Installation Manual

Connecting the Planet

IsoTropic
Networks, Inc.

iAutoSat

Thank you!

We are excited to have you as part of our installation and service team! You will be installing the innovative *iAutoSat* satellite antenna, a mobile satellite Internet system. This unique system has been designed for easy installation and serviceability.

The *iAutoSat* system uses the most current technology to provide fast, continuous Internet connectivity from a mobile environment. As the installer you are the company representative that the client will meet face-to-face. It is important that you follow the guidelines in this installation manual to properly access the client's needs and application type and provide the services needed in a timely and professional fashion.

Once you complete the hardware installation, you will need to configure the system to communicate with the appropriate satellite. Upon completion of this process, clients will have the ability to download files, access and play audio or video clips, check email, and surf the Internet from any location. The *iAutoSat* system is compatible with most Windows, Linux, Mac and other network platforms, so getting online almost anywhere will be easy for our clients! If they have a clear view of the Southern sky, they can have high-speed connectivity today, thanks to your help.

This high-quality system uses the latest technology to provide superior connectivity. Quick, clean, and proper installation is very important. As you do this your clients will become your greatest source of reoccurring business as they share their satisfaction with others. We look to you to help them have a successful and satisfying experience.

As a certified *iAutoSat* specialist we want you to feel confident that your skills and abilities are up to the challenge of providing and supporting this mobile satellite Internet system. If you have any questions or concerns about any part of the process of the installation for the *iAutoSat* system, please contact our 24 hour Tier III hotline at 866-430-3170. We are here to assist you.

Overview

Section 1

- Legal Notices

- Precautions and Reminders

- System Specifications and Requirements

Section 2

- Computer Requirements

- Components List

- Satellite System Overview

Section 3

- Installation Overview

- Installation Equipment and Materials List

- Installation

Section 4

- *iAutoSat* Controller Configuration Overview

- Controller Set-up

Section 5
- Installation Completion / User Interface Overview

- Registration / Warranty / Service

- Installer Agreements / Client Agreements

iAutoSat Legal Policy

1.1   There shall be relevant Installation Document(s) available to the Installer at the time of any Antenna Installation. That Installation Document(s) shall define the acceptable Installation methods, procedures, materials, and other guidance required to ensure that the Policies defined herein are met.

1.2   All Antenna Installers shall be Certified, and shall have expressly acknowledged the requirements for the Installation of both Permanent-Mount and Temporary-Fixed Antennas.

1.3   Certified Antenna Installers shall be specifically trained for Antenna Installations. Such training shall explicitly include at least these topics:

        a.   Installation methods and procedures

        b.   Selection and use of Installation materials and parts

        c.   Radiation hazard safety for Ka-band and high-power Ku-band operations

        d.   NEC grounding requirements

1.4   Unless explicitly authorized in writing, Antenna Installations may only be completed using Certified Indoor Units, Outdoor Units, and Antennas in approved configurations.

1.5   Installers shall ensure that Antennas are installed only in locations that are not readily accessible to children and in a manner that prevents human exposure to potential harmful levels of radiation.

1.6   All Antennas shall be installed such that there is "Controlled Access" to the Antenna.

1.7   All Antennas shall be installed such that the lip of the antenna reflector is at least 1 meter (3 feet, 3 inches) from any opening (e.g., window or door) in a building or other adjacent structure.

1.8   Antennas of all sizes shall carry industry-standard and government-approved Radiation Hazard Caution Labels. The Installer shall inspect the labels to verify that they are present, legible, and visible to persons approaching the Antenna.

1.9   If access to the antenna is controlled under the requirement in Section 1.6, then Radiation Hazard Caution Signs, as defined in Section 6 must be placed on the access door, gate, fence, or permanently mounted ladder and be within plain sight of anyone approaching the Installation from the front and sides of the reflector.

1.10   Installers shall indicate upon completion of the Installation whether a Permanent-Mount Installation was performed in compliance with Subsection 1.6 or Subsection 1.6, or whether the Installation was a Temporary-Fixed Installation.

1.11   A Certified Permanent-Mount Antenna shall not be utilized as a Temporary-Fixed Antenna. Under certain circumstances, this restriction may be waived if the antenna is properly pointed and crosspoled by a Certified Installer prior to any transmission from the Antenna, and the Installation is roped-off and caution signage placed as directed in Subsection 2.2.

Temporary-Fixed Two-Way Installations - Additional Policies

The specific policies detailed below apply to the Installation of all Temporary–Fixed Two-Way Antennas using the service. These requirements are ***in addition to*** the general policies in the iAutoSat Legal Policy and other policies herein.

2.1   Only Antennas that have been accepted as Certified Temporary-Fixed Antennas may be used for this purpose.

2.2   All Temporary-Fixed Antennas shall be installed and deployed so as to protect members of the general public from being exposed to radiation potentially in excess of the FCC's Maximum Permissible Exposure (MPE) levels. Such Installations shall either meet the requirements listed in Subsection 1.6 above or shall be roped off or otherwise have a physical barrier preventing any person from inadvertently being exposed to radiation levels potentially above the MPE. The roped-off area shall encompass an area whose boundary is not closer than 2 meters (6 feet, 7 inches) to the Antenna in any direction and that exceeds the distance, toward the front of the antenna, as defined in Annex D. The roped-off area shall have one or more Radiation Hazard Caution Sign(s), as defined in Section 6, prominently displayed such that they can be seen when approached from any accessible direction.

2.3   For vehicles with roof mounts, Temporary-Fixed Antennas, when deployed or in operation, shall be mounted such that the radio assembly, antenna feedarm, and the bottom lip of the reflector are at least 1.5 meters (no less than 5 feet) above the ground or any surrounding surface that a person may be expected to easily access. This requirement may be waived if the Installation is roped-off and caution signage placed as directed in Subsection 2.2.

2.4   For vehicles with roof mounts, if a roof access ladder or any other means of access to the roof exists on the vehicle, the ladder or access must be blocked by a suitable rope or other barrier while the Antenna is deployed or in operation. The Installer must provide this rope or barrier directly to the End User at the time of Installation and advise the user to employ it at all times when the antenna is deployed or in operation. Caution signs must also be provided by the installer to the End User to be posted on the rope or other barrier cautioning all persons not to attempt to access the roof of the vehicle while the antenna is deployed or in operation.

2.5   A Vehicle-Mounted Temporary-Fixed Antenna may only be operated when the Antenna and the vehicle on which it is mounted are fully stationary.

2.6   Neither the amplifier nor the Antenna reflector size of the Temporary-Fixed Installation shall be changed without obtaining approval.

2.7   A Certified Permanent-Mount Antenna shall not be utilized as a Temporary-Fixed Antenna. Under certain circumstances, this restriction may be waived if the Antenna is properly pointed and crosspoled by a Certified Installer prior to any transmission from the antenna, and the Installation is roped-off and caution signage placed as directed in Subsection 2.2

2.8   As indicated in Subsection 1.2 above, all Temporary-Fixed Antennas may only be installed by Certified Installers. In order to be certified as an Installer of Temporary-Fixed Antennas, a person must have completed a special training session on installing such antennas. In addition to the training specified in Subsection 1.3, the training for Temporary-Fixed Antenna Installation shall explicitly include at least the following additional topics:

   a.   Installation methods and procedures for Temporary-Fixed Antennas as outlined in this section

   b.   Providing instructions to the End User of any such Antennas on the precautions that must be taken by End Users in the operation and Deployment of the Antenna, as specified in Subsections 2.2 through 2.4.

   c.   Securing an acknowledgement from the End User that he or she has been trained in the operation or Deployment of the Antenna and that he or she understands the precautions that must be taken to avoid radiation hazards.

Precautions & Reminders

This manual describes installing and servicing the *iAutoSat* mobile satellite system. It addresses technicians who will install, commission, operate, and maintain these systems. This product is only authorized to be installed by certified *iAutoSat* telecommunications specialists and should not be adjusted by any other persons.

Safety Considerations

If working on an RV always check with the manufacturer for any electrical or structural concerns before beginning.

Keep fingers, hands and other body parts away from the antenna when in motion. Do not try to manually stop the antenna from stowing or deploying, as this may cause serious injury.

Keep fingers and tools clear from all gears and connectivity points once the power is connected. Do NOT apply power to the antenna or *iAutoSat* controller until all mounting and wire connection processes have been completed.

The feed horn transmits radio energy. Keep hands, head and all other body parts from between the feed horn and antenna once power has been established. Unplug power supply before making any adjustments to the antenna or wiring connections.

iAutoSat systems are specifically designed and ship with all necessary parts. Please use only *iAutoSat* parts in your installation. If an installation kit is missing any piece or is damaged do not complete the install and contact your *iAutoSat* representative immediately.

NIOSH has determined that one person should not lift more than a maximum of 51 pounds. Assistance should be used when lifting the *iAutoSat* system.

PRODUCT: iAutoSat 0.84M (DT840)
TECHNICAL SPECIFICATIONS

General Information	
Max Deployed Height:	64"
Stowed Dimensions:	15.0"H x 58.5"L
Mount Plate Width:	22"
Reflector Type:	.84M Andrew Elliptical Short Focal Length
Max WR75 BUC Dimensions:	WR75 12" L x 8" W x 2.5" H
Polarization:	Cross-pole
Weight:	125 lbs. approximate
Mount Rotation	
Azimuth:	375 degrees
Elevation:	90 degrees to horizon
Skew (Polarization):	+/- 90 degrees
Environmental Survival	
Wind Deployed:	100 mph
Wind Stowed:	150 mph
Temperature:	-58 degrees F to 176 degrees F (-50C to +80C)
Operational	
Wind:	45 mph
Temperature:	-40 degrees F to 122 degrees F (-40C to +50C)
Deployment Sensors	
Global Positioning Satellite (GPS):	Yes
Compass:	+/- 10 degrees
Tilt Sensors:	+/- .5 degrees
Connections and Cabling	
Transmit (TX):	RG6
Receive (RX):	RG6
Electrical Data Interface:	RG6 Max 100' (38.5m)
Power Requirements	
AC Input:	100-250V 3A Max 47—63Hz
DC Output:	48V 2.5A Max
Acquisition Speeds	
Deploying Elevation:	17.3 degrees per second
Stowing Elevation:	20 degrees per second
Deploying Azimuth:	7.5 degrees per second
Peaking (Cross-Pol) Ku Band:	Average Overall Acquisition Time: 2 to 4 minutes
iAutoSat Controller	
Interfaces:	(3) Ethernet RJ45 (10x100), (2) USB A, (1) USB B, (1) Serial 9 Pin
Dimensions:	10.25" L x 10.0" W x 2.0"H (stowed) (26.04 cm L x 25.4 cm W x 5.08 cm H)

PRODUCT: iAutoSat 0.96M (DT960)
TECHNICAL SPECIFICATIONS

General Information	
Max Deployed Height:	74"
Stowed Dimensions:	12.5"H x 77.0"L (max 81.0"L while deploying)
Mount Rail Width:	13"
Reflector Type:	Andrew .96M Type 123
BUC Supported:	NGRC 3W or NGRC 4W
Polarization:	Cross-pole
Weight:	160 lbs. approximate
Mount Rotation	
Azimuth:	375 degrees
Elevation:	90 degrees to horizon
Skew (Polarization):	+/- 60 degrees with 90 degree offset option
Environmental Survival	
Wind Deployed:	100 mph
Wind Stowed:	150 mph
Temperature:	-58 degrees F to 176 degrees F (-50C to +80C)
Operational	
Wind:	45 mph
Temperature:	-40 degrees F to 122 degrees F (-40C to +50C)
Deployment Sensors	
Global Positioning Satellite (GPS):	Yes
Compass:	+/- 10 degrees
Tilt Sensors:	+/- .5 degrees
Connections and Cabling	
Transmit (TX):	RG6
Receive (RX):	RG6
Electrical Data Interface:	RG6 Max 50' (38.5m)
Power Requirements	
AC Input:	100-250V 3A Max 47—63Hz
DC Output:	48V 2.5A Max
Acquisition Speeds	
Deploying Elevation:	17.3 degrees per second
Stowing Elevation:	20 degrees per second
Deploying Azimuth:	7.5 degrees per second
Peaking (Cross-Pol) Ku Band:	Average Overall Acquisition Time: 2 to 4 minutes
iAutoSat Controller	
Interfaces:	(3) Ethernet RJ45 (10x100), (2) USB A, (1) USB B, (1) Serial 9 Pin
Dimensions:	10.25" L x 10.0" W x 2.0"H (stowed) (26.04 cm L x 25.4 cm W x 5.08 cm H)

PRODUCT: iAutoSat 1.2M (DT1200)
TECHNICAL SPECIFICATIONS

General Information	
Max Deployed Height:	82"
Stowed Dimensions:	12.5"H x 87.0"L (max 91.0" L while deploying)
Mount Rail Width:	13"
Reflector Type:	Andrew 1.2M
BUC Supported:	NGRC 3W or NGRC 4W
Polarization:	Cross-pole
Weight:	180 lbs. approximate
Mount Rotation	
Azimuth:	375 degrees
Elevation:	90 degrees to horizon
Skew (Polarization):	+/- 60 degrees with 90 degree offset option
Environmental Survival	
Wind Deployed:	70 mph
Wind Stowed:	150 mph
Temperature:	-58 degrees F to 176 degrees F (-50C to +80C)
Operational	
Wind:	35 mph
Temperature:	-40 degrees F to 122 degrees F (-40C to +50C)
Deployment Sensors	
Global Positioning Satellite (GPS):	Yes
Compass:	+/- 10 degrees
Tilt Sensors:	+/- .5 degrees
Connections and Cabling	
Transmit (TX):	RG6
Receive (RX):	RG6
Electrical Data Interface:	RG6 Max 100' (38.5m)
Power Requirements	
AC Input:	100-250V 3A Max 47 - 63Hz
DC Output:	48V 2.5A Max
Acquisition Speeds	
Deploying Elevation:	17.3 degrees per second
Stowing Elevation:	20 degrees per second
Deploying Azimuth:	7.5 degrees per second
Peaking (Cross-Pol) Ku Band:	Average Overall Acquisition Time: 2 to 4 minutes
iAutoSat Controller	
Interfaces:	(3) Ethernet RJ45 (10x100), (2) USB A, (1) USB B, (1) Serial 9 Pin
Dimensions:	10.25" L x 10.0" W x 2.0"H (stowed) (26.04 cm L x 25.4 cm W x 5.08 cm H)

Mounting Dimensions .96M and 1.2M (inches)

MOUNTING HOLES - 8 PLACES (1.2 METER AND .96 METER)

86.39

80.00

12.90

10.90

20.38

37.25

20.38
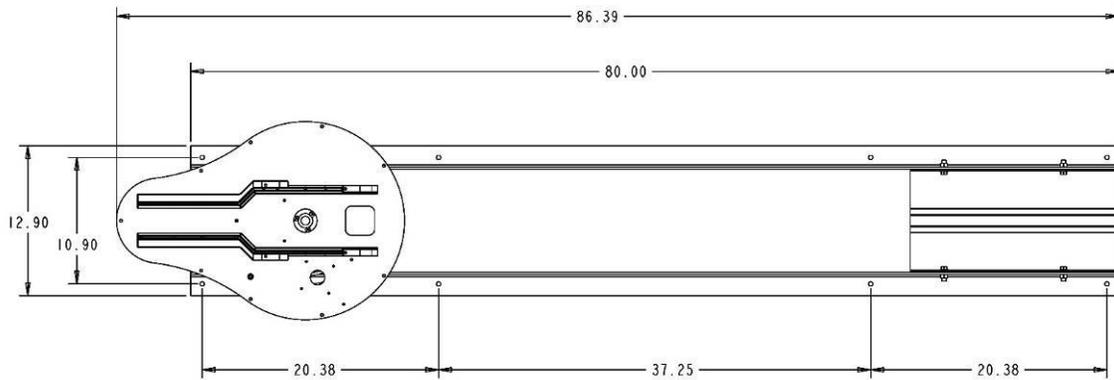
Max Stow Dimensions 1.2M (inches)

STOWED MOUNTING DIAMETER (1.2 METER)

Ø91.00
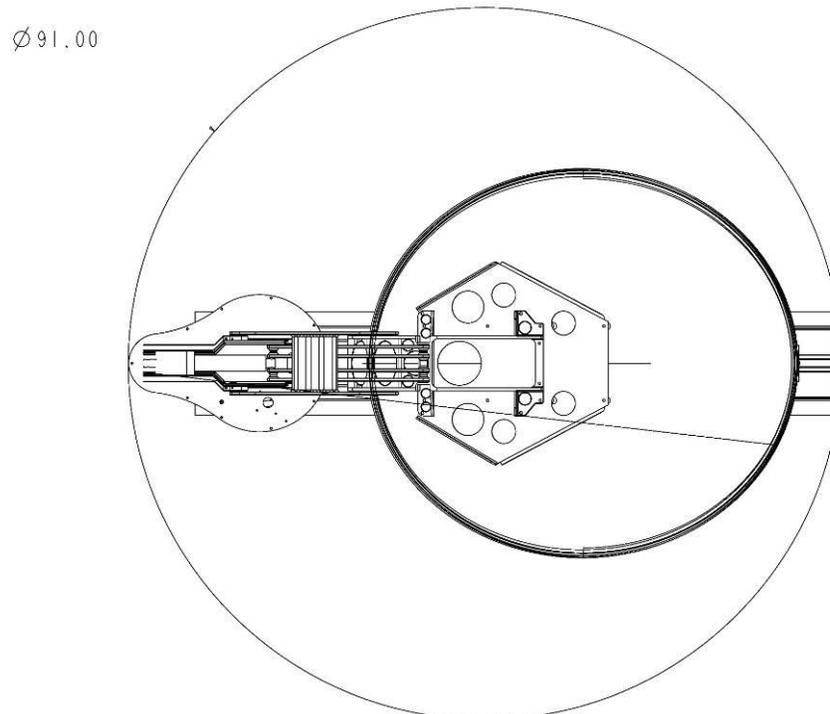
Max Deployed Swing Dimensions 1.2M (inches)

SWING DIAMETER - WORST CASE (1.2 METER)

Ø150.00
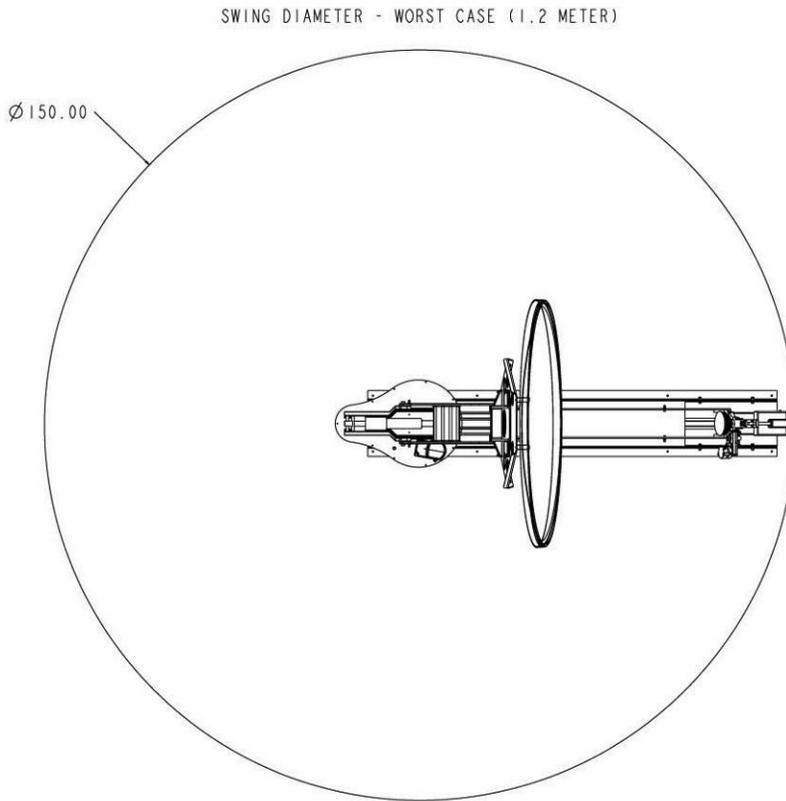
Computer Requirements

In order to verify complete installation and functionality of the *iAutoSat* system, you will need access to a laptop with Internet Explorer version 6 or newer.

Operating system:	**PC:** Windows 98 SE, Windows Me, Windows 2000, Windows XP
	MAC: 10.1 or higher
Processor:	**PC:** Pentium II 333 MHz or faster
	MAC: 300 MHz or faster
Memory (RAM):	**PC:** 64MB RAM (Windows 98SE and Windows Me) 128MB RAM (Windows 2000 and Windows XP)
	MAC: 128MB
Free Hard Drive Space:	**PC:** 100MB
	MAC: 150MB
Networking Capability:	10/100 Ethernet

Components List

iAutoSat Dish & Mount	
iAutoSat Controller	
Cables/Connectors	
Satellite Modem	

Antenna System Overview: How Does the *iAutoSat* Satellite System Work?

The *iAutoSat* satellite antenna utilizes technology to create a two-way send and receive satellite system. This means that it both receives data from a satellite and transmits to the same satellite 22,300 miles in orbit above the Earth. The *iAutoSat* system does not require a cell phone or phone line to established two-way broadband access but creates direct satellite connectivity. The mobile satellite antenna eliminates the need for dial-up connections, providing faster Internet access anywhere.

To obtain Internet access, the *iAutoSat* satellite will use one of the satellites currently in geosynchronous orbit around the Earth. Each satellite beams down a "footprint" onto the Earth. This footprint is the coverage area where the satellite will work. The images below show the satellite footprint for some of the satellites.

Frequencies, Timing & Cross Polarization

The signals transmit on the Ku frequency band of the electromagnetic spectrum. Satellites communicate with the Earth through transponders or frequencies, which pick up on a small slice of the Ku frequency band. Each satellite has "receive" and "transmit" transponders. For example, when you make a request to the satellite for a website, you are transmitting to a receive transponder on the satellite. In turn, the satellite replies back from a "transmit" transponder.

Transponders have the ability to transmit and to receive on both horizontal and vertical planes, doubling the potential of each transponder's bandwidth.

There are two major issues that can affect the antenna's ability to effectively communicate with a satellite in orbit. The first one is **timing**. In order for communication to take place, the signal that transmits from the antenna must be timed precisely in order to be received by the satellite.

The other issue that can affect communication between the antenna and a satellite in orbit is whether or not they are in **perfect alignment**. Because a satellite can transmit on both vertical and horizontal waves, the satellite antenna's horizontal and vertical alignment must match as exactly as possible with that of the satellite in orbit. Moving the antenna face can effectively match up its alignment with that of the satellite. This process of moving the antenna face to make the signal as strong as possible and avoid interference with the satellite is called peaking the Cross Polarization. This process of moving the antenna to isolate the signal to be as strong as possible is called Cross Polarization or Isolation.

Some time sensitive and low latency applications such as day trading and real time applications (gaming, telnet, and some VPN applications) may not function as well as expected on a satellite network.

Installation Overview

The *iAutoSat* system has been designed to make installation as easy as possible. The individual nature of each vehicle or other mounting site will create unique challenges for you to properly assess with the client prior to starting your installation. Please review the following information prior to starting your installation.

Installation Site Survey

To facilitate a smooth installation the following information should be acquired prior to proceeding with the installation. This information may have already been obtained from the customer, please check with the dealer / seller of the system.

1. What will be your primary use for your *iAutoSat* system?
    Internet Networking   Phone (VoIP)   VPN

2. Where do you plan to use your *iAutoSat* system?
    Continental   US   Canada   Mexico   Other: _____
    (USA: NW   SW   N Central   S Central   NE   SE)

3. What kind of vehicle or trailer is the satellite going on?   _____

4. What material is the roof of the vehicle made of?   _____

5. Is there a space on the roof at least 56" x 40" (+7" clearance)   ⑧ Yes   ⑧ No

6. Do you have a schematic or blue print of the vehicle?   ⑧ Yes   ⑧ No

7. Where in the vehicle would you like the modems located? _____
    Is this a well-ventilated area?   ⑧ Yes   ⑧ No

8. Is there a 110 electrical outlet in the area where the unit is to be installed?
                                                                     ⑧ Yes   ⑧ No

9. Is there access-allowing cable runs to be brought to the roof?   ⑧ Yes   ⑧ No

General rule for installation charges:

- 1 Hour of drive time ($___ an hour for additional driving)
- 1 trip to install location (additional service calls will be billed at $___ each)
- Assembly of unit and installation of the *iAutoSat* system to the vehicle.
- Up to 100 ft. of coax cables run inside to the unit location ($1 per each additional foot)
- Initial *iAutoSat* Controller setup and modem commissioning for 'Cross-pol' communication check between the *iAutoSat's* system and the Network Operation Center.
- Internet connectivity check through Internet browsing general sites like MSN or Yahoo.
- Additional charges may apply depending on the vehicle and any additional computer and networking requirements.

Permit Waiver. Customer acknowledges and understands that various permits may be required by local authorities when installing a satellite antenna and that it is the Customer's responsibility

14

to obtain all required permits prior to commencement of the installation. (Oregon customers may be assessed a $100 LEA Permit fee.) Customer acknowledges that if any of the above information is incorrect, they are responsible for notifying Isotropic Networks, Inc.; failure to do so may delay installation and increase cost of install. Customer understands that there may be additional charges should an installation require more than what is listed in the Basic Installation package.

Modem

The Modem makes connecting to the Internet easier by incorporating software inside the unit, so there is no software to load on your computer. In addition, the modem houses both transmit and receive components in one compact unit. The modem uses an Ethernet connection, making it easy to connect to a single computer or to a hub and from there to a network.

Coax Cables & Connectors

Standard RG-6 coax cables connect the *iAutoSat* Controller and the modem inside the vehicle to the base of the *iAutoSat* system.
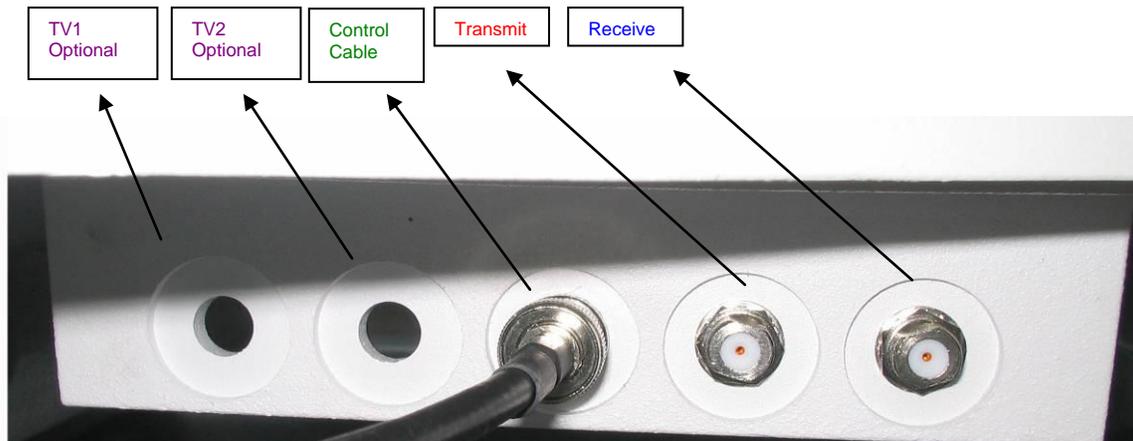
The connector panel, where the five coax cables connect to the antenna and are then routed into the vehicle, is located below the mount (see image above).

From left to right, the connectors are:

1. TV 1 (for optional satellite TV connection)
2. TV 2 (for a second satellite TV connection)
3. Control Cable (the cable is shown connected to the iAutoSat antenna)
4. Transmit connection (connects to the radio on the satellite antenna)
5. Receive connection (connects to the LNB on the satellite antenna)

iAutoSat Controller

The *iAutoSat* Controller connects to the antenna and controls its movements with a single power button that lights up green when the unit is turned on.

8 connections are located on the back of the *iAutoSat* Controller (see image above):
- 3 - 10x100 Ethernet ports
- 1 - 9-pin serial port
- 2 - USB A ports
- 1 - USB B port
- BNC Connection
- Power Supply

Below is an overview of the system components that comprise the *iAutoSat* system and how they are all interconnected:
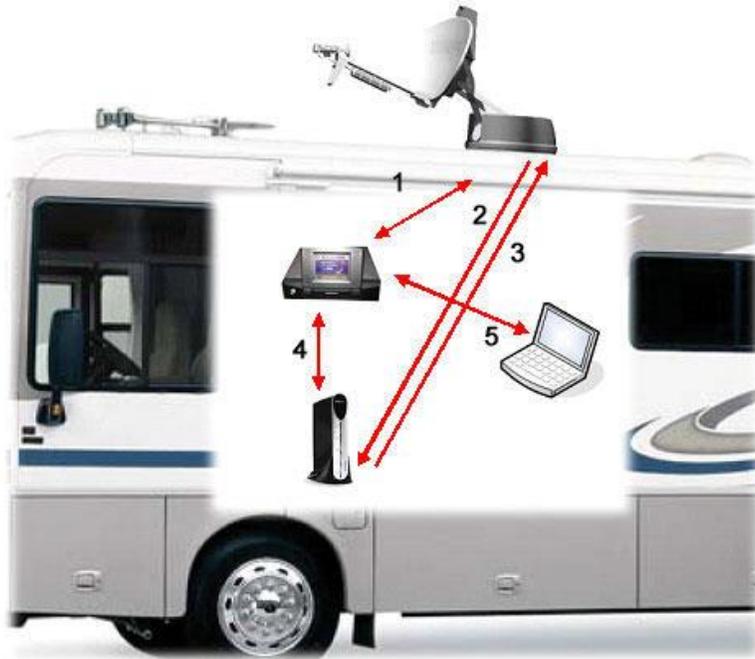
In general, the installation cable runs and connections are as follows:
- The *iAutoSat* system is connected with 3 (RG6) cables
    - Cable 1 from the image above is the Communication and Power from the *iAutoSat* Controller
    - Cables 2 and 3 are the Communication Cables (Rx / Tx) Cables to connect to the Modem
- Internal connection between the *iAutoSat* Controller, Modem and client computer are done with (2) 10/100 Ethernet (RJ45) cables
    - Cable 4 connects the *iAutoSat* Controller to the Modem
    - Cable 5 connects the *iAutoSat* Controller to the client computer

Installation: Preparing to install

Previous to install, the vehicle should be outside with a clear view of the southern sky. Some steps are more easily accomplished with an assistant. Make sure you have appropriate SAN and PIN numbers before beginning installation. These should be provided by the dealer or end user once a subscription application has been filled out and properly processed.

Inspect Structure of Vehicle Roof Inspect the structure of the vehicle roof to determine the type of screws and approved sealant that is recommended by RV manufacturer. **Fiberglass Roof** If the vehicle has a **fiberglass roof** be sure to pre-drill the holes *before* using roof sealant around the marked hole. **WARNING:** **DO NOT** use a self-tapping screw on a fiberglass roof, as it will crack or fracture the roof. **Rubber Roof** If your roof is rubber over a foundation of wood, DO NOT use self-tapping screws. **Metal Roof** It is okay to use self-tapping sheet metal screws on a metal roof.	
WARNING: Beware... Do not drill into the roof deeper than the length of the screw, as you could potentially drill all the way through the roof into the interior of the vehicle or into electrical wiring. • Verify before you drill that there are no electrical wires in the wall near where you will be drilling. You may be killed or seriously injured if you contact wiring while drilling.	

Installation: Mounting Dish to the Vehicle Roof

Unpack & Inspect Dish Unpack and inspect your packages for the following components: • The ***iAutoSat*** system will come fully assembled in 1 palletized box which includes all components necessary to get the system working. • First remove all the parts and inspect them for any damage or missing parts. If necessary contact the manufacturer for replacements. Keep all parts in a safe location as you start your assembly. Component list: Modem, power supply, LNB cover, LNB ramp, ***iAutoSat*** Controller, Power cord, hardware manuals, and hardware bag. Hardware bag: **includes, {4} bolts, {3} ¼-20 x 2 buttonhead screws, {3} ¼ flat washers, {3} ¼-20 nylon insert nuts, {2} flat washers #10, and {2} buttonhead screws, to install LNB cover, LNB Ramp, {1} hex nut and {4} 3/8-16 x 9/16 locknuts, {4} 3/8-16 x 1 to bolt the mount plate angles to the main assembly.**	

Select & Mark Location on Roof to Mount Dish

Please refer to the previous section for the roof space specifications, then find a clear, sturdy space on top of the vehicle roof (such as a strong cross member) to mount the antenna, making sure that the roof structure is stabile enough to support the unit.

Remember: The modem must be located in an area where cables can be routed from the rooftop. For best results, install the base plate near the center where the surface is the most level.

Make sure the LNB ramp is facing towards the rear of the vehicle.

Give yourself at least seven (7) inches between the ramp and anything next to it. The system requires this clearance to operate.

When you are satisfied with the positioning of the plate, mark the corners of the plate as well as all of the screw positions. The corner marks will help you to realign the plate on the roof later.

Pre-drill & Pre-seal the Screw Holes

The objective is to mount the base plate securely to the vehicle roof by only drilling into sound structures, such as cross beams. It is not necessary to place a screw in every hole that is provided on the base plate.

For best results, use holes in the base plate that lie directly above cross beams in the roof. A stud finder is helpful in finding the crossbeams.

You may need to drill new holes in the base plate if the factory drilled holes do not line up with roof cross beams.

Remember to pre-drill holes in the roof *before* applying sealant. Be aware of internal cabling and electrical lines.

Remove the mounting plate and place a large amount of sealant directly over each of the holes you've marked to ensure a weatherproof seal.

20

Center & Screw Base Plate into Place on Roof Carefully align the holes in the base plate over each of your pencil markings and press down slightly. Make sure you use plenty of sealant – it should bleed through the holes in the plate. Once centered, attach the plate to the roof with appropriate screws.	
Weatherproof Screws with Sealant Completely cover each screw with approved sealant when the plate is in place to create a waterproof seal. On many vehicles it is advisable to seal the entire outer edge of the base plate just to make sure the seal is tight.	 Lap Sealant

Connecting & Running Wires & Cables

List of Tools Needed • Cordless screw gun • Short screw gun • Pilot drill bit • Hole saw • Electrical fish to help feed cabling through opening *List of Supplied Wires/Cables* • Transmit control cable • Receive control cable • Power/control RG6 cable	

Locate Where You Want to Drill the Pilot Hole for the Cables

The hole that you drill on the roof should be as close to the modem as possible.

Tip: If possible, use existing openings on top of the roof, such as vents, to avoid drilling through the roof.

From *inside* the vehicle, locate where you want the cables to enter from the roof. For best results, choose a location in the vehicle where you can't see the cables entering, like inside a cabinet.

Drill the Pilot Hole for the Cables

WARNING: When you have found where you are going to drill the pilot hole from inside the vehicle, it's important to make sure that you are not going to hit anything, such as wiring when drilling.

Use the pilot drill to break through the first layer of roof. When the drill comes in contact with the insulation, *stop drilling*. Do not drill in this insulation area, as you could hit unseen electrical wiring. Simply push the non-spinning drill bit up through the insulation until you feel the solid roof layer.

Look into the opening with a flashlight to try to detect any loose wires that the drill may hit. If the area you are drilling is clear of loose wiring, drill through the outer roof layer.

From the roof of the vehicle, locate the pilot hole on top of the roof that you just drilled. Using the pilot hole, guide the hole saw through *only the top layer* of the roof.

Once you are sure you can finish drilling the hole without hitting any preexisting wiring, drill from inside the vehicle with a hole saw.

Pilot hole location

Run Cables Through Pilot Hole in Vehicle Roof

Feed the 2 RG6 cables and power cable from the inside of the vehicle up through the pilot hole, or pre existing vents, to the antenna mount.

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Attach Connectors to Cables with a Crimper

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Fill the Ends of All Exterior Connectors with Dielectric Gel

Seal the ends of each exterior coax cable connector with dielectric grease to weatherproof the outside connections.

Connect Cables to the Dish Mount

The connector panel, where the five cables connect to the antenna and are then routed into the vehicle, is located below the mount

From left to right, the connectors are:

- **TV 1** (for optional satellite TV connection not available on all models)
- **TV 2** (for a second satellite TV connection not available on all models)
- **Control Cable** (the cable is shown connected)
- **Transmit** connection (connects to the ODU on the satellite antenna)
- **Receive** connection (connects to the LNB on the satellite antenna)

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Bundle Cables Together with Cable Ties Bundle your wires so that they will stay tight and tie off. This may not be necessary if your cabling is prebundled. Space the cable ties no more than 12" apart.	
Mark Cables at Each End Mark the transmit cable where you can see the label from inside the vehicle. Mark the receive cable where you can see the label from inside the vehicle. Mark the power cable where you can see the label from inside the vehicle.	
Sealing the Entry Hole In the hole, place a piece of scrap plastic around the cables so that they do not rub against any sharp edges. You may use a split loom to cover your cables running on the roof. (There is a slit along the length of it that allows you to slide the cables in from the side). **IMPORTANT:** Squeeze DICOR between and underneath the wires at the entry point into the vehicle to create a watertight seal. Liberally apply DICOR to seal under the clamshell. Secure clamshell with screws, making sure you cover the tops of screws with DICOR. Never place split loom under the clam shell.	
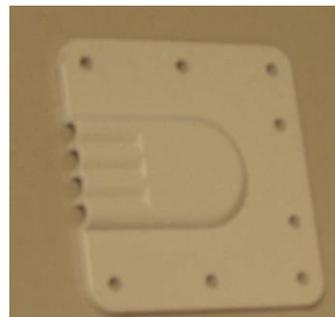
Connect Power to Dish Attach BNC Connector to "Power" coax. Connect to IDU. Plug in IDU power supply, and connect to IDU. Plug modem in at this time and connect it to IDU Press power button on front of IDU.	

GUI (Graphical User Interface) for Installer – Completing Installation

Set up the *iAutoSat* Controller Once you finished physically installing the *iAutoSat* system, you should have everything ready to initiate the configuration of the *iAutoSat* Controller. • Plug in the system to 110 power source or inverter • Pull out the 'Touch Screen' • Power up the system by pushing the 'Green' power button on the left.	
	Introductory Splash Screen Initial update and launcher screens will display, followed by the Introductory Splash Screen. This splash screen displays for a few seconds before going to the next screen.
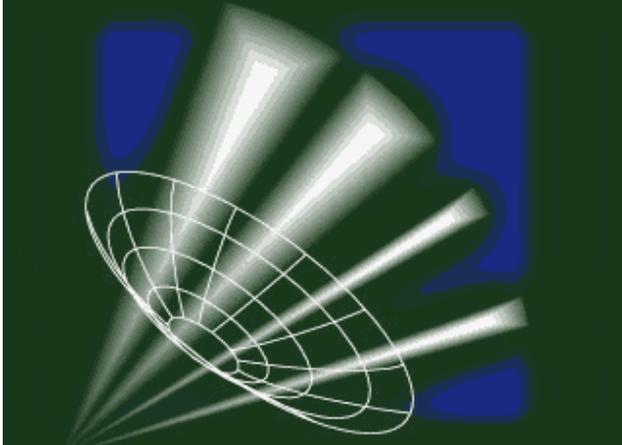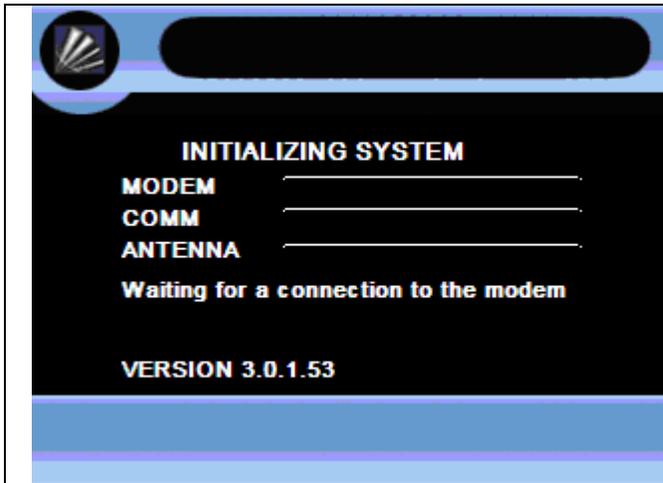
INITIALIZING SYSTEM MODEM COMM ANTENNA **Waiting for a connection to the modem** **VERSION 3.0.1.53**	**Initialization Screen** This screen provides valuable information about the software version, as well as initializing your *iAutoSat* components. Bar definitions: Modem–verifies modem connectivity Comm–verifies connectivity to antenna Antenna–verifies GPS activity, this can take up to 5-10 minutes on initial install or if the unit has been moved a significant distance, usually several hundred miles.
Setup **Unable to connect to the modem. Please check connections and restart, enter Setup mode, or Factory test mode.** Factory Setup Restart	**Modem Error** If there is an issue communicating with the modem this screen will appear. It is critical that the *iAutoSat* is connected to the modem – please check all your connections and restart the controller.
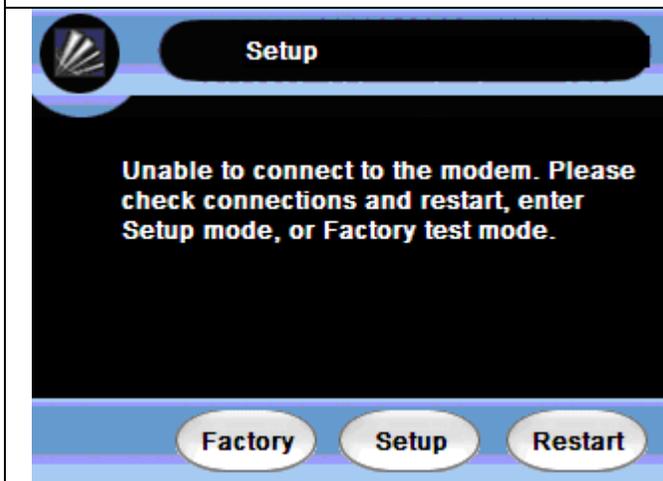
GUI (Graphical User Interface) for Installer – Setting up your software
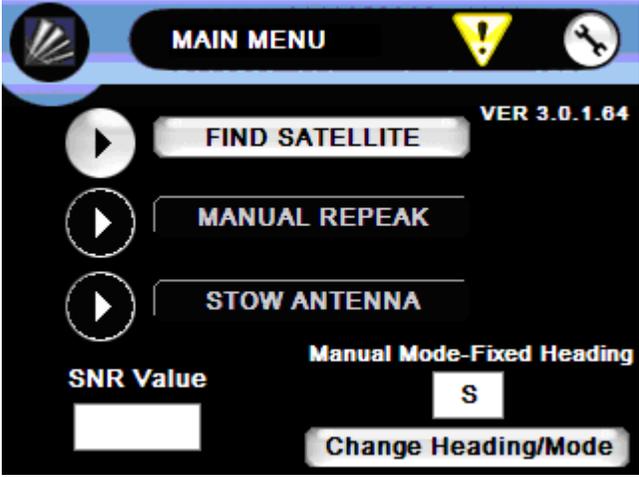
	Main Menu Select the yield icon at the top of the screen, enter the Installer Passnum and go to the installation menu. The "Find Satellite" button will not work until the system has been fully configured.
	Installation Choose "Authorized Installer" if this is your initial installation or a certified reinstallation.
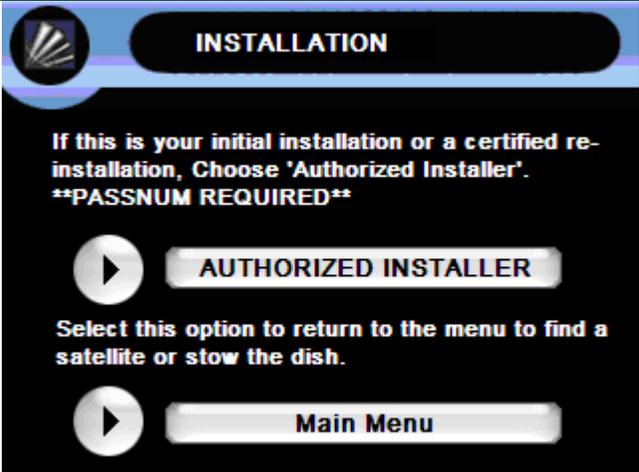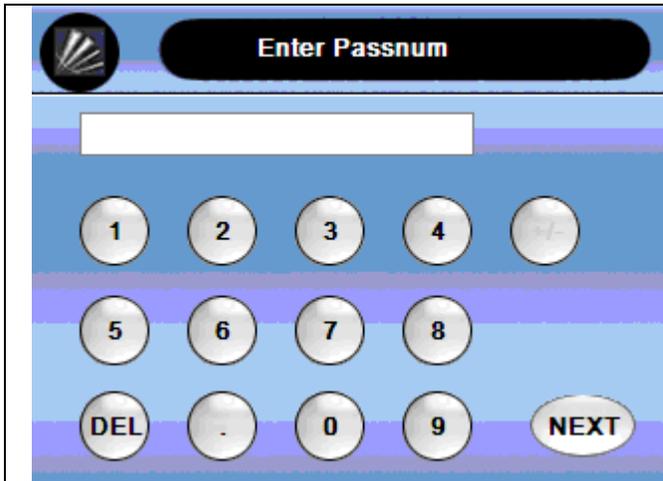
Enter Passnum 1 2 3 4 +/- 5 6 7 8 DEL . 0 9 NEXT	**Passnum** Enter Authorized Installer Passnum and hit 'Next'
Setup Do you want to move the antenna to finish assembly and wiring? YES NO **INSTALL MOVEMENT** STEP SIZE 10 AZIMUTH 0.0 ELEVATION 0.0 SKEW 0.0 MAIN NEXT	**Set-Up Movement** If the mount needs to be moved into a certain position for ease of installation select 'Yes' and the manual movement screen will be displayed. If no further movement is needed for installation hit 'No' to move on.
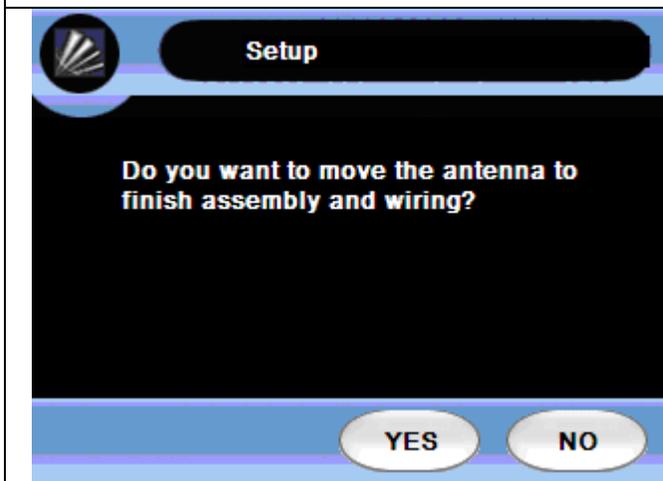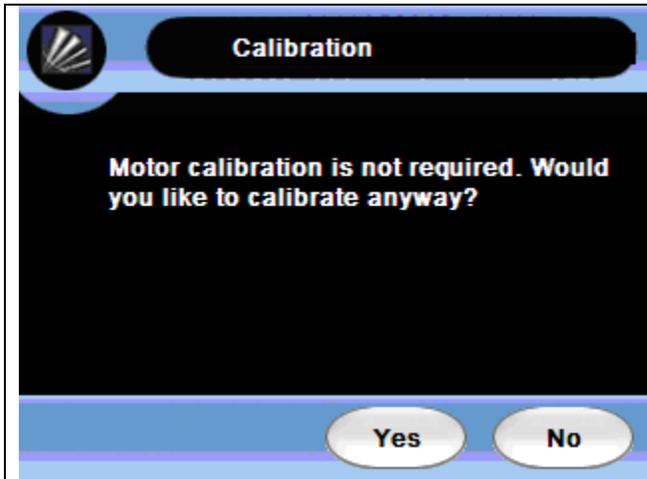
Calibrate the Mount

If the mount is already calibrated, you will be asked if you wish to calibrate the mount. Press "Go" to begin the calibration process. The antenna icon will show movement as the mount calibrates. Each degree of calibration, in terms of azimuth, elevation and skew, is displayed in a field box.

To discontinue calibration, simply press "Stop." Select "Go" to continue. The bar located between the "Go" and "Next" buttons indicates the progression of the calibration process. When finished, the next page will automatically display.
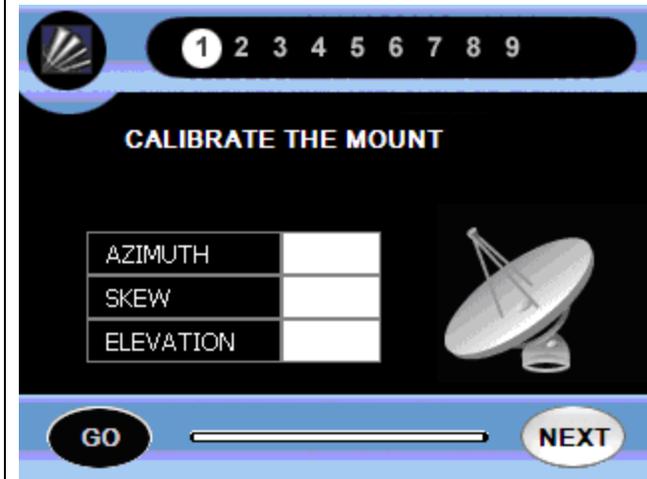
Calibrate Compass
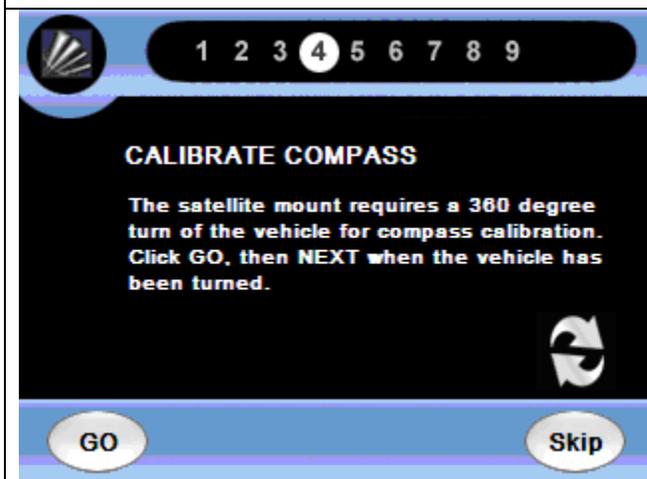
This screen gives you the option of calibrating the compass to improve its accuracy after the system is mounted.

This step may be skipped if it has already been completed once with the antenna mounted by selecting the lower right button which will say "skip" when you enter the screen. The progress bar represents a 360 degree movement. If you have moved the vehicle in a full circle and do not see the progress bar filled, it is still safe to continue.

Turn the vehicle a full 360 degrees slowly on level ground. Press "Next" when the vehicle has been turned.
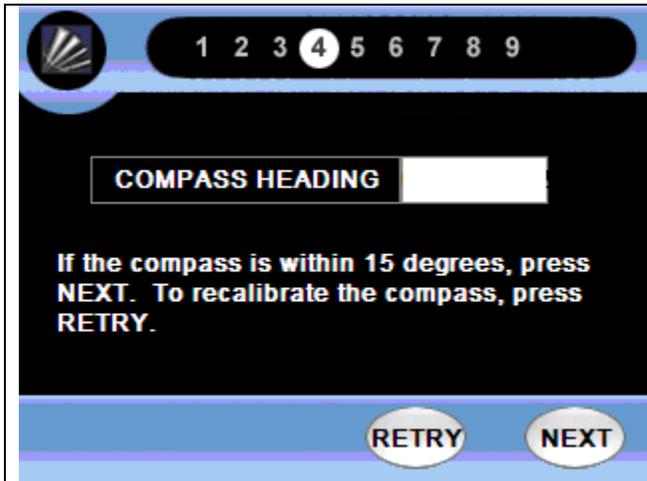
1 2 3 **4** 5 6 7 8 9 **COMPASS HEADING** If the compass is within 15 degrees, press NEXT. To recalibrate the compass, press RETRY. RETRY NEXT	**Calibrate Compass** This screen displays the current compass reading. Press "Next" if the compass is within 15 degrees. Press the "Retry" button to return to recalibrate the compass.
1 2 3 4 **5** 6 7 8 9 **MODEM SELECTION** Hughes Generic Generic Serial iDirect NEXT **Hughes Europe** Is this a Hughes Europe system? ** Passnum Required ** YES NO	**Modem Selection** Select between the types of modem being commissioned.
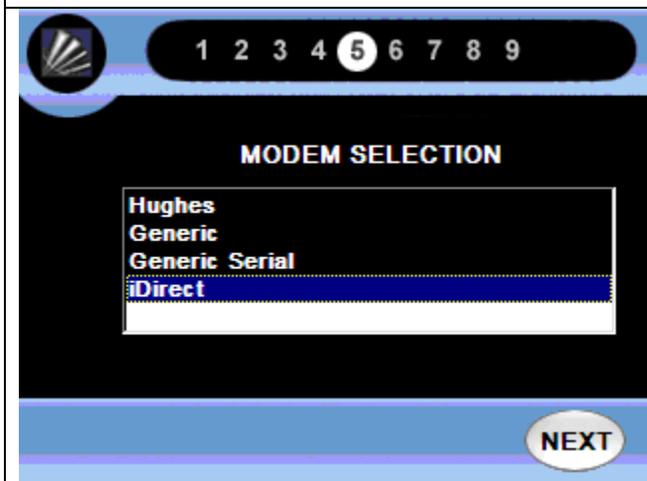
Modem Status	**Modem Status (HNS ONLY)** If your modem has already been commissioned, you will bypass all commissioning screens later in the installation process. Is your modem already commissioned? Answering NO will configure your modem. No　　Yes	

Modem Status (HNS ONLY)

If your modem has already been commissioned, you will bypass all commissioning screens later in the installation process.
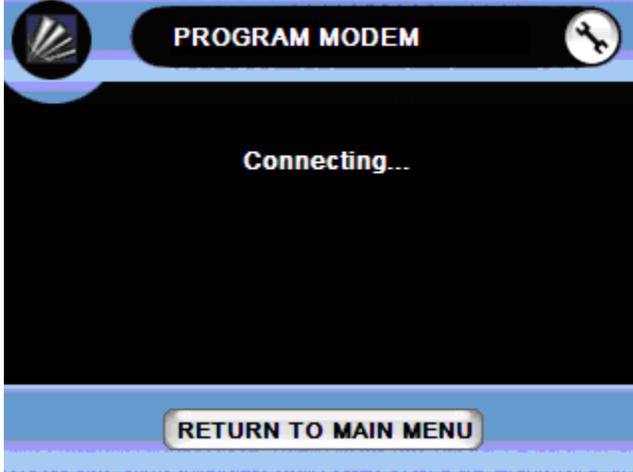
Program Modem (HNS ONLY)

No interaction is necessary during this screen as your modem is set up for completion of install. This will only appear if the modem is not commissioned.
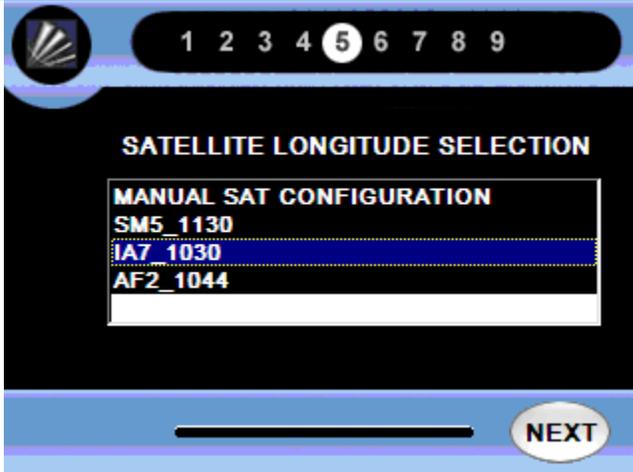
PROGRAM MODEM

Connecting...

RETURN TO MAIN MENU

Satellite Longitude Selection

Choose a satellite provider from the drop down box. If the desired provider is not available, press "Manual Sat Configuration" (the first option) to manually configure.

If provider is in the dropdown box, select and press "Next" to continue to Find Satellite Test.

1 2 3 4 **5** 6 7 8 9

SATELLITE LONGITUDE SELECTION

MANUAL SAT CONFIGURATION
SM5_1130
IA7_1030
AF2_1044

NEXT

Verify Settings AMC3_1150_10k at 87.00° W. Are you ready to search? NO YES	Skip to 'Find Satellite' Box
	MANUAL ENTRY BELOW
1 2 3 4 **5** 6 7 8 9 **SATELLITE LONGITUDE POSITION** 83 ▶ EAST ▶ WEST Ⓦ NEXT	**Manual Orbital Settings** If manually configuring the Satellite Longitude Position, press "East" or "West" to define the direction of the coordinates. Then choose the desired degree position by selecting in the field boxes. When you select one of the field boxes, a numerical keypad will be displayed for you to enter the numerical data (see next screen box). Press "Next" to exit from keypad and return to the previous page. Press "Next" to continue.
1 2 3 4 +/- 5 6 7 8 DEL . 0 9 NEXT	**Number keypad** This keypad is displayed anytime a numeric value is must be entered. Press "Next" to continue to next screen.
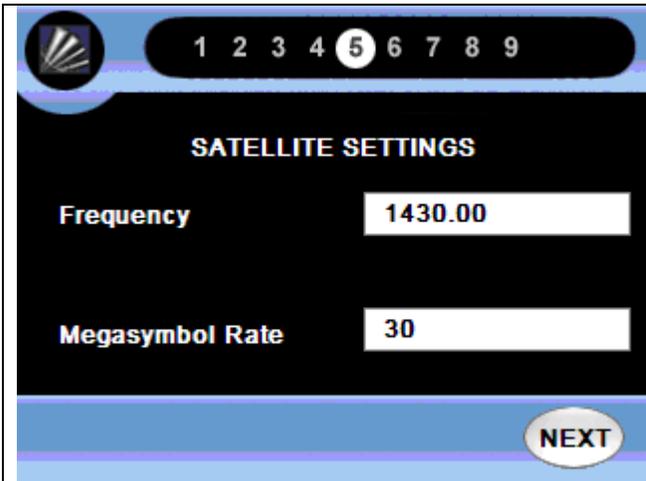
1 2 3 4 ⑤ 6 7 8 9 **SATELLITE SETTINGS** Frequency 1430.00 Megasymbol Rate 30 NEXT	**Satellite Settings** If manually configuring the satellite information, enter the frequency and megasymbol rate on this screen.
1 2 3 4 ⑤ 6 7 8 9 **POLARIZATION SETTINGS** Rx V Tx H NEXT	**Polarization Settings (HNS Only)** If manually configuring the satellite information, enter the polarization settings on this screen. Clicking on the polarization values toggles them between Horizontal and Vertical settings.
Skew Offset Would you like to set a skew offset? YES NO	**Skew Offset** If manually configuring the satellite information and a skew offset value is required, press "Yes" to enter the skew offset value.
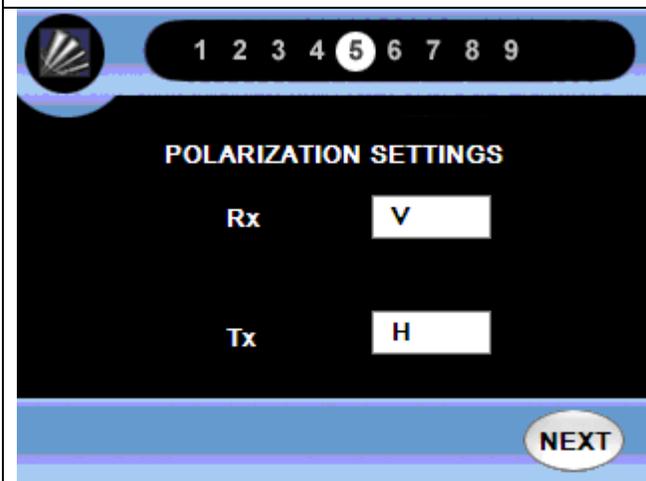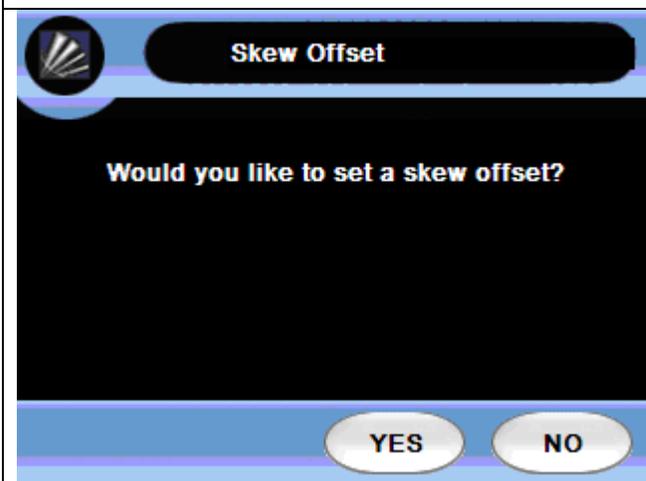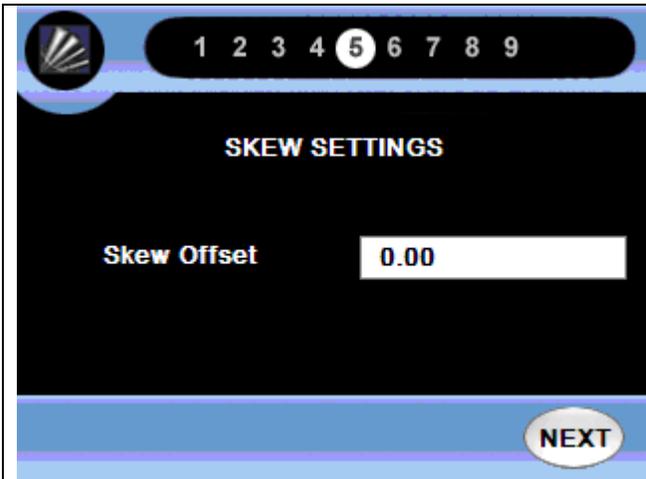
Skew Offset

If manually configuring the satellite information and a skew offset value is required, enter the skew offset value on this screen.
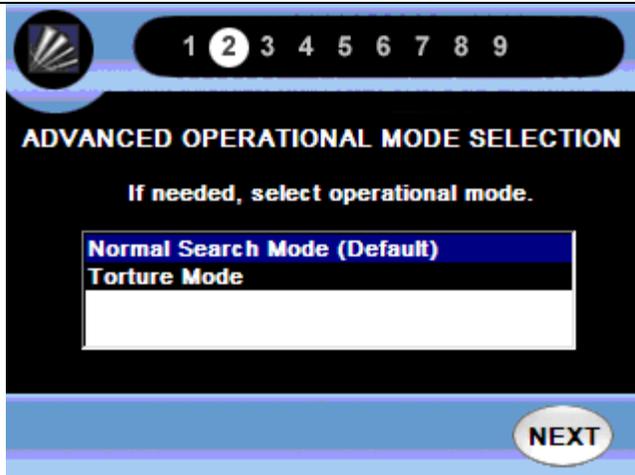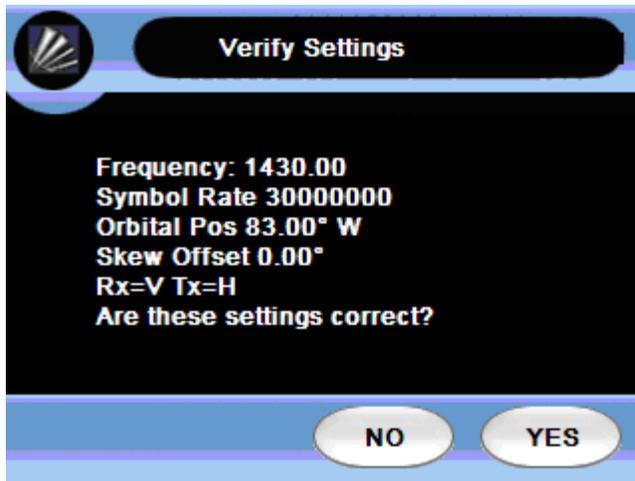
Operational Mode Seletion

This will allow for 'Normal Search Mode' – 'Test Search Loop Mode' for sales demonstration purposes – 'Torture Mode' for putting the unit through all motions in effort to test the reliability of the system.
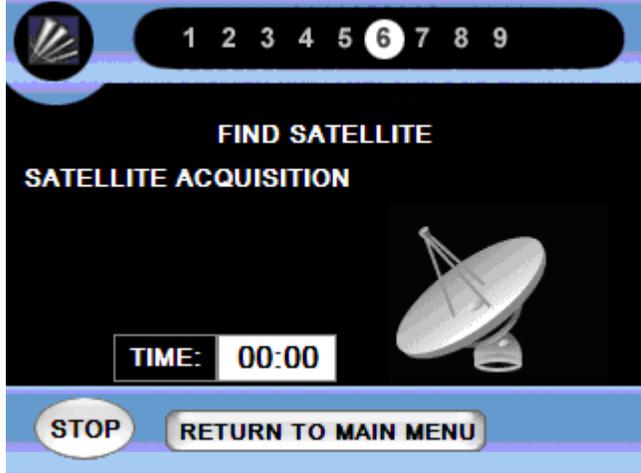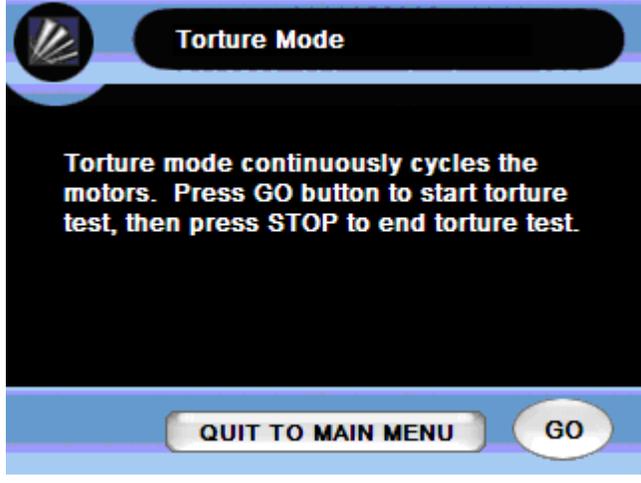
Find Satellite

On this screen, you will see a moving satellite animation indicating that the system is automatically searching for a satellite. The Satellite Acquisition Time is displayed as it counts up the time it takes to find the satellite. Press "Stop" to stop searching for a satellite and stow the antenna.
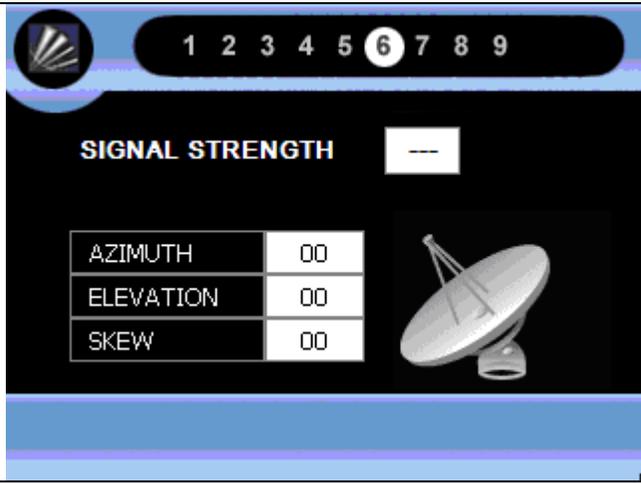
Satellite Found

When a satellite is found, the satellite icon to the right of the screen will stop rotating. On the left, you will see 4 populated field boxes indicating the Signal Strength, Azimuth, Elevation and Skew.

This screen will be displayed for a few seconds before automatically advancing to the cross polarization screen.
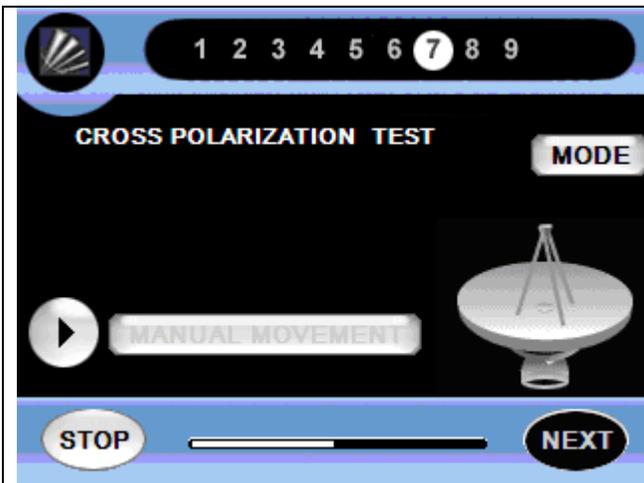
Cross Polarization Test (HNS ONLY)

If connection to a satellite and cross polarization is successful, the screen will automatically advance to the Main Menu. On first commission the modem may reboot.
If there is not enough signal for connection to occur, you will see an error message. At any point you may press the "stop" button, then press "Manual Movement" to manually change the antenna position. Once repositioned, you may select the same button, now labeled "go," to retry the test.

If the cross polarization test fails, the antenna will automatically stow and you will need to begin the process again.
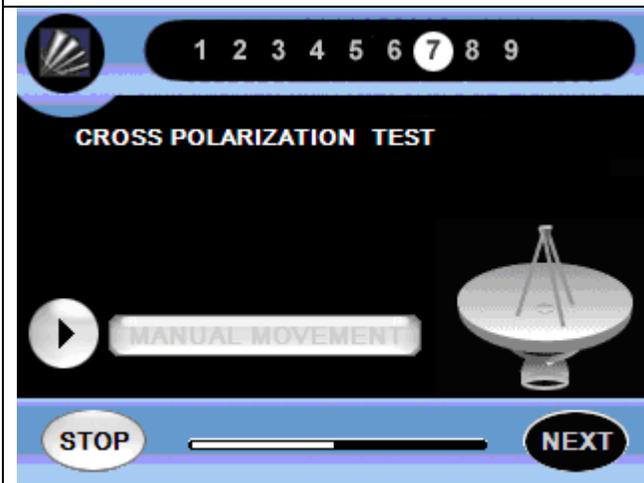
Cross Polarization Test (iDirect ONLY)

At this point the antenna will peak on SNR using AZ and EL – this could take several minutes to complete.
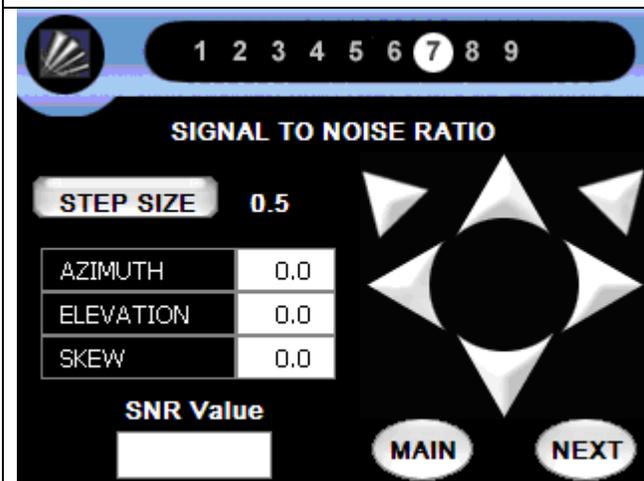
Manual Movement

Change the orientation and skew angle of the antenna manually by pressing the arrow buttons. Press "Next" when done manually moving the antenna. The diagonal North West button shows what arrows will look like when pressed with the black internal arrow. Step size will determine the number of degrees the antenna will move with each button press.

Installation Completion

You have successfully installed the *iAutoSat* system. As a certified installer you should be licensed and bonded to cover all your work. Isotropic Networks, Inc. will not be held responsible for any damages incurred relating to the installation of the *iAutoSat* system.

After completing the installation, please fill out the following information in the 'Owner's Manual' in Section 5. By doing so, it will provide the client the appropriate information to work with the Tier I, II, and III level supports teams, in case there are ever any support issues with the *iAutoSat* system.

Information to be filled out in the Owner's Manual

This information is specific to the user's antenna and modem and should be kept where it is accessible but confidential.

Your Site Account Number (San Number)	
Your PIN Number is	
Registered to	Name: Installation Address: Installation Address: City, State, Zip: Country Telephone: E-mail:
Modem Type	
Service Package	
Satellite Name	
Service & Support Group	Name: Contact: Address: Address: City, State, Zip: Telephone: E-mail Website:
Certified Installer:	Name:
Installer Certification Number:	

Registration / Warranty / Service

In order to qualify for the 1-year warranty, the customer will need to register their system by calling 262-248-9600 or by visiting our website at www.iautosat.net/registration/

User Warranty

ISOTROPIC NETWORKS, INC. – ONE YEAR LIMITED WARRANTY

IsoTropic Networks, Inc. warrants this IsoTropic Networks, Inc. product against any defects in materials or workmanship within one (1) year from date of installation. No warranty claim will be honored unless at the time the claim is made, you present proof of purchase to an authorized IsoTropic Networks, Inc. dealer (if unknown, please contact 262-248-9600).

IsoTropic Networks, Inc. (at its option) will either repair or replace the defective product at no charge to you. This warranty covers parts, but does not cover any costs incurred in removal, shipping or reinstallation of the product. This limited warranty does not apply if the product is damaged, deteriorates, malfunctions or fails from: misuse, improper installation, abuse, neglect, accident, tampering, modification of the product as originally manufactured by IsoTropic Networks, Inc., usage not in accordance with product instructions or acts of nature such as damage caused by wind, lightning, ice or corrosive environments such as salt spray and acid rain.

For a period of one (1) year from the date of installation, IsoTropic Networks, Inc. will pay the labor charges for repairs made to any defective equipment or component manufactured by IsoTropic Networks, Inc. when the product is returned by customer to the nearest IsoTropic Networks, Inc. approved repair facility. Labor cost for field services including alignments, removals or disassembly of any component manufactured by IsoTropic Networks, Inc. and must be approved in advance at labor rates and terms mutually agreed between IsoTropic Networks, Inc. and the repair facility.

The One (1) Year Warranty is provided on the condition that the equipment is properly delivered with all handling and freight charges prepaid to your IsoTropic Networks, Inc. dealer for return to our factory for repair or replacement. IsoTropic Networks, Inc. dealers will arrange for the replacement or repair and return to you without charge the product which failed due to defective material or workmanship.

ISOTROPIC NETWORKS, INC. WILL NOT ASSUME ANY LIABILITIES FOR ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, MADE BY ANY OTHER PERSON.

ALL OTHER WARRANTITES WHETHER EXPRESS, IMPLIED OR STATUTORY INCLUDING WARRANTITES OF FITNESS FOR A PARTICULAR PURPOSE AND MERCHANTABILITY ARE LIMITED TO THE ONE YEAR PERIOD OF THIS WARRANTY.

The foregoing shall be the sole and exclusive remedy of any person, whether in contract, tort or otherwise, and IsoTropic Networks, Inc. shall not be liable for incidental or consequential damage or commercial loss, or from any other loss or damage except as set forth above.

Some states do not allow limitations on how long an implied warranty lasts, or the exclusion of limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.