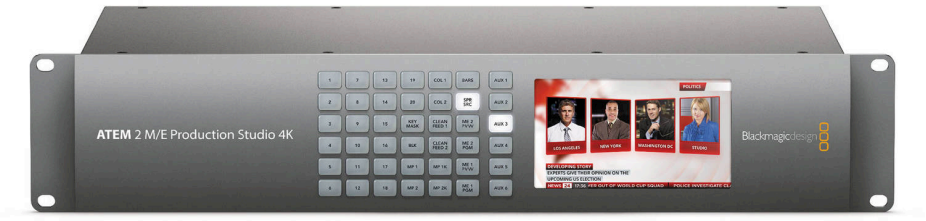
Device: BMD ATEM

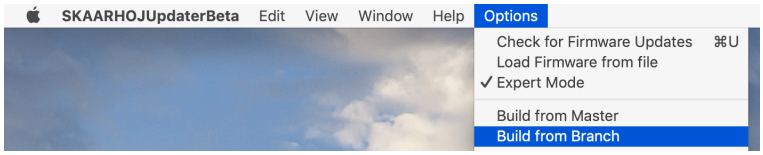


Update January 2020

With release of UniSketch v2.3.8 we now have support (for UniSketch controllers) for ATEM 8.1 and the ATEM Constellation.

Known Bugs:

- UniSketch v2.3.8 + v2.3.9 had connectivity issues. Please update to v2.4.0
- Adjustments of some camera actions will not work beyond CAM7. A temporary fix is to download firmware via "Build from Branch" with the branch name: atem_fix_camera_clamp
  subject to change without notice



Standalone Firmwares

Please find the latest standalone firmware updates at: https://www.skaarhoj.com/support/firmware-updater/

For the ATEM-TCP Link on AVR control of ME3 and ME4 is not possible due to memory restrictions. On the Due it works.

Please notice we do not have a firmware update for the ATEM Proxy yet.

Introduction

A larger number of functions on the ATEM series of switchers can be controlled from a SKAARHOJ control panel and we have integrated with the ATEM switchers for a long time.

When using the ATEM Device Core our controllers can connect to the ATEM Switcher directly without the need of running ATEM Software Control Panel on your computer. But you can, and any change made either way will be reflected on each device.

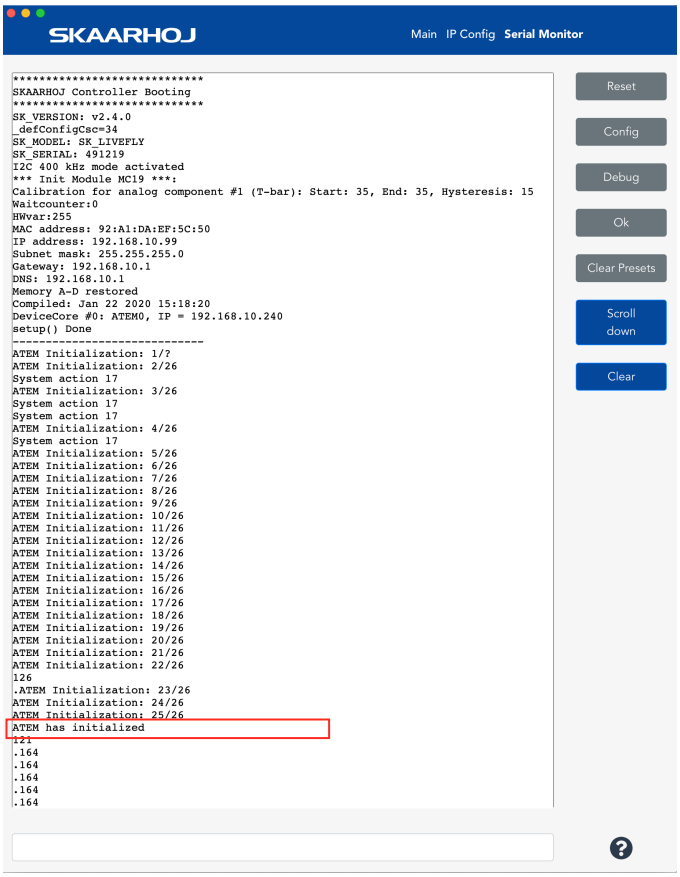
You can connect to multiple ATEM Switchers from the same SKAARHOJ interface but limitations apply. The different ATEM Switchers varies in how many clients can be connected at the same time. For details see https://www.youtube.com/watch?v=ApYouYfX5G4

Please notice the ATEM Switchers are very picky as to latency for connected clients. Ensure a stable and fast network. If using VPN or other long distance network solutions latency may be too high and connection will not be established.

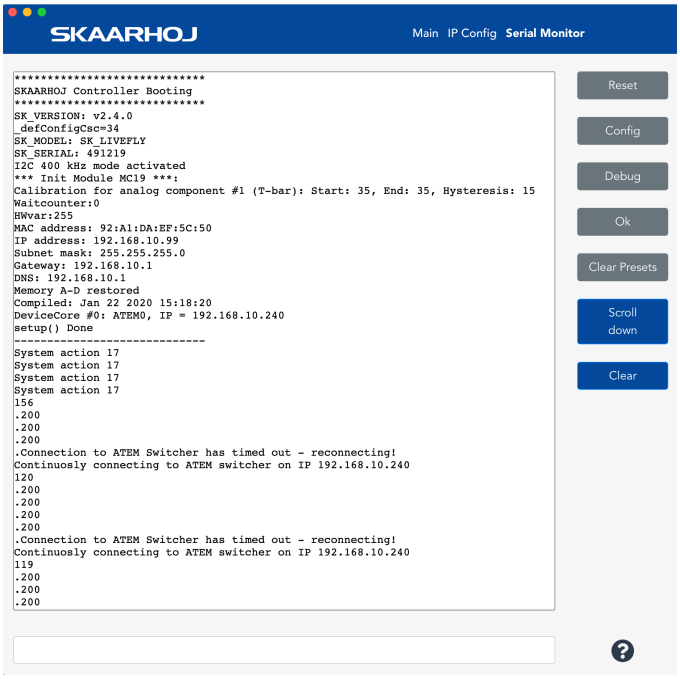
Protocol	Source Port (Random)	Destination Port
UDP	50100 -65300	9910

Connection

When a SKAARHOJ controller have successfully connected to the ATEM the serial monitor will report:
ATEM has initialized



If the SKAARHOJ controller is unable to locate the ATEM on the network the serial monitor will report:
.Connection to ATEM Switcher has timed out - reconnecting!
Continuosly connecting to ATEM switcher on IP 192.168.10.240



About ATEM Audio, Video and Camera Sources

Whenever you can select audio, video and camera sources you will find special options in the drop down:

- Whenever you see "Mem A"-"Mem D" it means the source selected will be the one from the list which the given memory register value currently points to, starting the counting from zero. For example, if Mem A is41, the source will be "Bars" because it's element number 42 in the list (and the first element, "Black", has number 0).
- For video sources, selecting AUX1-40 means the source will be whatever source is currently on AUX1-40. This will be dynamically evaluated.
- For video sources, selecting MVx/y means the source will be whatever source is currently on the multiviewer "x" (1-4) in window number "y". This will be dynamically evaluated.
- For camera sources, "Mem A"-"Mem D" will not point to the list, but simply refer to the camera number.

Device Configurations

Device configuration options exist:

- Index 0: **Sensor Gain / Camera Gain Setting Range**
  - If "0" = default
  - If "1" = Extended -12dB/12dB Range (-12, -6, 0, 6, 12)
  - If "2" = Original 0db/18dB Range (0, 6, 12, 18)

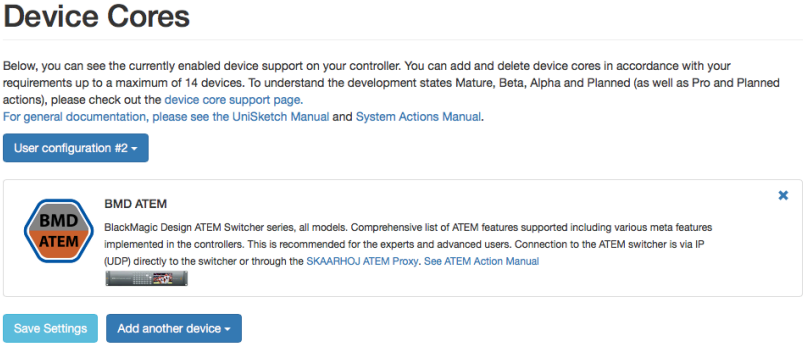
Example:

Enabling "Sensor Gain / Camera Gain Setting Range" with the extended could look like this device configuration code: "D0:0=1" where the general form would be "Dx:0=1" where "x" is the number of the device core as installed on the controller (starting with zero for the first device core).

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:

```
Memory A-D restored
Compiled: Dec 18 2017 15:17:32
DeviceCore #0: ATEM0, IP = 192.168.10.240
ATEM: Extended CCU Sensor gain range
setup() Done
----------------------------
Sending connect packet to ATEM switcher on IP 192.168.10.240 from port
55548
ATEM _hasInitialized = TRUE
171
```

Example: If the ATEM device core is the first like below:



Then settings the extended rage would be set by this configuration under “Manage Media” on cores.skaarhoj.com:

This is a table of actions for Blackmagic Design ATEM Switchers

Program Src 	Sets Program Source on the given M/E row. *Binary triggers:* Sets the selected source on Program. If Hold Down is selected, the source will fall back to the previous source whenever the trigger is released. Toggle will select the source, but on a subsequent trigger, it will fall back to the previous value. If Cycle mode is selected, a trigger will set the next source on Program (corresponds to a single pulse input). Hold Group A+B works like "Hold Down" but adds the previous source to a queue from which the fall back value is pulled when the button is released. *Pulse inputs:* Will cycle through and set the possible sources for Program limited by the selected source and not including Black, unless Black is selected as source in which case all possible sources are traversed. *Binary outputs:* On when actual Program Src matches selected source (or when trigger is held in Cycle mode) *Button colors:* Will be red when Program Src matches selected source, otherwise dim. In Cycle mode color will be highlighted when button is held down.
Preview Src 	Sets Preview Source on the given M/E row. *Binary triggers:* Sets the selected source on Program. If Hold Down is selected, the source will fall back to the previous source whenever the trigger is released. Toggle will select the source, but on a subsequent trigger, it will fall back to the previous value. If Cycle mode is selected, a trigger will set the next source on Program (corresponds to a single pulse input). Hold Group A+B works like "Hold Down" but adds the previous source to a queue from which the fall back value is pulled when the button is released. *Pulse inputs:* Will cycle through and set the possible sources for Preview limited by the selected source and not including Black, unless Black is selected as source in which case all possible sources are traversed. *Binary outputs:* On when actual Preview Src matches selected source (or when trigger is held in Cycle mode) *Button colors:* Will be green when Program Src matches selected source, otherwise dim. In Cycle mode color will be highlighted when button is held down.
Prv/Prg Src 	Set Preview Source on the given M/E row and if the trigger is held down for more than 1 second, it will perform a Cut action too. *Binary inputs:* Sets the select source on Preview. If Cycle mode is selected, a trigger will set the next source on Preview (corresponds to a single pulse input) when released unless the button is held until a Cut is performed in which case no new Preview source is selected. *Pulse inputs:* Will cycle through and set the possible sources for Preview limited by the selected source and not including Black, unless Black is selected as source in which case all possible sources are traversed. *Binary outputs:* On when actual Preview source or Program source matches the selected source (or when trigger is held in Cycle mode) *Button colors:* Will be red or green when Program or Preview Src matches selected source, otherwise dim. In Cycle mode color will be highlighted when button is held down. For mono-color buttons, the button will blink when the source is on preview (normally green on a multicolor button).

AUX Output Src

Set AUX source on the given AUX bus.

Binary inputs: Sets the select source on the AUX bus. If Hold Down is selected, the source will fall back to the previous source whenever the trigger is released. Toggle will select the source, but on a second trigger, it will fall back to the previous value. Hold Groups will fall back to a previous source for a group of triggers using a queue system and finally to the first previous value before any trigger in the group was activated. If Cycle mode is selected, a trigger will set the next source on the AUX bus (corresponds to a single pulse input).

Pulse inputs: Will cycle through and set the possible sources for AUX limited by the selected source and not including Black, unless Black is selected as source in which case all possible sources are traversed.

Binary outputs: On when actual AUX bus source matches selected source (or when trigger is held in Cycle mode)

Button colors: will be highlighted when AUX bus source matches selected source, otherwise dim. In Cycle mode color will be highlighted when button is held down.

Upstream Keyer

Turns upstream keyers on and off

Binary inputs: If Toggle mode, the given upstream keyer is turned or/off successively. If On or Off the upstream keyer is set On or Off respectively. Hold Down will turn the keyer on as long as the trigger is held. Auto will fade in the keyer (still pending as of June 2016)

Pulse inputs: Will turn on/off

Binary outputs: Follows highlighted button color.

Button colors: Will be highlighted if the keyers state corresponds to the selected mode. For most modes except "Off" this means the color will be highlighted (but for Off a button is highlight in case the keyer is actually off)

Upstream Keyer Fill

Selects the fill source for Upstream Keyer

Binary inputs: Sets the selected source.

Pulse inputs: Cycles through the available sources. Press and hold will reset to the selected source.

Binary outputs: On if current keyer source is the selected source.

Button colors: Will be highlighted if current keyer source is the selected source.

Downstream Keyer

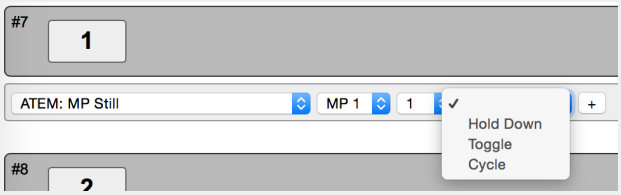
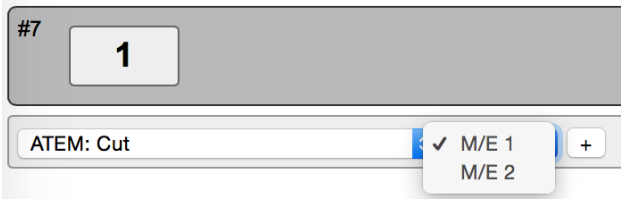
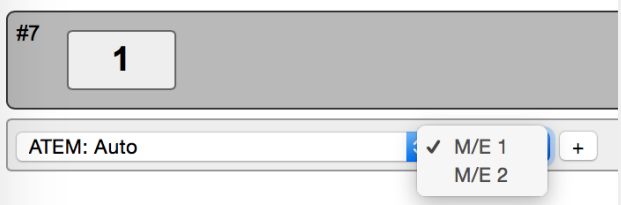
Turns downstream keyers on and off

Binary inputs: If Toggle mode, the given downstream keyer is turned or/off successively. If On or Off the downstream keyer is set On or Off respectively. Hold Down will turn the keyer on as long as the trigger is held. Auto will fade in the keyer.

Pulse inputs: Will turn on/off

Binary outputs: Follows highlighted button color

Button colors: Will be highlighted if the keyers state corresponds to the selected mode. For most modes except "Off" this means the color will be highlighted (but for Off a button is highlight in case the keyer is actually off)

Downstream Keyer Fill 	Selects the fill source for Downstream Keyer *Binary inputs:* Sets the selected source. *Pulse inputs:* Cycles through the available sources. Press and hold will reset to the selected source. *Binary outputs:* On if current keyer source is the selected source. *Button colors:* Will be highlighted if current keyer source is the selected source.
Downstream Keyer Key 	Selects the key source for Downstream Keyer *Binary inputs:* Sets the selected source. *Pulse inputs:* Cycles through the available sources. Press and hold will reset to the selected source. *Binary outputs:* On if current keyer source is the selected source. *Button colors:* Will be highlighted if current keyer source is the selected source.
MP Still 	Sets selected Media Player Source. *Binary inputs:* Sets the selected source in selected Media Player. If Hold Down is selected, the source will fall back to the previous source whenever the trigger is released. Toggle will select the source, but on a subsequent trigger, it will fall back to the previous value. If Cycle mode is selected, a trigger will set the next source on in selected Media Player (corresponds to a single pulse input). *Pulse inputs:* Cycles through the available sources. Press and hold will reset to the selected source. *Binary outputs:* On if current media player source is the selected source. *Button colors:* Will be highlighted if current media player source is the selected source.
CUT 	Executes CUT transition on selected M/E bus. *Binary triggers:* Transitions source in preview to program and program to preview. *Pulse inputs: Toggles Preview and Program. Pressing down executes the command.* *Binary outputs:* On while transition executes. *Button colors: Will be highlighted when held down.*
AUTO 	*Executes assigned transition on the selected M/E bus.* *Binary trigger: Transition source in preview to program and program to preview using the transition type assigned to the selected M/E bus.* *Pulse inputs: Turning executes the transition. Pressing down executes the transition* *Binary outputs: On while transition executes.* *Button colors: Red while executing transition*

Fade to Black (FTB)

Fades Program Output to Black on selected M/E bus.

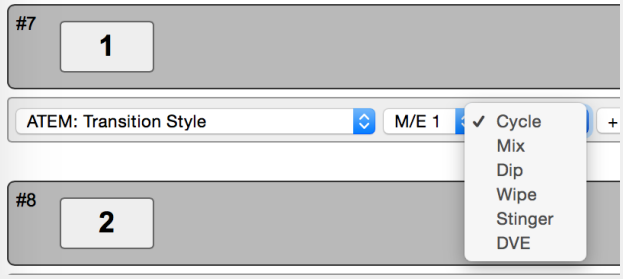
Binary trigger: Pressed once, fades program output to black on selected M/E bus. Pressed a second times, fades program up from back on selected M/E bus.

Pulse input: Turning executes the transition. Pressing down executes transition

Binary output: On if triggered. Triggering again will turn off.

Button colors: Solid red while executing transition. Flashes red while in black.

Transition Style



Selects the Auto Transition type for selected M/E bus.

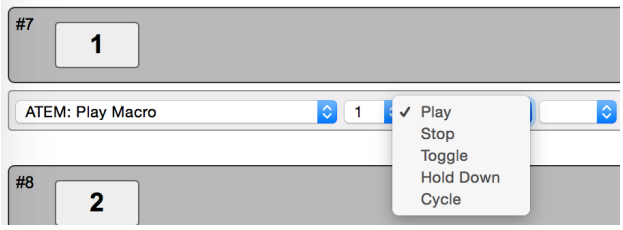
Binary trigger: Will cycle through available auto transition types on selected M/E bus.

Pulse input: Pressing left or right will cycle through transition types.

Binary output: Cycles through transition types

Button color: Will be dimmed.

Macro



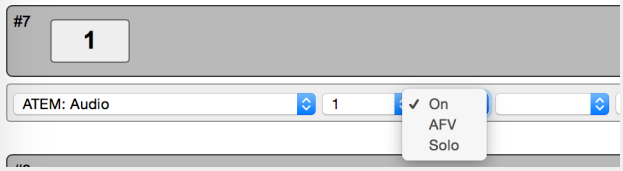
Will execute Macro command selected

Binary trigger: Play will play macro. Stop will stop macro. Toggle will play macro but on a subsequent trigger will stop macro. Hold down will play the macro. Cycle will cycle through available macros.

Binary output: Cycles through available macros.

Button color: Will be highlighted when playing macro, otherwise dimmed.

Audio



Controls selected audio channel.

Binary trigger: Hold down will turn on desired function of audio channel, ie-On/Off, AVF On/AVF Off, Solo On/Solo Off, while held down. Toggle will turn on desired function, subsequent trigger will turn off. Cycle will cycle between On/Off/AVF On.

Binary Output: Cycles through On/Off/AVF

Button color: Highlighted when on. Otherwise dimmed.

Audio Volume

Control the Audio Volume of selected audio channel.

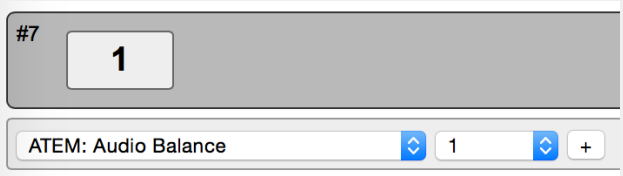
Binary Input: Left/Right button push adjust the volume linearly but does not cycle around. Push down for 1 second resets to 0dB.

Pulse input: Left/Right button push adjust the volume linearly but does not cycle around. Push down for 1 second resets to 0dB.

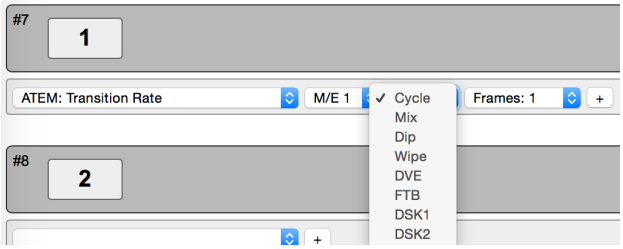
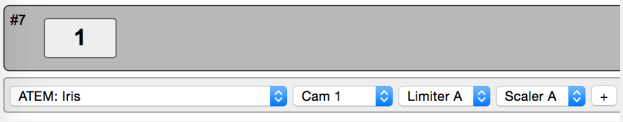
Binary Output: On when triggered otherwise off.

Button color: Highlight when pushed, otherwise dimmed.

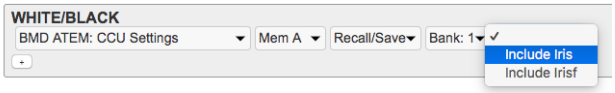
Audio Balance



Have been implemented - description coming soon

Transition Rate 	*Adjusts the video transition rate for the selected M/E bus.* *Binary Input: Cycles through the transition types.* *Pulse Input: Cycles through transition rate in frames for selected transition type. Holding down changes transition type you are adjusting. Subsequent triggers continue to cycle through available transition types.* *Binary output: On when triggered otherwise off.*
Iris 	Changes iris value for the selected camera Iris range: 0-100% - will ***not*** reflect change in ATEM Software Control Panel but still transmit iris data. *Binary inputs:* Will trigger auto iris *Pulse inputs:* Changes the value up/down. *Analog inputs:* Set the value between 0-100% *Displays:* Will show the current value Values: - Select Camera 1-10. If you choose Mem A-D, the camera value will be taken from the value of this memory register.
Iris (f-stop) 	Changes iris value for the selected camera Iris range: f1.4-f22 - will reflect change in ATEM Software Control Panel. *Binary inputs:* Will trigger auto iris *Pulse inputs:* Changes the value up/down. *Analog inputs:* Set the value between f1.4-f22 *Displays:* Will show the current value Values: - Select Camera 1-10. If you choose Mem A-D, the camera value will be taken from the value of this memory register.
Focus	*Have been implemented - description coming soon*
Sensor Gain	*Have been implemented - description coming soon*
Shutter	*Have been implemented - description coming soon*
White Balance	*Have been implemented - description coming soon*
Lift	*Have been implemented - description coming soon*
Gamma	*Have been implemented - description coming soon*
Gain	*Have been implemented - description coming soon*
Hue	*Have been implemented - description coming soon*
Contrast	*Have been implemented - description coming soon*
Saturation	*Have been implemented - description coming soon*
Bars	*Have been implemented - description coming soon*
Detail	*Have been implemented - description coming soon*
CCU Reset	*Have been implemented - description coming soon*

CCU Settings



Save, Recall or Save/Recall CCU Settings (color parameters)

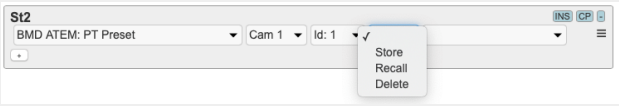
Binary inputs: If Save mode, the given CCU settings will be saved to the chosen bank. Iris can be included if wanted. In Recall mode the CCU settings will be recalled. The button will blink for 10 seconds and if you push the button again within this period of time settings will revert back to the settings prior to the recall. If Recall/Save mode the two functions are combined. Press and hold will Save. One press will recall.

Displays: Will show File 1-6

Values:
- Select Camera 1-10. If you choose Mem A-D, the camera value will be taken from the value of this memory register. A total of 6 banks can be selected, not per camera but in *total*. The function originates from the RCP implementation.

CCU Settings include:
Lift YRGB + Gamma YRGB + Gain YRGB + Contrast + Saturation + Hue + LumMix + Shutter + Iris + irisf + Gain

PT Preset



Save, Recall or Save/Recall Pan/Tilt Settings (zoom and focus not included)

Binary inputs: If Save mode, the given Pan/Tilt settings will be saved to the chosen bank. In Recall mode the Pan/Tilt settings will be recalled. In Recall/Save mode (the blank option) the two functions are combined. Press and hold will Save. One press will recall.

Displays: Will show Cam x: Set/Pre/Rec/Del

Values:
- Select Camera 1-10. If you choose Mem A-D, the camera value will be taken from the value of this memory register. A total of 6 banks can be selected, not per camera but in *total*. The function originates from the RCP implementation.

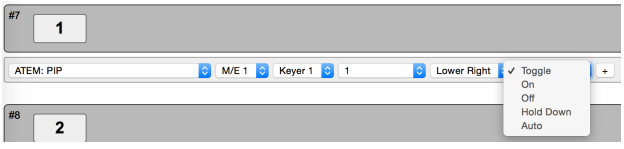
Video Tally

Have been implemented - description coming soon

Audio Tally

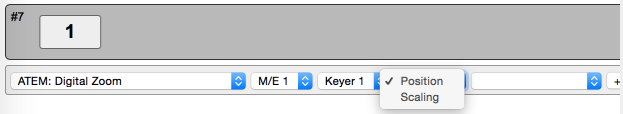
Have been implemented - description coming soon

Picture-In-Picture (PIP)



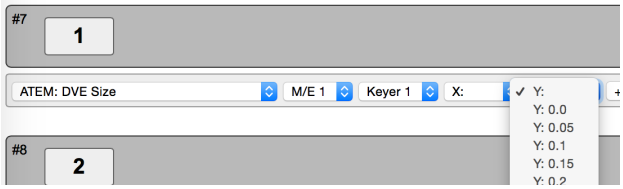
Have been implemented - description coming soon

Digital Zoom



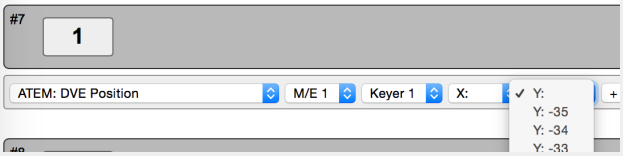
Have been implemented - description coming soon

DVE Size



Have been implemented - description coming soon

DVE Position



Have been implemented - description coming soon

DVE Boarder

Have been implemented - description coming soon

DVE Fill Source

Selects the DVE Fill Source

Binary Input: Paired with System: Force HWC Type: Pulsed will cycle through available fill sources for selected M/E and Keyer combination

Pulse Input: Will cycle through available fill sources for selected M/E and keyer combination.

Binary Output: On when triggered otherwise off.

Button color: Highlight when pushed, otherwise dimmed.

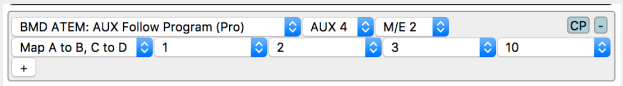
Hold Group Defaults

Configuration of a fixed Hold Group default source - the source that a Hold Group queue will fall back to.

If you are using Hold Groups with very quick triggers you may experience that the original source was not correctly picked up due to the timing gap between a command is sent and to the ATEM reports back the new value. With this configuration value you are guaranteed that the fall back will always be a particular source.

This action does not depend on any trigger from the HWC, it will always be evaluated if inside the proper state and shift levels.
Has a transparent return value.

AUX Follow Mode

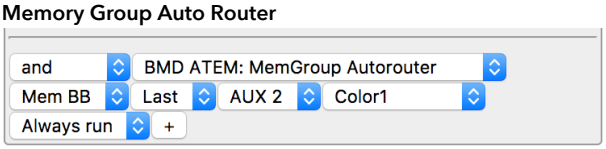


Forces an AUX channel to follow the Program output of an M/E (bus linking).

The Mapping function allows you to exclude certain sets of sources. "Map A,B,C to D" means the sources entered in the following 3 drop downs (1,2, and 3 in the screenshot) will map to the forth source (10 in the screenshot). "Map A to B, C to D" means that the first source maps to the second and the third to the forth (in the example screenshot this would be 1 -> 2 and 3 -> 10).

This action does not depend on any trigger from the HWC, it will always be evaluated if inside the proper state and shift levels. The way you could enable / disable this function is by placing it in a given shift level or state.
Has a transparent return value.

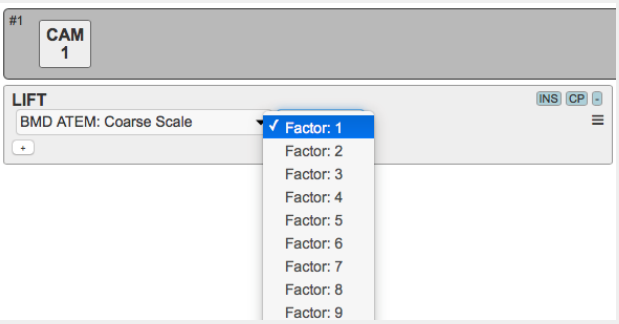
Memory Group Auto Router



Will monitor the selected memory group for its values (first or last) and if it changes it will set this value as the input for the selected aux output. If the value in the memory group is 0 (the group is empty) it will set the selected input source as input on the aux output.
The Memory Group Auto Router will run either always or when a particular selected system flag is set.

This action does not depend on any trigger from the HWC, it will always be evaluated if inside the proper state and shift levels.
Has a transparent return value.
This action is well suited to be placed in the Controller virtual HWC.

Coarse Scale



Will change the steps for coarse adjustments. The parameter cannot be adjusted via binary/pulse/analog inputs. The action just need to added somehere on the controller and it will take effect.