

## 4K Arcana 18Gbps

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# ARCANA



## User Manual 4K Arcana Rev 1.20

## FCC-B Radio Frequency Interference Statement

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This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the measures listed below.

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

### Notice 1

The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

### Notice 2

Shielded interface cables and A.C. power cord, if any, must be used in order to comply with the emission limits.

VOIR LA NOTICE D'INSTALLATION AVANT DE RACCORDER AU RESEAU.



This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- 1) this device may not cause harmful interference, and
- 2) this device must accept any interference received, including interference that may cause undesired operation.

## CE Conformity

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Hereby, ICboss Tech CO., LTD. declares that this device is in compliance with the essential safety requirements and other relevant provisions set out in the European Directive.



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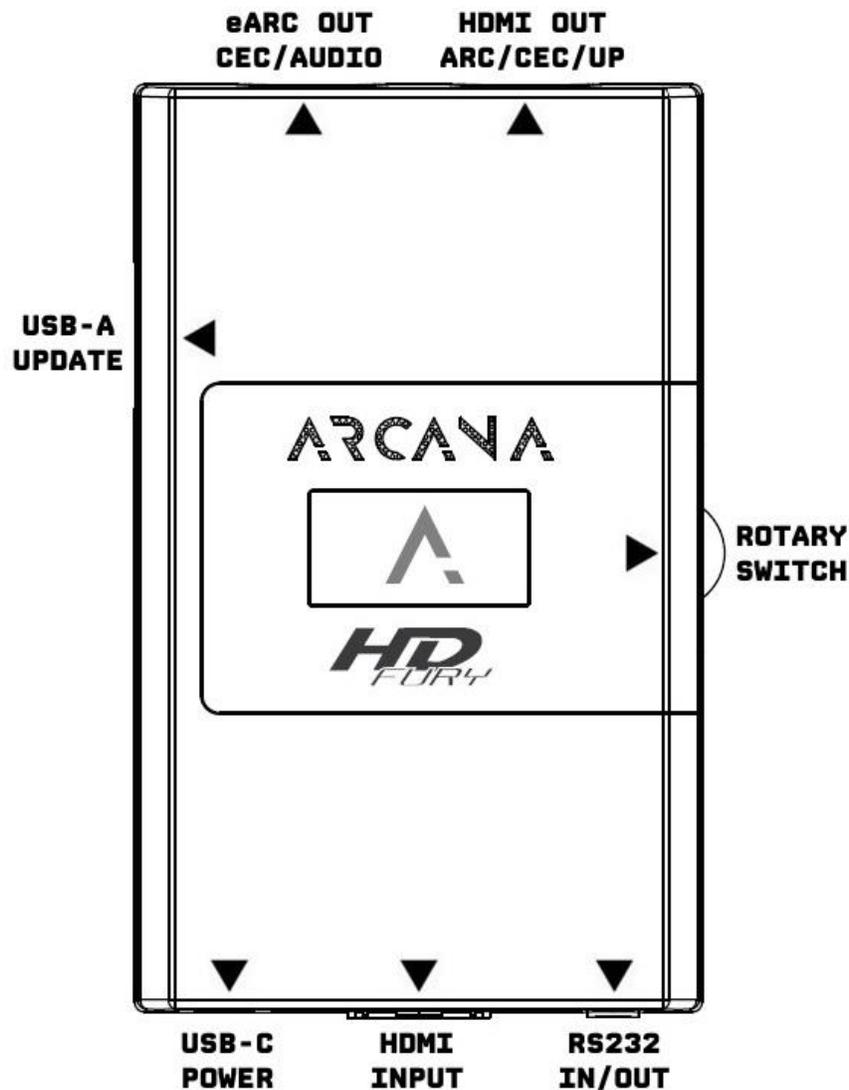
**Disclaimer:** 3<sup>rd</sup> party and/or custom firmware providing extra features are not covered in this manual.

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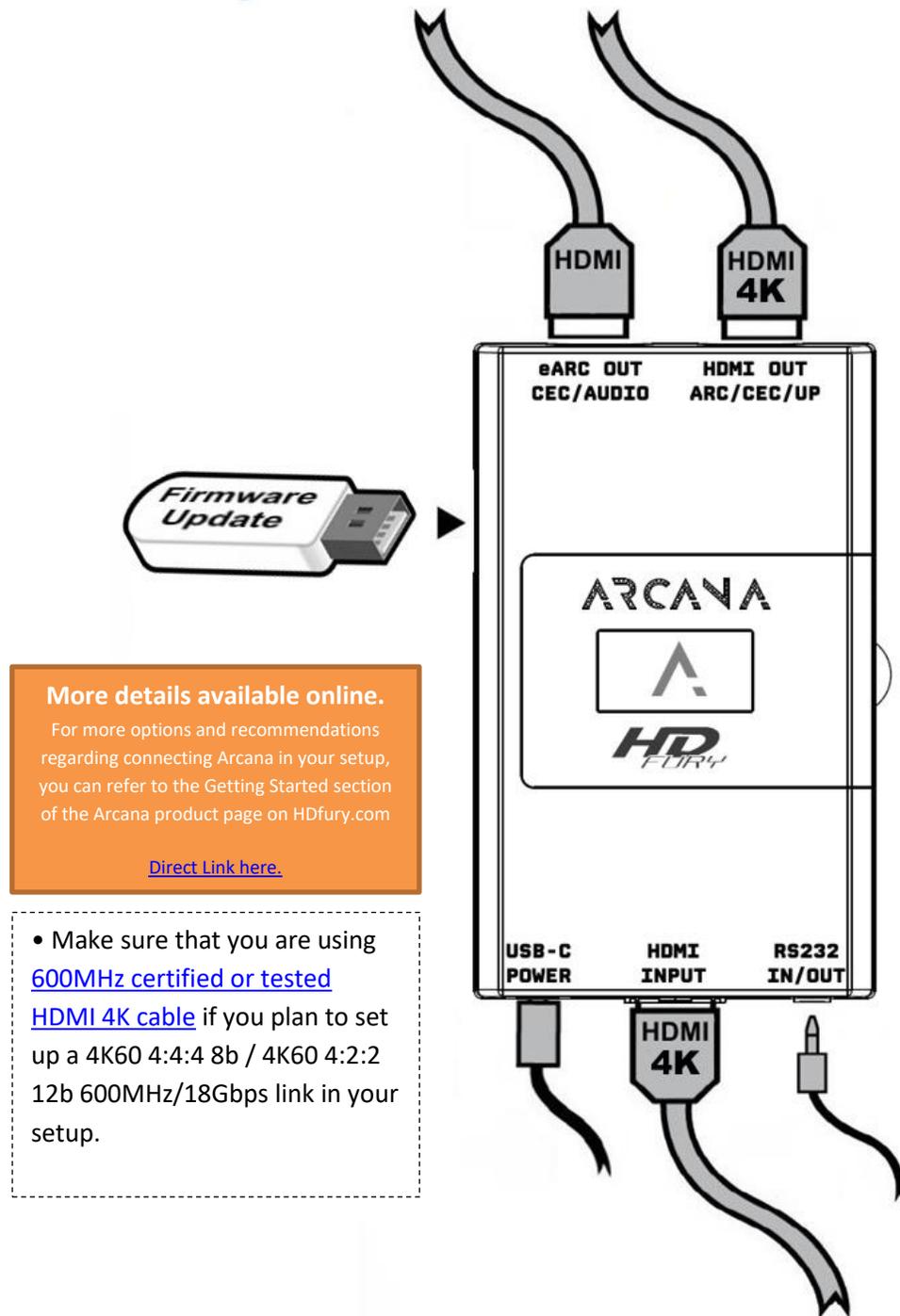
## Arcana Overview

Team HDFury would like to thank you personally for purchasing the 4K Arcana!

This unique HDMI2.0b device supports true full 4K60 4:4:4 600MHz 18Gbps bandwidth signals. It will allow you to solve any HDCP error, extract full HDMI audio from any HDMI sources up to Atmos HBR over TrueHD to feed any eARC sound system and extract ARC sound from ARC TVs as well as passing CEC commands between all involved equipment. Arcana supports any SD/HD/FHD/UHD/HDR/DV/LLDV/HLG or PC signals up to 600MHz. It can downscale UHD to FHD, display relevant information on OLED/OSD, select between multiple converting options. Inject, replace or translate HDR metadata. Display DV content on HDR10 display. Control can be completed via OLED menu with rotary switch or via RS-232 (MAC/WIN/Linux) and an optional USB control is available if needed in future update.



## Connecting Cables to Arcana



### More details available online.

For more options and recommendations regarding connecting Arcana in your setup, you can refer to the Getting Started section of the Arcana product page on Hdfury.com

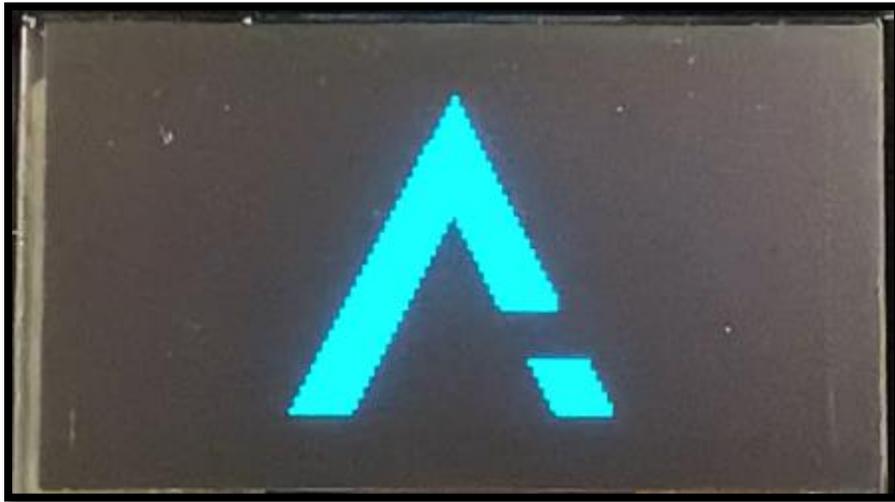
[Direct Link here.](#)

- Make sure that you are using [600MHz certified or tested HDMI 4K cable](#) if you plan to set up a 4K60 4:4:4 8b / 4K60 4:2:2 12b 600MHz/18Gbps link in your setup.

- Connect USB-C Power connector from Power supply (110-240V 1.2A IN & 5V 2A OUT).
- Connect a source via HDMI input cable to the HDMI input.
- Connect any other HDMI, sound or RS232 cable that you might need (optional)
- HDMI cable must support 18Gbps if any 18Gbps source/sink is connected (except for Audio Out)

**Disclaimer:** 3<sup>rd</sup> party and/or custom firmware providing extra features are not covered in this manual.

## Arcana Power/Status OLED



The Arcana OLED will turn ON when power supply is applied; Arcana Logo will be displayed followed by a similar default infopage to the one represented below.



If any active input is connected, Arcana will process handshake with the active input and once completed the signal information will be displayed.

**IN: 4K59.94 371MHz 420 BT2020 10b HDR on above pic.**

If any sink is connected at TX0 output, T0 section of the default OLED infopage will display the current signal going to it.

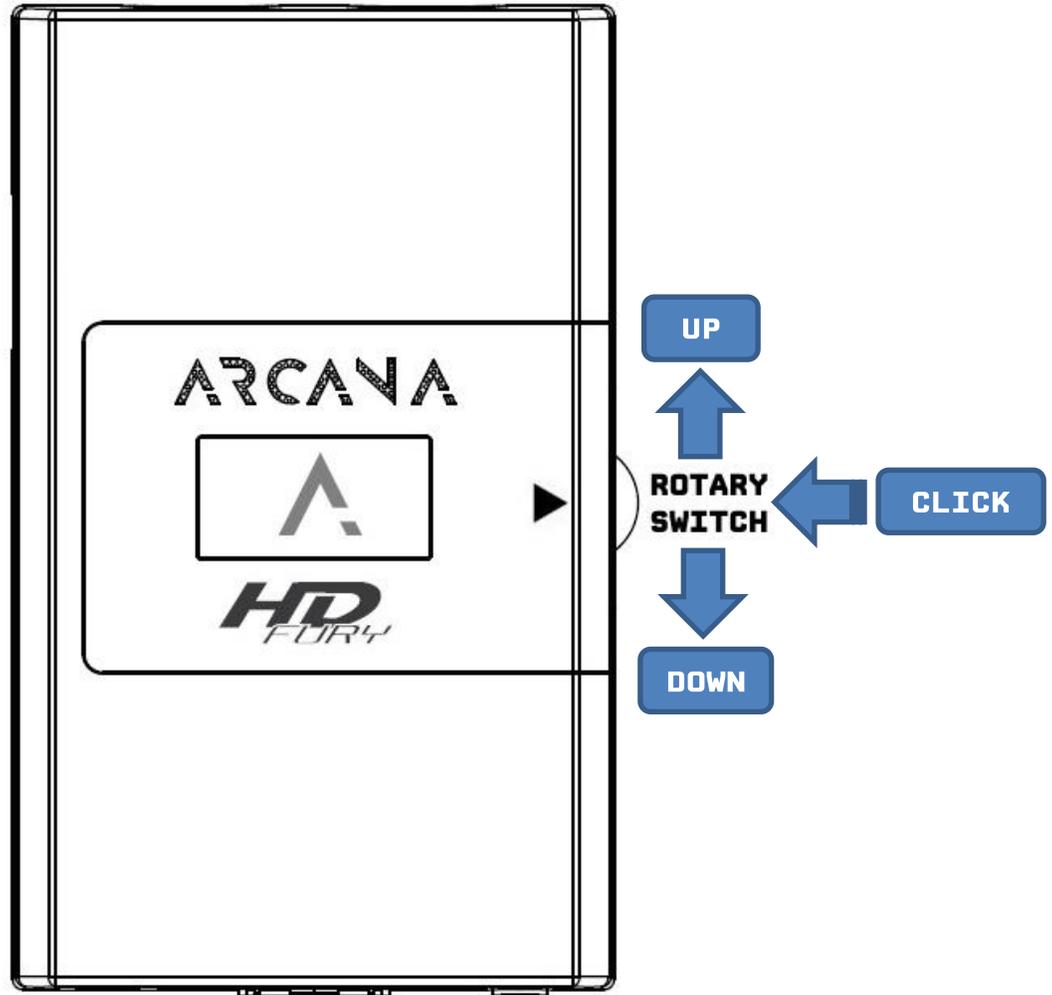
**[OLED OFF]:** Insufficient power or OLED timer expired (default 30s). Use the Arcana power supply or press any button if OLED timer expired.

**[OLED ON]:** The Arcana unit is receiving power and is ready to accept an HDMI signal.

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**Disclaimer:** 3<sup>rd</sup> party and/or custom firmware providing extra features are not covered in this manual.

## Arcana Up/Down/Select Button



The 4K Arcana offers 2 main navigation functions via its rotary switch.

**[UP/DOWN]** Navigate Up or Down in OLED menu or cycle info page.

**[PRESS/CLICK]** Valid a choice or selection while in OLED menu.

**Note:** You can also control and change settings with RS232 for MAC/WIN/Linux.

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**Disclaimer:** 3<sup>rd</sup> party and/or custom firmware providing extra features are not covered in this manual.

## Arcana Info pages



### Default info page

- Display incoming signal info, outgoing signal info and Audio routing (HDMI or eARC) and Audio format types.



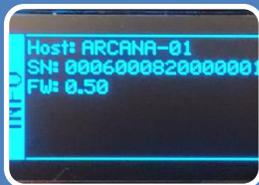
### Incoming signal info page

- Display resolution, frame rate, color depth, color space, chroma, hdcp, bandwidth in MHz and Gpbs, HDR type and Audio type.



### Incoming HDR info page

- Display EOTF, WP, Max Lum, Min Lum, max CLL, maxFALL.



### Unit info page

- Display Serial and Firmware version.



### Outgoing signal info page

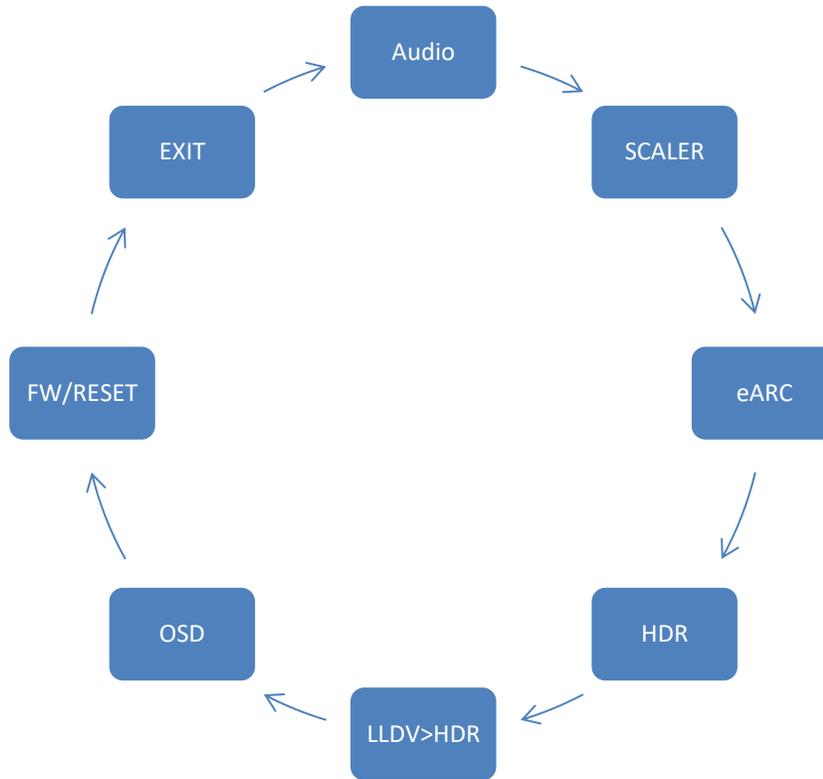
- Display TV MAX cap, resolution, frame rate, color depth, color space, chroma, HDR/DV mode and Audio type.

When you have not entered the Arcana menu (by clicking the rotary switch button), the above info pages are available to scroll and cycle through using UP or DOWN direction of the rotary switch.

**[UP]** Wake up from sleep/fade mode or Cycle OLED infopage: INFO > RX INFO > HDR INFO > ...

**[DOWN]** Wake up from sleep/fade mode or Cycle OLED infopage: INFO > UNIT INFO > HDR INFO > ...

## Arcana OLED Menu



By clicking the Rotary button on the 4K Arcana, you can enter the OLED menu.

**[CLICK]** Enter OLED menu, validate a selection in sub-menu.

**[UP]** Cycle through the available sub-menus or options.

**[DOWN]** Cycle through the available sub-menus or options.

**Note:** You can also control and change settings with RS232 for MAC/WIN/Linux.

## Arcana Audio sub-menu



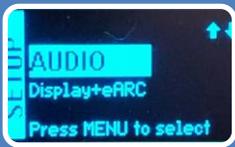
**Audio sub-menu entry**

- Click rotary button to enter Audio sub-menu



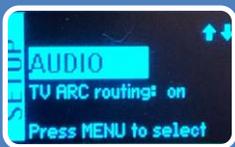
**eARC Only (default mode)**

- By default after reset or firmware update, auto mode is selected.
- Arcana will only sound to eARC sound system such as SONOS Arc and not send any sound to the display.



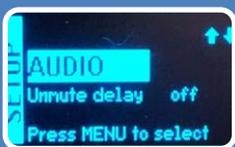
**Display+eARC**

- By selecting this mode, Arcana will use eARC capabilities and send sound to eARC and Display.
- This mode can help with for ARC retrieval issues on some displays .



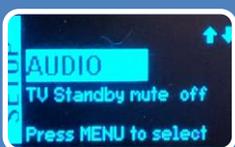
**TV ARC Routing ON (default)**

- By selecting this mode, Arcana will allow ARC sound retrieval from display.
- This mode can be turned OFF if there is ARC retrieval issue in the setup.



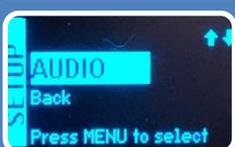
**Unmute delay OFF (default)**

- By selecting this mode, Arcana will add extra delay between audio format change or source/signal switching.
- This mode can be turned ON if there is noise sound in your setup.



**TV Standby mute OFF (default)**

- By selecting this mode, Arcana will stop sending sound to eARC (SONOS Arc) when TV is turned off.
- By default, Arcana will continue sending sound to eARC sound system when TV is off.



**Back**

- To exit Audio sub-menu, click Rotary switch when "Back" is displayed

**Note:** You can also control and change settings with RS232 for MAC/WIN/Linux.

## Arcana Scaler sub-menu

Not always getting ATMOS at startup? Setting a scaler mode that matches your display max capabilities can solve such startup issues if any.



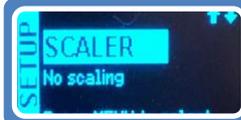
### Scaler sub-menu entry

- Click rotary button to enter Scaler sub-menu



### Auto default mode

- By default after reset or firmware update, auto mode is selected.
- Arcana will only scale if needed by any limitations of the connected display



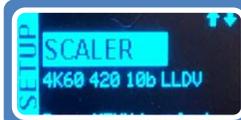
### No scaling

- If selected, this mode ensure that what comes in/goes out untouched



### 4K60 444 8b or 4K60 422 12b LLDV/HDR or SDR

- If selected, the max possible output signal will be 4K60 422 12b LLDV/HDR or SDR
- Please make sure you correctly select LLDV/HDR or SDR choice according to your display.



### 4K60 420 10b LLDV/HDR or SDR

- If selected, the max possible output signal will be 4K60 420 10b LLDV/HDR or SDR
- Please make sure you correctly select LLDV/HDR or SDR choice according to your display



### 4K60 420 8b or 4K30 422 12b LLDV/HDR or SDR

- If selected, the max possible output signal will be 4K60 420 8b LLDV/HDR or SDR
- Please make sure you correctly select LLDV/HDR or SDR choice according to your display



### 4K30 444 8b or 4K30 422 12b LLDV/HDR or SDR

- If selected, the max possible output signal will be 4K30 444 8b LLDV/HDR or SDR
- Please make sure you correctly select LLDV/HDR or SDR choice according to your display



### 1080p 12b HDR

- If selected, the max possible output signal will be 1080p 12b HDR



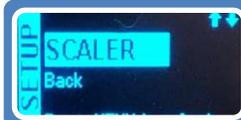
### 1080p 12b SDR

- If selected, the max possible output signal will be 1080p 12b SDR



### 1080p 8b SDR

- If selected, the max possible output signal will be 1080p 8b SDR



### Back

- To exit Scaler sub-menu, click Rotary switch when "Back" is displayed

## Arcana eARC sub-menu



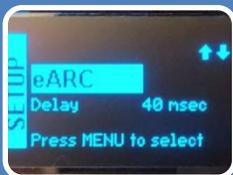
### eARC sub-menu entry

- Click rotary button to enter eARC sub-menu



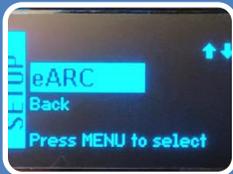
### Off default mode

- by default after reset or firmware update, off mode is selected.
- Arcana will not use any delay for eARC



### eARC delay mode

- By selecting this mode, Arcana allows you to adjust the eARC delay



### Back

- To exit eARC sub-menu, click the rotary button when "Back" is displayed

**Note:** You can also control and change settings with RS232 for MAC/WIN/Linux.

## Arcana HDR sub-menu

### LLDV SYNC OPTION BEHAVIOR

**LLDV input:** Custom HDR is sent with MaxCLL set to the LLDV Max Luminance value.

**SDR input:** LLDV Sync option is ignored. HDR Auto option is utilized. Custom HDR is not sent. SDR output.

**HDR input:** LLDV Sync option is ignored. HDR Auto option is utilized. Custom HDR is not sent. HDR output with original content metadata.



### HDR sub-menu entry

- Click rotary button to enter HDR sub-menu



### Auto default mode

- By default after reset or firmware update, auto mode is selected.
- HDR comes in and goes out untouched



### Off

- Arcana will remove HDR metadata from the signal (for JVC PJ mainly)



### Force 4000 nits

- By selecting this mode, incoming HDR nits value will be forced and replaced by 4000 nits value



### Force 2000 nits

- By selecting this mode, incoming HDR nits value will be forced and replaced by 2000 nits value



### Force 1000 nits

- By selecting this mode, incoming HDR nits value will be forced and replaced by 1000 nits value



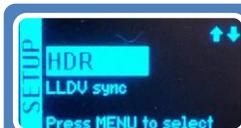
### Boost +/- nits

- By selecting this mode, incoming HDR nits value can be increased or decreased by the defined nits value



### Custom nits

- By selecting this mode, incoming HDR nits value will be forced and replaced by the value of your choice



### LLDV Sync

- By selecting this mode, incoming HDR nits value will be forced and replaced by the value defined in the DV datablock.



### Back

- To exit HDR sub-menu, click the rotary button when "Back" is displayed

## Arcana LLDV&gt;HDR sub-menu



## LLDV-&gt;HDR10 sub-menu entry

- Click rotary button to enter LLDV->HDR10 sub-menu



## Off default mode

- By default after reset or firmware update, off mode is selected
- Arcana will not force LLDV support.



## On

- If selected LLDV support will be forced
- HDR metadata is injected when content is LLDV



## Primaries

- Set BT2020 or DCI-P3 value for DV datablock



## Min Luminance

- Set Min Luminance value for DV datablock



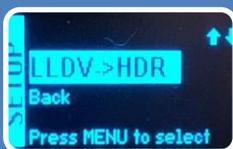
## Max Luminance

- Set Max Luminance value for DV datablock



## About

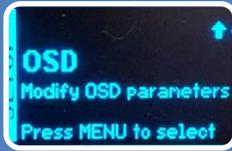
- Vertex2/Diva/Maestro offer more advanced tweaking options



## Back

- To exit LLDV>HDR10 sub-menu, click the rotary button when "Back" is displayed

## Arcana OSD sub-menu



### OSD sub-menu entry

- Click rotary button to enter OSD sub-menu



### On default mode

- by default after reset or firmware update, on mode is selected.
- Turn if off if you do not want OSD info on the video stream.



### Timer

- Set OSD to be displayed during a defined period in secs.
- If set to 0, OSD will never fade, always on.



### Color

- Select the OSD color you prefer from 0 to 31 value.



### Back

- To exit OSD sub-menu, click the rotary button when "Back" is displayed

**Note:** You can also control and change settings with RS232 for MAC/WIN/Linux.

## Arcana FW/RESET sub-menu



### FW/RESET sub-menu entry

- Click the rotary button to enter FW/RESET sub-menu



### Factory Default

- Select this option to reset Arcana to factory default



### Firmware Update

- Select this option to force a firmware update



### Export Config

- When issue, select this option to save a support file on a USB stick. Default filename is arcanaex.txt



### Baudrate

- Defines the RS232 communication baudrate



### About

- Show the founders and credits list



### Back

- To exit FW/RESET sub-menu, click the rotary button when "Back" is displayed

**Note:** You can also control and change settings with RS232 for MAC/WIN/Linux.

## Arcana EXIT sub-menu

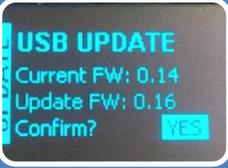


### EXIT sub-menu

- Click the rotary button to exit the list of sub-menus
- Browse back to the OLED info pages

**Note:** If you let your unit idle in any sub-menu, OLED display will turn off automatically and return to main oled infopages after a while.

## Arcana Firmware Update



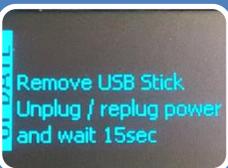
### USB UPDATE

- When inserting an USB stick with a firmware update file, Arcana will automatically detect the update and prompt for update confirmation
- Select YES or NO



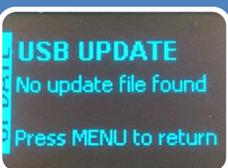
### UPDATING ARCANA...

- A progress message is displayed while updating the unit
- Wait till operation is completed



### UPDATE COMPLETED

- Once completed, unit needs to be power cycled (disconnect/reconnect USB power cord)
- After power is attached back, wait 15sec until OLED turns back on.



### NO UPDATE FILE FOUND

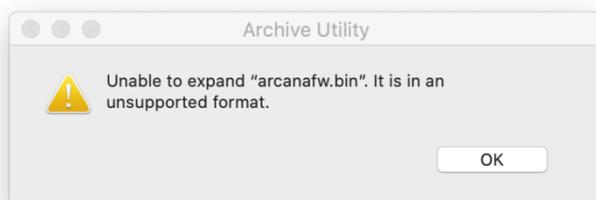
- While forcing an update from the FW/RESET sub-menu, you will see a no update file found message if there is no update file detected on the USB stick inserted in Arcana.

Arcana Firmware package are available to download in .zip extension, once downloaded the archive/zipped package must be extracted/unzipped in order to have the arcanafw.bin file available.

Arcanafw.bin file must be copied on the root of a FAT32 formatted USB stick.

We have tested various USB sticks (2/4/8/16/32/64/128/256GB) from Sandisk without issue. Some users reported small capacity USB stick to be more reliable, a larger capacity stick might need some dummy files to be present.

**[MAC USERS]:** when unzipping the ZIP file, macOS also attempts to expand the .BIN file and might throws an error message when it can't as per below picture, it seems to affect macOS 10.13.x only. You can simply discard this error.



Firmware update can be found on  
[Arcana product page](#) > Download  
 TAB

**Firmware Update In-System:**

If you update unit "in-system" with all cables attached, please make an extra power cycle after firmware is flashed, unit restarted, wait 15s for OLED to come back on then make an extra power cycle (or simply disconnect/reconnect a HDMI cord)

If you do not update with cables attached, then above step is not needed.

**Instructions within Windows to fix ANY USB stick:**

If you are having issues with an USB stick, make sure it is primary partition formatted. If you are not confident with Windows, please try another USB stick instead of trying below method for advanced users only.

1. Type diskpart into search and run
2. Type "list disk" and enter
3. Check which disk number your usb stick is seen as
4. Type "select disk X" and enter..... X is whatever number disk USB stick is eg. 3

**Double & Triple Check As If You Chose Wrong Drive You Will Wipe The Drive Selected With Next Instruction!**

5. Type "clean" and enter
  6. Type "create part primary" and enter
  7. Type "select part one" and enter
  8. Type "active" and enter
  9. Type "format fs=fat32 quick label="Arcana\_FW"
- All ready for you to then copy the bin firmware file over and will work.

Above tip is courtesy of @mkd73





## RS232 Command List

### ARCANA RS232 COMMAND LIST

ARCANA RS232 jack expects the following plug signals:

TIP = TX [sends data out from ARCANA]

RING = RX [receives data to ARCANA]

SLEEVE = GND

Parameters: 19200, n, 8, 1, no handshake

Each command must start with #arcana header and must end with a carriage return \r or a newline \n

Each response will have both carriage return \r and a newline \n added in the format <cr><lf>

Use only lowercase characters

Each firmware package comes with the full and latest RS232 commands list, please always use the latest commands from the latest firmware package.

#### A generic RS232 command to write a value:

#arcana set x y

where #arcana is the header and all commands start with this header

set - indicates value will be written to arcana

x - target to be written

y - value or values

#### A generic RS232 command to read a value:

#arcana get x

where #arcana is the header and all commands start with this header

get - indicates value will be read from arcana

x - target to be read

The get-command generally first returns the command name and then the value.

Command list [current set-values can be read with the get-command]:

#### #arcana set hotplug

Hotplugs the source device

#### #arcana set reboot

Restarts Arcana

#### #arcana set scalemode x

where x is one of the following: auto, none, 4k60\_420\_10\_hdr, 4k60\_420\_10\_sdr, 4k60\_420\_8\_hdr, 4k60\_420\_8\_sdr, 4k30\_444\_8\_hdr, 4k30\_444\_8\_sdr, 1080p60\_12\_hdr, 1080p60\_12\_sdr, 1080p60\_8\_sdr

Sets the scaling style for the HDMI video output signal

In auto mode, optimizes according to the best sink capabilities

Ex. #arcana set scalemode auto

**#arcana set hdrmode x**

where x is one of the following: auto, off, force4000, force2000, force1000, boost, custom, lldvsync  
Controls how the HDR metadata is sent.

Auto setting uses incoming if available and OFF setting turns off any HDR metadata at the output

Ex. #arcana set hdrmode force4000

**#arcana set audiomode x**

where x is one of the following: auto, display, earc, both

Controls audio transmit:

auto -outputs audio depending what is connected

display -outputs only to the display and mutes eARC TX

earc -outputs via eARC only

both -outputs always from both

Ex. #arcana set audiomode auto

**#arcana set hdrcustomvalue x**

where x is 0-10000 nits

Modifies the incoming HDR MAXCLL value

This setting is used to replace the incoming metadata or to create the metadata using this value.

Ex. #arcana set hdrcustomvalue 1000

**#arcana set hdrboostvalue x**

where x is -5000 - +5000 nits

Modifies the incoming HDR MAXCLL value by adding/subtracting this value

This setting is used to replace the incoming metadata or to create the metadata using this value.

Ex. #arcana set hdrcustomvalue 1000

**#arcana set lldvtohdrmode x**

where x is [on / off]

Adds LLDV data block to the input EDID and modifies video stream to allow HDR conversion

Ex. #arcana set lldvtohdrmode on

**#arcana set lldvtohdrprimmode x**

where x is [bt2020 / dcip3]

Modifies LLDV data block accordingly

Ex. #arcana set lldvtohdrprimmode bt2020

**#arcana set lldvtohdrminlumvalue x**

where x is between 0-10000 expressed in 1/1000 nits

Modifies LLDV data block accordingly

Ex. #arcana set lldvtohdrminlumvalue 10

This sets minlumvalue as  $10/1000\text{nits} = 0.01\text{ nits}$

**#arcana set lldvtohdrminlumvalue x**

where x is between 0-10000 expressed in 1/1000 nits

Modifies LLDV data block accordingly

Ex. #arcana set lldvtohdrminlumvalue 10

This sets minlumvalue as 10/1000nits = 0.01 nits

**#arcana set lldvtohdrmaxlumvalue x**

where x is between 0-10000 nits

Modifies LLDV data block accordingly

Ex. #arcana set lldvtohdrmaxlumvalue 4000

**#arcana set earcdelaymode x**

where x is [on / off]

Activates or deactivates eARC protocol based delay information issues to the sink

Ex. #arcana set earcdelaymode on

**#arcana set earcdelayvalue x**

where x is 0-255 msec

When earcdelaymode is ON, this value is sent to the sink

Ex. #arcana set earcdelayvalue 66

**#arcana set oledmode x**

where x is [on / off]

Sets the OLED display visibility

Ex. #arcana set oledmode on

**#arcana set oledfade x**

where x is [0-255]

Sets the OLED display fade timer in seconds. After this time OLED goes blank

0 = no fade

Ex. #arcana set oledfade 60

**#arcana set osdmode x**

where x is [on / off]

Enables / disables osd

Ex. #arcana set osdmode on

**#arcana set osdfade x**

where x is [0-255]

Sets the OSD display fade timer in seconds. After this time OSD fades out

0 = no fade

Ex. #arcana set osdfade 30

**#arcana set osdcolorvalue x**

where x is [1 - 31]

Sets the OSD foreground color

Ex. #arcana set osdcolorvalue 20

**#arcana set factoryreset 3**

ERASE and overwrite default on all settings

Ex. #arcana set factoryreset 3

-----

The status of the above set commands can be fetched using "#arcana get ..". In addition these commands can be used

**#arcana get serial**

Returns the Arcana unit serial number

**#arcana get ver**

Returns the Arcana unit current version number

**#arcana get status x**

where x is [rx, tx, txcaps, aud, earc, spd]

rx indicate the input video stream received from the HDMI input

tx indicate the outgoing video stream from the HDMI output port

txcaps indicate EDID capabilities of the connected sink on the HDMI output

aud indicate the audio stream type going to the sink connected to the HDMI output port

spd indicate the source name coming from the HDMI input

Ex. #arcana get status rx

Gets the current incoming video format

**#arcana get audioctx**

Returns the audio channel count for the output. Applies only in LPCM mode

**#arcana get audiopcm**

Returns the audio mode LPCM / bitstream from the selected input

**#arcana get cdsstr**

Returns the current connected eARC device CDS string

**#arcana get edidtable x**

where x is [rx, tx]

Returns the current 256-byte EDID table of the corresponding port

## FAQ

### **Can Arcana accept 4K60 4:4:4 or any HDR signal and have the output at lower resolution?**

Yes, by default, Arcana will automatically scale down UHD to FHD if required by the connected SINK (Display, AVR or others). You can force the output signal using Scaler sub-menu option or set scaling to none if you don't want any scaling.

### **My display is supposed to accept 4K60 4:4:4 signals but it does not work?**

For most UHD TV set we tried, there are always extra configuration options to active in order to achieve a 4K60 4:4:4 600MHz link. For ex, on samsung: in order to enable the 444 colorspace for 4k in Samsung TV's you must go to "settings" and "hdmi" and "UHD color" and enable it. Then also you must assign the HDMI port1 as "PC" in the tools menu. Only after these two steps will 600MHz be accepted. Similar activation tricks are required on most UHD TV's. Additionally, most UHD TV's only have specific ports that are 600MHz capable.

### **I have a PC mode on my TV (or a PC monitor) what resolutions are supported for graphics mode?**

All PC graphics mode within the 600MHz bandwidth are supported, including ultra-high resolution such as WQXGA, QUXGA, QFHD, WQUXGA and 4K.

### **What input/output resolution does the Arcana support in HDTV mode?**

All known SD, HD, Full HD and UHD formats are supported including: 480i50,480i60, 480p50, 480p60, 576p50, 576p60, 720p50, 720p60, 720p100, 720p120, 1080i25, 1080i30, 1080p24, 1080p25, 1080p30, 1080p48, 1080p50, 1080p60, 1080p72, 1080p75, 1080p96, 1440p50, 1440p60, 2160p24, 2160p25, 2160p30, 2160p50, 2160p60 (these are examples only, anything within the 600MHz bandwidth is supported.)

### **What version of HDMI does the Arcana work with? Do I need HDMI 1.3/1.4a/2.0a/2.0b/2.1? Does it matter?**

It does not matter. Hdfury Arcana works with any version of HDMI from 1.0 and up.

### **Do I need to set anything special in my HDMI source device to set the resolution correctly?**

No. The Hdfury Arcana will be detected as 2160p60 4:4:4 capable device by your source and it will always accept and process the highest quality stream from your source devices. There is no need to set the HDMI source to any specific resolution.

### **Is there any latency (delay) introduced to the signal?**

Virtually none. The latency added is in the order of a few pixel clocks only. Nothing noticeable at all.

### **What about long HDMI cable runs? Can I expect issues?**

For 600MHz users must use "high speed" cables, or 600MHz/18Gbps certified, ideally the length should be between 6ft and 12ft for proper 600MHz/18Gbps pass-thru. For 4K30, 1080p or less almost all cables are ok. Hdfury Arcana acts as a HDMI repeater device. So having Hdfury Arcana in the path will amplify and recover the signal. You should not need any passive (or active) HDMI amplifiers, especially if you put the Hdfury Arcana in the middle of your cable run. If you previously had to use an amplifier, the Hdfury Arcana can most likely take its place. The Hdfury Arcana has been used with 50 foot (and longer) HDMI cables without issues including copper, active or fiber solutions.

**How are the new lossless audio formats via HDMI input handled? E.g. DTS-HD/MA and DD/E-AC3: Are they stripped down to DTS core or Dolby Digital respectively to fit the requirements of the S/PDIF standard?**

HDfury Arcana does not compress or otherwise down convert the incoming audio.

**I notice a short black screen / resync when starting a content that i didn't have or noticed when connected direct to TV?**

All that is normal, you will have the same if you insert any device in between, like an AVR, splitter, matrix, switcher, video processor, and the more device you have in the same chain, the longer this will take, the only way to have that nearly not noticeable is SOURCE > DISPLAY direct since signal goes straight to panel driver.

if menu is 60Hz and content 24Hz then there will be a resync like for any video format change, if you have SOURCE > TV, then sure you never noticed it but insert any device in between and you will have the exact same, just normal, HDMI resync

**Can i power Arcana from USB port to avoid another ac plug?**

There is no exact answer to that, power consumption depends on signal bandwidth, to be optimal 5V2A is best (we always recommend higher specs than real consumption, so everything runs cool). In reality you need around 5V 1.5A to operate perfectly at max capabilities.

A classic/single USB port as per specs is 5V 0.5A max normally, in such case, unit won't get enough power.

However, USB ports are usually built and implemented using 4 ports USB HUB chipset, and most of the time, the power is shared thru all of them, that means that if you only use 1 of them, then you can get up to 5V 2A from it. So, if you have a device with 4 USB ports and you only use one of them for Arcana, then it should work just fine.

## FAQ CEC/ARC

Make sure your TV audio format is set to Bitstream or Dolby Digital until SONOS Arc support multi-channel PCM on upcoming release.

ARC/CEC features added during development due to people request are not yet flawless on all display brands/models and will need many updates to become anywhere close to perfect simply because CEC is 25 years old coming from old scart age in Europe. There is no standard for it and every manufacturer implements it as they want it.

If ARC is not working well yet out of the box, you can turn OFF option called TV ARC ROUTING in AUDIO menu that is present since Firmware FW0.71 or turn off TV ARC and/or CEC or not use TV ARC input till there is a next update available and you can retry.

There might be several different settings to try, example on Sony TVs: some got their displays ARC sound working after using the Sony CEC reset commands listed.

eARC ONLY option (default since FW0.71) might need to be changed to TV+Display or Auto for ARC/HDMI selection to work on some display, so make sure you tried that too.

For any CEC/ARC issues, you can try the below:

- 1) Turn TV OFF / wait a few minutes / Turn ON.
- 2) Unplug / wait a few minutes / Replug TV powercord.
- 3) Turn TV CEC OFF then back ON (if many source at TV inputs, try adding them one by one slowly)
- 4) Unplug/Replug HDMI cable going to SONOS Arc.
- 5) Turn OFF and then back ON, Arcana and Source.
- 6) FACTORY RESET ARCANA (Click rotary button to enter menu and go to FW/RESET, click again to enter sub-menu, then go to FACTORY RESET and confirm by clicking)

HDMI cables need to be good enough, that's why first step is not VOLUME CONTROL or CEC or ARC. First step is to make sure SOURCE > ARCANA > DISPLAY play any content correctly without issue to make sure the HDMI LINK is SOLID, then only people should consider volume control / CEC / ARC stuff.

**Samsung CEC/ARC help:** Visit [here](#).

### Vizio TV CEC/ARC help:

1. From the AUDIO menu on your TV, change the Digital Audio Setting to Dolby Digital or Bitstream.
2. From the AUDIO menu, disable the TV's internal speakers.
3. From the SYSTEM menu, enable CEC Function.
4. From the CEC menu, select Device Discovery to register the sound bar with the TV.

The following steps are for use with a VIZIO TV, steps may differ by TV manufacturer. See your TV's user manual for more information.

If you want to use the volume buttons on the TV remote control to control the sound bar, enable System Audio Control from the CEC menu

To enable, disable, or adjust CEC settings:

1. Press the MENU button on the remote. The on-screen menu is displayed.
2. Use the Arrow buttons on the remote to highlight System and press OK. The SYSTEM menu is displayed.
3. Use the Arrow buttons on the remote to highlight CEC and press OK. The CEC menu is displayed.
4. Use the Arrow and OK buttons to adjust each setting:
  - CEC - Select Enable to use the TV remote to control CEC devices connected to HDMI. Select ARC Only for plug and play of an audio device connected to the HDMI ARC input. The ARC setting does not support video devices connected to the audio device (Select Enable to enable support for these devices). Select Disable to turn CEC off.
  - Device Discovery - Use this function to determine if your device is connected and supports CEC. (Required for Enable option only)
5. Press the EXIT button on the remote

### Sony TV reset CEC command

From Sony manual: Unplug the AC power cord (mains lead) and wait for 2 minutes (3 minutes for models equipped with an OLED panel).

For anyone who google searches this issue, this is how I fixed it:

```
force stop AudioOutputService
clear data on AudioOutputService
force stop bravia sync settings
clear data on bravia sync settings
powered off TV and unplugged it
unplugged all hdmi cables (both sides from tv and
soundbar)
unplugged sound bar
turned back on tv, wait for it to fully turn on.
Plug in sound bar
Run Bravia sync
```

Plug everything else in now.

was able to now see the sound bar under the bravia device list and was able to switch to it for sound.

## FAQ ATV4K

### **How should I set ATV4K if I'm trying to display DV content from LLDV source to a HDR10 display?**

Video set to 4K Dolby Vision.

Match Range set to Off.

Results in everything being output in DV, when you have an HDFury device spoofing an LLDV display.

Video set to 4K SDR.

Match Range set to On.

SDR is output as SDR, HDR as HDR, and DV as DV (with the spoofing).

Note that when you start up the ATV4K the first time after configuring the LLDV EDID in the HDFury device, the ATV4K should bring up a prompt asking if you want to test for Dolby Vision compatibility. You need to pass this test before any LLDV would be output. Passing the DV test will set video to 4K Dolby Vision, so you would need to reset it to 4K SDR if that is your preferred option.

Also, if you ever change the configured EDID, the ATV4K will notice and ask you to test for Dolby Vision compatibility again. Once you pass the test with a particular EDID, the ATV4K will remember the next time you configure that EDID and not ask to test Dolby Vision again.

There is an additional option: Match Frame Rate that will output the same frame rate as the source is encoded rather than always upscaling to 4K60. Although the ATV4K currently does not support content encoded at true 24P. It will output true 24P as 23P that results in frame drops that may or may not be noticeable.

### **Netflix on ATV4K only show 5.1 titles?**

One tip to save other Apple TV users some confusion, it may not say Atmos in the menu of the app (ex 5.1 in Netflix) you're using at first, but as long as you see Atmos under audio settings, just begin playing content you know supports Atmos and the app will adjust. Prime Video and Netflix seems similar in this regard. As for titles we know have Atmos, Prime video has Jack Ryan, Netflix The Old Guard and Disney + the Mandalorian. Each of those is platform original and there for should be available in every region. If you verify audio format with SONOS APP, make sure to restart it fully before checking.

### **After having installed Arcana, i am no longer able to control the SONOS Arc volume when using the ATV4K remote?**

A: Re-sync the ATV4K remote with the SONOS Arc.

From within the app, settings -> system -> under products select your arc setup -> near the bottom there is "remote control setup" then follow the onscreen instructions

### **TV does not turn off when i turn off ATV4K and/or sound continue to play when i turn off ATV4K**

Since FW0.74 Arcana will stop sending sound if display at output is turned off. Since FW0.77, it is now an users selectable option under OLED MENU>AUDIO>TV STANDBY MUTE ON (OFF by default).

For previous firmware version: First verify in ATV4K Settings > Remotes and Devices > then make sure Control TV and Receivers is on and Volume Control is set to via HDMI (Auto via HDMI)

Then make sure that ATV4K is NOT set to NEVER SLEEP!

Some users also reported success by toggling above ATV4K option OFF>ON and some had success by toggling TV CEC OFF>ON.

Actually there is an interesting caveat. With Sleep set to any time period and you are on the Apple TV homescreen, using the TV remote will turn the Apple TV off. If you have something playing with sound (ex. Channels TV app or Plex) the Apple TV won't turn off. ATV4K behavior

Alternatively, if TV does not turn OFF from ATV4K, you can try this trick/tips:

Here's the deal with HDMI CEC on my LG OLED. The Apple TV will send the 'On' command through HDMI. But the TV will not accept any 'Off' commands through HDMI therefore the Apple TV will send an 'Off' command through the remotes IR. When turning off your ATV, keep holding the remote towards the TV and it will turn off the TV. Works every time

**I cannot get Atmos from ATV4K but I can from other source.**

Make sure your Apple TV 4K Audio setting Change Format is turned off. If you had it turned on to get at least Dolby Digital 5.1 out of your TV before you got Arcana. Turn Change Format off, ATV4K will then detect the Arcana as Atmos compatible.

**I can get Atmos from all sources and all apps but not from Netflix on Shield 2019 or ATV4K?**

If you can get Atmos on Prime and Disney + from both devices no problem but never better than 5.1 from Netflix – simply go into your Netflix account setting on a Laptop and check your audio payback setting and make sure it is set to high and not any lower and restart your source.

**My ATV4K remote is not working for SONOS Arc volume control?**

ATV4K source remote is different because it just waits if there is "audio system" device on the network that it can control. If there is then it shown in the remote menu "hdmi control(via receiver)"

That will only work if the source sees an audio system in the CEC network.

It is just ATV4K trying to discover if audio system is present or waiting for Sonos to advertise it is there.

Of course sometimes when there is no audio then Sonos is not active and then volume doesn't do anything, if no sound going then volume doesn't blink it (white led on SONOS Arc)

## FAQ LLDV>HDR10

### What is LLDV and why is it used?

Dolby Labs created LLDV for Sony Dolby Vision TVs. HDFury enables the sending of LLDV to HDR10 TVs and projectors

### How to turn on LLDV>HDR?

1. In LLDV > HDR sub-menu set it ON.
  2. In HDR sub-menu, set LLDV sync or HDR option to AUTO
- You might need to restart your source.

If you have the Arcana set so the ATV4K sends Dolby Vision LLDV instead of HDR10, the ATV skips the DV to HDR conversion and directly tone maps the Dolby Vision source to LLDV. The result can be amazingly better to have the Arcana output the LLDV from the ATV4K as HDR10 than have the ATV4K sending HDR10 to your TV.

### What is the difference in LLDV>HDR on and HDR auto vs LLDV sync

With LLDV>HDR ON. HDR Auto will send custom HDR for LLDV, but not for any other input. Colors should always be correct. Whereas HDR LLDV Sync always sends custom HDR for any input type including SDR so colors will be over saturated for SDR content but correct for LLDV. If you will send SDR, HDR10, or LLDV to the Arcana depending on the original content type, it is best to leave HDR to Auto. If you only send LLDV to the Arcana then you can set HDR to LLDV Sync.

### If I have a less than full bandwidth 18Gbps display or PJ can I still view LLDV?

Yes as long it supports HDR. Most DV content is actually 4K24 so if you set Match Frame Rate to ON your projector might be able to accept 4K24 422 12bit.

For example The Epson 6040 is limited to 4K60 4:2:0 8-bit. It can support 4K24 4:2:2 12-bit HDR (or LLDV to HDR) as that signal is under the 10.2 Gbps limitation of the chipset used in the Epson 6040.

Also there is no such thing as 422 10-bit in the HDMI specs. And 444 10-bit is a higher bandwidth than 422 12-bit.

### I have a display that supports HDR and Dolby Vision should i set the Arcana for LLDV to HDR conversion?

No, it is not necessary to have the Arcana convert LLDV to HDR10 if your display supports Dolby Vision, except if it's DV30 only and you want/need to overcome this limitation.

### What series LG OLEDS support both full Dolby Vision and also LLDV?

The LG OLEDS from 7 series on support both full Dolby Vision and LLDV.

### What is Maximum Luminance and MaxCLL value in Dolby Vision?

LLDV to HDR conversion for Maximum Luminance only affects LLDV output and not full Dolby Vision. The Maximum Luminance value tells the player what the maximum brightness your TV is capable of. The player takes that into account when tone mapping full Dolby Vision to LLDV.

There is a Maximum Luminance value in the Dolby Vision data block that can be adjusted in the LLDV->HDR settings. Its default value is 1000 nits and is used to tell the player what max luminance to use when tone mapping the Dolby Vision content to LLDV. There is also a nits option value in the HDR settings of the Arcana. This value may or may not be used by the HDR TV when tone mapping HDR

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**Disclaimer:** 3<sup>rd</sup> party and/or custom firmware providing extra features are not covered in this manual.

input. The only way to determine how it is used is to adjust the value and check the results. Changing the HDR nits value should have an immediate effect, if any. Typically, lowering the nits value will result in a brighter picture at the risk of clipping highlights. It might seem counter intuitive but telling the TV that the content has a lower max luminance means that the TV does not need to use as much compression to reduce the dynamic range of the content to fit the range that the TV is capable of displaying. Too much compression is what results in an overly dark picture. If the HDR TV has Dynamic Tone Mapping, the HDR metadata might not be used at all when tone mapping. So changing the metadata nit values would make no difference in the result. You could turn off DTM and see if changing nit values makes a difference in the resulting picture.

So basically, The Hdfury Arcana tells the player what the max luminance is; the player then performs tone mapping of the full Dolby Vision signal to LLDV taking the max luminance value into account. It is not a simple brightness adjustment.

The Force 1000/2000/4000 nits options and the Boost option adjust the MaxCLL value in the HDR metadata in the output. The Max Luminance value is not changed and is always output as 4000 nits. So if your HDR TV uses Max Luminance in tone mapping the results after changing the HDR nits values may be lessened. HDR Max Luminance is the maximum luminance of the HDR grading monitor used when creating the HDR. Titles graded with a 4000 nit monitor are referred to as Mastered at 4000 nits. MaxCLL represents the brightest pixel contained in any frame of the content. Most newer TV models use MaxCLL and have less reliance on Max Lum. Changing the LLDV nits value may need a restart of the title depending on the player. ATV4K is probably the worst player for testing different values since each time an adjustment is made it requires a new test for Dolby Vision. This is because the Max Luminance value is contained in the EDID presented to the player. The ATV4K recognized the EDID had changed and wants you to test Dolby Vision again.

#### **Why when I select a new EDID do the ATV4K want to retest Dolby Vision?**

The ATV4K keeps a memory of successful EDIDs. If you configure a new EDID it will ask to retest Dolby Vision and/or HDR. But the next time you configure that same tested EDID it won't ask to test again.

#### **What value should the LLDV value for max Lum be set to for most users?**

For most users, the default LLDV value for Max Lum of 1000 nits will be good. Most HDR TVs do a good job of tone mapping 1000 nits. And if you set the HDR setting to LLDV Sync, the HDR MaxCLL metadata value sent to the TV will always match the value set for LLDV.

#### **Why do I have a red tint and colors that are too saturated?**

If you set the DV primaries to DCI-P3 and send the LLDV to a display device that does not have a DCI-P3 color profile; the colors, when applying a BT2020 color profile instead, will appear more saturated including a red tint noticeable on faces. The solution is to send BT2020 and not DCI-P3.

#### **If you have a display that supports DCI-P3 but the fire stick 4k only supports RGB and YCbCr how can you force it to output DCI-P3?**

When you set the LLDV->HDR Primaries setting to DCI-P3, the Fire Stick is told that the TV wants DCI-P3 instead of BT2020. Even though the Fire Stick may not have a DCI-P3 color format output option, the Dolby Vision to LLDV tone mapping performed by the Dolby provided software should output DCI-P3 colors. The ATV4K does not have a DCI-P3 output option and it does send DCI-P3 colors when the DV EDID is configured to DCI-P3.

**How do you set the Oppo UDP 203/205 to output LLDV instead of Dolby vision?**

In Oppo HDR Setting, set Dolby Vision Processing to Player-led. You can leave HDR to Auto if you only want LLDV for Dolby Vision discs. If you want the Oppo to convert SDR and HDR10 to LLDV, set HDR to Dolby Vision.

**How do you tell if the Oppo UDP 203/205 is setup correctly and outputting LLDV?**

Do a long press on the Oppo remote Information button. Scroll down to Output Information. You should see: Format Dolby Vision and Color Space 12-bit. That is confirmation of LLDV output from the Oppo.

**If I have a less than full bandwidth 18Gbps projector can I still view LLDV?**

It depends on the projector. Most DV content is actually 4K24 so if you set Match Frame Rate to ON your projector might be able to accept 4K24 422 12bit.

For example The Epson 6040 is limited to 4K60 4:2:0 8-bit. It can support 4K24 4:2:2 12-bit HDR (or LLDV to HDR) as that signal is under the 10.2 Gbps limitation of the chipset used in the Epson 6040.

Also there is no such thing as 422 10-bit in the hdmi specs. And 444 10-bit is a higher bandwidth than 422 12-bit.

## FAQ SONOS Arc

### **Audio cuts in and out, what could it be?**

If the audio cuts in and out on a SONOS Arc, try power cycling it (unplug the power cord, wait a few seconds, and then plug it back in).

### **It seems there is distortion or surround channel cutting in and out, what could it be?**

If anything weird is happening with your video or audio, your FIRST step should be to make sure the HDMI cables between your source and the Arcana and between the Arcana and your TV/PJ are known to be good at full speed (We recommend Zeskit, Kabeldirekt or Cable Matters from Amazon). Even if you sent 4K60 video with Atmos over the cables and the Arcana showed the full 600MHz speed, and even if they pass the built-in Apple TV 4K Dolby Vision tests, there may still be intermittent errors, like distortion or surround channels cutting in and out. Many users finally determined the problem to be caused by a 1-foot cable between Arcana and their displays. Use only cables that are at least 6 feet/2 meters and max 12 feet/4 meters for copper. We recommend using SONOS supplied cable from Arcana eARC output to SONOS Arc.

## FAQ NVIDIA SHIELD

### Why my Shield is not offering Atmos from all APPS?

There are several factors, the Shield model: Shield 2017 or Shield 2019/2020/Pro, the APP in use and the TV maximum capabilities. Arcana offer dedicated Scaler mode that will advertise full 4K HDR/SDR or LLDV at input even if your display is only 10.2Gbps or 1080p capable. However please understand that sending HDR or LLDV signal to a SDR display will results in washed out colors. If your TV is only SDR capable, only use a SDR scaler mode such as 4K60 444 8b SDR. Make sure to always reboot the Shield after changing the scaler setting

Service/App - Title Played - Arc Audio reported in Sonos App (make sure to always restart the APP to have accurate audio format reported)

4K SDR Display or Scaler set to 1080p SDR

Disney+ - The Mandalorian - Dolby Digital Plus 5.1

Disney+ will not output Atmos in 4K SDR > 1080 SDR on Shield 2017 and PRO.

Netflix - The Old Guard - Dolby Digital Plus 5.1 (Netflix playback screen displays Ultra HD 4k and 5.1) on Shield 2017

Netflix will not output Atmos in 4K SDR > 1080p SDR on Shield 2017 but will do it on Shield 2019/2020/Pro.

4K HDR Display or Scaler set to 1080p HDR

Disney+ - The Mandalorian - Dolby Atmos (DD+)

Disney+ will output Atmos in 4K HDR > 1080p HDR on Shield 2017 and PRO.

Netflix - The Old Guard - Dolby Digital Plus 5.1 (Netflix playback screen displays HDR and 5.1)

Netflix will not output Atmos in 4K HDR > 1080p HDR on Shield 2017 but will do it on Shield 2019/2020/Pro

### I can get Atmos from all sources and all apps but not from Netflix on Shield 2019 or ATV4K?

If you can get Atmos on Prime and Disney + from both devices no problem but never better than 5.1 from Netflix – simply go into your Netflix account setting on a Laptop and check your audio playback setting and make sure it is set to high and not any lower and restart your source.

### Prime APP on Nvidia Shield 2019 is not giving me Atmos?

Try turning off Dolby Audio processing.

## FAQ XBOX

### **I don't have sound in Xbox One S BR APP?**

Make sure to turn off decode settings in (Settings -> Blu Ray Settings) otherwise you will be forcing multi-channel LPCM to SONOS Arc, which is not yet supported by SONOS Arc. Once SONOS Arc supports multi ch PCM, then you will be able to turn that option ON or OFF and both settings will work. Such settings apply to any source that offers such option as long as SONOS Arc does not support multi-channel PCM. It is expected to be supported on SONOS Arc 13.0

## FAQ AUDIO

### **I hear an audio echo?**

If anyone is having issues with echo on your audio, the problem may be that the audio channel being sent to your TV is actually getting played through the built-in TV speakers (which is hard to notice when your sound bar is right in front of or below your TV) and you're hearing two sets of speakers slightly out of sync. Checking the sound-output setting on your TV will confirm if that is the cause. You can fix it by setting your Arcana to eARC-only mode (default mode since FW0.71), so no audio gets sent to TV and you only hear audio from eARC sound bar.

### **I'm experiencing lip-sync issue after installing Arcana?**

The only possible situation with HDMI source at Arcana input is that audio is AHEAD of pic. You can fix it with SONOS APP delay or Arcana delay. AUDIO cannot be LATE (assuming you did not force delay yourself via SONOS APP or Arcana). For folks with an Apple TV, the Wireless Audio Sync feature will automatically and very accurately take care of remaining (audio before video) sync. It didn't work before Arcana because it can't delay video and got confused.

### **My TV displays unsupported audio format banner continuously, what can I do?**

Some TV will go nuts/crazy if you send ATMOS signal to their input, probably the Atmos MAT metadata of it that they don't like, in such case eARC ONLY must be selected under Arcana > Audio so NO ATMOS is sent to the TV (default mode since FW0.71).

Actually anyone with any issue should try that especially if issue when playing Atmos only!

Verified/Affected models: Sony XF9005 - X900F and Samsung UN75NU6950FXZA

### **I cannot always get Atmos at startup?**

Make sure that you are at least running firmware 0.74. Please ensure the source is connected to the Arcana's HDMI input and then pick and use a scaler mode in Arcana OLED MENU > SCALER that is an appropriate match setting for your display. This has been proven to fix the issue 100%. If you do not get Atmos from source at Arcana input with Scaler mode, it is 100% Settings issue, GUARANTEED.

### **I cannot get any sound to a brand new/never used SONOS Arc from any source at Arcana input when Arcana is connected to a non CEC capable projector/monitor or display**

In order to get audio from any sources at Arcana input, users of brand new/never used SONOS Arc must go through the APP setup process while connected to a CEC capable display, if you never when through the SONOS APP setup process with your SONOS Arc soundbar yet, please connect it to any HDMI display that offer CEC support and complete the SONOS APP setup process, once done you can connect it back in your setup with a non CEC capable display, monitor or TV and you will be able to get Full Audio from any source to SONOS Arc as expected. This SONOS restriction requires such initial setup first with CEC capable display. If your SONOS Arc has been setup before, then there is no need to set it up again after Arcana is connected and you can just proceed normally.

## FAQ VIDEO

### **I notice a short black screen / resync when starting a content that i didn't have or noticed when connected direct to TV?**

All that is normal, you will have the same if you insert any device in between, like an AVR, splitter, matrix, switcher, video processor, and the more device you have in the same chain, the longer this will take, the only way to have that nearly not noticeable is SOURCE > DISPLAY direct since signal goes straight to panel driver.

If menu is 60Hz and content 24Hz then there will be a resync like for any video format change, if you have SOURCE > TV, then sure you never noticed it but insert any device in between and you will have the exact same, just normal, HDMI resync.

### **My TV brightness seems to fluctuate, what can I do?**

Some TV will go nuts/crazy if you send ATMOS signal to their input, probably the Atmos MAT metadata of it that they don't like, in such case eARC ONLY must be selected under Arcana > Audio so NO ATMOS is sent to the TV (default mode since FW0.71).

Actually anyone with any issue should try that especially if issue when playing Atmos only!  
Verified/Affected models: Sony XF9005 - X900F and Samsung UN75NU6950FXZA

### **I have loss of sync, drop or black screen playing high bandwidth signals?**

This is a cable issue, replace cables by Zeskit, Cable Matters or KabelDirekt from Amazon in min6ft/max12ft and you will be fine. If you need fiber cable for high bandwidth in 30ft(10m) or 60ft(20m), please visit [this page](#).

## FAQ ARC <> HDMI input switching

### How to use Arcana when retrieving ARC sound from display?

Always use the display remote (or the display remote IR codes with a universal remote) to switch between TV HDMI input and TV APPS. It is mandatory and extremely important to use your TV remote or TV remote IR codes to switch between TV APPS (ARC sound) and the TV HDMI input where Arcana is connected. Whenever you click TV remote APP selection or input channel selection there will be a multitude of CEC commands flying. Arcana capturing these are essential to switching the audio. Please verify this is the case carefully so it is consistent and ok. We expect this to be one of the main issues due to the flakiness of CEC implementations overall in consumer video. Also verify TV other inputs to make sure audio flows through TV ARC into Arcana and then to SONOS. Please note that if you don't use CEC and ARC sound retrieval, then the above is irrelevant.

### How I can switch between TV ARC and HDMI INPUT?

For HDMI/ARC switching to work, when you use your TV remote and select APPS on TV, then ARCANA should switch to ARC(From TV) on the main OLED page, when you use your TV remote and select HDMI input where Arcana is connected, then Arcana OLED should report eARC HDMI INPUT. As long as this does not work correctly it means that ARC/CEC is not working as it should and you should try new update when they comes out and report back via our discord support server: [here](#).

When TV sees a source it asks the source what it is. The source responds it is "audio system". Then TV starts ARC and turns off its own TV speakers and allows TV remote volume control to pass as CEC commands. Now all audio either from tv apps or routed to TV via TV HDMI inputs will flow back via ARC. To enable HDMI audio from Arcana input then Arcana must be instructed to switch to its own input audio rather than use the ARC from TV. This happens with two ways: TV remote is used to select the input where Arcana is connected OR the Arcana input source issues routing change -message which happens when you press Menu button on ATV4K for example

When Arcana is rebooted this entire sequence is interrupted and all start from scratch and again the timing when SONOS Arc tells "audio system" vs when ATV4K source send its routine message is random. Arcana play no role in that, Arcana only listens to these commands and they come randomly after power up.

Sometimes TV is first and sometimes ATV4K is first so the startup selection by Arcana will be random It is only in sequence if you never reboot Arcana.

If you see "eARC/ARC not active" on Arcana OLED > click Netflix or APPS on TV remote to enter ARC mode and then click HDMI (or wherever Arcana is) to have TV select HDMI input.

On some TVs you might need to set MENU > AUDIO > AUTO (instead of eARC ONLY by default since FW0.71)

## FAQ TV Remote for Volume Control on SONOS Arc

### How to use TV remote for controlling SONOS Arc volume?

Please note that this DOES NOT apply to SOURCE REMOTE for volume control.

In basic principle the only way that TV remote can start working is that TV enters "system audio" mode (it's a different mode from "audio system"). The only possible way for a TV to enter a "system audio" mode is by receiving a certain command via CEC. In "system audio" mode TV mutes its own speakers and starts controlling external products via CEC commands. The only equipment issuing this command is SONOS Arc. No other device can control TV to enter this mode. Anyone having issue where TV remote does not work then it means SONOS Arc has not yet issued the command or TV have not yet reacted to it. As long as TV does not mute its TV speaker, then TV remote control for volume will not work.

### Solution could be:

1) Turn TV CEC OFF>ON or CEC SCAN

Some TVs might have delay after CEC ON to detect equipment.

2) SONOS HDMI cable unplug/replug

Some TVs might have delay after SONOS replug to detect it and switch to "system audio" mode.

3) SONOS power cord remove/reconnect

Some TVs might have delay after SONOS replug to detect it and switch to "system audio" mode.

4) TV Power cord unplug, wait 3min, replug

Some TVs might have delay after power cord unplug/replug to switch to "system audio" mode.

5) Some order or power up sequence might need to be found in particular setup.

6) Unplug/replug Arcana HDMI Out or Arcana > FW/RESET > Factory Default.

It can help if luckily that is corresponding to option number 5 above in your setup.

## Highlight Features:

### **Arcana Exclusive: Full HDMI Audio eARC output (extract HDMI/ARC sound to feed eARC system)**

Arcana was designed for SONOS Arc (eARC sound system and upcoming) as well as any ARC or eARC only sound system. Its main purpose is to extract up to full audio from HDMI source and feed SONOS Arc or similar eARC sound system with the best possible audio from any HDMI source thus bypassing possible limitations in AV setup (ARC capable display or non-ARC capable display). An eARC display is not needed anymore to get full audio from HDMI source with SONOS Arc or similar eARC only sound system.

1 HDMI input, 1 HDMI video output with scaling option and 1 dedicated HDMI full audio eARC output, OLED/MENU Control, RS232, OLED display and a rotary switch button on the side allowing to enter/exit and perform change in the device system menu. The HDMI input is capable of 4K HDR/HLG/DV/LLDV/HDR10+ up to 18Gbps for video and support any sound format in existence today, HDMI TX0 video output is capable of outputting 18Gbps and all sound formats as well. Arcana is always running in automatic mode by default to ensure your setup remains always optimized at its best capabilities.

### **HDR Booster**

Arcana is capable of injecting and modding HDR metadata at any resolution in real time. Easy control allow quick change to HDR metadata, translate HLG>HDR, replace or boost value from any metadata on the fly or simply disable HDR metadata for display with dedicated HDR mode.

### **LLDV>HDR10**

Display DV content on HDR/HDR10 display from LLDV capable sources.

Using Arcana will allow any HDR10 display without DV support to finally render DV content from LLDV capable source.

### **Down Scaler when needed**

Always feeding best capabilities HDMI signal to connected sink devices, automatically or manually. No matter if you have HDMI first generation or second generation equipment, any devices always get the best possible signal in FHD(1080p) or UHD(2160p) GUARANTEED. Featuring Downscale, Passthru as well as Chroma Conversion, Color Space and Color Depth modification on the fly at 8, 10 and 12bit for FHD, UHD and DCI 4096x2160p.

### **Extract up to Atmos over DD+ from TV ARC Input to ANY eARC sound system**

ARC (for up to DD+/Atmos over DD+ bitstream) is possible from TX0 HDMI video out.

### **Max Audio capabilities and format extracted from any HDMI sources to feed any eARC sound system**

Thru a dedicated HDMI eARC output, any HDMI sound format from any incoming signal is automatically extracted and forwarded via eARC to feed any eARC sound system. ARC Audio format from TV apps are output to your eARC sound system thru the same HDMI eARC Audio output.

### **OLED Menu**

Controlling your HDFury has never been so easy, fast and elegant. With a single up/down/click 3 functions rotary switch, you can navigate and select any options in the embedded OLED menu. Firmware update are made easier with no need of any driver installation or hassle of any kind. Simply copy the firmware update file on a FAT32 formatted USB stick and plug it in Arcana update port.

**HDMI Explorer (OSD/OLED)**

Signal and setup info is everywhere and always available at first sight. Enhance your AV knowledge thru exact signal timing report with up to 3 digits decimals accuracy on frame rate. Display source name, resolution, chroma, colordepth, colorspace, hdcp, cst1, VIC, eotf, colorimetry, primaries, white point, max/min lum, maxCLL, maxFall, range. Our new generation hardware is bringing HDMI explorer to another level; simply anything that travels thru is intercepted and exposed to the user via OLED display or On Screen Display.

**RS232 Control**

All Arcana controls are also available via RS232 in order to ensure a total control from any serial based computer.

**HDMI/CEC TOTAL COMMANDER**

Hdfury Arcana offers a unique CEC command manager, with CEC compatible equipment.

CEC commands allow a HDMI device to send commands to connected HDMI devices.

Arcana unique solution allows control between source, TV and eARC sound system in all directions.

**Unique HDCP Doctor**

Providing a total of 4 HDCP 1.4 and 2.2 engines for decryption/encryption, Hdfury Arcana offers a total HDCP workaround solution including HDCP 2.2 > HDCP 1.4 and HDCP 1.4 > HDCP 2.2 both ways conversion within the same unit. It is capable of connecting any HDCP1.x or HDCP2.x source devices to any HDCP1.x or HDCP 2.x sink devices. RX block decrypts the input first whether its 1.x or 2.x. Then output port can individually encrypt it to 1.4 or 2.2 or not encrypt it at all if it was not encrypted initially.

**Display HDCP 2.2 Content with Non-HDCP2.2 Compliant Devices**

HDCP 2.2 is the new copy-protection scheme for 4K UHD content. Source devices, including media servers and head-ends like Netflix, will encode their 4K content with this new scheme. TVs must be HDCP 2.2-enabled to play it, and everything in the video chain including switches and receivers must be compliant as well, or the display will go dark and/or display a HDCP error message. Bad news for consumers who have purchased expensive, high-bandwidth, processor-rich switchers, receivers and displays to accommodate 4K. Once Arcana is an active part of your setup such issue will not bother you ever again.

## Main Specifications

- ▶ 1x Input / 2x Output / Scaler + eARC Audio out (HDMI2.0b/HDMI1.4/DVI1.0 compatible)
      - 4K60 4:4:4 600MHz 18Gbps Pass through
      - 4K24/25/30/50/60 <> 1080p24/25/30/50/60 Downscale with or without colordepth maintained and with or without chroma or colorspace conversion.
      - Video Bandwidth - 18 GBP/sec.
      - HDR10+/Dolby Vision Support.
      - 4K 10, 12, 16 Bit Support
      - 16 Bit Per Pixel Deep Color Depth Available (48 Bit)
      - Max Res:                   4K60 4:4:4 8b, 4K60 4:2:2 12b, 4K120 4:2:0 8b or 8K30 4:2:0 8b
      - Signal Conversion:    Resolution, Chroma Subsampling, Color Space, Color Depth, HDCP
- ▶ HDCP Doctor (HDCP Workaround solution to any HDCP error)
  - HDCP 2.2 > HDCP 1.4 conversion
  - HDCP 1.4 > HDCP 2.2 conversion
  - HDCP x.x > HDCP x.x conversion
  - Dual HDMI2.0b & HDMI 1.4 combined
  - Dual HDCP 1.4 & HDCP 2.2 combined
- ▶ CEC Support: For inter-device control between the primary input and both outputs.
- ▶ OLED infoscreen and OSD to provide useful and insight view of signal information
- ▶ Audio Extracting: Extract Full Audio from HDMI source at input and ARC sound from TV ARC input at output.
- ▶ Advanced EDID management via RS232
  - Improved EDID Management solution.
  - Sniff EDID and CDS from connected sink devices.
  - AutoMix EDID feature will create a custom EDID by mixing both sinks EDID and CDS connected to the output ports.
  - Some modes can be forced, such as: TV only, eARC only, TV+eARC.
- ▶ Infoframe Modes:     replace HDR metadata.
- ▶ Control Modes:        OLED Menu, RS232.
- ▶ HDMI Booster/Extender: Capable of extending 1080p resolution up to 15m. in and 15m. out (30m. total for 1080p), 10.2Gbps UHD resolution up to 10m, 18Gbps UHD resolution to 5m.
- ▶ HDMI Doctor: Solves most HDMI integration issues such as HDCP, EDID, HPD, and audio breakout.
- ▶ HDMI Equalevel: Precise signal equalization for both input and output signals delivers the best possible picture quality with no dropouts.
- ▶ Deep Color Support
- ▶ xvYCC Color Support

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**Disclaimer:** 3<sup>rd</sup> party and/or custom firmware providing extra features are not covered in this manual.

- › Flexible/Portable/Plug'n Play
- › 3D Ready: Capability to pass 3D stereoscopic signal formats.
- › Public API/DLL access – not yet published.
- › Share your config with the community.

## Supported Audio/Video Signals

- › Supported Format: SD/HD/FullHD/UHD/4K30/4K60, basically INPUT/OUTPUT any video format up to 4K60 4:4:4 600MHz 18Gbps.
- › Supported Resolution examples:  
480p/720p/1080i/1080p24/1080p25/1080p30/1080p50/1080p60/1440p50/1440p60/2160p24/2160p25/2160p30/2160p50/2160p60 and DCI
- › Support all UHD/BR and HDR standard resolution: 4K60 4:2:2 12bit BT2020 HDR, 4K60 4:2:0 10bit BT2020 HDR, 4K60 4:2:0 12bit, 4K30 4:4:4 12bit, ..
- › Support all VESA mode video formats (PC Resolutions) up to ultra-high resolution such as WQXGA, QUXGA, QFHD, WQUXGA, 4K
- › Support any Audio format such as PCM at up to 192kHz, compressed audio (IEC61937), DSD, DST,DTS, DTS-HD, Dolby True HD, DTS-MA, HBR, DD+, DTS:X and Dolby Atmos.

## Technical Specifications

- › I/O: 1x HDMI In, 2x HDMI Out, RS232, USB power, USB update.
- › OLED Display: 1" diagonal, 128x64, 2 colors
- › Audio: PCM at up to 192kHz, compressed audio (IEC61937), DSD, DST, DTS, DTS-HD, Dolby True HD, DTS-MA and HBR.
- › Power Supply: External 5 Volt 2 Amp.
- › Input Lag: <1ms (nanoseconds count)
- › Product Dimensions: 3.9"L x 2.3"W x 0.8"H - in CM: 10 x 6 x 2.2 Weight: 120g – 0.23 LBS
- › Enclosure: Black PVC/black metal/Chrome grid and Blue OLED
- › Regulation: CE, EAC, FCC, RoHS

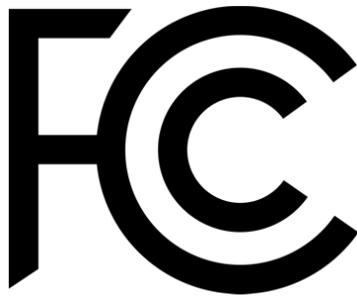
## Certifications



[Arcana CE Certification](#)



[Arcana RoHS Certification](#)



[Arcana FCC Certification](#)

## Pro Tips

- Dolby Vision: DV mode 0 and 1 travels thru 8b RGB container, so it is normal that Arcana report RGB 8b when playing such DV mode. If Arcana is not directly connected to your DV TV and you have equipment in between, please first connect Arcana TO output to your TV input and let Arcana boot up. Then disconnect and insert equipment in between. Arcana will sniff the DV string from your TV EDID and present it to your source, therefor allowing you to go thru equipment that doesn't support Dolby Vision.
- HDMI TO Output is CEC/ARC and eARC capable.
- iRule use `\x0D` instead of `\r` (or `\x0A` for `/n`) to terminate the RS232 command string.
- Some sources like X15 or K8500 might need to have powercord removed/reconnected between EDID changes
- Atmos via ARC require HDMI Cable that support 192khz ARC, even if a cable support 600MHz video signal it can still fail for 192khz audio signal.
- Any 4:2:2 signals is always processed at 12b and never clipped. That's why it mentions "up to 12b".
- Source VS Arcana frame rate reported: Actually very few devices will report the correct frame rate. It is all about the clock frequency, the theory is  $24/1.001 = 23.976023976$   
BUT there is no PLL ([https://en.wikipedia.org/wiki/Phase-locked\\_loop](https://en.wikipedia.org/wiki/Phase-locked_loop)) at the source that actually gives a corresponding clock which would yield that. So once a signal leaves the source, the clock is always off and usually ebbs and flows, means changes all the time. We just decided to show what it really is from the particular source rather than approximating what it should be as many are doing since they cannot report exact frame rate like we are doing with Arcana.

## Credits

Arcana is a community driven project, below are some of the usernames who actively participated in making Arcana a reality, you guys have been truly amazing, thank you!

Rum, Tim1983, rohanmowthelawn, th1nkdifferent, Kill3rmonk, Anachronism, rjona, sphinxbr, deano72, kashfr, nodis, bshollis88, scott83, milkplus, Mehul, Frederick Umeri, MikeHyde, Mike, jutre, Dan1985, GReeeeN, motoridersd, mttjj, Siemar, mj7900, stuey77, Smudgedj, Micha K, RPAW, melvimbe, Olok, Derek, rayace, CatHerder, Michiel, Sojhinn, Abhijit Karmokar, FC, Danio, jonathanq, lilsmeat, Kudzai, BobvonRocket, slopokdave, PopDay123, antraneek, Smully, akkord, Tlos, JollyRioger, billp0527, Fonz, Gundam 0-1(Brad), Tmilner09, fmier, Prathik1, Moshe, Furq, Zog, mattjames355, spiff, kinteseay, jaminfrog, BlueMagic, Yarga, phyuze, Stefan Makrides, Poldilein, Spike.M, mcw, MarcoH, Samsonite71, Johan L, Veritirritable, sim, jus10finity, dcsfai, Serpent, Sir Pubis-Humongis, pixelfan, guitarsuperstar, Highfalutintodd, brainnxdomain, jepzor, Rowley, Beau Daniels, DaddyZeeky, Bolagnaise, bringiton665, Spook\_, FrankeBob, scotinbama, Riche, tito12384, carrig, Pennypacker, allandor/Moirainne, kgh00007, CraigMcC11, Sixpack, cuttyone70, Rogbott, Gokin, mattgintx, kksk2000, Alleviate, Kingbo, Brad, Bishamon, dr8, canada45, futureisnow, AVPro007, basonos, Guinan, Edjas, sllmhjn, sdmnx, J\_SQUARED, Dennis, Lmx, riesm, Elraw, sciguy, MikeLanders, mcfearsome, Dimitri Etienne, Wilker, spark, Camman595, alyc100, czhoume, TeamRosen, reformedbear, tachi, Azzone, ...

Team HDfury thanks you for your support

For help visit our [support server](#) or [contact us](#).



[www.HDfury.com](http://www.HDfury.com)

*Arcana was built with love and passion.*

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**Disclaimer:** 3<sup>rd</sup> party and/or custom firmware providing extra features are not covered in this manual.