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Livegrade Integration with BoxIO

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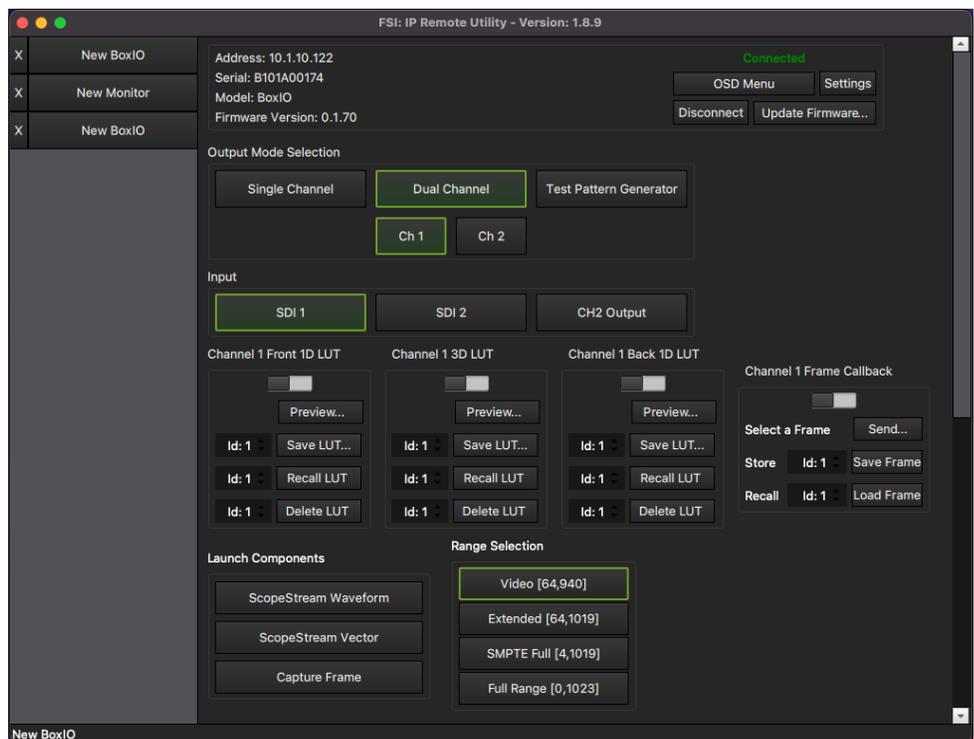
Pomfort's Livegrade software supports FSI's BoxIO. For general information about setting up Livegrade with HD-SDI devices, please refer to the article here: [HD-SDI Setup for Livegrade](#)

In order to exchange look information between BoxIO and Livegrade you will need to have a working network connection with the Mac that Livegrade is running on. The default IP address for a BoxIO is 192.168.1.244. When connecting multiple BoxIO devices, each device will need to have a unique IP address. The use of a router or network switch is necessary. For more information on changing BoxIO IP addresses and other BoxIO networking considerations please see the [BoxIO User Manual](#).

Note: A single BoxIO device can be connected via Wi-Fi, however, **for best performance an ethernet connection is highly recommended**. Ethernet is required for configurations using multiple units.

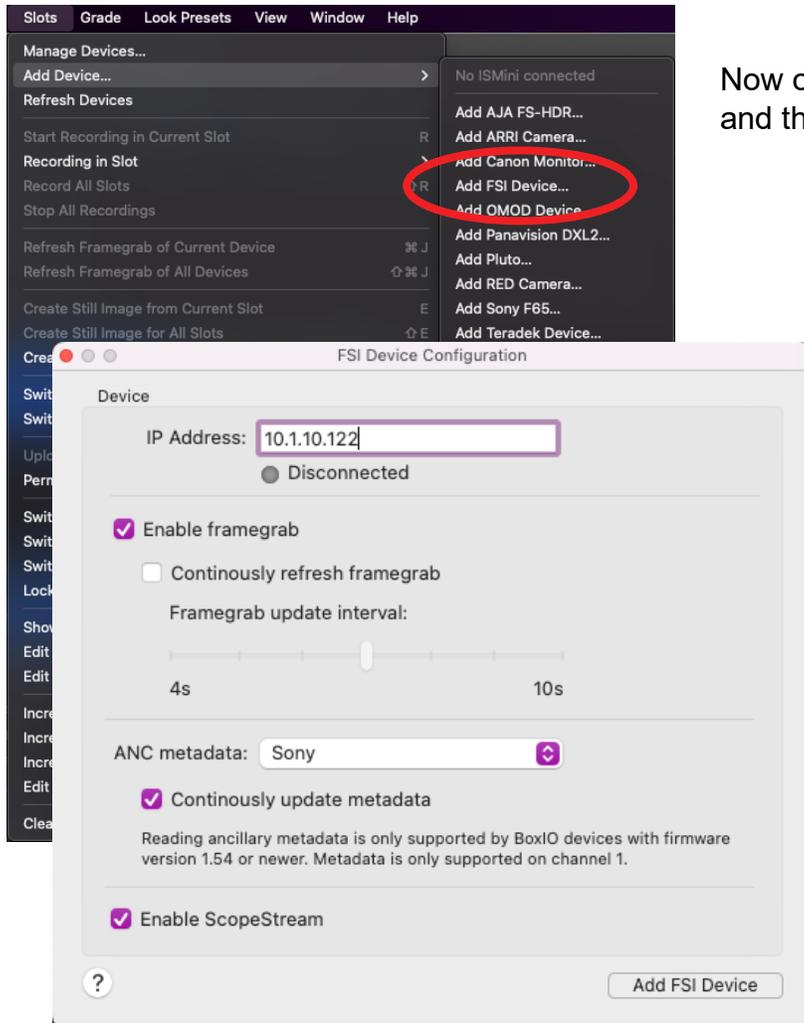
Before connecting BoxIO to Livegrade you will want to open the [IP Remote Utility](#) (IPRU) and verify that BoxIO is setup in the correct mode.

Connect to BoxIO within the IP Remote Utility using BoxIO's IP address. Once connected, select Single Channel Mode or Dual Channel Mode. For each Output Channel that will be used make sure to assign a corresponding SDI input.



Signal range can be managed by BoxIO or by Livegrade. For most use cases setting the desired signal range in the IPRU before launching Livegrade is preferred as it can provide a higher degree of precision, especially when using Video Range. Select between Video, Extended, SMPTE Full, or Full Range from the Range selection option in the IPRU.

Signal ranges can also be managed from within Livegrade and this is especially useful if performing a range conversion, for example Full to Extended. If managing Signal Ranges from within LiveGrade do NOT change the range setting in the IPRU after making your selections in Livegrade. Livegrade will set BoxIO to Full Range automatically and perform all necessary signal range management at the software level. Changing this selection in the IPRU after Livegrade has taken control of signal range operations can cause range scaling problems.



Now open Livegrade and select Slots, Add Device and then Add FSI Device.

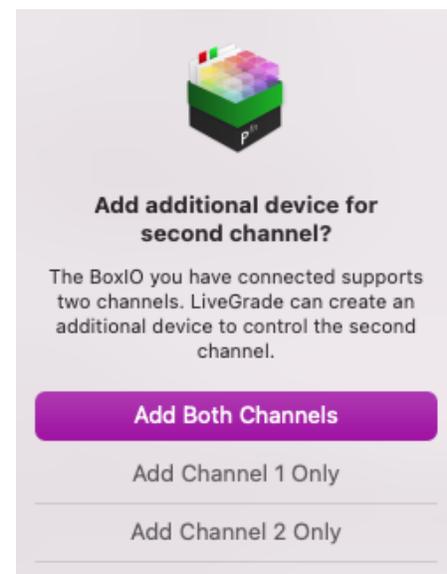
In the new window enter the IP address of the BoxIO. Here you can also optionally enable BoxIO's framegrab, ANC metadata capture, and ScopeStream features.

We strongly suggest leaving Continuously refresh framegrab disabled as this is an automated high load operation that, especially if interrupted mid capture, could cause unwanted BoxIO behavior. With Enable framegrab checked and Continuously refresh unchecked you will still be able to capture framegrabs manually as needed in Livegrade. If you do require the use of Continuous Automatic Refresh of Framegrabs, it is best to set the interval to a longer duration to make framegrab interruptions less likely.

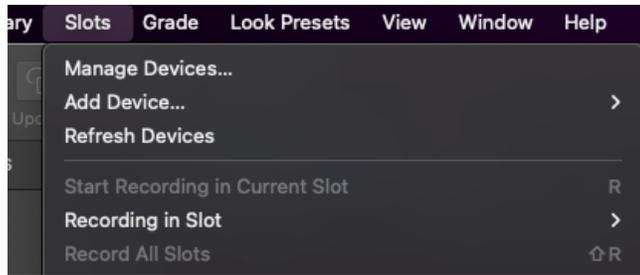
Once options are set then select Add FSI device.

If connecting BoxIO in Dual Channel mode a separate window will ask if you want to connect both channels or only a single channel. Repeat this process if connecting multiple BoxIO.

Note: BoxIO can also be connected directly from within the Device Manager window in Livegrade.



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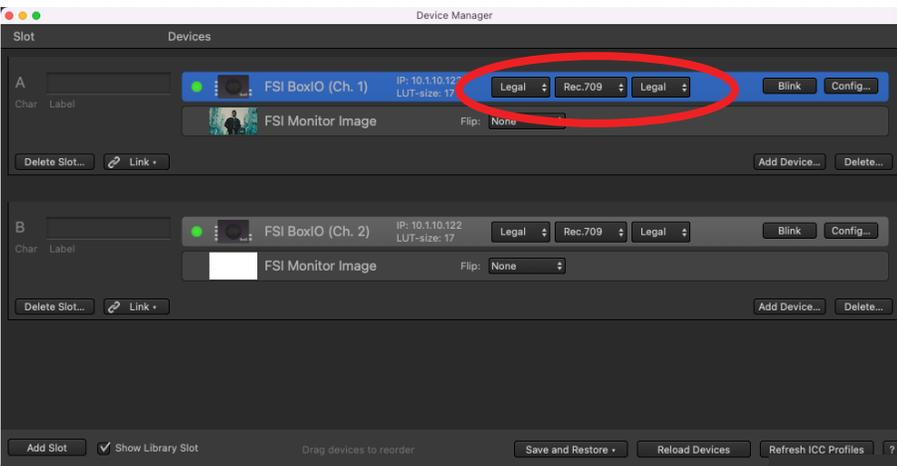
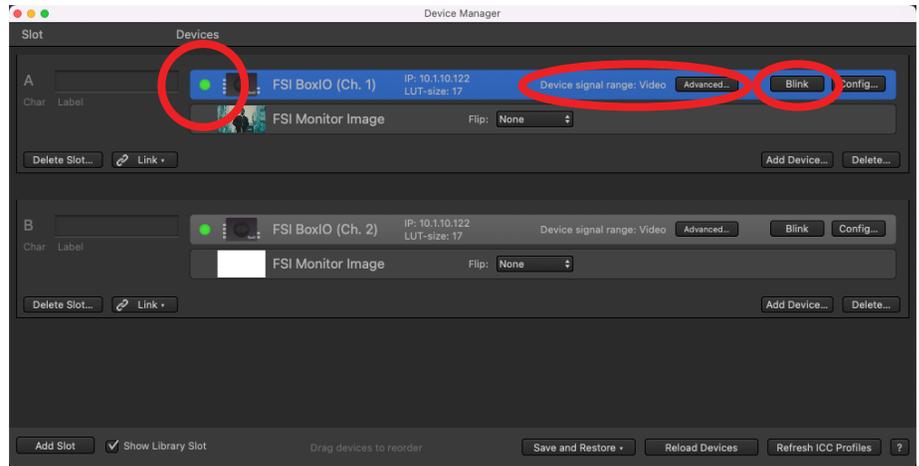
Once connected, select Slots and Manage Devices.

If using a BoxIO in dual channel mode each channel will show as a separate device.

A green indicator shows that BoxIO is properly connected.

You can also use the Blink button to send a red, green and blue flash sequence to BoxIO to verify the device is ready to use and to visually confirm what displays are receiving a signal from BoxIO.

Livegrade will detect and confirm the signal range you have set on BoxIO via the IPRU. If you would like Livegrade to control signal range you can click on Advanced and then confirm that you want Livegrade to control signal ranges.



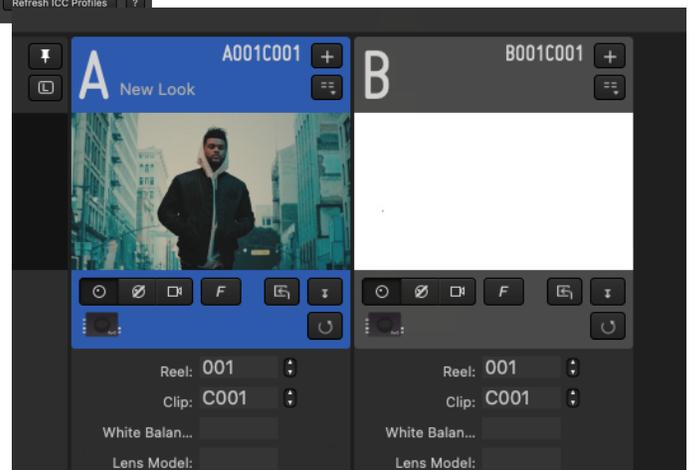
If controlling signal range with Livegrade you can now select the desired input and output ranges.

With range selection verified and/or set you can close out of the Device Manager window.

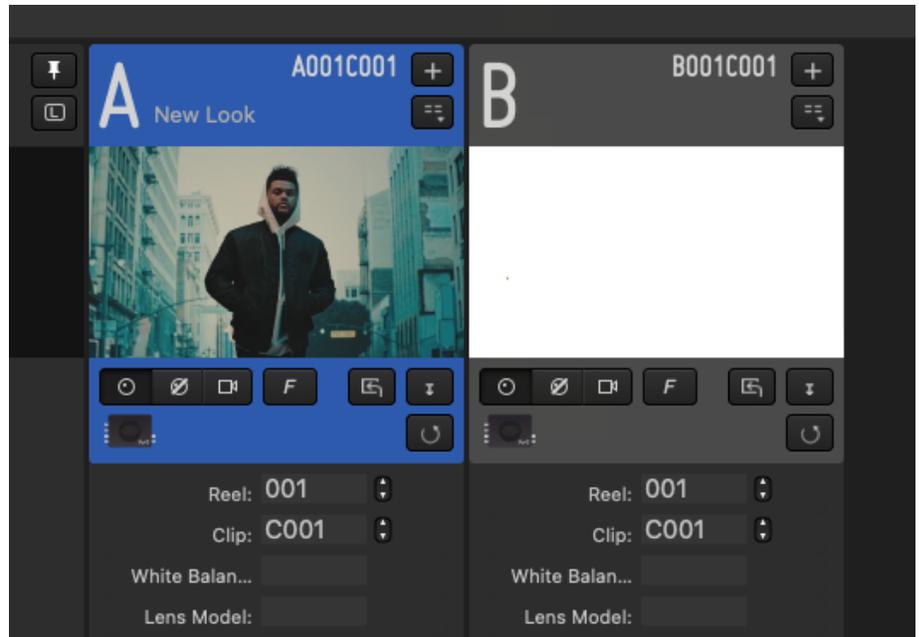
More information on Range Control in Livegrade can be found [here](#).

The connected BoxIO is now shown in the main Livegrade window in the corresponding grading slot as shown in the Device Manager window. A framegrab from the incoming signal to BoxIO is also captured and displayed at connection.

You can open the image viewer to display the image by double clicking the BoxIO image thumbnail.



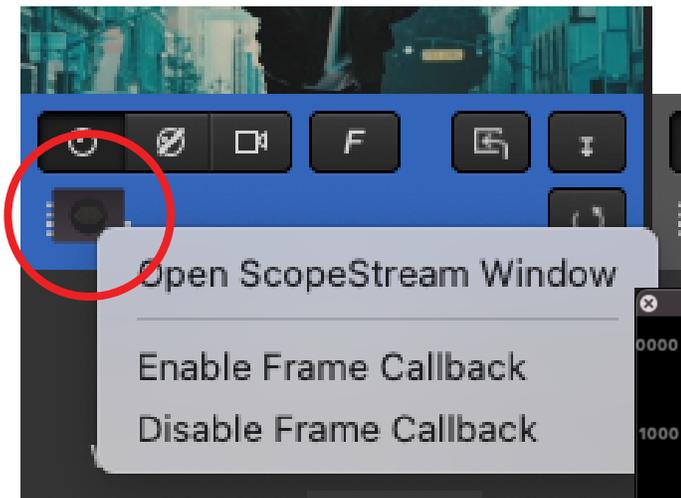
From the main Livegrade window you can also update the Image Preview of the live image, save stills, and access ScopeStream.



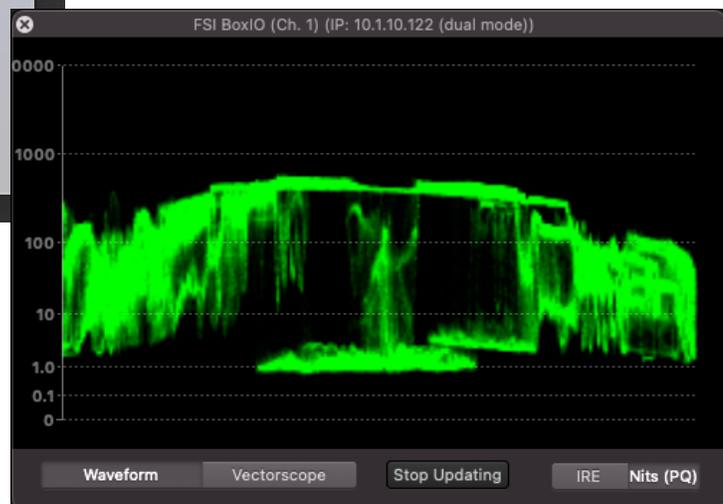
The Refresh Image button can be used to update the preview image shown in LiveGrade.



Still images can be saved by selecting the Save Current Image to Disk button. The directory for where those images are saved can be changed by going to Preferences -> Library.



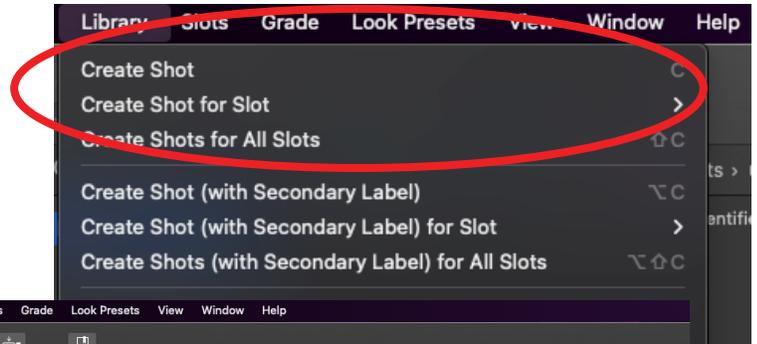
To access ScopeStream, right click the BoxIO icon under the desired channel and select Open ScopeStream Window. Your ScopeStream scope will open in a separate window. From this window you can select between Waveform and Vectorscope.



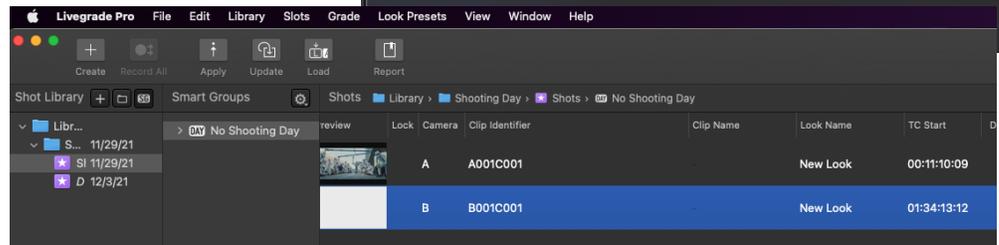
BoxIO's Frame Callback functionality can now be accessed directly from Livegrade. This feature allows you to display a previously saved reference still via BoxIO's SDI output.

Livegrade must be version 5.5 or later.

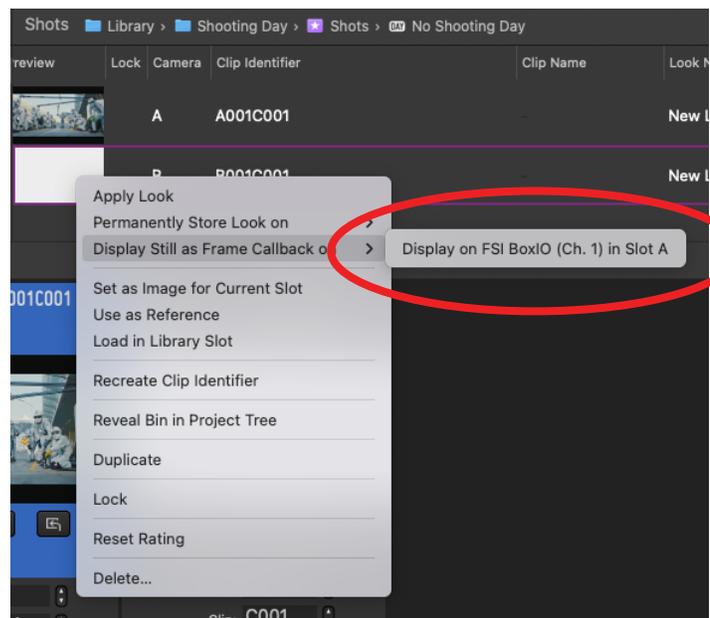
You will first need to have still images in the Shot Library. To create a shot, go to Library in the menu and select Create Shot, Create Shot for Slot, or Create Shot for All Slots.



Your created shots will now be shown in the Shot Library.



Now select a still in the Shot Library, right click and select Display Still as Frame Callback on and then Display on FSI BoxIO (ch.1) in Slot A.

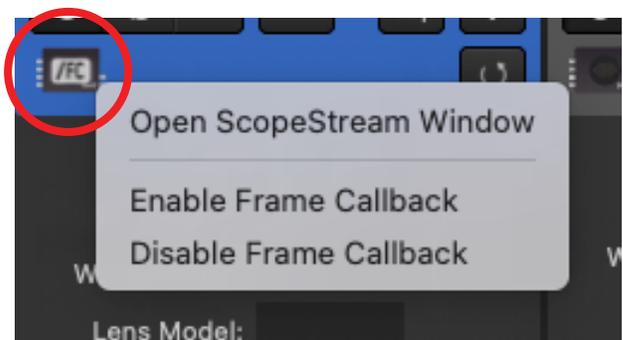


The selected still will now be shown on the Channel 1 output.

The BoxIO icon on the main Livegrade window will change and show /FC when Frame Callback is enabled.



To enable or disable Frame Callback, right click the BoxIO icon and select to either Enable or Disable Frame Callback.



Tips and Troubleshooting

BoxIO allows for real-time look application with almost no delay between signal input and output. To achieve practically zero latency in the signal chain and to apply looks in a visually seamless and smooth way, BoxIO does two important things:

- 1) BoxIO's SDI outputs obtain their signal clock / sync from the SDI inputs.
- 2) LUTs are applied during the signal's vertical blanking interval.

Therefore, if your input signal is unstable, inconsistent, or otherwise out of normal tolerances it can interrupt normal operation of BoxIO. For this reason, when troubleshooting BoxIO operation, make sure to review the signal chain going to BoxIO as problems with input signals are often what can trigger issues with BoxIO use. For example, if using a wireless video transmitter/receiver upstream of BoxIO that is intermittently losing signal or switching video formats this can interrupt normal BoxIO operation.

If erratic upstream behavior is unavoidable consider first routing your signal through a device, such as a cross converter, that generates and maintains its own stable SDI output regardless of input signal conditions. Note, these types of cross converters do typically introduce a measurable signal chain delay so there is a trade off when using such devices.

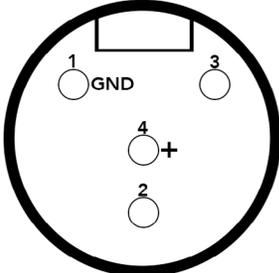
Additionally, the following tips and troubleshooting solutions can assist with solving common issues:

Problem	Solution	Notes
Scrambled image or other display problems while in dual channel mode	Verify that both incoming signals are the same resolution and frame rate	Incoming signals do not need to be genlocked, but for proper operation should be the exact same frame rate and resolution. This includes ensuring that you do not have a mix of true progressive and PsF (progressive segmented frame) signals between the two inputs.
Black or unexpected color output on startup	Be sure to select "permanently Store looks on Device" before closing out of Livegrade. Toggling 1D / 3D LUTs on/off from IPRU may also be done to ensure no 'black' or corrupt LUT is loaded.	BoxIO will boot with the last LUT that was recalled from non-volatile memory. Livegrade uses the volatile memory slot for normal operation and will not save a LUT to the non-volatile memory unless you permanently store look on device from the software.
Flickering output, lost image, or distorted frame grab	Reload BoxIO in Livegrade once signal is restored.	If the incoming signal drops, signal format changes, or an unclean switch occurs BoxIO may need to re-lock to the incoming signal. Re-loading the device is the easiest way to force a re-clock to signal.

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Problem	Solution	Notes
BoxIO loses ethernet connection/ freezes	Power cycle BoxIO and reconnect to Livegrade. Ensure that Continuously refresh frame grab is disabled.	If Continuously refresh framegrab is active and a framegrab is interrupted before it can complete this can cause BoxIO to freeze and/or lose connection to Livegrade. The best way to prevent interrupted frame grabs is to disable Continuously refresh framegrab and only take framegrabs as needed during normal signal conditions. If continuous frame grab functionality is required we recommend setting the interval to a longer duration to make interruptions less likely.
BoxIO will not connect when using a previously used configuration.	Ensure that computer Wi-Fi is turned off. If simultaneous use of Wi-Fi is needed set the service order of the incoming connections under Network Preferences with the ethernet connection of BoxIO as top priority.	It is recommended that Wi-Fi not be used when also using an ethernet connection. This can lead to IP conflicts and cause devices to not be able to connect. If Wi-Fi is needed setting the ethernet connection of BoxIO as top priority will ensure that the Mac is always using that connection first. It is also imperative to make sure that the ethernet connection and Wi-Fi connection are not utilizing the same IP pool.
Blue screen on output (only affects M1 Max systems)	Ensure that the MacOS is not on Monterey 12.2 or newer. If Mac is on 12.2 and the issue occurs rolling back the OS will solve this issue.	More info can be found here .
BoxIO overheating	Ensure that BoxIO has adequate airflow and nothing is stacked on top of BoxIO. BoxIO will need to be powered off and allowed time to cool down before reconnecting.	BoxIO will need time to cool down if the unit does overheat. BoxIO does not contain any fans. To cool internal components the chassis operates as a heat-sink. Allow for adequate airflow across the chassis, and never stack BoxIO with any other equipment including another BoxIO.
Signal issues when using wireless video receivers	Ensure that the output of the wireless receiver is outputting a fractional and progressive frame rate (e.g. 23.98).	Wireless transmission systems can introduce a significant amount of jitter / signal timing issues. When this jitter becomes too excessive a downstream device may not be able to establish or maintain signal lock. In our experience many of these wireless receivers exhibit significantly less jitter when outputting a fractional frame and true progressive, not PsF, format so you may want to try using those settings as defaults.

Problem	Solution	Notes
Power issues when using wireless video receivers	Ensure that the wireless receiver is powered from a separate source than BoxIO. We would also strongly suggest using an SDI Video Ground Path Isolator.	Use of some wireless video receivers can cause dangerous ground loop issues that can damage connected equipment like BoxIO as well as monitors. Using a ground loop isolator and powering BoxIO and the receiver from a separate power source will help keep downstream equipment protected. SDI Video Ground Path Isolators are available at ShopFSI.com and ShopFSI.eu.
BoxIO power issues	Ensure that BoxIO is only powered using the provided power supply or using an approved DTAP to Mini-XLR cable and receiving the proper voltage.	<p>Using a power supply other than the one provided may cause damage to BoxIO. Optional DTAP to Mini-XLR cables are also available at ShopFSI.com and ShopFSI.eu. If using a third party power adapter, please ensure the proper voltage and pinout are being used. Proper pinout is shown below:</p> <p>AC Input: 100-240V AC DC Input: 4pin Mini-XLR 12-18V</p> <div style="text-align: center;">  </div> <p>4 pin mini XLR pinout</p>