# KVH Industries, Inc.

# TracVision® TV5

# Installation Guide

# TracVision TV5 Installation Guide

This guide explains how to install the TracVision TV5 satellite TV antenna system on a vessel. Operation instructions are provided in the Quick Start Guide.

## Installation Steps

## Appendices

## Who Should Install the System?

To ensure a safe and effective installation, KVH recommends that a KVH-authorized marine technician install the TracVision antenna. KVH-authorized technicians have the tools and electronics expertise necessary to install the system. To find a technician near you, visit www.kvh.com/wheretogetservice.

## Technical Support

If you need technical assistance, please contact KVH Technical Support:

**Europe, Middle East, Africa, Asia-Pacific**
Phone: +45 45 160 180
E-mail: support@emea.kvh.com
(Mon.-Thu., 8 am-4:30 pm, +1 GMT)
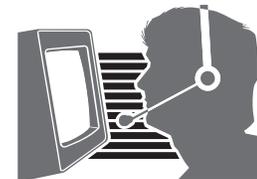(Fri., 8 am-2 pm, +1 GMT)

**North/South America, Australasia**
Phone: +1 401 847-3327
E-mail: support@kvh.com
(Mon.-Fri., 9 am-6 pm ET, -5 GMT)
(Sat., 9 am-2 pm ET, -5 GMT)

# 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**<br>To avoid electric shock, do not open the TV-Hub chassis enclosure. There are no user-serviceable parts inside. |

| ⚠ WARNING |
|---|
| **Risk of Electric Shock**<br>If any component of the TracVision 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**<br>Do not operate the TV-Hub (or any other electrical device) in an environment where flammable gases, vapors, or dusts are present. In addition, do not operate the TV-Hub 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**<br>Failure to ground the TracVision system properly to ship's ground will cause an unsafe floating ground condition, risking potentially lethal electric shock. See "Connect Power" on page 24 for details on the proper grounding of the equipment. |

# 1 Inspect Parts and Get Tools

Before you begin, follow the steps below to ensure you have everything needed to complete the installation.

┌─ **IMPORTANT!** ──────────────────────┐

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

└───────────────────────────────────────┘

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

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

**c.** Gather the tools and materials listed below. You will need these items to complete the installation.

- Flat-head and Phillips-head screwdrivers

- Electric drill and 3/8" (10 mm) and 1/8" (3 mm) drill bits

- 3" (80 mm) hole saw

- 10 mm socket wrench

- 7/16" open-end torque wrench set to 20 in.-lbs (2.25N-m)

- 7/16" open-end torque wrench set to 15 in.-lbs (1.7 N-m)

- Torque wrench and 2 mm Allen hex key

- Light hammer, center punch, adhesive tape, and scriber or pencil

- RG-6 or RG-11 RF coax cable(s), with "F" connectors, and terminations tools (see page 7)

- Silicone sealant or equivalent

- Satellite TV receiver(s)/DVRs for your desired service (see Figure 2)

- Wi-Fi-enabled laptop PC with the latest TracVision software and satellite library downloaded from the KVH Partner portal (www.kvh.com/partners), or iPhone®/iPad® with the latest downloads through the TracVision TV/RV App
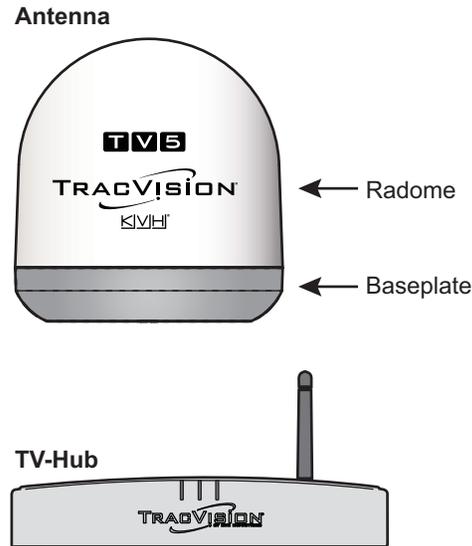
Figure 1: TracVision TV5 System Components



**Antenna**

Radome

Baseplate

**TV-Hub**

Figure 2: KVH-Validated Receivers

| **Linear** | |
|---|---|
| For information on the recommended receivers for linear service, contact your local KVH dealer/distributor. Go to www.kvh.com/wheretogetservice to find a dealer/distributor near you. | |
| **DIRECTV*** | **DISH Network*** |
| H20 | 311 |
| H21 | 211 |
| H22 | 211k |
| H23 | 211z |
| H24 | |
| H25 | **Bell TV*** |
| HR21, HR21 Pro | 6100 |
| HH22 | 6131 |
| HR23 | 6400 |
| HR24 | |
| HR34 | |
| HR44 | |

*_List is subject to change. For information on connecting different receiver models, contact KVH Technical Support._

**3**

# 2 Plan the Antenna Installation

Before you begin, consider the following antenna installation guidelines.

> **IMPORTANT!**
>
> Be sure to follow the guidelines below. Damage caused by an improper installation is not covered under KVH warranty.

- Minimize blockage. The antenna requires a clear view of the sky to receive satellite TV (see Figure 3). The fewer obstructions, the better the system will perform.

- KVH recommends that you do not mount the antenna on the same level as the radar, because the radar's energy may damage the LNB. Ideally, you should mount the antenna 3 ft (1 m) away from and above or below the 15° radar beam path (see Figure 4).

- Make sure the mounting surface is wide enough to accommodate the antenna's base (see Figure 5). Also make sure it is flat, level (within ±1°), strong enough to support the antenna's weight, and rigid enough to prevent antenna vibration.

- Select a location that is as close as possible to the intersection of the vessel's fore-and-aft centerline and midships.

- Be sure to mount the antenna near enough to the TV-Hub to allow you to connect the 100 ft (30 m) coax cable between them, while still maintaining sufficient slack in the cable.

*NOTE: If you need to use a longer cable, use a RG-11 (75 Ω) cable that does not exceed 200 ft (60 m) in length (see "Prepare the RF Cables" on page 7).*

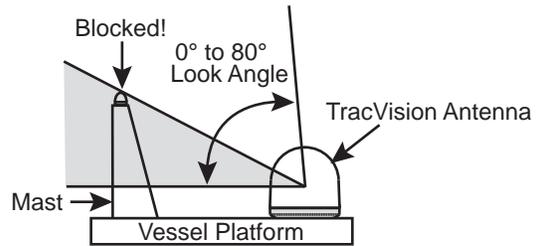Figure 3: Blockage from Obstruction
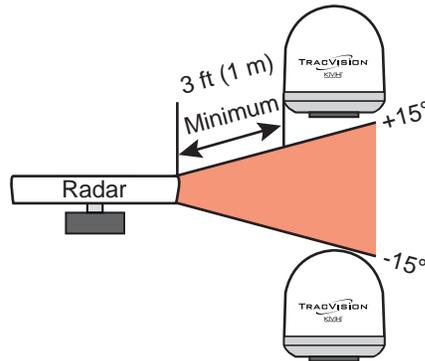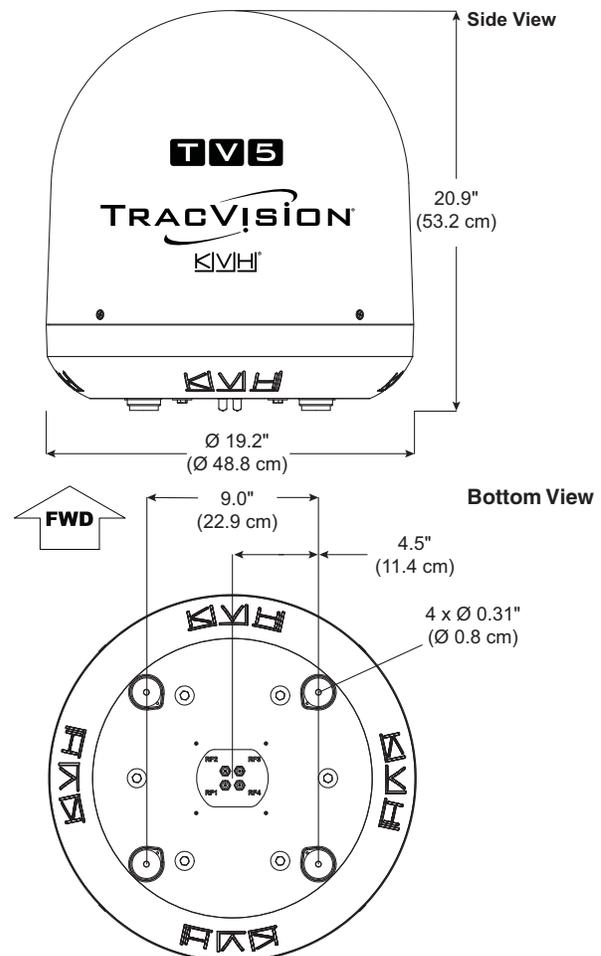


Figure 4: Distance from Radar



Figure 5: Antenna Dimensions

# 3 Plan the TV-Hub Installation

Consider the following TV-Hub installation guidelines.

- Select a mounting location in a dry, well-ventilated area belowdecks away from any heat sources or salt spray.

- Do not install the TV-Hub in an area surrounded by metal or near any electrical devices that emit RF noise.

- The TV-Hub can be mounted horizontally or vertically on a flat surface (see Figure 6 and Figure 7). This includes mounting on a ceiling or in a rack.

- Be sure the TV-Hub LED lights will be visible to the user.

- Select a location that will provide adequate clearance for the TV-Hub dimensions (see Figure 6 and Figure 7).

- Leave enough room behind the rear panel (horizontal mount) or below the rear panel (vertical mount) to accommodate connecting the cables and making service loops within the proper bend radius.

- If you plan to use the TV-Hub's Wi-Fi connection, ensure the TV-Hub mounting location provides adequate Wi-Fi reception.

- If you plan to connect the TV-Hub to the vessel LAN, choose a location that takes Ethernet connection into consideration.

*NOTE: A template showing the exact locations of the TV-Hub mounting holes and the dimensions between them is provided in the Welcome Kit. Installation details are provided in "Mount the TV-Hub" on page 11.*

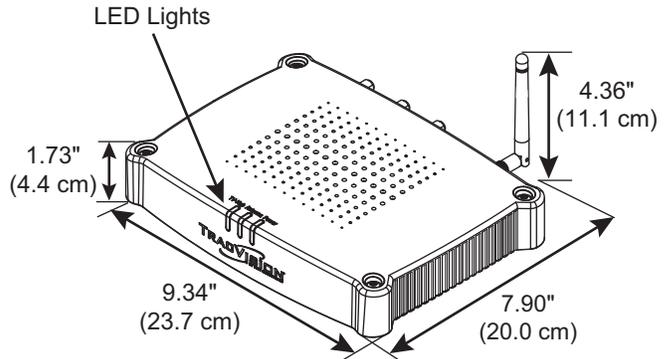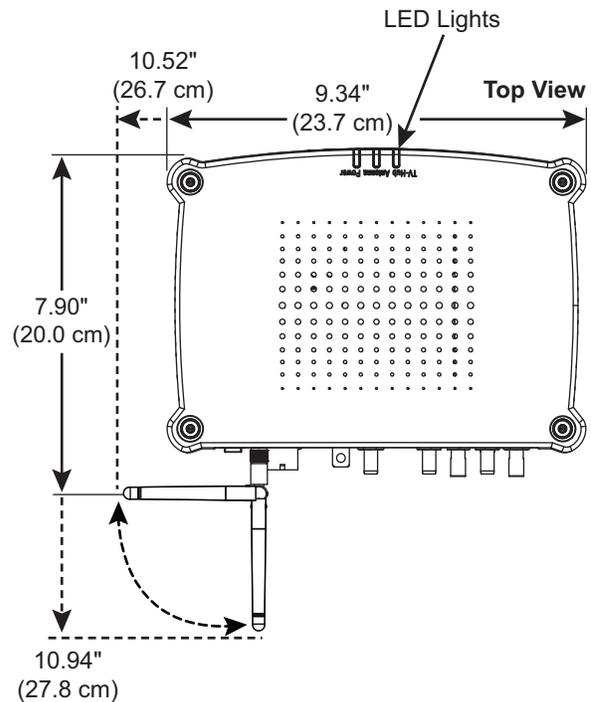Figure 6: TV-Hub Dimensions - Horizontal Orientation



Figure 7: TV-Hub Dimensions - Vertical Orientation

# ④ Prepare the Antenna Site

Once you have identified a suitable antenna mounting site, according to the guidelines provided on page 4, follow these steps to drill the mounting holes and cable access hole to prepare the site for installation.
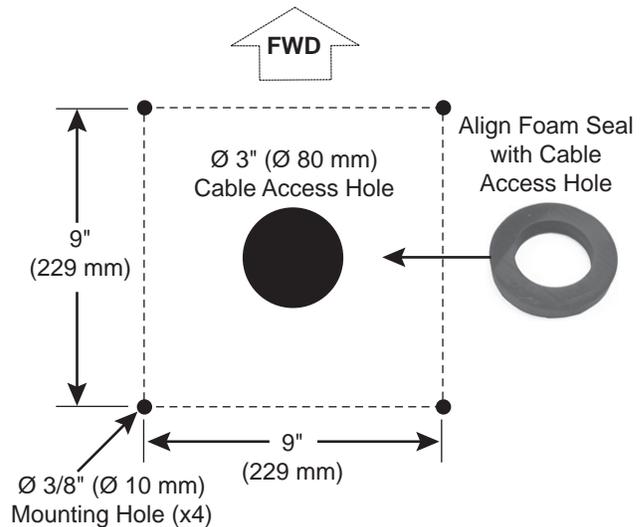
a. Unfold the antenna mounting template (supplied in the Customer Welcome Kit) and place it onto the mounting surface. Make sure the "FWD" (forward) arrow points toward the bow and is **parallel** to the vessel's centerline (see Figure 8). Tape in place.

*NOTE: You don't need to mount the antenna exactly on the vessel's centerline (the closer, the better), 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 3/8" (10 mm) hole at the four mounting hole locations you marked in Step b. Later, you will insert four 1/4"-20 bolts through these holes to secure the antenna to the mounting surface.

d. Cut out the 3" (80 mm) cable access hole in the location you marked in Step b. Smooth the edges of the hole to protect the cables. Later, you will route the RF cable(s) through this hole and into the vessel.

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 8).

*NOTE: Apply the foam seal to the vessel mounting surface, not to the antenna's baseplate. You will have difficulty connecting the cable(s) to the antenna if the foam seal is attached to the baseplate.*

Figure 8: Antenna Mounting Holes Layout

# ⑤ Prepare the RF Cables

Determine the type of RF cable(s) and connectors required for any RF cables required in addition to what is supplied in the antenna kit (see Figure 9). Then follow the guidelines below to select and prepare the antenna's RF cable(s).

**IMPORTANT!**

- RF cables must be rated for 75Ω, not 50Ω.

- Use of any cables not specified in Figure 9 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.

- When determining cable lengths, be sure to account for an adequate service loop, approximately 8" (20 cm) at both ends of each cable.

Figure 9: RF Cable Requirements

| Up to 100 ft (30 m) Cable Run | |
|---|---|
| Cable | RG-6 (KVH part no. 32-0417-0100) |
| Connector | Thomas & Betts SNS1P6 (KVH part no. 23-0170) |
| Tools | Augat IT1000 (KVH part no. 19-0242) |
| Strip Lengths | 0.064" (1.63 mm) dia. 0.25" (6.35 mm) 0.5" (12.7 mm) |
| **Up to 200 ft (60 m) Cable Run** | |
| Cable | RG-11 (KVH part no. 32-0566-0200) |
| Connector | Thomas & Betts SNS11AS (KVH part no. 23-0213) |
| Tools | Thomas & Betts CST596711, L3011B (KVH part no. 72-0493) |
| Strip Lengths | 0.064" (1.63 mm) dia. 0.25" (6.35 mm) 0.5" (12.7 mm) |

*Note*: LMR-400-75 is a suitable substitute.

# ⑥ Wire the Antenna

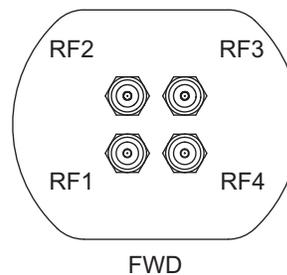Follow the steps below to connect the antenna cable(s) to the antenna.

**a.** First determine the number of RF coax cables you need to connect to the antenna for your particular installation (see Figure 10).

**b.** Clearly label the RF1 cable on both ends. If you connect two or more RF cables, label both ends of each cable to match the connector. This will make it easier to identify the cables later.

**c.** Route the RF cable(s) belowdecks through the 3" (80 mm) cable access hole. Leave an adequate service loop, approximately 8" (20 cm) of slack, in the cables for easy serviceability.

**d.** Clean and dry the connectors on the RF cable(s) and the antenna (see Figure 11).

**e.** Fill half of the inner body of the RF1 cable's connector with the supplied silicone grease.

**f.** Connect and **SLOWLY** hand-tighten the RF1 cable to the "RF1" connector on the bottom of the antenna allowing the grease to diffuse and settle into the entire space within the connector.

**g.** Make sure the RF cable is tightened all the way into the connector. Then tighten it with a 7/16" torque wrench to 20 in-lbs, or a 7/16" wrench for 1/4 turn.

**h.** Wipe off any excess grease from the outside of the connector.

**i.** Repeat steps **d-h** to connect any additional RF coax cables to the antenna's RF2, RF3, and RF4 connectors. Later, you will connect the RF1 cable to the TV-Hub and any other RF cable(s) (RF2, RF3, and RF4) to a grounding block, and to the receiver(s) according to the specific configuration.

**j.** Seal the RF cable connections with silicone sealant or equivalent.

**k.** Weatherproof and seal the cable access hole as required.

Figure 10:  Number of RF Coax Cables to Connect to Antenna

| Connecting to: | RF Cables |
|---|---|
| *System with Stacked Circular LNB* | |
| 1 receiver | 1 |
| 2 or more receivers | 1* |
| *System with Tri-Americas Circular LNB* | |
| 2 or more receivers | 2* |
| *System with DIRECTV LA Circular LNB* | |
| 1 receiver | 1 |
| 2 or more receivers | 2* |
| *System with Linear Quad LNB* | |
| 1 receiver | 1 |
| 2 receivers | 2 |
| 3 receivers | 3 |
| 4 receivers | 4 |
| More than 4 receivers | 4* |

\* Multiswitch may be required.

Figure 11:  Connectors on Bottom of Antenna

# 7 Remove the Shipping Restraint

Inside the antenna, a shipping restraint prevents the antenna assembly from moving during shipment. Follow these steps to remove this shipping restraint.

a. Remove the four #10-32 Phillips screws securing the radome to the baseplate (see Figure 12). Carefully lift the radome straight up until clear of the antenna assembly and set it aside in a safe place.

*TIP: If you keep the radome topside, secure it with a lanyard to prevent it from falling overboard. Also, do not place the radome on a hot steel deck – the heat may warp the radome.*

b. Using a 10 mm socket wrench, remove the bolt and spacer securing the antenna assembly to the baseplate (see Figure 13). Save the restraint hardware for future use.

### IMPORTANT!

Once you have removed the restraint, keep the antenna level as much as possible and handle the antenna carefully. Prevent the internal antenna assembly from rotating freely within the baseplate to avoid damaging the limit switch.
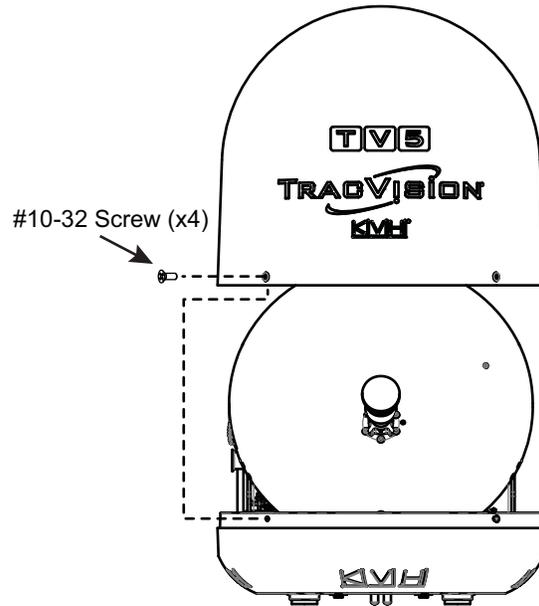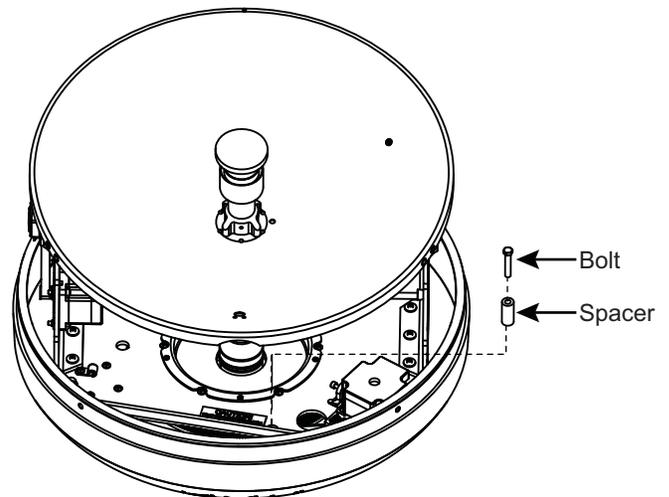
Figure 12: Removing the Radone

#10-32 Screw (x4)

Figure 13: Shipping Restraint Hardware

Bolt

Spacer

# 8 Mount the Antenna

Follow these steps to mount the antenna to the mounting surface.

**a.** Place the antenna baseplate over the holes drilled in the mounting surface. Ensure the forward arrow inside the baseplate points toward the bow and is **parallel** to the vessel's centerline (see Figure 14).

---
**IMPORTANT!**

You will need to rotate the antenna assembly by hand to see all four mounting holes. Rotate the antenna assembly slowly. If it hits a mechanical stop with excessive force, the limit switch might become damaged.

---

**b.** Apply a thin layer of the supplied anti-seize lubricant to the threads of the four 1/4"-20 mounting bolts (see Figure 15).

---
⚠ **CAUTION**

Observe the safety warnings printed on the tube of Loctite® anti-seize lubricant: "Contains mineral oil, calcium hydroxide, and copper. May cause skin, eye, and respiratory irritation. Wear eye protection and gloves. **First aid:** In case of eye or skin contact, flush with water. Obtain medical attention for any eye or internal contact."

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**c.** Secure the antenna's base to the mounting surface using four 1/4"-20 bolts, 1/4" washers (above and below), and 1/4"-20 lock nuts (see Figure 15).

**d.** 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.

**e.** Reinstall the radome onto the antenna. Secure in place with the four #10-32 screws you removed on .

**f.** Install a protective plastic screw cap (supplied in the kitpack) over each radome screw.

Figure 14:  Overhead View of Forward Arrow in Antenna Baseplate
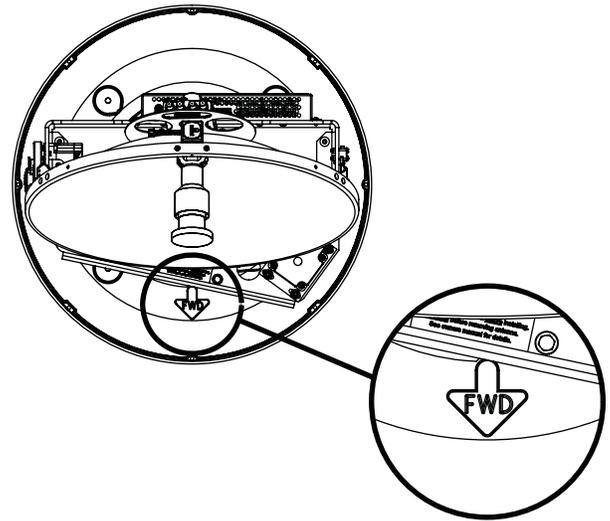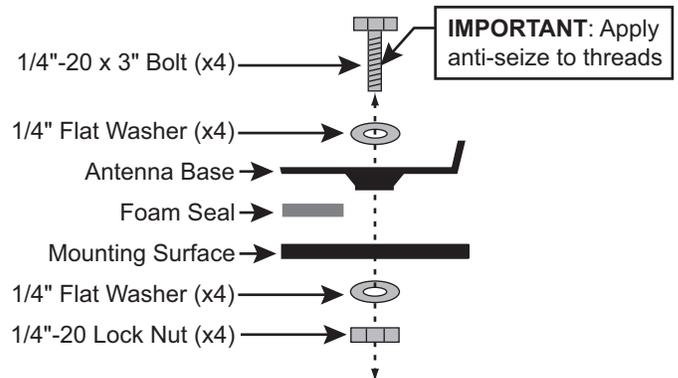


Figure 15:  Mounting the Antenna (Side View)



1/4"-20 x 3" Bolt (x4) → **IMPORTANT**: Apply anti-seize to threads
1/4" Flat Washer (x4) →
Antenna Base →
Foam Seal →
Mounting Surface →
1/4" Flat Washer (x4) →
1/4"-20 Lock Nut (x4) →

# **9** Mount the TV-Hub

Follow these steps to install the TV-Hub inside the vessel:

a. Tape the mounting template in the location selected for the TV-Hub. Punch holes at each of the two keyhole locations and at the mounting tab location.

b. Remove the template.

c. Drill a 1/8" (3 mm) hole at the three hole locations you marked in Step **a**.

d. Install a #8 Phillips thread-forming screw partway into one of the keyhole holes leaving a small gap for hooking the TV-Hub onto it. Use the thickness (2.5 mm) of the M10 washer supplied in the kit as a gauge for the size gap to leave.

e. Repeat step **d** on the other keyhole.

f. Peel off the backing on the adhesive-backed washer (supplied in the kit) and place it over the mounting tab hole (see Figure 16).

g. Align the wide part of the TV-Hub's keyholes, as shown in Figure 17, over the screws, then slide downwards to secure the screws into the narrow part of the keyholes.

h. Press the rear mounting tab of the TV-Hub onto the adhesive washer and install the third #8 Phillips thread-forming screw in the mounting tab hole.
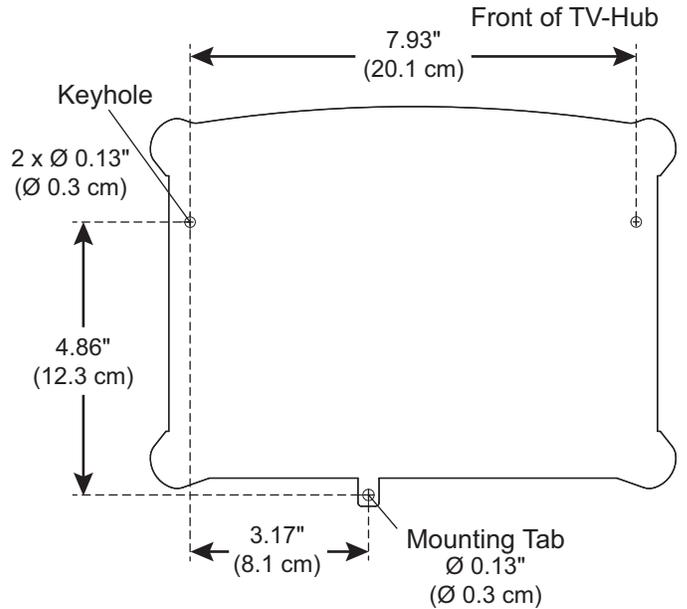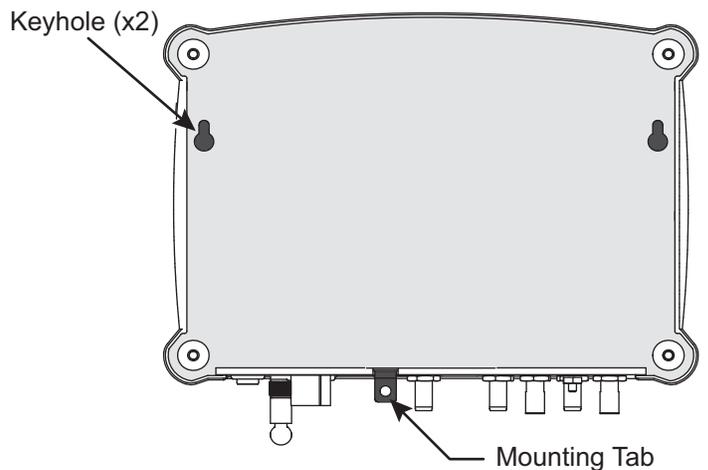
Figure 16: TV-Hub Mounting Template



Figure 17: TV-Hub Keyholes and Mounting Tab

# 10 Wire the TV-Hub

Follow these steps to wire the TV-Hub.

## Antenna

**a.** Connect the RF1 cable from the antenna to the "Antenna" jack on the TV-Hub (see Figure 18).

> **IMPORTANT!**
>
> Do not connect anything other than the antenna's RF1 cable to the "Antenna" jack. The "Antenna" jack has 42 VDC on it which will damage other devices such as multiswitches, DVRs, etc.

**b.** Hand-tighten the RF cable until it is all the way into the "Antenna" jack. Then tighten it with a 7/16" torque wrench to 15 in-lbs, or a 7/16" wrench 1/8 turn.

The wiring of any additional RF cables in the configuration are covered in the receiver wiring section (see ).

## Receiver(s)

Connecting the TV-Hub to the system receiver(s) and setting up the receivers according to the system configuration depends upon the satellite television service being used (see Figure 19 and Figure 20). Detailed instructions are provided in the next section.

*NOTE: The wiring for other optional system components follows this section. Proper grounding and power wiring is described in .*
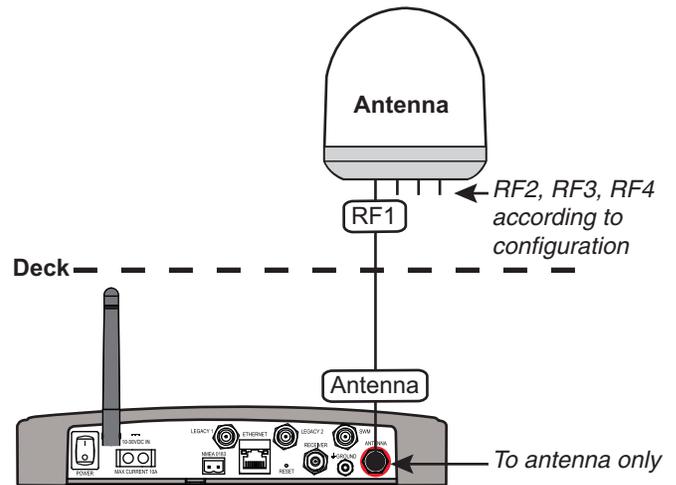
Figure 18: TV-Hub Antenna Connection
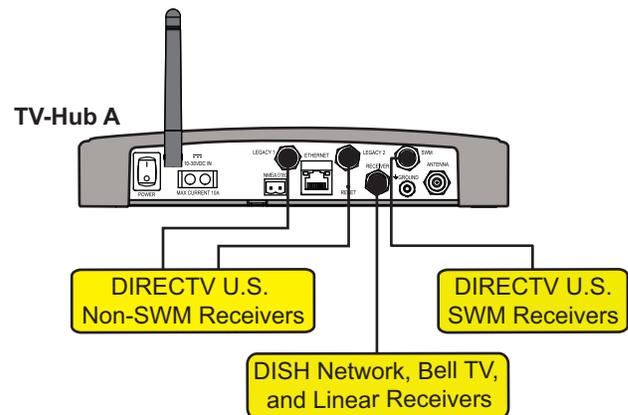


Figure 19: TV-Hub A Receiver Connections



Figure 20: TV-Hub B Receiver Connections

# 11 Wire the Receivers

Follow these steps to wire the receivers for the associated satellite service, then connect the receiver(s) to the customer's television(s).

## Linear Wiring

Follow the steps below to wire the receivers in a linear configuration.

### Connecting 1-4 Receivers

**a.** Connect an RF cable from the "Receiver" jack on the back of the TV-Hub to the "Satellite In" connector of the receiver.

**b.** When connecting more than one receiver, connect each RF cable coming from the antenna to a grounding block belowdecks (see "Grounding Requirements" on page 24).

**c.** Connect the other end of the RF1 cable to the "Antenna" port of the TV-Hub and connect an RF cable from the other side of each grounding position used on the grounding block to the "Satellite In" connector of each additional receiver (see Figure 21).

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**IMPORTANT!**

To enable any of the additional receivers to control satellite selection, install an optional IP AutoSwitch (KVH part no. 72-0634) inline with the RF input to each desired receiver. See Appendix B on page 41.

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### Connecting 5 or More Receivers

**a.** Connect an RF cable from the "Receiver" connector on the back of the TV-Hub to the "18V" connector of the multiswitch.

**b.** Connect each RF cable coming from the antenna to a grounding block belowdecks (see "Grounding Requirements" on page 24).

**c.** Connect an RF cable from the other end of each grounding position used on the grounding block to the multiswitch (KVH part no. 19-0573) as shown in the diagram in Appendix A on page 33.

**d.** Connect the multiswitch outputs to the "Satellite In" connector on the receivers.

Figure 21: Wiring 2 to 4 Linear Receivers

# 11 Continued Wire the Receivers

## DIRECTV – SWM Wiring

Follow the steps below to wire a DIRECTV system that includes SWM receivers.

### Connecting 1 Receiver

Connect an RF cable from the "SWM" jack on the TV-Hub to the "Satellite In" jack on the receiver/DVR.

### Connecting 2-8 Receivers

Configurations for connecting multiple receivers include a SWM splitter that supports up to 8 tuners.

Refer to Figure 23 to determine the tuners consumed by each type of SWM component.

Refer to wiring diagrams in Appendix A for connecting multiple SWM receivers and connecting a network for autoswitching (see ), and wiring for Genie devices (see ).

Wire the system as follows:

a. Connect an RF cable from the "SWM" jack on the back of the TV-Hub to the "SWM" port on the SWM splitter.

b. Connect an RF cable to each port of the SWM splitter required by the configuration, and connect its other end to the "Satellite In" connector on the receiver/DVR, or "Network" port when connecting a Genie client.

c. Terminate any unused connectors on the splitter with a supplied 75Ω terminator.

d. Connect the TV-Hub and each receiver you want to control satellite selection to the vessel's network. If a network is not available, manual switching with a mobile device is an alternative.

Figure 22: DIRECTV SWM Wiring for 1 Receiver



Figure 23: Tuners per DIRECTV SWM Device

| Device | Tuners |
|---|---|
| Non-Genie SWM receiver | 1 |
| Non-Genie SWM DVR | 2 |
| Genie™ DVR | 5 (2 for its DVR, 3 shared with clients) |
| Genie client* | None |

*\* Genie clients cannot switch satellites. Clients can view programming carried on the satellite currently selected on the Genie DVR.*

## DIRECTV – Non-SWM Wiring

Follow the steps below to wire a DIRECTV system that includes non-SWM receivers.

### Connecting 1-2 Receivers

**a.** Connect an RF cable from the "Legacy 1" jack on the back of the TV-Hub to the "Satellite In" jack on the receiver.

**b.** When installing 2 receivers, connect an RF cable from the "Legacy 2" jack on the back of the TV-Hub to the "Satellite In" jack on the second receiver (see Figure 24).

### Connecting 3 or More Receivers

Configurations for connecting 3 or more non-SWM receivers include two DC block splitters and require a 4 x 8 multiswitch (customer-supplied or KVH part no 19-0573).

*NOTE: See Appendix A,* *, for a wiring diagram for this configuration.*

Wire the system as follows:

**a.** Connect an RF cable from the "Legacy 1" jack on the back of the TV-Hub to the "Antenna" port on one of the DC block splitters.

**b.** Connect the "Primary" connector on the DC block splitter to the "18V" connector on the multiswitch, and connect the "Secondary" connector on the DC block splitter to the "18V/22KHz" multiswitch connector.

**c.** Repeat steps **a** and **b** with "Legacy 2" and the second DC block splitter using the "13V" and "13V/22KHz" connectors on the multiswitch.

**d.** Connect the multiswitch outputs to the "Satellite In" jacks on the non-SWM receivers.

*NOTE: Non-SWM receivers are limited to manual switching.*

Figure 24: DIRECTV Non-SWM Wiring for 1 to 2 Receivers

## DIRECTV – SWM and Non-SWM Wiring

To wire a DIRECTV system that includes both SWM and non-SWM receivers, refer to the diagram shown in Figure 25 and the individual SWM and non-SWM instructions provided on the previous pages.

*NOTE: See "DIRECTV SWM and Non-SWM Configuration" on page 37, for another example wiring diagram for a SWM, Genie clients, and Non-SWM DIRECTV configuration.*

Figure 25: DIRECTV SWM and Non-SWM Wiring



RF1

Antenna

TV-Hub

**Non-SWM Receiver**
Satellite In
Legacy 2
*AC Power*

**Non-SWM Receiver**
Satellite In
Legacy 1
*AC Power*

***Supports up to 8 tuners:***
*Each SWM receiver = 1 tuner*
*Each SWM DVR = 2 tuners*

*Terminate unused outputs*

**SWM Splitter**

**SWM Receiver/DVR**
Satellite In
*AC Power*

*Connect any combination of SWM receivers/DVRs that add up to 8 or fewer tuners at the SWM splitter*

## DIRECTV Latin America Wiring

Follow the steps below to wire a DIRECTV Latin America system.
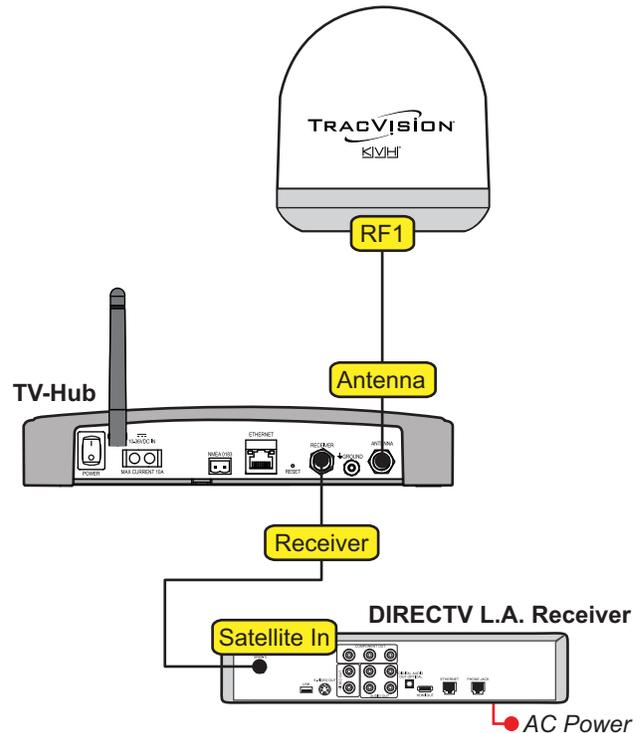
### Connecting 1 Receiver

Connect an RF cable from "Receiver" jack on the back of the TV-Hub to the "Satellite In" jack on the receiver.

### Connecting Multiple Receivers

Configurations for connecting multiple DIRECTV L.A. receivers require a second RF cable to be run from the antenna (see "Wire the Antenna" on page 8), include a power inserter, and require either a 3 x 4 passive multiswitch (KVH part no. 19-0861) for up to 4 receivers, or a 4 x 8 multiswitch (customer-supplied or KVH part no 19-0573) for more than 4 receivers.

*NOTE: See Appendix A, page 38, for a wiring diagram for a DIRECTV Latin America configuration with multiple receivers.*

Wire the system as follows:

a. Connect an RF cable from the "Receiver" jack on the back of the TV-Hub to the "13V" port on the multiswitch.

b. Ground the RF1 and RF2 cables coming from the antenna to a grounding block (see "Grounding Requirements" on page 24) then connect the RF2 cable to the "13V" port on the power inserter.

c. Connect the "V-OUT" connector on the power inserter to the "18V" port on the multiswitch.

   *NOTE: The power inserter switch can be in either position.*

d. Connect the multiswitch outputs to the "Satellite In" jacks on the receivers.

e. If using the 3 x 4 passive multiswitch, terminate any unused connectors on the multiswitch with a supplied 75Ω terminator and verify all connections are tight.

Figure 26: DIRECTV Latin America Wiring for 1 Receiver

## Tri-Americas Wiring
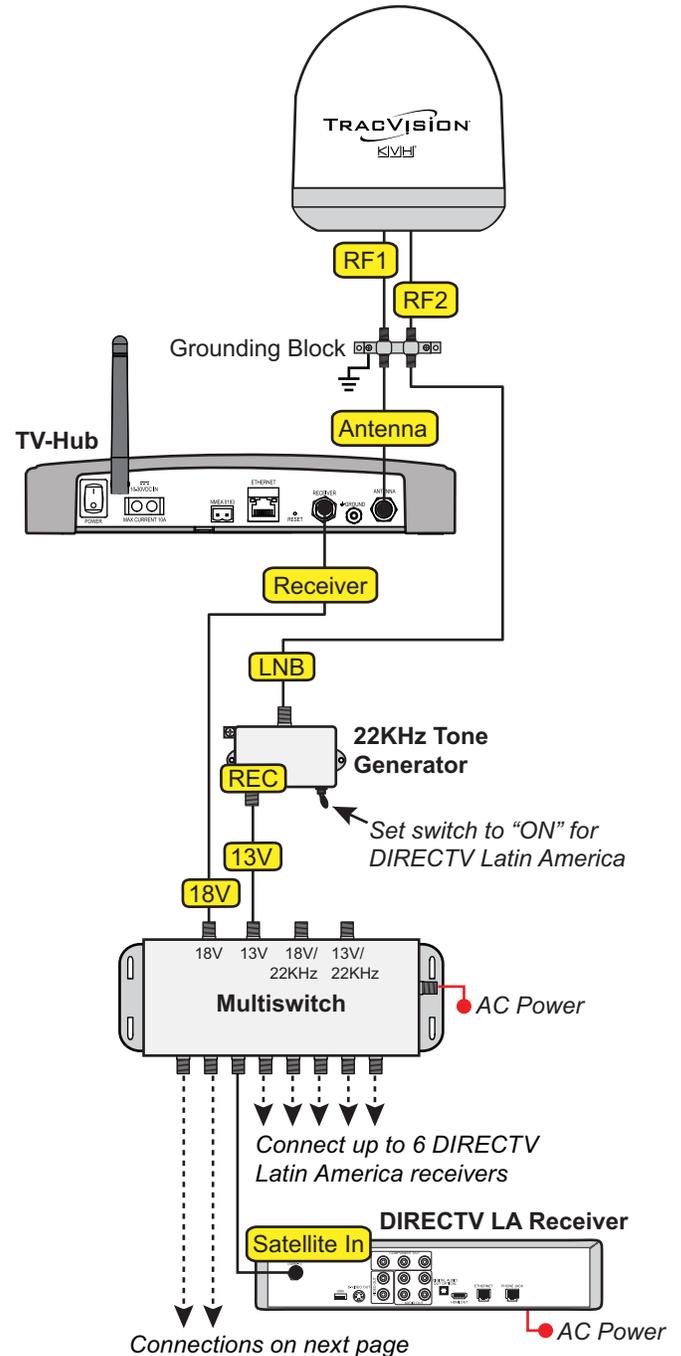
Follow the steps below to wire a Tri-Americas system.

To support both DIRECTV Latin America and DIRECTV U.S. receivers, Tri-Americas systems require a second RF cable to be run from the antenna (see "Wire the Antenna" on page 8) and a multiswitch. The system includes a 22KHz tone generator and two DC block splitters.

When using a 4 x 8 multiswitch (KVH part no. 19-0573), a SWM-8 Module (KVH part no. 19-0605) and SWM splitter (KVH part no. 19-0618) are also required. Refer to Figure 27 and Figure 28 on page 19 to wire the system as follows:

a. Connect an RF cable from the "Receiver" connector on the back of the TV-Hub to the "18V" port on the multiswitch.

b. Ground the RF1 and RF2 cables coming from the antenna to a grounding block (see "Grounding Requirements" on page 24), then connect the RF2 cable to the "LNB" port on the tone generator.

c. Connect the "REC" connector on the tone generator to the "13V" port on the multiswitch.

d. Connect the multiswitch outputs to the "Satellite In" connector on the receivers.

   *NOTE: The DIRECTV U.S. steps continue on the next page.*

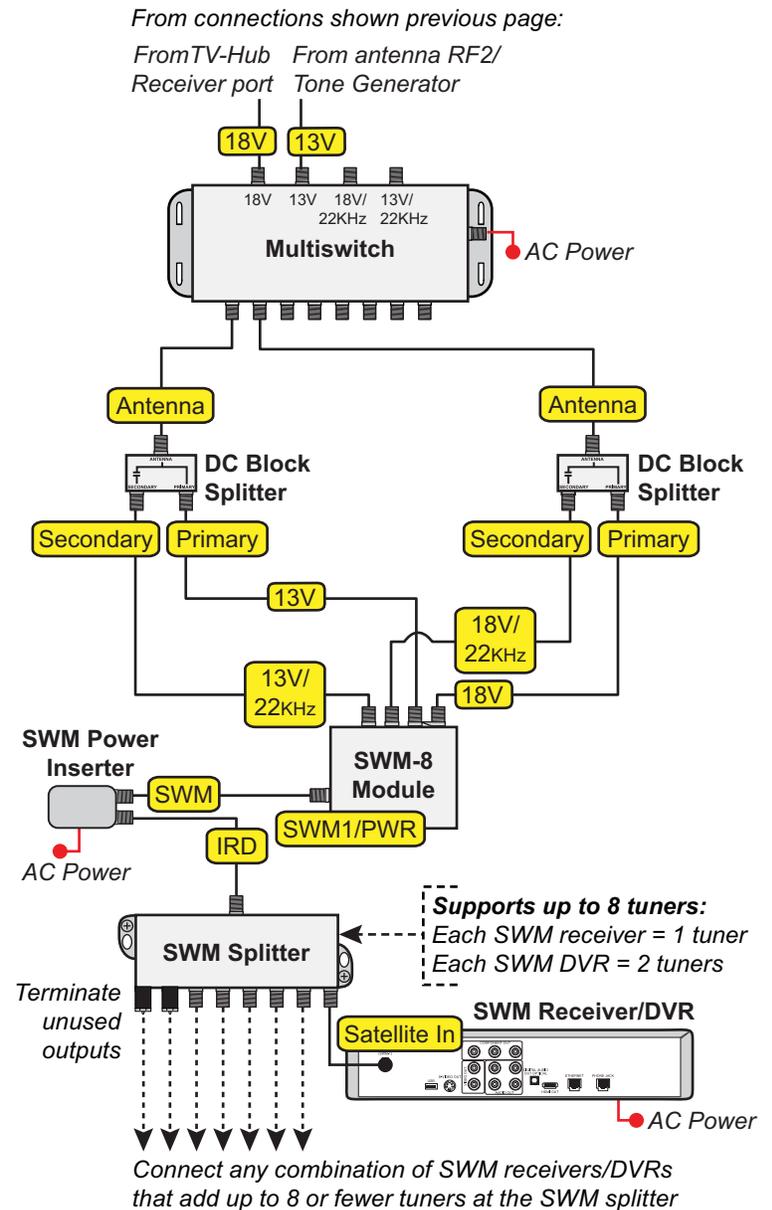Figure 27: Tri-Americas Wiring - DIRECTV Latin America Receivers

**e.** Connect the "Antenna" port of each DC block splitter to one of the outputs of the multiswitch.

**f.** Connect one of the DC block splitters to the 13V ports on the SWM-8 Module. Connect the "Primary" port to "13V"and the Secondary port to "13V/22KHz."

**g.** Connect the other DC block splitter to the 18V ports on the SWM-8 Module. Connect the "Primary" port to "18V" and the Secondary port to "18V/22KHz."

**h.** Connect the "Secondary" port on the DC block connected to the "13V" port to the "13V/22KHz"port on the SWM-8 Module; connect the other DC block splitter's "Secondary" port to the "18V/22KHz" port on the SWM-8 Module.

**i.** Make the connections shown in Figure 28 to wire the SWM power inserter, then connect its IRD port to the SWM splitter.

**j.** Connect an RF cable to each port on the SWM splitter required by the DIRECTV U.S. receivers, and connect its other end to the "Satellite In" connector on the associated SWM receiver/DVR.

**k.** Terminate any unused connectors on the splitter with a supplied 75Ω terminator.

**l.** For DIRECTV Latin America service, set the tone generator switch to the "ON" position; when using DIRECTV U.S. service, set the tone generator switch to "OFF."

*NOTE: Appendix A, , also includes an alternative wiring diagram for using a 4 x 16 multiswitch.*

Figure 28: Tri-Americas Wiring - DIRECTV U.S. Receivers

## DISH Network and Bell TV Wiring

Follow these steps to wire a DISH Network or Bell TV configuration.

> **IMPORTANT!**
>
> Receivers must be DISH Pro-compatible. Look for the DISH Pro logo on the box.

### Connecting 1 Receiver

Connect an RF cable from the "Receiver" jack on the back of the TV-Hub to the "Satellite In" connector of the receiver.

### Connecting 2 or More Receivers

Configurations for connecting 2-8 receivers require a DC block splitter, configurations with 3-4 receivers can use a 3 x 4 passive multiswitch (KVH part no. 19-0861), and configurations with 3-8 receivers require a 4 x 8 multiswitch (customer-supplied or KVH part no. 19-0573).

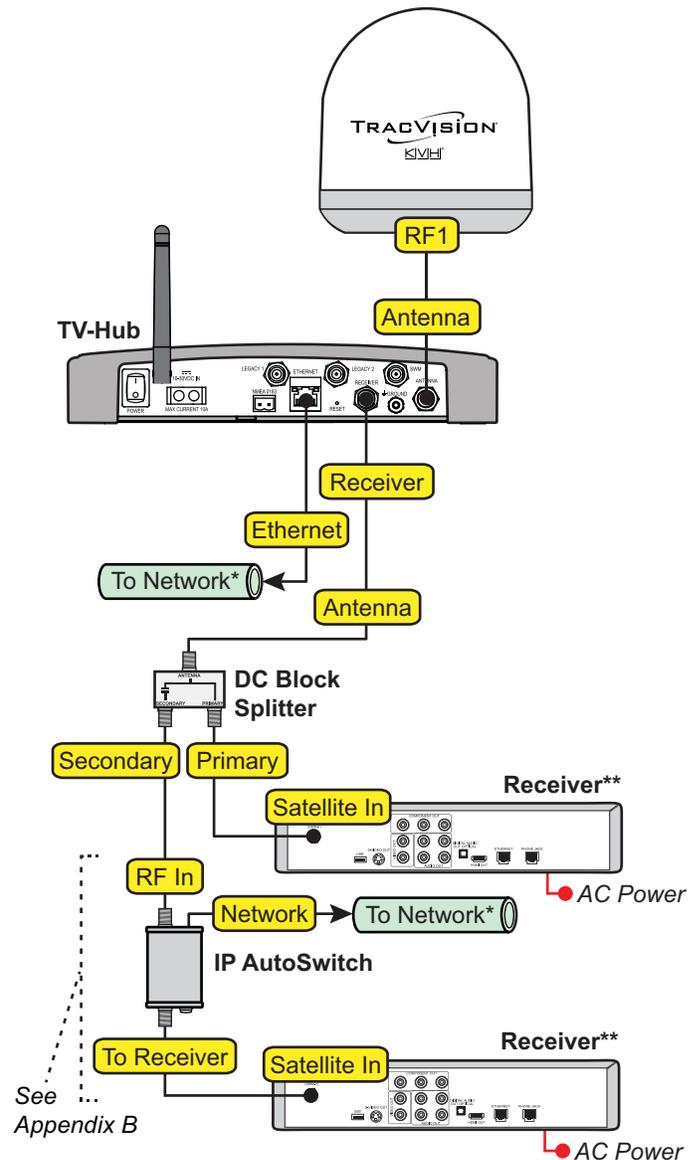*NOTE: See for an example wiring diagram for connecting a multiswitch.*

Wire the system as follows:

> **IMPORTANT!**
>
> If you want to enable any of the additional receivers to control satellite selection, install an optional IP AutoSwitch (KVH part no. 72-0364) with each desired receiver. Refer to Appendix B on for details.

a. Connect an RF cable from the "Receiver" jack on the back of the TV-Hub to the "Antenna" port on the DC block splitter.

b. Connect the "Primary" connector on the DC block splitter to the "Satellite In" connector on the first receiver, and connect the "Secondary" connector on the splitter to the "Satellite In" on the second receiver, or, if connecting more than two receivers, connect it to the "18V" port on the multiswitch (see Figure 29).

c. When using a multiswitch, connect the multiswitch outputs to the "Satellite In" jacks on the associated receivers.
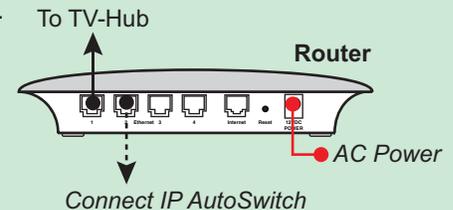
Figure 29:  DISH/Bell Receiver Wiring



** Receivers must be DISH Pro-compatible

**\* Network Connections**

*Connect the TV-Hub and IP AutoSwitch to your onboard network. If you do not have a network, install a router as shown below.*

# 12 Connect a NMEA Device

If an optional NMEA device is connected to the TV-Hub, the antenna can use its GNSS position and heading data to speed up satellite acquisition. The current position and heading will also be displayed on the Home page of the web interface.

If the customer would like to connect a NMEA device to the TV-Hub, make the connection **after** the RF cabling is complete as follows:

a. Wire and connect the 2-position terminal strip connector (supplied in the kit) as shown in Figure 30.

b. Configure the NMEA device to transmit one or more of the NMEA 0183 messages at 4800 baud (see Figure 31).

Later, you will select the NMEA source at the TracVision Setup Wizard (see "Setup the System" on page 27).

Figure 30: TV-Hub NMEA Connections



NMEA 0183 Talker

Figure 31: Supported NMEA Messages

| NMEA 0183 $--xxx | Description |
|---|---|
| HDG | Heading, Deviation & Variation |
| HDM | Heading, Magnetic |
| HDT | Heading, True |
| OSD | Own Ship Data |
| THS | True Heading & Status |
| VHW | Water Speed and Heading |
| RMC | GNSS Position Data |

# ⑬ Connect to a Network

Connecting the TV-Hub to an onboard local area network (LAN) is required if any of the following apply:

- One or more IP AutoSwitches are installed to enable automatic satellite switching *(Linear/ DISH Network/Bell TV only)*

- One or more DIRECTV SWM-compatible receivers are connected to the system and customer requires automatic switching between the 101W and 119W satellites

- Customer wants access the TV-Hub's web interface using any device connected to the network (see Figure 32)

*NOTE: Connecting the TV-Hub to the onboard network using its Wi-Fi rather than a cable is not recommended. Although possible, once the TV-Hub's wireless settings are changed from Access Point mode to Infrastructure mode, the ability to connect directly to the TV-Hub using a mobile device is lost – connection will always have to be made via the network.*

## Wired LAN Connection

┌─ **IMPORTANT!** ─────────────────────┐
For DIRECTV systems set up for automatic satellite switching, make sure the receiver(s) are connected to the same subnet as the TV-Hub.
For systems with IP AutoSwitch(es), make sure they are on the same local LAN segment as the TV-Hub.
└──────────────────────────────────────┘

a. Connect the TV-Hub Ethernet port to he network using the supplied Ethernet cable.

   By default, the TV-Hub's Ethernet port is configured as a DHCP client, and the network's router automatically assigns it an IP address.

b. In **Dynamic** (DHCP) mode, the TV-Hub could get assigned a different IP address whenever it is turned on. Therefore, it is recommended that the TV-Hub is configured for **Static** mode. This is done by entering a static IP address through the Settings page of the web interface (see Figure 33).
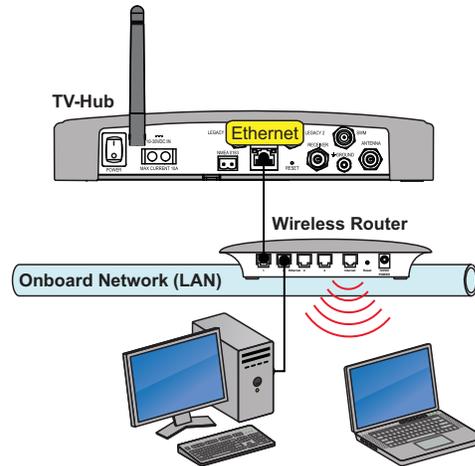
Figure 32:  TV-Hub Ethernet Connections



Figure 33:  Web Interface Ethernet Settings

# ⑭ Secure the Wi-Fi Connection

By default, the TV-Hub's wireless settings are configured for the following:

- Wireless Mode: AP (Access Point)

- SSID: TV-Hub-<TV-Hub serial number>

- IP Address: 172.16.0.1

- Security Mode: Off

After the system is turned on (see ) and set up (see ), KVH strongly advises that you select the **WPA_PSK** security mode as shown in Figure 34 and assign a unique password to prevent unauthorized access to the TV-Hub. If you keep the default settings, you're allowing anyone to access the TV-Hub with their mobile device.

---
**IMPORTANT!**

If you select Infrastructure (IF) mode to connect the TV-Hub to your onboard network, you will no longer be able to access the TV-Hub's web interface directly.

---

Figure 34:  TV-Hub Security and Password Setting



**Wireless Settings**

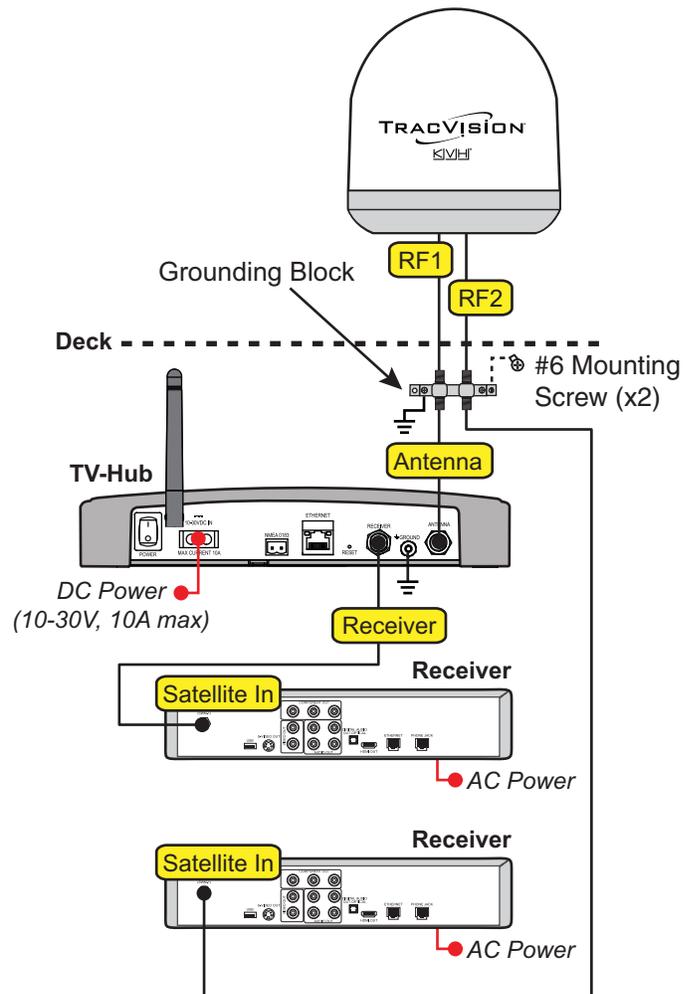| | |
|---|---|
| Wireless Mode | AP (Access Point) ▾ |
| SSID | TVHub-140311659 |
| IP Address | 172.16.0.1 |
| Subnet | 255.255.255.0 |
| Gateway | 172.16.0.1 |
| Broadcast | 172.16.0.1 |
| Security Mode | WPA_PSK ▾ |
| Password | 240300659 |

# 15 Connect Power

Before connecting power, be sure the vessel is properly grounded in accordance with marine standards.

## Grounding Requirements

Proper grounding of the TracVision system to ship's ground is critically important, as it protects the equipment from lightning and electrostatic discharges (ESD). Follow these steps to ground the system.

a.  Single cable systems are grounded by the TV-Hub grounding wire. Connect the hoop of the grounding wire (supplied in the kit) to the "Ground" screw on the rear of the TV-Hub.

b.  Connect the other end of the grounding wire to ship's ground.

c.  For any systems with additional antenna RF cables, connect these cables to one (for RF1 and RF2) or two (for RF3 and RF4) grounding blocks (supplied in the kit). Attach the supplied ground wire to ship's ground, and, using the two #6 screws supplied with the grounding block, mount the block inside the vessel (see Figure 35).

---

⚠ **WARNING**

**Failure to ground the TracVision system properly to the vessel'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 vessel's ground can measure well over 100 volts, when it normally should not exceed 25 volts. Therefore, always measure the difference in potential between chassis ground and the vessel'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.

---

Figure 35:  Grounding Block Example

# 15 Continued Connect Power

## Connect Power to the System

*NOTE: When powering up a SWM configuration, apply power to all other system components before powering up the receivers and DVRs (tuners are assigned channels during startup).*

Follow the steps below to connect power to the TracVision system (see Figure 36).

---
**IMPORTANT!**

All power connections must be hard wired.

---

a. Make sure that the ground wire from the TV-Hub has been connected as described on the previous page.

b. Connect the TV-Hub power cable (supplied in the kit) to the 10-30 VDC power input on the rear of the TV-Hub.

c. Connect the black wire of the TV-Hub power cable to ship's ground.

d. Connect the red wire of the TV-Hub power cable to the vessel's 10-30 VDC Power source.

   *NOTE: An optional AC/DC power supply is available from KVH, part no. 72-0669.*

Figure 36: TracVision System Power

# ⑯ Turn On the System

Follow these steps to turn on the system for the first time.

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

b. Press the power switch on the rear of the TV-Hub to apply power to the TracVision system (see Figure 37).

c. Within a few minutes, the TV-Hub and Power lights should be lit green (the Antenna light will be flashing green (see Figure 38).

d. Plug in and turn on any connected receivers, DVRs, Genie clients, and televisions.

e. Follow the steps in the next section to access the web interface and set up the TracVision system for the customer's service provider.
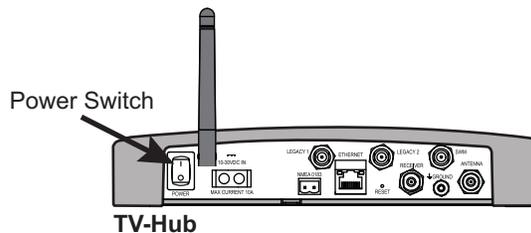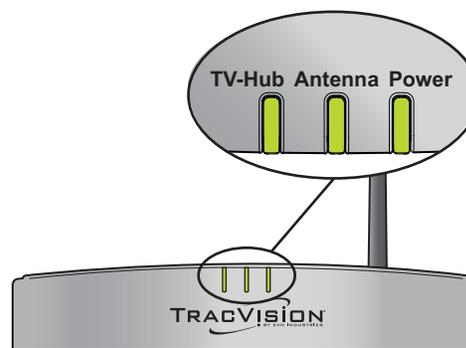
Figure 37: TV-Hub Power Switch



Power Switch

TV-Hub

Figure 38: TV-Hub Status Lights



TV-Hub  Antenna  Power

TRACVISION

# 17 Setup the System

Before you begin to set up the system:

- Know the service provider and associated satellite(s)

- Check for the latest software version (see page 28)

- Verify all system components are connected

## Access the Web Interface – Wireless

To access the web interface from any Wi-Fi-enabled mobile device:

a. Select the **TVHub-**<*TV-Hub serial number*> network from your device's Wi-Fi settings to connect to the TV-Hub.

b. Start a browser and enter **http://tvhub.kvh**.

The Setup Wizard's home page appears upon initial startup to step you through system configuration (see Figure 39).

## Alternate Interface Access Options

Other options for connecting to the TV-Hub web interface include:

- Connect a PC configured for DHCP directly to the "Ethernet port" on the back of the TV-Hub (see Figure 40).

  Once you have connected the PC, enter **http://169.254.253.1** into your web browser.

- When connected to a vessel's LAN (see "Connect to a Network" on page 22), enter the IP Address (dynamic or static) assigned to the TV-Hub.

  *NOTE: The TV-Hub is Bonjour®-enabled. You can use Bonjour to connect to the TV-Hub using a computer on the same network without using the IP address if Bonjour is installed and enabled.*
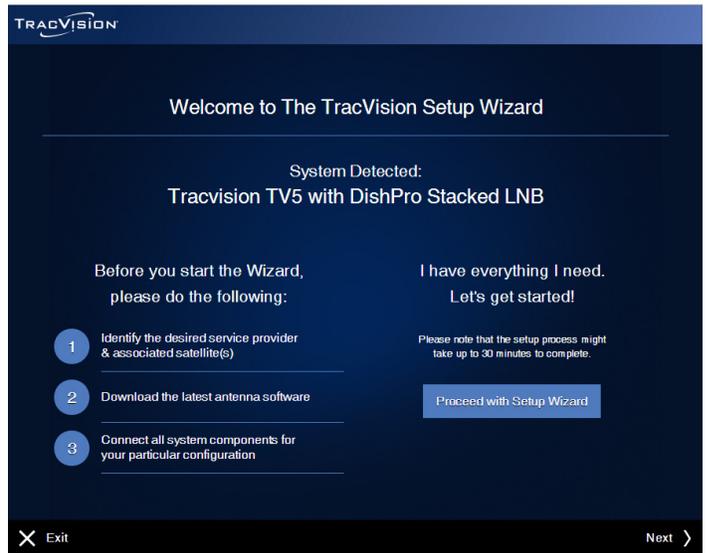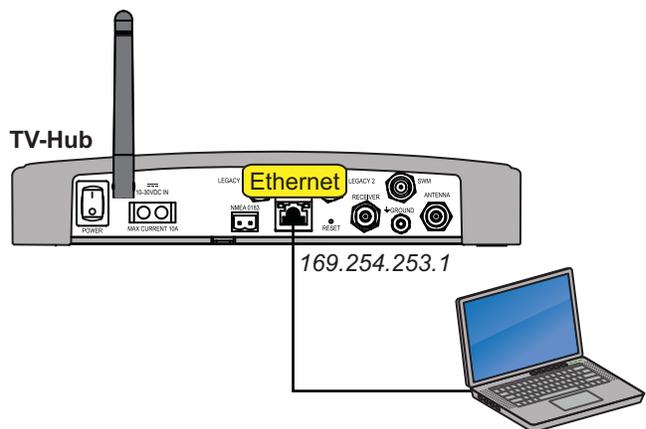
Figure 39: Setup Wizard



Figure 40: Wired Connection
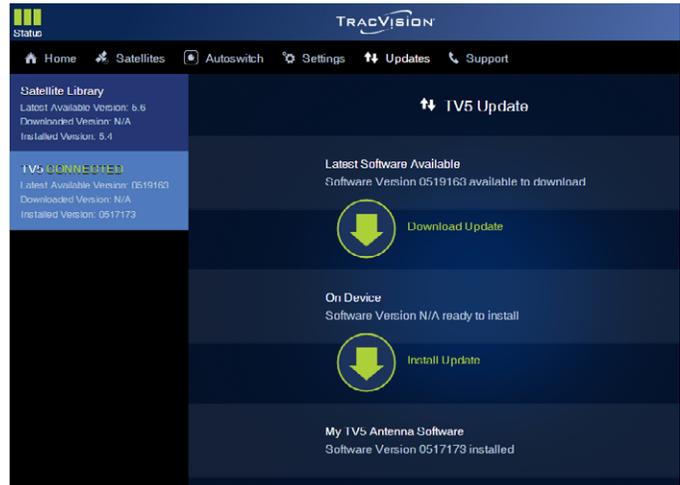
## Update Software and Satellite Library

Before you start the Setup Wizard, update the system software and satellite library with the latest versions. Use the iPhone/iPad App, or follow these steps to use a laptop PC that has the latest update files downloaded to it.

a. Select **Exit** in the Setup Wizard page. The web interface appears.

b. At the **Updates** page, select the antenna. Then select **Install Update** (see Figure 41). Find the *<software version>*.**kvh** file in your downloads folder, then double-click to install.

c. Wait for the update to complete. It may take up to 45 minutes. The TV-Hub's lights will alternate orange while the update is in progress. Once complete, the web interface will report that the latest version is installed.

d. When the software update is complete, select the Satellite Library in the left pane, and select **Install Update**. Find the .**xml** file you had downloaded, and double-click to install.

e. Select **Settings** then select **Setup Wizard**.

*NOTE: Whenever you close the web interface before completing the Setup Wizard, the Setup Wizard will automatically reappear when you re-enter* **http://tvhub.kvh**.

f. Select **Proceed with Setup Wizard** on the Setup Wizard home page.

Figure 41: Software Updates Page

## Setup Wizard

System configuration continues by prompting you to enter information or perform specific tasks as needed. For example:

- Enter installer and vessel information

- Select a source for GPS position

- Select a source for heading data (if NMEA device is connected)

- Select the satellite TV service

- Select satellite(s) to track (single, or one of the preset groups listed in Figure 42), or create user-defined satellites

- Select a configuration

- Set up automatic switching, if applicable

## Additional Setup Information

Once the Setup Wizard has been completed, perform follow-up tasks such as:

- Setting the skew angle (linear only)

- Setting up receivers to operate with the system (as instructed by the Wizard)

- Activating the receivers (as instructed by the Wizard)

Figure 42: Preset Satellite Groups

| Service | Satellites (A-B-C-D) |
|---|---|
| Linear | Europe 1: Hotbird, Astra1, Astra2S, Astra3<br>Europe 2: Astra3, Astra1, Hotbird, Astra2S<br>Scandinavia: Astra4, Thor, Hotbird, Astra1 |
| DIRECTV U.S. | DIRECTV Dual: 101W and 119W |
| DISH Network | Western Arc: 110W, 119W, 129W<br>Eastern Arc: 61W, 72W, 77W<br>Legacy East Arc: 61W, 110W, 119W<br>DISH 500: 110W, 119W |
| Bell TV | Bell TV Dual: 82W and 91W |
| Tri-Americas<br>(DIRECTV U.S. + Latin America) | Tri-Am TriSat: 101W, 119W, 95W<br>Tri-Am Dual: 101W, 95W |

**Note**: List is subject to change.

## Linear Receiver Setup for Automatic Switching

For automatic switching to work properly using the DiSEqC communications protocol, set up linear receivers for the same satellites installed in the TracVision system. Set up the satellites in the receiver in the exact same order as they were set up in the antenna. The specific setup process varies among receiver models – refer to the receiver's manual for details. Use the table below and Figure 43 as a guide.

| Satellites in Antenna | Matching Satellites in Receiver |
|---|---|
| Slot A | Port/Switch/LNB/DiSEqC 1 or A |
| Slot B | Port/Switch/LNB/DiSEqC 2 or B |
| Slot C | Port/Switch/LNB/DiSEqC 3 or C |
| Slot D | Port/Switch/LNB/DiSEqC 4 or D |

Figure 43: Example Linear Receiver DiSEqC Settings

# ⓲ Set the LNB Skew Angle

Follow the steps below to set the antenna's LNB to the skew angle supplied by the Setup Wizard.

a. Turn off and unplug your satellite TV receiver.

b. Press the TV-Hub power switch off and verify the Power LED light goes out.

> ⚠ **CAUTION**
>
> Disconnect power from the antenna before you remove the radome. The antenna has moving parts that can cause injury.

c. Remove the antenna's radome as described on page 9.

*TIP: If you keep the radome topside, secure it with a lanyard to prevent it from falling overboard. Also, do not place the radome on a hot steel deck – the heat may warp the radome.*

d. Locate the LNB on the back of the antenna's reflector (see Figure 44).

e. Using a 2 mm Allen hex key, loosen the two M4 set screws securing the LNB to the choke feed (see Figure 45).

f. Adjust the LNB, clockwise or counter-clockwise, until the skew arrow on the LNB points to the correct skew angle you noted when running the Setup Wizard (see Figure 46).

> **IMPORTANT!**
>
> Make sure the LNB is fully inserted into the choke feed to ensure optimum performance.

g. Tighten the two M4 socket set screws to secure the LNB in place. Apply 9 in-lbs (1 N-m) of torque, if possible.

h. Reinstall the antenna's radome and protective caps as described at the end of page 10.

Figure 44: Location of LNB on Back of Antenna Reflector

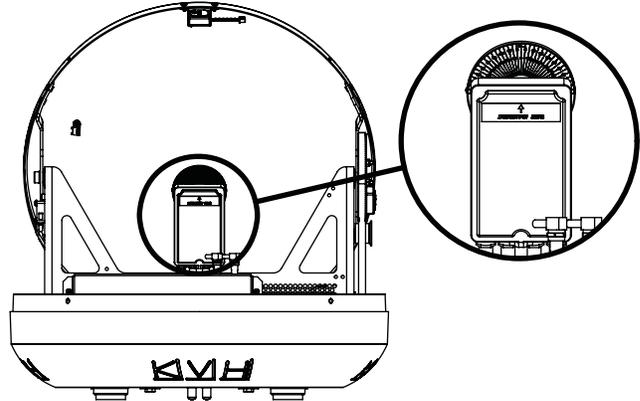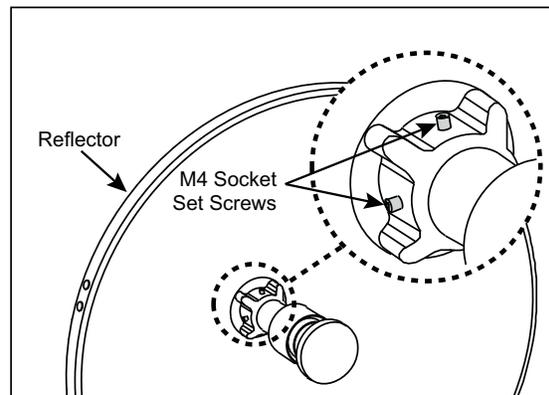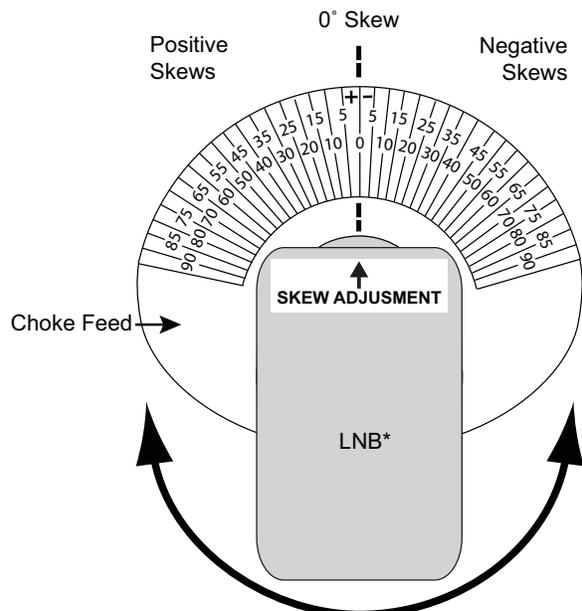Figure 45: Set Screws Securing the LNB to the Reflector

Reflector

M4 Socket Set Screws

Figure 46: LNB Skew Angle Adjustment

0° Skew

Positive Skews

Negative Skews

SKEW ADJUSMENT

Choke Feed

LNB*

*actual LNB not shown

# ⑲ Educate the Customer

Before you leave the vessel, test the system to ensure the antenna works properly. Fill out the Installation Checklist (provided in the Welcome Kit) and return it to KVH. Refer to the instructions on the form.

Give the Customer Welcome Kit to the customer, provide any passwords you set up, and explain how to use the system. Ensure the customer understands the following.

- How to:
    - Turn on the system
    - Access the web interface
    - Switch satellites (see Figure 47)
    - Select a master receiver (see Figure 48)
    - Interpret TV-Hub status
    - Download software and satellite library updates (using web interface and/or iPhone or iPad App)
    - Perform general troubleshooting

- Keep the radome installed on the antenna at all times. The radome protects the antenna's moving parts from wind, rain, and debris.

| ⚠ | CAUTION |
|---|---------|

In the unlikely event that you need to remove the radome, remove power from the antenna first because the antenna's moving parts can cause injury.

- The antenna must have a clear view of the sky to receive satellite TV. Common causes of blockage include trees, buildings, bridges, and onboard equipment (see Figure 49). Heavy rain or snow may also temporarily interrupt reception.

- Clean the antenna regularly. Dirt buildup on the radome can affect satellite TV reception.

- The vessel must be located within the satellites' coverage area to receive satellite TV signals. To view coverage information, visit www.kvh.com/footprint.

- Please register the system with KVH. The registration process is quick, easy, online, and ensures the best possible service from KVH. Visit www.kvh.com/register for details.

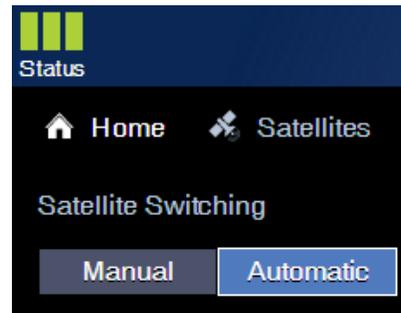Figure 47:  Satellite Switching Selection on Home Page



Figure 48:  Master Receiver Selection



Figure 49:  Blockage Example

# A Wiring Diagrams

The wiring diagrams that follow supplement the basic wiring diagrams provided in "Wire the Receivers" on page 13.

## Linear Configuration with 5 to 8 Receivers

The diagram below shows the wiring for a linear configuration with multiple receivers, an IP AutoSwitch, and network.



**TracVision KVH**

RF1  RF3
RF2  RF4

Grounding Block

Antenna

**TV-Hub**

DC Power
(10-30V, 10A max)

Receiver

Ethernet

To Network*

18V/22KHz
18V
13V
13V/22KHz

| 18V | 13V | 18V/22KHz | 13V/22KHz |
|-----|-----|-----------|-----------|

**Multiswitch** — AC Power

Connect up to 8 receivers

RF In

Network → To Network*

Connect an IP AutoSwitch with each receiver you want to control satellite selection

**IP AutoSwitch**

To Receiver

**Receiver**

Satellite In

AC Power

**\* Network Connections**

*Connect the TV-Hub and IP AutoSwitches to your onboard network. If you do not have a network, install a router or router and switch as shown below.*

To TV-Hub

**Router** — AC Power

Connect up to 3 IP AutoSwitches

**OR**

To TV-Hub

**Router** — AC Power

Connect up to 2 IP AutoSwitches

**Switch** — AC Power

Connect up to 7 IP AutoSwitches

33

## DIRECTV Configuration - up to 8 SWM Tuners

The diagram below shows the wiring for a DIRECTV configuration with up to 8 SWM tuners.

RF1

Antenna

**TV-Hub**

DC Power
(10-30V, 10A max)

Ethernet

To Network*

SWM

**Supports up to 8 tuners:**
Each SWM receiver = 1 tuner
Each SWM DVR = 2 tuners

Terminate
unused
outputs

**SWM Splitter**

**SWM Receiver/DVR**

Satellite In

Ethernet

To Network*

AC Power

Connect any combination of SWM receivers/DVRs
that add up to 8 or fewer tuners at the SWM splitter

**\* Network Connections**

Connect the TV-Hub and any SWM receivers
and/or DVRs you want to control satellite selection
to your onboard network.
If you do not have a network, install a router or
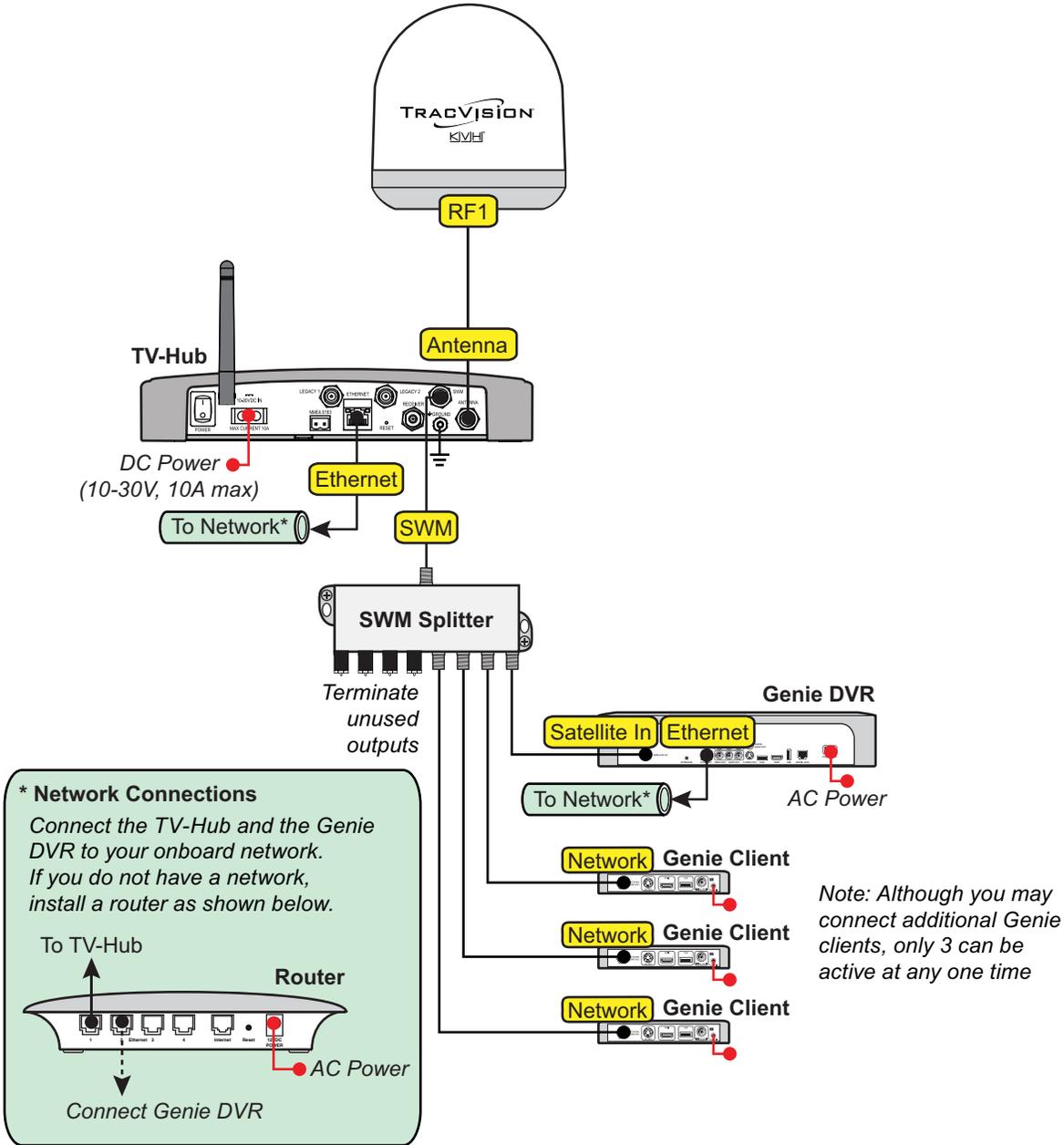router and switch as shown below.

To TV-Hub

**Router**

AC Power

Connect up to 3 SWM receivers/DVRs

**OR**

To TV-Hub

**Router**

AC Power

Connect up to 2 SWM receivers/DVRs

**Switch**

AC Power

Connect up to 7 SWM receivers/DVRs

## DIRECTV Genie Configuration

The diagram below shows the wiring for a DIRECTV configuration with Genie DVR and Clients.

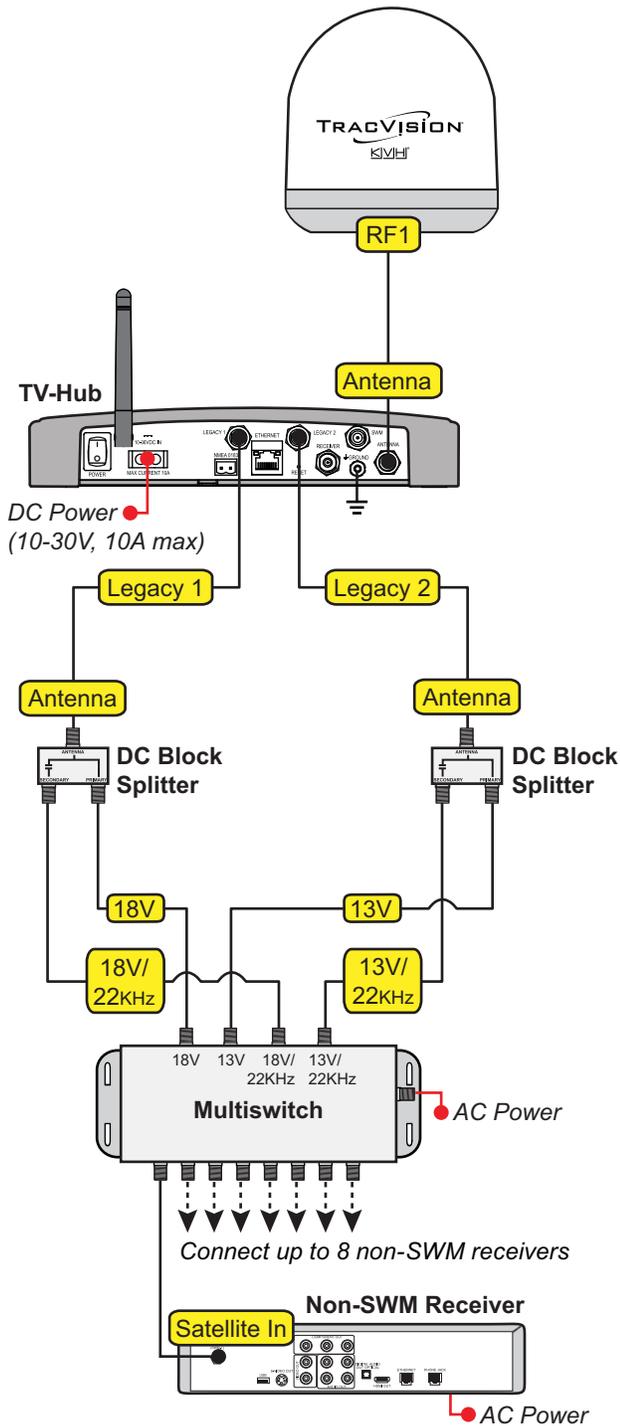All DIRECTV configurations can include a Genie network.

TRACVISION
KVH

RF1

Antenna

**TV-Hub**

LEGACY 1   ETHERNET   LEGACY 2   SWM
NMEA 0183              RECEIVER   ANTENNA
POWER   MAX CURRENT 10A   RESET   GROUND

*DC Power*
*(10-30V, 10A max)*

Ethernet

To Network*

SWM

**SWM Splitter**

*Terminate unused outputs*

**Genie DVR**

Satellite In   Ethernet

To Network*

*AC Power*

**\* Network Connections**

*Connect the TV-Hub and the Genie DVR to your onboard network. If you do not have a network, install a router as shown below.*

To TV-Hub

**Router**

1   Ethernet 3   4   Internet   Reset   12V DC POWER

*AC Power*

Connect Genie DVR

Network   **Genie Client**

Network   **Genie Client**

Network   **Genie Client**

*Note: Although you may connect additional Genie clients, only 3 can be active at any one time*

## DIRECTV Non-SWM Configuration

The diagram below shows the wiring for a non-SWM configuration with 3-8 receivers.



TRACVISION
KVH

RF1

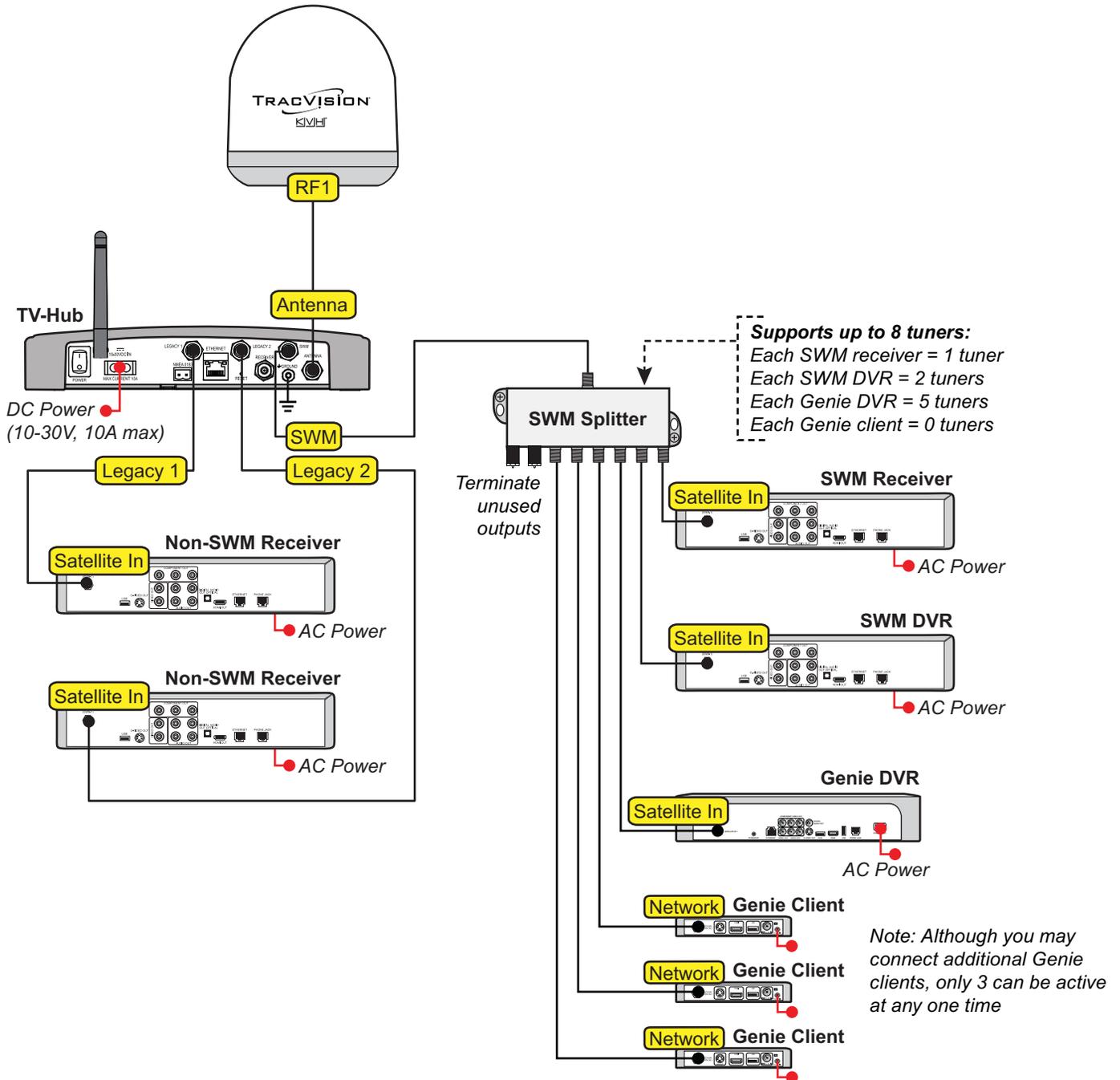Antenna

**TV-Hub**

POWER/DC IN
MAX CURRENT 15A
LEGACY 1
NMEA 0183
ETHERNET
LEGACY 2
RECEIVER
RESET
SWM
ANTENNA
GROUND
POWER

*DC Power*
*(10-30V, 10A max)*

Legacy 1

Legacy 2

Antenna

Antenna

ANTENNA
SECONDARY  PRIMARY
**DC Block Splitter**

ANTENNA
SECONDARY  PRIMARY
**DC Block Splitter**

18V

13V

18V/
22KHz

13V/
22KHz

18V   13V   18V/   13V/
           22KHz  22KHz

**Multiswitch**

● *AC Power*

*Connect up to 8 non-SWM receivers*

**Non-SWM Receiver**

Satellite In

● *AC Power*

# A  Continued Wiring Diagrams

## DIRECTV SWM and Non-SWM Configuration

**DIRECTV – SWM and Non-SWM**

The diagram below shows the wiring for a DIRECTV configuration with both SWM tuners (including Genie clients) and non-SWM receivers.
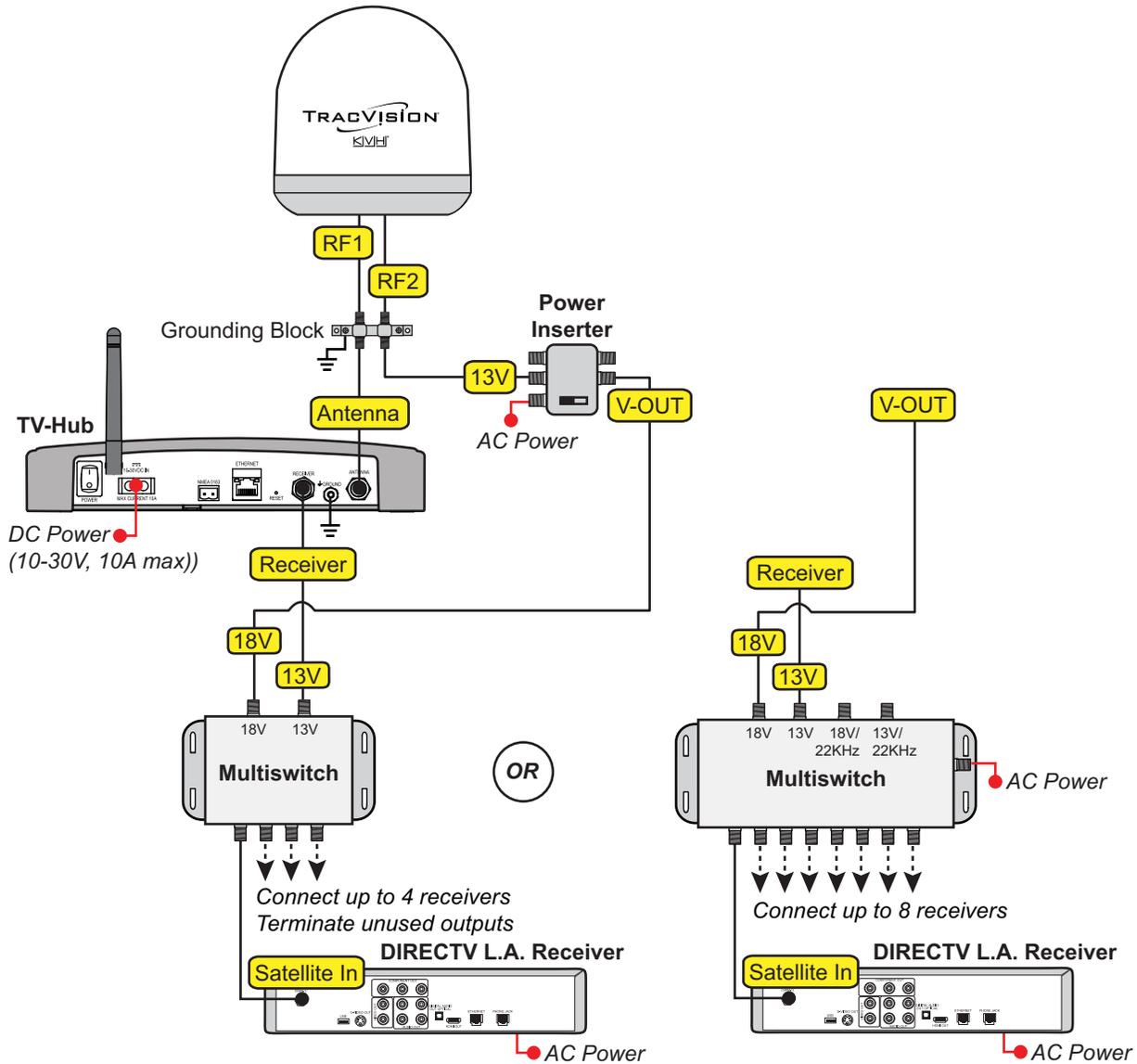


**Supports up to 8 tuners:**
Each SWM receiver = 1 tuner
Each SWM DVR = 2 tuners
Each Genie DVR = 5 tuners
Each Genie client = 0 tuners

*Note: Although you may connect additional Genie clients, only 3 can be active at any one time*
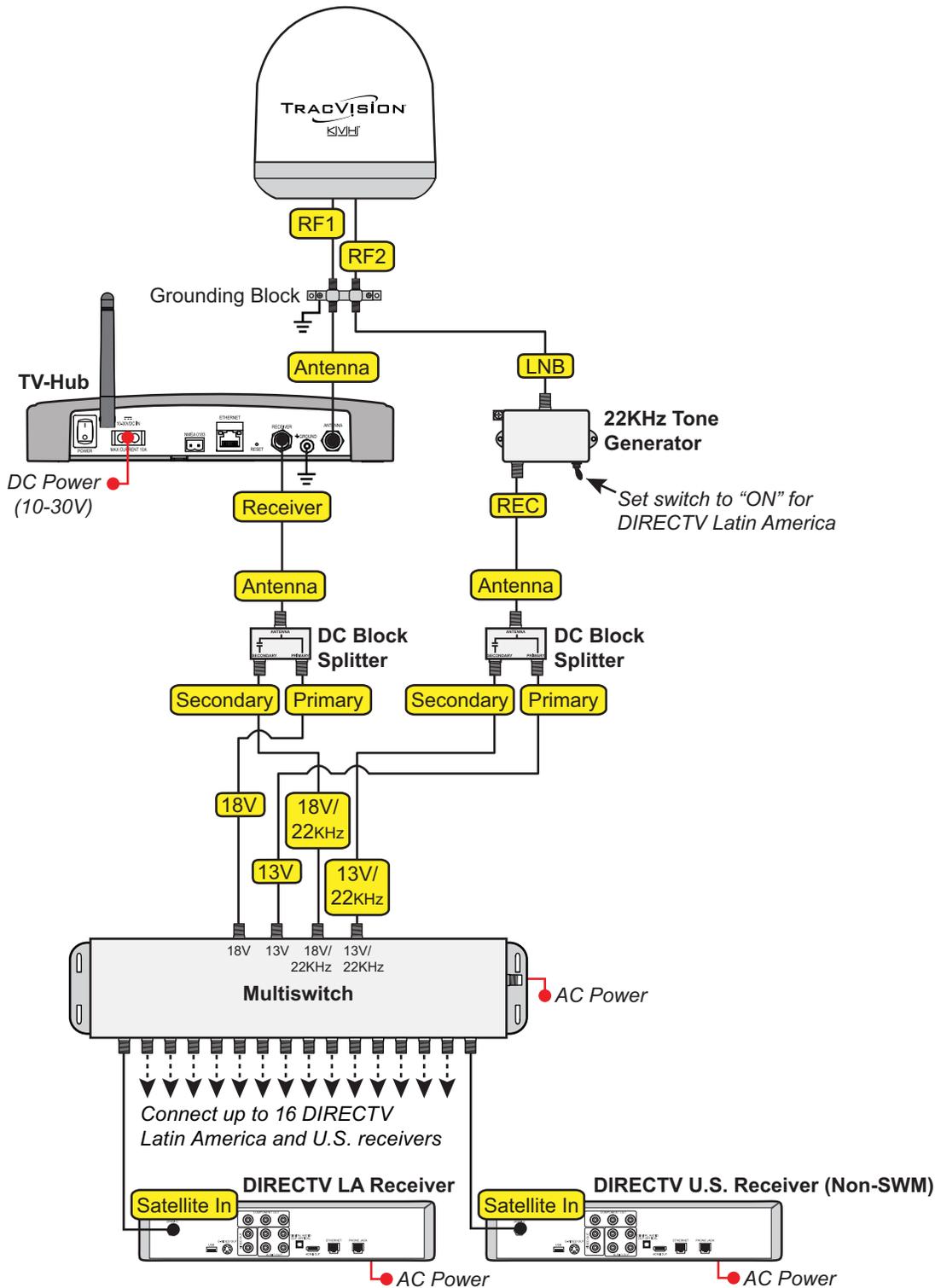
37

## DIRECTV Latin America Configuration

The diagram below shows both multiswitch options for wiring a DIRECTV Latin America configuration with multiple receivers.

## Tri-Americas with 4 x 16 Multiswitch

The diagram below shows the wiring when using a 4 x 16 multiswitch.

**TracVision** KVH

RF1
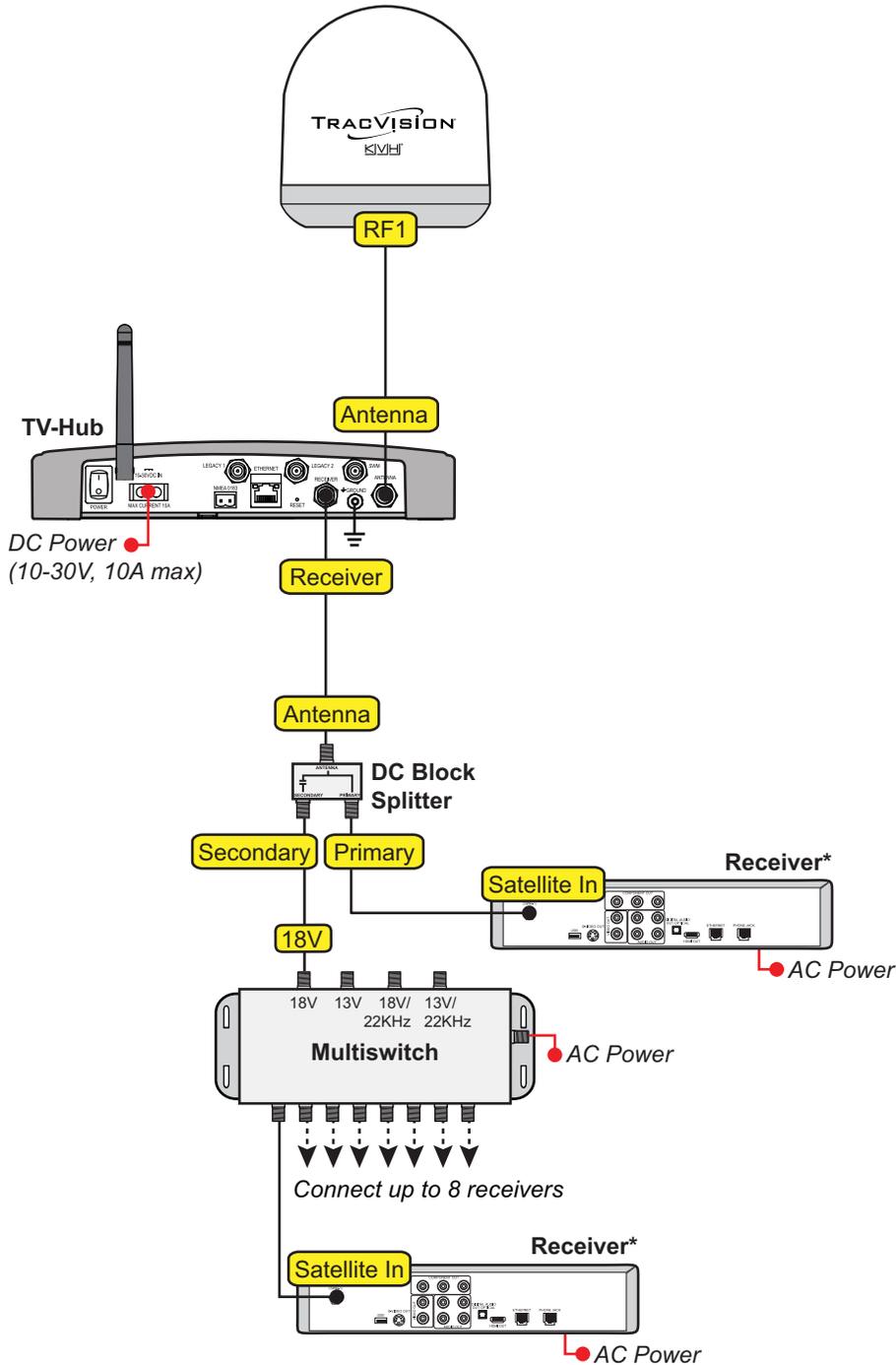RF2

Grounding Block

Antenna

LNB

**TV-Hub**

*DC Power (10-30V)*

**22KHz Tone Generator**

Receiver

REC

*Set switch to "ON" for DIRECTV Latin America*

Antenna

Antenna

**DC Block Splitter**

**DC Block Splitter**

Secondary | Primary

Secondary | Primary

18V

18V/ 22KHz

13V

13V/ 22KHz

18V | 13V | 18V/ 22KHz | 13V/ 22KHz

**Multiswitch**

*AC Power*

*Connect up to 16 DIRECTV Latin America and U.S. receivers*

**DIRECTV LA Receiver**

**DIRECTV U.S. Receiver (Non-SWM)**

Satellite In

Satellite In

*AC Power*

*AC Power*

## DISH Network and Bell TV Configurations

The diagram below shows the wiring for either a DISH Network or Bell TV configuration with 3 - 8 DISH Pro-compatible receivers.



RF1

**TV-Hub**

Antenna

*DC Power (10-30V, 10A max)*

Receiver

Antenna

**DC Block Splitter**

Secondary | Primary

Satellite In | **Receiver***

*AC Power*

18V

| 18V | 13V | 18V/ 22KHz | 13V/ 22KHz |

**Multiswitch**

*AC Power*

*Connect up to 8 receivers*

**Receiver***

Satellite In

*AC Power*

*\* Receivers must be DISH Pro-compatible*

# B Connecting IP AutoSwitches

Follow the steps below to add IP AutoSwitches (KVH part no. 72-0634) to DISH Network, Bell TV, or linear configurations.

## Inspect Parts

Follow these steps to inspect the kit contents.

a.  Unpack the box and ensure it contains one each of the following items:

    • 3 ft (1 m) Ethernet cable

    • 2 ft (60 cm) RF cable

    • Adhesive-backed Velcro strip

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

c.  Locate the serial number on the bottom of the IP AutoSwitch (see Figure 51) and record it in the space below. You will need this number later.

    S/N _____

    *NOTE: Record all IP AutoSwitch serial numbers on the Installation Checklist supplied in the Welcome Kit.*

## Choose a Mounting Location

Choose a mounting location that meets the following requirements:

•  Dry, well-ventilated, and away from heat sources

•  Provides a clear view of and easy access to the Master Select button (see Figure 51)

•  Provides adequate clearance for running the cables and allows for service loops and strain relief

•  Within 2 ft (60 cm) of the associated receiver in order to use the supplied cable

•  Either a horizontal or vertical surface

Figure 50: IP AutoSwitch



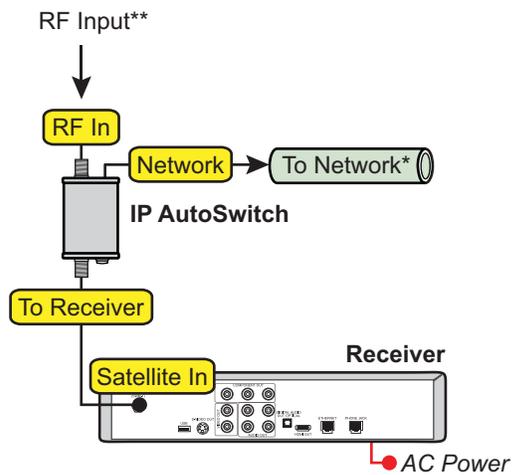Figure 51: Serial Number and Master Select Button



Bottom View

Serial Number

Master Select Button

## Wire the IP AutoSwitch

The wiring of the IP AutoSwitch depends on the specific configuration. Refer to the wiring diagrams provided in this guide, while following the general wiring steps below:

**a.** Disconnect the RF input cable from the receiver and connect it to the **RF In** jack on the IP AutoSwitch. Then tighten the hex nut to 15 in.-lbs of torque.

**b.** Connect the supplied 2 ft (60 cm) RF cable from the **To Receiver** port on the IP AutoSwitch to the receiver's satellite input and tighten the hex nut to 15 in.-lbs of torque.

**c.** Using the supplied Ethernet cable, connect the Network port of the IP AutoSwitch to the onboard network. If a network is not available, install a router as shown in Figure 52.

**d.** If not already connected, connect the TV-Hub to the onboard network (see Figure 52).

**e.** Using the supplied Velcro strip, secure the IP AutoSwitch to the mounting surface.

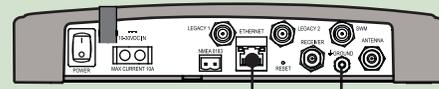Figure 52: IP AutoSwitch Connections
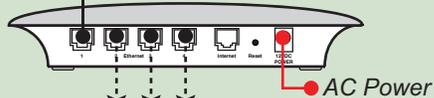


** Varies depending on your system configuration

**\* Network Connections**

*Connect the TV-Hub and IP AutoSwitches to your onboard network. If you do not have a network, install a router or router and switch as shown below.*

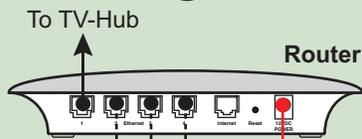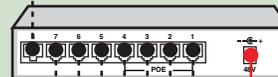## Configure the IP AutoSwitch

When performing system setup (see "Setup the System" on page 27), follow these instructions to configure the IP AutoSwitch.

*NOTE: KVH recommends that you run the Setup Wizard in the web interface whenever you change your system's configuration by adding or removing devices.*

a. At the AutoSwitch page of the web interface, select **Add IP AutoSwitch** (Figure 53).

b. Enter the serial number and choose a friendly name for the IP AutoSwitch (for example, "Salon").

c. Select **Save** to save changes.

## Select a Master Receiver

Any receiver connected to an IP AutoSwitch can become the master receiver for the system. The master receiver controls satellite selection.

### Important!

The TV-Hub has a built-in IP AutoSwitch. Any receiver connected directly to the TV-Hub can therefore be selected as a master receiver through the web interface.

a. To choose a master receiver, select it on the home page of the web interface, or press the Master Select button on the associated IP AutoSwitch.

b. Verify that the LED in the Master Select button on the IP AutoSwitch is lit green (see Figure 54). The LEDs for any other IP AutoSwitches should be lit orange.
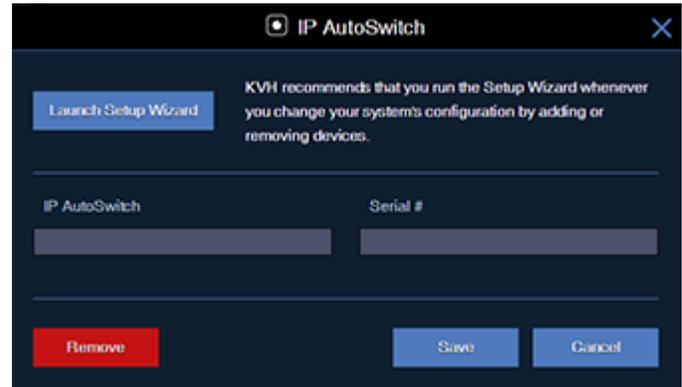
Figure 53: Add IP AutoSwitch Screen



Figure 54: IP AutoSwitch LED Status Indications

| LED Color | Indication |
| --- | --- |
| Orange | Registered with the system but not currently the master |
| Orange, flashing | Initializing |
| Red | Error:<br>• unable to communicate with the system,<br>• network is not detected, or<br>• unable to register |
| Green | Registered with the system and currently the master |

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