Litenet
Voice Data Mobile

Live Streaming Solution

Thank you for purchasing the Litenet Live Streaming Solution, a live internet and social media streaming solution for places of worship.

In the wake of the Covid-19 global pandemic, severe restrictions have been placed on populations worldwide in an effort to contain the spread of the virus. Restrictions on many businesses and public places have been imposed, including restricting the numbers of people attending places of worship for general services, marriages, christenings and funerals.

Litenet Ltd have been trading since 2019 as experts in telecommunications, internet connectivity and audio/video conferencing. We noticed that there is a demand for technological solutions to help places of worship reach their congregations amongst these restrictions, Litenet have used our expertise in networking and A/V systems to develop a live streaming solution that is cost effective, easy to use, inconspicuous and sympathetic to the buildings it is being installed in.

Litenet have used our existing relationships with trusted suppliers to procure high quality, cutting edge, broadcast equipment and build a live streaming solution that will provide an immersive and engaging experience for the viewers.

This manual covers basic operation, for in-depth instructions please see the user manuals for the individual devices.

https://www.blackmagicdesign.com/support/

https://www.datavideo.com

https://support-uk.panasonic.eu/

https://mevo.com/

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The Components

Datavideo BC-50 Camera

We chose the BC-50 camera because of its' sleek design and it's "fit and forget" characteristics. Datavideo are a global manufacturer of high quality broadcast equipment, designed to be functional, reliable, easy to use and cost effective.

The BC-50 is a High Definition, 1080p, broadcast quality camera in a very small form factor. The BC-50 is ideally suited to the Litenet Live Streaming solution since it is powered via ethernet cable, meaning no local power is required, and can be run over long distances using it's 3G-SDI connection. It is light weight and small enough to be mounted in a fixed position and left unmanned, therefore not requiring any monitor or viewfinder and allowing them to be placed at height within the buildings.

Datavideo PTC-140 Pan-Tilt-Zoom (PTZ) Camera

The PTC-140 is a robotic Pan-Tilt-Zoom camera with many of the same characteristics of the BC50, but with the ability to remotely control the camera's position and zoom, using either the built in web controls, a separate joystick controller, or the Datavideo "PTZ Assist" application for smartphones and tablets (available from your app store).

It is a quiet, sleek and versatile camera offering the possibility of moving between several views quickly and quietly.

Blackmagic Design Atem Mini/Mini-Pro/Mini-Pro ISO HDMI switcher

Blackmagic Design released a small, value for money live production switcher, specifically aimed at the amateur and home user market, called the Atem Mini. Whilst being easy to use and cost effective, it boasts a lot of powerful features found on their large scale professional models and has been an instant hit with YouTube stars, Video Gamers and amateur producers. The Atem Mini can be used straight out of the box, with no configuration required.

The Atem Mini allows the operator to switch between 4 different HDMI devices, embed audio feeds from microphones, HDMI sources or external audio mixing desks, and presents them to a computer as a simple webcam device for streaming to social media.

Features such as Chroma Keying (Green Screen), picture-in-picture, slide and fade transitions and image overlays are built into the unit, allowing slick professional looking production for a fraction of the cost of most other video production equipment.

Advanced features can be used with the Atem Software Control application, downloadable from the Blackmagic Design website.

Panasonic Lumix G-80 SLR Camera

An optional additional camera on the Litenet solution is the Panasonic Lumix G-80. Panasonic are another big brand in the broadcast and imaging industry. The G-80 camera was chosen due to it's exceptional value for money and large number of features. It has a clean HDMI output (ie. no screen overlays) and can record in 4k.

Being lightweight and easy to use, it is ideally suited to scenarios where mobility is required. Being tripod mounted it can be kept stable and secure. It has an additional benefit of being used as a standard camera outside of it's streaming uses.

Connectivity

Included in the solution are various cables, convertors and capture devices required to make sure everything works together seamlessly. 3G-SDI co-ax cable was chosen for it's high quality, reliable and fast video transmission over long distances. Blackmagic Design SDI-HDMI converters take care of the video feeds from the BC-50 cameras to the Atem Mini production switcher. In single use cases, a Datavideo CAP-2 capture card converts from HDMI to USB for single camera applications.

Cables are an unavoidable part of a good quality and reliable camera solution. We have tried to keep the installation as simple as possible.

Set-Up

Cameras

The BC50 and PTC-140 are both cabled and connected in the same manner.

Each camera has two cables connected to it. An ethernet connection providing power and connectivity for remote administration, and a slightly thicker co-axial cable to deliver the video feed.

These cables are usually connected at installation and do not require unplugging.

Network Switch

The network switch provides power to the cameras and connectivity for remote administration. Depending on the model of switch supplied there will be at least 4 ports labelled "PoE". This stands for "Power over Ethernet". These ports should be used to power up the cameras (and the Magewell Pro Convert NDI to HDMI convertor if using a Mevo).

The remaining ports will be used for your link to the internet, laptop/computer used for streaming and any other functions requiring a network connection.

SDI to HDMI Converters

These are vital pieces of the solution. They convert the SDI signal coming from the cameras into an HDMI signal that the Atem Mini Video Switcher can use.

They are powered via a USB plug, in the case of multiple converters these will all run from a single power adapter plugged into the side of the converter.

The incoming signal from the camera will plug into the port labelled "SDI IN"

The outgoing signal to the Atem Mini will use an HDMI cable plugged into "HDMI OUT"

Atem Mini (inc Pro, ISO and Extreme)

The Atem Mini video switcher is the brains behind the whole system. The cameras feed into the HDMI ports on the back of the Atem using the HDMI cables from the SDI converters.

This is also where the audio inputs are connected. In most cases the input "MIC 1" is the only one in use and will have a connection from the existing sound system.

"Webcam Out" is a USB-C connection which is used to connect the Atem Mini to a computer for live streaming. This allows the computer to see the Atem Mini as a webcam.

A separate monitor can be used to view all of the camera inputs if connected to "HDMI OUT". You do not need to have anything connected into the "ATEM CONTROL" port.

Camera Configuration

Each camera will have it's own IP address, these can be used to log on to each camera and adjust it's configuration. To access this simply open up a page or tab in a web browser (Chrome seems to be the most stable) and type in the IP address of the camera you wish to connect to.

The username is "admin" and the password is "admin". It is the customer's responsibility to change these if required, but please make a note of the new password for future reference.

For the BC50 cameras you can adjust image settings, and for the PTC-140 cameras you can adjust the Pan-Tilt-Zoom positions.

To set the preset, follow the steps outlined below.
1. First adjust the camera head to the desired pan and tilt positions.
2. Make sure zoom and focus are adjusted as well.
3. Select a preset number from the Preset drop-down menu.
4. Click the Set button to save the PTZ settings to the selected preset number.

To recall a saved preset, simply select a preset number from the Preset drop-down menu then click the Run button to apply the saved settings.
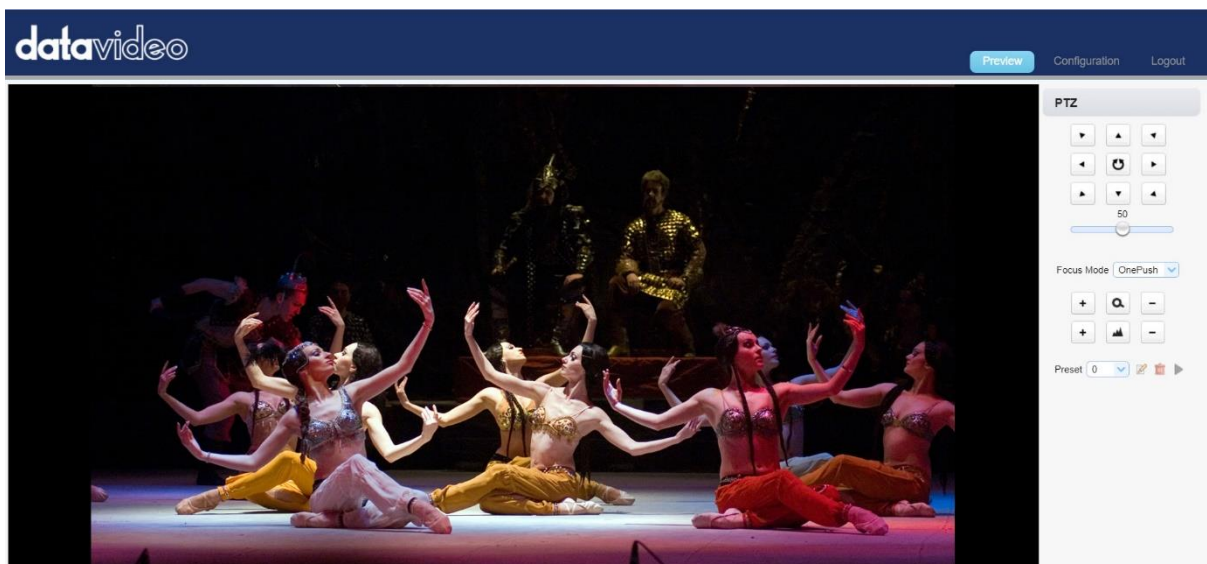
Before Going Live

1. Check all power connections. The network switch should have lights and activity on all occupied ports.
2. Check the Atem Mini to ensure all cables are secure
3. Check the output of the Atem Mini, either with a monitor plugged into the HDMI Out socket, or the webcam input on your computer. Ensure that you can switch between each HDMI input and that you are receiving a video feed correctly.

Going Live

Open the streaming application of your choice (YouTube, Facebook Live, Vimeo, Restream.io, Castr.io etc) and ensure that you are receiving the correct preview from the Atem.

The cameras should remember their zoom settings, however if you find this has changed you can log into the desired camera using the IP address below from a computer on the same network and adjust the zoom accordingly. The username is admin and the password is admin.
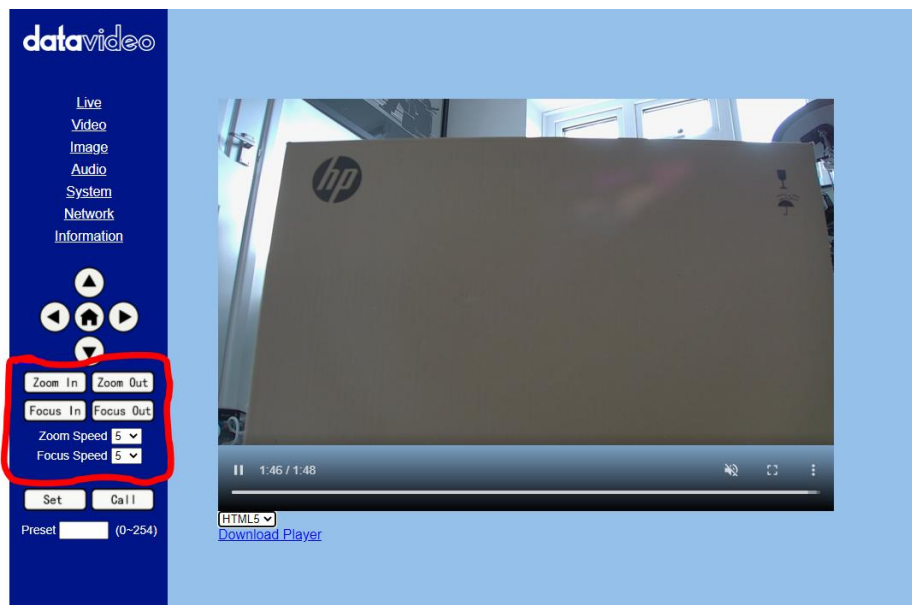

The input device for both Audio and Video should be set to "Blackmagic Design". An example of the YouTube set-up screen is shown below.
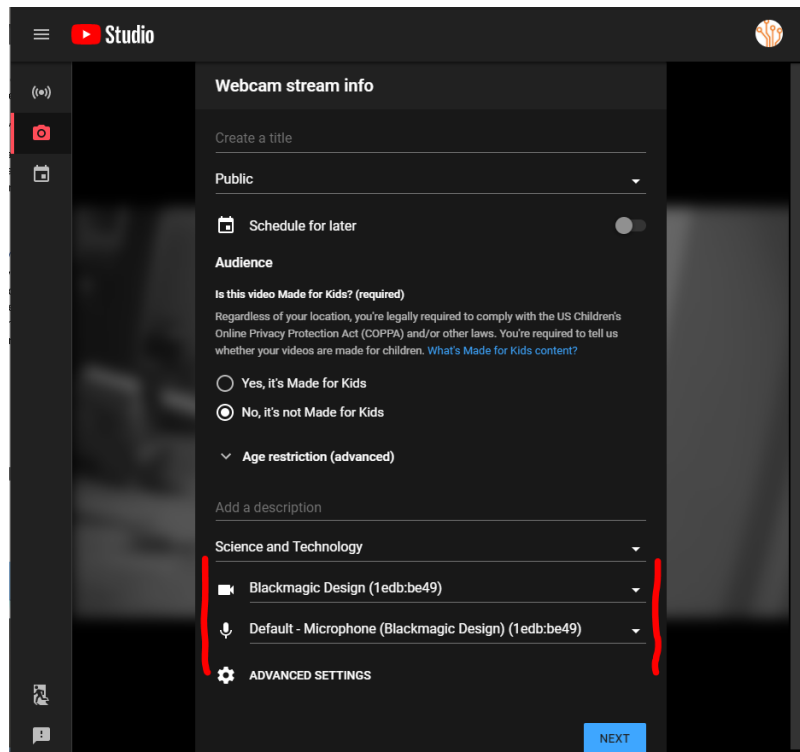
The Atem Mini is designed to work straight out of the box. By default, camera 1 will be displayed and all audio inputs will be set to **"OFF"**.

In most cases "Mic 1" will be the only audio input being used. Turn this to **"ON"** and the lamp should turn red. "Mic 2" should only be used if you have a secondary audio input. The audio controls for each camera do not need to be used and should remain **"OFF".** The output volume can be adjusted using the "up" and "down" arrows for the chosen input.
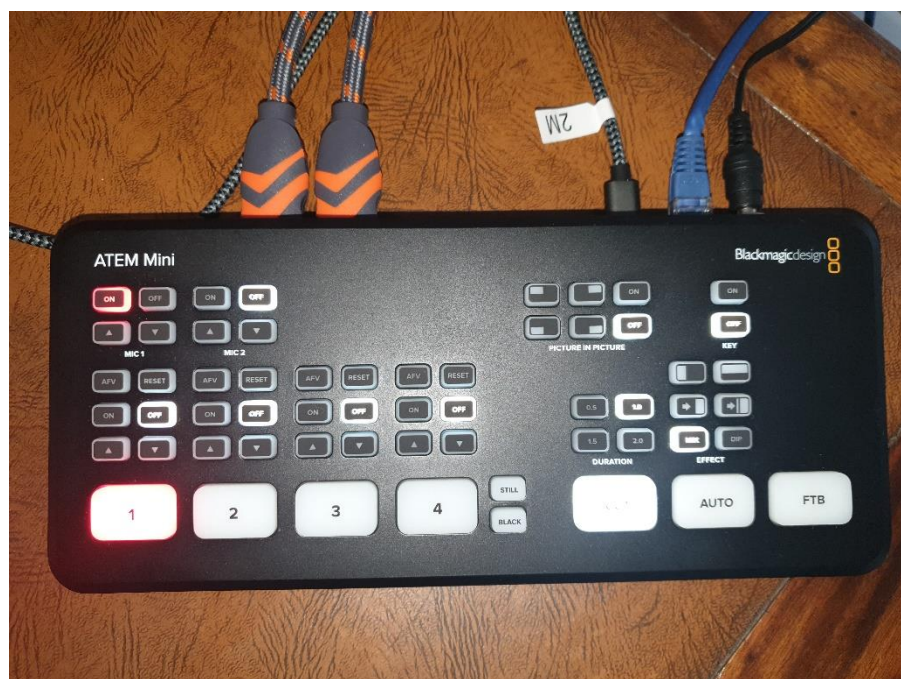
You can switch between camera feeds by simply pressing the desired camera button, 1, 2, 3 or 4. By default the Atem will perform an instant cut to the selected feed.

Different transition effects can be employed by selecting the "Auto" button. The transition duration is set using the "duration" buttons, from 0.5 seconds to 2.0 seconds. The transition effects can be changed by pressing the required button. In all cases, the chosen transition and duration will have their relevant button lit.

The "FTB" button is a "fade to black".

The "Still" button will display preloaded still images that have been stored in the Atem. This will require use of the Blackmagic Design "Atem Software Control" software, which can be downloaded from the Blackmagic Design website mentioned earlier.

Picture-in-picture (PIP) can be employed to display the feed from Camera 1 in any chosen corner, over the top of another background feed. Be careful not to overlay Camera 1 using PIP over the existing feed for Camera 1. The correct order is to switch the main view to either Camera 2, 3 or 4, and then overlay Camera 1 using PIP simply by pressing the "on" button.

Troubleshooting

Internet connection

Most streaming issues are caused by the internet connectivity. It is recommended to have a minimum of 10Mbps upload speed to stream HD content reliably. Internet speed test utilities such as www.speedtest.net can show you how much upload bandwidth is available.

It is not recommended to use WiFi to stream, a cabled connection is faster and more reliable.

Ensure that the internet connection is not being used for other traffic, such as being shared by mobile devices and other computers.

Power

The BC-50 cameras are Power-Over-Ethernet (PoE), meaning they receive their power via the network switch. Ensure that the power to the network switch is on, the cables are seated correctly and that the link lights are lit. You may also be able to see the connections on the back of the BC-50 cameras to ensure that they are also lit and the activity light is flashing. PoE is available on ports 1 to 4 on the network switch and these must be used for the cameras. Below is an example of how it should look with three cameras, in ports 1 to 3.

Check the power to the SDI-HDMI convertors, these are powered by a micro USB cable.

Check the power to the Atem Mini, the unit should have several of the buttons lit.

Check the power to the internet router.

Common Issues

One of my cameras is not working

Check the network port that the camera is plugged into. These ports are referenced in the configuration table below. There should be a green link light for that port, don't worry if it's flashing or flickering, this means there is network activity.

If the port is not lit there is an issue with the ethernet cable, check the cable at both ends to ensure it is connected.

If the port is lit, this suggests an issue with the SDI convertor. Ensure that the SDI convertor is plugged in and powered on, and that the HDMI cable is connected to both the convertor and the Atem Mini.

All of my cameras are not working

Check the network switch. There should be lights on all used ports.

If there are no lights lit, please check the power supply is connected and turned on.

If there are lights lit, specifically for the ports running cameras, then the issue is likely to be with the Atem Mini, ensure it is turned on and plugged in correctly.

The computer is not recognising the Atem as a webcam device

Ensure that the Atem Mini is plugged in and powered on correctly. Ensure that the USB cable is connected from the Atem Mini to the streaming computer. Ensure that the software (camera input or streaming platform) is set to use the "Blackmagic Design" device.

There is no audio on my live stream

Ensure that the audio connection is seated correctly in the Atem Mini. Ensure that the chosen MIC input is set to "On". Ensure that the external audio mixing desk is switched on and the output levels are set accordingly. If needed the output volume of the Atem Mini can be adjusted using the "up" and "down" arrows on the Atem Mini.

Net Port	Device	Location	IP Address	Other info
1				
2				
3				
4				
5				
6				
7				
8				

1. Set up the Network switch and power on, connect the ethernet cables from the cameras to the PoE ports (depending on the model of network switch, there may be 4 or 8 PoE ports). This will power up the cameras.

2. Set up the Atem Mini video mixer and power on. Connect the USB lead from the Atem to the computer you are using to stream.

3. Connect the HDMI cables between the **"HDMI OUT"** port on the convertor boxes and the Atem Mini. The cables will be labelled for each camera.

4. Connect the USB power leads for each of the convertor boxes from the USB power block. It does not matter which order you do this in.

5. Connect the BNC co-ax cables to the **"SDI IN"** port on the convertor boxes. The cables will be labelled for each camera.

6. Connect any audio inputs to the Atem Mini. Remember that the default setting is "Off". Turn it on.

Appendix 1 – Mevo with Magewell NDI-HDMI Converter

In some installations a separate mobile camera can be used in conjunction with the Atem Mini to add versatility to your production.

This consists of a Mevo mobile camera connected to WiFi, and a Magewell converter to capture the video and convert it to HDMI for input into the Atem Mini.

This will be set up at the point of installation, but for reference here is how to use the Mevo.
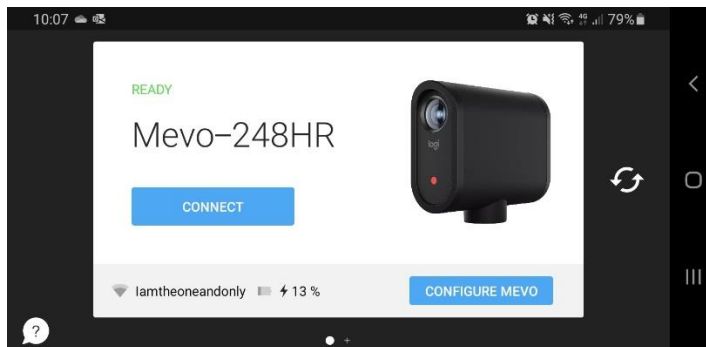
Mevo

To power on/off the Mevo camera please press and hold the power button for a few seconds. The device will beep and the light on the front of the camera will turn on.
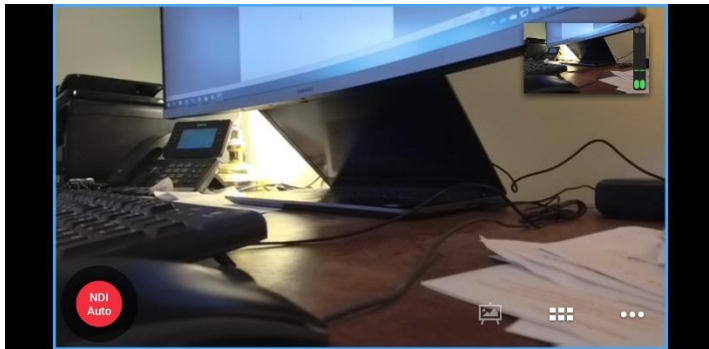

Use the Mevo app (available from your Appstore) if you wish to change any of the settings.

The Mevo and Magewell need to be on the same network in order to work correctly.

Ensure that the Mevo is set to NDI mode. The main screen, once connected, should show "NDI Auto" on the bottom left corner.

If this has changed, enter the settings menu by pressing on the three dots icon on the far right side. This will bring up a setting screen where you can access the configuration menu by pressing on the cog wheel icon.

Ensure NDI Mode is switched on.
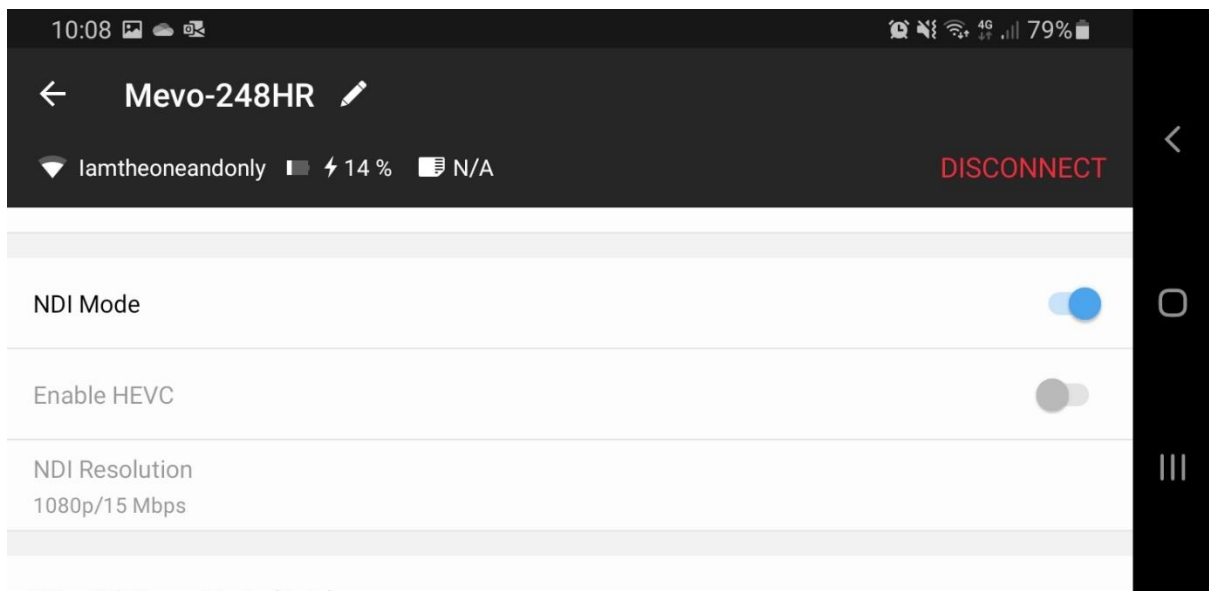
Also check that the Mevo is connected to the correct WiFi network.

Magewell Pro Convert NDI-HDMI

This device requires very little configuration. Ensure the "NDI+POE" port is connected to one of the PoE ports on the network switch. This will provide power and connectivity to the converter.

Connect the "HDMI OUT" port to on of the inputs on the Atem Mini using a HDMI lead.

You do not require any other connections.