How to set up Pomfort Livegrade for ARRI Cameras

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Version History

Version	Author	Change Note
2022-09-14	Simon Duschl	First creation
2022-09-15	Simon Duschl	Added chapter for external LUT box
2022-09-21	Simon Duschl	Added chapter ACES
2024-09-04	Simon Duschl	Added "CDL + CMT" and "DRT only" grading modes
2024-12-03	Simon Duschl	Minor changes
-	-	-

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Introduction

This short document will help you to set up Pomfort Livegrade correctly for use with an ARRI camera.The latest changelog can be found here and additional information and frequently asked questions can be found on the offical Pomfort Knowledge Base for Livegrade.

Please note: A basic understanding of computer networks is advantageous for a correct setup.

1 Set up an ARRI Camera

1.1 Activate CAP Server

This chapter explains how to set up an ARRI camera for connecting Pomfort Livegrade with the camera. For more information regarding this topic have a look into the corresponding camera user manuals. To get access via the ARRI CAP (Camera Access Protocol), please activate the CAP functionality in-camera. This option can be activated in the menu under "Network /Wifi" -> "CAP Server".
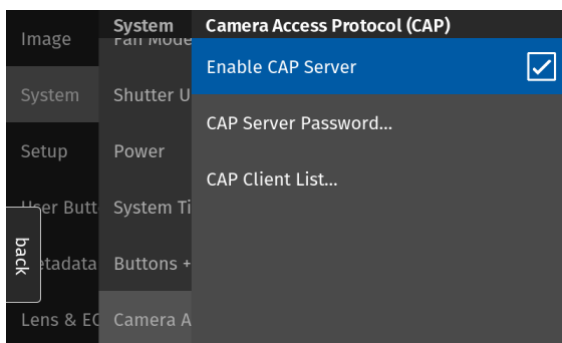
The default password to get access to the CAP functionalities is "arri". For security reasons, we suggest to change the default password.

1.2 Wired / Ethernet connection

Please connect the camera to your network (ethernet device or network switch). In our example we are using an ALEXA 35 and the offical Lemo 10 pin cable / ALEXA ETH/RJ45 (3.0m/9.8ft) KC 153-S (K2.72021.0).

1.2.1 Camera wired ethernet network settings

Please check that your camera receives an IP adress and is accessible in your LAN. If you have a DHCP server you can select "DHCP" within the camera's menu. In case you have to use a fixed IP adress, it's also possible to select "Static" IP adress here.
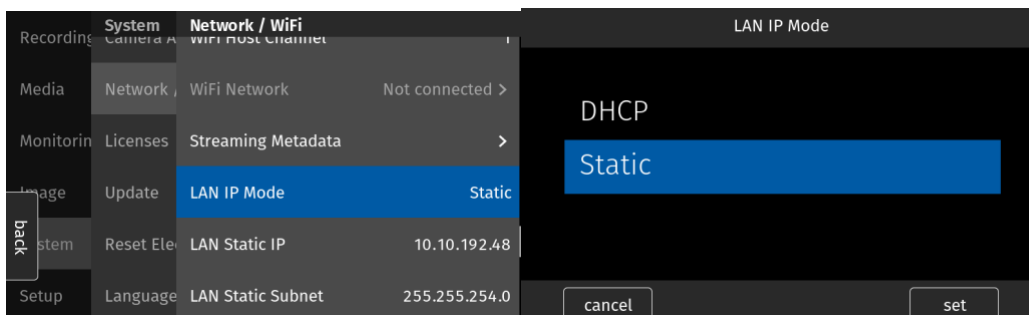
Please also check your LAN Static Subnet (Subnet mask) address. This can also be 255.255.255.0 or similar. Note down the IP adress of your camera. To get an overview of the network settings the "Network Info" page in-camera is very helpful.
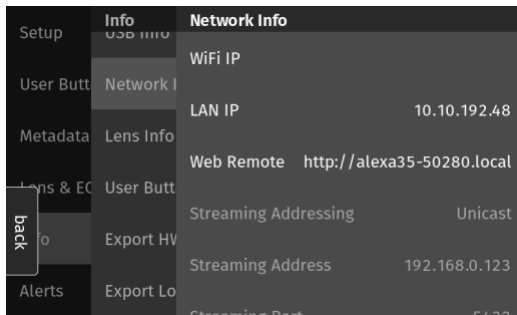
Each camera also has a unique name and can be reached by your web browser e.g. Google Chrome. Both the camera name and IP adress can be used to get access to the webremote of the camera. For example:

http://alexa35-50280.local (.local can also be different and depends of the used camera and setup in your local area network)

http://10.10.192.48

1.2.2 macOS network settings
To configure your macOS, you must open the macOS "System Settings" -> "Network"
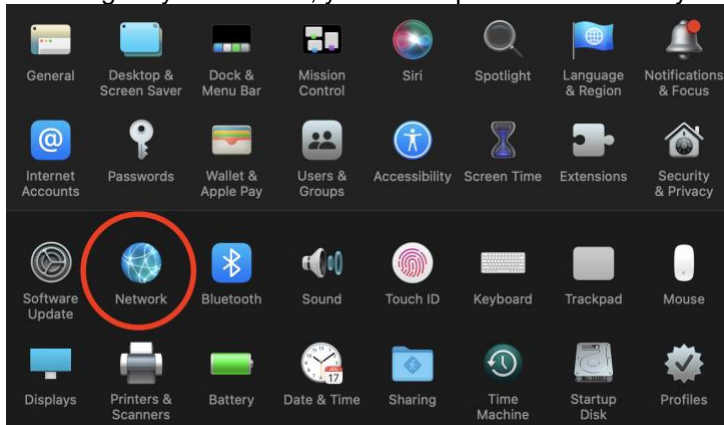
Set the correct settings for your network here.

If everything is set up correctly you can try to ping your camera in macOS terminal by using its name or ip address. Open the macOS terminal and type

> ping alexa35-50280.local

> or

> ping 10.10.192.48

MacOS terminal should get an answer from the camera, and it should look like this:
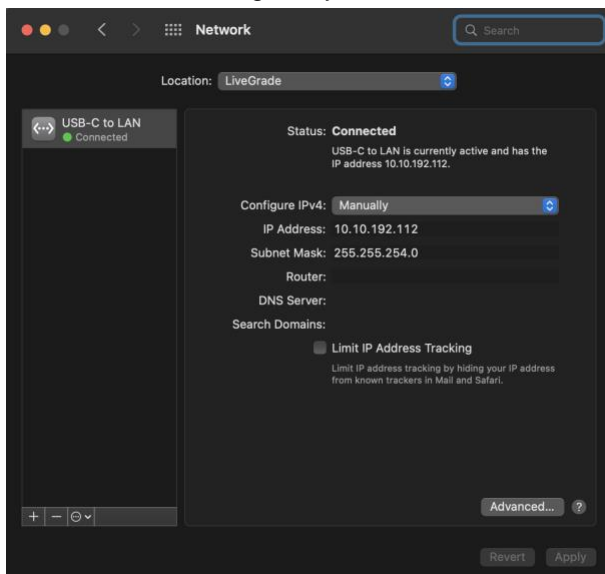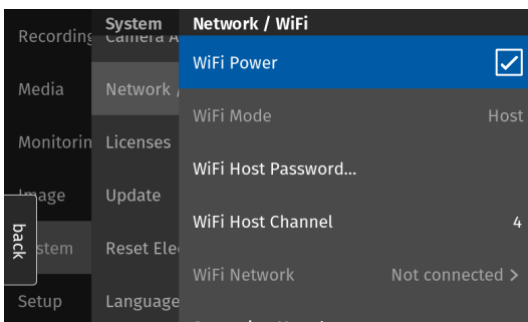
```
PING alexa35-50280.local (10.10.192.48): 56 data bytes
64 bytes from 10.10.192.48: icmp_seq=0 ttl=64 time=0.484 ms
64 bytes from 10.10.192.48: icmp_seq=1 ttl=64 time=0.690 ms
64 bytes from 10.10.192.48: icmp_seq=2 ttl=64 time=0.634 ms
```

1.3 Wireless / WiFi connection

You have two options to set up the camera to use a WiFi connection: as a "Client" or "Host". With "Host" mode the camera will create its own WiFi network and you may connect directly to it. . If your camera is in "Client" mode, then your camera is a "Client" in a bigger WiFi network and connected to an Access Point (AP). Multiple cameras may be connected to the same WiFi network if in "Client" mode. The following steps will assume that the camera is in Host mode and that you are connecting a MacOS device directly to the WiFi network generated by the camera.

1.3.1 Camera WiFi network settings

Please ensure that the camera's WiFi mode is set to Host and then activate the WiFi Power to turn on the WiFi module of your camera. You will find this under "System" -> "Network / WiFi".. The default Wifi password of our cameras is "arriarri". For security reasons we suggest changing the default password.

To configure your macOS, you must open the macOS "System Settings" -> "Network" and select the camera WiFi. Type in the WiFi password that was set under 1.3.1, when prompted. Afterwards, the WiFi connection to the camera should be established successfully.
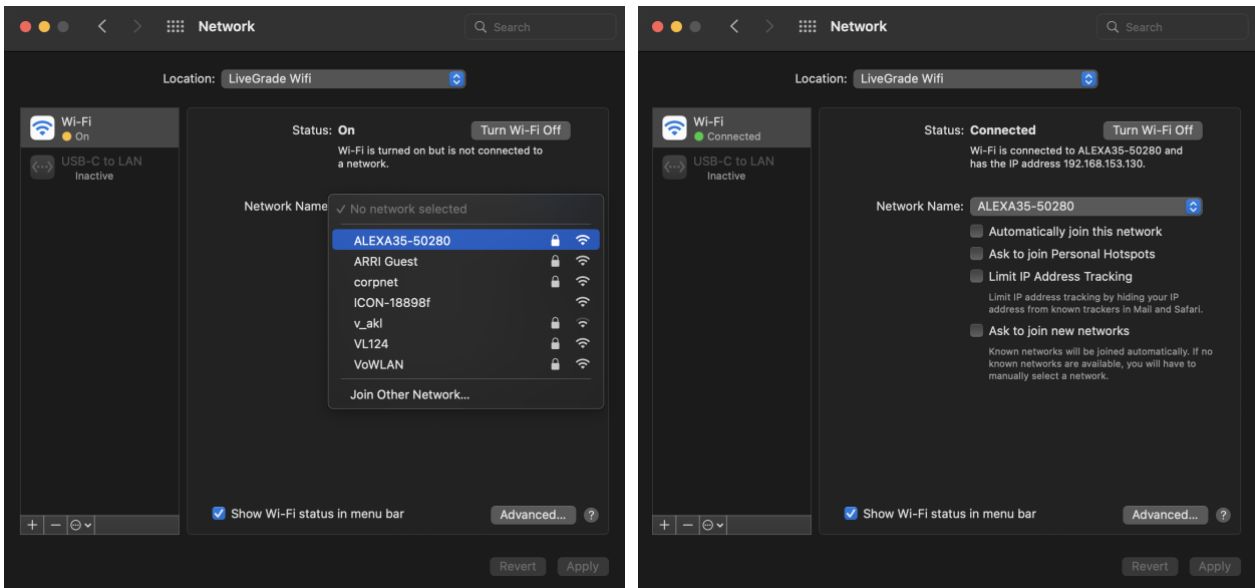
If everything is set up correctly you can try to ping your camera in macOS terminal by using its name or ip address. Open the macOS terminal and type the following, using your camera-specific details:

    ping alexa35-50280.local

    or

    ping 192.168.153.130

MacOS terminal should get an answer from the camera, and it should look like this:

```
PING alexa35-50280.local (10.10.192.48): 56 data bytes
64 bytes from 10.10.192.48: icmp_seq=0 ttl=64 time=0.484 ms
64 bytes from 10.10.192.48: icmp_seq=1 ttl=64 time=0.690 ms
64 bytes from 10.10.192.48: icmp_seq=2 ttl=64 time=0.634 ms
```

2 Set up Pomfort Livegrade and an ARRI CAP compatible camera

With the latest update of Livegrade to version 6.5 (and later) it is now possible for the user to choose between two grading modes when working with an ALEXA 35 camera. The grading mode must be selected in advance during the device configuration in the "Device Manager" window. Each of the two grading modes offers specific workflows and should be chosen based on the use case and color pipeline. Pomfort also offers a very good [Knowledge Base Article here](#).

Please note: In our example we are using an ALEXA 35 camera.

Currently there are two different options for the [ARRI Look File 4 (ALF4):](#)
- ALF4 (*.alf4) file with ARRI Color Management
- ALF4c (*.alf4c) file with Custom Color Management

Pomfort Livegrade 6.5 (and later) now added the option for the user to select one or the other color pipeline, which has an effect on the ALF4 or ALF4c file.

- **Option 1**: "CDL + CMT" is using ARRI Color Management or Custom Color Management, depending on the look file which is currently loaded in the camera. CDL values and the CMT, stored as a log-to-log 3D LUT, can be adjusted in this grading mode. The CDL and CMT 3D LUT is stored in an ALF4 or ALF4c file when sending it to the camera. The DRT is fixed to the official ARRI DRTs for LogC4/AWG4 The DRT will be left untouched and stays like it is defined in the loaded look file. We refer to [chapter 2.1](#) to setting up the ARRI Camera with Camera Access Protocol (CAP) and Pomfort Livegrade correctly.

- **Option 2**: "DRT only" is using Custom Color Management
  All adjustments are being sent in one concatenated 3D LUT and stored into the DRT part of the ALF4c file. ARRI offers two different DRTs in the ALF4c file, one for SDR and one for HDR. Currently Pomfort Livegrade is using only one for both DRTs.

Important note: Please verify to add the camera as a device in Pomfort Livegrade after you'd selected a ALF4/ALF4c in-camera, otherwise the CDL and CMT of the ALF4/ALF4c is not being reset properly. This could result in a wrong behavior when doing live grading.

2.1 Livegrade and ARRI camera with Camera Access Protocol (CAP) in "CDL & CMT" grading mode

2.1.1 Configure SDI paths, look and color spaces

To get a correct image out of the camera you have to set up your SDI image pipeline correclty. To do so, please check the "SDI/VF Processing" and "SDI Color Space". For using ALF4 looks please select "Look" for the corresponding SDI paths.
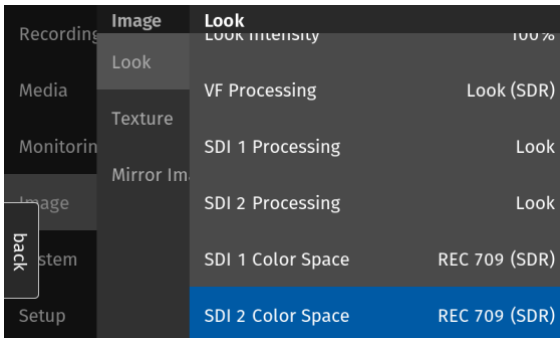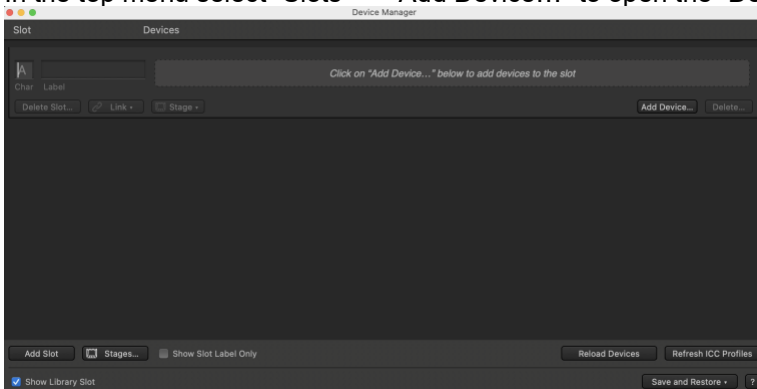

Please note: These settings depend on your monitoring setup e.g. Standard Dynamic Range (SDR) or High Dynamic Range (HDR) displays.
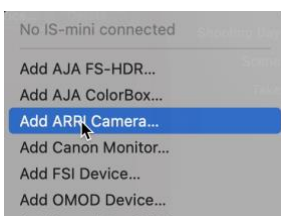
To prepare the camera for in-camera grading, please select an editable look first (e.g. through duplicating the read-only "Default" look), before adding the camera as a device in Livegrade "Device Manager".

2.1.2 Add device to Livegrade

In the top menu select "Slots" -> "Add Device…" to open the "Device Manager".

Here please select the button "Add Device…" and select "Add ARRI Camera".


If everything in the previous steps was set up correctly, your camera should appear here after a few seconds. Select the camera and type in your CAP password, that was set in-camera (default: arri). Next activate/deactivate the framegrab option. Activate the "Advanced Color Pipeline" with the "CDL + CMT" option for the ALEXA 35. Press "Add ARRI Camera" and confirm the next window.
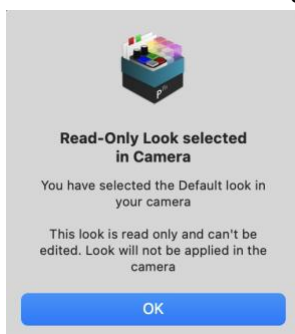
Please note: The option "look sync" should not be activated with ALEXA 35.
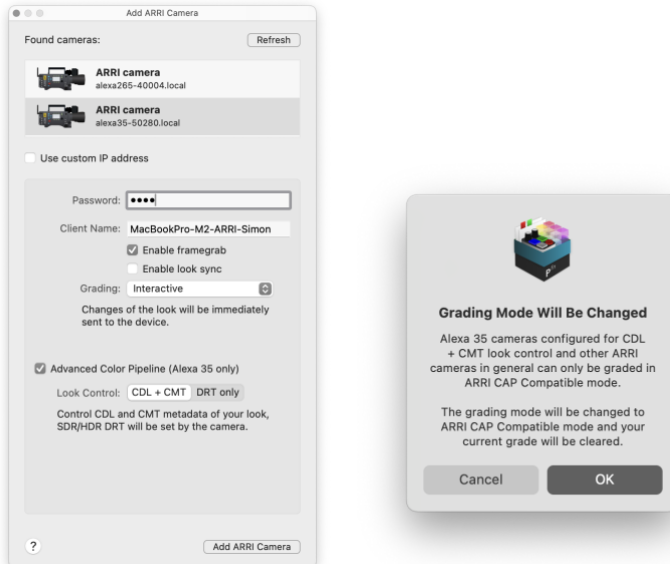
The camera should now appear as a device in the "Device Manager".
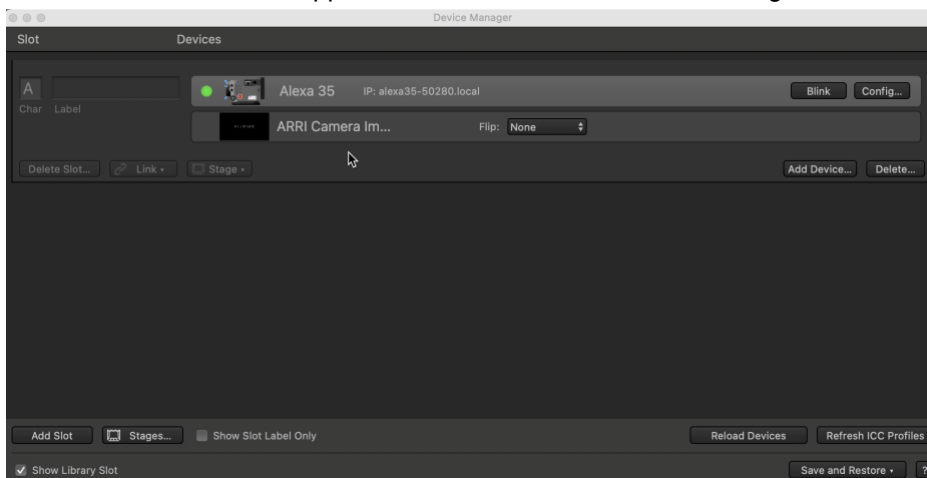
Close the "Device Manager" and press OK for the following message.

Please note: This message appears only if the default look in-camera is selected. The default look cannot be changed.

## 2.1.3 "CDL + CMT" node tree setup with ARRI Color Management

Once the camera was added as device in "CDL + CMT" mode into your slot this should result in the following node setup:

- Node 1: CDL values
- Node 2: Saturation adjustment
- Node 3: CMT for the Creative Modification Transform as 3D LUT (log-to-log)
- Node 4: DRT for the Display Render Transform | 3D LUT

Your nodes should look like this:
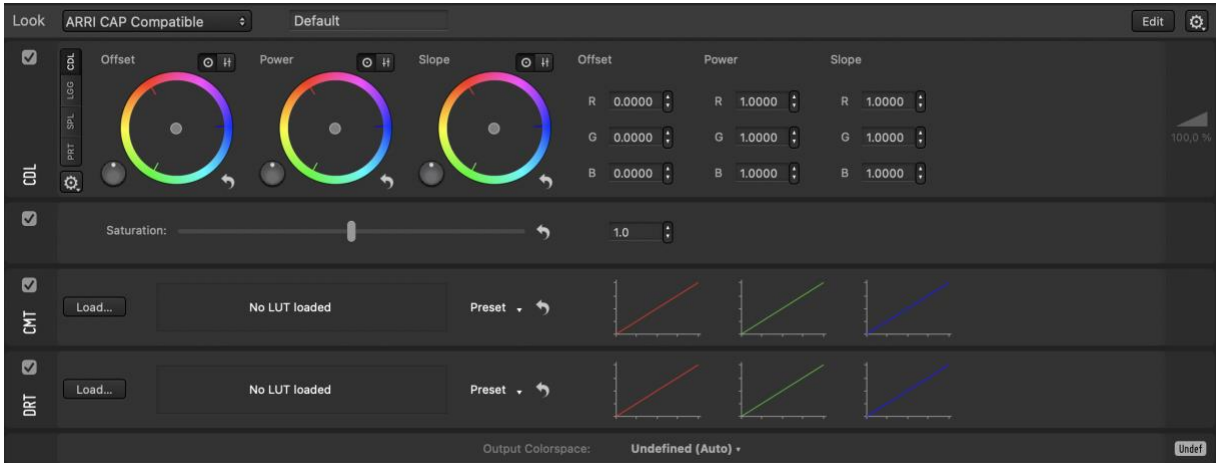
For a correct image preview within Livegrade, please select the official ARRI LogC4 to Rec709 LUT for the DRT node here (last node). The official color conversion for AWG4 / LogC4 should be built in Livegrade already.
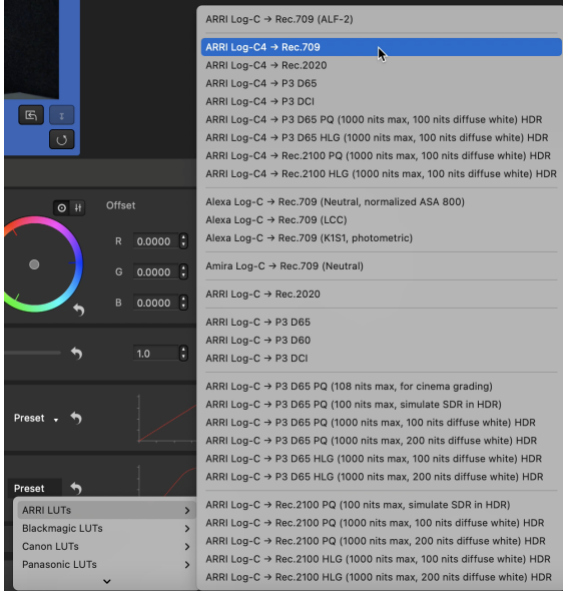

The LUT name of the node should be "ARRI_LogC4-to-gamma24_Rec709-D65_v1" for the conversion to Rec709.

Please note: In this grading mode, the last node will be ignored by the ALEXA 35 camera, because the "Display Render Transform (DRT)" in-camera is happening on the SDI-Output. **The last node is only needed for a correct image preview within Pomfort Livegrade.**

2.1.4 Apply CDL values and a CMT (log-to-log) 3D LUT

If everything is set up correctly, it's possible to use CDL values or a CMT (log-to-log) 3D LUT by using the corresponding nodes in Livegrade (CDL node & 3D LUT node). It's also possible to add other nodes for example HSL curves or standard curves to your setup. All kind of curves that are not CDL compatible are being applied as a combined 3D LUT.
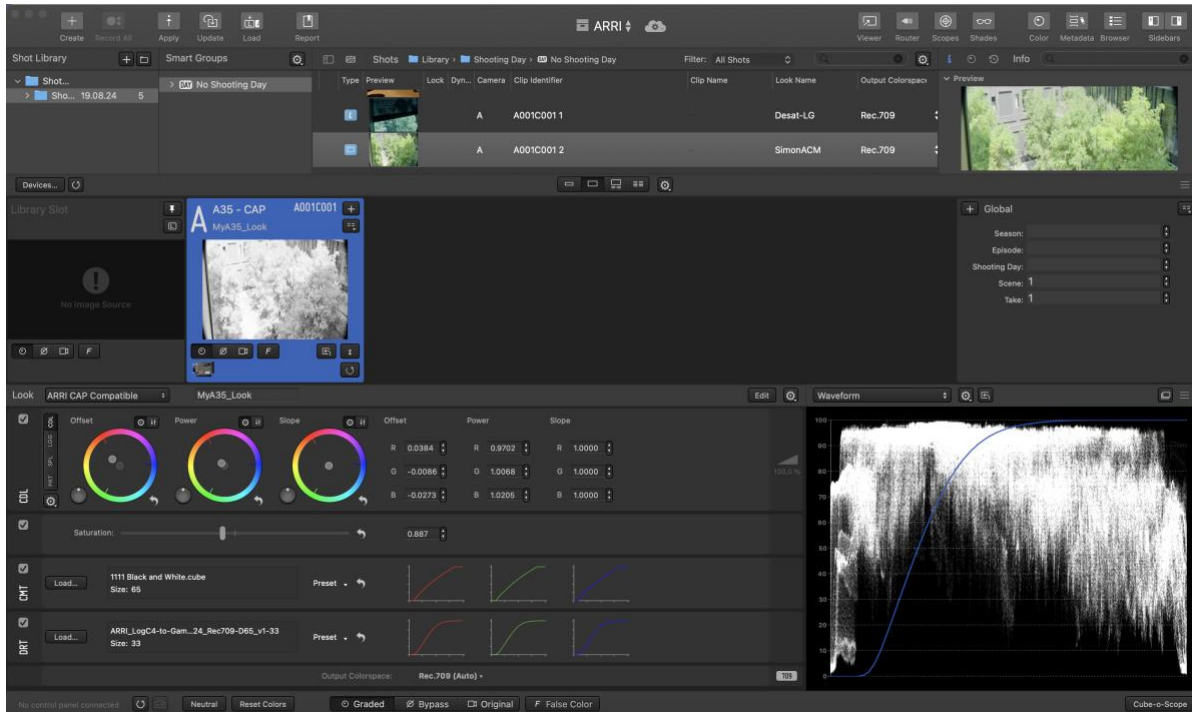
You can do live grading and send your ALF4 look directly to your camera. The new ALF4 look will appear in your camera under "Image" -> "Look" and will be stored into the file header of the file.
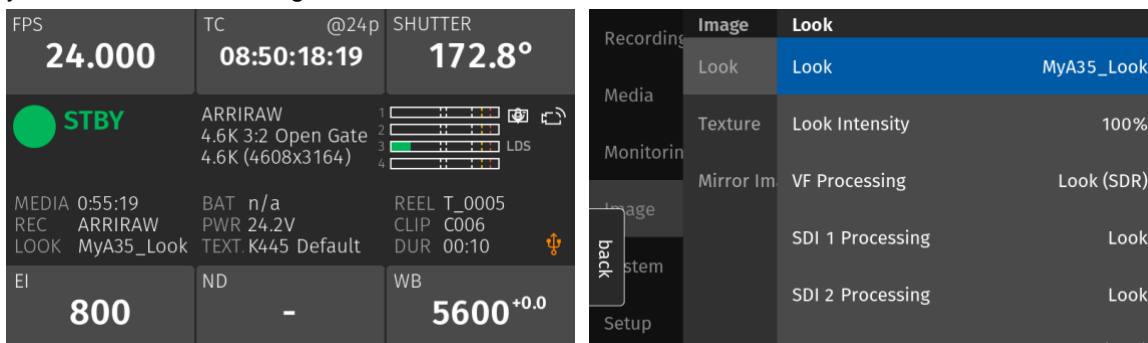

2.2 Livegrade and ARRI camera with Camera Access Protocol (CAP) in "DRT only" grading mode

To prepare the camera for this dedicated "DRT only" grading mode, please duplicate the "Default" look first, before adding the camera as a device in Livegrade "Device Manager".

Important note: To get a correct starting point in the "DRT only" grading mode, we suggest duplicating the "Default" look, add a new name to it and activate the new duplicated look in-camera. This can be done in the menu "Image" -> "Look" -> "rename/duplicate" -> "duplicate" -> add new name -> "set" -> "close" -> select the new look -> "set". If this recommendation is not adhered to, this could lead to problems during live grading.

2.2.1 Configure SDI paths, look and color spaces

To get a correct image out of the camera you have to set up your SDI image pipeline correclty. To do so, please check the "SDI/VF Processing" and "SDI Color Space". For using ALF4c looks please select "Look" for the corresponding SDI paths.
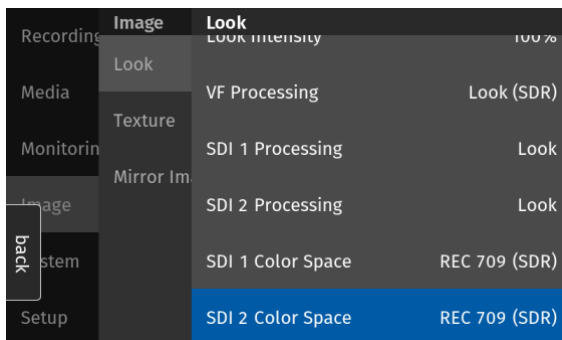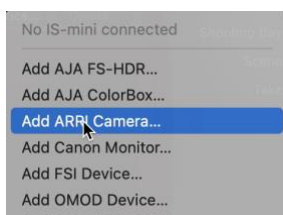

Please note: These settings depend on your monitoring setup e.g. Standard Dynamic Range (SDR) or High Dynamic Range (HDR) displays.

2.2.2 Add device to Livegrade
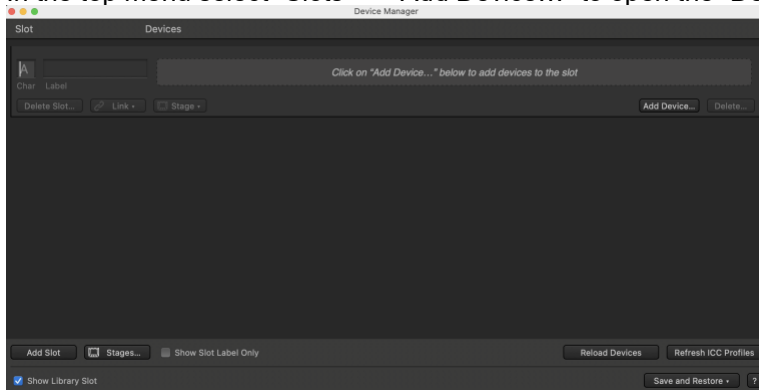
In the top menu select "Slots" -> "Add Device…" to open the "Device Manager".

Here please select the button "Add Device…" and select "Add ARRI Camera".


If everything in the previous steps was set up correctly, your camera should appear here after a few seconds. Select the camera and type in your CAP password, that was set in-camera (default: arri). Next activate/deactivate the framegrab option. Activate the "Advanced Color Pipeline" with the "DRT only" option for the ALEXA 35. Select your preferred Target Color Space (SDR or HDR). Press "Add ARRI Camera" and confirm the next window.

Please note: The option "look sync" should not be activated with ALEXA 35.
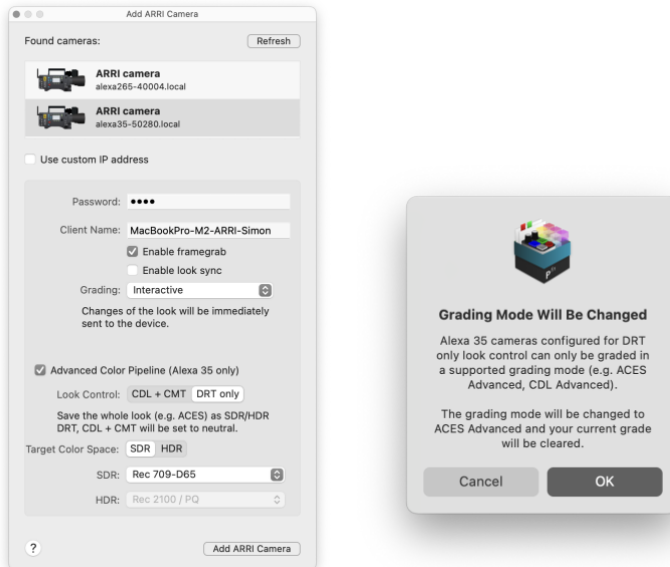
The camera should now appear as a device in the "Device Manager".

.
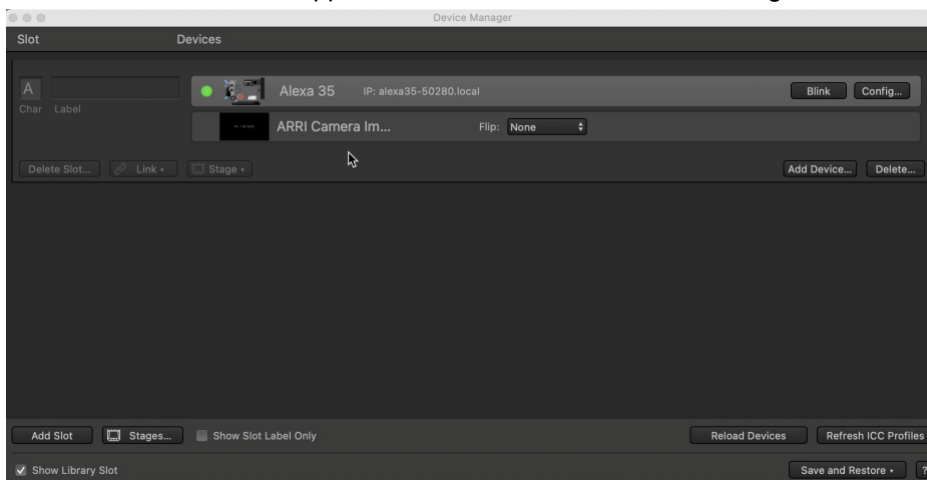
2.2.3 "DRT only" node tree setup in Custom Color Management

Once the camera was added as device in "DRT only" mode into your slot this should result in the following node setup within the "ACES CDL Advanced" grading mode

- Node 1: IDT - ARRI LogC4/AWG4 to ACES 1.3.0 (ACEScct)
- Node 2: CDL 1 values
- Node 3: CDL 2 values
- Node 4: Saturation adjustment
- Node 5: Curves
- Node 6: HSL Curves
- Node 7: LMT in ACEScct
- Node 8: ODT (RRT + ODT) - ACEScct to Rec. 709 – Rec.709 100nits

Your nodes should look like this:

Please note: In this grading mode, all adjustments are being concatenated into one 3D LUT that is then being stored in the DRT for SDR and HDR within the ALF4c file. We suggest not to use any ALF4c file with changed CDL or CMT values, since the CDL and CMT part will not be reset in the "DRT only" grading mode. Will only be reset when adding the camera to the slot, but not during live-grading.
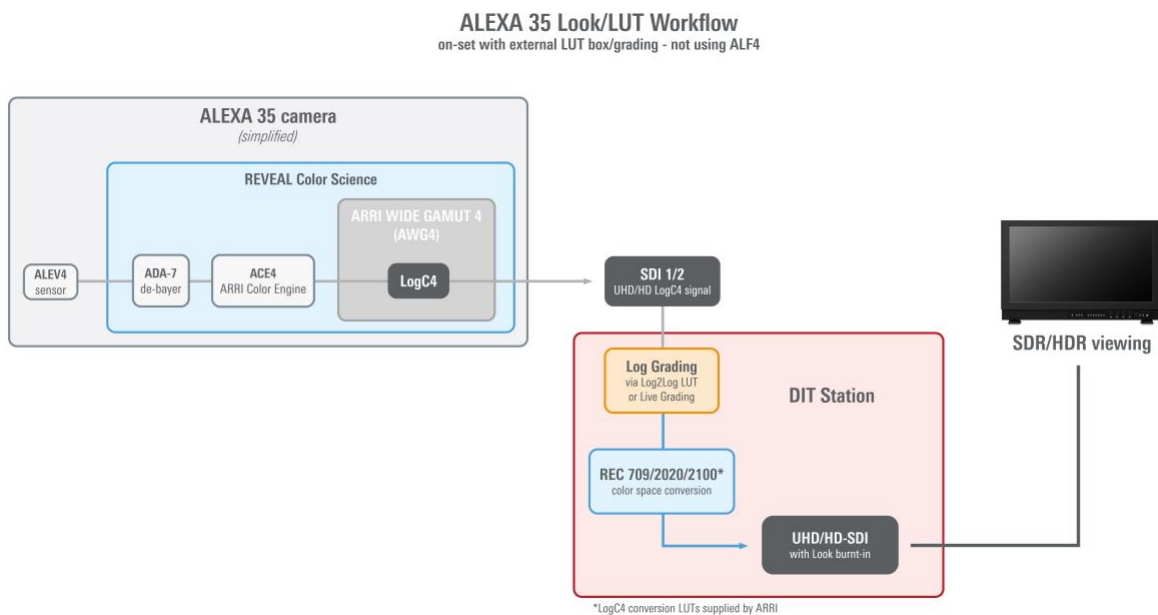
Once your adjustments have been made, you can send the updated look into the camera and the changed look file name will appear.
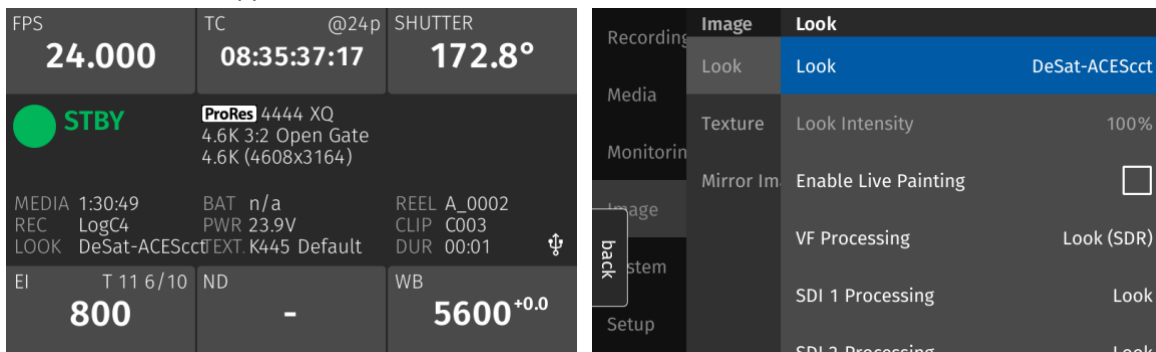
The new ALF4 look will appear in your camera under "Image" -> "Look" and will be stored into the file header of the file.

2.3 Livegrade using an ARRI camera & external LUT boxes

In this chapter you will find basic information how to connect an external LUT box with Livegrade and an ARRI camera. In this example we are using a TVLogic "IS-mini X" and an ALEXA 35 camera.

ALEXA 35 Look/LUT Workflow
on-set with external LUT box/grading - not using ALF4

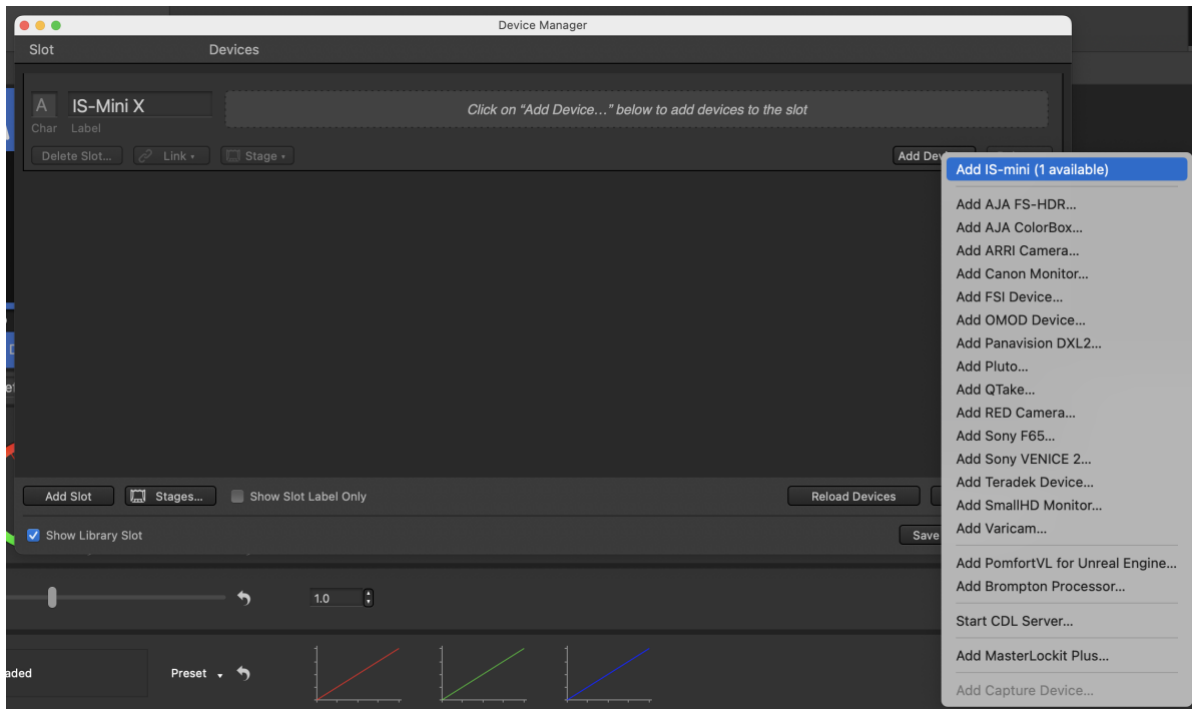### 2.3.1 Configure SDI paths, look and color spaces

To get a correct image out of the camera you have to set up your SDI image pipeline correctly. To do so, please check the "SDI/VF Processing" and "SDI Color Space". To use external LUT boxes with 3D LUTs incl. color space conversions, please select "LogC4" for the corresponding SDI pathes.
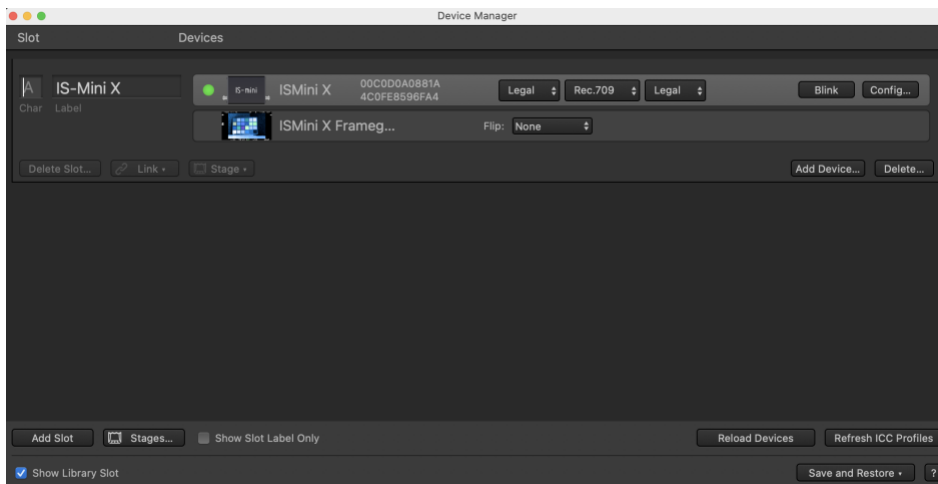

Please note: Please select "LogC4" for the corresponding SDI Color Space in the camera. Selecting Rec709 (SDR) or other Color Spaces here results in a "double LUT" and therefore in a wrong image.

2.3.2 Add external LUT box device to Livegrade

It is recommended to connect the IS-mini via USB. Once a correct connection between the IS-mini device and your computer is established, launch Livegrade and proceed to add the IS-mini as a device. In order to do that, you can choose "Slots" in the main menu and then "Add Device". Alternatively, you can add the device through the Device Manager. The IS-mini X should appear automatically if it's connected correctly.
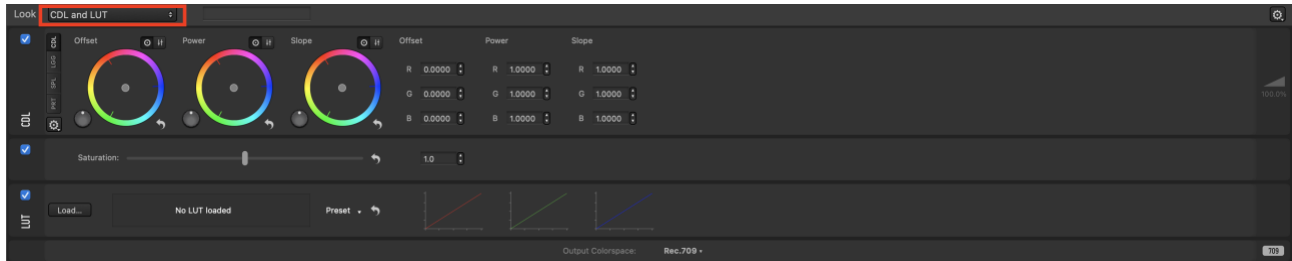

Select "Add Device…" -> "Add IS-mini".

The SDI output of ARRI camera is always "Legal".

Please note: Please check that the corresponding "SDI 1 Color Space" in-camera is set to LogC4. Selecting Rec709 (SDR) or other Color Spaces here results in a "double LUT" and therefore in a wrong image.

Select your desired grading mode e.g. "CDL and LUT".

Next, please select the "Display Render Transform (DRT) LUT" for the 3D LUT node. The official color conversion for AWG4 / LogC4 should be built in Livegrade already.
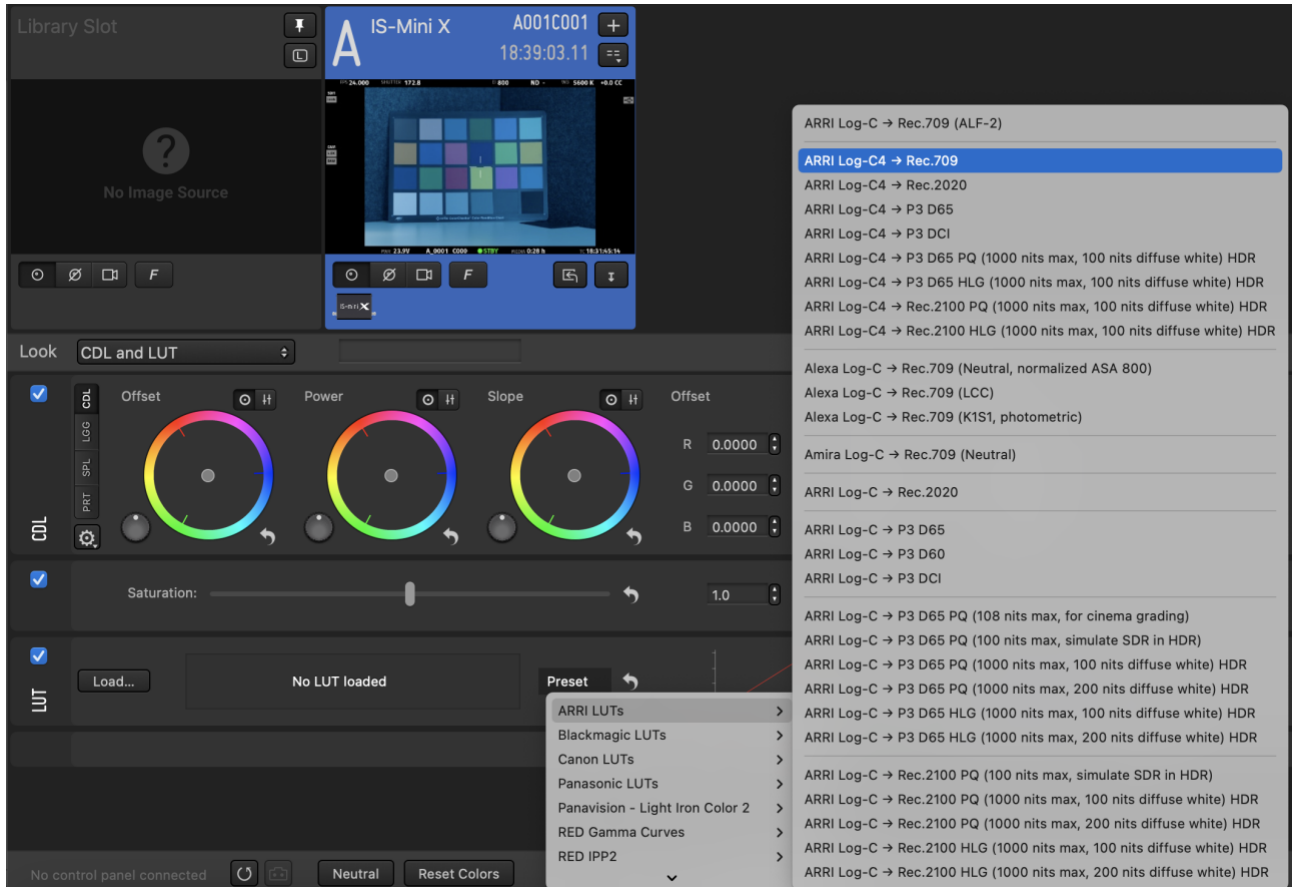
The LUT name of the node should be "ARRI_LogC4-to-gamma24_Rec709-D65_v1" for the conversion to Rec709.

Your node setup should look like this:

- Node 1: CDL values
- Node 2: Saturation adjustment
- Node 3: Display Render Transform (DRT) | 3D LUT

2.3.3 Adjust CDL values and Saturation

If everything is set up correctly, it's easily possible now adjust the CDL or Saturation values by using the corresponding nodes in Livegrade (Node 1 & 2). It's also possible to add other nodes for example HSL curves or standard curves to your setup. All kind of curves are not CDL compatible and being applied as a combined 3D LUT.

2.4 Livegrade using an ARRI camera, external LUT Box and ACES color space

In this chapter you will find basic information how to work in ACES color space with an external LUT Box and an ARRI camera. In this example we are using a TVLogic "IS-mini X" and an ALEXA 35 camera.

Please note: The latest Pomfort Livegrade version should have official support for the Input Device Transform (IDT) for ARRI AWG4/LogC4.

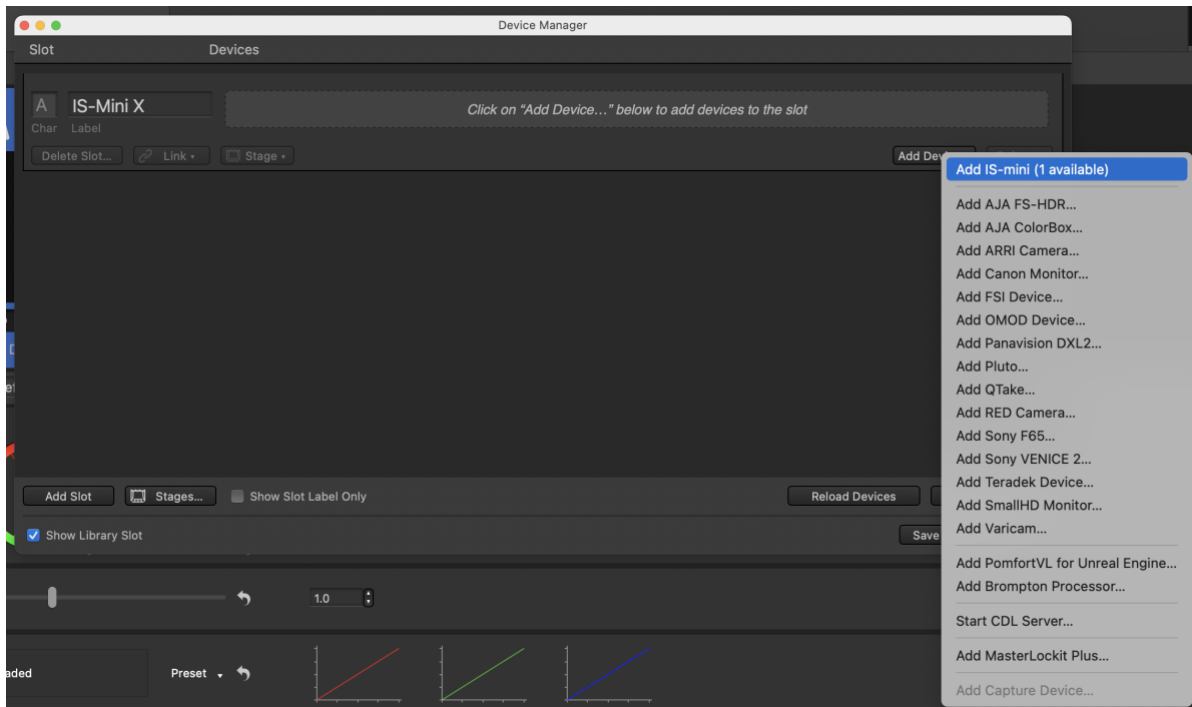### 2.4.1 Configure SDI paths, look and color spaces

To get a correct image out of the camera you have to set up your SDI image pipeline correctly. To do so, please check the "SDI/VF Processing" and "SDI Color Space". To use external LUT boxes with 3D LUTs incl. color space conversions, please select "LogC4" for the corresponding SDI pathes.
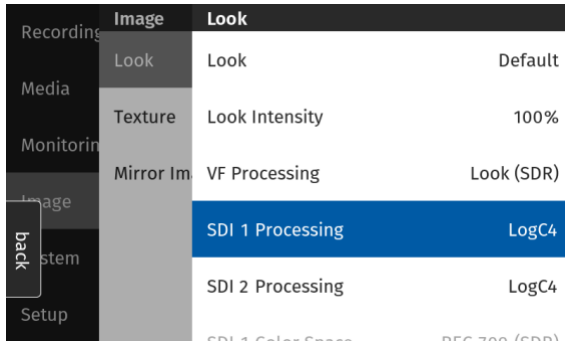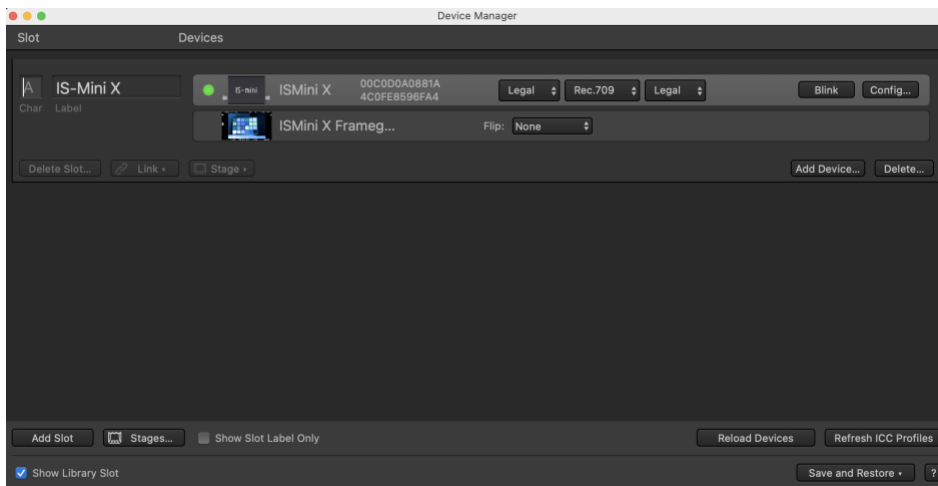

Please note: Please select "LogC4" for the corresponding SDI Color Space in the camera. Selecting Rec709 (SDR) or other Color Spaces here results in a "double LUT" and therefore in a wrong image.

2.4.2 Add external LUT box device to Livegrade

It is recommended to connect the IS-mini via USB. Once a correct connection between the IS-mini device and your computer is established, launch Livegrade and proceed to add the IS-mini as a device. In order to do that, you can choose "Slots" in the main menu and then "Add Device". Alternatively, you can add the device through the Device Manager. The IS-mini X should appear automatically if it's connected correctly.
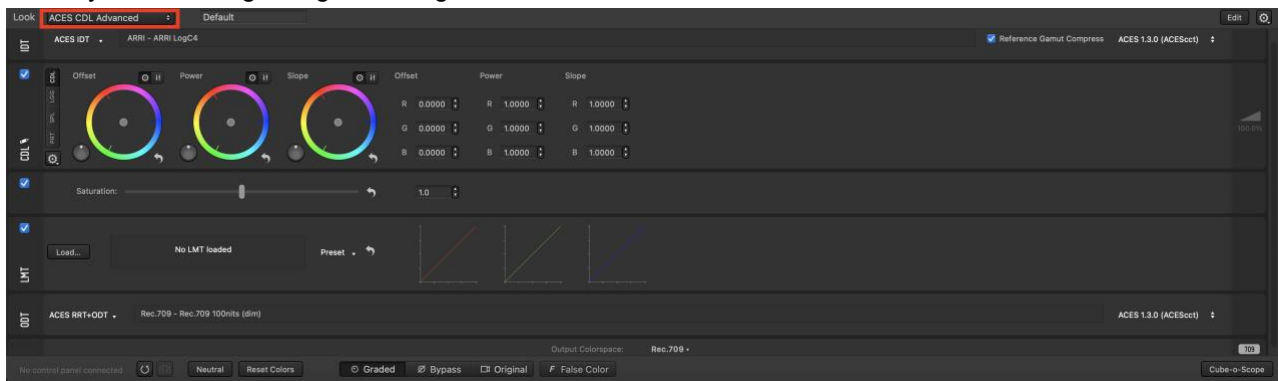

Select "Add Device…" -> "Add IS-mini".

The SDI output of ARRI camera is always "Legal".

Please note: Please check that the corresponding "SDI 1 Color Space" in-camera is set to LogC4. Selecting Rec709 (SDR) or other Color Spaces here results in a "double LUT" and therefore in a wrong image.
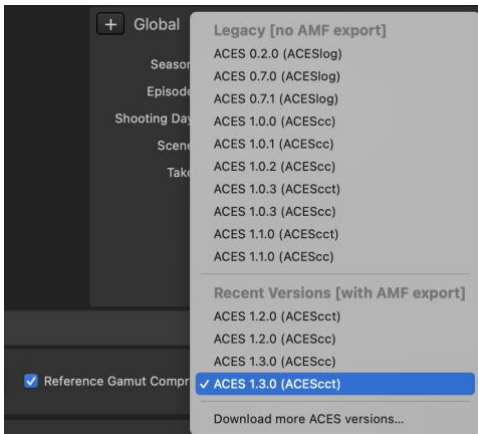
Select your desired grading mode e.g. "ACES CDL Advanced".

Next, please define the correct ACES "Input Device Transform (IDT)" for ARRI AWG4/Log4. Please select "ARRI – ARRI LogC4" here.
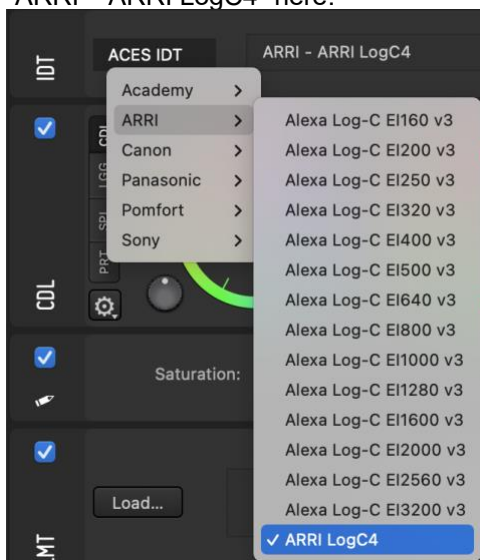
On the right-hand side you can select your ACEScc or ACEScct working space. In this example we are working in ACES 1.3.0 (ACEScct).

In a last step you must define your Output Device Transform (ODT). This of course depends on your monitor/display environment. In this example we are using a monitor with Rec. 709 (Gamma 2.4) color space and 100nits.
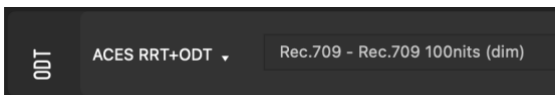
Your node setup should look like this:

- Node 1: IDT
- Node 2: CDL values
- Node 3: Saturation adjustment
- Node 4: LMT
- Node 5: ACES RRT + ODT

2.4.3 Adjust CDL values and Saturation

If everything is set up correctly, it's easily possible now adjust the CDL or Saturation values by using the corresponding nodes in Livegrade (Node 2 & 3). In addition to that, the user can select an ACES LMT or add another additional node for example a 3D LUT with a creative look. It's also possible to add other nodes for example HSL curves or standard curves to your setup. All kind of curves are not CDL compatible and being applied as a combined 3D LUT.

Please note: LMTs are specified by the ACES specification as a transform from and to ACES AP-0 (the linear ACES color space). Consequently, loaded LUTs in the LMT node will always be applied in ACES AP-0. For this reason, the LMT node only accepts LUTs in the Common LUT Format (CLF) matching the ACES specification. If you need to load a 3D LUT (e.g., in a typical grading working color space such as ACEScct), you can add a 3D LUT node and load any compatible 3D LUT format without limitation. LUTs in the 3D LUT node will be applied in the working colorspace (ACEScct/ACEScc). [1]

3 Links

Links to Pomfort Livegrade Knowledge Base:

- [Livegrade (general overview)](#)
- [Color Controls and Grading Modes](#)
- [ARRI CAP](#)
- [ACES](#)

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[1] Pomfort Livegrade Knowledge Base

3 Contact

In case you have questions or recommendations, please contact the Digital Workflow Support group within ARRI via email: digitalworkflow@arri.de