Device: AJA FS HDR

Introduction

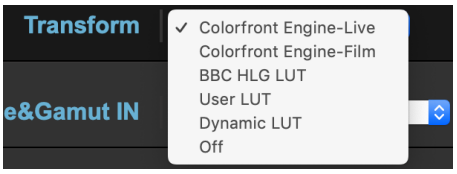
A number of parameters on the AJA FS HDR frame synchronizer can be controlled from a SKAARHOJ control panel. The complete feature set is not implemented but a large variety of actions can be found. This document gives you an overview of possible control parameters.

The implementation have been done on a HDR with Software Version 3.2.0.33

Colorfront Engine Control

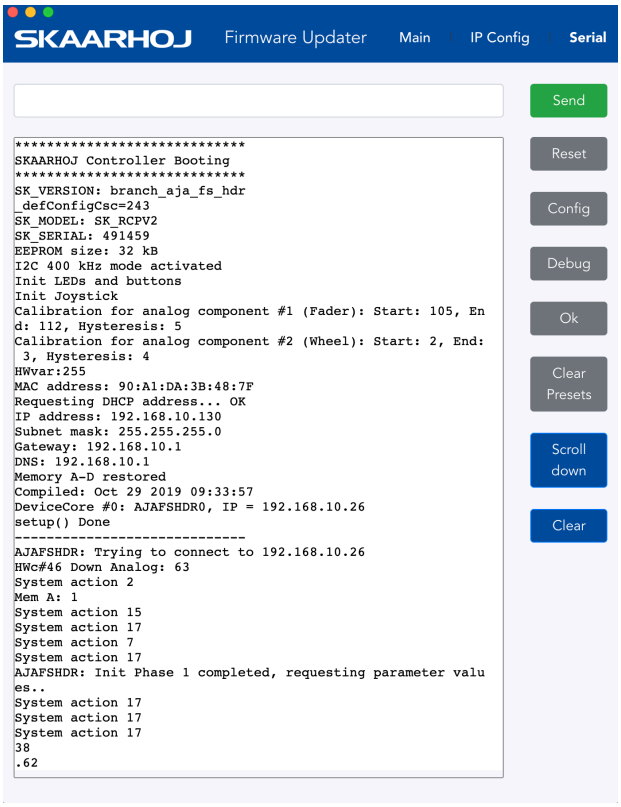
Please notice the Colorfront Engine changes functionality depending on which Transform type the HDR is set too. Our integration has focused on implementing Colorfront Engine control for the "**Colorfront Engine-Live**" transform type and ***not*** the Colorfront Engine-Film.

With v. 3.2.0.33, AJA has brought CC control to the FS-HDR. Color Correction is available only when not in Transform = Colorfront Engine.



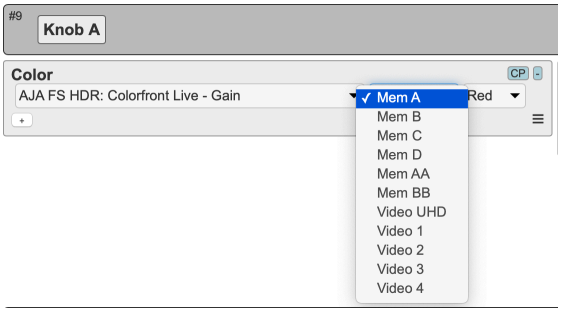
Connection

Connection status to the FS HDR is shown in the serial monitor.



Mapping of Channels

From the same panel it is possible to control the 4 different 2K/HD/SD channels and switch between these on the fly. Alternatively if the HDR is in 4K/UltraHD mode just 1 channel is possible to control. When relevant the channel for Actions on the FS4 Device Core can be set to Mem A-D, Mem AA-BB or Video 0-4. In the default configurations you will often find this set to Mem A so the different channels can be controlled on the fly by changing the Memory Parameter A to values between 0 to 4 elsewhere on the panel. The mapping between the Memory A and channels are shown below.



Mem A = 0 = Video UHD (this is used in 4K/UltraHD mode)

Mem A = 1 = Video 1 = Channel Video 1

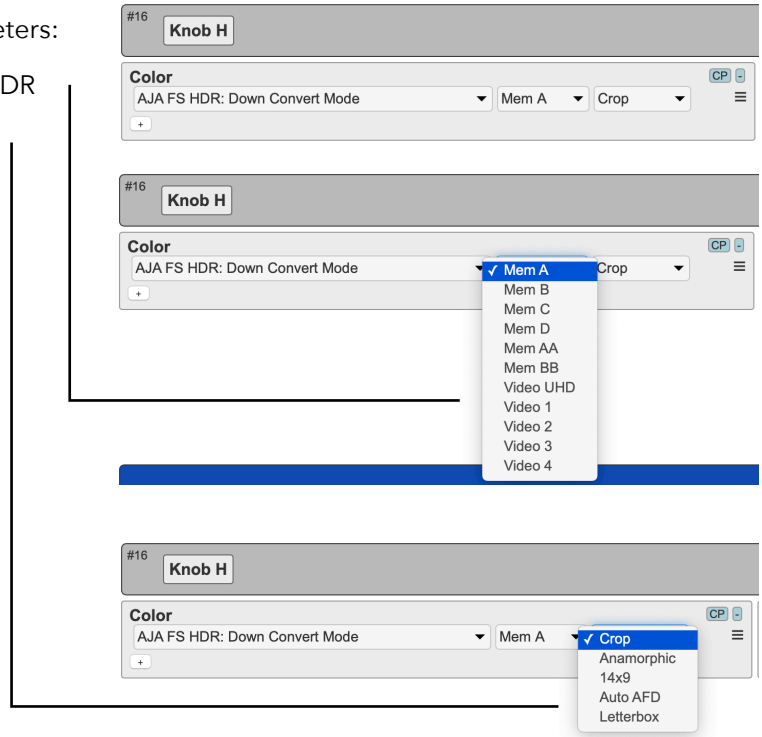
Mem A = 2 = Video 2 = Channel Video 2

Mem A = 3 = Video 3 = Channel Video 3

Mem A = 4 = Video 4 = Channel Video 4

A action is typically build up of two parameters:

- Selection of the Video Channel on the HDR
- Selection of a specific value if it exists

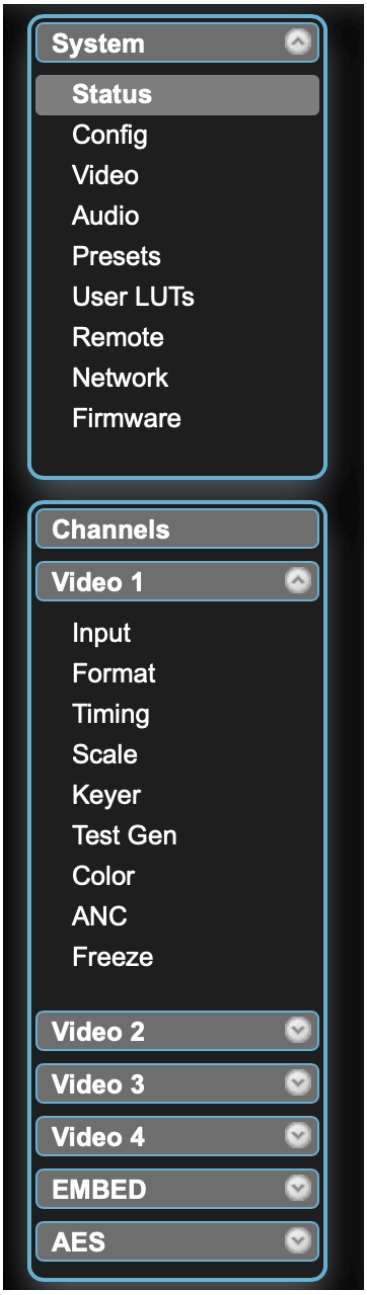


This is a overview of the actions implemented in the Device Core

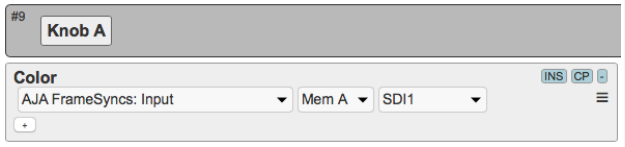
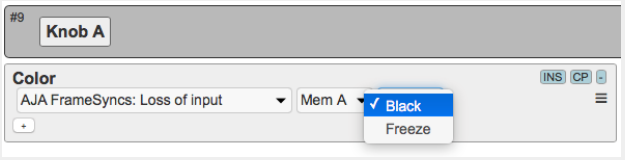
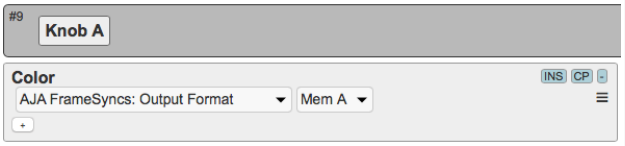
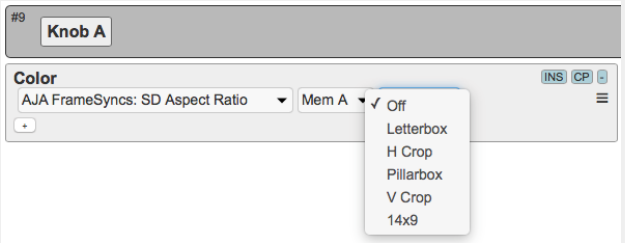
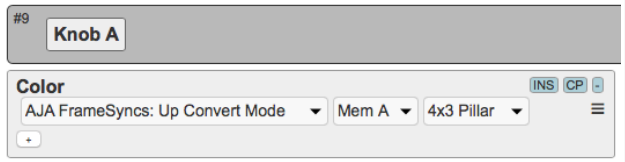
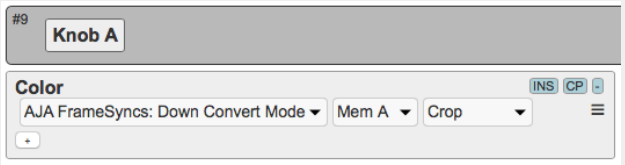
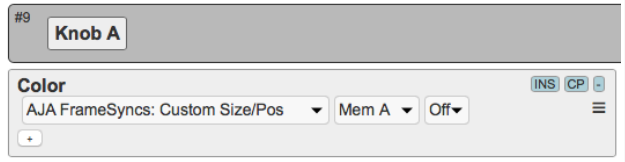
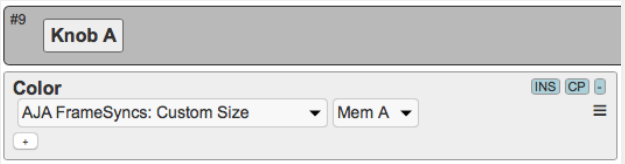
AJA FS HDR: Input
AJA FS HDR: Loss of input
AJA FS HDR: Output Format
AJA FS HDR: SD Aspect Ratio
AJA FS HDR: Up Convert Mode
AJA FS HDR: Down Convert Mode
AJA FS HDR: Custom Size/Pos
AJA FS HDR: Custom Size
AJA FS HDR: Custom Aspect
AJA FS HDR: Custom Position
AJA FS HDR: Region of Interest
AJA FS HDR: ROI
AJA FS HDR: Test Pattern Gen
AJA FS HDR: Test Pattern Type
AJA FS HDR: ProcAmp Enable
AJA FS HDR: ProcAmp Settings
AJA FS HDR: Transform
AJA FS HDR: Colorfront Live - Dyn Range&Garmut IN
AJA FS HDR: Colorfront Live - Dyn Range&Garmut OUT
AJA FS HDR: Colorfront Live - SDR Preview
AJA FS HDR: Colorfront Live - Colorfront Engine
AJA FS HDR: Colorfront Live - HDR Amount
AJA FS HDR: Colorfront Live - Amb Light Comp
AJA FS HDR: Colorfront Live - HDR Log Look
AJA FS HDR: Colorfront Live - SDR Softness
AJA FS HDR: Colorfront Live - Lift
AJA FS HDR: Colorfront Live - Gamma
AJA FS HDR: Colorfront Live - Gain
AJA FS HDR: Colorfront Live - Saturation
AJA FS HDR: Colorfront Live - Exposure
AJA FS HDR: Colorfront Live - Color Temp
AJA FS HDR: Colorfront Live - Tint
AJA FS HDR: Colorfront Live - BT.2408 Mode
AJA FS HDR: Colorfront Live - Colorfront Reset
AJA FS HDR: BBC HLG LUT
AJA FS HDR: User LUT
AJA FS HDR: Dynamic LUT - In Colorspace
AJA FS HDR: Dynamic LUT - Out Colorspace
AJA FS HDR: Dynamic LUT - In Scale
AJA FS HDR: Dynamic LUT - Out Scale
AJA FS HDR: Dynamic LUT - Transfer Characteristic
AJA FS HDR: Video Legalizer
AJA FS HDR: Video Legalizer Settings
AJA FS HDR: Freeze Output
AJA FS HDR: Color Corrector
AJA FS HDR: CC Gain
AJA FS HDR: CC Black
AJA FS HDR: CC Gamma
AJA FS HDR: Fan Speed
AJA FS HDR: Output Frame Rate
AJA FS HDR: Genlock Source
AJA FS HDR: Mon 2K Crop
AJA FS HDR: HDMI RGB Range
AJA FS HDR: Monitor Map
AJA FS HDR: Preset
AJA FS HDR: Audio Embed Map
AJA FS HDR: Audio Out

The Actions are divided by using the control categories from the Frame Sync.

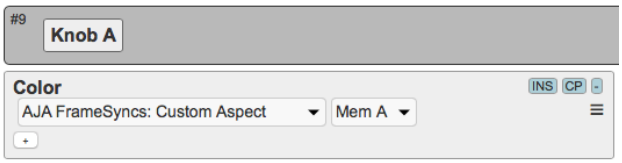
AJA FS HDR: Input AJA FS HDR: Loss of input	Channels - Input
AJA FS HDR: Output Format AJA FS HDR: SD Aspect Ratio AJA FS HDR: Up Convert Mode AJA FS HDR: Down Convert Mode	Channels - Format
AJA FS HDR: Custom Size/Pos AJA FS HDR: Custom Size AJA FS HDR: Custom Aspect AJA FS HDR: Custom Position AJA FS HDR: Region of Interest AJA FS HDR: ROI	Channels - Scale
AJA FS HDR: Test Pattern Gen AJA FS HDR: Test Pattern Type	Channels - Test Gen
AJA FS HDR: ProcAmp Enable AJA FS HDR: ProcAmp Settings AJA FS HDR: Transform AJA FS HDR: Colorfront Live - Dyn Range&Garmut IN AJA FS HDR: Colorfront Live - Dyn Range&Garmut OUT AJA FS HDR: Colorfront Live - SDR Preview AJA FS HDR: Colorfront Live - Colorfront Engine AJA FS HDR: Colorfront Live - HDR Amount AJA FS HDR: Colorfront Live - Amb Light Comp AJA FS HDR: Colorfront Live - HDR Log Look AJA FS HDR: Colorfront Live - SDR Softness AJA FS HDR: Colorfront Live - Lift AJA FS HDR: Colorfront Live - Gamma AJA FS HDR: Colorfront Live - Gain AJA FS HDR: Colorfront Live - Saturation AJA FS HDR: Colorfront Live - Exposure AJA FS HDR: Colorfront Live - Color Temp AJA FS HDR: Colorfront Live - Tint AJA FS HDR: Colorfront Live - BT.2408 Mode AJA FS HDR: Colorfront Live - Colorfront Reset AJA FS HDR: BBC HLG LUT AJA FS HDR: User LUT AJA FS HDR: Dynamic LUT - In Colorspace AJA FS HDR: Dynamic LUT - Out Colorspace AJA FS HDR: Dynamic LUT - In Scale AJA FS HDR: Dynamic LUT - Out Scale AJA FS HDR: Dynamic LUT - Transfer Characteristic AJA FS HDR: Video Legalizer AJA FS HDR: Video Legalizer Settings	Channels - Color
AJA FS HDR: Freeze Output	Channels - Freeze
AJA FS HDR: Color Corrector AJA FS HDR: CC Gain AJA FS HDR: CC Black AJA FS HDR: CC Gamma	Channels - Color
AJA FS HDR: Fan Speed	Status - Config
AJA FS HDR: Output Frame Rate AJA FS HDR: Genlock Source AJA FS HDR: Mon 2K Crop AJA FS HDR: HDMI RGB Range AJA FS HDR: Monitor Map	Status - Video
AJA FS HDR: Preset	Status - Presets
AJA FS HDR: Audio Embed Map AJA FS HDR: Audio Out	Channels - EMBED + AES



This is a table of actions for AJA FS HDR Device Core

Input 	Routes input to the selected Channel *Binary triggers:* Sets the selected input to the selected channel. *Pulse inputs:* Will cycle through the Inputs for the selected channel. *Displays:* "Input/Input x"
Loss of input 	Selects option for Loss of input *Binary triggers:* Sets the selected mode for loss of input. *Pulse inputs:* Will cycle through options for loss of input *Displays:* "In Loss/mode"
Output Format 	Selects Output Format *Binary triggers:* Not implemented *Pulse inputs:* Will cycle through options for Output Format *Displays:* "Output/Format"
SD Aspect Ratio 	Selects SD Aspect Ratio *Binary triggers:* Sets the selected SD Aspect Ratio *Pulse inputs:* Will cycle through options for Aspect Ratio *Displays:* "SD Aspect/mode"
Up Convert Mode 	Selects Up Convert Mode *Binary triggers:* Sets the selected Up Convert Mode *Pulse inputs:* Will cycle through options for Convert Mode *Displays:* "Up Conv/mode"
Down Convert Mode 	Selects Down Convert Mode *Binary triggers:* Sets the selected Down Convert Mode *Pulse inputs:* Will cycle through options for Convert Mode *Displays:* "Dn Conv/mode"
Custom Size/Pos 	Turn off/on Custom Size/Position *Binary triggers:* Sets Custom Size/Postion to on/off *Pulse inputs:* Will cycle through on/off for Custom Size/Pos *Displays:* "Cust S/P/mode"
Custom Size 	Sets the Custom Size *Binary triggers:* Not implemented *Pulse inputs:* Will set the custom size *Displays:* "Cust Size/%"

Custom Aspect



Sets the Custom Aspect

Binary triggers: Not implemented

Pulse inputs: Will set the custom aspect

Displays: "Cust Asp/%"

Custom Postion

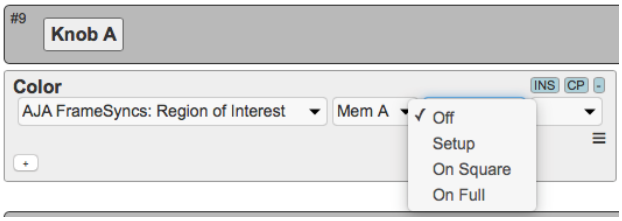
Sets the Custom Position for either H or V

Binary triggers: Not implemented

Pulse inputs: Will set the custom position for H or V

Displays: "CustPos H/%" or "CustPos V/%"

Region of Interest



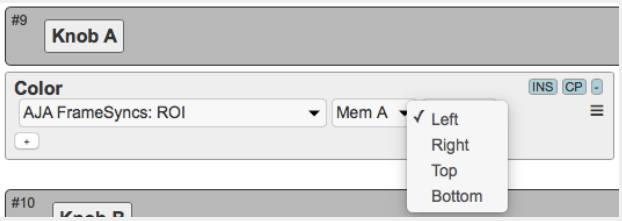
Sets the Region of Interest

Binary triggers: Sets Region of Interest. If Toggle is selected it will toggle between "Off" and the selected option.

Pulse inputs: Will cycle through options for Region of Interest

Displays: "ROI Mode/mode"

ROI



Sets the ROI parameters

Binary triggers: Not implemented

Pulse inputs: Will cycle through the selected ROI parameter

Displays: "ROI Left/%", "ROI Right/%", "ROI Top/%", "ROI Bottom/%"

Test Pattern Gen

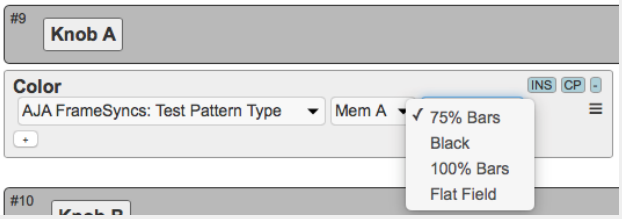
Controls the Test Pattern Generator

Binary triggers: Sets the generator to on or off

Pulse inputs: Will cycle through on/off

Displays: "Test Gen/mode"

Test Pattern Type



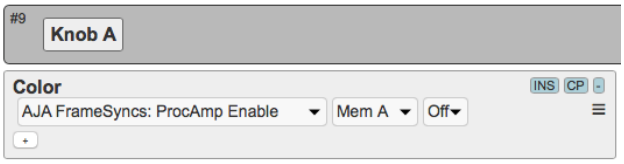
Controls the Test Pattern Type

Binary triggers: Sets the type to the chosen mode

Pulse inputs: Will cycle through the modes

Displays: "Test Ptrn/mode"

ProcAmp Enable



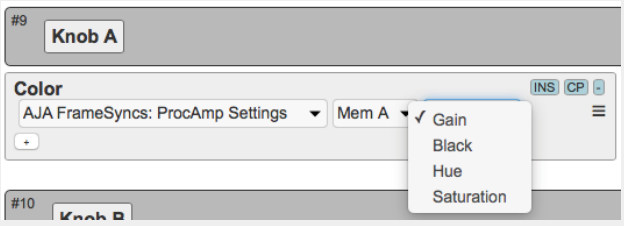
Sets ProcAmp to on or off

Binary triggers: Sets ProcAmp to the chosen mode

Pulse inputs: Will cycle through the modes

Displays: "ProcAmp/mode"

ProcAmp Settings



Controls the 4 ProcAmp values

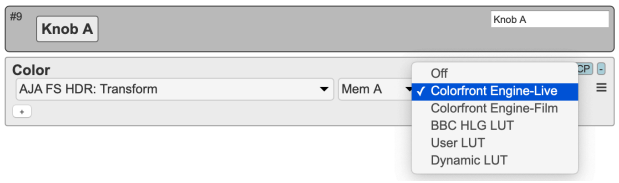
Binary triggers: Not implemented

Pulse inputs: Will cycle the selected ProcAmp parameter

Displays: "Gain/value" , "Black/value", "Hue/value", "Sat/value"

For "Gain" + "Black"
Analog inputs - Gain: Set the value between 0-1.5
Analog inputs - Black: Set the value between -20 - +20

Transform



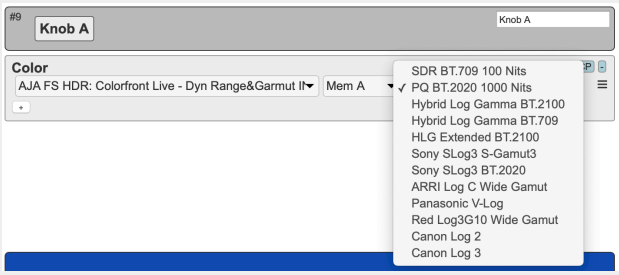
Sets the Transform type

Binary triggers: Sets ProcAmp to the chosen mode

Pulse inputs: Will cycle through the modes

Displays: "Transform/mode"

Colorfront Live - Dyn Range&Gamut In



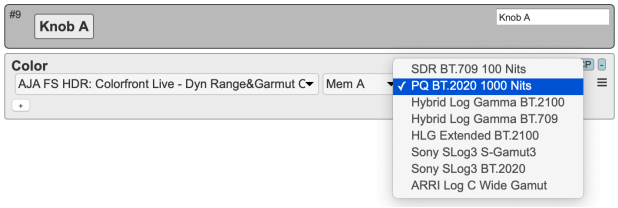
Sets the Dyn Range&Gamut IN
Only for Transform = Colorfront Engine-Live

Binary triggers: Sets Dyn Range&Gamut IN to the chosen mode

Pulse inputs: Will cycle through the modes

Displays: "Dyn R&G IN/mode"

Colorfront Live - Dyn Range&Gamut Out



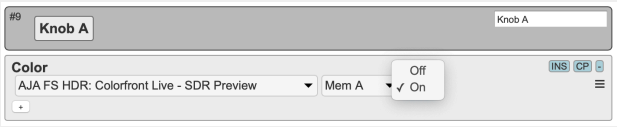
Sets the Dyn Range&Gamut OUT
Only for Transform = Colorfront Engine-Live

Binary triggers: Sets Dyn Range&Gamut OUT to the chosen mode

Pulse inputs: Will cycle through the modes

Displays: "Dyn R&G OUT/mode"

Colorfront Live - SDR Preview



Controls SDR Preview
Only for Transform = Colorfront Engine-Live

Binary triggers: Sets SDR Preview to on or off

Pulse inputs: Will cycle through on/off

Displays: "SDR Prev./mode"

Colorfront Live - Colorfront Engine

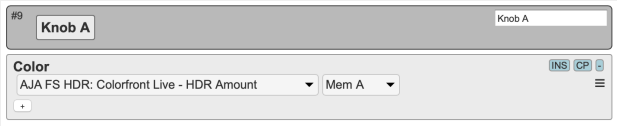
Controls Colorfront Engine
Only for Transform = Colorfront Engine-Live

Binary triggers: Sets Colorfront Engine to Default or Adjust

Pulse inputs: Will cycle through Default/Adjust

Displays: "Cfr Engine/mode"

Colorfront Live - HDR Amount



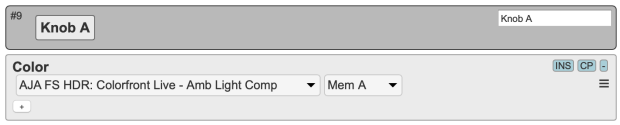
Adjust HDR Amount
Only for Transform = Colorfront Engine-Live

Binary triggers: Not implemented

Pulse inputs: Will cycle the HDR Amount value

Displays: "HDR Amount/value"

Colorfront Live - Amb Light Comp



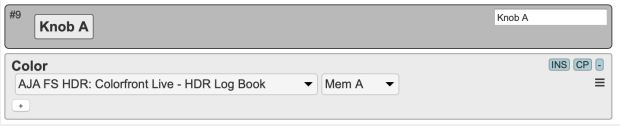
Adjust Amb Light Comp
Only for Transform = Colorfront Engine-Live

Binary triggers: Not implemented

Pulse inputs: Will cycle the Amb Light Comp value

Displays: "Amb L. Com/value"

Colorfront Live - HDR Log Look



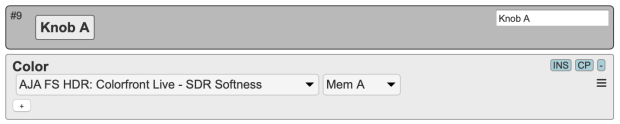
Adjust HDR Log Look
Only for Transform = Colorfront Engine-Live

Binary triggers: Not implemented

Pulse inputs: Will cycle the HDR Log Look value

Displays: "HDR L. Loo/value"

Colorfront Live - SDR Softness



Adjust SDR Softness
Only for Transform = Colorfront Engine-Live

Binary triggers: Not implemented

Pulse inputs: Will cycle the SDR Softness value

Displays: "SDR Soft./value"

Colorfront Live - Lift

Controls the Colorfront Engine Lift RGB + Master Values
Only for Transform = Colorfront Engine-Live

Binary triggers: Not implemented

Pulse inputs: Will cycle the selected RGB + Master Lift value

Displays: "Lift R/value" , "Lift G/value", "Lift B/value", "Lift M/value"

Colorfront Live - Gamma

Controls the Colorfront Engine Gamma RGB + Master Values
Only for Transform = Colorfront Engine-Live

Binary triggers: Not implemented

Pulse inputs: Will cycle the selected RGB + Master Gain value

Displays: "Gamma R/value" , "Gamma G/value", "Gamma B/value", "Gamma M/value"

Colorfront Live - Gain

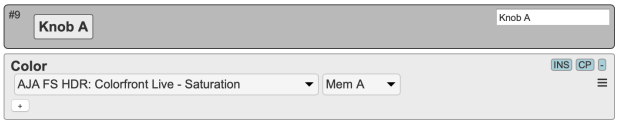
Controls the Colorfront Engine Gain RGB + Master Values
Only for Transform = Colorfront Engine-Live

Binary triggers: Not implemented

Pulse inputs: Will cycle the selected RGB + Master Gain value

Displays: "Gain R/value" , "Gain G/value", "Gain B/value", "Gain M/value"

Colorfront Live - Saturation



Adjust Saturation
Only for Transform = Colorfront Engine-Live

Binary triggers: Not implemented

Pulse inputs: Will cycle the Saturation value

Displays: "Saturation/value"

Colorfront Live - Exposure

Adjust Exposure
Only for Transform = Colorfront Engine-Live

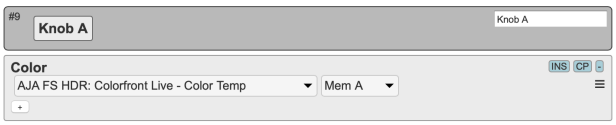
Analog inputs: Set the value between -4.000-4.000

Binary triggers: Not implemented

Pulse inputs: Will cycle the Exposure value

Displays: "Exposure/value"

Colorfront Live - Color Temp



Adjust Color Temp
Only for Transform = Colorfront Engine-Live

Binary triggers: Not implemented

Pulse inputs: Will cycle the Color Temperature value

Displays: "Color Temp/value"

Colorfront Live - Tint

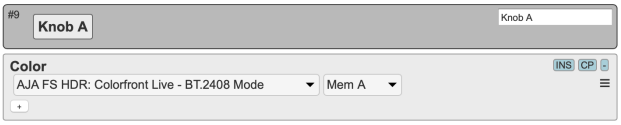
Adjust Color Temp
Only for Transform = Colorfront Engine-Live

Binary triggers: Not implemented

Pulse inputs: Will cycle the Tint value

Displays: "Tint/value"

Colorfront Live - BT.2408 Mode



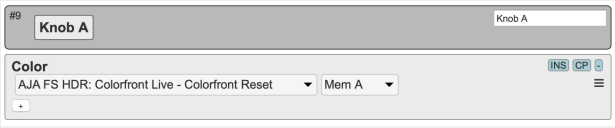
Adjust BT.2408 Mode Value
Only for Transform = Colorfront Engine-Live

Binary triggers: Not implemented

Pulse inputs: Will cycle the BT.2408 value

Displays: "BT.2408 M./value"

Colorfront Live - Colorfront Reset



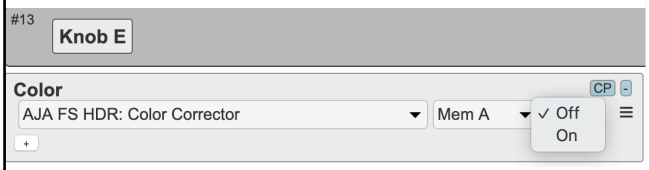
Reset the Colorfront values
Only for Transform = Colorfront Engine-Live

Binary triggers: Resets Colorfront values but *only* with a long press

Pulse inputs: Not implemented

Displays: "CFE-Live/Reset"

Color Correct



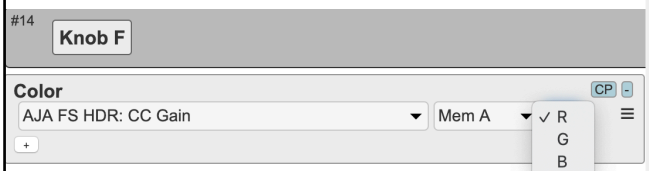
Enables Color Correct
Only for Transform = Non-Colorfront Engine

Binary triggers: Not implemented

Pulse inputs: Will toggle between On/Off

Displays: ColorCorr ON/ OFF

CC Gain



Controls the CC Gain RGB

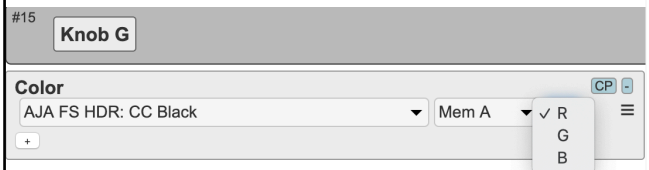
Only for Transform = Non-Colorfront Engine

Binary triggers: Not implemented

Hold Down: Resets individual value to Unity

Pulse inputs: Will cycle the selected RGB
Displays: "Gain R/value" , "Gain G/value", "Gain B/value"

CC Black



Controls the CC Black RGB

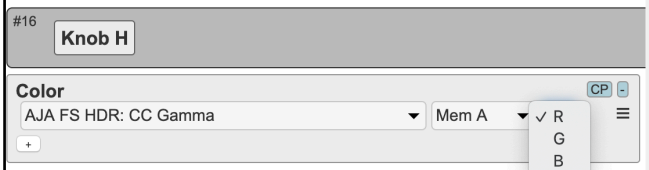
Only for Transform = Non-Colorfront Engine

Binary triggers: Not implemented

Hold Down: Resets individual value to Unity

Pulse inputs: Will cycle the selected RGB
Displays: "Black R/value" , "Black G/value", "Black B/value"

CC Gamma



Controls the CC Gamma RGB

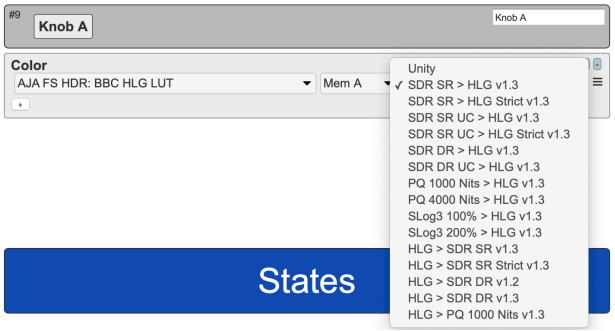
Only for Transform = Non-Colorfront Engine

Binary triggers: Not implemented

Hold Down: Resets individual value to Unity

Pulse inputs: Will cycle the selected RGB
Displays: "Gamma R/value" , "Gamma G/value", "Gamma B/value"

BBC HLG LUT



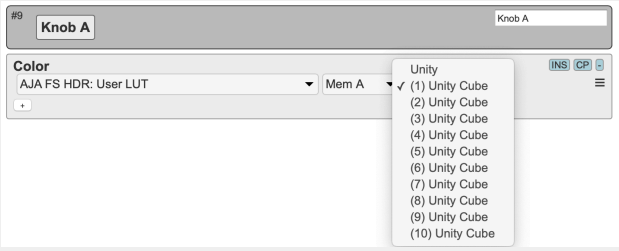
Sets the BBC HLG Lut mode
Only for Transform = BBC HLG LUT

Binary triggers: Sets BBC HLG Lut to the chosen mode

Pulse inputs: Will cycle through the modes

Displays: "BBC LUT/mode"

User LUT



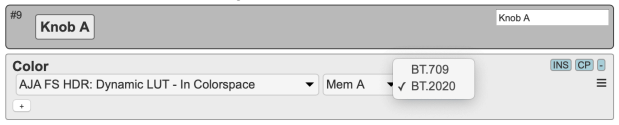
Sets the User LUT mode
Only for Transform = User LUT

Binary triggers: Sets User LUT to the chosen mode

Pulse inputs: Will cycle through the modes

Displays: "User LUT/mode"

Dynamic LUT - In Colorspace



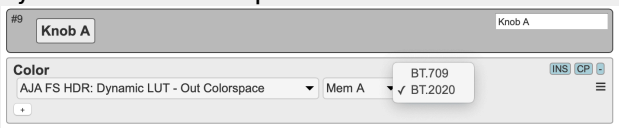
Sets the In Colorspace option for Dynamic LUT
Only for Transform = Dynamic LUT

Binary triggers: Sets In Colorspace to the chosen mode

Pulse inputs: Will cycle through the modes

Displays: "In Col.Sp/mode"

Dynamic LUT - Out Colorspace



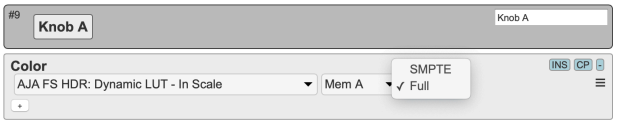
Sets the Out Colorspace option for Dynamic LUT
Only for Transform = Dynamic LUT

Binary triggers: Sets Out Colorspace to the chosen mode

Pulse inputs: Will cycle through the modes

Displays: "Out Col.Sp/mode"

Dynamic LUT - In Scale



Sets the In Scale option for Dynamic LUT
Only for Transform = Dynamic LUT

Binary triggers: Sets In Scale to the chosen mode

Pulse inputs: Will cycle through the modes

Displays: "In Scale/mode"

Dynamic LUT - In Scale

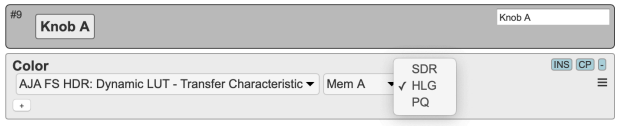
Sets the Out Scale option for Dynamic LUT
Only for Transform = Dynamic LUT

Binary triggers: Sets Out Scale to the chosen mode

Pulse inputs: Will cycle through the modes

Displays: "Out Scale/mode"

Dynamic LUT - Transfer Characteristic



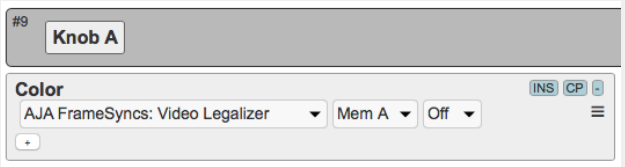
Sets the Transfer Characteristic for Dynamic LUT
Only for Transform = Dynamic LUT

Binary triggers: Sets Transfer Characteristic to the chosen mode

Pulse inputs: Will cycle through the modes

Displays: "Tra. Char/mode"

Video Legalizer



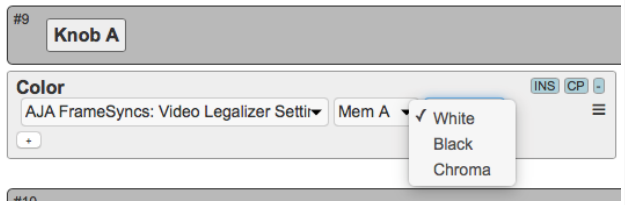
Sets the Video Legalizer to on or off

Binary triggers: Sets the Video Legalizer to the chosen mode

Pulse inputs: Will cycle through the modes

Displays: "Legalizer/mode"

Video Legalizer Settings



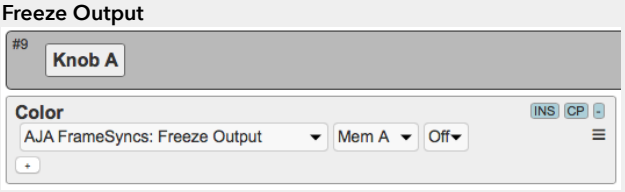
Controls the Video Legalizer Settings

Binary triggers: Not implemented

Pulse inputs: Will cycle through the selected values

Displays: "LegWhite/value", "LegBlack/value", "LegChroma/value"

Freeze Output



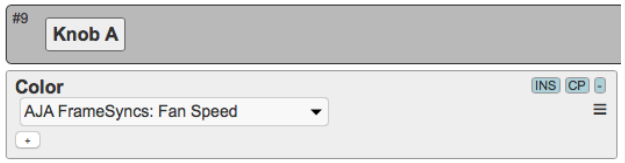
Controls the mode for Freeze Output

Binary triggers: Sets the Freeze Output to the chosen mode

Pulse inputs: Will cycle through the modes

Displays: "Freeze/mode"

Fan Speed



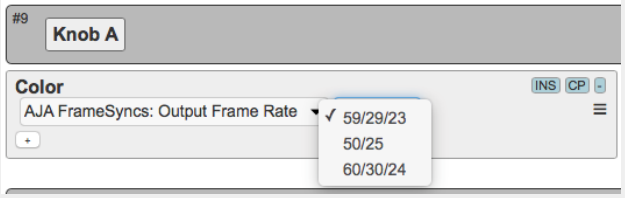
Controls the Fan Speed

Binary triggers: Not implemented

Pulse inputs: Will cycle Fan Speeds

Displays: "Fan Speed/value"

Output Frame Rate



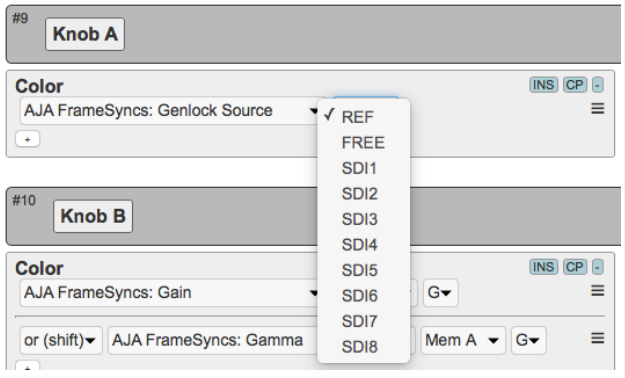
Controls the global Output Frame Rate

Binary triggers: Sets the Output Frame Rate to the chosen mode

Pulse inputs: Will cycle through the modes

Displays: "FrameRate/mode"

Genlock Source



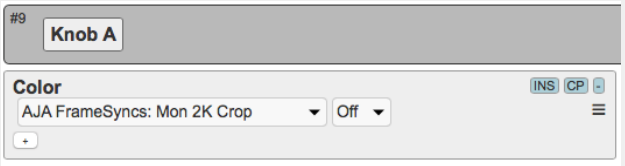
Controls the global Genlock Source

Binary triggers: Sets the Genlock Source to the chosen mode

Pulse inputs: Will cycle through the modes

Displays: "GenLokSrc/mode"

Mon 2K Crop



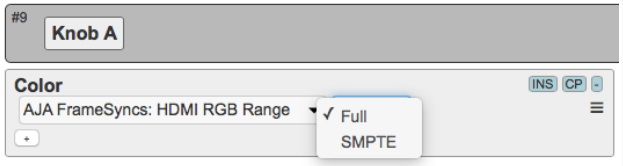
Controls the Mon 2K Crop

Binary triggers: Sets the Mon 2K Crop to the chosen mode

Pulse inputs: Will cycle through the modes

Displays: "Mon2KCrop/mode"

HDMI RGB Range



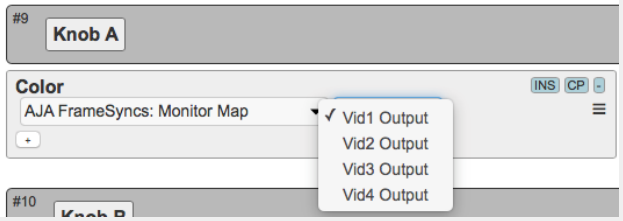
Controls the HDMI RGB Range

Binary triggers: Sets the HDMI RGB Range to the chosen mode

Pulse inputs: Will cycle through the modes

Displays: "HDMIRGBRA/mode"

Monitor Map



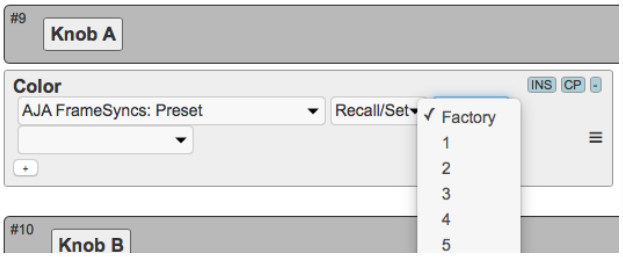
Controls the mapping of the Monitor Output

Binary triggers: Sets the Monitor Map Routing to the chosen mode

Pulse inputs: Will cycle through the modes

Displays: "Mon Map/mode"

Presets



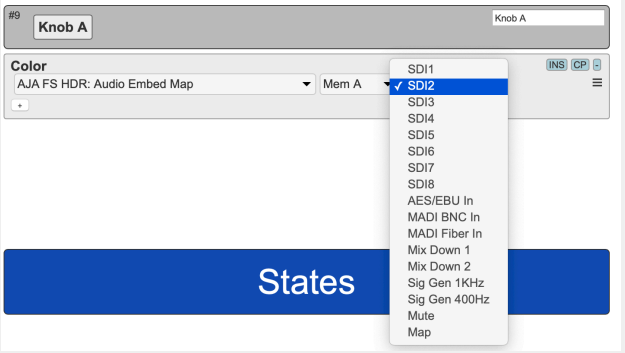
Controls the Presets on the FS. Select between 40 Presets and the Factory Default

Binary triggers: If "Recall/Set" - press and hold will perform a Preset Set
A single press will recall the preset
If "Set" a single press will save the preset
If "Recall" a single press will recall the preset

Pulse inputs: Not implemented

Displays:
If "Recall/Set" "Preset/no"
If "Set" "Set/no"
If "Recall "Recall/no"

Audio Embed Map



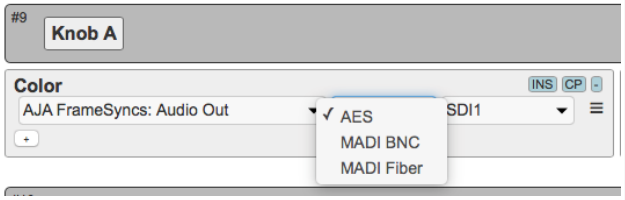
Controls the Audio Embedding Mapping

Binary triggers: Sets the Audio Embedding Mapping to the chosen mode

Pulse inputs: Will cycle through the modes

Displays: "Aud.Embed/mode"

Audio Out



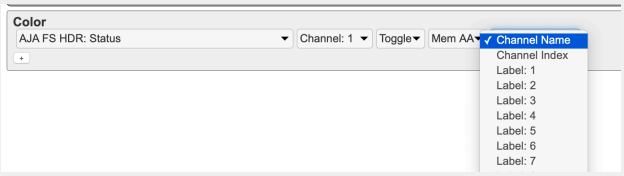
Controls the Audio Out for AES, MADI BND or MADI Fiber

Binary triggers: Sets the Audio Rout to the chosen channel

Pulse inputs: Will cycle through the channels for the chosen mode

Displays: "Audio Out/channel"

Status



Action used in combination with the Device Core option (see further below).

Binary triggers: If "Toggle" is not set the action will show connection status for the chosen Channel. If "Toggle" is set, the chosen channel will be selected in the Memory Group AA. Therefore actions you want to control based on selection from the Status Action should have Mem AA set as channel selection. Channel selection will later on be referred to as a "Global Channel" selection.

Pulse inputs: Not Integrated

Displays:
If connected: "Connected/FrameSync x/Channel: Y"
If connecting: "Initializing/FrameSync X/Channel: Y"
If unavailable: "Unavailable/Virtual Channel"

Button Colors:
If connected: Green
If connecting: Yellow
If unavailable: Red
If connected *and* with Toggle function: Purple

Device Configurations

Device configuration options exist:

- Index 0: **Sets additional number of Frame Synchronisers for control**
  - If "0" = default (just a single connection to the Frame Synchroniser set by the Device Core)
  - If "1-x" = Additional connecting Frame Synchronisers with consecutive IP addresses set by the Device Core

If the value is set to 4 the SKAARHOJ panel will try and connect to 4 additional Frame Synchronisers with a consecutive IP structure like this:

- **Device Core IP (FrameSync #1):** 192.168.10.92
- **FrameSync #2:** 192.168.10.93
- **FrameSync #3:** 192.168.10.94
- **FrameSync #4:** 192.168.10.95
- **FrameSync #5:** 192.168.10.96

Note: For this functionality it is *not* required to install additional Device Cores on the controller.

The Device Core option is suggested to be used in combination with the action "Status". This will display if connection have been established and offer the possibility to select one or more channels for control, and thereby enabling control of changing parameters for multiple channels across multiple frame synchronisers at the same time.

Color Corrector

The functionality have been developed with focus on controlling the Color Corrector parameters:

- Gain (RGB)
- Black (RGB)
- Gamma (RGB)

Across multiple Frame synchronisers. The parameters can be adjusted relatively from their original value or they can be reset to unity and thereby have the same values. If the values differ the display will show "MUL". If they values are aligned the actual value will be displayed. This functionality is only implemented for the above parameters.

Channel and System Limitations

There is a limitation on the number of channels that can be controlled. Adding additional channels/frame synchronisers takes up resources on the SKAARHOJ panel, and having too many channels will result in connection stability issues and in general stability issues in setting parameters.

Resources required for handling channels is **not linear**. So controlling 3 x AJA FS HDR units in HD mode (12 channels in total), takes up less resources than controlling 12 x AJA FS1-X units (fewer connections).

We have tested with success controlling 17 channels (from 2 x HDR, 2 x FS4 and 1 x FS1-X). We recommend not going beyond 18/20 channels (where majority of channels originate from HDR or FS4 units).

Mode: 2K/HD/SD or 4K/UltraHD

The FS4 and HDR can be set in either HD or UltraHD mode. In HD mode the 4 channels can be selected via the action "AJA FS HDR: Status" while in UltraHD mode only a single channel can be selected. You can combine control of Frame Synchronisers in HD and UltraHD mode.

It is not possible to change between HD and UltraHD mode on a Frame Synchroniser and have control, without rebooting the SKAARHOJ panel.

Channel Name

When a Frame Synchroniser is in HD mode, the 4 channels (FS4 & HDR) can be named via the Frame Synchroniser web GUI. This is also the case for UHD mode. These channel names can be rendered via the action "AJA FS HDR: System" if the option "Channel Name" is selected.

Connection Time

Connection time for a SKAARHOJ panel increase when adding multiple Frame Synchronisers. A SKAARHOJ panel connecting to 2 x HDR, 2 x FS4 and 1 x FS1-X units takes around 1:30 minute from boot up until all channels are controllable.

Delay of Channel Control

Adjusting multiple channels does not happen instantly. There is a delay before a change is transmitted to the selected channels. The more channels that are selected the longer delay.

If controlling 17 channels (from 2 x HDR, 2 x FS4 and 1 x FS1-X), the delay between channel 1 and channel 17 is approximately 3 seconds.

The delay is present when changing parameters directly on the Frame Synchronisers as well. It will take some time before a change is reflected on the display on the SKAARHOJ panel.

Speed of feedback in displays versus values on Frame Synchronisers

Due to the delay mentioned above there will be intermediate conditions where SKAARHOJ panel and Frame Synchronisers will appear "out of sync". Consider the following two scenarios

- Multiple channels have been selected. A reset to unity is performed for for Gain Red (setting all channels to value 1.00) the SKAARHOJ display will show 1.00 while it will take x seconds for the value to be set on all channels. So in the intermediate timeframe we have a "out of sync" scenario.
- Multiple channels have been selected. Presets are recalled from the Frame Synchronisers which happens almost instant. However it will take x seconds for the values to be updated on the SKAARHOJ displays.

Stressing the System

If many values are changed rapidly for multiple channels there can be scenarios where change in values will not reach the Frame Synchronisers. Consider the following scenario:

- Multiple channels have been selected. They are reset to unity (all equal in value). A encoder is moved rapidly many times. Values will be transmitted, but might not reach the Frame Synchroniser channels intime until a new value will be transmitted. This can result in channels having different values, although the intention was for them to have the same value. In such a case MUL will appear in the display to indicate all channels does not have the same value. A delay before MUL appear is to be expected.

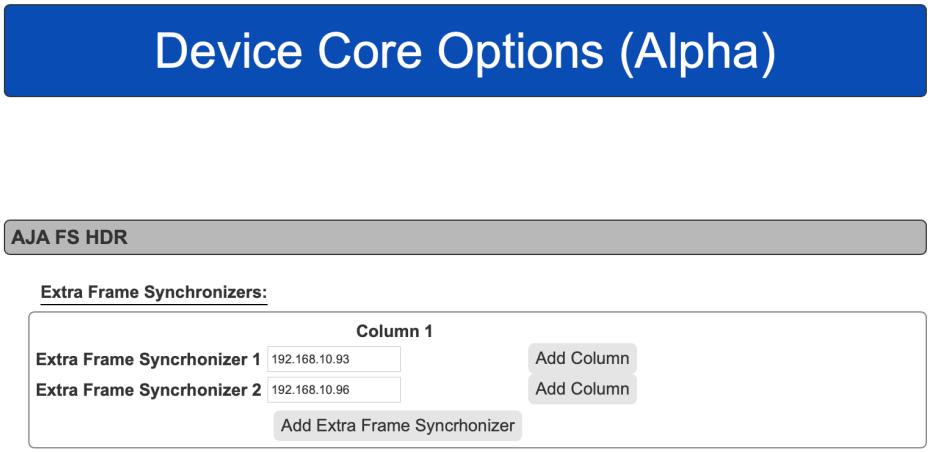
When dealing with multiple Frame Synchronisers in this way each Frame Synchroniser will have a "local channel" while the system will work with "global channels". A example is given below. The Global Channel is what you set via the action "AJA FS HDR: Status"

	Mode	Local Channel	Global Channel
HDR #1	HD	1	1
HDR #1		2	2
HDR #1		3	3
HDR #1		4	4
HDR #2	UHD	1	5
FS4 #1	HD	1	6
FS4 #1		2	7
FS4 #1		3	8
FS4 #1		4	9
FS4 #2	HD	1	10
FS4 #2		2	11
FS4 #2		3	12
FS4 #2		4	13
FS1-X	-	1 (Color control)	14
FS1-X	-	2	15

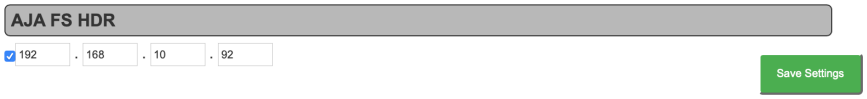
Example - new method:

Go to the configuration page of your controller. Scroll down to the section called “Device Core Options. Here you can add *additional* Frame Synchronisers to control.

NOTICE: This method will *only* work if no Device Core options have been set under Device Core options in the “Manage Media” tab.



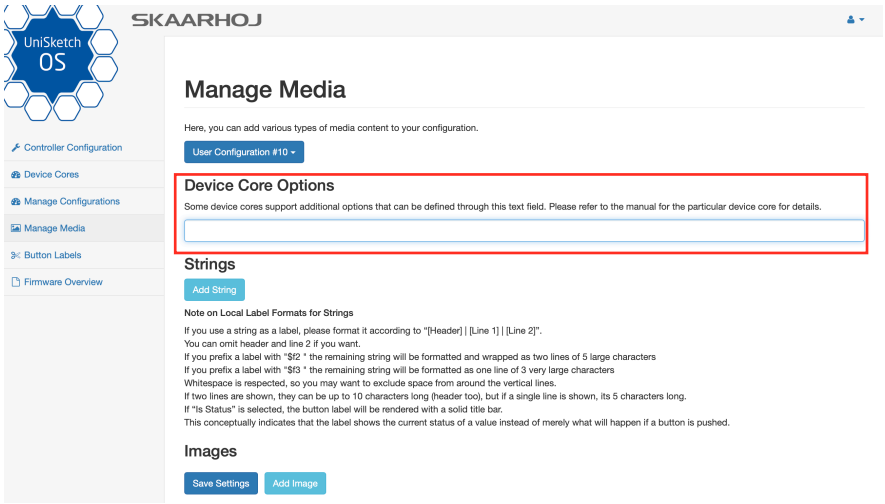
Notice the Device Core IP itself will be Frame Sync #1



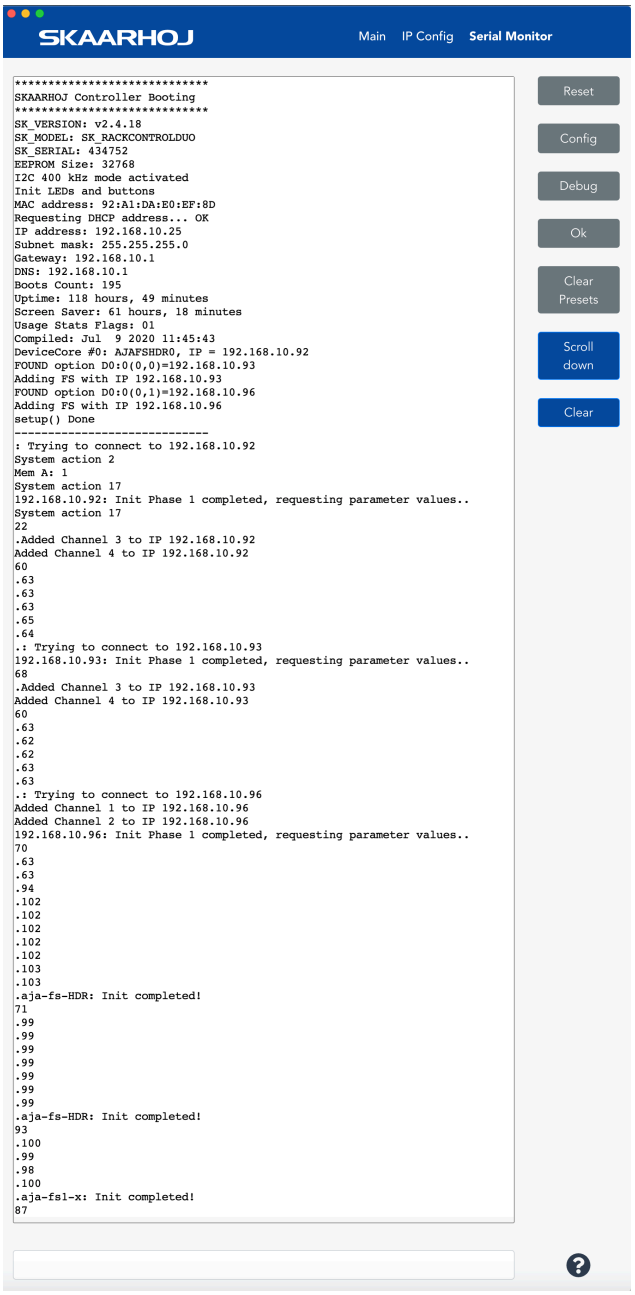
So the above example gives

- **Device Core IP (FrameSync #1):** 192.168.10.92
- **FrameSync #2:** 192.168.10.93
- **FrameSync #3:** 192.168.10.96

In order for the above to take effect *no* options must be set under the “Manage Media” tab.



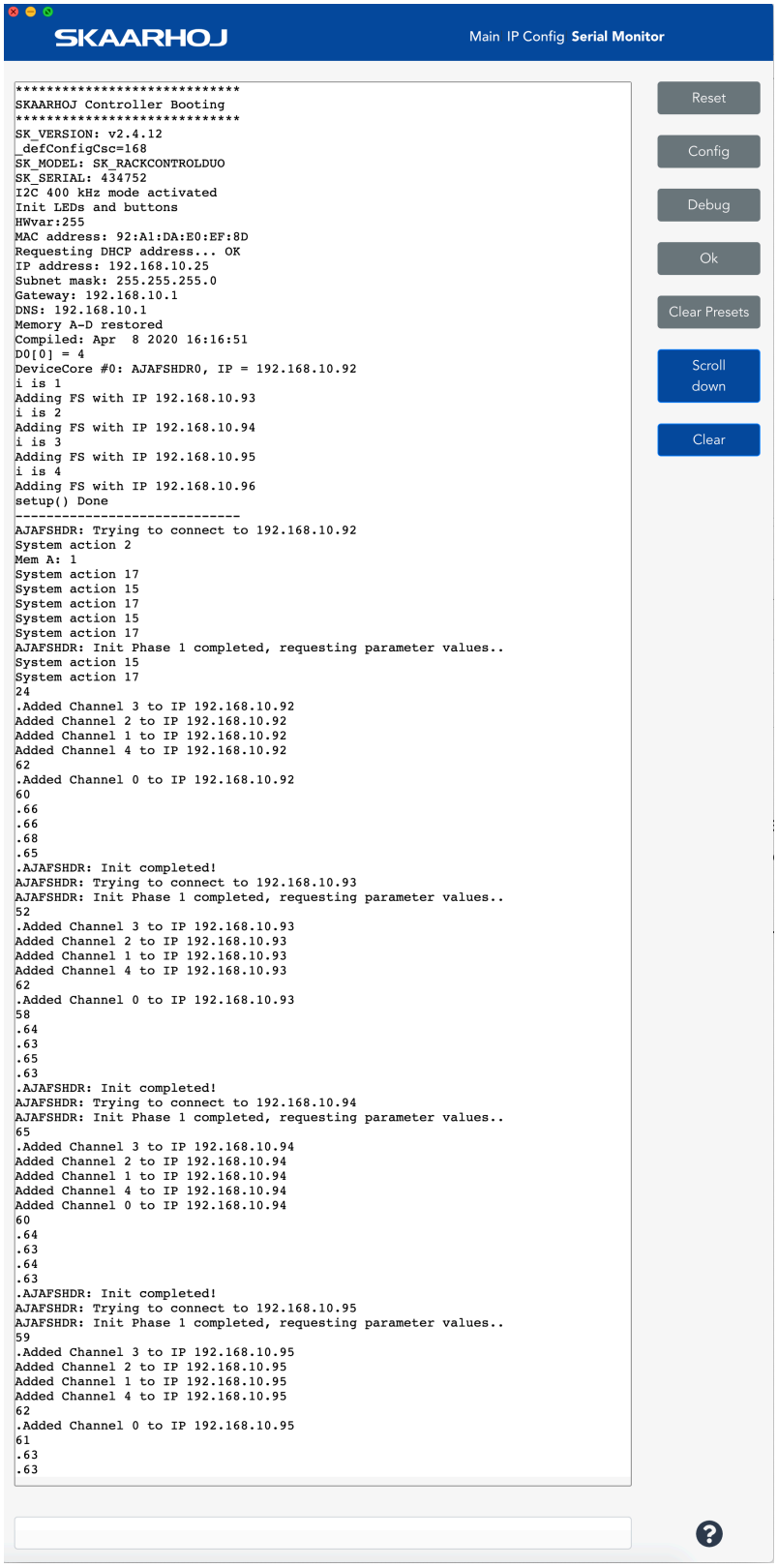
Output from the Serial Monitor when connecting



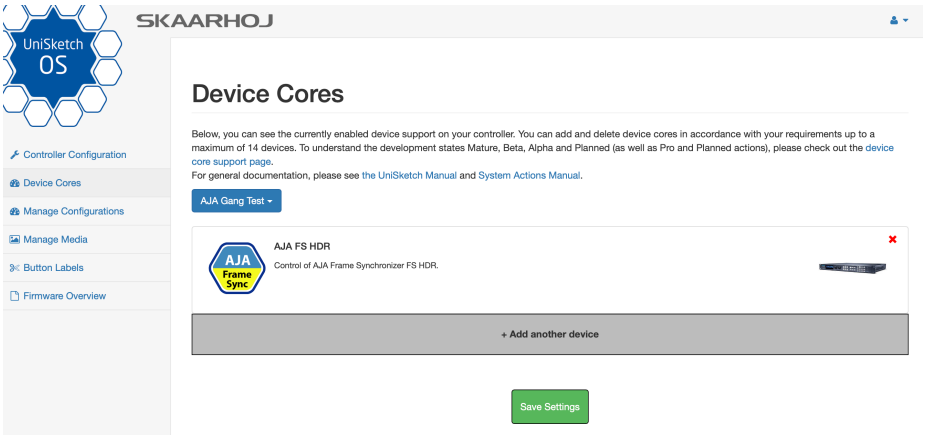
Example - old method:

Setting the Device Core option to connect to additional 4 Frame Synchronisers could look like this device configuration code: "D0:0=4" where the general form would be "Dx:y=z" where "x" is the number of the device core as installed on the controller (starting with zero for the first device core), "y" the index number and "z" the value for that index.

To confirm that a device configuration is in fact detected by the controller, please check it out on the serial monitor where it will be mentioned:



Example: If the AJA FS HDR device core is the first like below:



Then settings the additional connection behaviour would be set by this configuration under “Manage Media” on the configuration page for your controller