TracVision M3DX
Circular Configuration

User’s Guide

This user’s guide provides all of the basic information you need to operate, set up, and troubleshoot the TracVision M3DX satellite TV antenna system. For detailed installation information, please refer to the TracVision M3DX Installation Guide.

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If you have any comments regarding this manual, please e-mail them to manuals@kvh.com. Your input is greatly appreciated!
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# Table of Contents

1 **Introduction**
- Using this Manual..............................................................................3
- System Overview...............................................................................5

2 **Operation**
- Receiving Satellite TV Signals .........................................................11
- Turning the System On/Off ..............................................................12
- Understanding the Status Screen....................................................13
- Switching Satellites.........................................................................14
- Changing the Satellite Switching Mode.................................16
- Product Care ....................................................................................17

3 **System Preferences**
- Adjusting the Display Brightness.....................................................21
- Entering Latitude/Longitude ...........................................................22

4 **Setup**
- DIRECTV Setup.................................................................................25
- DISH Network Setup ........................................................................27
- ExpressVu Setup..............................................................................31
- Manual Mode Setup........................................................................34
- Resetting the System to Change Setup ...........................................35
5 Troubleshooting

Five Simple Checks.........................................................39
System Status Lights....................................................40
Error Messages............................................................42
Running the Diagnostics Test........................................43
Viewing System Information.........................................45
Calibrating the Gyros...................................................47
Changing Tracking Parameters....................................48
Technical Support.......................................................50

A Wiring Diagrams

Wiring Diagram - 1 Receiver........................................53
Wiring Diagram - 2 Receivers........................................54
Wiring Diagram - 3 Receivers........................................55
Wiring Diagram - 1 Receiver and 1 DVR.........................56

B Menus Quick Reference Guide

Interface Box Menus....................................................59
1. Introduction

This chapter provides a basic overview of this manual and your TracVision system.

Contents

Using this Manual .......................................................... 3
System Overview ........................................................... 5
Using this Manual

This manual provides complete operation, setup, and troubleshooting information for your TracVision system.

Who Should Use This Manual

The **user** should refer to the “Operation” and “System Preferences” chapters to learn how to operate the system.

The **user**, **installer**, or **servicing technician** should refer to the “Setup” chapter for information on configuring the system for the desired satellite TV service and satellites. The **user**, **installer**, or **servicing technician** should also refer to the “Wiring Diagrams” appendix for information on connecting additional receivers.

The **user** and/or **servicing technician/installer** should refer to the “Troubleshooting” chapter to help identify the cause of a system problem.

Flowchart Conventions

When instructions indicate to select a specific menu option, press the corresponding interface box button located below the display (see Figure 1).

Figure 1  Example of Menu Option and Corresponding Interface Box Button

![Flowchart Example](image)
Typographical Conventions

This manual uses the following typographical conventions:

<table>
<thead>
<tr>
<th>Text Example</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SELECT SATELLITES</td>
<td>Text as it appears on the interface box display; also denotes receiver remote control buttons</td>
</tr>
<tr>
<td>See “System Overview” on page 5</td>
<td>Cross-reference to another chapter in the manual or to a website</td>
</tr>
</tbody>
</table>

Types of Notices

This manual uses the following types of notices to call attention to important or related information:

**IMPORTANT!**

Be sure to read these carefully to ensure proper operation and configuration of your TracVision system.

**NOTE:** Notes contain useful information about system settings.

**TIP:** Tips contain helpful information, allowing you to get the most out of your TracVision system.

Related Documentation

In addition to this User’s Guide, the following documents are provided with your TracVision system:

<table>
<thead>
<tr>
<th>Document</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation Guide</td>
<td>Complete installation instructions</td>
</tr>
<tr>
<td>Product Registration Form</td>
<td>Details on registering the product</td>
</tr>
<tr>
<td>Warranty Statement</td>
<td>Warranty terms and conditions</td>
</tr>
<tr>
<td>Contents List</td>
<td>List of every part supplied in the kit</td>
</tr>
</tbody>
</table>
System Overview

Your TracVision M3DX is a state-of-the-art, actively stabilized antenna system that delivers live satellite TV to your mobile audio/video entertainment system. A basic system is illustrated below. Detailed wiring diagrams are provided in “Appendix A” on page 51.

Figure 2  TracVision M3DX Basic System Diagram
System Components

The TracVision M3DX system includes the following components:

The **antenna** uses integrated DVB technology to quickly acquire and track the correct satellite, switch between satellites, and send TV signals to the interface box. Internal gyros allow the antenna to track the satellite at all times, even while you’re on the move!

The **interface box/controller** supplies power to the antenna and delivers satellite TV signals to your satellite TV receiver. The interface box also allows you to set up the system using the pushbuttons and LCD display.

Compatible Receivers

To ensure compatibility with the TracVision system, KVH recommends the receiver models shown in the table below. These receivers have all been validated by KVH to work well with the TracVision system. *For information on connecting different receiver models, contact KVH Technical Support at 401-847-3327.*

<table>
<thead>
<tr>
<th>Standard-Definition Models</th>
<th>EXPRESSVU</th>
<th>DISH NETWORK</th>
<th>DIRECTV</th>
</tr>
</thead>
<tbody>
<tr>
<td>D12</td>
<td>3100</td>
<td>311</td>
<td>D12</td>
</tr>
<tr>
<td>D11</td>
<td></td>
<td>311</td>
<td>D11</td>
</tr>
<tr>
<td>D10</td>
<td></td>
<td>311</td>
<td>D10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>High-Definition (HD) Models</th>
<th>EXPRESSVU</th>
<th>DISH NETWORK</th>
<th>DIRECTV</th>
</tr>
</thead>
<tbody>
<tr>
<td>H21*</td>
<td>6100</td>
<td>211</td>
<td>H21*</td>
</tr>
<tr>
<td>H20*</td>
<td></td>
<td>211</td>
<td>H20*</td>
</tr>
</tbody>
</table>

* For compatibility with a Tri-Sat AutoSwitch, use model-manufacturer ID H21-200 or H20-600.
DISH Network Configuration

Other than a satellite TV receiver, no additional components are necessary to receive both high-definition (HD) and standard-definition programming from three DISH network satellites: 119, 110, and either 61 or 129 (choose the third satellite for your particular region - see “DISH Network Setup” on page 27). The antenna will automatically switch between these three satellites as necessary as you change channels using the primary receiver’s remote.

DIRECTV Configuration

You can receive DIRECTV programming from the 101 and 119 satellites without any special equipment. All you need is a DIRECTV receiver. The antenna will automatically switch between these two satellites as necessary as you change channels using the primary receiver’s remote.

The antenna system also supports the optional KVH Tri-Sat AutoSwitch for receiving the limited Ku-band portion of DIRECTV HDTV programming available on the 101, 110, and 119 satellites. Visit www.kvh.com/hdtv for details.

ExpressVu Configuration

Other than a satellite TV receiver, no additional components are needed to receive both high-definition (HD) and standard-definition programming from ExpressVu’s 91 and 82 satellites. The antenna will automatically switch between these satellites as necessary as you change channels using the receiver’s remote.
2. Operation

This chapter explains everything you need to know to operate the TracVision M3DX system.

Contents

Receiving Satellite TV Signals ............................................. 11
Turning the System On/Off ................................................ 12
Understanding the Status Screen ...................................... 13
Switching Satellites ......................................................... 14
Changing the Satellite Switching Mode ............................. 16
Product Care .................................................................... 17
Receiving Satellite TV Signals

Television satellites are located in fixed positions above the Earth’s equator and beam TV signals down to certain regions of the planet (not worldwide). To receive TV signals from a satellite, you must be located within that satellite’s unique coverage area.

**TIP:** For your convenience, KVH provides links to several websites that offer satellite coverage information. Simply visit our website at [www.kvh.com/footprint](http://www.kvh.com/footprint).

![Figure 4 Location and Coverage Area of DIRECTV 101 Satellite](image)

In addition, since TV satellites are located above the equator, the TracVision antenna must have a clear view of the sky to receive satellite TV signals. Anything that stands between the antenna and the satellite can block the signal, resulting in lost reception. Common causes of blockage include trees, buildings, and bridges. Heavy rain, ice, or snow might also temporarily interrupt satellite signals.

![Figure 5 Example of Satellite Blockage](image)
Turning the System On/Off

Since the interface box supplies power to the antenna, you can turn the antenna on or off using the interface box Power switch.

Turning On the System

Follow the steps below to turn on your TracVision system.

1. Make sure the antenna has a clear view of the sky.
2. Turn on your satellite TV receiver and TV.
3. Press the Power switch on the front of the TracVision interface box.

4. Wait one minute for system startup.

Once the antenna finds the correct satellite, all three status lights on the interface box should be lit green. If any lights are not lit green, see “System Status Lights” on page 40.

Turning Off the System

Follow the steps below to turn off your TracVision system.

1. Press the Power switch on the front of the TracVision interface box.
2. Turn off your satellite TV receiver and TV.
Understanding the Status Screen

Following startup, the interface box displays the current system status.

Figure 7 Interface Box Status Screen

<table>
<thead>
<tr>
<th>Screen Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antenna State</td>
<td>Current state of the antenna:</td>
</tr>
<tr>
<td></td>
<td>• Idle</td>
</tr>
<tr>
<td></td>
<td>• Initializing</td>
</tr>
<tr>
<td></td>
<td>• Searching</td>
</tr>
<tr>
<td></td>
<td>• Tracking</td>
</tr>
<tr>
<td></td>
<td>• Error</td>
</tr>
<tr>
<td>Service</td>
<td>Satellite TV service currently set up in the TracVision system:</td>
</tr>
<tr>
<td></td>
<td>• DTV (DIRECTV)</td>
</tr>
<tr>
<td></td>
<td>• DISH (DISH Network)</td>
</tr>
<tr>
<td></td>
<td>• EXVU (ExpressVu)</td>
</tr>
<tr>
<td></td>
<td>• MAN (Manual)</td>
</tr>
<tr>
<td>Satellite</td>
<td>Satellite that the antenna is currently tracking</td>
</tr>
<tr>
<td></td>
<td><em>This number refers to the satellite’s “orbital slot,” which is its longitudinal location above the equator.</em></td>
</tr>
<tr>
<td>Signal Strength</td>
<td>Strength of the satellite TV signal, as measured by RF level</td>
</tr>
<tr>
<td></td>
<td><em>The more bars, the stronger the signal, just like a cell phone. Three bars = good reception.</em></td>
</tr>
<tr>
<td>Operating Mode</td>
<td>Mode of operation currently set up in the TracVision system:</td>
</tr>
<tr>
<td></td>
<td>• Dual-Sat (DIRECTV or ExpressVu)</td>
</tr>
<tr>
<td></td>
<td>• Single-Sat (ExpressVu)</td>
</tr>
<tr>
<td></td>
<td>• DISH 1000/129 (DISH Network)</td>
</tr>
<tr>
<td></td>
<td>• DISH 1000/61 (DISH Network)</td>
</tr>
<tr>
<td></td>
<td>• DISH 500 (DISH Network)</td>
</tr>
<tr>
<td></td>
<td>• Tri-Sat Auto (DIRECTV)</td>
</tr>
<tr>
<td></td>
<td><em>For a list of satellites tracked in each operating mode, see “Setup” on page 23.</em></td>
</tr>
</tbody>
</table>

For a list of satellites tracked in each operating mode, see “Setup” on page 23.
Switching Satellites

If your system is set up to track multiple satellites, you can easily switch between them. Use the switching method that applies to your particular setup. You can identify the current satellite switching method by the format of the status screen:

<table>
<thead>
<tr>
<th>Status Screen Example</th>
<th>Satellite Switching Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRACKING DISH 119.-----                        DISH 1000/129 MODE</td>
<td>Automatic</td>
</tr>
<tr>
<td>TRACKING DISH 119.-----                        PUSH □ TO SWITCH SAT</td>
<td>Manual</td>
</tr>
<tr>
<td>TRACKING&lt;101&gt;/119.-----                        PUSH □ FOR 101/110</td>
<td>Automatic in Tri-Sat Pairs mode (Not used with new systems; supports old DIRECTV HDTV configurations that required an HDTV converter)</td>
</tr>
</tbody>
</table>
Automatic Switching

All operating modes provide automatic satellite switching using the primary receiver (the receiver connected to the “Unstacked Output” jack on the interface box). The antenna will automatically switch satellites as you change channels using the primary receiver’s remote.

NOTE: The receiver might take up to 30 seconds to display video when changing channels, switching between satellites, and/or switching between standard-definition and high-definition channels.

NOTE: DISH Network receivers may switch to a different satellite on their own in response to a blockage condition. For example, if the antenna’s view of the 110 satellite becomes blocked for over a minute, the receiver may try switching to the 119 satellite. If this occurs, you will see an error message on the TV. Once the antenna can see the selected satellite again, the receiver will automatically switch back and the error message will disappear.

How Switching Satellites Affects Additional Receivers

The TracVision system tracks one satellite at a time. Therefore, if you switch satellites using the primary receiver, televisions connected to other receivers might display different programming, no programming, or an error message. Simply select a channel carried by the new satellite, or use the primary receiver to switch back to the original satellite. Only the primary receiver controls satellite selection.

DIRECTV Tri-Sat Auto Mode Requires Tri-Sat AutoSwitch

In Tri-Sat Auto mode, the antenna will automatically switch among the 101, 110, and 119 satellites as you change channels using any receiver that is equipped with a Tri-Sat AutoSwitch (receiver model H21-200 or H20-600 required). Refer to the instructions that came with the Tri-Sat AutoSwitch kit for complete details.

Manual Switching

If you set up the system to track a custom set of satellites in Manual mode, you can use the interface box to switch among them. Simply press the CHANGE button until the display shows the desired satellite. Then press ACCEPT.
Changing the Satellite Switching Mode

Unless your system is set up in Manual mode, the antenna will automatically switch satellites as you change channels using the receiver’s remote control. However, if you want to manually select a satellite for some reason, the interface box allows you to switch from automatic to manual switching. (You can also switch back to automatic switching using this same menu function.)

Follow the steps in the flowchart below to change the satellite switching mode.

Figure 8 Satellite Switching Mode

Press MENUS until DIAGNOSTICS= No is displayed.

- DIAGNOSTICS= NO
  - NEXT MENU
  - CHANGE

- DIAGNOSTICS= YES?
  - CHANGE
  - ACCEPT

ENTERING DIAGNOSTICS

- SYSTEM_RESET= NO
  - NEXT MENU
  - CHANGE

- SAT SWITCH= AUTO
  - NEXT MENU
  - CHANGE

- SAT SWITCH= MANUAL?
  - CHANGE
  - ACCEPT

- SAT SWITCH= MANUAL

Press MENUS until SAT SWITCH= AUTO is displayed.
Product Care

Please consider the following antenna care guidelines for maintaining peak performance:

- Periodically wash the exterior of the antenna dome with fresh water and mild detergent. Avoid harsh cleansers and volatile solvents (such as acetone) and do not spray the dome directly with high-pressure water.

- If you wish to paint the dome, use only non-metallic automotive paint without a primer coat. Any paint that contains metal will block satellite signals and impair reception.
3. System Preferences

This chapter explains how to change the brightness and latitude/longitude settings.

Contents

Adjusting the Display Brightness........................................ 21
Entering Latitude/Longitude.............................................. 22
**Adjusting the Display Brightness**

Follow the steps in the flowchart below if you need to adjust the brightness of the interface box display.

**Figure 9 Brightness Setting**

Press MENUS until BRIGHTNESS is displayed.

**Flowchart:**

- Press MENUS until BRIGHTNESS is displayed.
  - **BRIGHTNESS = HIGH**
  - Press NEXT MENU, then press CHANGE.
  - **BRIGHTNESS = MEDIUM?**
    - Press CHANGE, then press ACCEPT.
  - **BRIGHTNESS = MEDIUM**

Press EXIT to exit the menu.
Entering Latitude/Longitude

Follow the steps in the flowchart below to enter your vessel’s latitude and longitude into the system. The antenna will use your position information to speed up satellite acquisition. (If the antenna knows where you are located, it knows where it should start looking for the satellite.)

Figure 10 Latitude/Longitude Setting

Press MENUS until LAT/LONG is displayed.

LAT/LONG = 41N, 071W

Press CHANGE to set each digit plus N/S (north or south) and E/W (east or west). Press ACCEPT to save each digit.

LAT/LONG = 41N, 071W?

LAT/LONG = 55N, 012E?

RESTARTING ANTENNA
4. Setup

When you turn on the TracVision M3DX system for the first time, the interface box displays SYSTEM NEEDS SETUP. This chapter explains how to set up the system for your desired satellite TV service.

Contents

DIRECTV Setup................................................................. 25
DISH Network Setup....................................................... 27
ExpressVu Setup............................................................ 31
Manual Mode Setup......................................................... 34
Resetting the System to Change Setup.............................. 35
DIRECTV Setup

You can set up the system for any one of the following DIRECTV operating modes:

<table>
<thead>
<tr>
<th>Mode</th>
<th>Satellites Tracked</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tri-Sat Auto</td>
<td>101, 110, and 119</td>
</tr>
<tr>
<td>Tri-Sat Pairs</td>
<td>101, 110, and 119</td>
</tr>
<tr>
<td>(Not Used)</td>
<td></td>
</tr>
<tr>
<td>Dual-Sat</td>
<td>101 and 119</td>
</tr>
</tbody>
</table>

**Tri-Sat Auto**

Select this mode for DIRECTV Ku-band Tri-Sat service if you have a Tri-Sat AutoSwitch installed. The antenna will track DIRECTV’s 101, 110, and 119 satellites and automatically switch among them using the Tri-Sat AutoSwitch and an H21-200/H20-600 receiver.

**Tri-Sat Pairs**

This mode is only necessary for older DIRECTV Ku-band HDTV configurations that required an HDTV converter instead of a Tri-Sat AutoSwitch. It should not be used with new systems.

**Dual-Sat**

Select this mode for DIRECTV service if you do not have a Tri-Sat AutoSwitch installed.

Follow the steps in Figure 11 on page 26 to set up the antenna for your selected DIRECTV operating mode.

**NOTE:** If the status screen does not show “SYSTEM NEEDS SETUP,” follow the steps in “Resetting the System to Change Setup” on page 35.
Chapter 4 - Setup

Figure 11  DIRECTV Setup

Press any button to begin.

Press CHANGE until desired mode displays; then press ACCEPT.

Displays satellites installed for the selected mode.
DISH Network Setup

You can set up the system for any one of the following DISH Network operating modes:

<table>
<thead>
<tr>
<th>Mode</th>
<th>Satellites Tracked</th>
</tr>
</thead>
<tbody>
<tr>
<td>DISH 1000/129</td>
<td>119, 110, and 129</td>
</tr>
<tr>
<td>DISH 1000/61</td>
<td>119, 110, and 61</td>
</tr>
<tr>
<td>DISH 500</td>
<td>119 and 110</td>
</tr>
</tbody>
</table>

Whichever mode you choose, the antenna will automatically switch between satellites as necessary as you change channels using your primary receiver’s remote control.

**DISH 1000/129 or DISH 1000/61**

To ensure you receive the best satellite reception, use the map in Figure 12 to help determine the appropriate DISH 1000 mode for your geographic area.

**DISH 500**

Select this mode if you wish to receive programming from just the 119 and 110 satellites for DISH 500 service.

**Setup Process**

Once you have chosen an operating mode, perform the steps on the following pages to set up the system for DISH Network service:

1. Set the operating mode in the antenna
2. Run receiver Check Switch tests
Step 1 - Set the Operating Mode in the Antenna

Follow the steps in Figure 13 to set up the antenna for your selected DISH Network operating mode. Then keep the antenna turned on for the next step.

**NOTE:** If the status screen does not show “SYSTEM NEEDS SETUP,” follow the steps in “Resetting the System to Change Setup” on page 35.

Figure 13 DISH Network Setup

Press any button to begin.

Press CHANGE until desired mode displays; then press ACCEPT.

Displays satellites installed for the selected mode.
Step 2 - Run Receiver Check Switch Tests

To configure the primary receiver for your selected DISH Network mode and automatic satellite switching, you need to run two Check Switch tests on the receiver. The first Check Switch test finds the correct satellites; the second configures the receiver for those satellites. To configure additional receivers for your selected mode, you need to run just one Check Switch test on each (see page 30).

IMPORTANT!
If you remove a receiver from the vessel and use it in a home setup, you will need to repeat this step to reconfigure that receiver whenever you reconnect it to the TracVision system.

Primary Receiver - Run Two Check Switch Tests

Follow these steps to run two Check Switch tests on the primary receiver, which is connected to the “Unstacked Output” jack on the interface box. This receiver controls satellite selection.

1. Make sure the vessel is docked in calm water, and ensure the antenna has an unobstructed view of the sky so it can “see” all of the desired satellites.

2. Apply power to the TV and receiver. (If the antenna is turned off, turn it back on using the interface box power switch and wait for system startup, until the interface box shows “Tracking.”)

3. Using the receiver’s remote, go to the “Point Dish/Signal Strength” screen (press MENU, 6, 1, 1).

4. Choose Check Switch, then press SELECT.

5. Choose Test, then press SELECT.

6. Wait at least 15 minutes before proceeding to allow the antenna to find all of the satellites. Disregard any messages that appear on the TV screen; they do not correctly indicate when the antenna is ready for the next Check Switch test.

7. After you have waited 15 minutes, repeat Steps 4-6 to run a second Check Switch test.

8. Refer to the tables in Figure 14 on page 30 and verify the values displayed on your TV match those required for your selected satellite TV service.

If your values match: Exit the menu and allow the receiver to download the program guide.

If your values do not match: Reset the system (follow the process on page 35), then repeat the entire DISH setup process, starting with Step 1 on page 28.
Additional Receiver(s) - Run One Check Switch Test

If any receivers are connected to the “Stacked Output” jack on the interface box, follow these steps to run a single Check Switch test on each additional receiver, one at a time.

1. Temporarily disconnect the primary receiver from the “Unstacked Output” jack on the interface box. Connect the additional receiver in its place.

2. Perform Steps 1-5 on page 29 to run the test.

3. Wait 15 minutes, then verify that the values displayed on the TV match those shown in Figure 14. If the values do not match, try running another Check Switch test.
ExpressVu Setup

You can set up the system for any one of the following ExpressVu operating modes:

<table>
<thead>
<tr>
<th>Mode</th>
<th>Satellites Tracked</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual-Sat</td>
<td>91 and 82</td>
</tr>
<tr>
<td>Single-Sat</td>
<td>91 only</td>
</tr>
</tbody>
</table>

Step 1 - Set the Operating Mode in the Antenna

Follow the steps in Figure 15 to set up the antenna for your selected ExpressVu operating mode. Then keep the antenna turned on for the next step.

**NOTE:** If the status screen does not show “SYSTEM NEEDS SETUP,” follow the steps in “Resetting the System to Change Setup” on page 35.

Figure 15 ExpressVu Setup

1. **TRACKING DTV 101 1**
   - SYSTEM NEEDS SETUP
     - Press any button to begin.

2. **SERVICE= DIRECTV?**
   - Press CHANGE until DirectVU displays; then press ACCEPT.

3. **SERVICE= EXPRESSVU?**
   - Press CHANGE until ExpressVu displays; then press ACCEPT.

4. **MODE= DUAL-SAT?**
   - Press CHANGE until desired mode displays; then press ACCEPT.

5. **MODE= SINGLE-SAT?**
   - Displays satellites installed for the selected mode

6. **INSTALLING EXVU SATS**

7. **RESTARTING ANTENNA**
Step 2 - Run Receiver Check Switch Tests

To configure the primary receiver for your selected ExpressVu mode and automatic satellite switching, you need to run two Check Switch tests on the receiver. The first Check Switch test finds the correct satellites; the second configures the receiver for those satellites. To configure additional receivers for your selected mode, you need to run just one Check Switch test on each (see page 33).

**IMPORTANT!**

If you remove a receiver from the vessel and use it in a home setup, you will need to repeat this step to reconfigure that receiver whenever you reconnect it to the TracVision system.

Primary Receiver - Run Two Check Switch Tests

Follow these steps to run two Check Switch tests on the primary receiver, which is connected to the “Unstacked Output” jack on the interface box. This receiver controls satellite selection.

1. Make sure the vessel is docked in calm water, and ensure the antenna has an unobstructed view of the sky so it can “see” all of the desired satellites.

2. Apply power to the TV and receiver. (If the antenna is turned off, turn it back on using the interface box power switch and wait for system startup, until the interface box shows “Tracking.”)

3. Using the receiver’s remote, go to the “Point Dish/Signal Strength” screen (press MENU, 6, 1, 1).

4. Choose Check Switch, then press SELECT.

5. Choose Test, then press SELECT.

6. Wait at least 15 minutes before proceeding to allow the antenna to find all of the satellites. Disregard any messages that appear on the TV screen; they do not correctly indicate when the antenna is ready for the next Check Switch test.

7. After you have waited 15 minutes, repeat Steps 4-6 to run a second Check Switch test.
8. Refer to the table in Figure 16 and verify the values displayed on your TV match those required for your selected satellite TV service.

   If your values match: Exit the menu and allow the receiver to download the program guide.

   If your values do not match, and you selected Single-Sat mode: It is normal for your TV to show “No Switch Detected,” “Switch Type Unknown,” or a similar error message. No action is required.

   If your values do not match, and you selected Dual-Sat mode: Reset the system (follow the process on page 35), then repeat the entire ExpressVu setup process, starting with Step 1 on page 31.

---

**Figure 16  Expected Check Switch Results**

**ExpressVu Dual-Sat Results**

<table>
<thead>
<tr>
<th>Input</th>
<th>1</th>
<th>1</th>
<th>2</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satellite</td>
<td>91</td>
<td>91</td>
<td>82</td>
<td>82</td>
</tr>
<tr>
<td>Polarity</td>
<td>Odd</td>
<td>Even</td>
<td>Odd</td>
<td>Even</td>
</tr>
<tr>
<td>Status</td>
<td>Reception Verified</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Switch</td>
<td>SW21</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Additional Receiver(s) - Run One Check Switch Test**

If any receivers are connected to the “Stacked Output” jack on the interface box, follow these steps to run a single Check Switch test on each additional receiver, one at a time.

1. Temporarily disconnect the primary receiver from the “Unstacked Output” jack on the interface box. Connect the additional receiver in its place.

2. Perform Steps 1-5 on page 32 to run the test.

3. Wait 15 minutes, then verify that the values displayed on the TV match those shown in Figure 16. If the values do not match, and the system is set to Dual-Sat mode, try running another Check Switch test. If your system is set to Single-Sat mode, an error message will appear instead; this is normal.
Manual Mode Setup

If none of the automatic modes described earlier include all of the satellites you wish to track, you can set up the system in Manual mode to track up to five satellites of your choice. You will then be able to switch between these satellites using the buttons on the interface box.

Follow the steps in Figure 17 to set up the antenna in Manual mode.

**NOTE:** If the status screen does not show “SYSTEM NEEDS SETUP,” follow the steps in “Resetting the System to Change Setup” on page 35.

**Figure 17 Manual Mode Setup**

1. **Tracking DTV 101**
   - System Needs Setup

2. **Service = DIRECTV?**
   - Press CHANGE until SERVICE= MANUAL is displayed.

3. **Service = Manual?**
   - Press CHANGE until SERVICE= MANUAL is displayed.

4. **Sat 1 of 5 = 101?**
   - Press CHANGE until the display shows the desired satellite: 61, 72, 82, 91, 101, 110, 119, 129, 148 or NONE. Then press ACCEPT.

5. **Sat 2 of 5 = None?**
   - Repeat this procedure for satellites 3-5. Then press ACCEPT.

6. **Installing Sats**
   - XXX XXX XXX XXX XXX

7. **Restarting Antenna**

Press any button to begin.
Resetting the System to Change Setup

If you need to change the antenna’s setup to receive a different satellite TV service and/or track a different satellite, follow the steps in Figure 18 to reset the system. Once the system has reset to its factory conditions, you will be able to set up the system as described earlier in this section.

**IMPORTANT!**

(DISH/ExpressVu only) You will need to reconfigure all of the receivers after you select a different operating mode. Refer to page 29 (DISH) or page 32 (ExpressVu) for details.

---

**Figure 18  Factory Reset**

Press MENUS until DIAGNOSTICS= No is displayed.

```
DIAGNOSTICS= NO
NEXT MENU CHANGE
```

```
DIAGNOSTICS= YES?
CHANGE ACCEPT
```

**ENTERING DIAGNOSTICS**

```
SYSTEM RESET= NO
NEXT MENU CHANGE
```

```
SYSTEM RESET= YES?
CHANGE ACCEPT
```

```
RESET TO FACTORY?
ACCEPT EXIT
```

**SYSTEM RESET**

```
TRACKING DTV 101
SYSTEM NEEDS SETUP
```
5. Troubleshooting

This chapter identifies potential problems along with their possible causes and solutions. It also explains how to get technical support.

Contents

Five Simple Checks .......................................................... 39
System Status Lights .......................................................... 40
Error Messages ................................................................. 42
Running the Diagnostics Test ........................................... 43
Viewing System Information ............................................ 45
Calibrating the Gyros ....................................................... 47
Changing Tracking Parameters ....................................... 48
Technical Support ........................................................... 50
Five Simple Checks

If you are experiencing a problem receiving satellite TV with your TracVision M3DX, perform the five simple checks below. If none of these are the problem, check the status lights on the interface box and/or perform a diagnostics test, as explained in “System Status Lights” on page 40 and “Running the Diagnostics Test” on page 43.

\textit{TIP:} You can also try resetting the satellite TV receiver. Turn off and unplug the receiver, wait one minute, then plug it back in and turn it back on.

Can the antenna see the satellite?

The antenna requires an unobstructed view of the sky to receive satellite TV signals. Common causes of blockage include trees, buildings, bridges, and mountains.

Is there excessive dirt or moisture on the antenna dome?

Dirt buildup or moisture on the dome can reduce satellite reception. Clean the exterior of the dome periodically.

Is it raining heavily?

Heavy rain or snow can weaken satellite TV signals. Reception should improve once the inclement weather subsides.

Is the receiver configured for your selected mode? (DISH/ExpressVu Only)

All DISH Network and ExpressVu receivers that you connect to the TracVision system need to be configured for the antenna’s operating mode. To configure a receiver, you need to run its Check Switch test. Refer to the step-by-step instructions on page 29 (DISH) or page 32 (ExpressVu).

Is everything turned on and connected properly?

Make sure the power switch on the front of the interface box is turned on (the VOLTAGE light on the front of the interface box should be lit green). Also, make sure your TV and receiver are both turned on and set up for the satellite input. Finally, check the cables connecting all of these components to ensure none have come loose.
System Status Lights

Three status lights on the front of the interface box indicate the current status of the system and can help you identify problems (see Figure 19).

Figure 19 System Status Lights

During normal operation, all three status lights should be lit green. The following tables explain what the different light conditions indicate.

VOLTAGE Light

The table below explains what the VOLTAGE light indicates.

<table>
<thead>
<tr>
<th>Light is...</th>
<th>Indicates</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>Off</td>
<td>Interface box is off (power switch is off) or no power input</td>
</tr>
<tr>
<td>Green</td>
<td>OK</td>
<td>Good power (10-16 VDC at interface box)</td>
</tr>
<tr>
<td>Green, flashing</td>
<td>Cable Open</td>
<td>Open detected in antenna cable (check the antenna coax connection)</td>
</tr>
<tr>
<td>Orange</td>
<td>Low Power</td>
<td>Low power (9-10 VDC) at interface box</td>
</tr>
<tr>
<td>Red, flashing</td>
<td>Bad Power</td>
<td>Insufficient power (less than 9 VDC or more than 16 VDC input)</td>
</tr>
</tbody>
</table>
### RECEIVER Light

The table below explains what the RECEIVER light indicates.

<table>
<thead>
<tr>
<th>Light is...</th>
<th>Indicates</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>OK</td>
<td>Good communications with receiver</td>
</tr>
<tr>
<td>Orange</td>
<td>No comm</td>
<td>No communications with receiver; receiver is off or disconnected</td>
</tr>
<tr>
<td>Orange, flashing</td>
<td>Overload</td>
<td>Overload or short circuit detected on the antenna cable</td>
</tr>
<tr>
<td>Red</td>
<td>Fault</td>
<td>Internal power fault</td>
</tr>
</tbody>
</table>

### ANTENNA Light

The table below explains what the ANTENNA light indicates.

<table>
<thead>
<tr>
<th>Light is...</th>
<th>Indicates</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>Off</td>
<td>Antenna is off, disconnected, or has insufficient power</td>
</tr>
<tr>
<td>Green</td>
<td>Tracking</td>
<td>Antenna is tracking the selected satellite</td>
</tr>
<tr>
<td>Green, flashing</td>
<td>Searching</td>
<td>Antenna is searching for a satellite</td>
</tr>
<tr>
<td>Orange, flashing</td>
<td>Overload</td>
<td>Overload or short circuit detected on the antenna cable</td>
</tr>
<tr>
<td>Red</td>
<td>No comm</td>
<td>No communications with antenna</td>
</tr>
<tr>
<td>Red, flashing</td>
<td>Fault</td>
<td>Error detected in antenna</td>
</tr>
</tbody>
</table>
Error Messages

The table below lists possible error messages and the appropriate corrective action.

<table>
<thead>
<tr>
<th>Warning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SYSTEM SAT MISMATCH</strong>&lt;br&gt;PRESS ✓ TO FIX</td>
<td>The interface box and antenna are out of sync. Just press ACCEPT to synchronize.</td>
</tr>
<tr>
<td><strong>SAT NOT INSTALLED</strong></td>
<td>The receiver is tuned to a channel carried by a satellite that is not installed in the antenna. You might need to change your setup.</td>
</tr>
<tr>
<td><strong>TRACKING DTV 101</strong>&lt;br&gt;<strong>SYSTEM NEEDS SETUP</strong></td>
<td>This is not a true error message. This screen indicates that the system needs to be configured for the desired satellite service/ configuration. Refer to “Setup” on page 23 for detailed setup information.</td>
</tr>
</tbody>
</table>
Running the Diagnostics Test

In addition to the front panel status lights, the interface box includes a self-test function within its Diagnostics menu. Follow the steps in Figure 20 to perform a diagnostic test. For information on diagnostic test results, see “Diagnostic Test Results” on page 44.

Figure 20  Diagnostics Test
Press MENUS until DIAGNOSTICS= No is displayed.

Once the test is complete, the display shows the antenna status.

Press MENUS to scroll through the remaining status messages.
### Diagnostic Test Results

The table below lists all of the status messages.

<table>
<thead>
<tr>
<th>Status Message</th>
<th>Description</th>
</tr>
</thead>
</table>
| **ANTENNA: TRACKING**
**PRESS ↓ TO CONTINUE** | Antenna status: Idle, Initializing, Searching, Tracking, or Error |
| **SATELLITE: 119**
**PRESS ↓ TO CONTINUE** | Name of the currently selected satellite |
| **BIT ERROR: OK, 928**
**PRESS ↓ TO CONTINUE** | Bit error rate:
OK: Less than 2001
High: Between 2001-8000
Bad: Greater than 8000 |
| **AGC LEVEL: OK, 22500**
**PRESS ↓ TO CONTINUE** | Automatic gain control level:
OK: Between 20000-25000
Bad: Less than 20000; greater than 25000 |
| **SAT 1: 101**
**PRESS ↓ TO CONTINUE** | List of installed satellites. Press MENUS to scroll through the list |
| **LAT/LONG: 41N, 071W**
**PRESS ↓ TO CONTINUE** | Last latitude/longitude that you entered into the antenna |
| **CABLE STATE: OK**
**PRESS ↓ TO CONTINUE** | Antenna cable status:
OK, Open, or Shorted |
| **SYSTEM DC: OK, 12.3**
**PRESS ↓ TO CONTINUE** | Input voltage (DC power):
OK: 10-16 VDC
Low: 9-10 VDC
Bad: Less than 9 VDC or more than 16 VDC |
| **ANTENNA DC: OK, 41.0**
**PRESS ↓ TO CONTINUE** | Antenna voltage (DC power):
OK: 39-42 VDC
Low: 37-39 VDC
Bad: Less than 37 VDC |
Viewing System Information

You can view the TracVision M3DX system’s software versions and serial numbers on the interface box display. Follow the steps in Figure 21 to display the system information. For more information on system information results, see “System Information Results” on page 46.

Figure 21 System Information
Press MENUS until DIAGNOSTICS= No is displayed.

Press MENUS until SHOW SYS INFO=NO is displayed.

Press MENUS to scroll through the system information screens.
## System Information Results

The table below lists all of the status information messages.

<table>
<thead>
<tr>
<th>Information Message</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TRACVISION M3</strong></td>
<td>Model of TracVision Antenna</td>
</tr>
<tr>
<td>PRESS ∨ TO CONTINUE</td>
<td></td>
</tr>
<tr>
<td><strong>SYS SW: 1.2</strong></td>
<td>Version of antenna main software</td>
</tr>
<tr>
<td>PRESS ∨ TO CONTINUE</td>
<td></td>
</tr>
<tr>
<td><strong>RF SW: 1.3</strong></td>
<td>Version of antenna RF software</td>
</tr>
<tr>
<td>PRESS ∨ TO CONTINUE</td>
<td></td>
</tr>
<tr>
<td><strong>MOTOR SW: 1.4</strong></td>
<td>Version of antenna motor controller software</td>
</tr>
<tr>
<td>PRESS ∨ TO CONTINUE</td>
<td></td>
</tr>
<tr>
<td><strong>JBOX SW: 1.5</strong></td>
<td>Version of interface box software</td>
</tr>
<tr>
<td>PRESS ∨ TO CONTINUE</td>
<td></td>
</tr>
<tr>
<td><strong>ANT.SER.# 061201234</strong></td>
<td>Serial number of antenna</td>
</tr>
<tr>
<td>PRESS ∨ TO CONTINUE</td>
<td></td>
</tr>
<tr>
<td><strong>JBOX SER.# 061205678</strong></td>
<td>Serial number of interface box</td>
</tr>
<tr>
<td>PRESS ∨ TO CONTINUE</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** The first 4 digits of the serial number indicate the year and month (YYMM) the product was manufactured. For example, if the antenna has a serial number of 071201234, it was built in December 2007.
Calibrating the Gyros

The TracVision antenna’s gyros continuously measure the motion of your vessel and send this data to the antenna’s motor control circuitry to keep the antenna pointed at the satellite. At the factory, each antenna gyro is precisely calibrated to work with the antenna’s circuit board. Therefore, if you ever replace a gyro or circuit board in your antenna, follow the steps in Figure 22 to recalibrate the gyros for the new part.

**IMPORTANT!**

Calibrate the gyros only if directed by KVH Technical Support, and only while the vessel is stationary in calm water. A poor gyro calibration can reduce the performance of the antenna.

Figure 22  Gyro Calibration
Press MENUS until DIAGNOSTICS= NO is displayed.

DIAGNOSTICS= NO

NEXT MENU  CHANGE

DIAGNOSTICS= YES?

CHANGE  ACCEPT

ENTERING DIAGNOSTICS

SYSTEM_RESET= NO

NEXT MENU  CHANGE

CAL GYRO= NO

NEXT MENU  CHANGE

CAL GYRO= YES?

CHANGE  ACCEPT

CALIBRATING GYRO

AZ:  EL:

CALIBRATING GYRO

AZ: PASS  EL: PASS

Press NEXT MENU until CAL GYRO= NO is displayed.

Verify that azimuth (AZ) and elevation (EL) gyros both pass.
Changing Tracking Parameters

On rare occasions, a satellite service provider may change the configuration of one of its satellites. Since your TracVision antenna identifies a satellite based on the configuration data it has stored in memory, the antenna will no longer be able to track the satellite if its configuration changes. For this reason, the interface box allows you to change any satellite parameter stored in the antenna’s memory.

**IMPORTANT!**

Change tracking parameters only if directed by KVH Technical Support. An incorrect tracking parameter can significantly reduce the performance of the antenna.

Follow the steps in Figure 23 on the next page to change a tracking parameter for an installed satellite.
Figure 23 Tracking Parameter Changes

Press MENUS until DIAGNOSTICS= NO is displayed.

DIAGNOSTICS= NO

PRESS NEXT MENU  CHANGE

DIAGNOSTICS= YES?

CHANGE  ACCEPT

ENTERING DIAGNOSTICS

SYSTEM_RESET= NO

PRESS NEXT MENU  CHANGE

Press NEXT MENU until TRACKING_PARAMS= NO is displayed.

TRACKING_PARAMS= NO

PRESS NEXT MENU  CHANGE

TRACKING_PARAMS= YES?

CHANGE  ACCEPT

SATELLITE= 119?

CHANGE  ACCEPT

Select the satellite you need to modify.

POLARIZATION= RIGHT?

CHANGE  ACCEPT

Select the polarization you need to modify.

BAND= USA?

CHANGE  ACCEPT

FREQUENCY= 12345?

PRESS NEXT PARAM  CHANGE

Symbol rate of 10700-12700MHz.

SYMBOL_RATE= 12345?

PRESS NEXT PARAM  CHANGE

Select 10000-45000 kilosymbols per second.

FEC_CODE= 5/6?

PRESS NEXT PARAM  CHANGE

Select 1/2, 2/3, 3/4, 5/6, 6/7, 7/8, or Auto.

NETWORK_ID= 0x1234?

PRESS NEXT PARAM  CHANGE

Select 0x0000-0xffff (hexadecimal).

DONE?

PRESS NEXT PARAM  ACCEPT

Select 10700-12700MHz.

Select 10000-45000 kilosymbols per second.

Select 1/2, 2/3, 3/4, 5/6, 6/7, 7/8, or Auto.

Select 0x0000-0xffff (hexadecimal).
Technical Support

The TracVision M3DX system is a sophisticated electronic device; only KVH-authorized technicians have the tools and expertise necessary to diagnose and repair a system fault. Therefore, if you experience an operating problem or require technical assistance, please call or visit your local authorized TracVision dealer or distributor. You can find an authorized technician near you by visiting our website at www.kvh.com/wheretogetservice.

If you need help finding an authorized technician, please contact KVH Technical Support:

Phone: +1 401 847-3327
E-mail: techs@kvh.com

Product Registration

Be sure to register your TracVision M3DX system with KVH. The registration process is quick, easy, online, and ensures the best possible service from KVH. Visit www.kvh.com/register or refer to the Product Registration Form.

When you register, you’ll enjoy a wide range of benefits, including:

- Free e-mail notification of enhancements and software updates to improve the performance of your system
- Fast, convenient customer and technical support
- Alerts about changes and improvements to services and programming
- Product news and special offers
- Complete privacy - KVH will never sell or share your data with other companies or organizations
Appendix A
Wiring Diagrams

This appendix provides wiring diagrams for DISH Network, ExpressVu, and Dual-Sat DIRECTV configurations.

NOTE: Wiring diagrams for Tri-Sat DIRECTV configurations are provided in the instructions that came with the Tri-Sat AutoSwitch kit.

Contents

Wiring Diagram - 1 Receivers.......................................... 53
Wiring Diagram - 2 Receivers.......................................... 54
Wiring Diagram - 3 Receivers.......................................... 55
Wiring Diagram - 1 Receiver and 1 DVR.......................... 56
Wiring Diagram - 1 Receiver

To Antenna

Interface Box

Satellite TV Receiver (Primary)
The single-output destacker (KVH part #19-0347) converts a stacked signal into an unstacked signal, which standard satellite TV receivers are configured to decode. The interface box has two satellite TV outputs: “Unstacked” and “Stacked.” You will need to install the destacker between the “Stacked” output and your second receiver.

**Primary Receiver Controls Satellite Selection**

The receiver that you connect to the “Unstacked” output is the primary receiver. If the system is set up for automatic switching, the primary receiver controls satellite selection.
Wiring Diagram - 3 Receivers

Destacker (Dual-Output) Required

The dual-output destacker (KVH part #19-0410) converts a stacked signal into two unstacked signals, which standard satellite TV receivers are configured to decode. The interface box has two satellite TV outputs: “Unstacked” and “Stacked.” You will need to install the destacker between the “Stacked” output and your second and third receivers.

Primary Receiver Controls Satellite Selection

The receiver that you connect to the “Unstacked” output is the primary receiver. If the system is set up for automatic switching, the primary receiver controls satellite selection.
Appendix A - Wiring Diagrams

Wiring Diagram - 1 Receiver and 1 DVR

Destacker (Dual-Output) Required

The dual-output destacker (KVH part #19-0410) converts a stacked signal into two unstacked signals. Two outputs are required because DVRs have two unstacked inputs, whereas standard receivers have only one input.

Recording Limitation

The DVR can record any channel carried on the satellite that is currently selected by the primary receiver. (The primary receiver is connected to the “Unstacked Output.”) To record a channel on a different satellite, you need to select that satellite on the primary receiver as well. You don’t have to select the same channel; just make sure that channel is carried on the same satellite.
Appendix B
Menus Quick Reference Guide

This appendix provides a quick reference guide to the interface box menu structure.

Contents

Interface Box Menus........................................................ 59
Interface Box Menus

Press **EXIT** at any time to exit the menu

- **BRIGHTNESS** = HIGH
  - NEXT MENU  □ CHANGE
  - HIGH - MEDIUM - LOW
- **LAT/LONG** = 41N, 071W
  - NEXT MENU  □ CHANGE
  - Enter your position
- **DIAGNOSTICS** = NO
  - NEXT MENU  □ CHANGE
- **SYSTEM RESET** = NO
  - NEXT MENU  □ CHANGE
  - Reset system to factory conditions to change system setup
- **RUN TEST** = NO
  - NEXT MENU  □ CHANGE
  - Run system self-test
- **SHOW SYS INFO** = NO
  - NEXT MENU  □ CHANGE
  - View system information
- **SAT SWITCH** = AUTO
  - NEXT MENU  □ CHANGE
  - AUTO - MANUAL
- **CAL GYRO** = NO
  - NEXT MENU  □ CHANGE
  - Calibrate antenna gyros
- **TRACKING PARAMS** = NO
  - NEXT MENU  □ CHANGE
  - Change satellite tracking parameters

Press **EXIT** at any time to exit the menu.