KVH Industries, Inc.

TracPhone® V3HTS
in 24" (60 cm) Dome
(to match TracVision® HD7 or TV6 – tapered baseplate variant)

Installation Guide

TracPhone V3-HTS in 24" (60 cm) Dome Installation Guide

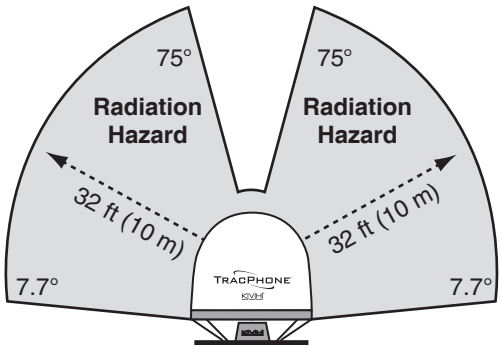
mini-VSAT Broadband℠ System with Integrated CommBox™ Modem

This guide explains how to install the TracPhone V3-HTS mini-VSAT Broadband satellite communications system. Operation instructions are provided in the Quick Start Guide.

Installation Steps

CAUTION - RF Radiation Hazard

The antenna transmits radio frequency (RF) energy that is potentially harmful. Whenever the system is powered on, make sure everyone stays more than 32 ft (10 m) away from the antenna within its 7.7-75° elevation range. No hazard exists directly above the antenna and anywhere below the antenna's mounting plane.



Who Should Install the System?

To ensure a safe and effective installation, only a KVH-certified technician should install the TracPhone system. To find a technician near you, visit **www.kvh.com/wheretogetservice**.

Technical Support

North/South America, Australasia:
Phone: 1 866 701-7103 *(U.S. only)*
Phone: +1 401 851-3806
Email: mvbsupport@kvh.com

Europe, Middle East, Africa, Asia-Pacific:
Phone: +45 45 160 180
Email: mvbsupport@kvh.com

Important Safety Information

This icon indicates a danger, warning, or caution notice. Be sure to read these carefully to avoid injury.

WARNING

Risk of Electric Shock
Potentially lethal voltages are present within the ICM when it is connected to AC power. To avoid electric shock, do not open the chassis enclosure. There are no user-serviceable parts inside.

WARNING

Risk of Electric Shock
If any component of the TracPhone system becomes damaged and/or no longer functions normally, disconnect it from vessel power, secure it from unintended operation, and contact KVH Technical Support (see "Technical Support" on page 1). All repairs or modifications must be performed by a trained, KVH-certified technician. If you are a KVH-certified technician, you still must contact KVH Technical Support prior to conducting any repairs or modifications to the equipment.

WARNING

Risk of Explosion
Do not operate the ICM (or any other electrical device) in an environment where flammable gases, vapors, or dusts are present. In addition, do not operate the ICM in an environment with a temperature outside its 5° F to 131° F (-15° C to 55° C) temperature range.

WARNING

Risk of Electric Shock
Failure to ground the TracPhone system properly to ship's ground will cause an unsafe floating ground condition, risking potentially lethal electric shock. See "Connect Power" on page 17 for details on the proper grounding of the equipment.

CAUTION

RF Radiation Hazard
The antenna transmits up to 4 watts of radio frequency (RF) energy that is potentially harmful. Whenever the system is powered on, make sure everyone stays more than 32 feet (10 m) away from the antenna. No hazard exists directly below the antenna.

1 Inspect Parts and Get Tools

Before you begin, follow these steps to make sure you have everything you need to complete the installation.

a. Unpack the box and ensure it contains everything shown in Figure 1 and on the *Kitpack Contents List*. Save the packaging for future use.

IMPORTANT!

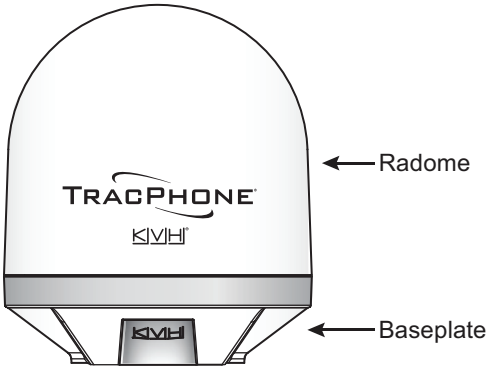
Always lift the antenna by the baseplate and never by the radome or any portion of the internal antenna assembly (see Figure 1).

b. Carefully examine all of the supplied parts to ensure nothing was damaged in shipment.

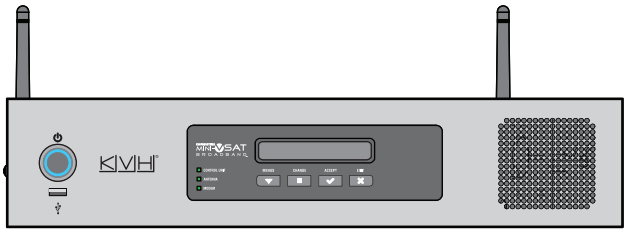
c. Gather all of the following tools and materials that you will need:

- Flat-head and Phillips-head screwdrivers
- Electric drill and 5/16" (8 mm) bit
- 3.75" (95 mm) hole saw
- 1/2", 3/4", and 7/16" sockets
- 7/16" open-end torque wrench set to 20 in.-lbs
- 3/4" torque socket/ratchet or nut driver set to 34 ft.-lbs
- Light hammer and center punch
- Adhesive tape
- Silicone sealant, self-vulcanizing tape, or equivalent
- Eye protection
- Shop towels
- Voltmeter
- Utility knife
- Flush cutters
- Wire stripper/terminal crimper
- File
- Two 75Ω RF coax cables, "F" connectors, and associated termination tools (see page 10)

Figure 1: TracPhone V3-HTS System Components



Antenna



Integrated CommBox Modem (ICM)

- NMEA 0183 talker and interface cable (see page 15)
- Isolation transformer, if required (see page 17)
- RS422-to-USB adapter
- Laptop PC with the latest TracPhone V3-HTS ICM/antenna software downloaded from the KVH Partner Portal (**www.kvh.com/partners**)

2 Plan the Antenna Installation

Before you begin, consider the following antenna installation guidelines.

Choose a Suitable Location

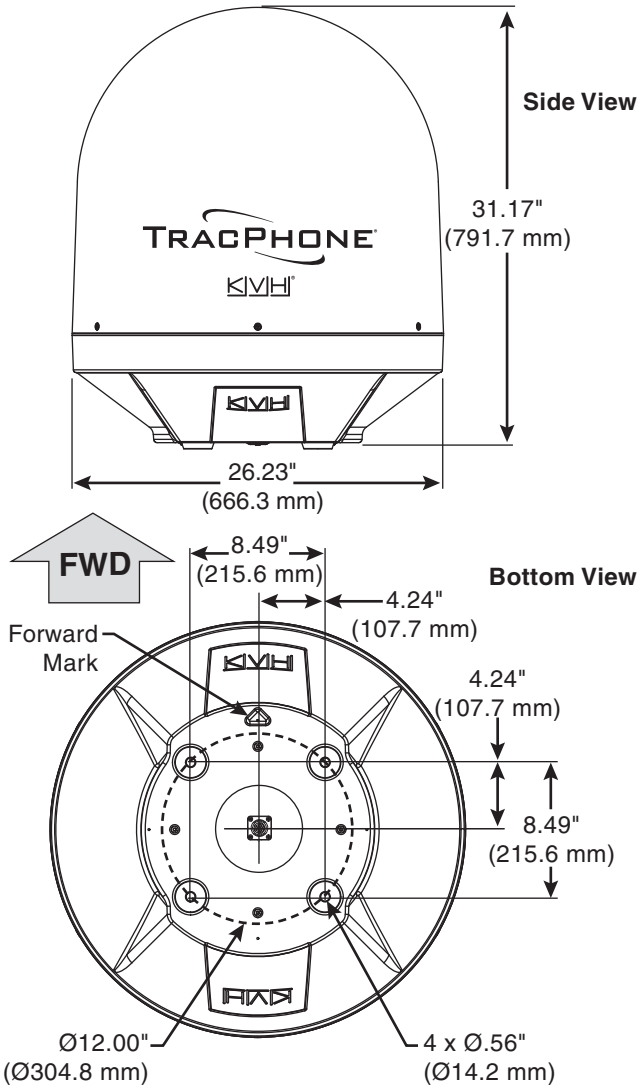
- Select a location that is as close as possible to the intersection of the vessel's centerline and midships.
- Temperature must be within the operating range (-25ºC to 55ºC (-13ºF to 131ºF)).
- Avoid placing the antenna near any magnetic compasses or other onboard antennas to prevent potential interference.
- Make sure the mounting surface is wide enough to accommodate the antenna's base (see Figure 2). Also make sure it is flat, level (within ±2º), rigid enough to prevent antenna vibration, and strong enough to withstand the weight of the antenna, as well as other cumulative forces related to expected operating conditions, such as ice, snow, wash down, and maximum expected values of pitch, roll, and wind pressure (including gusts).

Prevent RF Radiation Exposure

Select a location that is well above any areas accessible to passengers and crew to reduce the risk of RF radiation exposure. (See page 1 for an illustration of the hazard area.)

If mounting the antenna near an accessible area is unavoidable, you may configure one or two no-transmit zones to prevent transmissions in hazardous directions. (See "Set Up No-Transmit Zones" on page 22 for details.)

Figure 2: Antenna Dimensions

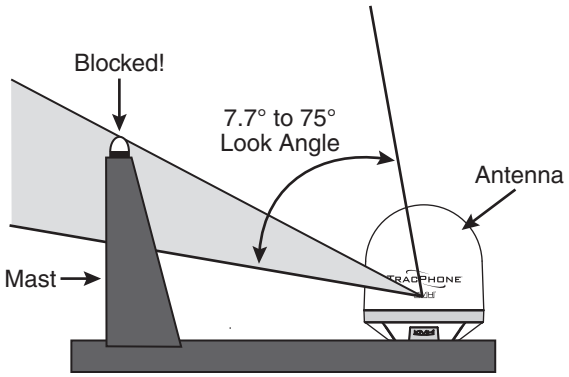


2 Continued Plan the Antenna Installation

Minimize Satellite Blockage

The antenna requires a clear view of the sky to transmit and receive satellite signals (see Figure 3). The fewer obstructions, the better the system will perform.

Figure 3: Blockage from Obstruction



Avoid RF Interference

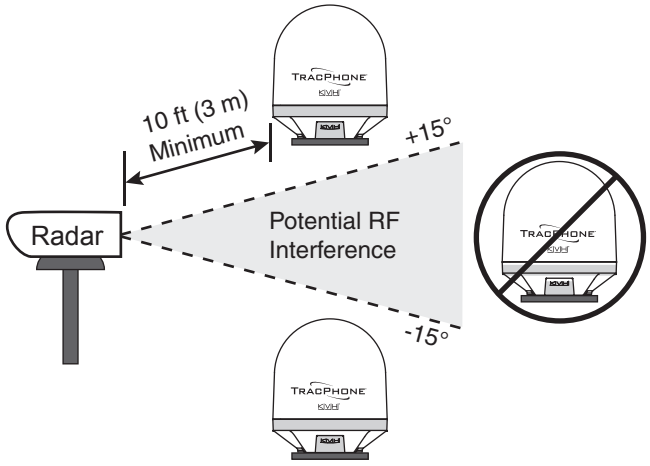
Although many variables determine the exact distance required between the antenna and radar/high-power radio transmitters, including transmitter beam properties and the reflective properties of nearby surfaces, consider the following general guidelines when selecting a safe antenna location:

IMPORTANT!

RF emissions from radars and high-power radio transmitters may damage the antenna or impair its performance if it's improperly positioned within the beam path.

- Mount the antenna as far away as possible from the radar and high-power radio transmitters.
- Do not mount the antenna at the same level as the radar. Most radar transmitters emit RF energy within an elevation range of -15° to +15° (see Figure 4). Therefore, mount the antenna outside this elevation range and at least 10 ft (3 m) away from the transmitter.

Figure 4: Avoiding RF Interference



IMPORTANT!

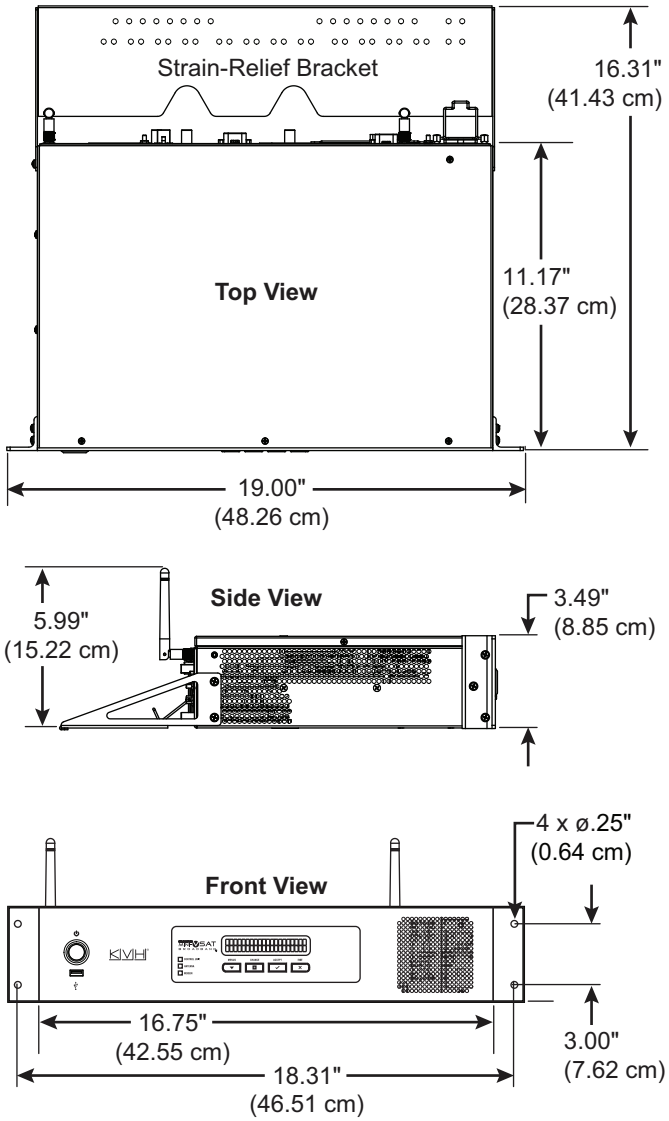
Never place the antenna in the beam path of the radar regardless of distance. Radar energy may damage the antenna or impair its performance.

3 Plan the ICM Installation

Before you begin, consider the following installation guidelines for the ICM.

- Select a mounting location in a dry, well-ventilated area belowdecks away from any heat sources or salt spray.
- Temperature must be within the operating range (-15°C to 55°C (5°F to 131°F)).
- Be sure the front panel will be easily accessible to the user.
- Leave enough room at the rear panel to accommodate the connecting cables.
- To use the supplied power/data cable, the ICM must be located within 100 ft (30 m) of the antenna. However, you can order a 1onger cable run if necessary.
- Be sure the location provides adequate Wi-Fi reception. Do not install it in an area surrounded by metal or near any electrical devices that emit RF noise.

Figure 5: ICM Dimensions



4 Mount the ICM

There are two options for mounting the ICM:

Option 1 - Inside an equipment rack

Option 2 - To a horizontal surface

NOTE: *You may choose to wait to mount the ICM until after you have completed all system wiring.*

Option 1 – Rack Mount

The ICM is sized to fit a standard 19" (48.26 cm) rack, occupying 2U of space. Follow these steps to secure the ICM in an equipment rack.

a. Attach the supplied strain-relief bracket to the back of the ICM using four supplied #6-32 screws and washers (see Figure 6).

b. Insert the ICM into the rack and secure its front mounting brackets to the rack using four M6 screws and washers (see Figure 7).

Option 2 – Horizontal Surface Mount

Follow these steps to mount the ICM to a horizontal surface.

a. Remove the six #6-32 screws and washers securing the two rack-mount brackets to the front of the ICM (see Figure 8). Remove the brackets.

b. Attach the supplied strain-relief bracket to the back of the ICM, and attach the supplied "L" mounting brackets to the sides of the ICM, using six supplied #6-32 screws and washers (see Figure 9).

c. Mount the ICM to the vessel using fasteners appropriate for the mounting surface.

Figure 6: Attaching the Strain-Relief Bracket

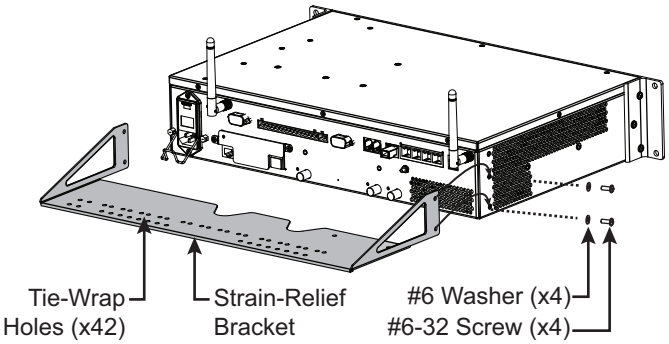


Figure 7: Securing the ICM in the Rack

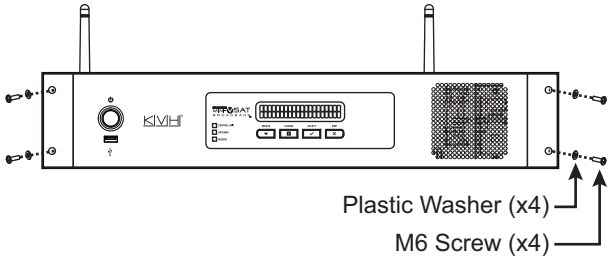


Figure 8: Removing the Rack-Mount Brackets

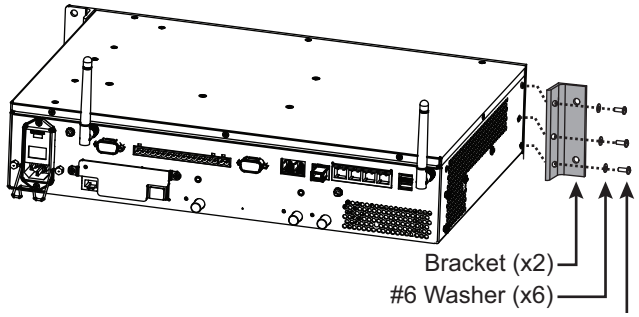
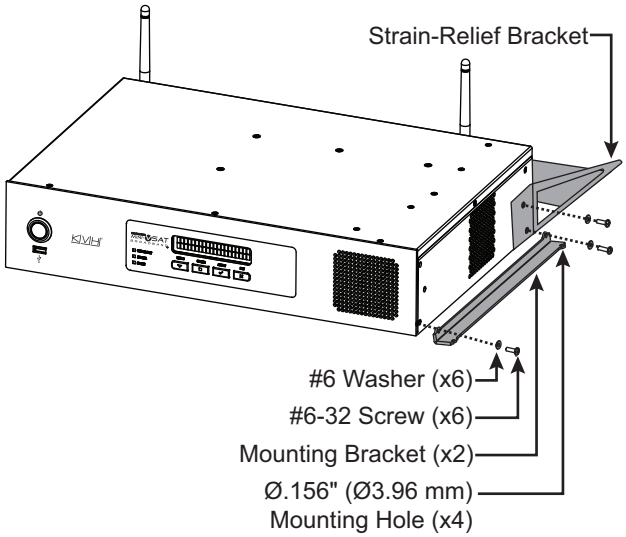


Figure 9: Attaching the Mounting and Strain-Relief Brackets



5 Prepare the Antenna Site

Once you have identified a suitable antenna mounting site, according to the guidelines provided in Step 2, follow these steps to prepare the site for installation.

a. Unfold the antenna mounting template (supplied in the Customer Welcome Kit) and place it onto the mounting surface. Make sure the "FWD" (forward) arrow points toward the bow and is parallel to the vessel's centerline (see Figure 10).

NOTE: *You don't need to mount the antenna exactly on the vessel's centerline, but the antenna's forward arrow must be parallel to it.*

b. Using a light hammer and center punch, mark the locations for the four mounting holes and cable access hole on the mounting surface in the locations indicated on the template.

c. Drill a 5/8" (16 mm) hole at the four mounting hole locations you marked in Step b. Later, you will insert four 1/2"-13 bolts through these holes **from above** to secure the antenna to the mounting surface.

IMPORTANT!

The 1/2"-13 bolts supplied in the kit are 2.25" (57 mm) long. Since the bolts must extend fully into and through nuts beneath the baseplate for proper thread engagement, you will need bolts of a different length if the mounting surface is thinner than 0.75" (19 mm) or thicker than 1" (25 mm).

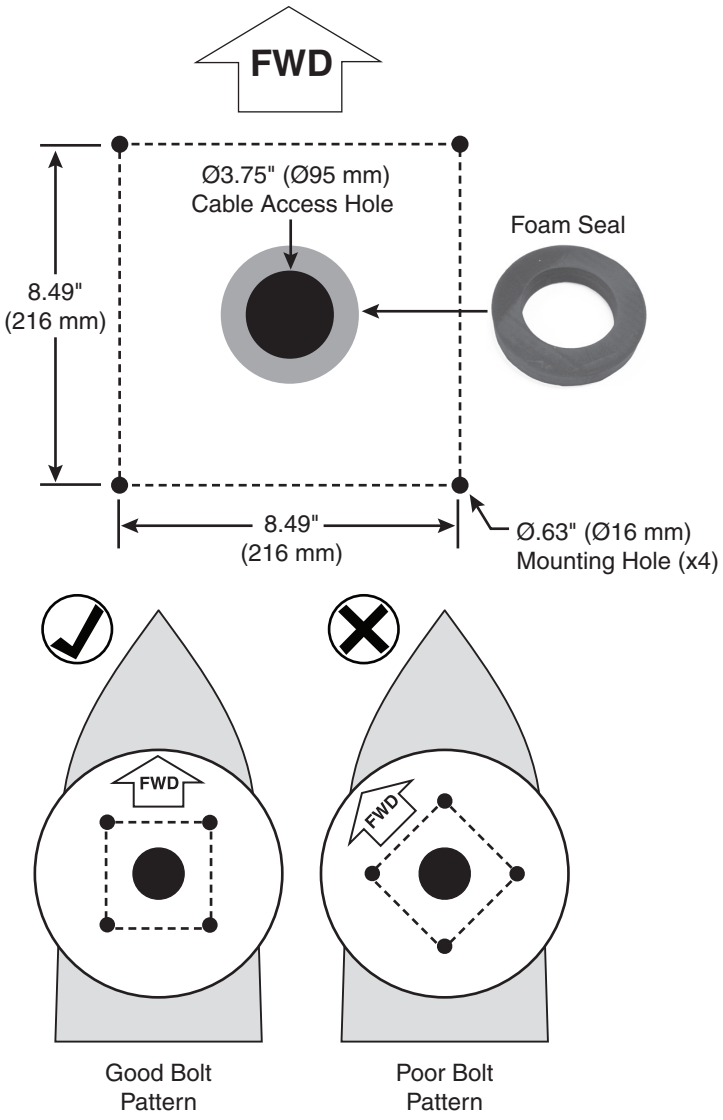
d. Cut out the 3.75" (95 mm) cable access hole in the location you marked in Step b. Smooth the edges of the hole to protect the cables. (You may also apply anti-chafe material around the cables to prevent abrasion.)

e. Clean and dry the antenna mounting surface.

f. Peel off the paper backing from the supplied foam seal to expose the adhesive. Then press the foam seal down firmly onto the mounting surface, ensuring the hole in the foam seal aligns with the cable access hole in the mounting surface (see Figure 10).

NOTE: *Apply the foam seal to the vessel mounting surface, not to the antenna's baseplate.*

Figure 10: Mounting Holes Layout



6 Remove the Shipping Restraints

Inside the antenna, two screws prevent the antenna assembly from moving during shipment. In addition, four bolts secure the antenna to the shipping pallet. Follow these steps to remove these restraints.

a. Remove the six #10-32 screws securing the radome to the baseplate (see Figure 11). Carefully lift the radome straight up until clear of the antenna assembly and set it aside in a safe place. If you keep the radome topside, secure it with a lanyard to prevent it from falling overboard.

b. Remove the four 1/2"-13 bolts and washers securing the antenna to the shipping pallet (see Figure 12).

c. Remove the two tagged #10-32 shipping restraint screws (see Figure 12). Save the restraints for future use.

IMPORTANT!

Once you have removed the restraints, handle the antenna carefully, as its internal assembly will rotate freely. If the antenna assembly hits a mechanical stop with excessive force, the limit switch might become damaged.

d. Transport the antenna to the mounting location.

Figure 11: Removing the Radome

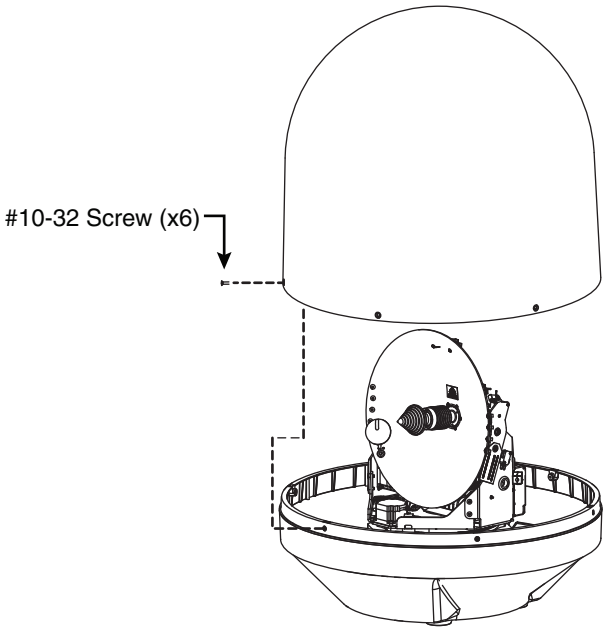
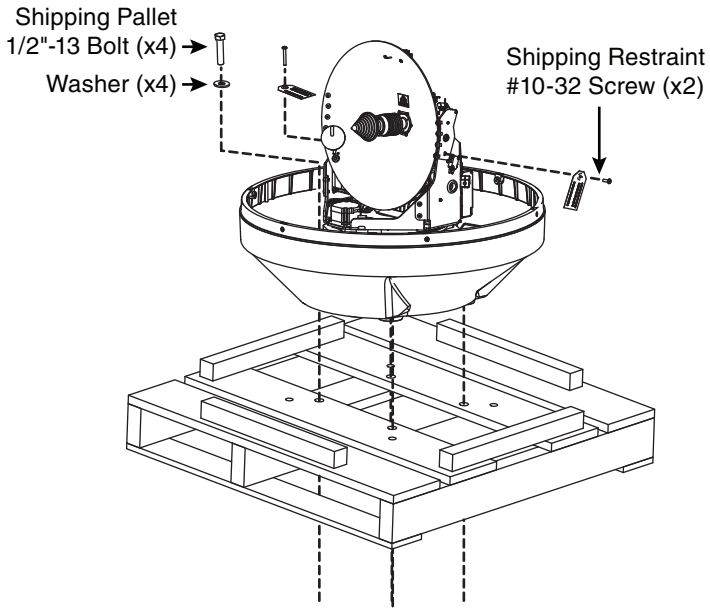


Figure 12: Shipping Restraints and Bolts



7 Prepare the Antenna Cables

Follow these steps to prepare and route the RF and power/data cables.

Prepare the Customer's RF Cables

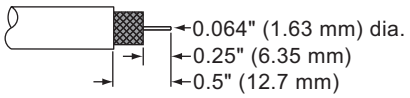
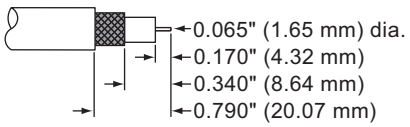
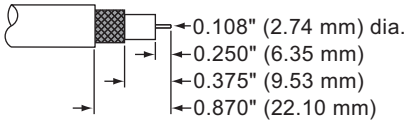
You need to connect two 75Ω RF coax cables from the antenna to the belowdecks ICM. Refer to Figure 13 to determine the type of cables and connectors required for your cable run. Then prepare both of them as described below.

IMPORTANT!

- If you use RG-11 RF cables 80-100 ft (25-30 m) in length, you can avoid the modem commissioning step. See "Commission the Modem" on page 23.
- RF cables must be rated for **75Ω**, not 50Ω.
- Do not use RG-6 cable, as it will damage the system. Use of any cables not specified in Figure 13 will void the warranty.
- Low-quality, poorly terminated, or improperly installed RF cables are the most common cause of system problems. Terminate all RF cables with high-quality "F" connectors using the proper stripping/crimping tools, exactly to the manufacturer's specifications. *See page 38 for instructions on terminating LMR cables.*
- Make sure the center conductor pin at each end of the finished cables is free of burrs and 1/4" (0.20"-0.28") (5-7 mm) in length, measured from inside the nut to the tip, to ensure proper engagement.
- *(LMR cables only)* Make sure there is no gap between the end of the cable jacket and the start of the connector.
- When determining cable lengths, don't forget to account for service loops, 14" (35 cm) in diameter, at each end.

NOTE: *If you only need to run RG-11 RF cables, you may use the pre-terminated 50 ft (15 m) RG-11 cables from KVH (KVH part no. S32-1087-50), and omit the pigtail cables described in the next section.*

Figure 13: RF Cable Options

RG-11	
Max. length	**100 ft (30 m)**
KVH part no.	50 ft (15 m): S32-0566-50 100 ft (30 m): S32-0566-0100
Connector	Belden SNS11AS*
Tools	Belden CST596711 and L3011B (KVH part no. 72-0493)
Strip lengths	
LMR-400-75	
Max. length	**200 ft (60 m)**
KVH part no.	100 ft (30 m): S32-0944-0100 150 ft (45 m): S32-0944-0150 200 ft (60 m): S32-0944-0200
Connector	Times Microwave EZ-400-FMH-75*
Tools	Times Microwave TK-400EZ-75 (KVH part no. 72-0374-75**)
Strip lengths	
LMR-600-75	
Max. length	**300 ft (100 m)**
KVH part no.	150 ft (45 m): S32-0945-0150 200 ft (60 m): S32-0945-0200 300 ft (90 m): S32-0945-0300
Connector	Times Microwave EZ-600-FMH-75*
Tools	Times Microwave TK-600EZ (KVH part no. 72-0375-75**)
Strip lengths	

* Cables from KVH include the proper connectors.
** LMR tool kits from KVH include a torque wrench.

7 Continued Prepare the Antenna Cables

Connect the Customer's RF Cables to the Supplied Pigtail Cables

IMPORTANT!

Use of the supplied RG-11 pigtail cables is **mandatory** if you are using LMR cables. Do not connect LMR-400-75 or LMR-600-75 cables directly to the antenna.

a. Clean and dry the RF cables' connectors.

b. **Label both ends** of the customer's RF cables. Label one cable "TX;" label the other "RX."

c. Fill half of the inner body of the customer's "TX" RF cable's connector with the supplied silicone grease to prevent moisture and corrosion.

d. Connect and **SLOWLY** hand-tighten the "TX" RF cable to the feed-thru adapter of one of the supplied 3 ft (90 cm) RG-11 pigtail cables, allowing the grease to diffuse and settle into the entire space within the connector (see Figure 14).

e. Make sure the RF cable's connector is tightened all the way into the pigtail cable's feed-thru adapter. Then tighten it with a 7/16" torque wrench set to 20 in.-lbs.

f. Repeat steps c-e to connect the "RX" RF cable to the other pigtail cable.

Route the Cables Belowdecks

a. Keep the connector end of the power/data cable and the right-angle connector ends of the RF cables at the antenna location.

NOTE: *Longer power/data cables are available from KVH (see Figure 15).*

b. Route the opposite ends of the power/data and RF cables belowdecks through the 3.75" (95 mm) cable access hole. Leave an adequate service loop, at least 14" (35 cm) of slack, in the cables at the antenna location.

c. Route the cables to the ICM. Be sure to always maintain the minimum bend radius in the RF cables (see Figure 16).

Figure 14: Connecting the Pigtail Cables to the RF Cables

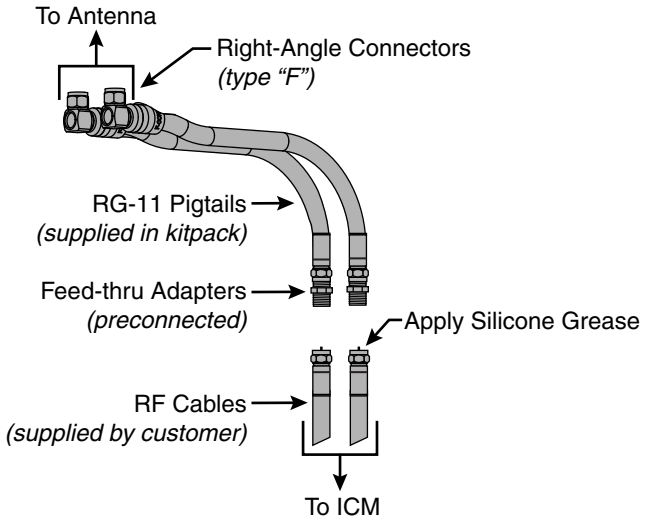


Figure 15: Longer Power/Data Cable Options

Length	Part Number
150 ft (45 m)	32-1031-0150
300 ft (90 m)	32-1031-0300

Figure 16: Minimum Bend Radius of RF Cables

Cable Type	Minimum Bend Radius
RG-11	4.5" (11.5 cm)
LMR-400-75	4.5" (11.5 cm)
LMR-600-75	6" (15.3 cm)

8 Wire the Antenna

Follow these steps to connect the antenna cables.

a. Pass the RF cables from belowdecks up through the hole in the center of the baseplate (see Figure 17).

b. Clean and dry the antenna's RF connectors.

c. Place one of the supplied rubber washers over the "MRx" jack on the antenna's connector plate (see Figure 18).

d. Fill half of the inner body of the "RX" pigtail cable's connector with silicone grease.

e. Connect and **SLOWLY** hand-tighten the "RX" pigtail cable to the "MRx" jack on the antenna, allowing the grease to diffuse and settle into the entire space within the connector (see Figure 18).

f. Make sure the "RX" pigtail cable's connector is tightened all the way into the antenna's connector. Then tighten it with a 7/16" torque wrench set to 20 in.-lbs. Make sure the rubber washer compresses against the connector plate.

g. Repeat steps c-f to connect the "TX" pigtail cable to the antenna's "MTX" jack.

h. Wipe off any excess grease from the cables.

i. Use a 15" tie-wrap (*supplied in kit*) to secure the RF pigtail cables to the connector plate to reduce strain.

j. Seal all above deck RF cable connections with silicone sealant or equivalent.

k. Connect the power/data cable to the "Power/Data" jack on the bottom of the antenna (see Figure 17). Hand-tighten until the connector locks in place; do not use excessive force.

l. Secure the cables near the antenna connectors to relieve stress.

m. Seal the cable access hole, as required.

IMPORTANT!

The integrity and reliability of the RF cables is critically important. Make certain that these cables are properly terminated, sealed against seawater and corrosion, strain-relieved, protected from abrasion, and free of stress.

Figure 17: Bottom View of Baseplate

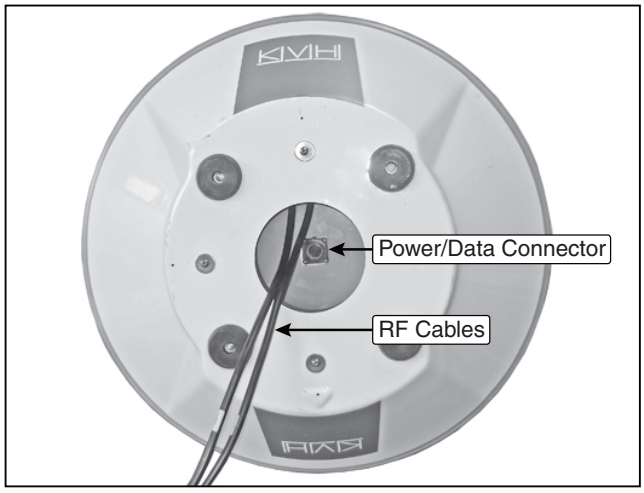
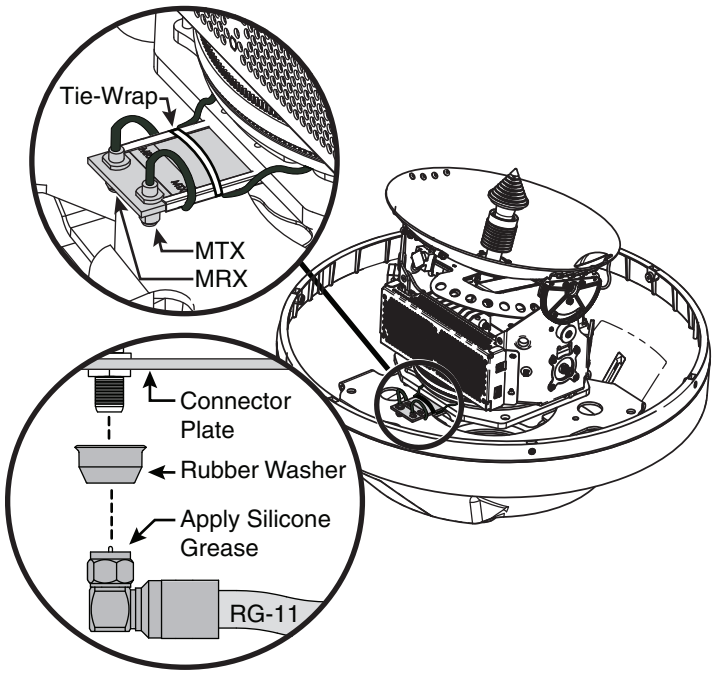


Figure 18: Connectors at Antenna



9 Mount the Antenna

Follow these steps to mount the antenna.

a. Place the antenna over the holes drilled in the mounting surface and make sure the forward arrow inside the baseplate points toward the bow and is parallel to the vessel's centerline (see Figure 19). The antenna's baseplate should rest squarely atop the foam seal.

> **CAUTION**
>
> Be sure to observe the safe handling instructions in the Material Safety Data Sheet (MSDS) provided with the anti-seize lubricant.

b. Apply a thin layer of the supplied anti-seize lubricant to the threads of the four 1/2"-13 mounting bolts to prevent galling.

c. Using a 3/4" socket, secure the baseplate to the mounting surface with four 1/2"-13 bolts and flat washers from above and four flat washers and locks nuts from below (*supplied in kit*), as shown in Figure 20. Tighten all four bolts until the four rubber feet on the baseplate are bottomed against the mounting surface and the foam seal is fully compressed. KVH recommends that you tighten the bolts with a 3/4" torque wrench set to 34 ft.-lbs (46.1 N-m).

NOTE: *If you mount the antenna to a surface with threaded inserts, the four lock nuts and flat washers used to secure the antenna from below will not be necessary.*

d. Reinstall the radome onto the baseplate. Secure in place with the six #10-32 screws you removed earlier (see Figure 11 on page 9).

e. Install a protective plastic screw cap (supplied in the kit) over each radome screw.

Figure 19: Forward Arrow in Antenna Baseplate

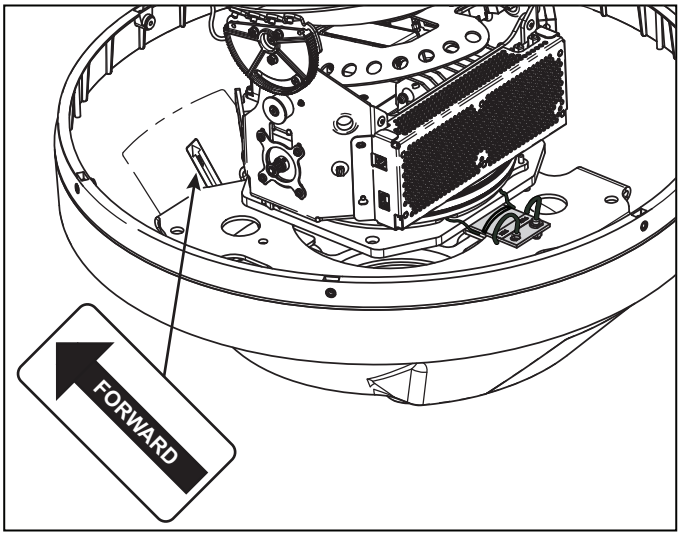
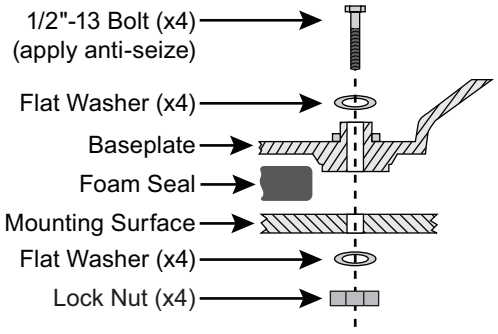


Figure 20: Mounting the Antenna to the Vessel (Side View)



10 Wire the ICM

Follow these steps to wire the belowdecks equipment (see page 48 for a complete wiring diagram).

Connect the ICM Jumper Cables

Connect the supplied straight-through Ethernet jumper cable from the "B1" jack to the "B2" jack on the rear panel of the ICM (see Figure 21).

Attach the Wi-Fi Antennas

Connect the two supplied Wi-Fi antennas to the rear panel of the ICM (see Figure 21).

Connect the Antenna Power/Data Cable

a. First dress the power/data cable from the antenna. Strip back the insulation of each wire approximately 1/4" (6 mm) and gently twist each wire to ensure a good electrical connection.

b. Connect the antenna power/data cable to the supplied 16-position terminal strip connector as shown in Figure 22.

> ***IMPORTANT!***
>
> The diagram refers to wires by **body color/ stripe color**. For example, "Brown/White" means the brown wire with white stripe.

c. Place the terminal strip connector into the base of the supplied cable shroud as shown in Figure 23.

d. Secure the end of the power/data cable to the base of the shroud using the supplied clamp. This clamp will help relieve stress on the cable. Secure the clamp in place with the two screws.

e. Carefully fit all of the power/data cable's wires within the base of the shroud.

f. Snap the shroud's cover onto the base. Be sure not to pinch any wires between the cover and the base.

g. Plug the terminal strip connector into the rear panel of the ICM.

Figure 21: Jumper Cable and Wi-Fi Antenna Connection

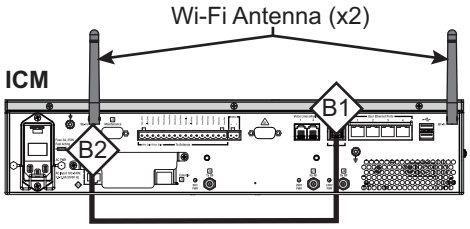


Figure 22: Antenna Power/Data Wiring

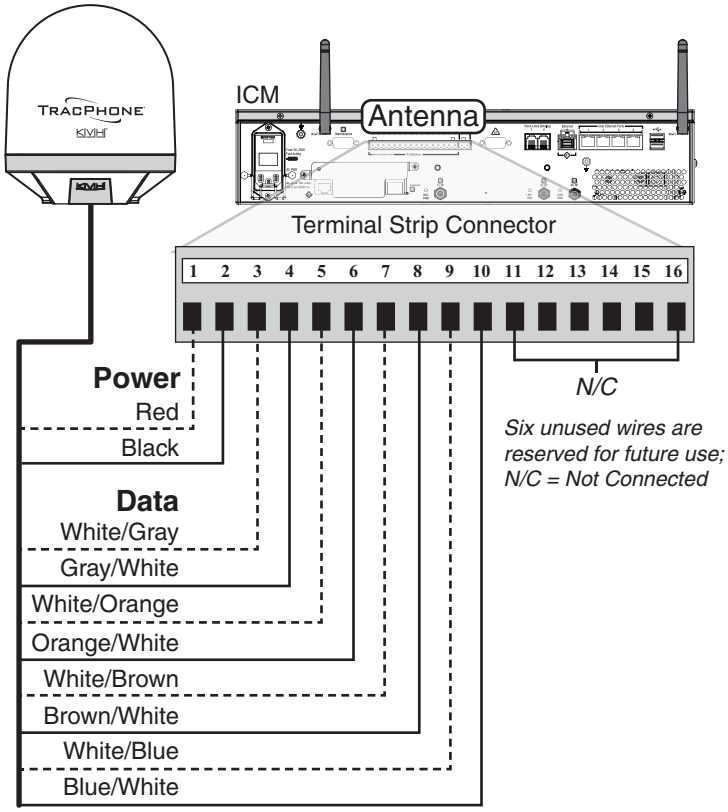
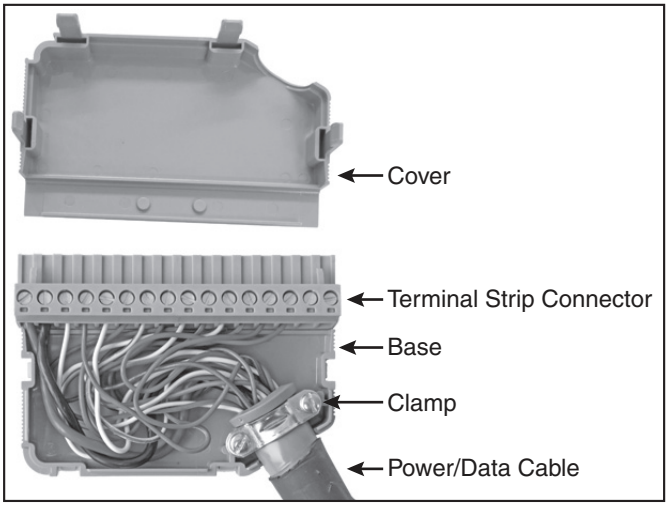


Figure 23: Power/Data Cable Shroud



10 Continued Wire the ICM

Connect an NMEA 0183 Talker

The antenna **requires** a vessel heading input from a customer-supplied NMEA talker. Optionally, you can also provide a vessel position input to serve as a backup to the antenna's internal GPS.

To supply both the required heading and the optional position to the ICM, you can either connect an NMEA 0183 talker that transmits both messages, or connect two devices using an NMEA data multiplexer, such as Actisense® model NDC-4.

a. Configure the customer's NMEA 0183 talker(s) to transmit a compatible message or messages at 4800 baud (see Figure 24). Refer to "Verifying the NMEA 0183 Message" on page 47 to confirm that the message is transmitting successfully.

NOTE: *The system does not accept messages that conform to either the NMEA 2000 or NMEA 0183 HS standards.*

b. Make sure the data message(s) includes the checksum, identifiable by a ***xx** field at the end of the data sentence (e.g., $HEHDT,123.4, T***1F**).

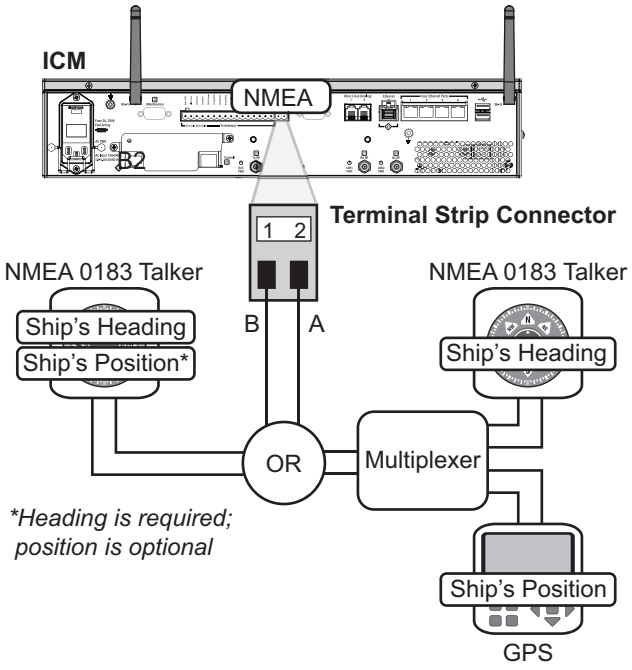
c. Connect the NMEA 0183 talker or NMEA data multiplexer to the supplied 2-position terminal strip connector as shown in Figure 25.

d. Plug the terminal strip connector into the rear panel of the ICM.

Figure 24: Compatible NMEA 0183 Inputs

Data Type	Compatible Messages
True or Magnetic Heading	$--HDG $--HDM $--HDT $--OSD $--THS $--VHW
Position	$--RMC

Figure 25: NMEA Wiring



10 Continued Wire the ICM

Connect the RF Cables

IMPORTANT!

If you are using LMR-600-75 RF cables, do not connect them directly to the ICM. Connect the supplied 1 ft (30 cm) pigtail cables between the RF cables and the ICM. Be sure to use the pigtail cable labeled "TX ONLY" at the ICM's "J2 Tx RF" jack.

a. Connect the RF coax cable labeled "RX" to the "J1 Rx RF" jack on the back of the ICM (see Figure 26). Hand-tighten, then tighten with a 7/16" torque wrench set to 20 in.-lbs.

b. Connect the RF coax cable labeled "TX" to the "J2 Tx RF" jack on the back of the ICM. Hand-tighten, then tighten with a 7/16" torque wrench set to 20 in.-lbs.

IMPORTANT!

Be sure the RF cables are terminated properly with type "F" connectors.

c. Remove the tag from the "J4 Rx RF" jack on the back of the ICM (see Figure 27). Then connect the supplied RF terminator to the "J4 Rx RF" jack according to the tag's instructions. Hand-tighten, then tighten with a 7/16" torque wrench set to no more than 20 in.-lbs.

IMPORTANT!

The RF terminator (KVH part no. 19-0972) must be installed on the "J4 Rx RF" jack. Improper cable installations are not covered under KVH warranty.

Figure 26: Antenna RF Transmit and Receive Wiring

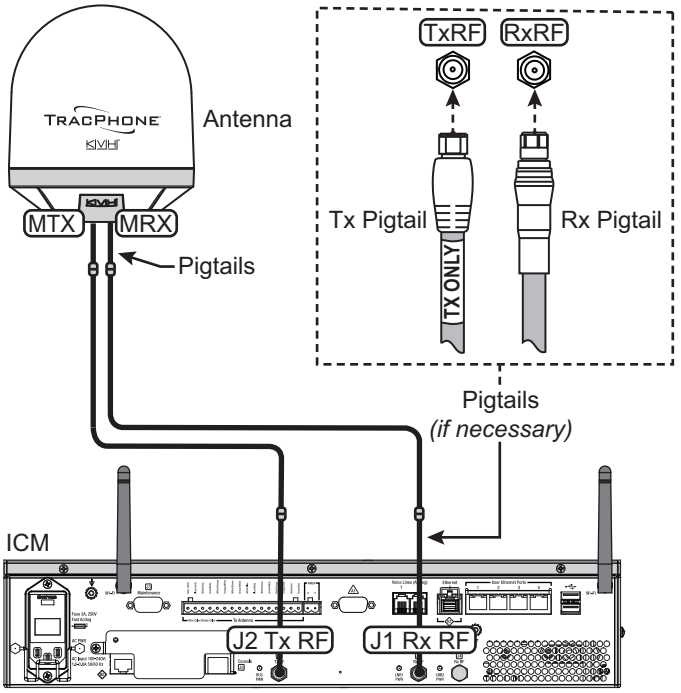
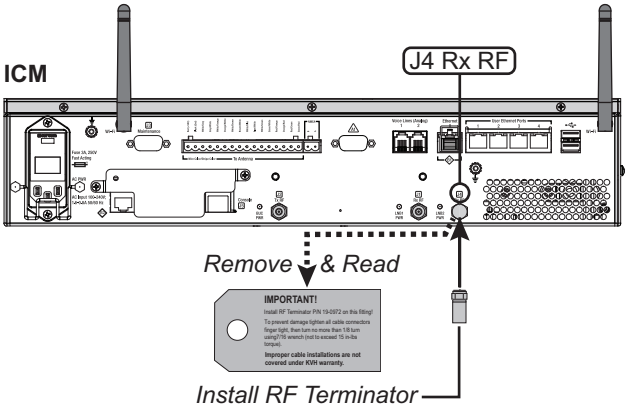


Figure 27: RF Terminator and Instructions Tag



11 Connect Power

Before you begin, be sure that you understand the following important requirements:

AC Power Requirements

The TracPhone system is designed to run on 3-wire single-phase AC power (hot, neutral, and ground). Voltage between hot-neutral and hot-ground should each measure between 100-240 VAC.

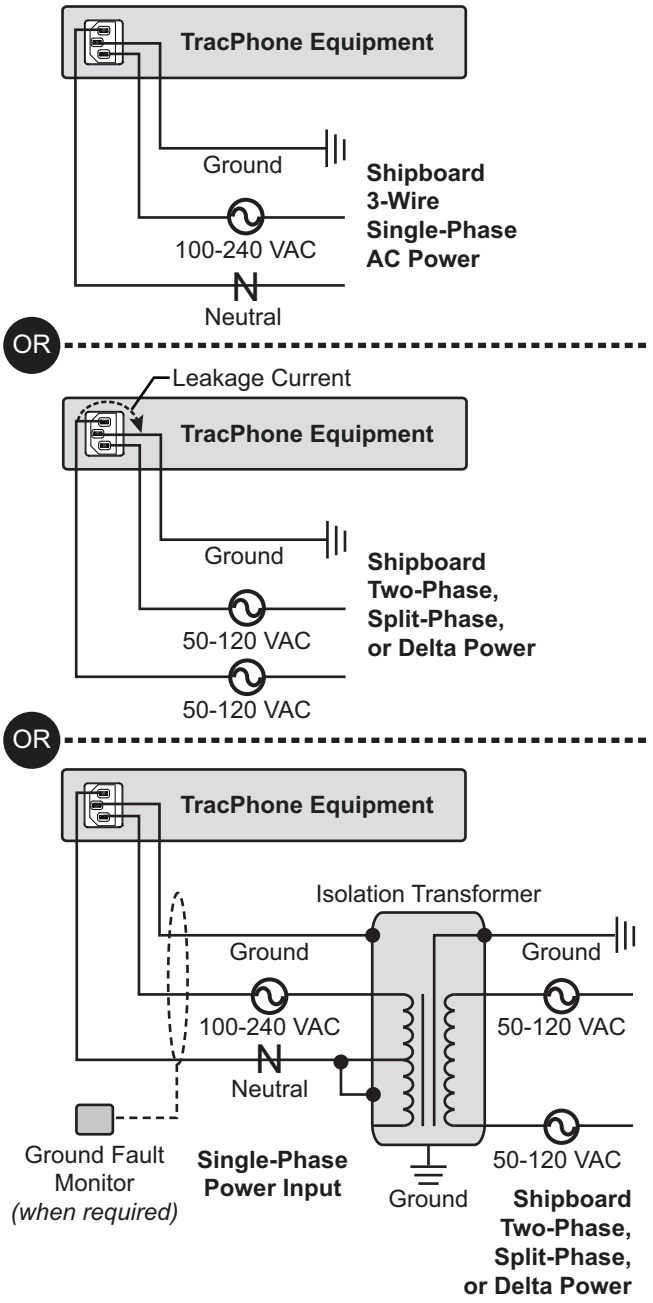
Many large ships use two-phase, split-phase, or delta power instead (3 wires: hot, hot, and ground; no neutral). In this case, voltage between hot-hot measures the proper voltage (100-240 VAC); while hot-ground measures only half the voltage (50-120 VAC). Although the TracPhone system can operate on this type of power, the excess voltage present on the second phase will cause a small amount of current to leak onto ship's ground. This leakage current might be unacceptable on some vessels. So check with the customer or ship's electrician and get permission before you run the system on two-phase power. Also be sure to ground the system, as explained below.

If two-phase power is the only available power source onboard, and if leakage current is unacceptable, KVH recommends that you install a suitable isolation transformer to supply single-phase power to the antenna system and run a ground wire from the transformer to ship's ground. In addition, since ground fault protection devices cannot detect faults behind a transformer, you will also need to install a ground fault monitoring device between the isolation transformer and the antenna system if ground fault protection is required on the vessel.

Grounding Requirements

Proper grounding of the TracPhone system to ship's ground is critically important, as it protects the equipment from lightning and electrostatic discharges (ESD). Failure to ground the chassis of the ICM risks damage to the antenna and electric shock.

Figure 28: AC Power Options



11 Continued Connect Power

Once you have read and understand the requirements described on page 17, follow these steps to connect power to the TracPhone system.

a. Before you begin, disconnect vessel power and be sure the vessel is properly grounded in accordance with marine standards.

b. Connect the supplied ground wire from the ground point on the ICM rear panel to ship's ground (see Figure 29).

c. Connect the supplied AC power cord to the ICM.

> **WARNING**
>
> **Failure to ground the TracPhone system properly to ship's ground will cause an unsafe floating ground condition, risking damage to the antenna and electric shock, potentially resulting in DEATH.** In a floating ground condition, the difference between the equipment's chassis ground and the ship's ground can measure well over 100 volts, when it normally should not exceed 2 volts. Therefore, always measure the difference in potential between chassis ground and ship's ground to make certain that there is no dangerous floating ground condition, even if the ground pin of the vessel's AC power plug appears to be intact.

d. Using tie-wraps, secure all wires to the strain-relief bracket at the back of the ICM (see Figure 30). Leave enough slack for easy serviceability.

e. Double-check all of your wiring.

f. Plug the ICM power cord into the vessel's 100-240 VAC supply.

NOTE: *Consider installing an uninterruptible power supply (UPS) to avoid service interruptions during power outages and transitions to/from shore power.*

Figure 29: Power Wiring

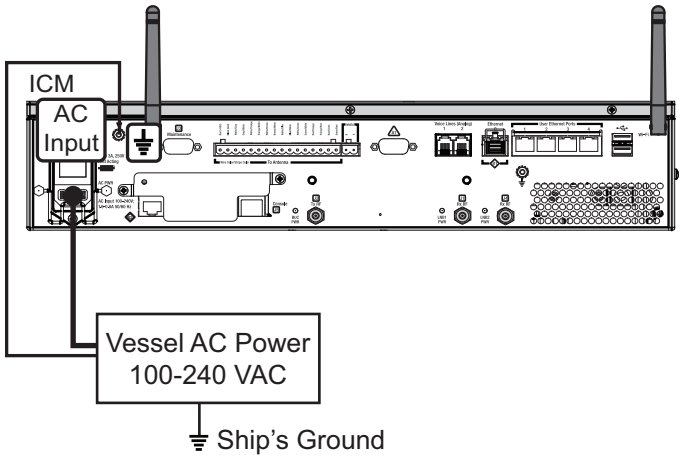
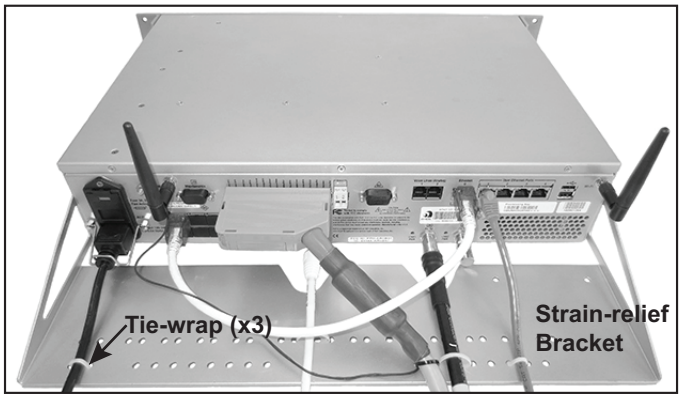


Figure 30: Strain-Relief Bracket



12 Turn On the System

Follow these steps to turn on the system.

a. Ensure the antenna has a clear, unobstructed view of the sky.

b. Apply vessel power to the TracPhone system.

c. Press the power button on the front of the ICM (see Figure 31). The button's light should illuminate blue.

d. Measure the AC and DC voltages between the ground point on the ICM's rear panel (chassis ground) and ship's ground. Make sure you measure less than 2 VAC/2 VDC.

e. Wait at least 5 minutes for system startup.

f. After the startup sequence is complete, verify that the ICM's Control Unit status light is lit solid green and the Antenna and Modem lights are lit solid or flashing green (see Figure 32).

g. Connect your PC to the "User Ethernet 1" port on the rear panel of the ICM (see Figure 33).

h. Turn off the Wi-Fi on your PC and keep it turned off while connected to the ICM.

i. Open a web browser on your PC and enter the following address: **http://minivsat.kvh**.

Verify that the TracPhone V3-HTS web interface appears in your browser. If the web interface is not displayed, enter the ICM's IP address *(you can find this address on the LCD: go to Settings > Network Settings > IP Assignments)* and make sure your PC is configured for DHCP (see page 42).

Figure 31: Power Button

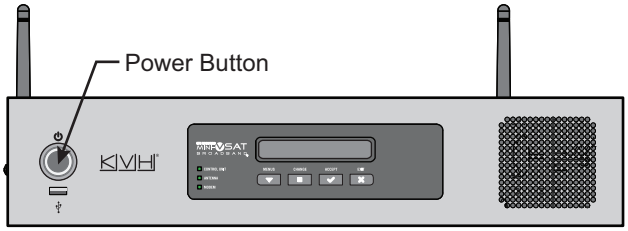


Figure 32: Status Lights

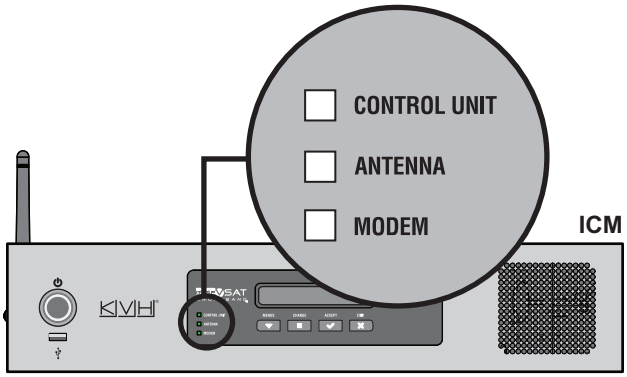
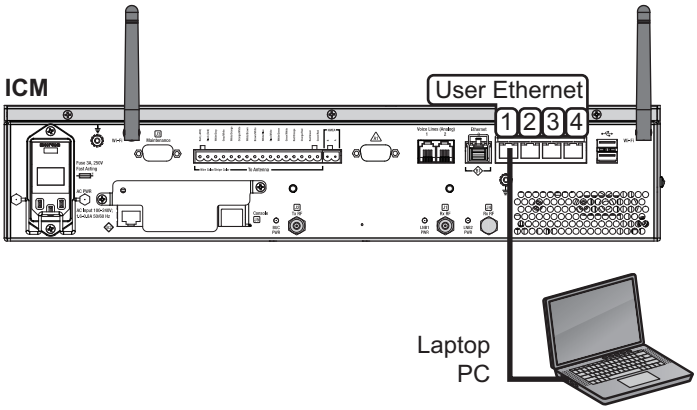


Figure 33: Connecting Your Laptop to the ICM



13 Update the System Software

If Necessary

Follow these steps to ensure the latest software is installed in the TracPhone system.

Check the Current Software Version

a. Go to the TracPhone V3-HTS web interface and click the **Updates** tab. Note the displayed ICM/Antenna software version (see Figure 34).

b. If the reported software version is earlier than the latest version you downloaded from the KVH Partner Portal, update the system following the steps below.

Update the Software, If Necessary

NOTE: *This procedure explains how to update the software using the TracPhone V3-HTS web interface. However, you can also update the software using the mini-VSAT iPhone®/iPod Touch® app, a USB drive, or, if the system is activated, via the antenna's Internet connection (airtime charges may apply). Details are available in the Help.*

a. Click **Choose File**.

b. At the Login window, enter the default password: "**password**".

c. Click **Browse** and navigate to the file you saved on your laptop (see Figure 35).

d. Click **Check File**.

e. At the confirmation message, click **Update**.

f. Wait for the software update to complete. It might take up to 40 minutes.

Figure 34: Updates Page on Web Interface

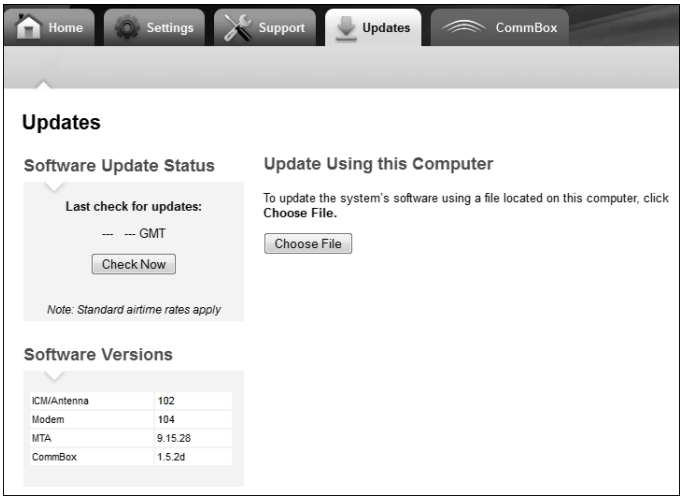
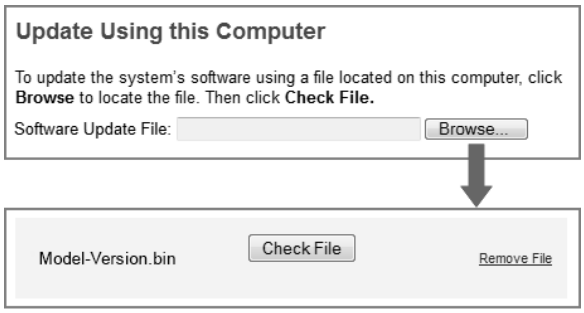


Figure 35: Update File Selected for Upload



14 Customize the Web Interface

Follow these steps to customize the web interface for the customer's use.

Set the Administrator Password

The user must be logged in as an administrator to make changes to the system's configuration. Follow these steps to change the administrator password to something unique.

a. At the TracPhone V3-HTS web interface, click the **Settings** tab. Then click **Account**.

b. In Security, click **Edit**.

c. For the current password, enter the default password: "**password**" (see Figure 36).

d. Enter and then re-enter the new password. Then click **Save Settings**.

Enter the Vessel Name

The vessel name is displayed on the home page and in all support communications. Follow these steps to enter the correct vessel name.

a. At the TracPhone V3-HTS web interface, click the **Settings** tab. Then click **Account**.

b. In Vessel Name, click **Edit**.

c. Enter the vessel name (see Figure 37). Then click **Save Settings**.

Assign Phone Line Name(s)

The phone line names are displayed on the home page and in all support communications. Follow these steps to assign a name (i.e., location) to Line 1. You also might want to enter "Not Used" for Line 2, since the system is limited to a single phone line.

a. At the TracPhone V3-HTS web interface, click the **Settings** tab. Then click **Other**.

b. In Phone Line Names, click **Edit**.

c. Enter names for Lines 1 and 2, as needed (see Figure 38). Then click **Save**.

Figure 36: Setting the Administrator Password

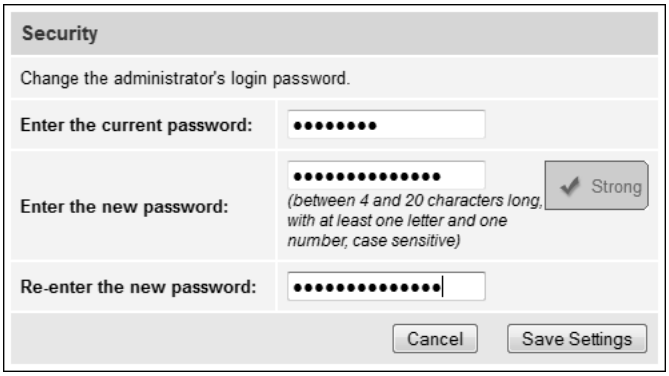
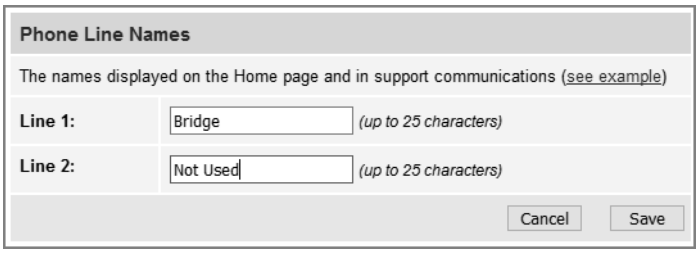


Figure 37: Entering the Vessel Name

Figure 38: Assigning Phone Line Names



15 Set Up No-Transmit Zones

Optional

To prevent exposure to RF energy (see the hazard area illustration on page 1), you can configure up to two no-transmit zones for areas where crew and/or passengers frequent (see Figure 39). The system will disable the transmitter whenever the antenna is pointing within one of these zones.

Follow these steps to set up a no-transmit zone.

a. Determine the necessary azimuth range for the no-transmit zone(s). You will need to enter, in clockwise order, beginning and ending azimuths that define the outer boundaries of the zone(s) **relative to the antenna's forward arrow**, which should be pointing toward the bow (see Figure 40).

NOTE: *Each no-transmit zone must span at least 5°. Therefore, be sure to set the beginning and ending azimuths at least 5° apart.*

b. At the TracPhone V3-HTS web interface, click the **Settings** tab. Then click **No-Transmit Zones**.

c. Click **Edit**.

d. Click **Enforce Zones** (see Figure 41).

e. Enter the azimuth range for Zone 1.

f. Enter the azimuth range for Zone 2, if required.

g. Click **Save All Settings**.

h. At the confirmation message, click **Save**.

Figure 39: Example of a No-Transmit Zone

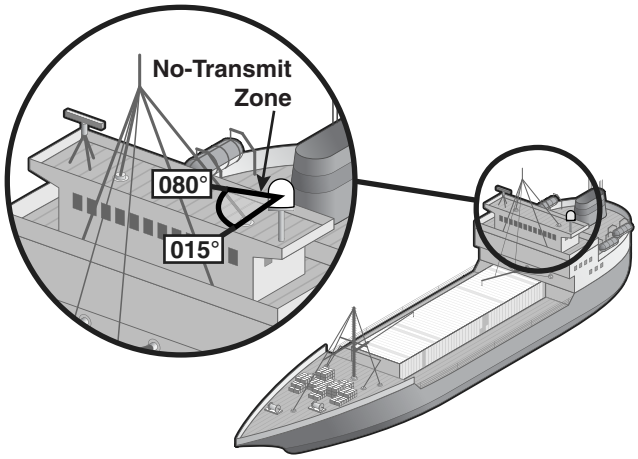


Figure 40: Azimuths Relative to Antenna's Forward Arrow

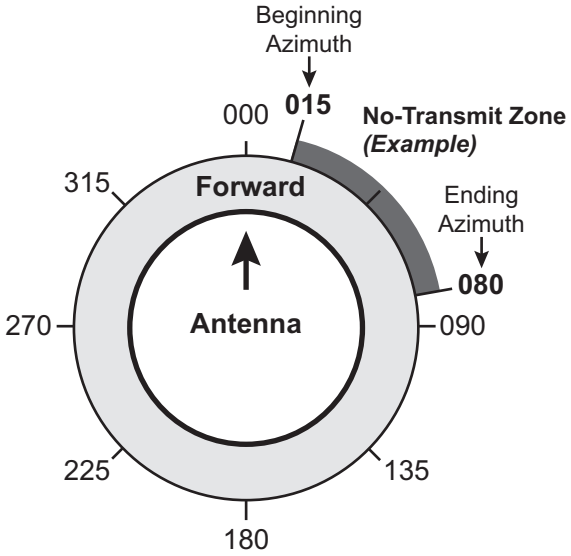
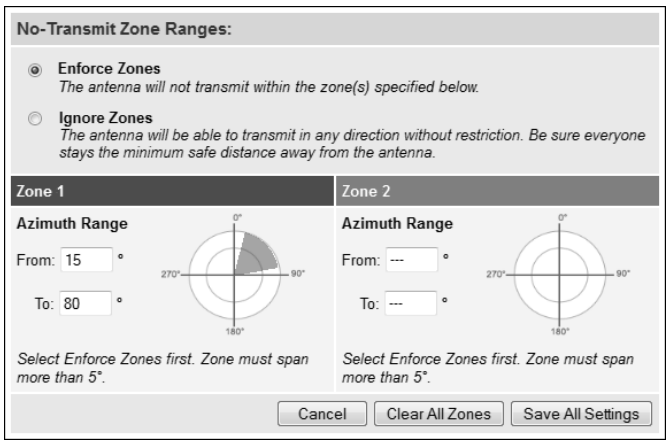


Figure 41: No-Transmit Zones Page of Web Interface



16 Commission the Modem

Follow these steps to commission the ICM's built-in modem, if required.

IMPORTANT!

If the modem was commissioned at the factory (look for a notice attached to the ICM), you can skip this step as long as you are using RG-11 RF cables 80-100 ft (25-30 m) in length. If a notice is not attached to the ICM, or you used a different RF cable type or length, or you installed a different antenna from the unit that shipped with the ICM, you must complete this step.

This process is required to determine the 1 dB compression point of the BUC (block up-converter) (see Figure 42) and the maximum transmit power. The process takes about 30 minutes to complete.

a. Ensure the antenna has a clear, unobstructed view of the sky.

b. At the TracPhone V3-HTS web interface, verify that the antenna is tracking the service satellite and the system is online (see Figure 43).

c. Click the **Support** tab and gather all the information listed on the Modem Commissioning Worksheet (supplied in the Welcome Kit).

d. Call KVH Technical Support. KVH will coordinate with the Network Operations Center (NOC) to complete the remaining commissioning steps over the air. You will just need to provide the information you noted on the worksheet.

NOTE: *If the NOC is unable to access the system remotely over the satellite connection, you will need to assist with the commissioning process by adjusting settings at the modem's local web interface as directed by the NOC. Refer to "Full Commissioning Steps" on page 32 for details.*

Figure 42: BUC's 1 dB Compression Point Determination

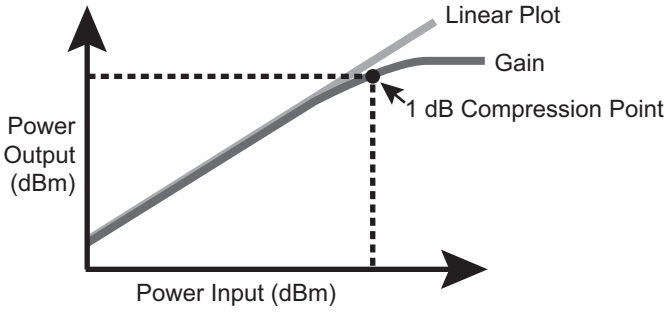


Figure 43: Good Service Connection Indicated on Home Page

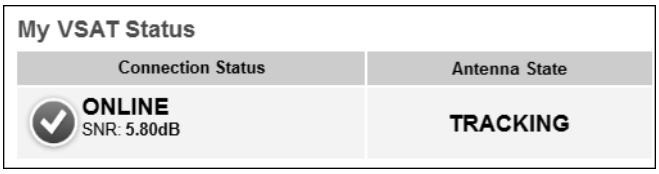


Figure 44: Modem Commissioning Worksheet Information

No.	Item	Value
1	Antenna State "TRACKING" required	
2	Orbital Slot	
3	Satellite Name (see table below)	
4	Beam ID	
5	Frequency	
6	Management IP	
7	Vessel Position	Lat: Long:
8	Modem State "IN_NETWORK" required	
9	FL Carrier Symbol Rate (2nd field)	
10	Modem S/N	

17 Test the System

Follow these steps to test the system for proper operation.

a. Ensure the antenna has a clear, unobstructed view of the sky.

b. Verify that the antenna is tracking the service satellite and the system is online, as indicated by the Home page of the TracPhone V3-HTS web interface (see Figure 45).

c. On the Home page, make sure the vessel's heading is displayed in the Real-time Vessel & VSAT Satellite Display (see Figure 46). If it is not shown, check your wiring to the NMEA 0183 talker.

d. Enter the following address in your web browser: **http://test.minivsat.net**.

Verify that the Welcome page appears, indicating good communication between the TracPhone system and the land-based hub (see Figure 47).

e. Turn on all other electronic equipment above deck within the proximity of the antenna. Verify that the system continues to operate without any degradation in performance.

f. Fill out the Installation Checklist (provided in the Customer Welcome Kit) and return it to KVH. Refer to the instructions on the form.

IMPORTANT!

Submission of the Installation Checklist is **required** to certify the quality of your installation.

Figure 45: Good Service Connection Indicated on Home Page

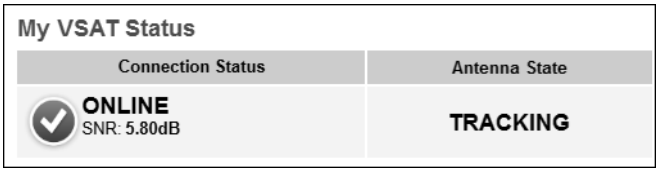


Figure 46: Heading Displayed on Home Page

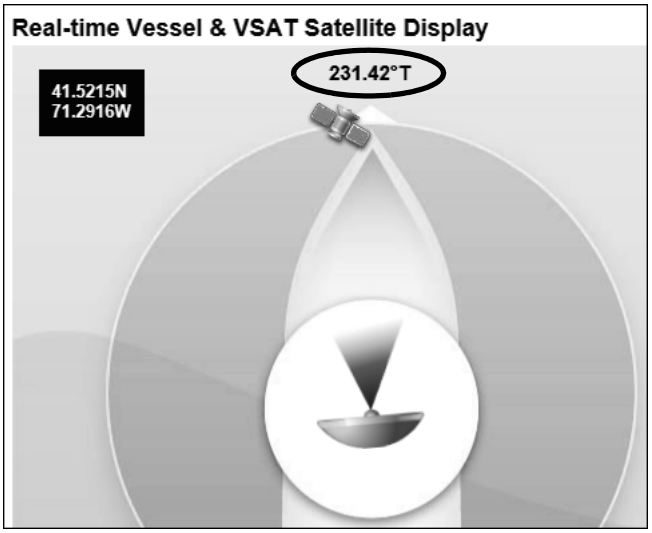
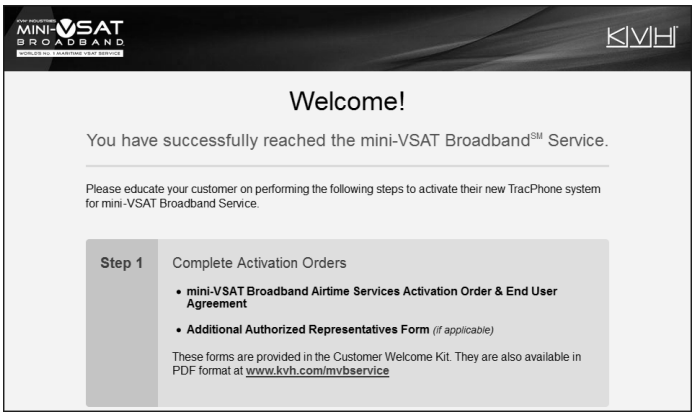


Figure 47: Welcome Page for Testing



18 Configure the Network

The ICM includes four Ethernet ports and a built-in wireless access point (WAP) that can be configured in a variety of ways to meet the customer's needs (see Figure 48). Some of the most common ICM network configurations can be selected directly from the TracPhone V3-HTS web interface. Follow these steps to select one of these configurations. If the customer requires a custom configuration, please contact KVH Network Services at **networkservices@kvh.com**.

NOTE: *The customer may also change the ICM's network configuration at the mini-VSAT Manager (go to **www.mykvh.com**). To access the mini-VSAT Manager, the customer will need to log in with the username and password provided by KVH at the time of activation.*

a. At the TracPhone V3-HTS web interface, click the **Settings** tab. Then click **Network Settings**.

b. In Network Configuration, click **Edit**.

c. Select an option from the **Configuration** drop-down menu. Then click **Save** (see Figure 49 and Figure 50).

d. At the confirmation message, click **Save**.

e. Follow the additional instructions on the following pages for your chosen configuration.

Standard Configuration: Go to page 26

Static IP Configuration: Go to page 27

Access Control Configuration: Go to page 28

Figure 48: ICM Ethernet Ports and Wireless Access Point

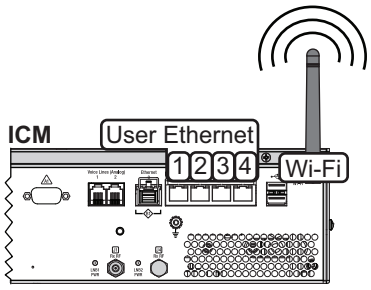


Figure 49: Selecting a Network Configuration

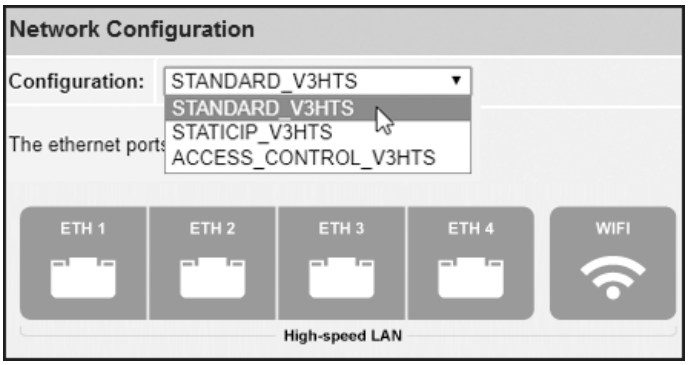


Figure 50: User Selectable Network Configurations

Option	Description
Standard Configuration	Ports 1-4, Wi-Fi: High-speed LAN with unrestricted access
Static IP Configuration	Ports 1-3, Wi-Fi: High-speed LAN with unrestricted access Port 4: Accessory LAN*
Access Control Configuration	Ports 1-3, Wi-Fi: High-speed LAN with access control Port 4: Accessory LAN*

* Accessory LAN reserved for optional service, such as Global Static IP, external MTA, or Crew Calling.

18 Continued Configure the Network

Standard Configuration

In a standard configuration, Ethernet ports 1 through 4 and the built-in WAP provide high-speed Internet access with no user logins or controls. Internet access is unrestricted. This is the default configuration. Follow these additional steps to configure the network.

a. To enable the ICM's WAP for wireless access, follow the steps in "ICM Wireless Settings" on page 29.

b. Connect the customer's computers and/or other network devices to the ICM (see Figure 52). You might wish to add an external WAP (or Wi-Fi router configured for bridge mode) to supplement Wi-Fi access.

c. Make sure all computers are configured for DHCP addressing (see page 42). Devices connected to the ICM (via Ethernet cables or Wi-Fi) will receive IP addresses from the ICM via DHCP. The ICM serves as a router.

NOTE: *By default, the High-speed LAN has a gateway of 192.168.5.1 and assigns IP addresses in the 192.168.6.50-150 range. If this configuration conflicts with an existing onboard network, you may change the settings at the TracPhone V3-HTS web interface (go to Settings > Network Settings).*

Figure 51: Standard Configuration

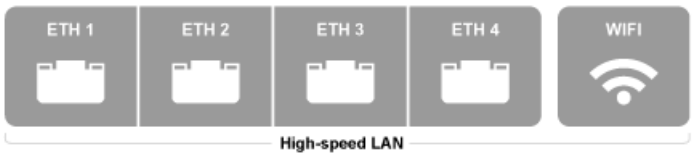
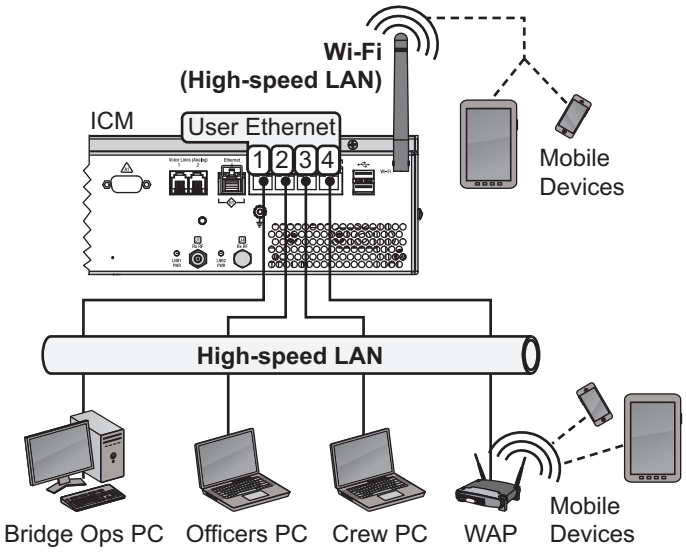


Figure 52: Standard Configuration Wiring Example



Static IP Configuration

In a static IP configuration, Ethernet ports 1 through 3 and the built-in WAP provide high-speed Internet access with no user logins or controls. Internet access is unrestricted. Port 4 is reserved for an optional KVH service, such as Global Static IP.

Global Static IP service allows you to set up a network device with an IP address that can be accessed directly from the Internet. It does not receive an IP address from the ICM. If you require Global Static IP Service, follow these additional steps to configure the network.

IMPORTANT!

A static IP address should only be assigned to a secure device, such as a firewall router.

a. Ask the customer to fill out the request form at **www.kvh.com/staticip**. In addition, the system must be activated for mini-VSAT Broadband service, and it must remain online until KVH configures the system over the air.

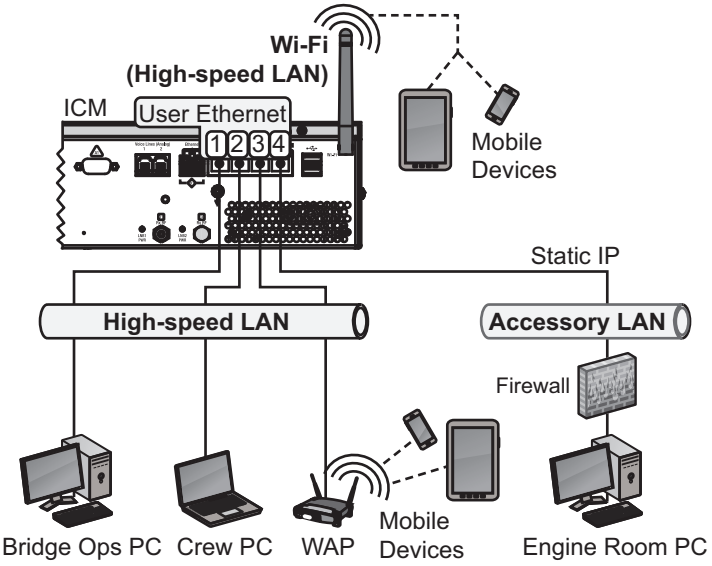
b. Connect the static IP device to "User Ethernet" port 4 on the ICM (see Figure 54).

c. The customer will need to configure the device's TCP/IP properties according to the instructions KVH will provide in an email upon fulfilling the static IP request.

d. Connect all other (non-static IP) computers and/or network devices to "User Ethernet" ports 1-3 and Wi-Fi, as required. Follow the steps in "Standard Configuration" on page 26.

Figure 53: Static IP Configuration

Figure 54: Static IP Configuration Wiring Example



18 Continued Configure the Network

Access Control Configuration

In an Access Control configuration, Ethernet ports 1 through 3 and the built-in WAP require a user login and provide high-speed Internet access. Port 4 is reserved for an optional KVH service, such as Global Static IP.

a. This configuration is identical to the static IP configuration described on the previous page with one exception: user names, passwords, and data allocations are enforced to control access to the High-speed LAN. Internet access is restricted.

b. Follow the steps in "Standard Configuration" on page 26.

c. Inform the customer that they need to set up user names and passwords and allocate data for each High-speed LAN user at the mini-VSAT Manager (**www.mykvh.com**).

Optional CommBox Software

CommBox software extends the system's network capabilities (see Figure 57). Two options are available:

- **Standard Bundle**: Provides least cost routing, onboard firewall, web caching, web image compression, ad removal, and URL and content filtering
- **Enterprise Bundle**: Adds automated file transfers, differential synchronization, mail relay server, web mail client, anti-spam and anti-virus filters, roaming crew accounts, and prepaid Internet and email services; integration with a CommBox hub is required

KVH will coordinate directly with the customer to select, install, and configure the appropriate bundle to meet their needs.

Figure 55: Access Control Configuration

Figure 56: Access Control Configuration Wiring Example

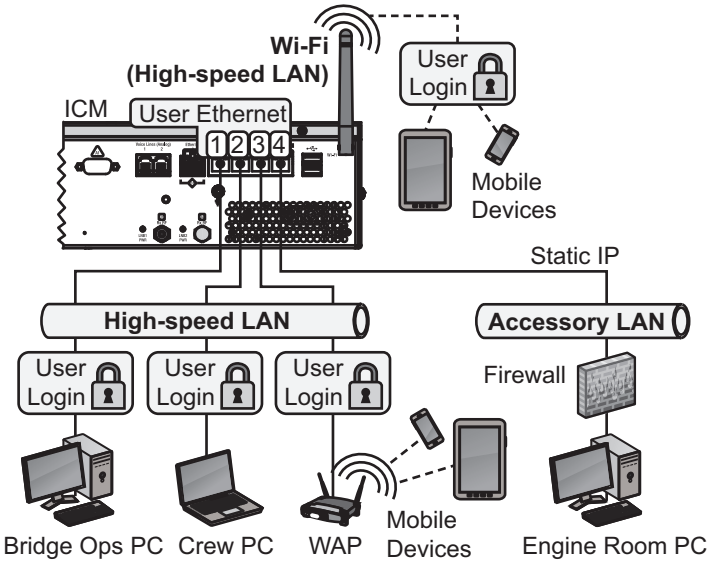


Figure 57: Available Network Options

Option	KVH Part No.
CommBox Standard Bundle*	35-0010
CommBox Enterprise Bundle*	35-0011

* *If the customer is interested in a CommBox solution, ask them to contact KVH Network Services at* ***networkservices@kvh.com*** *for a consultation.*

ICM Wireless Settings

With Wi-Fi enabled, vessel devices can connect to the ICM via its built-in wireless access point (WAP) and receive IP addresses from the ICM via DHCP (see Figure 58). Follow these steps to enable and configure the WAP, if desired by the customer.

IMPORTANT!

Establishing a wireless connection onboard a steel vessel might require a special external WAP and advanced networking expertise.

NOTE: *The customer may also change the ICM's wireless settings at any time at the mini-VSAT Manager (**www.mykvh.com**).*

a. At the TracPhone V3-HTS web interface, click the **Settings** tab. Then click **Network Settings**.

b. In Wi-Fi Settings, click **Edit**.

c. Set the following wireless options, then click **Save** (see Figure 59):

- **State:** Select On.
- **SSID**: Enter a unique name for the vessel network.
- **Protocol**: Select either 802.11b or 802.11g.
- **Security**: Select either security type – WPA2 or WEP (128-bit).
- **Password/Passphrase**: If you selected WPA2, enter a password (between 8-20 characters). If you selected WEP, enter a passphrase (must be 13 characters).
- **Channel**: Keep the default, or select any channel for wireless communications.

IMPORTANT!

Failure to apply security settings will make the vessel's wireless network vulnerable to outside intrusion.

d. At the confirmation message, click **Save**.

Figure 58: Wireless DHCP (Example)

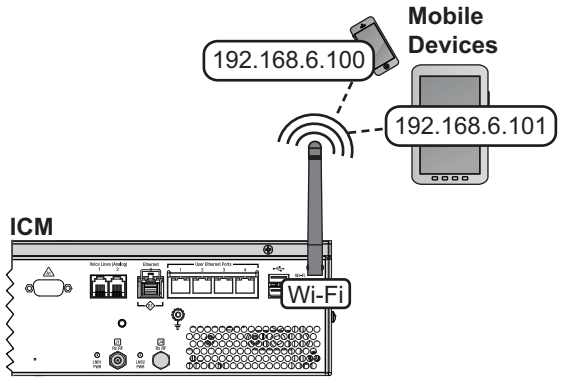
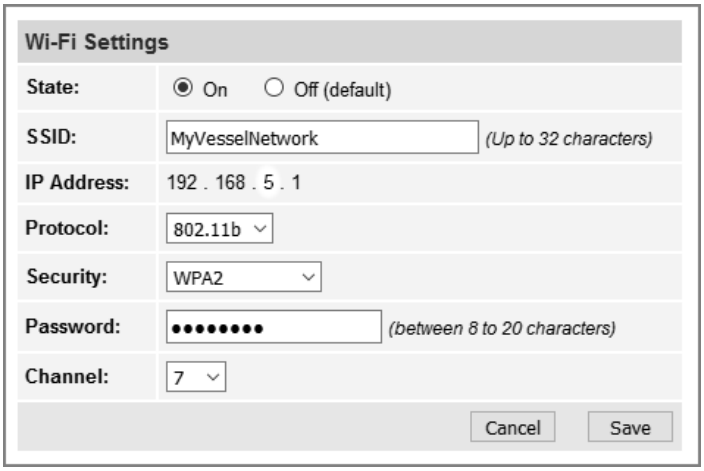


Figure 59: Wi-Fi Settings on the ICM



19 Connect Voice Line Equipment

Follow these steps to connect the vessel's phone.

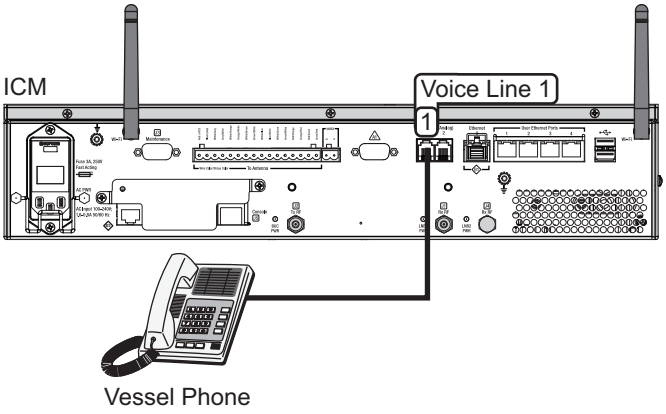
Connect the Vessel Phone

Using the supplied RJ-11 cable, connect the customer's analog (not digital) phone or PABX to the "Voice Line 1" jack on the ICM (see Figure 60).

IMPORTANT!

Do not connect anything to the "Voice Line 2" jack. Only "Voice Line 1" is enabled for use.

Figure 60: Connecting the Vessel Phone (Example)



20 Educate the Customer

Give the Welcome Kit to the customer, make sure they know the administrator and Wi-Fi passwords, and show them how to use the system. Be sure they understand the following:

- **The antenna transmits RF energy that is potentially harmful.** Whenever the system is powered on, make sure everyone stays the minimum safe distance away from the antenna (see illustration on page 1). If no-transmit zones were set up, make sure the customer understands where they are.
- Read the End User Agreement carefully (available at **www.kvh.com/mvbcustomercenter**).
- Keep the radome installed on the antenna at all times. The radome protects the antenna's moving parts from wind, rain, and debris.
- The antenna must have a clear view of the sky to communicate via satellite. Common causes of blockage include masts, trees, buildings, and bridges (see Figure 62). Dirt buildup on the radome can also affect communications.
- The vessel must be located within the coverage area of the satellite (see **www.kvh.com/minivsatmap**).
- The system must be activated for mini-VSAT Broadband service (see **www.kvh.com/mvbservice**).
- Data usage and overage alerts via email and text message, as well as user logins and their associated data allocations, can be configured easily over the Internet at the mini-VSAT Manager (see **www.mykvh.com**).

For More Information

Refer to the Help provided on the web interface's Support page (see Figure 63). The Condensed version is text only and resides on the ICM. The Extended version includes images and resides on the KVH website (airtime charges may apply).

Figure 61: Customer Welcome Kit

Figure 62: Example of Satellite Blockage

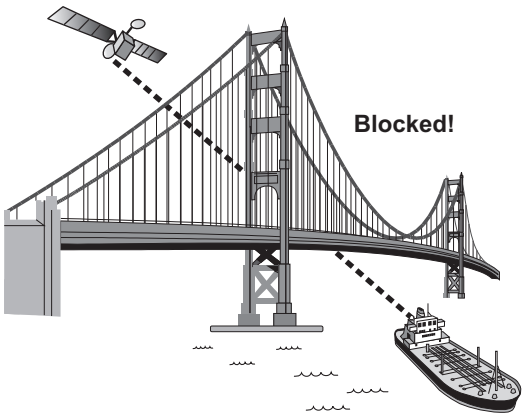
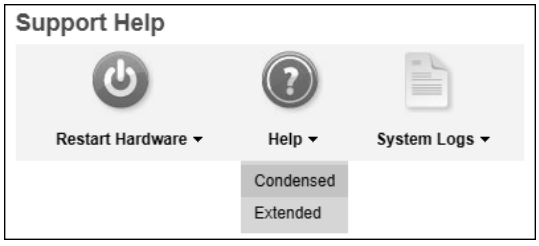


Figure 63: Help Options on Support Page



A Full Commissioning Steps

If you need to commission the modem (see “Commission the Modem” on page 23), and if the NOC is unable to access the TracPhone system remotely over the satellite connection (a rare case), follow the steps below to access the built-in modem’s web interface and assist the NOC with the commissioning process.

a. At the TracPhone V3-HTS web interface, click the **Support** tab.

b. Click the link on the Support page to open the modem commissioning wizard (see Figure 64). Then log into the wizard using the administrator password you set up earlier. The default settings are as follows:

- User Name: **admin**
- Password: **password**

c. At Step 1, click **Enter Commissioning Mode** (see Figure 65).

Figure 64: Support Page Link to Commissioning Wizard and Login

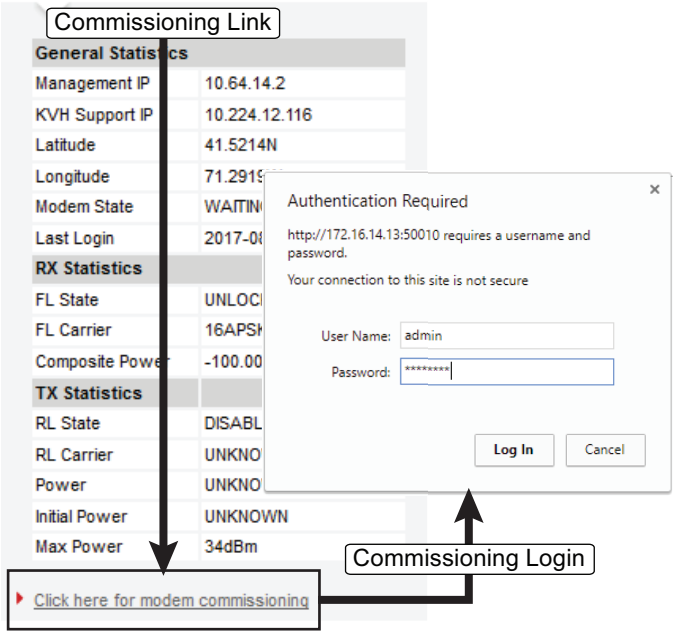


Figure 65: Commissioning Process – Step 1

d. At Step 2, click **Continue without changes** (see Figure 66).

IMPORTANT!

If you need to abort commissioning at any time, select **Exit commissioning mode**. *Cycling power will not revert the ICM to normal operation mode.*

e. At Step 3, enter your latitude and longitude (see Figure 67).

NOTE: *Select the direction (North/South, East/West) before entering each value.*

f. Enter the orbital slot (longitude) of the satellite the antenna is tracking.

NOTE: *Select the direction (East/West) before entering the value.*

g. Click **Save remote location and continue** (see Figure 67).

Figure 66: Commissioning Process – Step 2

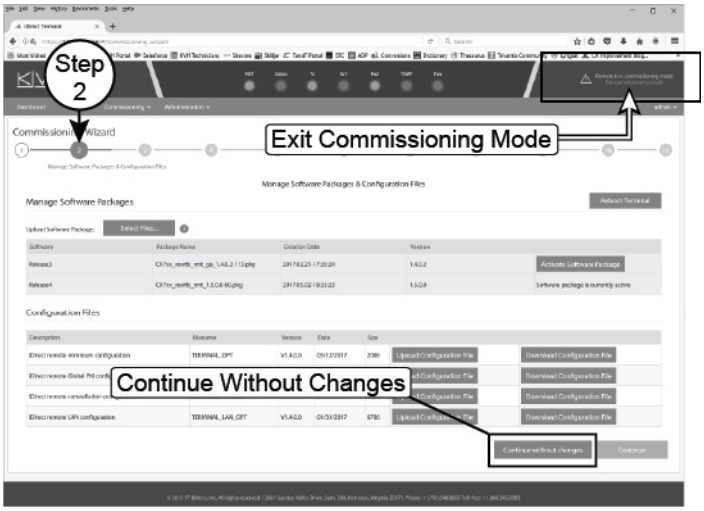
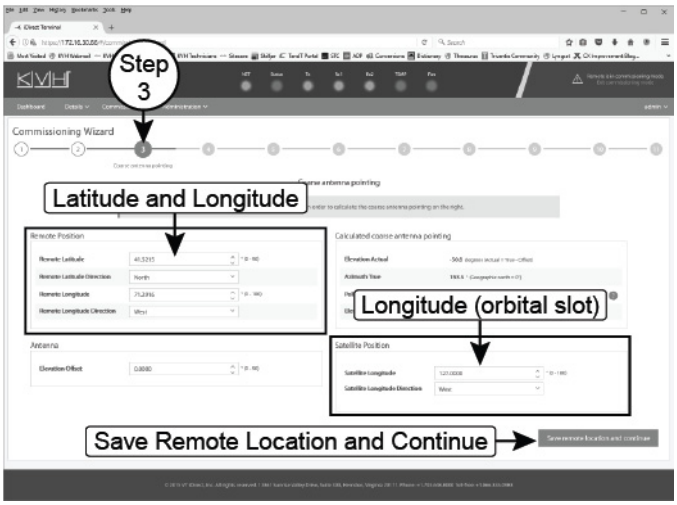


Figure 67: Commissioning Process – Step 3



h. At Step 4, enter the satellite parameters provided by the NOC (see Figure 68). Verify that the Frequency and the FL Carrier Symbol Rate match the values on the worksheet, and enter zeros for Latitude Variance and Polarization Skew.

When you are done, click **Continue and position antenna** (see Figure 68).

i. At Step 5, wait until you see the following (see Figure 69):

- Demod Lock Status: Locked
- Antenna Status: Functional, May Transmit

Then click **Stop Antenna pointing**.

Figure 68: Commissioning Process – Step 4

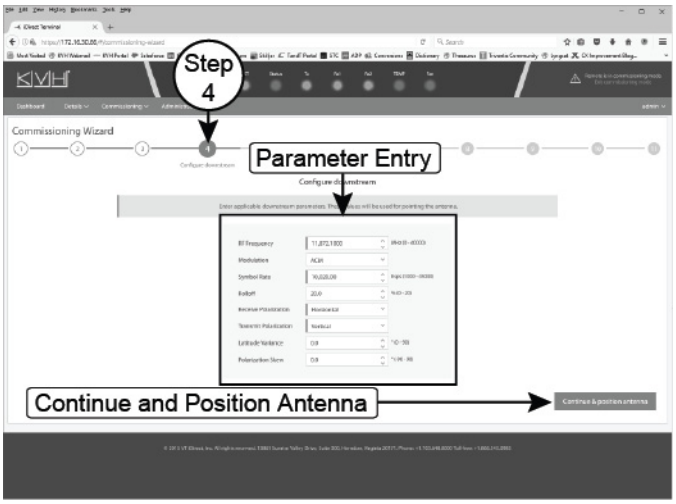
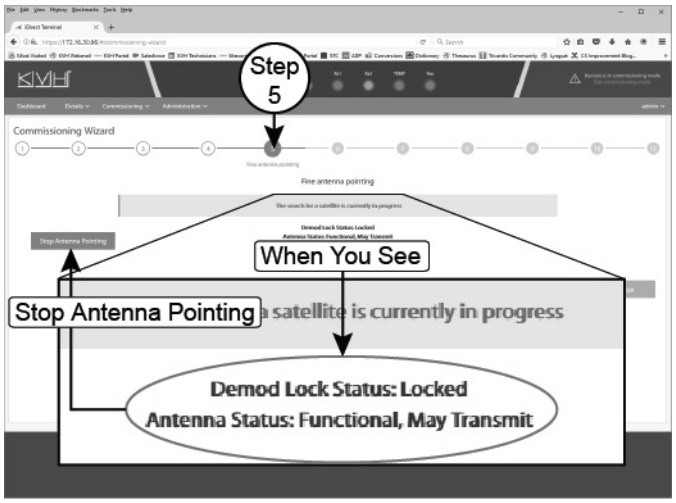


Figure 69: Commissioning Process – Step 5



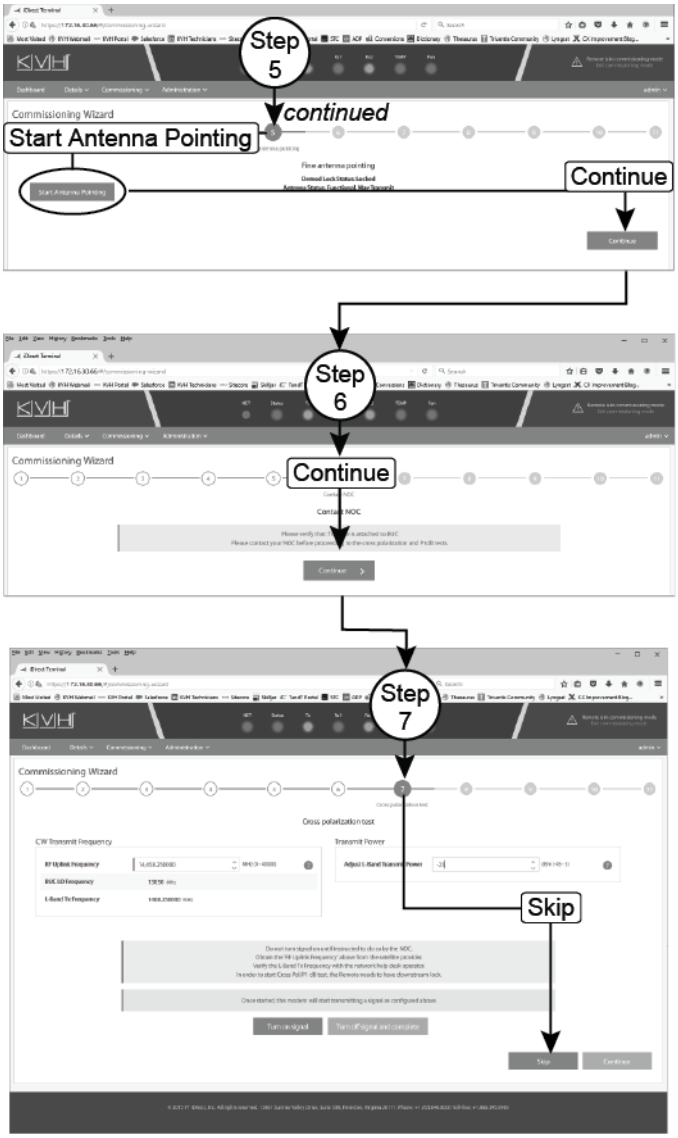
A Continued Full Commissioning Steps

j. When **Start Antenna Pointing** appears, click **Continue** (see Figure 70).

k. At Step 6, click **Continue** (see Figure 70).

l. At Step 7, click **Skip** (see Figure 70).

Figure 70: Commissioning – Steps 5 Through 7



m. At Step 8, select **CW modulation** and enter the **RF Uplink Frequency** and the initial **Transmit power** that the NOC provided (see Figure 71). Then click **Turn on signal**.

n. Continue by using **Adjust L-Band Transmit Power** to adjust the power in 1 dB increments as directed by the NOC and selecting **Apply changes** after each increment (see Figure 72). When directed, click **Turn off signal and complete**.

NOTE: *Take note of the P1dB compression value that is also provided by the NOC. You will enter this value later.*

o. Next, select **BPSK modulation** and enter the **RF uplink frequency** and the **Starting transmit power** (see Figure 73) provided by the NOC. Then click **Turn on signal**.

Figure 71: Commissioning – Step 8: CW Modulation

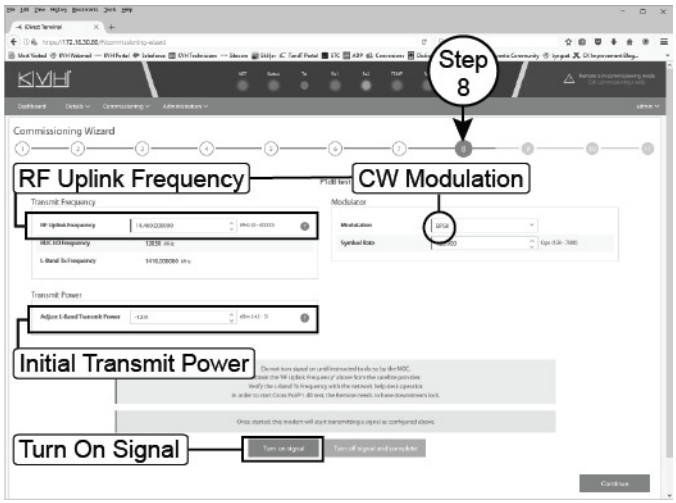


Figure 72: Commissioning – Step 8: CW Modulation *continued*

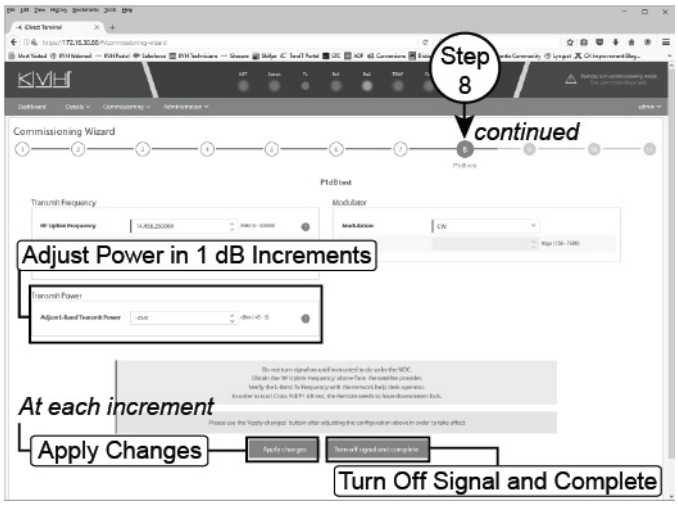
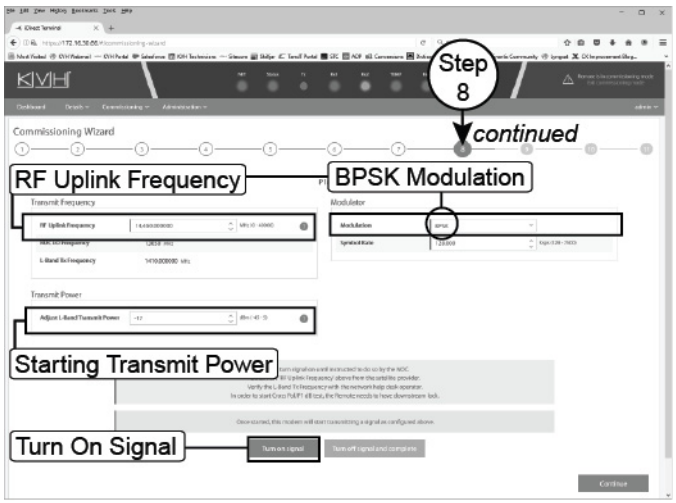


Figure 73: Commissioning – Step 8: BPSK Modulation



p. Continue by using **Adjust L-Band Transmit Power** to adjust the power in 1 dB increments as directed by the NOC and selecting **Apply changes** after each increment (see Figure 74). When directed, click **Turn off signal and complete**.

NOTE: *Take note of the Maximum transmit (TX) power value provided by the NOC.*

q. At Step 9, enter the **P1dB** compression value and the **Maximum transmit (TX) power** value provided by the NOC.

IMPORTANT!

Double-check your entries for the P1dB and Maximum TX Power. Maximum TX Power should **always** be one decibel less than the P1dB value. (For example, if P1dB = -15.0 dB then Max TX power = -16.0 dB.)

Then click **Continue** (see Figure 75)

r. At Step 10, click **Exit commissioning mode** (see Figure 76).

s. At Step 11, click **Return to dashboard** (see Figure 76).

Close the modem commissioning wizard. Commissioning is complete!

Figure 74: Commissioning – Step 8: BPSK Modulation *continued*

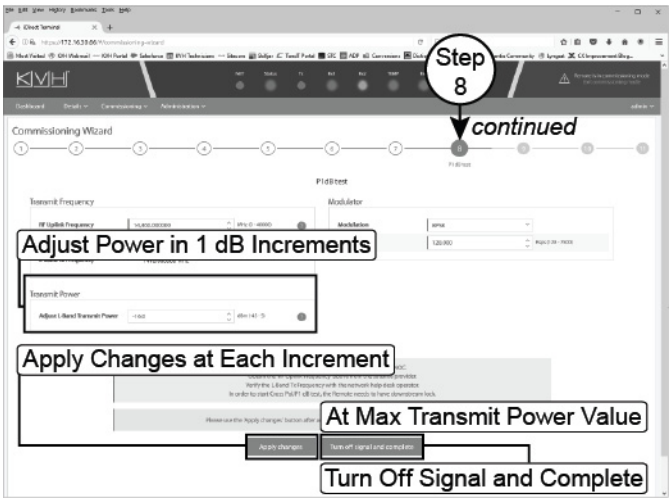


Figure 75: Commissioning – Step 9

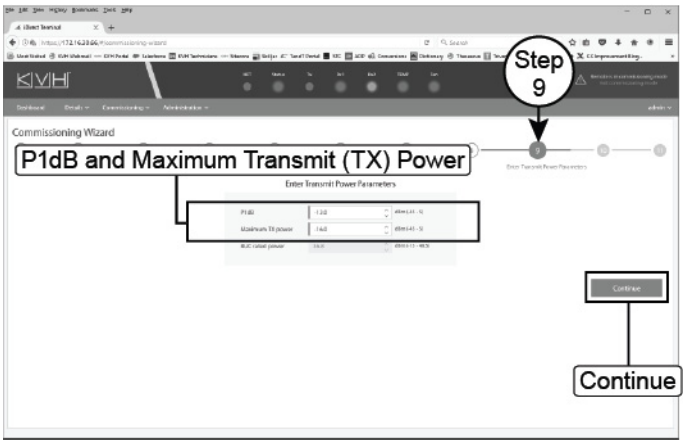
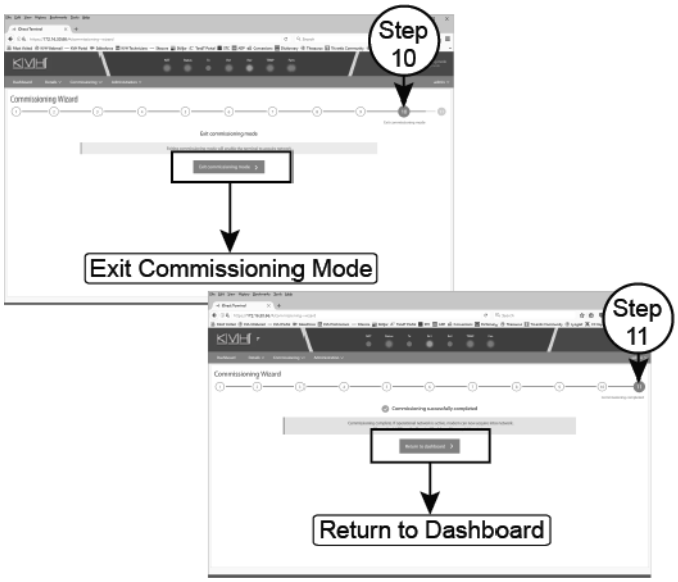


Figure 76: Commissioning – Steps 10 and 11



B Terminating LMR RF Cables

These instructions explain how to terminate an LMR-400-75 RF cable with an EZ-400-FMH-75 "F" connector using the tools from the TK-400EZ-75 tool kit. The same steps also apply to an LMR-600-75 cable, with the exception of the tools used.

For more detailed instructions, refer to the Times Microwave website: **www.timesmicrowave.com**.

1. Using the CCT-01 cutting tool, cut the cable evenly (see Figure 77).
2. Since cutting the cable can deform the end, gently round the end of the cable using a pair of needle-nose pliers (see Figure 78). Also make sure the center conductor is centered within the cable.
3. Place the heat shrink sleeve and metal ferrule onto the cable (see Figure 79).
4. Insert the end of the cable into the #1 end of the ST-400EZ stripping tool (see Figure 80). Then rotate the tool clockwise around the cable until the tool turns easily. The end of the cable should now be stripped to expose the center conductor.

Figure 77: Cutting the Cable

Figure 78: Reshaping the Cable

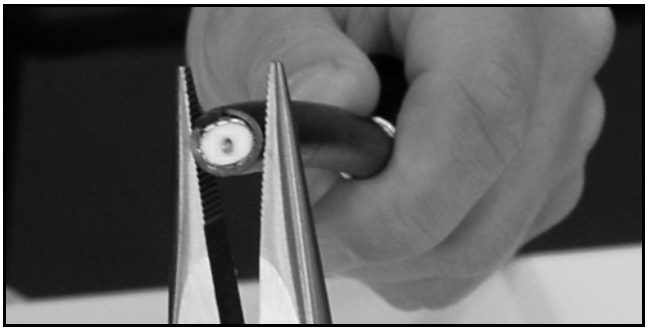


Figure 79: Placing the Heat Shrink Tubing and Ferrule

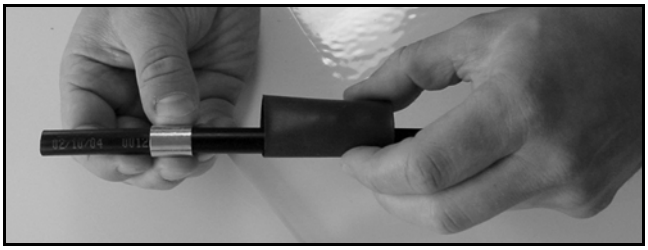
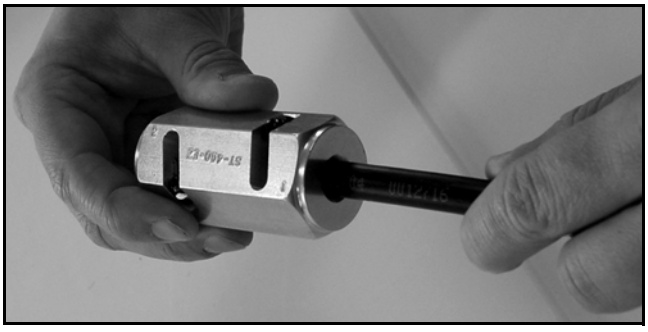


Figure 80: Stripping the End to Expose the Center Conductor



5. Using a utility knife, carefully remove any residual plastic from the center conductor, if necessary (see Figure 81).

6. Insert the end of the cable into the #2 end of the ST-400EZ stripping tool (see Figure 82). Then rotate the tool clockwise around the cable until the tool turns easily. This removes the cable jacket from the end of the cable, exposing the braid and dielectric (see Figure 83).

7. Using the DBT-02 tool, deburr and chamfer the center conductor (see Figure 84). Avoid nicking the aluminum tape covering the dielectric.

Figure 81: Removing Plastic Residue

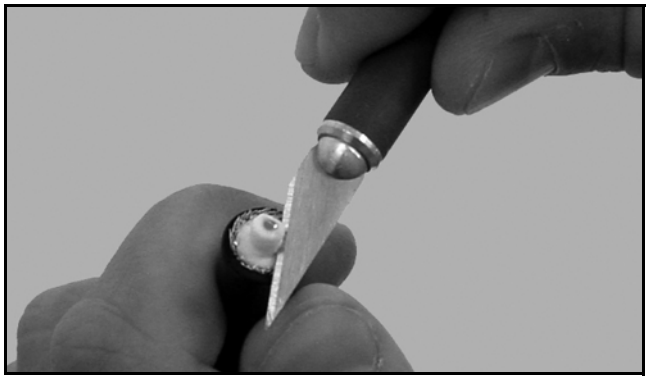


Figure 82: Stripping the Cable Jacket

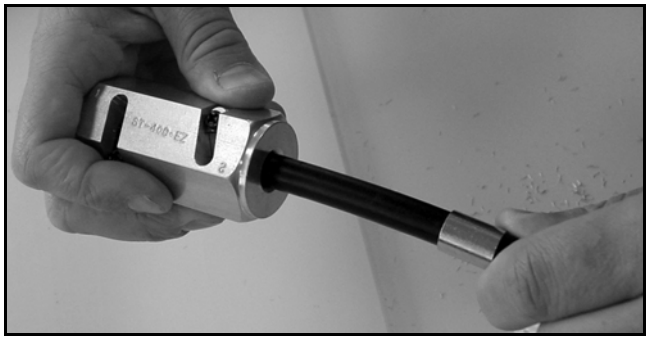


Figure 83: Cable Stripped, Exposing Dielectric

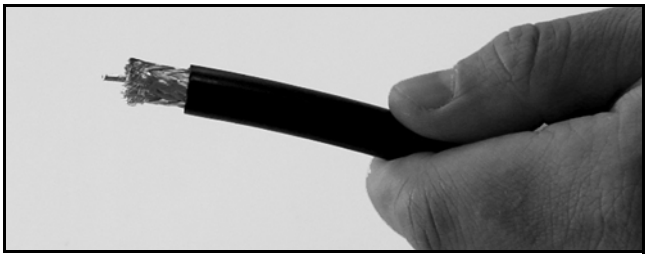
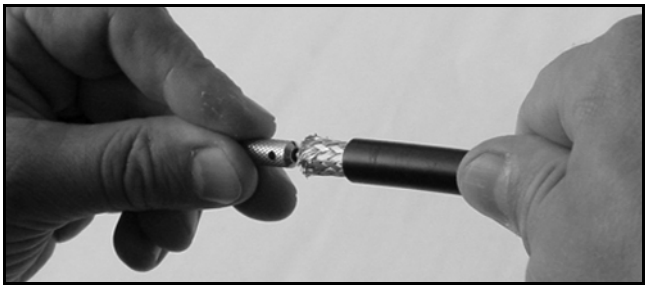


Figure 84: Deburring the Center Conductor



8. Gently flare the braid with your fingers (see Figure 85).

9. Insert the end of the cable into the connector body until the dielectric is firmly seated inside the connector (see Figure 86). Make sure there is no gap between the knurled end of the connector and the cable jacket. Also be sure all braid wires remain on the outside of the connector.

IMPORTANT!

A common installation failure occurs when the connector is not seated properly onto the cable. In these cases, the cable's center conductor does not fully engage the electrical contacts inside the connector. To ensure full engagement, make certain that there is no gap between the cable jacket and the knurled end of the connector before you crimp on the ferrule. You may need to deburr and center the end of the conductor to achieve a good fit.

10. Trim any excess braid (see Figure 87), if necessary. The braid should assemble flush to within 1/16" (1.6 mm) of the connector shoulder.

11. Slide the ferrule over the braid until it is flush against the connector shoulder (see Figure 88).

Figure 85: Flaring the Braid

Figure 86: Pushing On the Connector

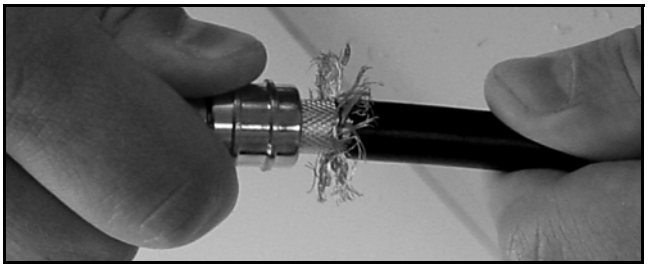


Figure 87: Trimming the Braid

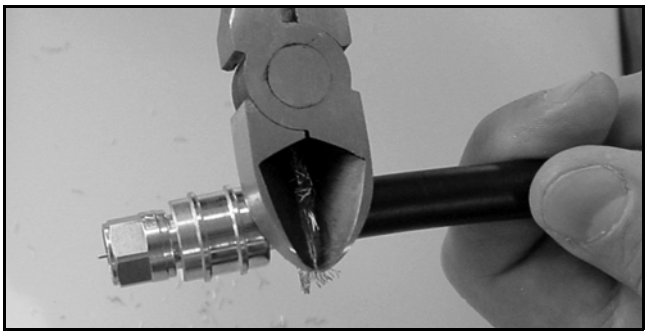
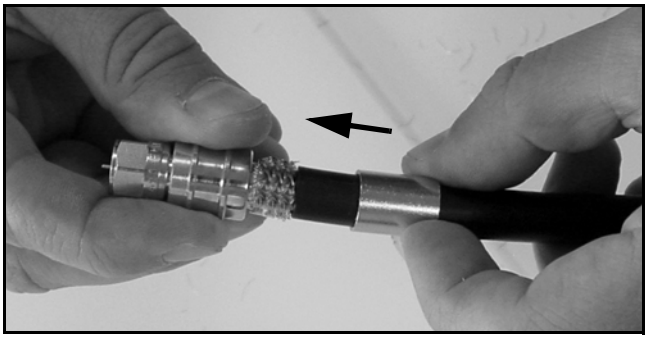


Figure 88: Sliding the Ferrule Over the Braid



12. Using an appropriate crimp tool (either the CT-400/300 or the HX-4 with Y1719 dies), crimp the ferrule in place (see Figure 89). Crimp as close to the connector body as possible.

13. Crimp the ferrule again, but further back from the connector. However, be careful not to crimp the cable jacket.

14. Slide the heat shrink sleeve over the connector body and heat it to compress it into place (see Figure 90). When you are done, the heat shrink should extend from the rear of the connector to the cable jacket. This forms a weather-tight seal.

15. Using a multimeter or similar device, check the continuity of the cable.

16. Ensure the center conductor pin measures between 0.20" and 0.28" (5-7 mm) in length, to ensure proper engagement with the mating connector (see Figure 91).

Figure 89: Crimping the Ferrule onto the Cable

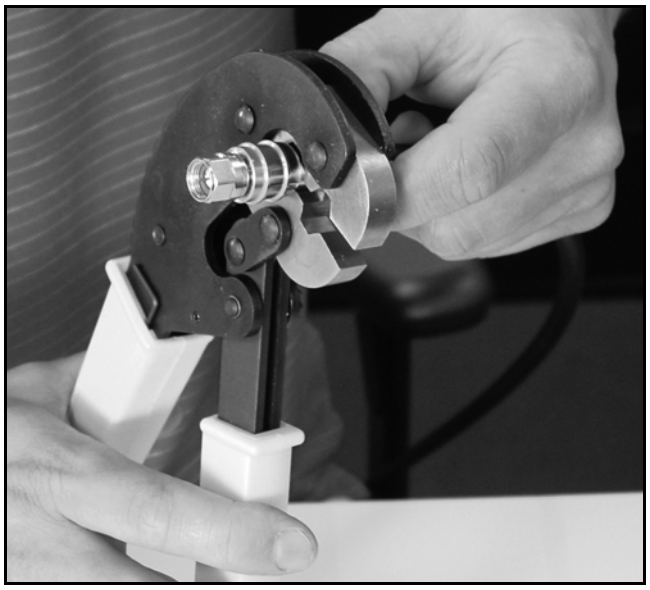


Figure 90: Applying the Heat Shrink Tubing

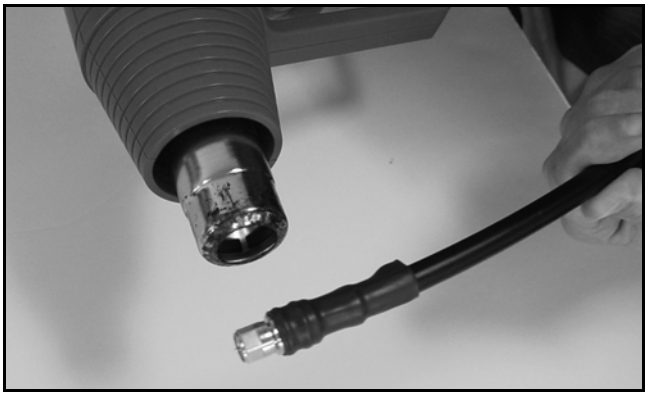
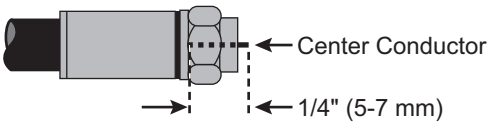


Figure 91: Proper



C Configuring Computers for DHCP

Appendix

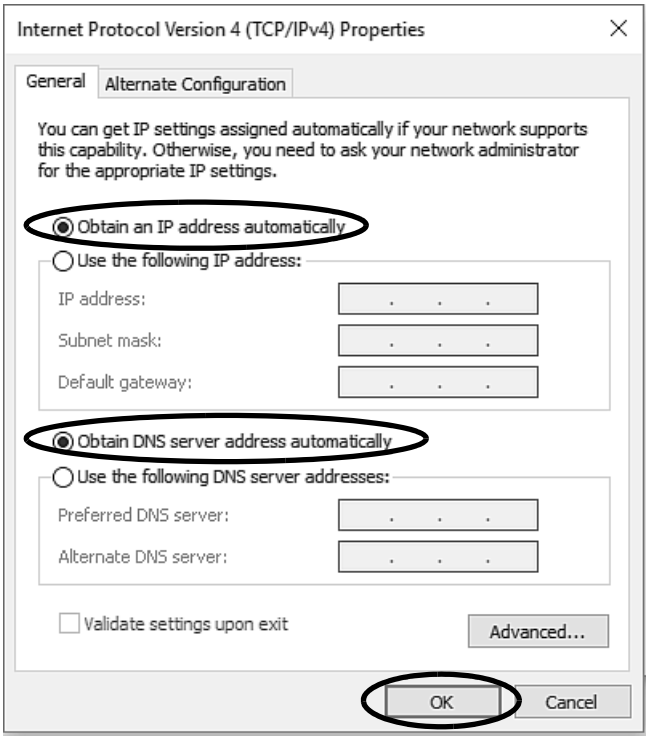
Follow these steps to configure your computer for DHCP to allow it to receive an IP address from the ICM. The location of this configuration setting varies slightly by operating system.

NOTE: *The computer must have a network interface card installed and all cabling must be 100 Mbps fast Ethernet UTP CAT-5 with RJ45 connectors.*

Windows 10

1. Turn on the computer.
2. Open the **Network and Sharing Center**. The easiest way to get there is to simply enter the name in the search box on the taskbar. *You can also navigate to it from the Start menu: Settings > Network & Internet > Ethernet > Network and Sharing Center.*
3. In Network and Sharing Center, click the **Ethernet** link for the Ethernet connection you are using.
4. In the Ethernet Status dialog box, click **Properties**. *If this screen doesn't appear, just skip to Step 5.*
5. In the Ethernet Properties dialog box, on the **Networking** tab, select **Internet Protocol Version 4**, and then click **Properties**.
6. In the Internet Protocol Properties dialog box, select **Obtain an IP address automatically** and **Obtain DNS server address automatically** (see Figure 92). Then click **OK**.
7. In the Ethernet Properties dialog box, click **Close**. Then click **Close** in the Ethernet Status dialog box.

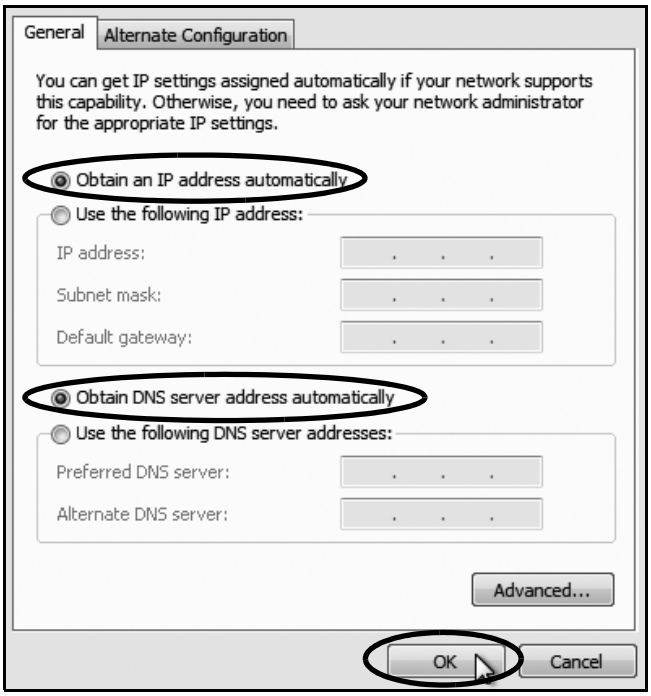
Figure 92: Windows 10 - Internet Protocol Properties



Windows 8

1. Turn on the computer.
2. In Control Panel, double-click **Network and Sharing Center**. *To open the Control Panel, go to the desktop, select Settings from the Charms bar, then select Control Panel.*
3. In Network and Sharing Center, double-click the **Ethernet** link for the Ethernet connection you are using.
4. In the Ethernet Status dialog box, click **Properties**. *If this screen doesn't appear, just skip to Step 5.*
5. In the Ethernet Properties dialog box, on the **Networking** tab, select **Internet Protocol Version 4**, and then click **Properties**.
6. In the Internet Protocol Properties dialog box, select **Obtain an IP address automatically** and **Obtain DNS server address automatically** (see Figure 93). Then click **OK**.
7. In the Ethernet Properties dialog box, click **Close**.

Figure 93: Windows 8 - Internet Protocol Properties



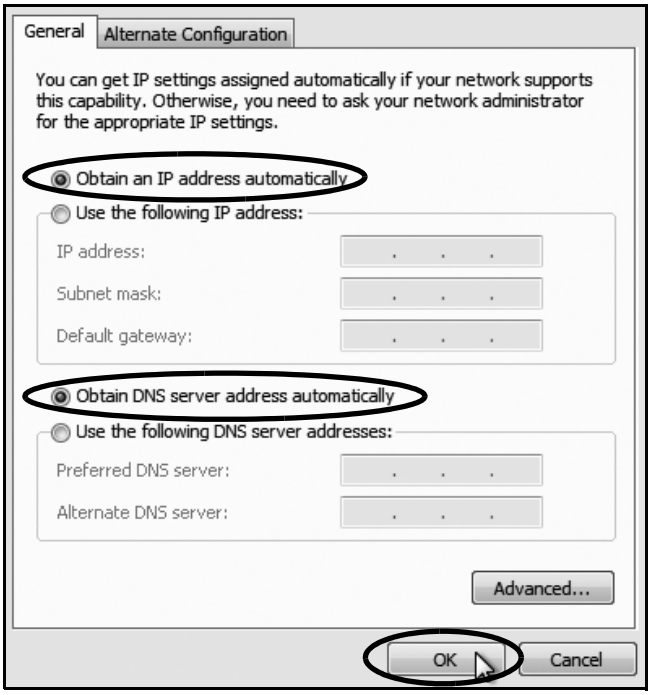
C Continued Configuring Computers for DHCP

Appendix

Windows 7 or Windows Vista

1. Turn on the computer.
2. In Control Panel, double-click **Network and Sharing Center**. (You might need to click **Network and Internet** first.) *You can find the control panel either through the Start menu or "My Computer."*
3. In Network and Sharing Center, double-click the **Local Area Connection** link (Windows 7) or **View Status** link (Windows Vista) for the Ethernet connection you are using.
4. In the Local Area Connection Status dialog box, click **Properties**. *If this screen doesn't appear, just skip to Step 5.*
5. In the Local Area Connection Properties dialog box, click the **Networking** tab, select **Internet Protocol Version 4**, and then click **Properties**.
6. In the Internet Protocol Properties dialog box, select **Obtain an IP address automatically** and **Obtain DNS server address automatically** (see Figure 94). Then click **OK**.
7. In the Local Area Connection Properties dialog box, click **OK**.

Figure 94: Windows 7/Windows Vista- Internet Protocol Properties

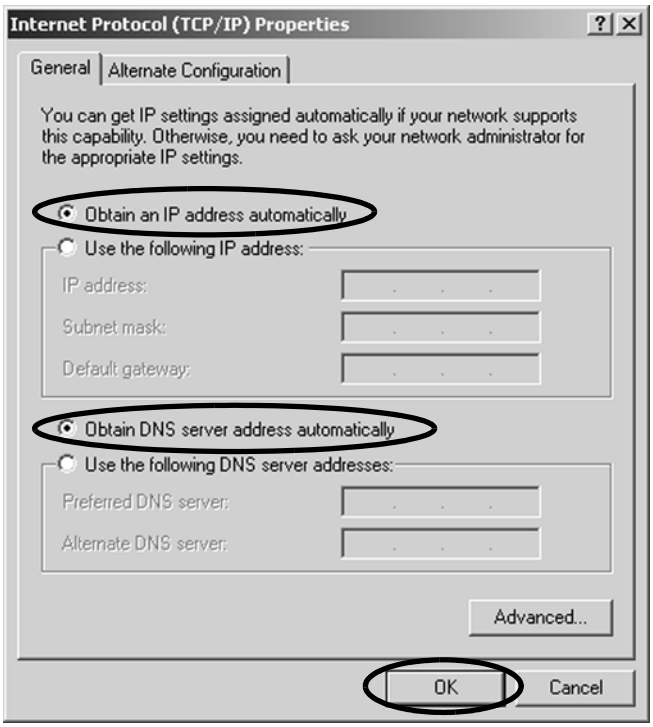


C Continued Configuring Computers for DHCP

Windows XP

1. Turn on the computer.
2. In Control Panel, double-click **Network Connections**. *You can find the control panel either through the Start menu or "My Computer."*
3. In Network Connections, double-click the **Local Area Connection** for the Ethernet connection you are using.
4. In the Local Area Connection Status dialog box, click the **General** tab. Then click **Properties**. *If this screen doesn't appear, just skip to Step 5.*
5. In the Local Area Connection Properties dialog box, click the **General** tab, select **Internet Protocol (TCP/IP)**, and then click **Properties**.
6. In the Internet Protocol (TCP/IP) Properties dialog box, click the **General** tab. Then select **Obtain an IP address automatically** and **Obtain DNS server address automatically** (see Figure 95). Then click **OK**.
7. In the Local Area Connection Properties dialog box, click **OK**.
8. Restart the computer.

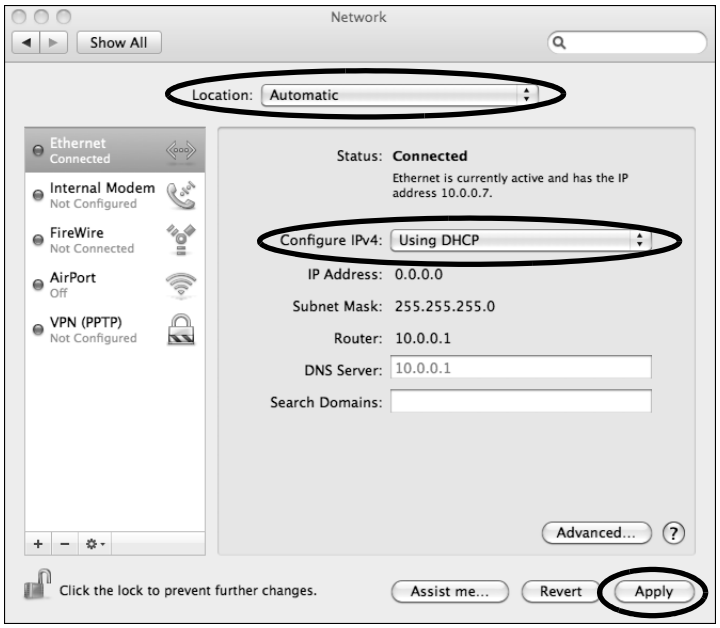
Figure 95: Windows XP - Internet Protocol (TCP/IP) Properties



Macintosh OS X

1. Turn on the computer.
2. In System Preferences, click **Network**.
3. In the Network dialog box, select **Ethernet** then set the following:
   - Location: **Automatic**
   - Configure IPv4: **Using DHCP**
4. Click **Apply**.
5. Restart the computer.

Figure 96: Macintosh OS X - Network Preferences



D Verifying the NMEA 0183 Message

Appendix

Verify the message supplied by the NMEA 0183 talker by connecting its output to a laptop using an RS422-to-USB adapter cable and viewing its data stream using PuTTY, HyperTerminal, or other terminal emulator. Follow the steps below to verify the message.

NOTE: *These example instructions assume you will be using PuTTY to enter antenna commands.*

1. Using an RS422-to-USB adapter, connect the NMEA 0183 talker to the adapter's RS422 input. Then connect the adapter to your laptop's USB port (see Figure 97).
2. Start PuTTY and specify your laptop's port, connection type, and baud rate (see Figure 98).
3. Configure options at the **Serial** configuration menu as follows (see Figure 99):
   - 4800 baud
   - 8 data bits
   - 1 stop bit
   - no parity
   - no flow control
4. Select **Open** to view the message data in a command line window (see Figure 100).

Figure 97: Connecting a NMEA 0183 Talker to a Laptop

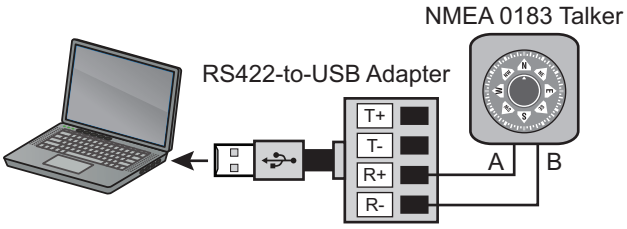


Figure 98: PuTTY Port Configuration Options (Example)

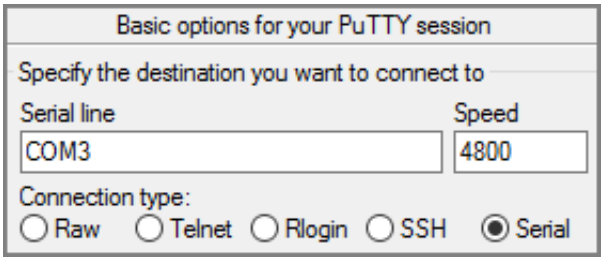


Figure 99: PuTTY Serial Configuration Options (Example)

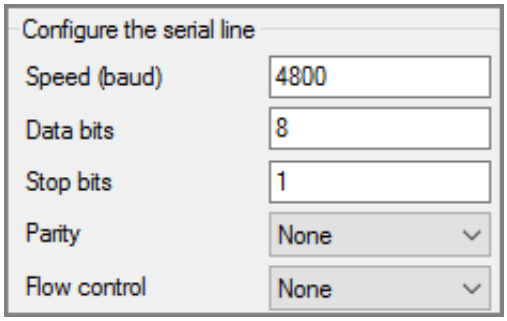
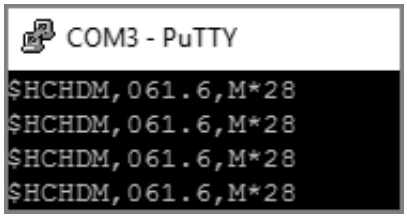
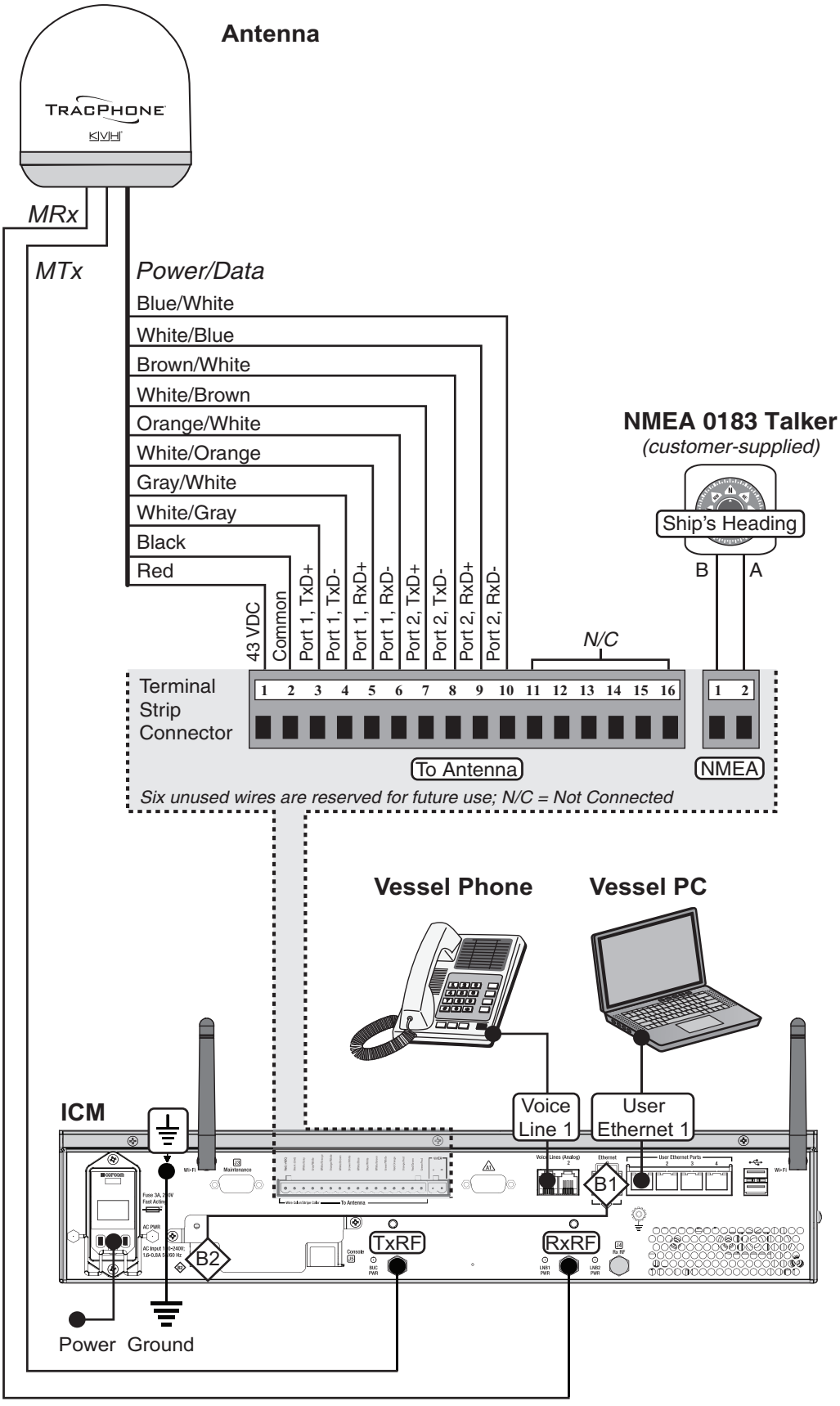


Figure 100: PuTTY Command Line Window (Example)



E Wiring Diagram



Regulatory Compliance

European Union Compliance

Hereby, KVH Industries, Inc. declares that the radio equipment type TracPhone V3-HTS is in compliance with Directive 2014/53/EU. For the full text of the EU Declaration of Conformity, go to www.kvh.com/euconformity.

Federal Communications Commission Compliance

The TracPhone system complies with Class B of Part 15 of the FCC (Federal Communications Commission) rules for radiated and conducted emissions.

FCC Identifiers: PPD-AR5B97 (ICM WiFi)

Use Conditions:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Note:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. To determine if the equipment is interfering with radio or television reception, remove or apply power to the equipment and observe if the interference goes away, or returns, when the unit is off or on. The user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult KVH for assistance.

IMPORTANT:

- To meet FCC requirements, shielded Ethernet cables are required to connect the ICM to the ship's network.
- This equipment contains no user serviceable parts. Opening this unit will violate the warranty and may result in this equipment no longer complying with FCC requirements for Class B digital devices.

QUALITY CERTIFIED SYSTEM ISO 9001

KVH

www.kvh.com

KVHI NASDAQ LISTED

KVH Industries A/S
EMEA Headquarters
Kokkedal, Denmark
Tel: +45 45 160 180 Fax: +45 45 160 181
Email: info@emea.kvh.com

KVH Industries, Inc.
World Headquarters
Middletown, RI U.S.A.
Tel: +1 401 847 3327 Fax: +1 401 849 0045
Email: info@kvh.com

KVH Industries Pte Ltd.
Asia-Pacific Headquarters
Singapore
Tel: +65 6513 0290 Fax: +65 6472 3469
Email: info@apac.kvh.com