IntelliStar 2 XD

Unofficial Setup Guide

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Congratulations!

You have successfully been able to obtain an IntelliStar 2 XD in some way or another, whether that be through ebay, grabbing an image archive somehow or some way, or maybe you're just seeing this from some random coincidence. If the third option somehow applies to you, remember: **No you didn't.**

This setup guide will help you through the process of setting up your instance of the IntelliStar 2 XD, getting data set up, and potential upgrade paths for your system.

Prerequisites

To run Viz – the engine responsible for rendering graphics on the system – you need mid-ranged hardware.

Minimum Hardware Requirements:

- A motherboard, preferably able to run UEFI with Legacy/CSM support.
- Quad-core CPU
- 8 GB Memory
- Nvidia Geforce GTX 750 TI 2GB or equivalent
- 200GB of available hard drive space
- 450W - 500W Power Supply

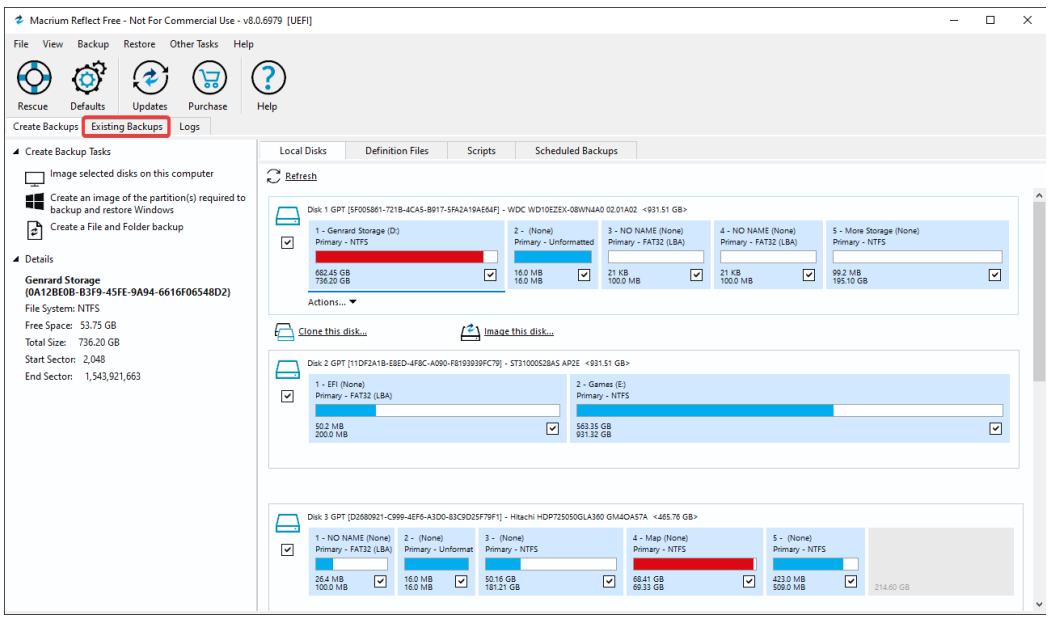
An ethernet connection is preferred through much of the setup process. If you are unable to get a wired ethernet connection, it may be worth skipping to the upgrades section part of the manual, or using a capable WiFi card connected through PCIe or USB.
In the event of having to flash the OS image for the IS2XD onto another hard drive, you need ~80GB of free space on another system in order to download the hard drive image. If you do not have sufficient SATA or SATA power cables in your current system, you may need to employ the use of a SATA to USB enclosure or cable. To flash the image also requires the free edition of Macrium Reflect.

Installing the i2 Software

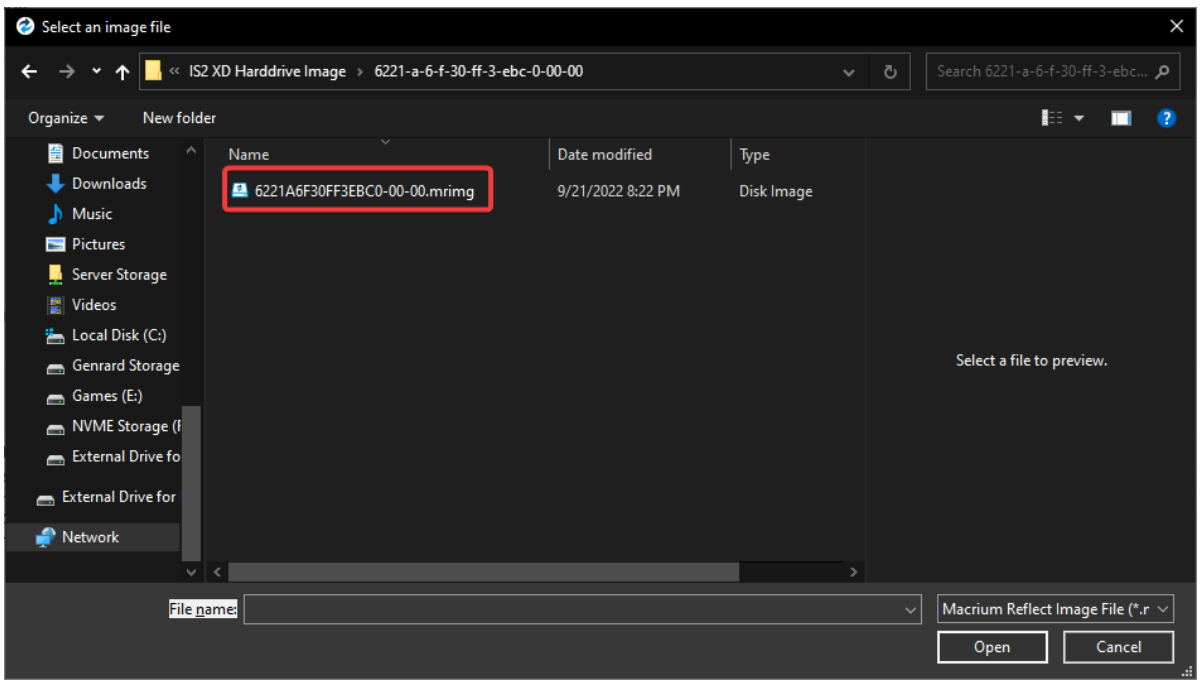
Restoring the hard drive image

After installing the necessary files and programs, you can proceed with installing the hard drive image for the IS2XD.

Start by opening Macrium Reflect and going to the "Existing Backups" tab.



Search for an existing image backup by clicking the “Browse for existing image file” button, then navigate to the location in which you saved the Macrium Reflect backup.



After this is selected, select “Restore” in the menu options and choose the drive you intend to flash.

NOTE: Do not turn off your PC, disconnect any of the drives. Drive flashing can take anywhere from 20 minutes to 2 hours on average, but this is dependent on the speed of your drives.
After the image is finished flashing onto the hard drive, you can plug it into the unit and let it boot up automatically. If this is not the only drive with an Operating System on it (e.g. using multiple drives for different flavors, testing the software on another system), then you may need to open the boot menu for your motherboard. The key for doing this is dependent on the motherboard you’re using, but common keys include F8, F11, or DEL. Select the Windows Boot Manager for the drive you flashed.

Manual Install [ADVANCED]

These are instructions for installing the i2 software manually. If you have the option, please use a hard drive image as this is extremely time consuming and difficult. You should have a stable internet connection through ethernet for the duration of this install as well, if possible. If a wired connection is not possible, then ensure your wifi connection is stable at all times.

This also assumes you have basic knowledge of how the i2 software works.

OSs for installation

- Windows 7 [UNTESTED]
- Windows Server 2008 R2 [UNTESTED]
- Windows Embedded Standard 7 [WORKS]
- Windows Embedded 8 Standard [UNTESTED]
- Windows 8.1 [UNTESTED]
- Windows 10 [UNTESTED]
- Windows 10 Enterprise LTSC [RECOMMENDED]
- Windows 10 IoT Core [UNTESTED]
- Windows 11 [UNTESTED]

Getting Windows ready for installation

After installing one of the operating systems listed above on the drive you plan to be using, you need to set up a few things to get everything up and ready.

Start by creating another Administrator account separate from the main account. Name this account **I2Admin** (Case Sensitive). This is the account that will be used for managing the i2 through the admin panel. You will not need to log into this account for the duration of setting up the i2, however.

It is also at this point you should install drivers, and whatever programs you need for ease of use. It may also be a good idea to check Windows Update for any updates to your system, if so desired.

Installing prerequisite distributables

You need a few redistributables before proceeding with the installation. Some of these include in-house TWC redistributables that are exclusive to the IntelliStar 2 systems.

You need the following VIsual C++ Redistributables:

- Visual C++ 2005 (x64)
- Visual C++ 2005 SP1 (x64)
- Visual C++ 2005 SP1 ATL Security Package (x64)
- Visual C++ 2008 (x64)
- Visual C++ 2008 SP1 (x64)
- Visual C++ 2008 SP1 MFC Security Update (x64)
- Visual C++ 2010 (x64)
- Visual C++ 2010 SP1 (x64)
- Visual C++ 2010 (x86)

You will also need to install Microsoft's F# Redist, which can be downloaded here. You will need to throw two DLLs into C:\Windows. The DLL files can be downloaded here.
Lastly, you will need a redistributable used for TWC so that the Viz Engine can run properly, which can be downloaded here.

Installing Viz|Engine

IMPORTANT: You need to have access to a pre-existing i2XD Hard Drive backup for this section. Ideally, you may create a Virtual Hard Disk using Windows' Disk Management program and then attach it, using Macrium Reflect to burn it onto the virtual disk, and mount it to your system without causing damage.

Do not skip ahead with this section, as Viz|Engine needs to be installed in a specific way in order to use the i2's activation keys.

First, download the installers for all of the Viz|Engine software and plugins:
https://drive.google.com/drive/folders/1QX9feoSR0omwgQJvrYgjnCNpvvLfoByy?usp=sharing

Begin by unpacking **VizInstall.zip** and installing it. This will install a basic install with paths properly set up. Do not change any installation settings.

If you haven't already mounted either a drive burned with a pre-existing drive image of the i2, you should do so now. ***X:*** *will serve as the drive letter in this manual, but yours may vary.*

Navigate to ***C:\Program Files (x86)\vizrt*** and delete the **viz** folder. We will be replacing this installation with one that is pre-activated and has a majority of in-house TWC plugins installed, as well as graphics necessary for running presentations.

Next, navigate to ***X:\Program Files (x86)\vizrt*** and copy both the **Common** and **viz** files to ***C:\Program Files (x86)\vizrt*.**

After this is done, proceed to install all of the included registry keys in the folder provided. After this is done, you can proceed to install the rest of the **.msi** files included in the folder. Viz|Engine is now installed.

Installing the IntelliStar 2 Pipeline, Service, and Client

IMPORTANT: You need to have access to a pre-existing i2XD Hard Drive backup for this section. Ideally, you may create a Virtual Hard Disk using Windows' Disk Management program and then attach it, using Macrium Reflect to burn it onto the virtual disk, and mount it to your system without causing damage.

Before we install the full i2 Software suite, we need to install a couple of TWC-specific drivers. Don't forget to throw the folder titled "**SysWOW64**" into ***C:\Windows***. These are DLLs for the I2Jr Pipeline. If Windows asks you to replace any files, do so!

Next up, download the installers for the I2, and install them all as normal. When installing the I2 Client, make sure to set your installation type as **Production.** After that's done, head to ***C:\Program Files (x86)\TWC*** and delete the **I2** and **TWCGetSDK** folders, replacing them with the ones from ***X:\Program Files (x86)\TWC*.** The i2 installed from the installer shown above does not contain

any form of data, graphics, or even scenes for the i2 to run with, and will cause errors, however, installing from the installer allowed us to automatically create a service for the i2 and also implemented its registry keys.

After that, we need to make symbolic links between the TWC and vizrt folders in **Program Files (x86)** to **Program Files**. Open an elevated command prompt *(cmd)* and type the following commands:

mklink /D “C:\Program Files\TWC” “C:\Program Files (x86)\TWC”
mklink /D “C:\Program Files\vizrt” “C:\Program Files (x86)\vizrt”

Then, set up SSL for the admin panel.

https://drive.google.com/drive/folders/1xqRUqLh3OyvBaoJ88iFD3lsynDr6YZ3V?usp=sharing ← SSL Keys + Script

Open an elevated windows powershell, and type the following commands:
set-executionpolicy remotesigned

cd [SSL_DOWNLOAD_DIRECTORY]
.\run.ps1

This will bind the SSL for the admin panel to port 9091, allowing internet explorer to connect properly to it without problems.

The last thing we need to do for the installation of the client software is set up the partition responsible for holding the map information for the IntelliStar. This should be the last time we need to use the mounted VHD for the rest of the installation. Open DIsk Management by pressing **WinKey + X,** then selecting it from the popup menu.

Right click on the partition labeled **(C:\),** and click the “Shrink Volume” option. In the textbox that says “Enter the amount of space to shrink in MB”, type in **71000.** This is the minimum amount of space that the Maps partition can have whilst still fitting all of the data it needs into it. After this is done, right click the new Unallocated space, and format it as a New Simple Volume. Leave all of the settings as default, but if possible, assign the partition the drive letter D, as well as make the volume’s label “Map”.

Finally, copy the **TWC** folder from **Y:** to the nearly created partition.

Collecting Data

TODO

Pipeline Input/Output configuration

Output configuration

Output through the i2JrPipeline, along with input, relies on the use of UDP multicast streams. Configuration files for the input and output of your system can be found in C:\Program Files\TWC\I2JrPipeline. The file names for configuration are PipelineDecoder.cfg, and PipelineEncoder.cfg. For this section, we will be focusing on output.

```
--encoutpmtpid=120
--encoutvidpid=32
--encoutaudpid=33
--encouttotbps=0
--encoutttl=16
--encout=udp:224.2.2.202:1234
--bcstoutif=192.168.0.179
--videofmt=hhhs
--encoutvidbps=3500000
--encoutvidbpshd=12000000
--encoutvidpidhd=48
--encoutaudpidhd=49
--encoutpgm=1
--encoutpgmhd=2
--dolbycert=-1
--uniquepids=3
```

The encout variable should be always set to an open port on your network. The encoder output also works for single-casting through UDP, which involves setting another device’s ipv4 address as the encoder output location.

The default settings should be fine for streaming across multiple devices off the i2. You can access the stream for your unit by opening software such as VLC Media Player, and connecting to the UDP address assigned for your encoder output.

Input Configuration

Input into the i2 also relies on a UDP multicast stream. **A single-cast stream will not work for encoder input.**

```
--bcstpgm=1
--bcstinvidpid=7680
--bcstinaudpid=4129
--twcdatapid=416
--nielsensupport=0
--nielsenmodedef=3
--nielsensiddef=FD,350,FX
--dpiin=4288
--cirrus=0
--dpigpi=4288
--bcstin=udp:224.1.1.101:1234
--bcstinif=192.168.0.179
--h264=1
--dpiopts=0
--dpidur=60
--nielsensidhd=FD,3601,CZ
```

When setting up input, a good way to ensure your output can make it outside of your intellistar 2 box is by setting the bcstin variable to “bars”. This will display a bar test on the input section of your i2 while playing a tone in the background, but all graphical functions through vizrt will work as intended.

After you’ve confirmed that output is working, you can now set up a UDP stream for your i2 to work off of.

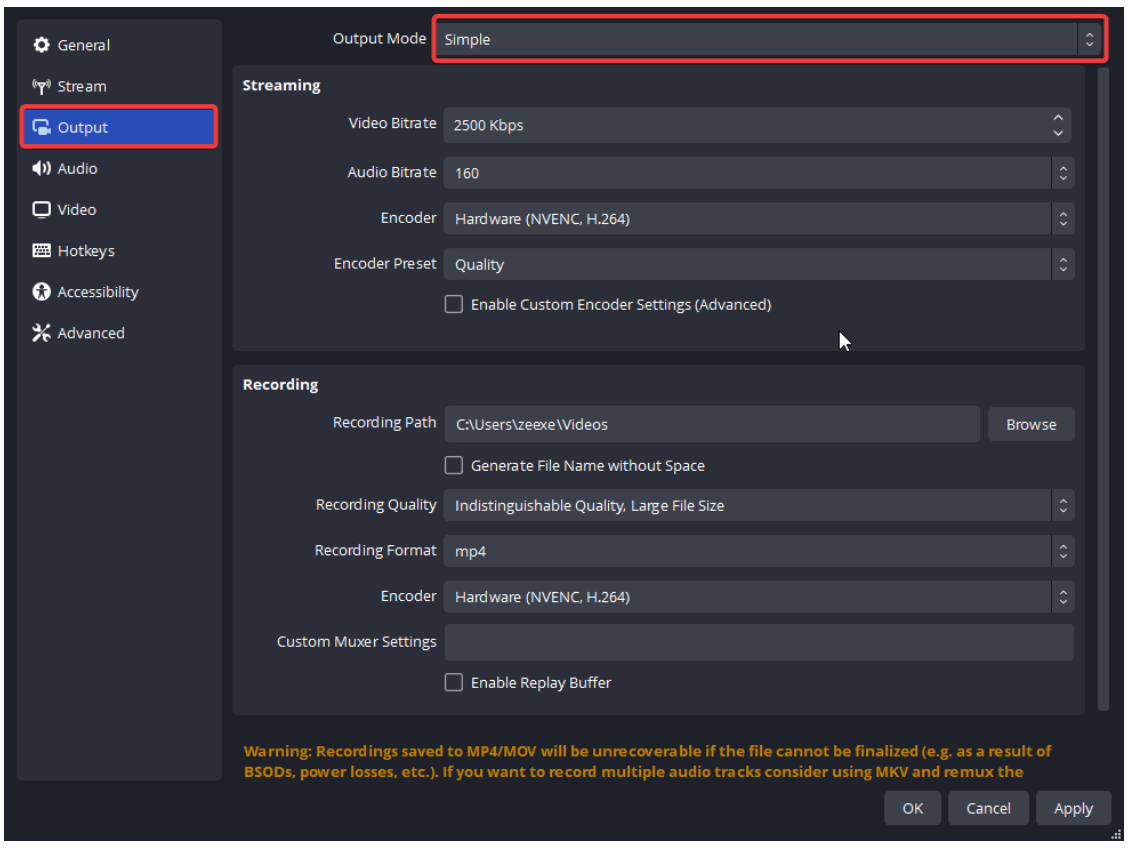
Setting up a UDP Multicast stream for input

Setting up an input stream is surprisingly simple, if not difficult. If the unit you have at the moment is not powerful enough, you may need another PC for transcoding the input multicast stream. Transcoding requires ffmpeg, using this command, and another software, such as OBS Studio, for streaming the input you’d like.

Note: Technically, running this using an m3u8 stream, or even another TS stream, is possible. However, running m3u8 causes heavy frame skipping and does not work properly as of the time of writing this.

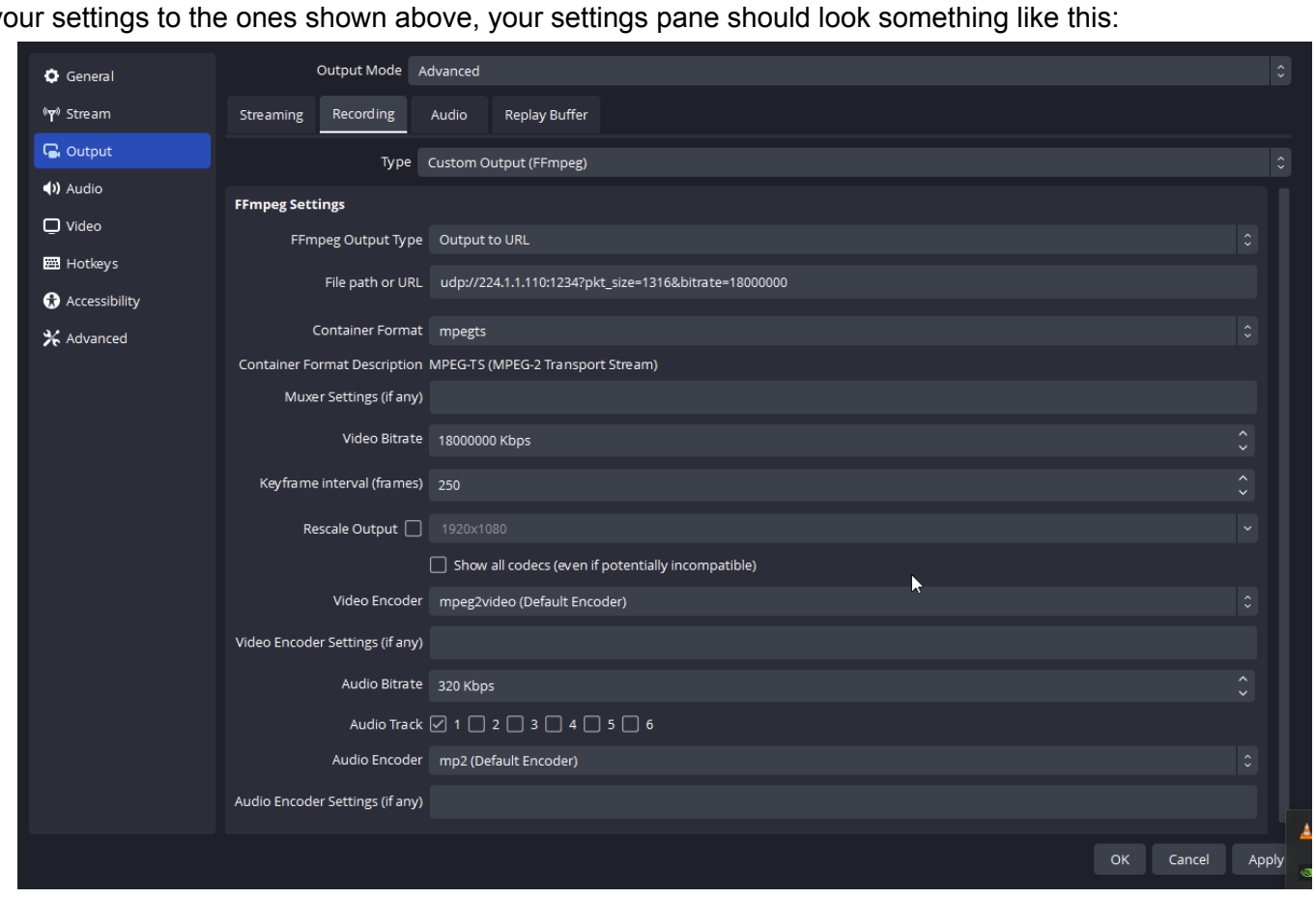
For this section of the manual, we will be using OBS Studio to stream to our ffmpeg muxer. Start by running the command previously linked. This will start a UDP input location for you to stream using OBS. Next, we need to fix some settings in OBS so that we can stream to the new UDP tunnel properly.

Begin by opening your OBS settings, and heading into the **Output** tab. At the top, you should see a dropdown that says “Simple”. Change this to “Advanced.”



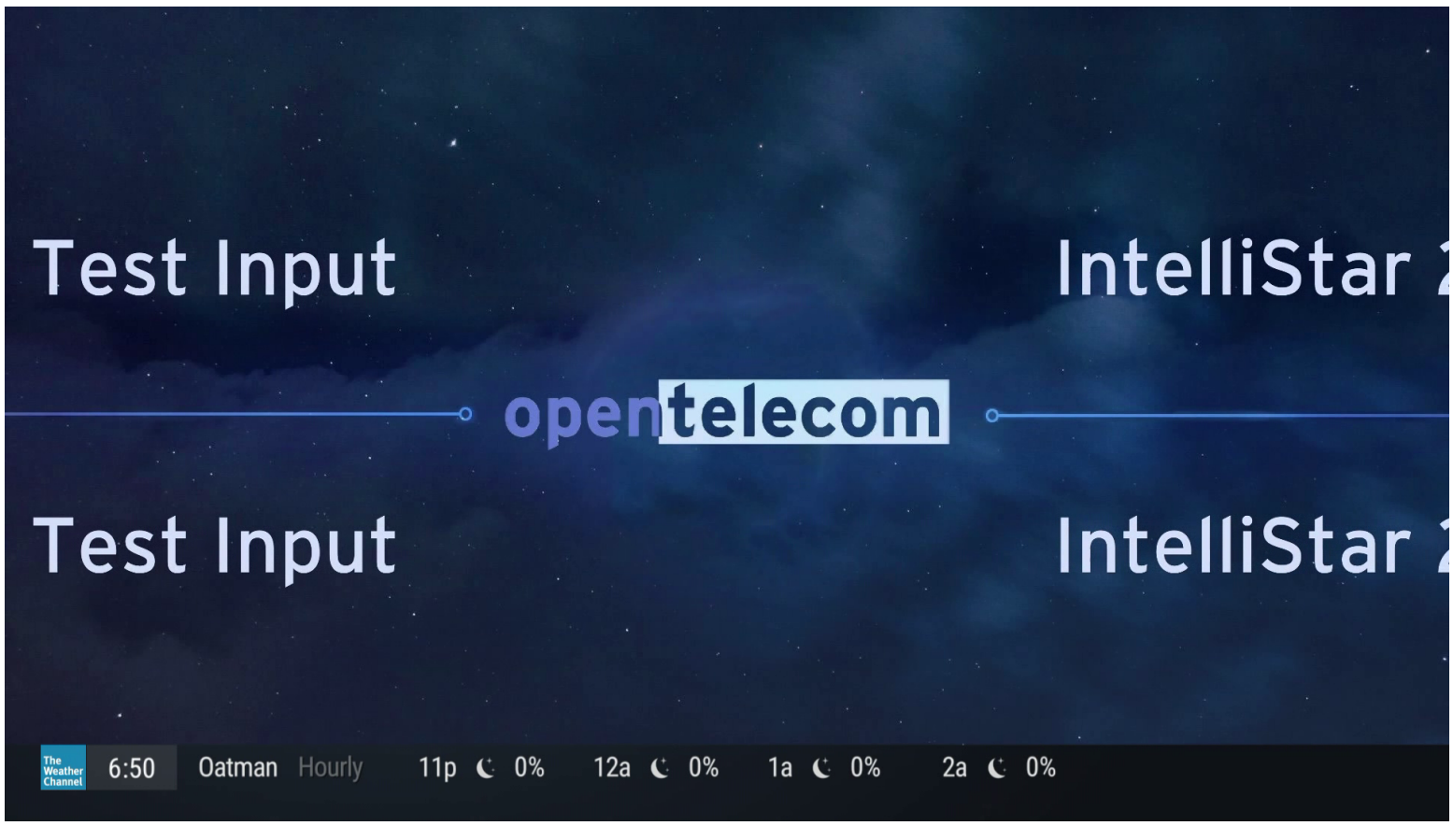
Next up, head into the recording tab and change the “Type” dropdown menu to use “Custom Output (FFmpeg)”. Next, copy the following settings:
FFmpeg Output Type: Output to URL
File path or URL: udp://224.1.1.110:1234?pkt_size=1316&bitrate=18000000
Container Format: mpegts
Muxer Settings (if any): [Leave Blank]
Video Bitrate: 18000000 Kbps
Keyframe Interval (frames): 250
Video Encoder: mpeg2video
Video Encoder Settings (if any): [Leave Blank]
Audio Bitrate: 320 Kbps
Audio Encoder: mp2

After setting your settings to the ones shown above, your settings pane should look something like this:



If these all look right, you should be good to start up your stream. Instead of pressing the “Start Streaming” button on your OBS window, you should click **“Start Recording”**. **Ensure that FFmpeg is running in the background before you begin streaming to the UDP address.**

If you previously changed your bcstin variable in PipelineDecoder.cfg to **bars**, you will need to change it to the UDP stream that FFmpeg is outputting. If you are using the script with default variables, the address for this is **udp:224.1.1.101:1234.** This will also require you to restart the TWC I2 Service.



If all went well, you should see your stream when tuning into the UDP output stream from your i2 in VLC.

[(Bonus Content: a test of the i2 with music and a UDP input)]

Troubleshooting Note:
If you have any virtual machine software installed, such as VMWare or Oracle VM Virtualbox, there is a chance that your FFmpeg muxer will not send to the correct network adapter. Head into Control Panel -> Network and Internet -> Network Connections, and ensure all adapters, except for your main wifi/ethernet adapter, are disabled.