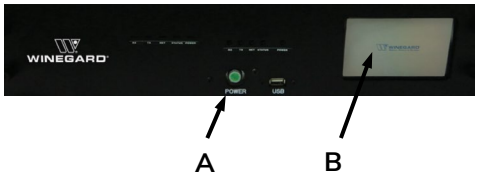
The Winegard Antenna MUST have a clear view of the Southern sky to establish a proper connection.

Deploying Satellite

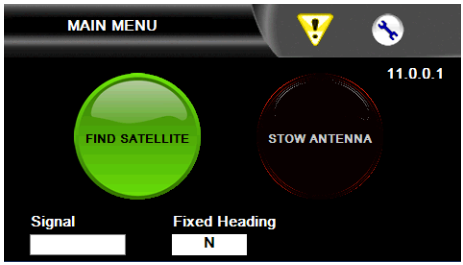
ℹ Refer to Winegard WV750 Owner's Manual for complete information.

For support regarding internet connectivity reach out to the Satellite Internet Service Provider.

1. Ensure the deployment location is on level ground and has a clear view of the Southern Sky.
   a. Use compass on satellite board for quick heading.
2. Fully stabilize NSD.
3. Turn on the Master Power Switch.
4. Wait 10 seconds, then turn on the Winegard WV750 controller by pressing its small green power button (A).



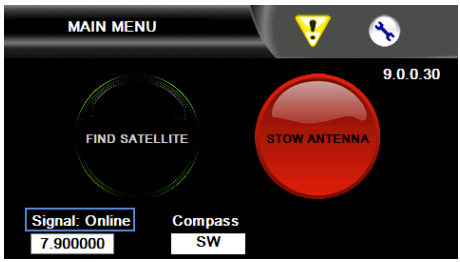
5. Allow the Winegard WV750 controller to boot up and gather its heading. The process can take several minutes.
   a. If it takes a long time waiting for heading and/or does not get a heading, follow compass calibration procedure.
6. Press the Large green button on the Winegard WV750 controller screen (B) that is labeled "Find Satellite".



7. The Winegard WV750 Dish will begin moving and search for the satellite. This process can take several minutes.
   a. There will be a beeping tone from the eTRIA that indicates

signal search status is functioning.

8. The system is connected to the internet when it states Signal Online in the lower left-hand corner.



Satellite Compass Calibration

In the event of failed heading acquisition, the satellite compasses will need to be calibrated. This is a similar process to cell phones.

Verify clear line of sight of the sky and avoid large nearby metal objects and buildings.

1. Power on system leaving satellite system stowed.
   a. Ensure neither mast nor stabilizers are deployed.
2. While on either the 'Waiting for Heading' screen or main screen that shows N/A under compass
   a. Walk the NSD in a figure 8 pattern. Repeat twice if necessary.
3. Compass will now read correct heading.

Stowing

1. Make sure there are no obstructions in the way of the antenna.
2. Press the "Stow Antenna" Button.
3. Antenna will break connection and stow into locked position.
4. When the antenna is finished stowing, the screen will return to the Main Menu with the "Find Satellite" button enabled (Green).
   a. DO NOT turn off controller or Master Power until the system returns to the Main Menu Screen.

Compass

The compass located on top of the satellite board will give an approximate heading to assist in initial positioning. The index mark on the compass identifies the direction the compass is pointing.

Nearby steel components may need to be removed to get a more accurate heading. This includes Satellite Board lock pins or padlock if present.

Compensation

Follow manufacture specifications for alignment and compensation.

Remote Satellite Deployment

In certain situations, it may be advantageous to dismount the Satellite Fly-away Board from atop the unit and set it up in a location away from the deployed NSD.

Deploying the satellite remotely away from the pod can be advantageous for multiple scenarios including:

- Rooftop access
- Improving Line of Sight
- Physical access to NSD indoors during inclement weather

The included extension cables in the Accessory Bag are 100ft long. For longer cable runs please consult the manufacturer.

Deploying Remote Satellite

Do not remove the Satellite Board until a safe and level spot for deployment has been identified.

1. Use the Crank Handle to lower the NSD as low as possible.
2. Unscrew the four (4) black knobs that secure the Satellite Board on top of the Pod.
3. Disconnect the two (2) cables attached to the Satellite PEP. (One Red and one Blue.
4. Remove lock securing board to NSD if present.
5. **TEAM LIFT** the board and place it in an appropriate deployment spot, as described above.
6. Place the Satellite Flyaway Board onto the firm, level surface.
7. Use Sandbags (or equivalent) to secure the corners of the Board.
8. Connect the Extension Cables from Accessory Bag to the outlets on the Enclosure, then route the extended cables and connect the opposite ends to their respective ports on the Satellite.
9. Follow Deploy Satellite Procedure on page 58.

Stowing Remote Satellite

1. Perform the Stow Antenna process on page 59.
2. Disconnect the two (2) Extension Cables. (One RED and one BLUE) Coil and stow back in the Accessory Bag.
3. Remove the sandbags (or equivalent) used to hold down the board.
4. **TEAM LIFT** the board and place it back on top of the Pod.
5. Use the Four (4) Black Knobs to screw the board back onto the top of the Pod.
6. Connect the two (2) original, short cables back into their respective connections on the Satellite PEP.
7. Replace lock securing Satellite Board to NSD if necessary.

ViaSat MITe App

ViaSat supports an app that is useful for reading the status of the satellite modem and where the terminal needs to point in the sky.

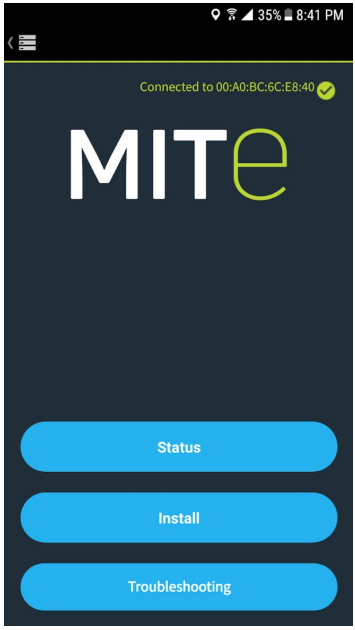
The app is available on both Google Play and the App Store as MITe by ViaSat, Inc.

Reading Modem Status

Reading the modem status is important to understand current

software, firmware, and BDT (Beam Data Table) versions.

1. Connect mobile device to the NSD network via Wi-Fi.
2. Open MITe app.
3. Select Status.



Satellite Sky Locator

Locating the exact location of the satellite in the sky is great information when trying to point the terminal between buildings, trees, mountains etc.

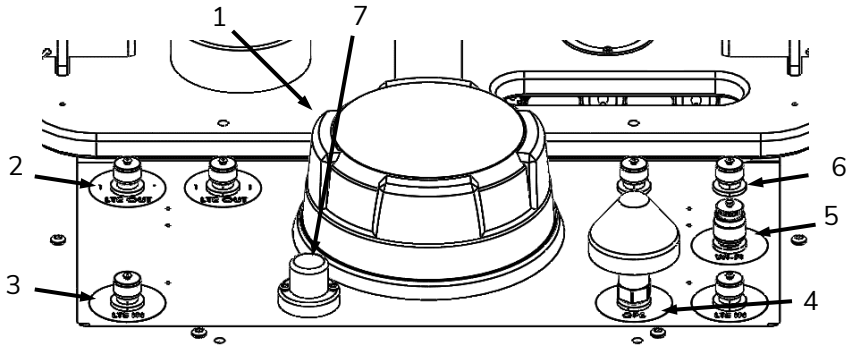
This feature utilizes the mobile phone's camera and GPS to be able to scan the sky.

Connection to the modem is not needed to locate the satellite. It is possible to find a location with the app to help find an optimal spot to deploy the NSD.

1. Open MITe app.
2. Select Install.
3. Select Satellite Info.
4. Select Update and then select correct satellite.
   a. For NSDs, depending on your location, it will be either Viasat-1, WildBlue-1, or Anik F2.
5. Select Satellite Finder.

Antennas

The antenna deck has numerous antennas for LTE, Wi-Fi, and GPS connectivity, as well as a position for the Alarm Strobe.



1. 10-in-1 Antenna
2. Mast LTE Out Ports (Yellow)
   a. For SBO Radio
3. LTE In (Blue)
   a. Connections to secondary LTE modem for Cradlepoint
4. GPS for SBO Radio
5. Wi-Fi (Red)
   a. Connected to Grey two-antenna Wi-Fi on Cradlepoint
6. Additional LTE connection points for optional equipment
7. Alarm Strobe

Always replace caps and plugs on antenna bulkheads to protect them from the elements.

The 10-in-1 antenna contains four Wi-Fi 2.4/5Ghz connected to the Yellow four-antenna Wi-Fi, four LTE connected to integrated modem, and two GPS. All these leads go directly to the Cradlepoint router except for secondary GPS which is used for optional equipment that require a GPS signal.

Cradlepoint LTE Antennas

The NSD comes pre-wired with two additional LTE antenna ports (3) for use with a secondary modem. Antennas are included and located in the storage drawer.

The LTE jumpers that connect to the front of the Cradlepoint are long enough to reach either modem. This allows either modem to be able to use the higher gain removable antennas.

Cradlepoint Wi-Fi Antennas

For faster system setup the default configuration on the Cradlepoint uses the Yellow Wi-Fi antennas connected to the 10-in-1.

The two additional Wi-Fi bulkhead ports (5) are for the ability to route external antennas.

If only two antennas are used on a 1200M (4 antenna modem) place antennas on Main 0 and Aux 0 for widest band availability.

Locks & Security

The Keys provided operate all locks on the NSD. One is a spare and it's recommended to have it in an accessible spot in case it is ever required during an emergency.

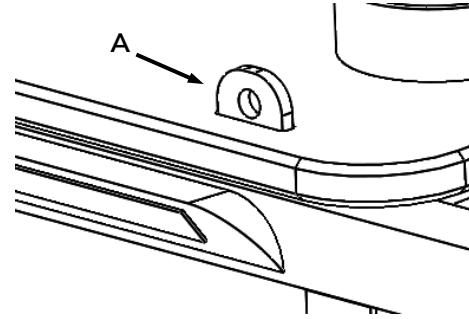
Satellite Board

The Satellite may be locked to the top of the pod. A lock is not provided, but mounting points are in place (A).

Travel Security

Recommended operations for security while traveling is the following:

- Lock all doors
- Lock the Satellite Board to the Pod



- Use a chain to lock the NSD to the vehicle. (Attach the chain to the vehicle's frame and through the NSD lower frame)

Wireless & Networking

All network operations and access are handled through the Cradlepoint router through its NetCloud OS (NCOS) interface.

Logging in to the Cradlepoint

There are two ways of logging into the router for status updates and/or configuration changes.

Local Access

If physical access to the Cradlepoint is available, it can be logged into over Wi-Fi or a direct ethernet connection.

Open a web browser and browse to http://192.168.60.1/

Factory default login credentials for the router are included with the NSD.

Cloud Access

Cloud access is managed through Cradlepoint's NetCloud Manager (NCM). Simply login at cradlepointecm.com using NCM account credentials.

If the router has not yet been loaded into the NCM account, it will need to be registered. Log into NetCloud OS (NCOS) locally and click on the NetCloud Logo . Click the Register Router button, enter the NetCloud username and password, then click the Register Router button in the Register Router with NetCloud dialog.

In order to make changes to the router through NCM the router must be online and connected to the internet.

It is recommended to make networking configuration changes to the router through NCM. This guarantees a successful sync between local and cloud configurations. In the event of any discrepancies the NCM will be the driving setting over local.

Default Configuration

The Cradlepoint router comes with some settings preconfigured that are required for NSD operation.

In the event of a factory reset on the router these settings must be reapplied.

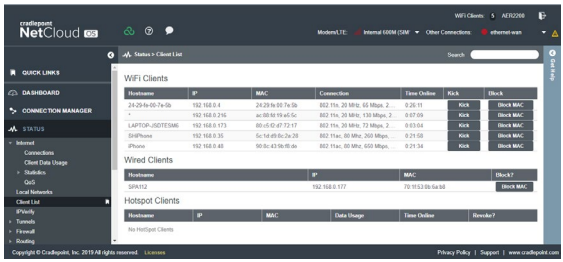
Networking Configuration

Standard configuration of the networking ports is one (1) WAN and four (4) LAN ports. LAN port 4 is reconfigured as the Satellite IP WAN port.

The default IP network access from Cradlepoint factory is 192.168.0.1. This is modified to 192.168.60.1 to avoid common problems with network connections between routers using the same gateway.

Client Data Usage is enabled to allow for monitoring individual device data usage for quick identification of excessive network usage.

Connection Manager Configuration



The Connection Manager screen allows for full prioritization of backhaul traffic. Standard NSD configuration is from the top-down prioritization:

WAN > LTE > VSAT

WAN Verify for all sources (except VSAT) is enabled to Active DNS to verify connection is established before relying on it for active IP backhaul. WAN Verify for VSAT is enabled to active ping connecting to 8.8.8.8 with a 45 second idle check interval.

All connection states are changed to Standby. This reduces the amount of down time required to transition between backhaul connections.

Wi-Fi Configuration

Modify the Wi-Fi Channel Selection Schedule to Daily, DTIM to 2, and channel width to 20 MHz. These settings apply to all three Wi-Fi Radios.

System Configuration

Under Administration > GPS, Enable GPS and GPS Keepalive.

GPIO configuration is modified for proper power cycling of the Cradlepoint and alarm state monitoring.

The router is wired directly to the battery and uses an ignition sense wire (Master Power Switch) to listen for when the router should power on. This feature allows the router to perform a safe shutdown procedure when the NSD is depowered. The router will remain on for 120 seconds after shutdown. This is controlled by GPIO '5 on expander' and set to Ignition Sense.

Alarm monitoring is set on GPIO '1 on expander' and has an alert trigger state of high. The default delay is for 30 seconds to avoid false alerts.

Status Monitoring

In the event the network appears to be operating sluggishly, check for heavy data users by using the Client Monitoring. This will show the amount of data being used by specific devices. Tools to manage these devices include kicking the user off the network, forcing them to re-sign in, and blocking the user completely.

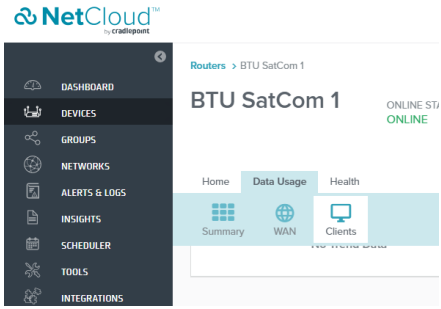
Managing Users Locally

To view current data usage by each individual client, go to Status > Internet > Client Data Usage.

To manage the clients, take note of which user to kick or block and go to Status > Client List.

Managing Users Through Cloud

1. Login to NCM.
2. Click Devices from left menu.
3. Click router to be managed.
4. Click Data Usage tab.
5. Click Clients.



6. At bottom of this screen all connected clients can be viewed with an easy option to block or unblock.

Managing Data Usage Over Wi-Fi

Many cell phone devices & laptops when connected to Wi-Fi will attempt to update their apps and/or sync content in the background. Both can cause heavy data usage without the user's knowledge.

This can be managed by the user setting the Wi-Fi connection as metered or low data mode. This will limit background updates and syncing processes. Many devices including Apple, Android, and Windows have this feature available.

Android:

1. Connect the phone to Wi-Fi.
2. Open the phone's Settings app.
3. Tap Network & internet > Wi-Fi.
   a. If not found, search for "Metered Wi-Fi".
4. Tap the Wi-Fi network currently connected.
5. Tap Advanced > Metered > Treat as metered.

Apple iOS:

1. Connect the phone to Wi-Fi.
2. Open the Settings app.
3. Tap Wi-Fi.
4. Tap the information button next to the Wi-Fi network that is connected.
5. Turn on Low Data Mode.

Mac:

Mac OSX does not currently have an effective way to stop excessive traffic. Third party software can be used to give better control of limiting internet traffic such as TripMode (www.tripmode.ch) or LittleSnitch (www.obdev.at).

Windows:

1. Select Start > Settings > Network & Internet > Wi-Fi > Manage known networks.
2. Select the Wi-Fi network > Properties > turn on Set as metered connection.

SIM Card Install

A valid SIM card is required to connect to LTE backhaul through the router. Only 2FF standard/mini SIM cards work. The use of adapters is not recommended.

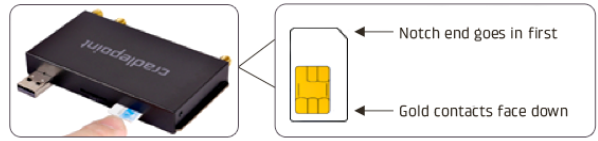
The modem cover must be replaced, or the modem will not power on.

Integrated Modem

1. Unscrew and remove the MC400 modular modem door from the front of the router.
2. Insert the card into SIM1 slot, metal contacts up and the notch in. It will click into place. Depress again to remove.
3. Insert a secondary SIM card into the SIM2 slot if applicable.
4. Replace the modem door and secure with screws.

MC400 Modular Modem

A second modem can be incorporated into the router. This can achieve faster failover in a dual SIM card setup or increase the availability of network access.



1. Unscrew and remove the MC400 modular modem door from the front of the router.
2. Remove MC400 modular modem.
3. Insert the card into SIM1 slot, metal contacts down and notch in.
4. Insert a secondary card into SIM2 slow if applicable.
5. Slide MC400 modem into the router, Cradlepoint logo side up, USB plug first.
6. Replace the modem door and secure with screws.
   a. Remove the plastic port covers from the modem door before returning the cover to the router.

Cradlepoint LEDs

Understanding the LEDs on the front of the router can give a good sense of the status of the router.

POWER: The Cradlepoint IBR1700 must be powered using an approved 9–36 V DC power source.

- Green = Powered ON
- Yellow = Attention is required
- No Light = Not receiving power. Check the power source connection

GPS: Indicates the status of GPS connection.

- Blue = GPS locked
- Blinking Blue = Obtaining lock
- No Light = Off/no lock

MC400 MODEM: Indicates information about the optional MC400 modem.

- Green = Modem has established an active connection
- Blinking Green = Modem is connecting
- Amber = Modem is not active
- Blinking Amber = Data connection error. No modem connection possible
- Blinking Red = Modem is in the process of resetting
- No Light = Modem not connected

INTEGRATED MODEM

Indicates information about the integrated modem.

- Same as MC400 Modem
- Blinking Red with Signal Strength LEDs = SIM door is not installed, modem is off

SIGNAL STRENGTH: Blue LED bars indicate the active modem's signal strength.

- 4 Solid Bars = Strongest signal
- 1 Blinking Bar = Weakest signal (a blinking bar indicates half of a bar)
- 4 Blinking Bars = SIM door is open and the modem is powered off

WiFi STATUS: Indicates information about WiFi channels.

- 2.4 GHz Green = Activity on 2.4 GHz WiFi band
- 5 GHz Blue = Activity on 5 GHz WiFi band

WiFi AS WAN: Indicates WiFi as WAN status.

- White = WiFi as WAN active

ADDITIONAL LED INDICATIONS

Other

- Several different LEDs blink when the factory reset button is detected
- Two of the modem LEDs blink red in unison for 10 seconds when there is an error during NCOS upgrade
- When an external USB modem is plugged in, only the Signal Strength LEDs will light up

Wi-Fi Calling

By enabling Wi-Fi Calling on cellular devices, it can make phone calls and text messages possible in an area with little or no cellular coverage.

Turning on Wi-Fi Calling may differ from phone to phone and carrier to carrier. Check with the mobile carrier for the official way to enable Wi-Fi Calling on a particular phone.

It might be needed to enter or confirm an address for emergency services prior to using Wi-Fi Calling.

Steps to enable Wi-Fi calling:

Android:

1. Go to Settings > Advanced Calling > Wi-Fi Calling
2. Enable Wi-Fi Calling
    a. Enter address if necessary

iPhone:

1. Go to Settings > Phone > Wi-Fi Calling
2. Enable Wi-Fi Calling
    a. Enter address if necessary

If the carrier and/or phone does not support Wi-Fi Calling natively, use one of the widely available apps that let to make calls such as:

- Facebook Messenger
- Google Voice
- Skype

Patch Panel

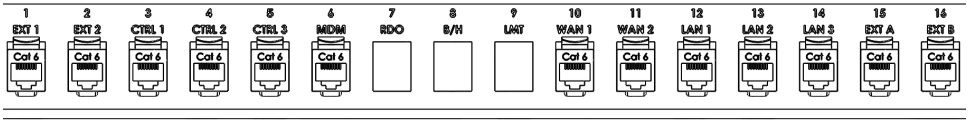
The patch panel brings all ethernet connections throughout the enclosure to one easily accessed position. This makes network configuration changes quick and easy.

Default Map

The default patch panel configuration is for the Winegard WV750 terminal and Cradlepoint IBR1700 and is color coded for correct operation. Make the connections between like colors and feed the IP out (blue ports) to the desired location.

Alternate Mapping

Different Patch Panel wiring setup may occur if alternate Satellite terminals, radios, and/or routers and installed for the NSD.



Patch Panel Port Mapping

Port	Description	Color	Location
1 – EXT 1	External Passthrough	Black	AC Inlet PEP
2 – EXT 2	External Passthrough	Black	AC Inlet PEP
3 – CTRL 1	Satellite Controller Port 1	Black	Satellite Controller
4 – CTRL 2	Satellite Controller Port 2	Yellow	Satellite Controller
5 – CTRL 3	Satellite Controller Port 3	Green	Satellite Controller
6 – MDM	Satellite Modem	Yellow	Satellite Modem
7 – RDO	SBO Band 14 Radio	Black	Radio Shelf
8 – B/H *	Backhaul	N/A	Radio Shelf
9 – LMT *	Local Maintenance Terminal	N/A	Radio Shelf
10 – WAN 1	Wide Area Network (IP In)	Orange	Cradlepoint WAN
11 – WAN 2	Wide Area Network (IP In)	Green	Cradlepoint LAN 4 **
12 – LAN 1	Local Area Network (IP Out)	Blue	Cradlepoint LAN 1
13 – LAN 2	Local Area Network (IP Out)	Blue	Cradlepoint LAN 2
14 – LAN 3	Local Area Network (IP Out)	Blue	Cradlepoint LAN 3
15 – EXT A	External Passthrough	Orange	DC Inlet PEP
16 – EXT B	External Passthrough	Black	DC Inlet PEP

* Optional equipment ports, not included in standard package

** Refer to Cradlepoint configuration page 64. LAN 4 is reconfigured as VSAT WAN.

Grounding Kit

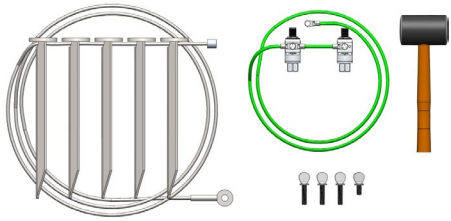
⚠ Before installing any grounding electrodes check for underground electrical, gas, water, or other utility lines.

⚠ Avoid installing the Grounding Kit in an area that has normal foot traffic. During a storm or a fault condition dangerous voltages induced could be hazardous to personnel.

⚠ Never lay system power cables or signal cables over Grounding Cables.

⚠ Wear gloves to protect hands when handling or inspecting Grounding Kit. Wear safety glasses when hammering Grounding Stakes.

The Surface Wire Ground Kit (SWGK) uses a radial system of three legs with five stakes each to connect the chassis to earth. The addition of the inline arrestor harness provides additional protection.



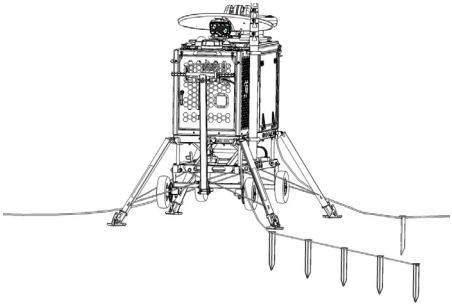
To get the best results from the Grounding Kit it must be installed on a sufficient substrate.

Types of Soil	Ground Quality
Wet soil	Very Good
Clay or shale	Good
Clay or shale mixed with gravel or sand	Poor
Gravel or sand	Very Poor

Grounding for Generator Use

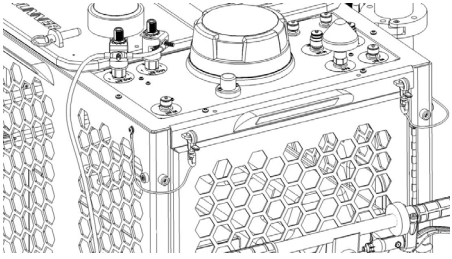
1. With the unit fully stabilized and parking brake engaged, retrieve the Grounding Kit Bag and the Mallet (B) from the Accessories Bag.
2. The NSD is equipped with 4 Grounding Points notated on the chassis with green stickers. You will use 3 of these points.
3. Using one wingnut provided from the Grounding Kit, attach one Wire Rope to one chassis Grounding Point using the eyelet.
4. Repeat this process with the 2 additional Wire Ropes and wingnuts provided.
5. Spread the 3 wire ropes out to full length away from the deployable as well as approximately 120° from each other.
6. For each Wire Rope, hammer the 5 corresponding stakes into the ground using the provided Mallet. Each stake should be equal

distance from each other and spread out to maximum distance apart.

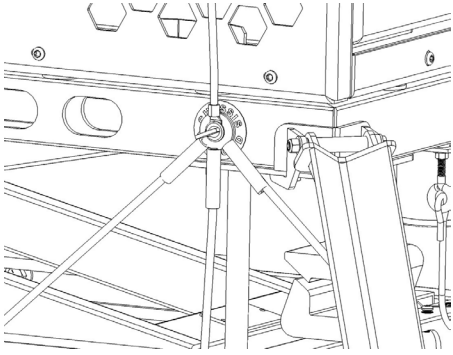


Grounding for Possible Lightning Strike

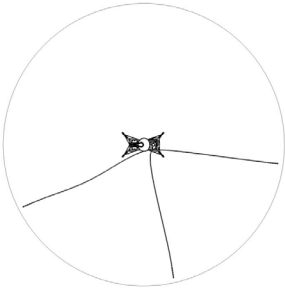
1. With the unit fully stabilized and parking brake engaged, retrieve the Grounding Kit Bag and the Mallet from the Accessories Bag.
2. Attach arrestors to appropriate LTE in ports on the Antenna deck to be used.



3. Run attached Ground Wire from arrestors down to the closest Grounding Point on the Chassis.
4. Attach 3 Wire Ropes together with the Ground Wire to the closest Grounding Point using one extra-long wingnut provided.



5. Spread the 3 Wire Ropes to full length away from the deployable and as far away from each other as possible. (Minimum separation should be 60° although it is preferred to be as close to 90° as possible away from each other.)



6. For each Wire Rope, hammer the 5 corresponding stakes into the ground using the provided Mallet. Each stake should be equal distance from each other and spread out to maximum distance apart.

Procedures

Connecting AC Power

⚠ Electric shock hazard if system not properly powered. If unsure always consult a qualified electrician.

⚠ If AC power source is neutral-ground bonded, connect to Shore Power inlet. Do not connect to generator power inlet or a ground loop will be created.

The NSD power system grounds differently depending on what AC power is available. The neutral-ground bond is completed at the source of Shore power. The onboard generator is neutral floating and does connect the neutral to AC receptacle ground pin. The NSD accounts for this and adds the bond internally.

If the system is on during these processes the alarm will become temporarily activated as the ICU is verifying the AC connection is stable before switching from battery to outside AC source. This can be silenced with the Alarm Silence Button on the PCM.

Connecting Shore Power

Powering from Shore

1. Switch the Power Input Selection Switch set to the 'OFF' position. (Refer to page 54).
2. Fully Insert the Power Cable into the RIGHT side Shore Receptacle.
3. Rotate switch right to Shore position.
4. Switch the Source Power Switch on PCM to the ‘AC’ position.
   a. It will take approximately 20 seconds before charging takes place. This allows the ICU to verify the AC source is stable.

Depowering from Shore

1. Switch the Source Power Switch on PCM to ‘DC’ position.
2. Turn the Input Selector Switch to the ‘OFF’ position.
3. Disconnect the AC Inlet Power Cable.
4. Replace cover over receptacle with the attached rubber cap.

Connecting Generator Power

Powering from Generator

1. Set the Power Input Selection Switch to the 'OFF' position. (Refer to page 54).
2. Insert the Generator Power Cable into the LEFT side Receptacle. (Labeled GEN)
3. Make sure the Cable is fully inserted.
4. Once ready to power the unit and the connections have been verified secure, move the Input Selector Switch to the 'GEN' position.

Depowering from Generator

1. Switch the Source Power Switch on PCM to 'DC' position.
2. Turn the Input Selector Switch to the 'OFF' position.
3. Disconnect the AC Inlet Power Cable.
4. Replace cover over receptacle with the attached rubber cap.

Connecting Outside DC Power

⚠ Electrical hazard! Do not connect any voltage greater than 14.6VDC!

The NSD includes a 30A 12VDC charging / power inlet. This allows external DC sources to power the unit including carrying vehicle, external battery bank, solar array, etc.

Connecting Vehicle DC Power

Included in the Accessory Bag is a charging harness that connects to a standard 7-pin connector that is included on many vehicles with towing packages.

1. Connect 7-pin connector to carrying vehicle.
2. Connect 4-pin connector from Lower Frame to pigtail from 7-Pin to operate Stop-Turn-Tail lights.
3. Connect 2-pin connector to NSD pod DC Inlet Port (page 54).

Connecting External DC Power

⚠ Do not short bare wire terminals! Electrical shock hazard!

AC power is the preferred power to operate the NSD. If AC power is not readily available external DC power can also be used.

1. Remove 7-pin connector from charging harness.
2. Connect white wire to +12VDC and black to -12VDC.

Choosing a Deployment Location

- The NSD should be deployed on firm, level ground. If the deployment area is not level, the Stabilizer Feet can accommodate for unlevel terrain. Refer to page 35.
- The Satellite must have a clear view of the Southern Sky. Obstructions will affect Satellite performance.
- The LTE and Wi-Fi Antennas perform best without obstructions (such as trees, mountains, buildings, or tall vehicles). Clear Line of Sight in all directions will prevent signal loss.

Cold Start (Below -20˚F)

To start the NSD when temperatures are below -20°F, but above -30°F:

1. Turn the generator around pointing the exhaust onto the Inverter Charger Cabinet.
2. Connect the power cord from the Generator to the Generator AC inlet and position Power Inlet Selection Switch to OFF.
3. Start the generator and wait 15 minutes.
4. Rotate Power Inlet Selection Switch to Gen.
5. Inverter Charger will start battery heating element.
6. Turn Master Power Switch on.

Low Power Operation

To extend runtime, particularly when operating from external DC sources or the internal battery, all unnecessary loads should be removed or deactivated.

These include:

- USB and Laptop charging ports
- LED Lighting
- Ambient temperature dependent:
  - AC/Heater turned OFF and operate with doors open.
  - ICU Cooling fan disabled. Operate with ICU door open

It is recommended to run the generator with ECO mode enable to minimize fuel consumption.

In extreme situations additional measures can be taken to decrease loads. These include:

- Pull Fuse #1 to disable Air Conditioner / Heater fully.
- Once fully deployed, connect a patch cable from Satellite Modem (MDM) directly to WAN 2. The Satellite Controller can now be depowered.

Accessory Bags & Drawer Contents

The contents of the accessory bag should be checked and verified after every deployment.

Accessory Bag Contents:

- 50 ft extension cord
- Vehicle power harness
- Stock generator cap
- 7/8” & 15/16” Wrenches
- 3x Guy Line Kit
  - Stake
  - Tensioner
  - 50 ft rope
- Mast Guy Plate
- Hammer
- Satellite Extension Cables
  - 100 ft red
  - 100 ft blue
- Emergency handle & 5/16” socket
- 50 ft Waterproof ethernet cable
- Waterproof ethernet connector
- Hitch Pin
- AC Out Connector

Storage Drawers Contents (if available):

- External antennas
  - 2x LTE
- Stabilizer Leg Cables
  - 4x Orange
  - 4x Red
  - 2x Black
- Spare Fuse Kit
- NSD and Storage Drawer Keys
- NSD & Component Manuals

Maintenance

Read these instructions carefully and then thoroughly inspect the equipment to become familiar with it before trying to perform maintenance.

Cleaning

It is recommended to clean the NSD of dirt and debris after each use. Soapy water and a shop rag will usually suffice but it is recommended to use a chamois or soft terry cloth to eliminate water spotting and scratching.

Prior to washing with a hose:

- Remove the Generator and Auxiliary Fuel Tank
- Ensure the Front and Back Doors are fully closed
- Ensure the Inverter Cabinet is Fully Closed

Do NOT directly spray the Antenna with water. Handwash with a damp rag.

Pivot Bolt Checks

With a lot of use the pivot bolts on the chassis will slowly wear in over time. These can easily be retightened using two wrenches.

Tighten these bolts enough to provide light friction but easy range of motion.

These include:

- Steering Axle
- Wheel Bolt
- Tail Axle
- Handle Pivot
- Stabilizer Leg

Storage

Do not store the unit when wet. Dry off all components as much as possible before storing.

Store in a covered, cool, dry location.

For optimal preparedness, leave the NSD plugged into shore power to keep system fully charged. See page 73.

Generator

Refer to manufacturers owner's manual for scheduled maintenance intervals, servicing procedures, and specifications.

Lubrication

The Hitch Adapter and thrust screw need periodic lubrication to keep components operating smoothly.

Lubricant Specification:

NLGI Grade 2 Moly Grease

Apply to the following:

- Chassis Thrust Screw

Lubricant Specification:

NLGI Grade 2 Grease

Apply to the following:

- Hitch Adapter
  - PitchLok Holes
  - PitchLok Pins
  - Mounting Pin
  - Mounting Pin Receiver

Battery Replacement

Only replace battery with identical size and type.

1. Switch off all circuit breakers.
2. Remove battery terminals starting with negative.
3. Remove the Winegard Controller.
4. Remove the PCM.
5. Remove Cradlepoint rack mount screws. Lift the Cradlepoint shelf up and out of the way.
6. Disconnect strap securing battery.
7. Remove Battery.
8. Reinstall in reverse order.

Troubleshooting

NSD System

Symptom	*Possible Cause*	*Solution*
System is not turning on	Battery is dead	Charge the system
	Circuit breaker disconnected	Reconnect battery circuit breaker.
	Master power control fuse blown	Find reason for blown fuse and repair then replace fuse
System not charging from AC	AC Source no good	Connect to known good AC source
	Shore/Gen switch does not match input plug	Set to appropriate AC input source
	PCM Input Power Source switch not set to AC	On PCM move Input Power Source switch to AC
	Circuit breaker in open state	Flip AC inlet circuit breaker switch to On.
Satellite not acquiring heading	GPS signal obstructed	Move to area with clear view of sky.
	GPS needs to be calibrated	With unit powered on and system stowed. Move unit in figure 8.
Satellite searches wrong part of sky	GPS signal incorrect	Stow the antenna and navigate back to the main menu. Press the wrench (advanced user menu) and verify the antenna heading. Verify the compass mode is set for desired operation.
Satellite controller Fatal Application Error	Windows performed a runtime operation error	Power cycle IDU. Stow and redeploy the antenna.
No AC power	Inverter did not turn on	Power cycle master power.

Symptom	*Possible Cause*	*Solution*
System alarm activated	Loss of AC power with Input Power Source set to AC	If attempting to run from AC source, see system not charging from AC. If running from onboard battery set Input Power Source switch to DC.
	Battery Monitor alarm condition	Check battery monitor for alarm fault. Most commonly a low charge. Charge the system.

Cellular Radio

Symptom	*Possible Cause*	*Solution*
No LED lights are on	No Power to the SBO	Ensure that the SBO is plugged in, and its switch is in the on position
SBO RF LED not solid green	Antenna or cable connections are not well seated	De-power the SBO and then disconnect and tightly reconnect the connections at the antenna deck and antennas before re-powering the SBO
SBO Backhaul LED not solid green	No backhaul source	Ensure that a backhaul source is active (Satellite, LTE, WAN, Wi-Fi as Wan)
	Connections are not well seated	Check connections between the SBO and the Router
	Cradlepoint configuration	Adjustments to the supplied Cradlepoint configuration can negatively affect system performance. Verify the Cradlepoint's configuration against the default Cradlepoint programing guide
SBO Status LED not solid green	SBO RF LED not solid green	Attempt SBO RF LED not solid green troubleshooting
	SBO Backhaul LED not solid green	Attempt SBO Backhaul LED not solid green troubleshooting
Any SBO issue	Various	Power cycle the SBO and wait 5 minutes for the system to fully boot

Notes:

Warranty

We warranty this product to the original purchaser to be free from defect in materials and workmanship for one year from the date of purchase. Please note that all warranty claims must be accompanied by an original proof of purchase in the form of a purchase receipt or invoice and a written detailed description of the defect. Any product or part found to be defective within that period will be replaced without charge provided that: (1) the product was not misused or overloaded; (2) no alterations or modifications were made; (3) its failure resulted from a defect in material or workmanship and not from normal wear expected in the use of this product; (4) the product or part is delivered, freight prepaid to Rescue 42, Inc. Please contact Rescue 42, Inc. at (888) 427-3728 / (530) 891-3473 to get a return authorization number prior to return. Manufacturers only obligation shall be to replace such products or parts proved to be defective.

Rescue 42, Inc.

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(Contact Rescue 42, Inc. for a Physical/Shipping Address)

No warranty is given for Rescue 42 products outside of the United States and Canada.

This warranty is expressly made in lieu of any and all other warranties, express or implied, including the warranties of merchantability and fitness for a particular purpose. Rescue 42's sole liability to any purchaser is limited to the remedy set forth above. In no event will Rescue 42 be liable for any lost profits, lost sales or for any consequential, direct, indirect, incidental, special or exemplary or punitive damages or for any other damages of any kind or nature.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations may not be applicable. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

Serial Numbers

NSD Components		
Item Desc	**Serial #**	**MAC Addr**
Chassis		
Enclosure		
PCM		
Air Conditioner		
Battery Monitor		
Cradlepoint		
Generator		
Inverter Charger		
Satellite Controller		
Satellite Terminal		
Satellite Modem (Ka)		
Satellite TRIA (Ka)		
Cradlepoint Settings		
Default Password		
SSID		
IMEI		
MEID		