

DRAFT

IntelliStar 2 HD

Installation & Maintenance Guide

April 28, 2014



The Weather Channel, LLC.
300 Interstate North Parkway
Atlanta, Georgia 30339

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1 Introduction

Congratulations on your new IntelliStar 2 HD! The IntelliStar 2 HD is a product in The Weather Channel's IntelliStar line, which has been enabling television networks to broadcast current weather content to viewers for decades.

1.1 What's in This Document?

This document describes the installation, maintenance, and use of the IntelliStar 2 HD. This information is intended for engineers who will install and operate the device.

Sections in this document are as follows:

- **Section 2 - About IntelliStar 2 HD** – Description of new features
- **Section 3 - Installation** – How to install the IntelliStar 2 HD machine
- **Section 4 - Maintenance** – How to maintain the IntelliStar 2 HD system for optimum performance and long-life
- **Appendix A** - Technical Specifications

1.2 Support Contact Information

To contact us for support:

- Email: starsupport@weather.com
- Phone: 1-800-554-7354, Option #1
- Mailing Address:

Star Support
The Weather Channel, LLC.
300 Interstate North Parkway
Atlanta, Georgia 30339

2 About IntelliStar 2 HD

2.1 What's New?

The IntelliStar 2 HD seamlessly delivers local weather to your customers in HD format. It is a state of the art HD video decoder, blender and MPEG-2 encoder all in one box. Some of the new features included are:

Decoder Features:

- Two decoders on board allowing the flexibility to decode a video clip or file from the host computer. This "off-line" video may be frame-accurately blended into the live video feed for product localization.
- Frame by frame video resizer
- GIGe Ethernet video input
- Audio: 24-bit, six channel, SMPTE 299 compliant. Frame accurate mixer is available to insert, blend and fade as needed
- Ancillary Data: Closed Captioning (CEA-708D), DPI, Dolby metadata, and VITC time code are all decoded and passed through to the encoder card

Encoder Features:

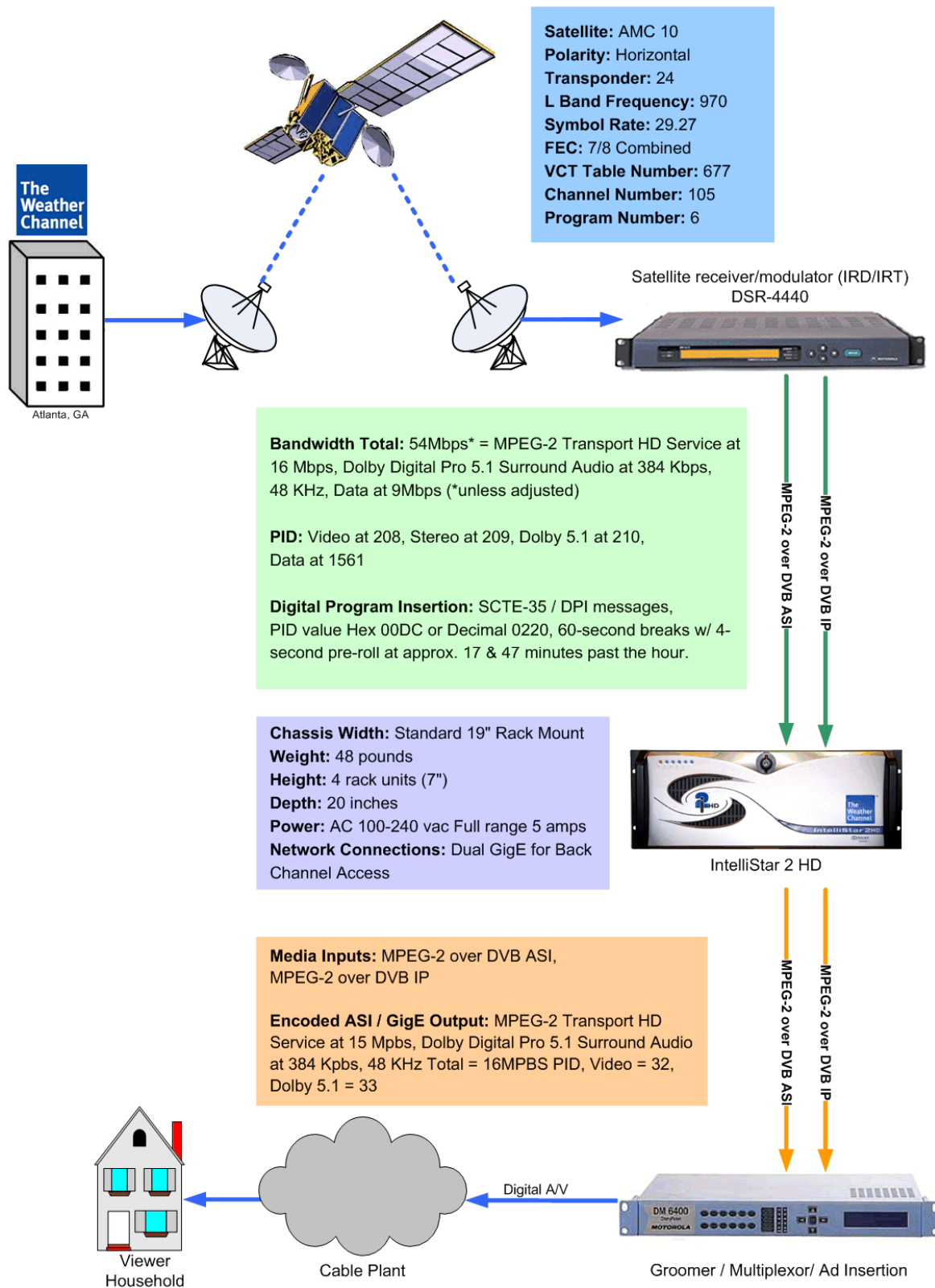
- Encodes real-time HD-SDI (SMPTE-292) into a broadcast quality MPEG-2 stream:
 - Supports an image structure of 1920x1080, 30fps (HDTV 1080i30, North America).
 - Standard GOP formats including I, B, and P frame encoding are used as well as sophisticated preprocessing techniques such as P-to-P frame look ahead.
 - Scene change and fade detection algorithms ensure maximum encoded video quality.
 - Film mode (inverse telecine or 3:2 pull-down) is automatically detected to efficiently compress the source video.
- Audio: 5.1 Dolby© Certified encoding
- Ancillary Data: Closed Captioning (CEA-708D), DPI (SMPTE-2010-2008), and VITC (SMPTE12M, RP188-1999) are transferred from the input HD-SDI stream and embedded in the MPEG-2 output.

2.2 Programming Data Flow

This section describes how programming data is transmitted from The Weather Channel to the IntelliStar 2 HD. See Figure 1 for an illustration.

1. The Weather Channel, LLC. transmits high definition (HD) programming through the satellite uplink in Atlanta, Georgia, to affiliates throughout the U.S. Transmitted with The Weather Channel programming are:
 - **Network control** commands and
 - **Weather data** supplied by **The Weather Channel Global Forecast Center** and the **National Weather Service** for thousands of weather zones.
2. The satellite-receive system at the cable headend receives the data from the **SES Americom AMC-10** satellite and passes it to the headend's satellite receiver/demodulator (**IRD/IRT**).
3. The **IRD/IRT** passes the feed to the **IntelliStar 2 HD**, which provides you with a digital video output. The IntelliStar 2 HD also receives additional cable neighborhood data and audio/video content from the SES Americom AMC-10 satellite.
4. The IntelliStar 2 HD captures the data designated for its specified weather zone and displays it automatically at the appropriate time, through the cable plant to the end viewer.

Figure 1. Programming Flow Diagram



2.3 Important Notes!

2.3.1 County Addresses/Zip Codes

The IntelliStar 2 HD requires the correct county addresses and zip codes to ensure proper delivery of severe weather warnings and appropriate localized forecasts. If the county addresses and zip codes are not correct, viewers will not receive important life-saving severe weather information such as tornado warnings.

Address information for your primary and secondary viewing county(s) has been pre-installed in your new IntelliStar 2 HD based on the data that your system previously provided to The Weather Channel, LLC. If for any reason the area served for this device has shifted or expanded to another county or zip code(s), please notify The Weather Channel Star Support immediately (**1-800-554-7354 Option #1**).

2.3.2 Warnings

The IntelliStar 2 HD has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this device in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at user's own expense.



- WARNING:** Do not open or remove the cover on the IntelliStar 2 HD. Changes or modifications to this device not expressly approved by The Weather Channel could void the user's authority to operate the equipment.
- WARNING:** To prevent fire or shock hazard, do not expose this equipment to rain or moisture.
- WARNING:** To prevent electrical shock, do not use the equipment electrical power plug (polarized) with an extension cord, receptacle, or other outlet unless the blades can be fully inserted to prevent blade exposure.
- CAUTION:** The IntelliStar 2 HD battery is NOT field replaceable. Dispose of the used battery according to the instructions included with the new battery. You should be aware that there is a risk of explosion if the battery is replaced by an incorrect type.

3 Installation

To install the IntelliStar 2 HD, you will complete these tasks:

- Unpack the box, inspect the contents, and identify all pieces.
- Mount the IntelliStar 2 HD in your rack, using the rack rails or wing assembly.
- Connect your satellite receiver/demodulator (IRD/IRT) and your system to the IntelliStar 2 HD.
- Reseat the hard drives.
- Power on the IntelliStar 2 HD.

Each task is described in detail in the following information.

3.1 Getting Started

Step 1. Unpack the Box

Unpack the IntelliStar 2 HD box. The box contains the following items:

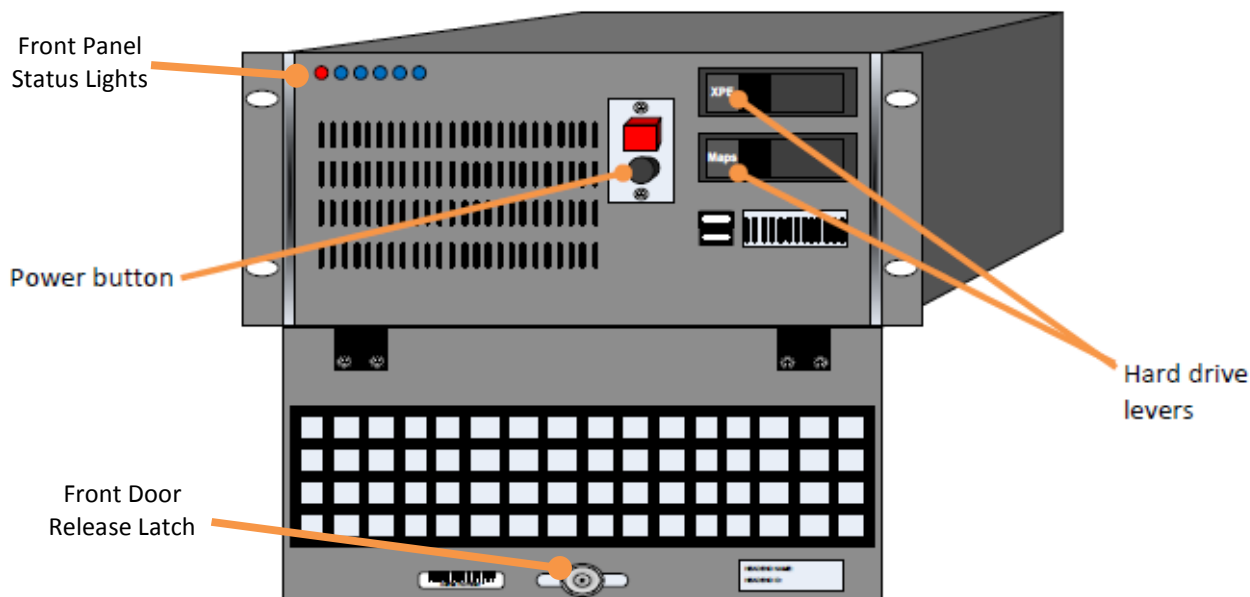
- IntelliStar 2 HD unit
- This manual
- Rack rail assembly
- Accessories bag containing:
 - A/C power cord
 - 12-inch BNC cable
 - HDMI to VGA converter
 - Two keys for the front door lock
 - Four keys (two each) for each hard drive sled lock
- Screws for assembly

NOTE: The Weather Channel has inspected and properly packaged the unit for shipment. It is the carrier's responsibility to deliver the unit safely. If any damage occurred during shipment, please note this on the delivery/packing slip, obtain the signature of the carrier at the time of delivery, and promptly notify The Weather Channel Star Support at: **1-800-554-7354 Option #1.**

Step 2. Identify Headend Name and ID

1. Open the front door of the IntelliStar 2 HD by turning the front door release latch clockwise (see Figure 2 below):

Figure 2. Front panel with door unlatched



2. Locate the headend information label on the inside of the front door as shown above, and verify that the Headend Name and the Headend ID match the information on the outside label of the shipping container. If the information on the two labels doesn't match, contact The Weather Channel Star Support at: **1-800-554-7354 Option #1**.

NOTE: See "3.4 Front Panel Status Lights" for a description of the front panel status lights shown above.

Step 3. Choose Rack Mounting Option

The next section describes how to mount the IntelliStar 2 HD securely in your rack or cabinet. First, choose one of these two options for mounting the IntelliStar 2 HD:

- **Wing Mount** – Use the IntelliStar 2 HD wings to mount the unit in your rack with four rack screws. If you choose this option, skip to "Step 5. Mount IntelliStar 2 HD in the Rack" on page 14.
- **Rail Mount** – Use the included rail assembly to mount the machine to your rack. If you choose this option, proceed to section "3.2 Assemble and Attach Rack Rails."

NOTE: If only one person is available to install the IntelliStar 2 HD, you **must** use the rail mount option.

3.2 Assemble and Attach Rack Rails

Step 1. Inspect Rack Rail Parts

1. Open the rack rail assembly box and ensure all the parts are there:
 - Two rack rail assemblies
 - Hardware bag

Step 2. Disassemble Rack Rail Assembly

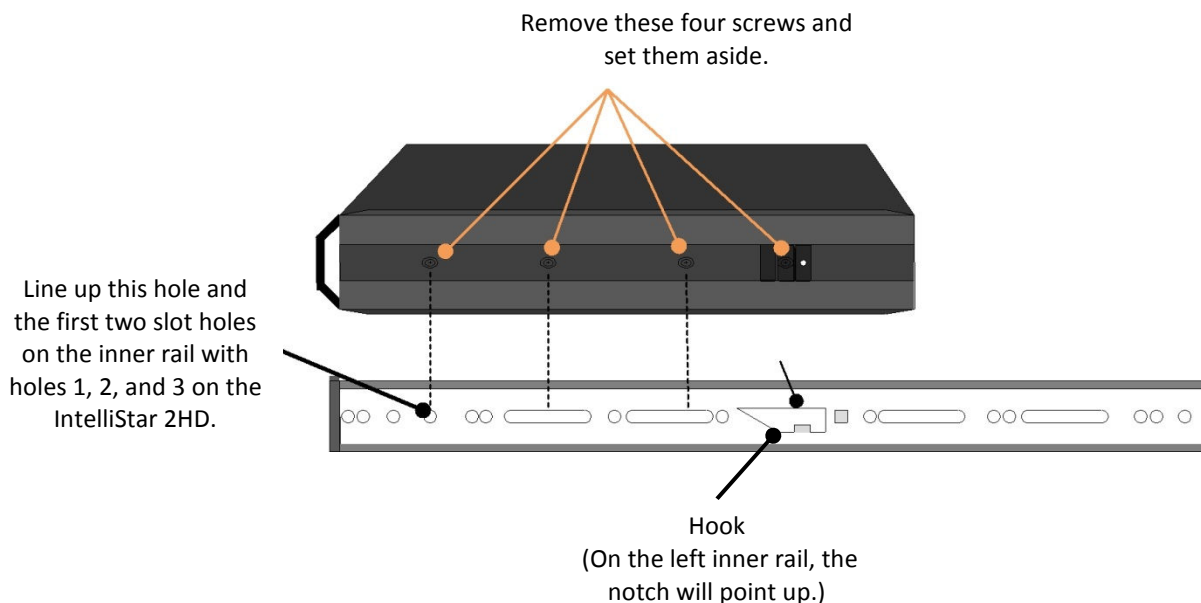
1. Place the first rack rail assembly on a flat surface.
2. Slide out the first inner rail toward the front of the assembly until it locks in place. Push up or down on the hook (see Figure 3) and slide the inner rail until it comes completely out of the rack rail assembly.
3. Repeat for the second rack rail assembly. You should now have four pieces:
 - Two outer rails – to be attached to your rack
 - Two inner rails – to be attached to the IntelliStar 2 HD

Step 3. Attach Rack Rails to the IntelliStar 2 HD

In this section, you will attach the inner rack rails identified above to the IntelliStar 2HD. The only tool you need is a Phillips screwdriver.

1. Remove the four black screws ($\frac{1}{4}$ " fine 4 x 0.50) from the right side of the IntelliStar 2 HD (as shown in Figure 3) and set them aside. You will be using them later.
2. Position the inner rail on the right side of the IntelliStar 2 HD where you removed the screws. The lip of the inner rail should face you.
3. From the closed end of the inner rail, align the fourth hole with the first hole on the side of the IntelliStar 2 HD (the hole next to the handle) as shown in Figure 3.
4. Now align the first two slot holes on the inner rail with holes 2 and 3 on the IntelliStar 2 HD as shown in Figure 3. Ignore the fourth hole on the IntelliStar 2HD.
5. Attach the inner rail to the IntelliStar 2 HD with three of the four screws you removed in Step 1.
6. Repeat steps to install the left inner rail on the left side of the IntelliStar 2HD.

Figure 3. Installing the Inner Rail (right side view)



Step 4. Attach Rail Assembly to Your Rack

1. Add the rack mounting hardware to both of the outer rack rails with the ears pointed toward you (see Figure 4). Depending on the depth of your rack, use two to four of the small screws from the bag labeled "S-017-1" (use the round head $\frac{1}{4}$ " fine 4 x 0.50) on each ear. **NOTE:** To slide the outer rail back in place if it opens to the locked position, push down on the hook and slide the rail toward the stop.
2. Position the right outer rack rail at the desired location in your rack, keeping the sliding rail guide facing inward. **NOTE:** Position of the rack mounting hardware and rack ear placement will vary depending on your rack configuration.
3. Insert one or two mounting screws into the ears (depending on your rack configuration) in the front and back of the right outer rack rail and screw the assembly to your rack.
4. Repeat steps for the left outer rack rail.

Figure 4. Attaching the rack mounting hardware to the outer rail



Step 5. Mount IntelliStar 2 HD in the Rack



Environment: For proper operation and safety, when installing the IntelliStar 2 HD in a closed or multi-unit rack assembly, the ambient temperature within the rack must not exceed 104°F (40°C).

- Rack Info:**
- To ensure proper ventilation, leave one empty rack unit on the top and bottom of the IntelliStar 2 HD.
 - Do not install the equipment at the top of an otherwise empty rack to avoid uneven mechanical loading.
 - The IntelliStar 2 HD is heavy (48 pounds). If possible, we recommend using a rack space near the bottom of the rack.

- Power Supply:**
- Before connecting the power, be aware that the IntelliStar 2 HD equipment ratings are: 100 – 240 vac full range, 5 amps.
 - Ensure the equipment rack power strip is grounded to the main building ground.

CAUTION: Slide/rail mounted equipment is not to be used as a shelf or a work space.

1. Assign one person to hold the IntelliStar 2HD from the back of the unit in the rack.
2. Assign a second person to secure the IntelliStar 2HD to your rack by attaching four rack screws to the IntelliStar 2HD wings.

3.3 Connecting the IntelliStar 2 HD

This section includes instructions and diagrams to help you connect your satellite receiver/demodulator (IRD/IRT) to the IntelliStar 2 HD.

Step 1. Connecting your IRD/IRT to IntelliStar 2 HD

There are two ways you can connect your IRD/IRT to the IntelliStar 2 HD unit:

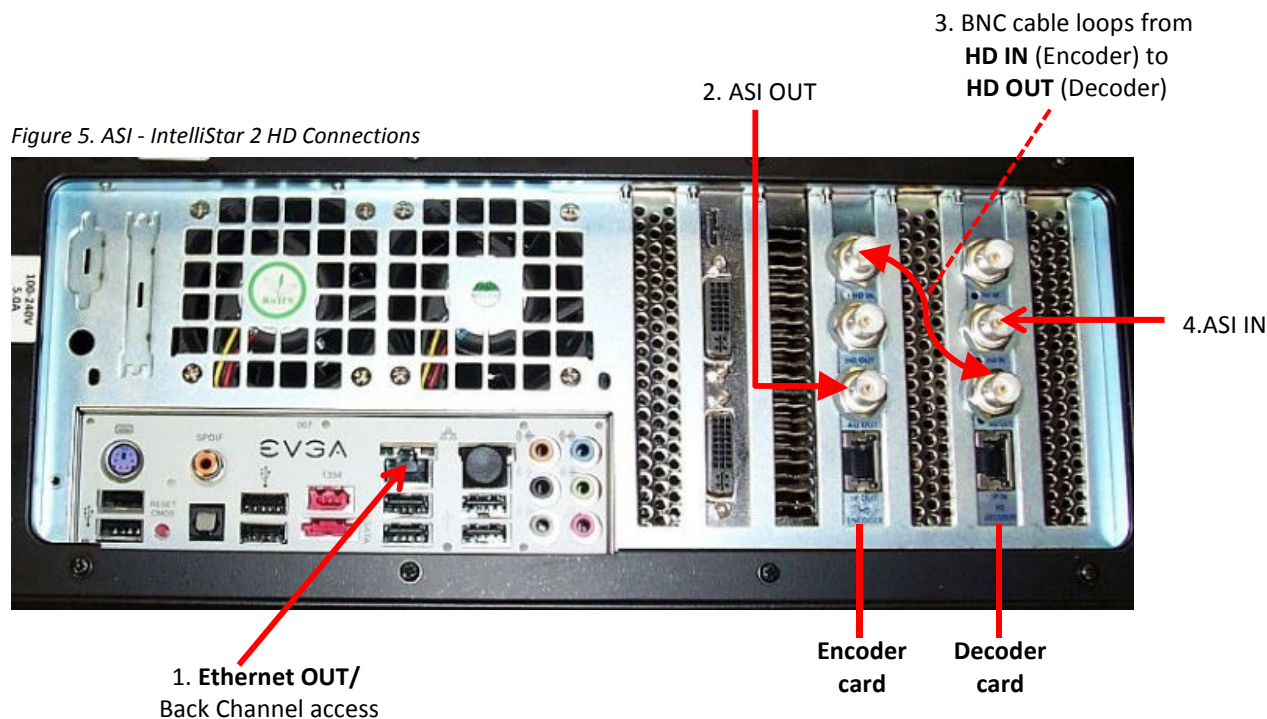
- ASI
- GigE

NOTE: GigE can only be used if you provided The Weather Channel with the appropriate IP information during the site survey.

Follow the steps for your type of connection below.

3.3.1 ASI Connection

Figure 5. ASI - IntelliStar 2 HD Connections



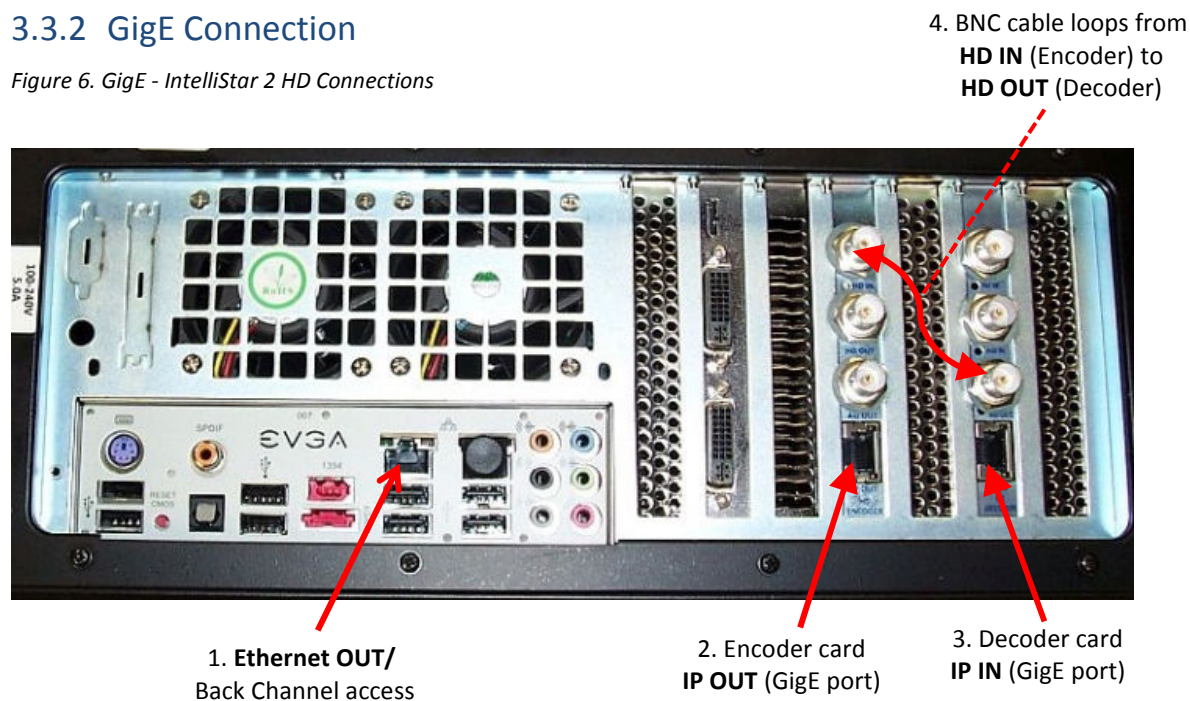
The numbered steps on the diagram are described below:

1. Connect “**Ethernet Out**” from the IntelliStar (the back channel connection without a black plug in it) to “**Ethernet In**” on your cable modem, switch, or similar equipment using a shielded CAT 5 or better RJ45 cable.

2. Connect “**ASI OUT**” from the IntelliStar Encoder card to “**ASI IN**” on your groomer, MUX, or QAM modulator. **NOTE:** Ensure that PID aliasing is turned off on your IRD.
3. Remove the 12-inch BNC cable from the bag containing the power cord (included with the IntelliStar 2 HD). Connect one end of the BNC cable to “**HD IN**” on the IntelliStar Encoder card and connect the other end of the BNC cable to “**HD OUT**” on the IntelliStar Decoder card.
4. Connect “**ASI OUT**” from your IRD to “**ASI IN**” on the IntelliStar Decoder card.

3.3.2 GigE Connection

Figure 6. GigE - IntelliStar 2 HD Connections



The numbered steps on the diagram are described below:

1. Using a shielded CAT 5 (or better) RJ45 cable, connect “**Ethernet OUT**” from the IntelliStar (the back channel connection on the left as shown in Figure 6) to “**Ethernet IN**” on your cable modem, switch, or similar equipment.
2. Connect a shielded CAT-5 (or better) Ethernet cable from the “**IP OUT**” on the IntelliStar Encoder card to your groomer, MUX, or Qam modulator. The PIDs you will see are Video = 208 and Audio = 210. **NOTE:** Ensure that PID aliasing is turned off on your IRD.
3. Connect a shielded CAT-5 (or better) Ethernet cable from the IntelliStar “**IP IN**” on the Decoder card to the “**Ethernet GigE port**” on your IRD/IRT.

4. Remove the 12-inch BNC cable from the bag containing the power cord (included with the IntelliStar 2 HD). Connect one end of the BNC cable to “**HD OUT**” on the IntelliStar Decoder card and connect the other end of the BNC cable to “**HD IN**” on the IntelliStar Encoder card.

Step 2. Reseating the Hard Drives

There are two hard drives in the IntelliStar 2 HD labelled **XPE** and **MAPS** as shown below.

XPE drive:




- Contains the operating software, current weather information, and experience data
- Should always be in the top slot

Maps drive:



- Contains the maps
- Should always be in the bottom slot

Due to shipping vibrations, the hard drives may dislodge. We recommend reseating the hard drives before applying power. To reseat the hard drives, complete the following steps:

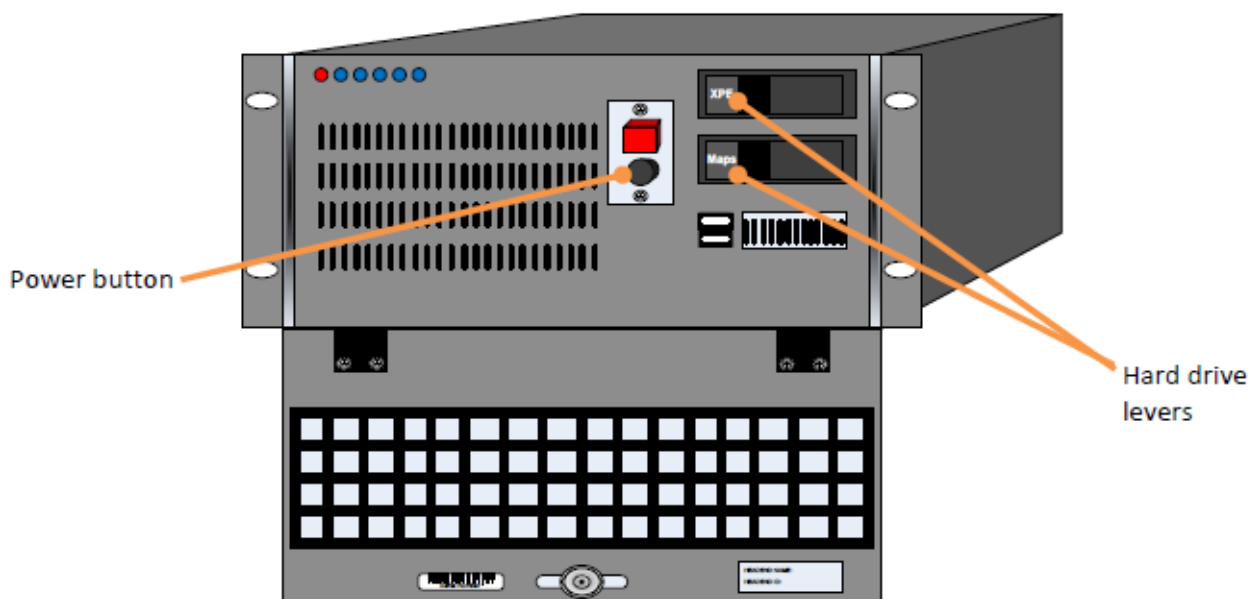


CAUTION:

AC power could damage the hard drives. Please make sure that **no** AC power is connected to the IntelliStar 2 HD when you reseal the hard drives.

1. Unplug the power cord to ensure that no AC power is connected.
2. Turn the latch on the front door of the IntelliStar 2 HD clockwise and open the front door.
3. Lift the hard drive lever for the **XPE** drive toward you (see Figure 7):

Figure 7. Reseating the Hard Drives



4. Firmly pull the hard drive lever left toward the **Power** button until the door opens.
5. Slide the hard drive out about two inches, and then slide the hard drive all the way back into the drive bay.
6. Close the door until the door and lever click in place.
7. Repeat steps on the **MAPS** drive.

Step 3. Powering on the IntelliStar 2 HD

To power up the IntelliStar2 HD, complete the following steps (see Figure 8):

1. Connect the A/C power cord (included in the accessories bag) to the back of the IntelliStar 2 HD on the lower left-hand side.
2. Connect the power cord to the A/C power outlet in your rack.
3. Press the power switch located on the back of the IntelliStar 2 HD next to the A/C power cord.
4. Turn the latch on the front of the IntelliStar 2 HD clockwise and open the front door.
5. Press the black power button located on the front of the unit next to the hard drives.
6. To **power off** the IntelliStar 2HD, press the power button on the front of the unit to power down the hard drives, and then press the power switch on the back of the unit to power down the unit.

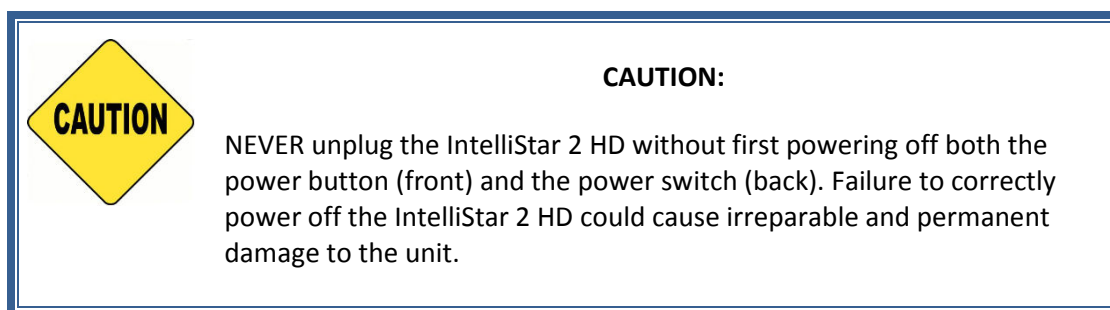
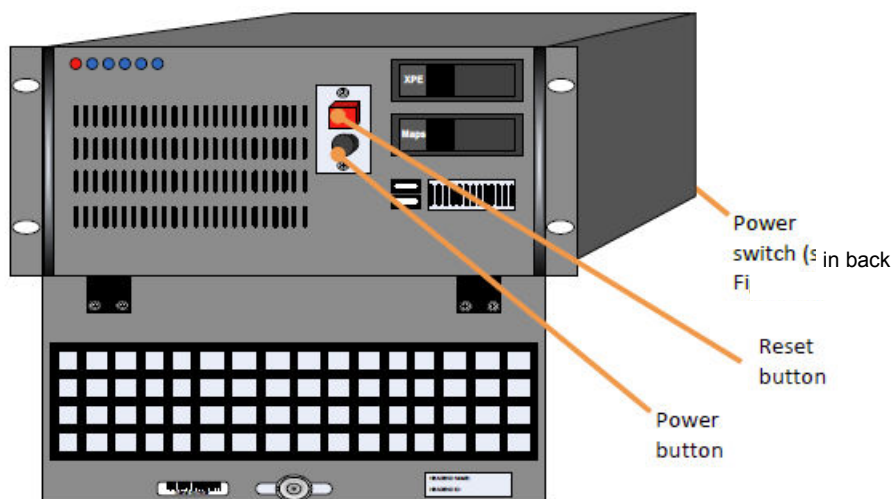


Figure 8. Power On the IntelliStar 2 HD



Step 4. Check Back Channel IP and Activate Localization

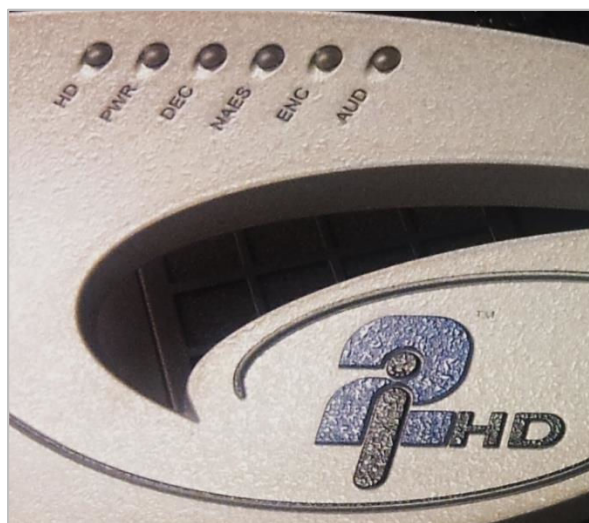
To complete installation of the IntelliStar 2HD, you must contact Star Support to check your back channel IP and turn on localization:

1. When you see video displayed by the IntelliStar 2 HD on your monitor, call Star Support at **1-800-554-7354**.
2. Star Support will log into the IntelliStar 2 HD unit via the back channel IP address. Star Support will then establish a connection and activate **localization** (which enables the IntelliStar 2 HD unit to display local weather information).

3.4 Front Panel Status Lights

For the most part, you need not concern yourself with the front panel lights. However, if you have a problem with your IntelliStar 2 HD, Star Support may ask you to check the status of the lights on the front panel:

Figure 9. Front Status Lights



The following table describes the front panel lights:

Light Position (L – R)	Label	Indicates	Light Color
1st	HD	Hard drive is being accessed	Red
2nd	PWR	Power is on	Blue
3rd	DEC	Images are being decoded	Blue
4th	NAES	Nielsen® audio watermarking is being inserted	Blue
5th	ENC	Video is being compressed	Blue
6th	AUD	Dolby® material is being embedded on the transport stream	Blue

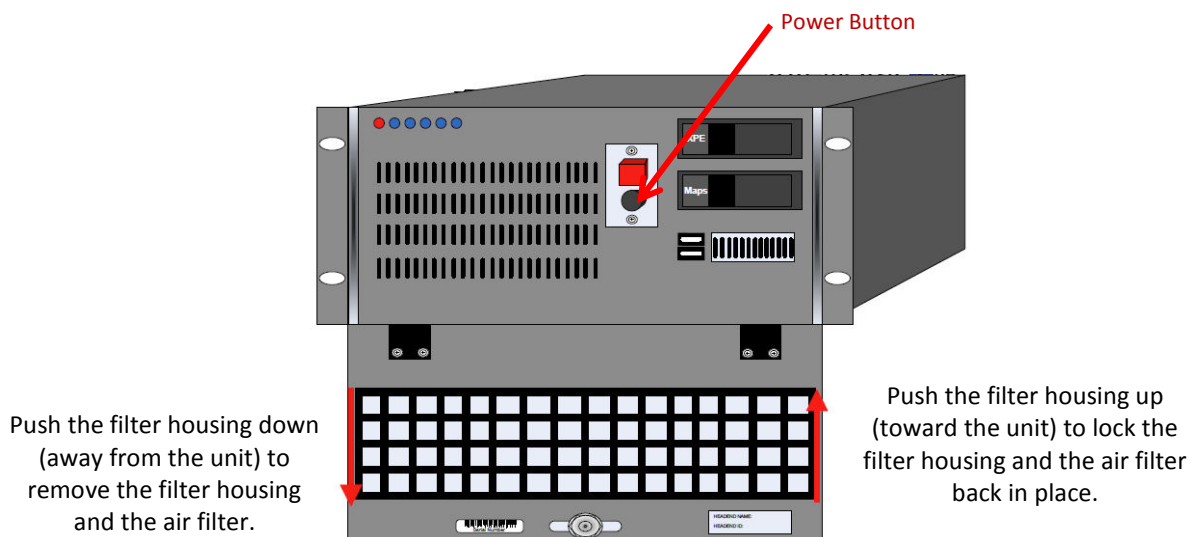
4 Maintenance

The IntelliStar 2 HD requires very little maintenance. At least twice a year or whenever you see an accumulation of dirt and dust, you should clean the air filter. You may never have to replace a hard drive. However, we have included instructions for replacing a hard drive in section “4.2 Replacing a Hard Drive.”

4.1 Cleaning the Air Filter

Step	Instructions
1	Turn the latch on the front door of the IntelliStar 2 HD clockwise and open the front door.
2	Slide the filter housing containing the air filter downward toward the front door latch (see Figure 10).
3	Lift the filter housing and set aside.
4	Remove the air filter and brush off the excess dirt and dust.
5	Put the air filter under running water and manipulate with your hands to remove any remaining dirt and dust.
6	Wring the air filter to remove excess water, and then lay flat to completely air dry.
7	Replace the air filter on the IntelliStar2 HD from where you removed it.
8	Replace the filter housing over the air filter.
9	Slide the filter housing containing the air filter upward until it locks into place.
10	Close the front door of the IntelliStar 2 HD and turn the latch counterclockwise to latch the door.

Figure 10. Removing air filter housing and air filter



4.2 Replacing a Hard Drive

Step	Instructions
1	Turn the latch on the front door of the IntelliStar 2 HD clockwise and open the front door.
2	Press the black Power button located on the front of the unit next to the hard drives to power down the hard drives (see Figure 10).
3	Press the Power switch on the back of the IntelliStar 2 HD (on the power supply) to the 'off' position to power down the unit.
4	Unplug the AC power cord from the back of the IntelliStar 2 HD (on the power supply). See Figure 7.
5	Lift the appropriate hard drive lever toward you.
6	Firmly pull the hard drive lever left toward the front Power button until the door opens.
7	Grasp the open door and pull towards you until the hard drive slides out.
8	To replace the hard drive, slide the new hard drive all the way into the hard drive bay.
9	Close the door until the door and lever click in place.
10	Plug AC power cord back into the IntelliStar 2HD.
11	Press the Power switch on the back of the unit (on the power supply) to the 'on' position to power on the IntelliStar 2HD.
12	Press the black Power button (front of unit) to power on the hard drives.
13	Close the front door on the IntelliStar 2 HD and turn the latch counterclockwise to latch the door.

Appendix A. Technical Specifications

Receiver Information	
Satellite	SES Americom AMC-10 Transponder 24
Transponder Polarization	Horizontal
Band	C
Uplink Facility	TWC Uplink
Encryption Method	DigiCipher II
Symbol Rate	29.27
FEC	7/8 Combined (subject to change)
Downlink Frequency	4.180 GHz
L Band Frequency	970
Digital Program Insertion	<ul style="list-style-type: none"> • SCTE-35 / DPI messages • PID value Hex 00DC or Decimal 0220 • 60-second breaks with 4 seconds pre-roll at approximately 17 and 47 minutes past the hour
TWC Approved Compatible IRDs	<ul style="list-style-type: none"> • Motorola DSR 4520X • Motorola DSR 4410 • Motorola DSR 4530 • Motorola DSR 4550 • Motorola DSR 4410MD, Motorola DSR 4400MD (only those with an IRD part no. of 475089-002, produced after Sept. 2003) • DSR-4440 • DSR-4460
Proper operation of the IntelliStar 2HD requires: MPEG-2 transport stream input containing all complete TWC HD services (video, audio, TWC data, and ancillary data PID streams).	
Network Information	
Network Connections	Dual GigE for media input/output (for future MPEG-2 over IP) Dual 10/100 for IRD control, local data, local monitoring, back channel (required) Note: Dial-up back channel is not supported
Environmental Information	
Chassis Width	Standard 19-inch rack mount
Chassis Height	Four rack units (7 inches)
Chassis Depth	20 inches
Chassis Weight	48 pounds
Power	AC 100 to 240 Vac Full Range 5 Amps
Ambient Temperature	0°—40°C 32°—104°F

Audio and Video Information	
HD Audio Configuration	3_2 <i>Dolby</i> Digital 5.1
Channel Number	105
Video Parameters	1920 x 1080i 29.97 fps. MPEG-2 MPHL
Media Inputs	MPEG-2 over DVB/ASI MPEG-2 over IP
Media Outputs	<ul style="list-style-type: none"> • HD-SDI (embedded audio, SMPTE 334M Captions) • MPEG-2 over DVB/ASI • MPEG-2 over IP
Encoded Outputs	MPEG-2 Transport at 16 Mbps MPEG-2 Video at 15 Mbps 5.1 Surround Audio at 384 Kbps, 48 KHz sample rate SCTE-35 DPI messages: Hex 00DC or Decimal 0220 CEA/EIA-708 Closed Caption PID value Video = 32 <i>Dolby</i> 5.1 = 33