

Device: AJA FS HDR



Introduction

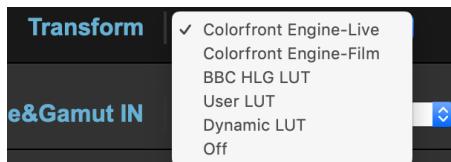
A number of parameters on the AJA FS HDR frame synchronizer can be controlled from a SKAARHOJ control panel. The complete feature set is not implemented but a large variety of actions can be found. This document gives you an overview of possible control parameters.

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.

 A screenshot of the SKAARHOJ Serial Monitor interface. The top navigation bar includes "Firmware Updater", "Main", "IP Config", and "Serial". On the right side, there are buttons for "Send", "Reset", "Config", "Debug", "Ok", "Clear Presets", "Scroll down", and "Clear". The main window displays a log of serial communication. The log starts with the device booting and connecting to the network, followed by a series of system actions and a message from AJAFSHDR indicating Phase 1 completed.

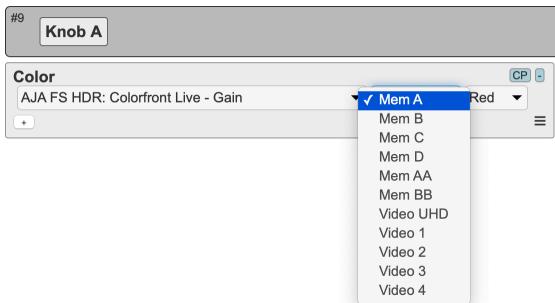
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*****
SKAARHOJ Controller Booting
*****
SK_VERSION: branch_aja_fs_hdr
_defConfigCsc=243
SK_MODEL: SK_RCPV2
SK_SERIAL: 491459
EEPROM size: 32 kB
I2C 400 KHz mode activated
Init LEDs and buttons
Init Joystick
Calibration for analog component #1 (Fader): Start: 105, End: 112, Hysteresis: 5
Calibration for analog component #2 (Wheel): Start: 2, End: 3, Hysteresis: 4
HWVar:255
MAC address: 90:A1:DA:3B:48:7F
Requesting DHCP address... OK
IP address: 192.168.10.130
Subnet mask: 255.255.255.0
Gateway: 192.168.10.1
DNS: 192.168.10.1
Memory A-D restored
Compiled: Oct 29 2019 09:33:57
DeviceCore #0: AJAFSHDR0, IP = 192.168.10.26
setup() Done
-----
AJAFSHDR: Trying to connect to 192.168.10.26
HWc#46 Down Analog: 63
System action 2
Mem A: 1
System action 15
System action 17
System action 7
System action 17
AJAFSHDR: Init Phase 1 completed, requesting parameter values...
System action 17
System action 17
System action 17
38
.62

```

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

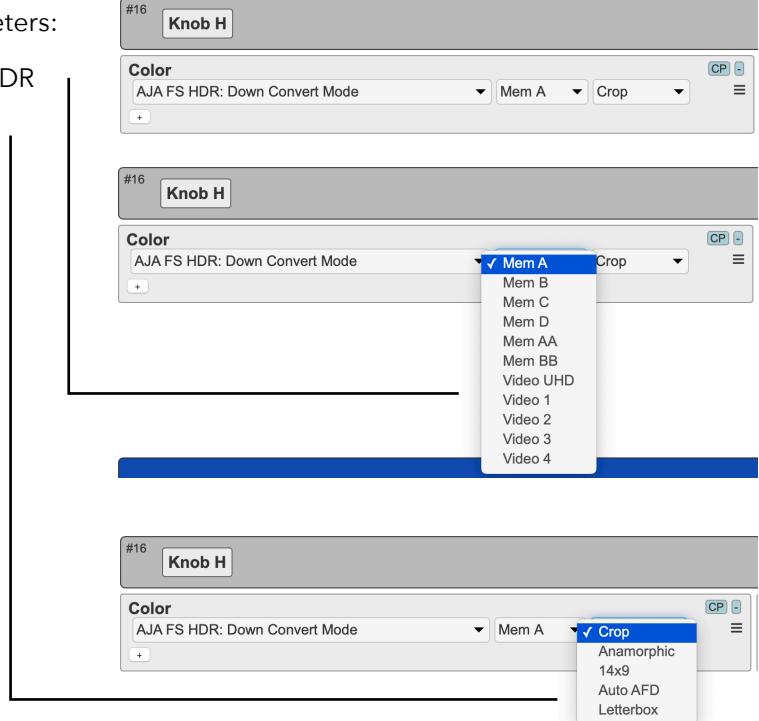
Mem A = 2 = Video 2 = Channel Video 2

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



SKAARHOJ DEVICE CORES

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.

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AJA FS HDR: Monitor Map
AJA FS HDR: Preset
AJA FS HDR: Audio Embed Map
AJA FS HDR: Audio Out

Channels - Input

Channels - Format

Channels - Scale

Channels - Test Gen

Channels - Color

Channels - Freeze

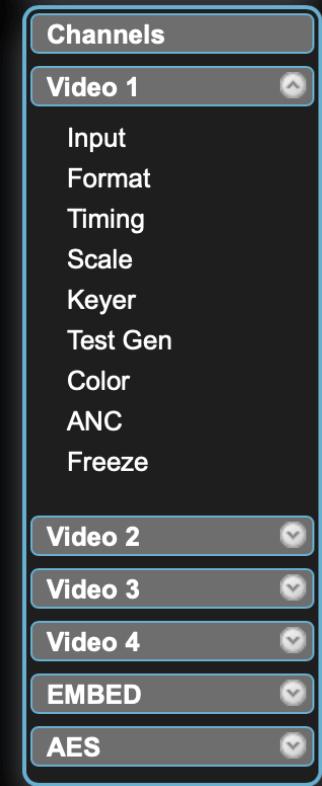
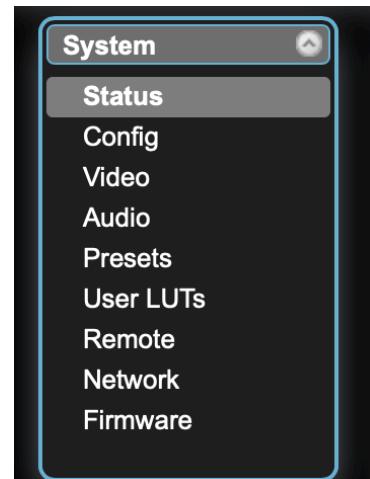
Channels - Color

Status - Config

Status - Video

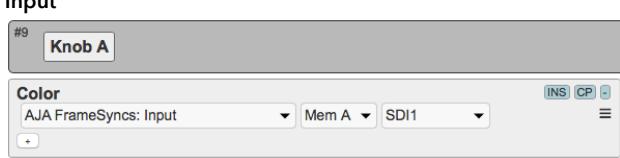
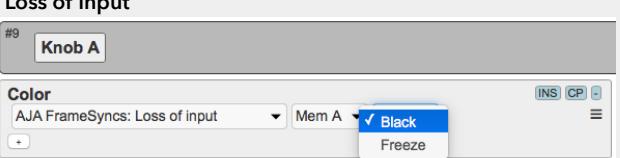
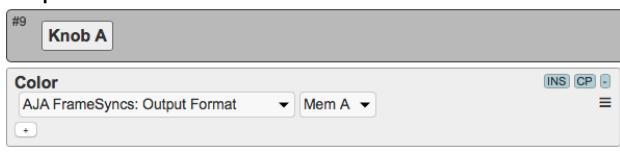
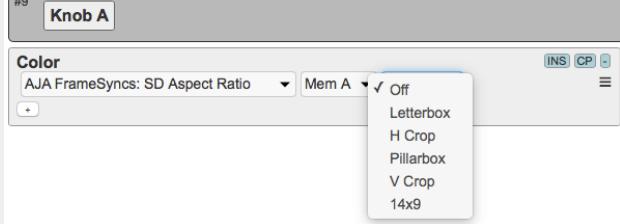
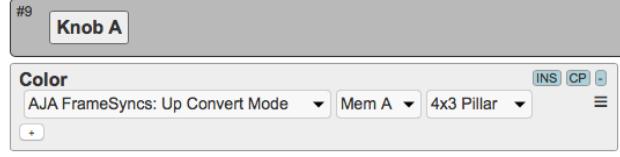
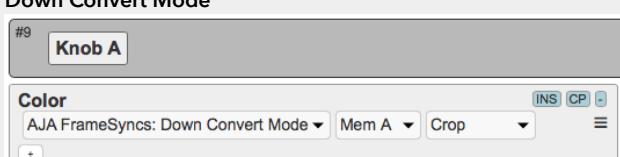
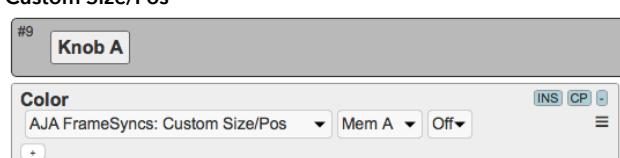
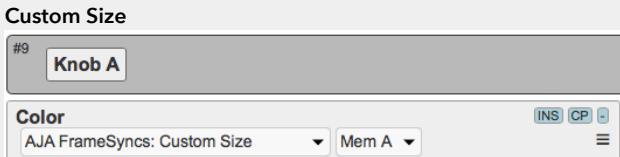
Status - Presets

Channels - EMBED + AES

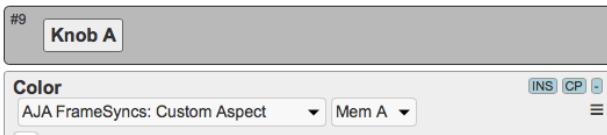
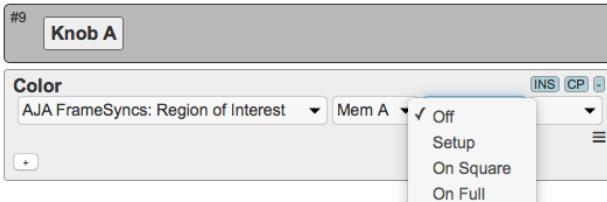
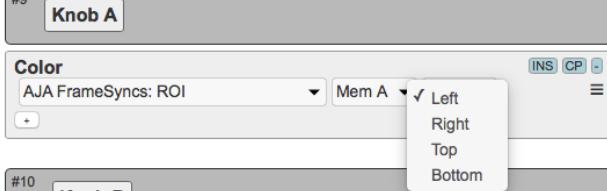
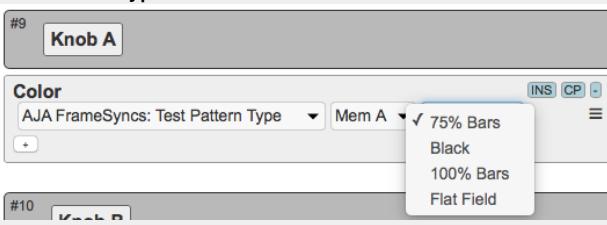
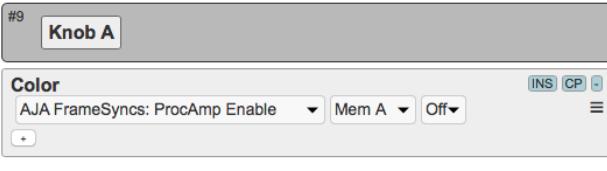


SKAARHOJ DEVICE CORES

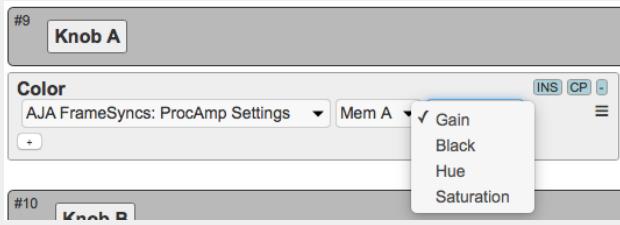
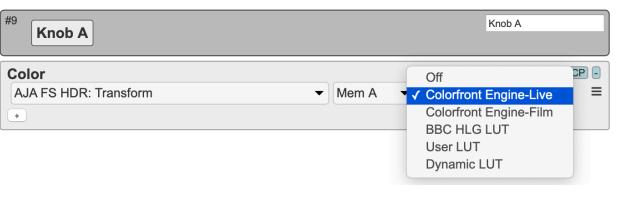
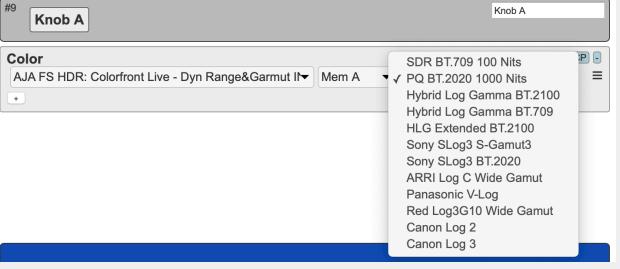
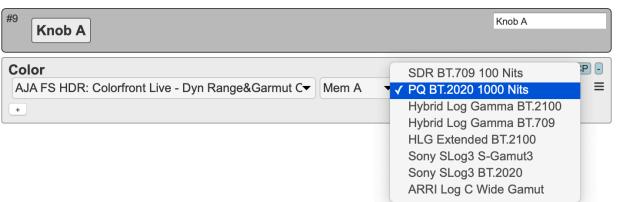
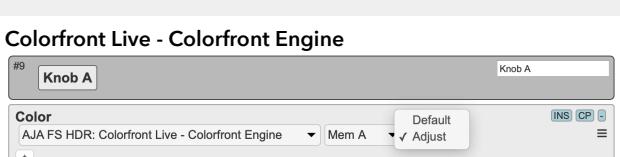
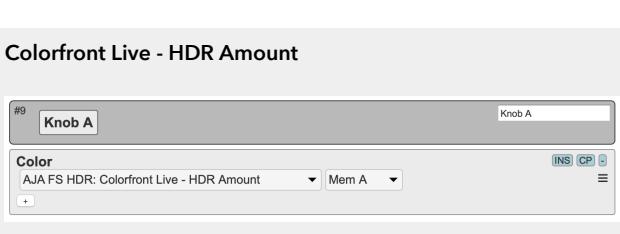
This is a table of actions for AJA FS HDR Device Core

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

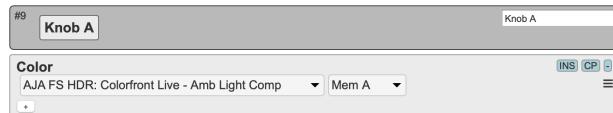
SKAARHOJ DEVICE CORES

Custom Aspect  <p>#9 Knob A</p> <p>Color AJA FrameSyncs: Custom Aspect ▾ Mem A ▾ INS CP ▾</p>	Sets the Custom Aspect <i>Binary triggers:</i> Not implemented <i>Pulse inputs:</i> Will set the custom aspect <i>Displays:</i> "Cust Asp/%"
Custom Postion  <p>#9 Knob A</p> <p>Color AJA FrameSyncs: Custom Position ▾ Mem A ▾ INS CP ▾</p>	Sets the Custom Position for either H or V <i>Binary triggers:</i> Not implemented <i>Pulse inputs:</i> Will set the custom position for H or V <i>Displays:</i> "CustPos H/%" or "CustPos V/%"
Region of Interest  <p>#9 Knob A</p> <p>Color AJA FrameSyncs: Region of Interest ▾ Mem A ▾ INS CP ▾</p>	Sets the Region of Interest <i>Binary triggers:</i> Sets Region of Interest. If Toggle is selected it will toggle between "Off" and the selected option. <i>Pulse inputs:</i> Will cycle through options for Region of Interest <i>Displays:</i> "ROI Mode/mode"
ROI  <p>#9 Knob A</p> <p>Color AJA FrameSyncs: ROI ▾ Mem A ▾ INS CP ▾</p>	Sets the ROI parameters <i>Binary triggers:</i> Not implemented <i>Pulse inputs:</i> Will cycle through the selected ROI parameter <i>Displays:</i> "ROI Left/%", "ROI Right/%", "ROI Top/%", "ROI Bottom/%"
Test Pattern Gen  <p>#9 Knob A</p> <p>Color AJA FrameSyncs: Test Pattern Gen ▾ Mem A ▾ Off ▾ INS CP ▾</p>	Controls the Test Pattern Generator <i>Binary triggers:</i> Sets the generator to on or off <i>Pulse inputs:</i> Will cycle through on/off <i>Displays:</i> "Test Gen/mode"
Test Pattern Type  <p>#9 Knob A</p> <p>Color AJA FrameSyncs: Test Pattern Type ▾ Mem A ▾ 75% Bars ▾ INS CP ▾</p>	Controls the Test Pattern Type <i>Binary triggers:</i> Sets the type to the chosen mode <i>Pulse inputs:</i> Will cycle through the modes <i>Displays:</i> "Test Ptnr/mode"
ProcAmp Enable  <p>#9 Knob A</p> <p>Color AJA FrameSyncs: ProcAmp Enable ▾ Mem A ▾ Off ▾ INS CP ▾</p>	Sets ProcAmp to on or off <i>Binary triggers:</i> Sets ProcAmp to the chosen mode <i>Pulse inputs:</i> Will cycle through the modes <i>Displays:</i> "ProcAmp/mode"

SKAARHOJ DEVICE CORES

ProcAmp Settings 	<p>Controls the 4 ProcAmp values</p> <p>Binary triggers: Not implemented</p> <p>Pulse inputs: Will cycle the selected ProcAmp parameter</p> <p>Displays: "Gain/value", "Black/value", "Hue/value", "Sat/value"</p> <p>For "Gain" + "Black" Analog inputs - Gain: Set the value between 0-1.5 Analog inputs - Black: Set the value between -20 - +20</p>
Transform 	<p>Sets the Transform type</p> <p>Binary triggers: Sets ProcAmp to the chosen mode</p> <p>Pulse inputs: Will cycle through the modes</p> <p>Displays: "Transform mode"</p>
Colorfront Live - Dyn Range&Gamut In 	<p>Sets the Dyn Range&Gamut IN</p> <p>Only for Transform = Colorfront Engine-Live</p> <p>Binary triggers: Sets Dyn Range&Gamut IN to the chosen mode</p> <p>Pulse inputs: Will cycle through the modes</p> <p>Displays: "Dyn R&G IN/mode"</p>
Colorfront Live - Dyn Range&Gamut Out 	<p>Sets the Dyn Range&Gamut OUT</p> <p>Only for Transform = Colorfront Engine-Live</p> <p>Binary triggers: Sets Dyn Range&Gamut OUT to the chosen mode</p> <p>Pulse inputs: Will cycle through the modes</p> <p>Displays: "Dyn R&G OUT/mode"</p>
Colorfront Live - SDR Preview 	<p>Controls SDR Preview</p> <p>Only for Transform = Colorfront Engine-Live</p> <p>Binary triggers: Sets SDR Preview to on or off</p> <p>Pulse inputs: Will cycle through on/off</p> <p>Displays: "SDR Prev./mode"</p>
Colorfront Live - Colorfront Engine 	<p>Controls Colorfront Engine</p> <p>Only for Transform = Colorfront Engine-Live</p> <p>Binary triggers: Sets Colorfront Engine to Default or Adjust</p> <p>Pulse inputs: Will cycle through Default/Adjust</p> <p>Displays: "Cfr Engine/mode"</p>
Colorfront Live - HDR Amount 	<p>Adjust HDR Amount</p> <p>Only for Transform = Colorfront Engine-Live</p> <p>Binary triggers: Not implemented</p> <p>Pulse inputs: Will cycle the HDR Amount value</p> <p>Displays: "HDR Amount/value"</p>

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"

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"

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"

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"

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"

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"

Adjust Saturation
Only for Transform = Colorfront Engine-Live

Binary triggers: Not implemented

Pulse inputs: Will cycle the Saturation value

Displays: "Saturation/value"

Adjust Exposure
Only for Transform = Colorfront Engine-Live

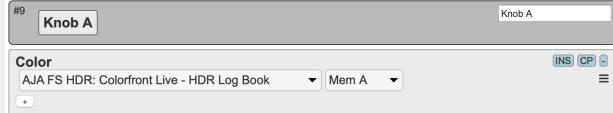
Analog inputs: Set the value between -4.000-4.000

Binary triggers: Not implemented

Pulse inputs: Will cycle the Exposure value

Displays: "Exposure/value"

Colorfront Live - HDR Log Look



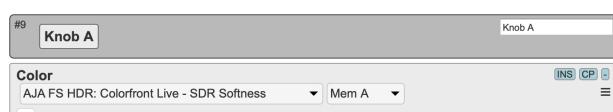
Binary triggers: Not implemented

Pulse inputs: Will cycle the HDR Log Look value

Displays: "HDR L. Loo/value"

Adjust SDR Softness
Only for Transform = Colorfront Engine-Live

Colorfront Live - SDR Softness



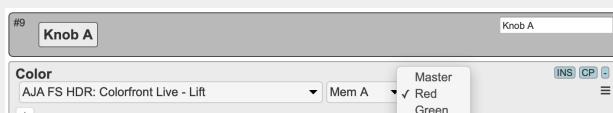
Binary triggers: Not implemented

Pulse inputs: Will cycle the SDR Softness value

Displays: "SDR Soft./value"

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

Colorfront Live - Lift



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"

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

Colorfront Live - Gamma



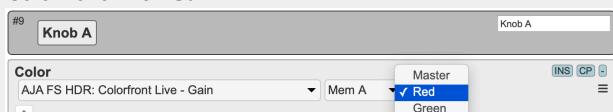
Binary triggers: Not implemented

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

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

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

Colorfront Live - Gain



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"

Adjust Saturation
Only for Transform = Colorfront Engine-Live

Colorfront Live - Saturation



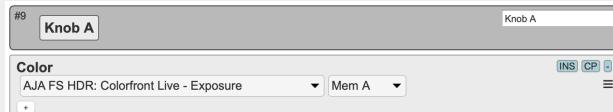
Binary triggers: Not implemented

Pulse inputs: Will cycle the Saturation value

Displays: "Saturation/value"

Adjust Exposure
Only for Transform = Colorfront Engine-Live

Colorfront Live - Exposure



Analog inputs: Set the value between -4.000-4.000

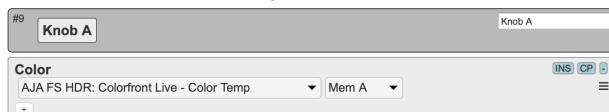
Binary triggers: Not implemented

Pulse inputs: Will cycle the Exposure value

Displays: "Exposure/value"

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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"

Adjust Color Temp

Only for Transform = Colorfront Engine-Live

Colorfront Live - Tint



Binary triggers: Not implemented

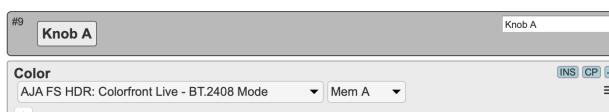
Pulse inputs: Will cycle the Tint value

Displays: "Tint/value"

Adjust BT.2408 Mode Value

Only for Transform = Colorfront Engine-Live

Colorfront Live - BT.2408 Mode



Binary triggers: Not implemented

Pulse inputs: Will cycle the BT.2408 value

Displays: "BT.2408 M./value"

Reset the Colorfront values

Only for Transform = Colorfront Engine-Live

Colorfront Live - Colorfront Reset



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

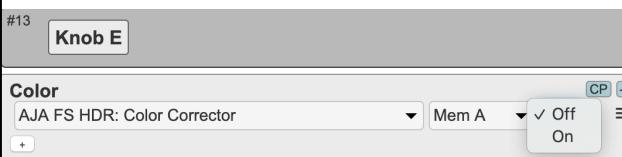
Pulse inputs: Not implemented

Displays: "CFE-Live/Reset"

Enables Color Correct

Only for Transform = Non-Colorfront Engine

Color Correct

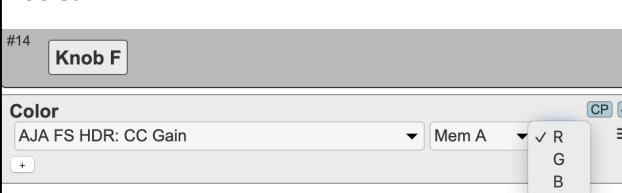


Binary triggers: Not implemented

Pulse inputs: Will toggle between On/Off

Displays: ColorCorr ON/ OFF

CC Gain



Controls the CC Gain RGB

Only for Transform = Non-Colorfront Engine

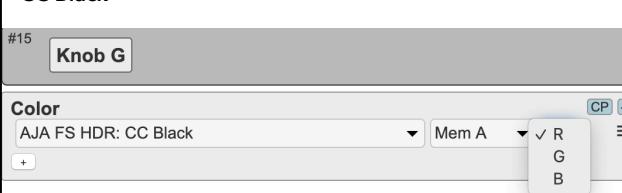
Binary triggers: Not implemented

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

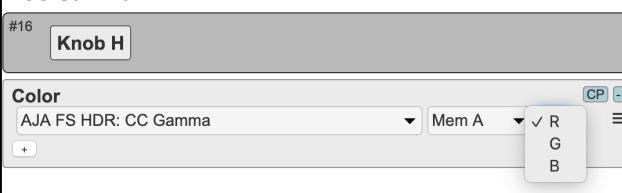
Binary triggers: Not implemented

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

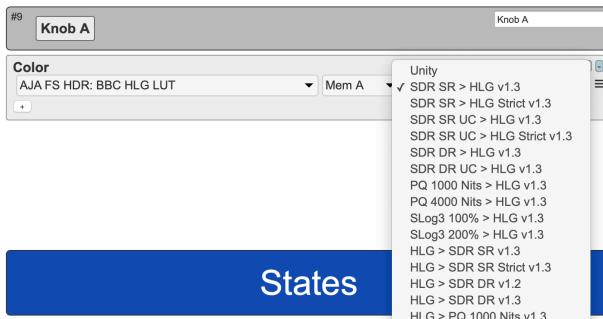
Binary triggers: Not implemented

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

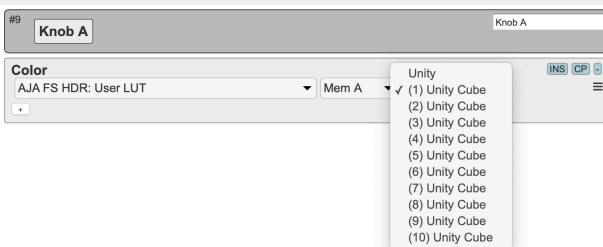
Only for Transform = BBC HLG LUT

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

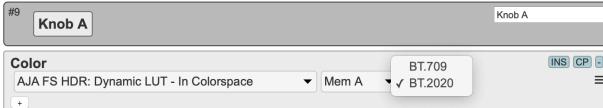
Only for Transform = User LUT

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

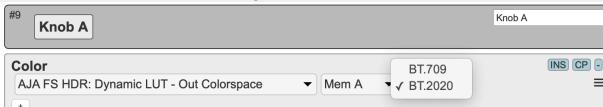
Only for Transform = Dynamic LUT

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

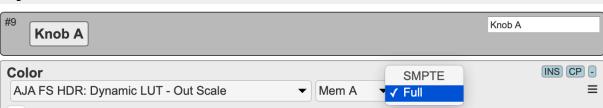
Only for Transform = Dynamic LUT

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

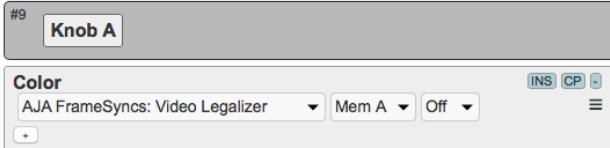
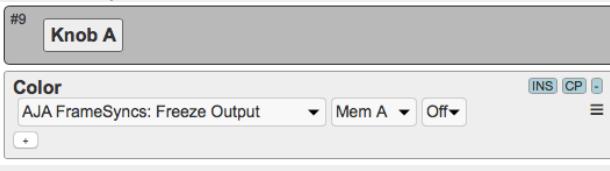
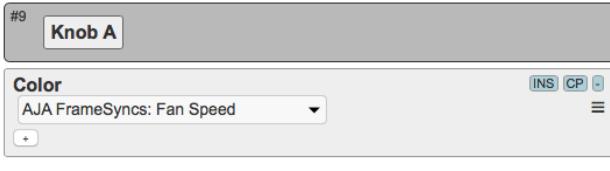
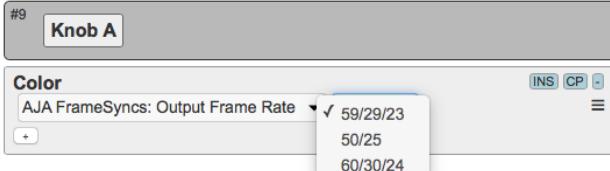
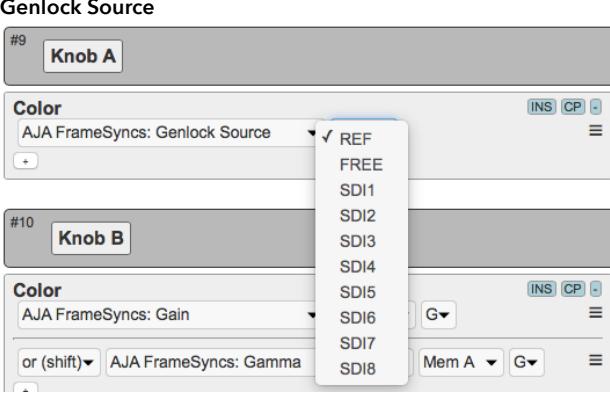
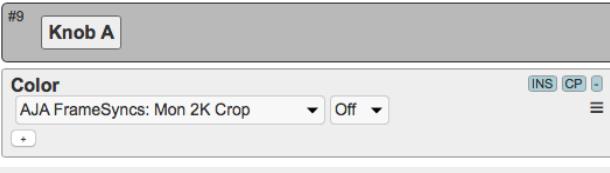
Only for Transform = Dynamic LUT

Binary triggers: Sets Transfer Characteristic to the chosen mode

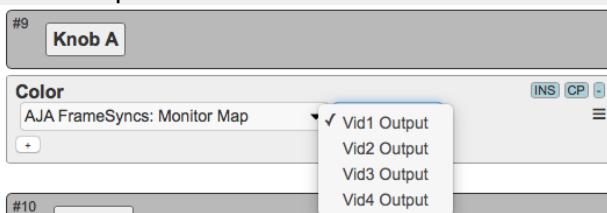
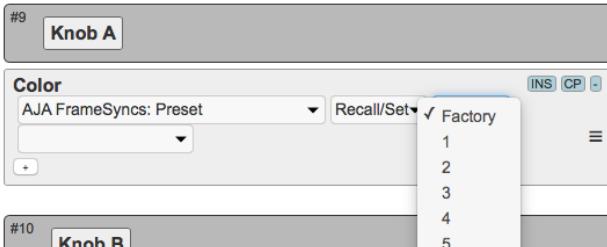
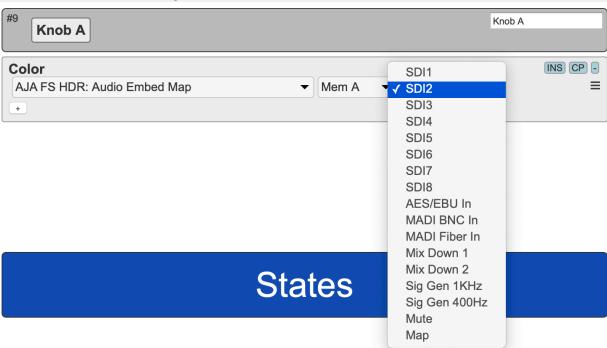
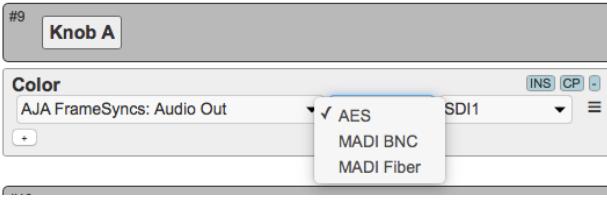
Pulse inputs: Will cycle through the modes

Displays: "Tra. Char/mode"

SKAARHOJ DEVICE CORES

Video Legalizer 	Sets the Video Legalizer to on or off <i>Binary triggers:</i> Sets the Video Legalizer to the chosen mode <i>Pulse inputs:</i> Will cycle through the modes <i>Displays:</i> "Legalizer mode"
Video Legalizer Settings 	Controls the Video Legalizer Settings <i>Binary triggers:</i> Not implemented <i>Pulse inputs:</i> Will cycle through the selected values <i>Displays:</i> "LegWhite/value", "LegBlack/value", "LegChroma/value"
Freeze Output 	Controls the mode for Freeze Output <i>Binary triggers:</i> Sets the Freeze Output to the chosen mode <i>Pulse inputs:</i> Will cycle through the modes <i>Displays:</i> "Freeze mode"
Fan Speed 	Controls the Fan Speed <i>Binary triggers:</i> Not implemented <i>Pulse inputs:</i> Will cycle Fan Speeds <i>Displays:</i> "Fan Speed/value"
Output Frame Rate 	Controls the global Output Frame Rate <i>Binary triggers:</i> Sets the Output Frame Rate to the chosen mode <i>Pulse inputs:</i> Will cycle through the modes <i>Displays:</i> "FrameRate mode"
Genlock Source 	Controls the global Genlock Source <i>Binary triggers:</i> Sets the Genlock Source to the chosen mode <i>Pulse inputs:</i> Will cycle through the modes <i>Displays:</i> "GenLokSrc mode"
Mon 2K Crop 	Controls the Mon 2K Crop <i>Binary triggers:</i> Sets the Mon 2K Crop to the chosen mode <i>Pulse inputs:</i> Will cycle through the modes <i>Displays:</i> "Mon2KCrop mode"

SKAARHOJ DEVICE CORES

HDMI RGB Range 	Controls the HDMI RGB Range <i>Binary triggers:</i> Sets the HDMI RGB Range to the chosen mode <i>Pulse inputs:</i> Will cycle through the modes <i>Displays:</i> "HDMIRGBRA/mode"
Monitor Map 	Controls the mapping of the Monitor Output <i>Binary triggers:</i> Sets the Monitor Map Routing to the chosen mode <i>Pulse inputs:</i> Will cycle through the modes <i>Displays:</i> "Mon Map/mode"
Presets 	Controls the Presets on the FS. Select between 40 Presets and the Factory Default <i>Binary triggers:</i> 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 <i>Pulse inputs:</i> Not implemented
Audio Embed Map 	Controls the Audio Embedding Mapping <i>Binary triggers:</i> Sets the Audio Embedding Mapping to the chosen mode <i>Pulse inputs:</i> Will cycle through the modes <i>Displays:</i> "Aud.Embed/mode"
Audio Out 	Controls the Audio Out for AES, MADI BND or MADI Fiber <i>Binary triggers:</i> Sets the Audio Rout to the chosen channel <i>Pulse inputs:</i> Will cycle through the channels for the chosen mode <i>Displays:</i> "Audio Out/channel"

SKAARHOJ DEVICE CORES

Status

Color AJA FS HDR: Status ▾ Channel: 1 ▾ Toggle ▾ Mem AA **Channel Name**

+ Channel Index
Label: 1
Label: 2
Label: 3
Label: 4
Label: 5
Label: 6
Label: 7

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.

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 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.

SKAARHOJ DEVICE CORES

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"

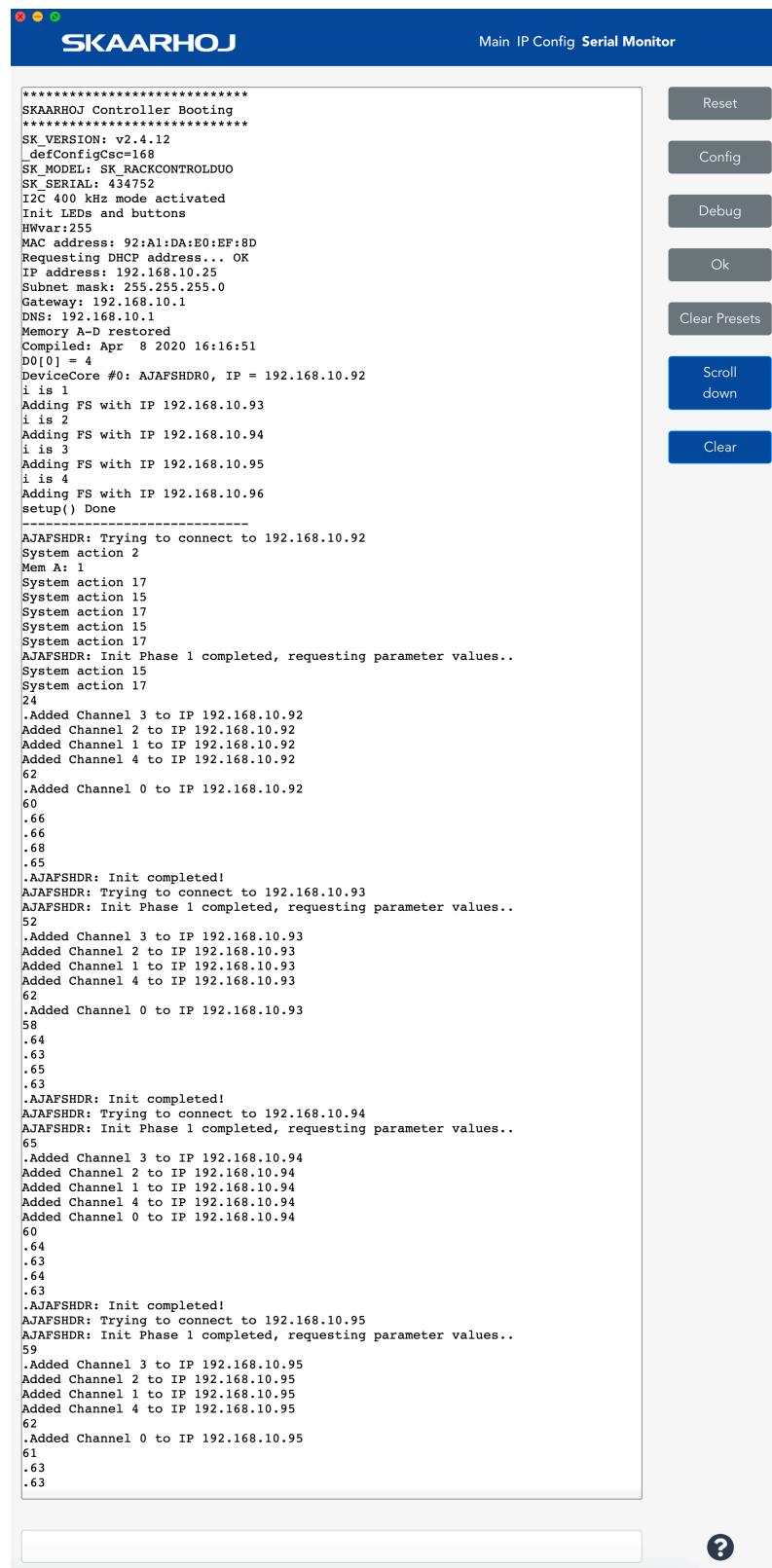
	Mode	Local Channel	Global Channel
HDR #1	HD	1	1
HDR #1		2	2
HDR #1		3	3
HDR #1		4	4
HDR #2	UHD	1	5
FS4 #1	HD	1	6
FS4 #1		2	7
FS4 #1		3	8
FS4 #1		4	9
FS4 #2	HD	1	10
FS4 #2		2	11
FS4 #2		3	12
FS4 #2		4	13
FS1-X	-	1 (Color control)	14
FS1-X	-	2	15

SKAARHOJ DEVICE CORES

Example:

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:



SKAARHOJ DEVICE CORES

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

The screenshot shows the SKAARHOJ Device Cores page. On the left is a sidebar with a blue hexagonal logo for UniSketch OS and links for Controller Configuration, Device Cores (which is highlighted in blue), Manage Configurations, Manage Media, Button Labels, and Firmware Overview. The main content area has a header "Device Cores". Below it is a note about device support and links to manuals. A "AJA Gang Test" button is visible. A card for the "AJA FS HDR" device core is shown, featuring its logo, a small image of the hardware, and a delete button. At the bottom is a "Save Settings" button.

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

The screenshot shows the SKAARHOJ Manage Media page. The sidebar is identical to the previous one. The main content area has a header "Manage Media" and a note about adding media content. A "AJA Gang Test" button is present. The "Device Core Options" section is highlighted in blue. It contains a note about device cores supporting additional options and a text input field with the value "D0:0=4". Below this is a "Strings" section with a "Add String" button. A "String 1" input field contains the value "CH Select|Vid|".