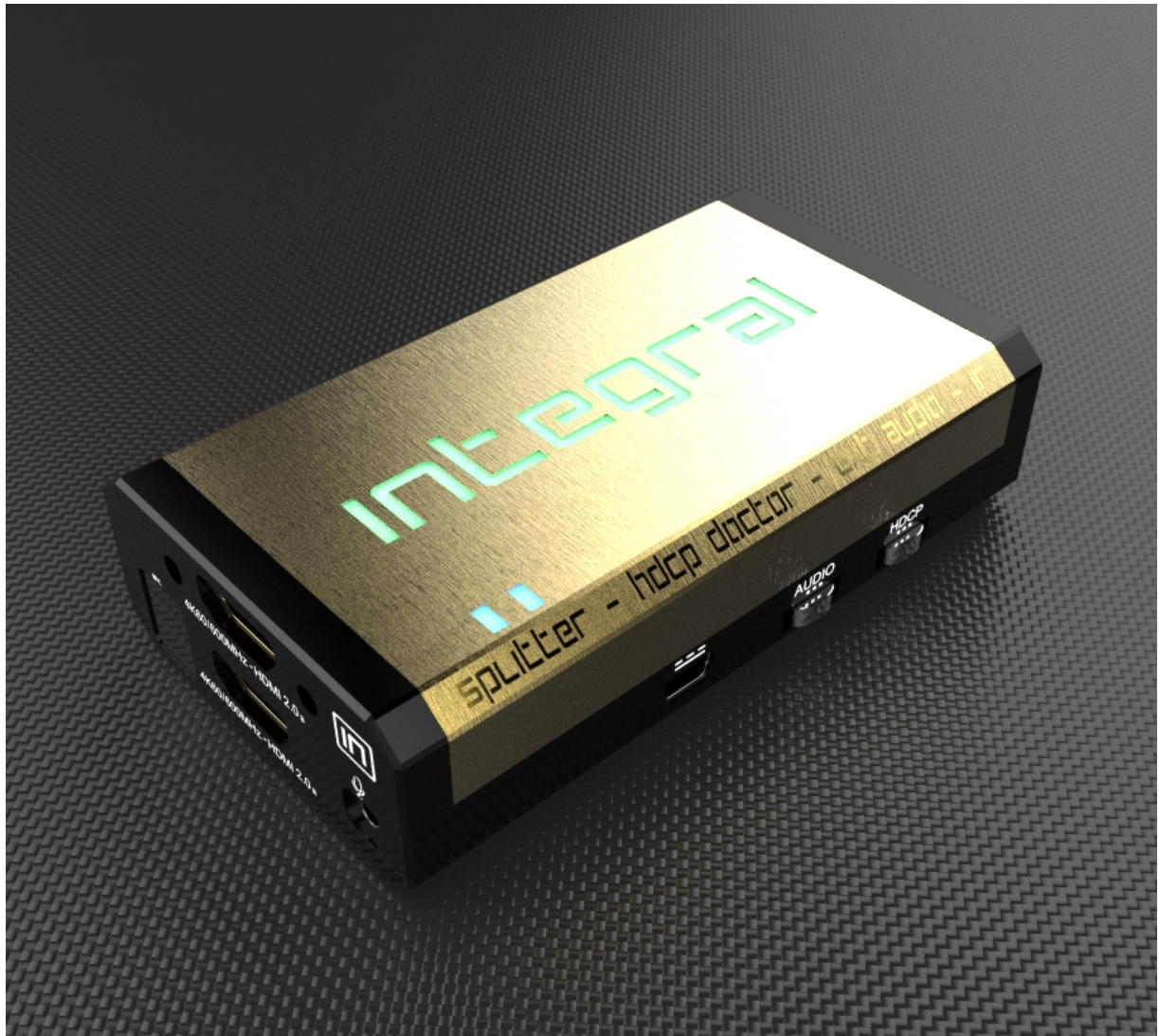


Integral



User Manual Integral FW Rev 1.0

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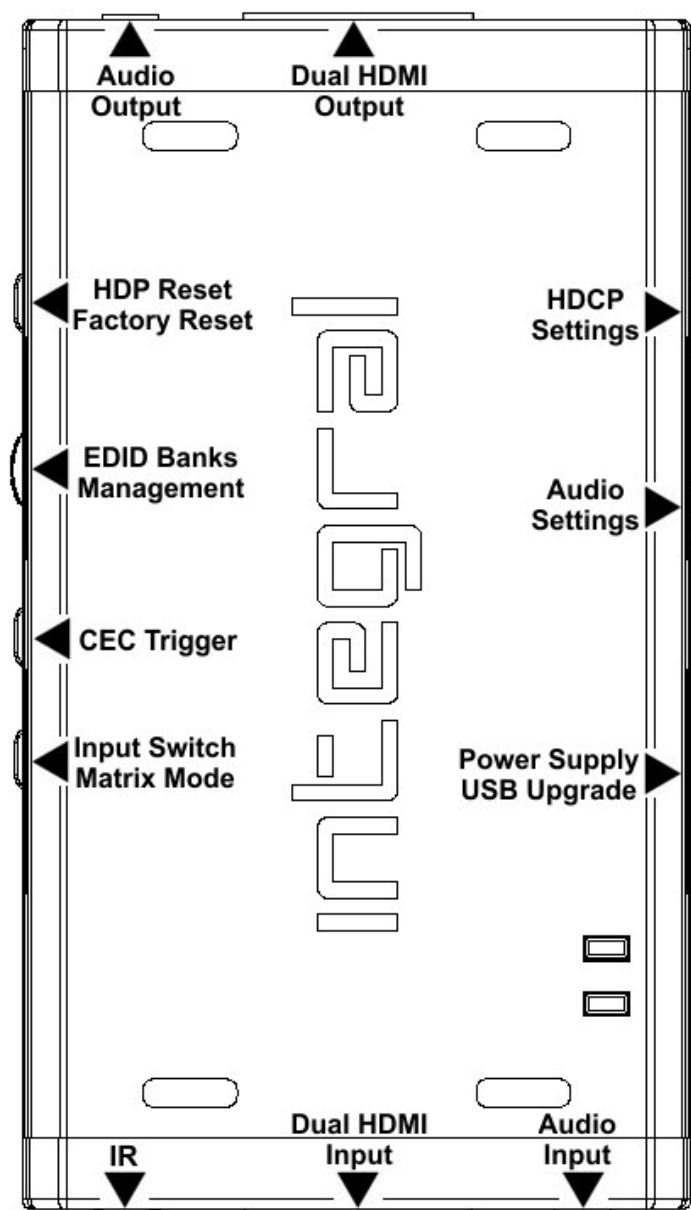
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Overview

The HDFury team would like to thank you personally for purchasing the Integral!

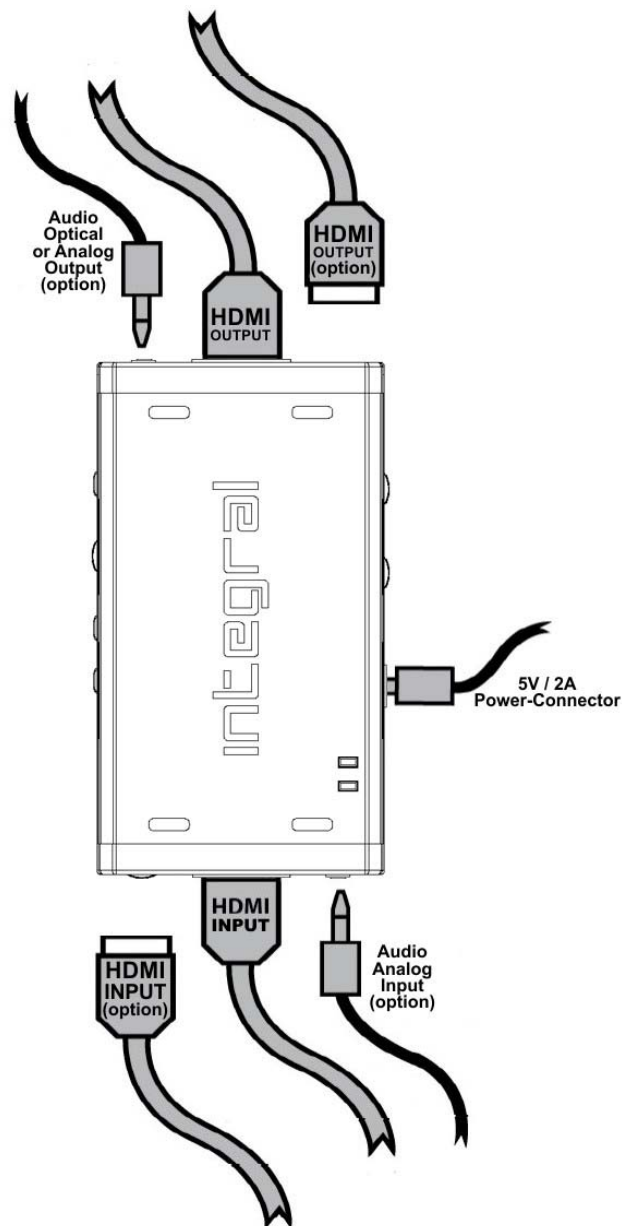
This unique HDMI2.0a and HDCP2.2 device with support of 4K60 4:4:4 600MHz 18Gbps bandwidth will allow you to solve any HDCP error, Split any SD/HD/Full HD/4K or PC signals up to 600MHz, replace or extract HDMI audio, Input any CEC commands, Update and switch between multiple edid banks and more. Operations can be completed through slide switch and push buttons on the unit, via wired USB connection or through wireless Bluetooth connection with any Smartphone or Tablet running Android. (IOS support underway)

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



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Connecting Cables



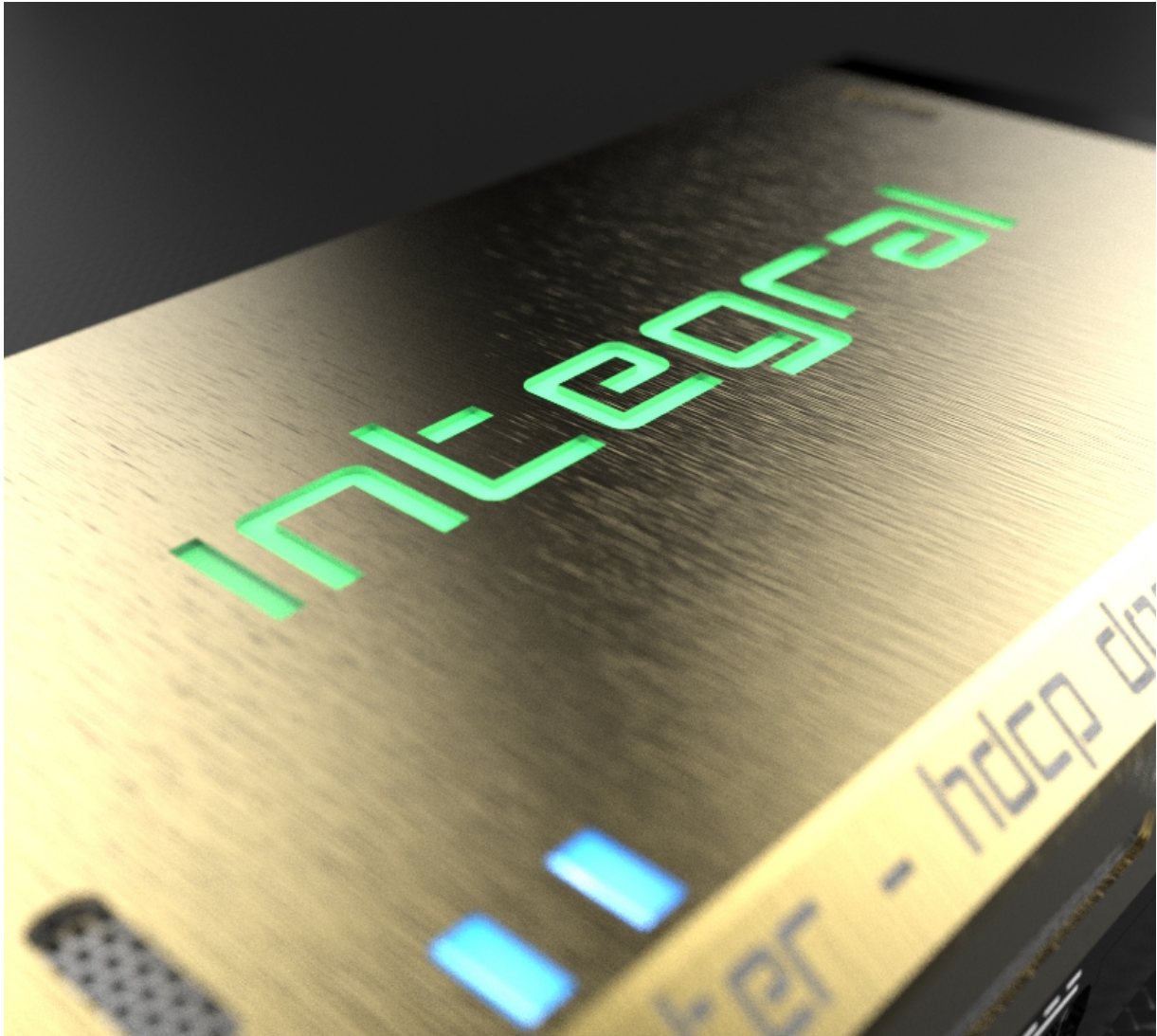
To use your Integral:

- Connect a HDMI input cable to the HDMI input.
- Connect a HDMI output cable to the HDMI output.
- Connect the Integral power supply.
- Connect any additional HDMI input/output cable or any audio input /output cable (optional).

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As shipped, the Integral defaults to HDCP1.4 on the Bottom output port. Top Output port can be configured to any HDCP revision. Make sure that you are using 600MHz certified HDMI 4K cable if you plan to set up a 4K60 4:4:4 600MHz 18Gbps link in your setup.

Power/Status LED



The Integral logo will glow Green when in use. When the Integral first receives an HDMI signal the logo will quickly turn on, then off, and then on permanently to indicate that the 4-letters handshake has been completed.

The status of the green logo may be used for troubleshooting:

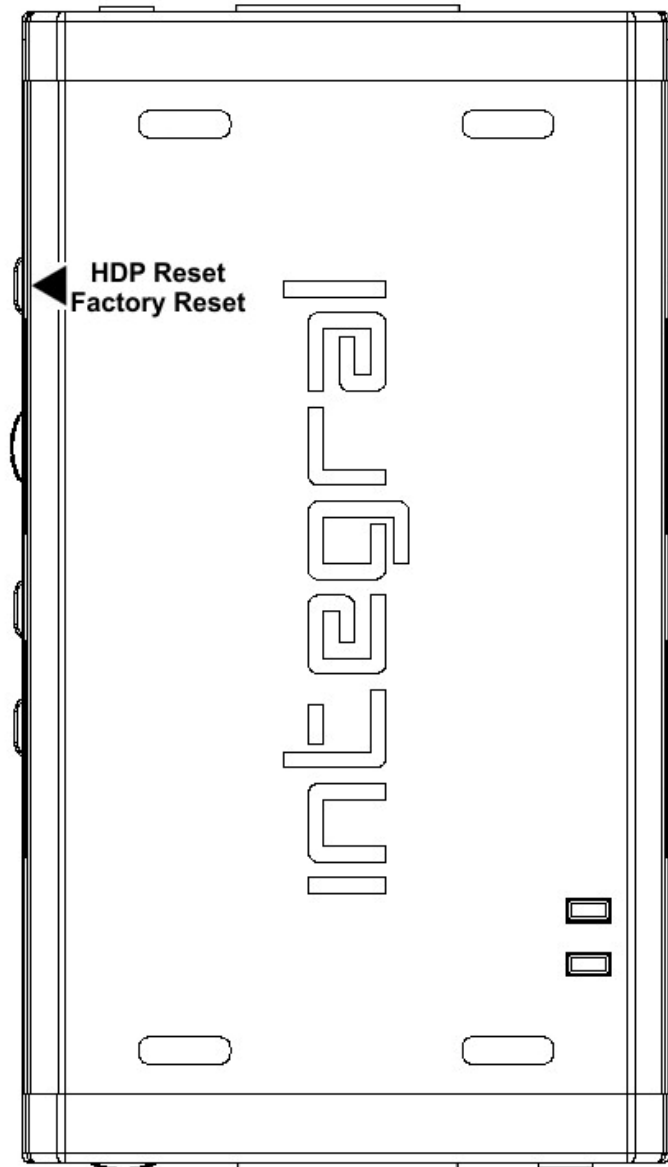
Logo OFF: Insufficient power. Use the Integral power supply.

Logo BLINKING (on for split second, off for 5 seconds): The Integral is receiving power and is ready to accept an HDMI signal.

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

Logo ON: The Integral is powered and receiving and decoding the HDMI signal.

Reset HPD (Short Press) or Reset to factory default (Long Press)



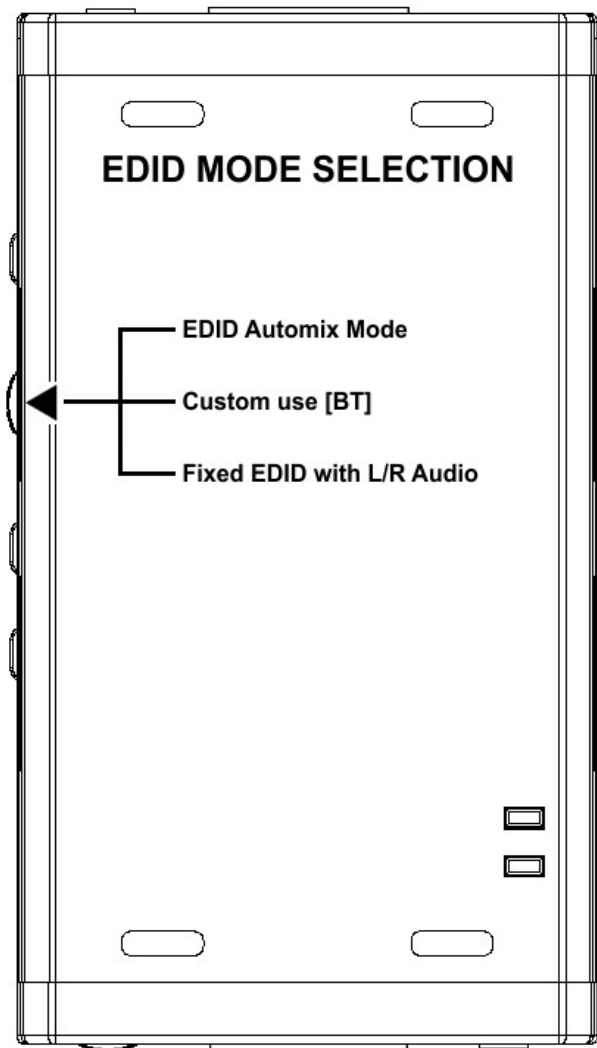
The Integral offers 2 functions per push button.

Short Press on Reset Button will generate Hot Plug Detection event.

Long Press (over 10s for security) will reset the integral to factory default.

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EDID Mode Selection



EDID slide switch have 3 positions.
Switch should be set to middle position to allow control via USB, IR or Bluetooth device.

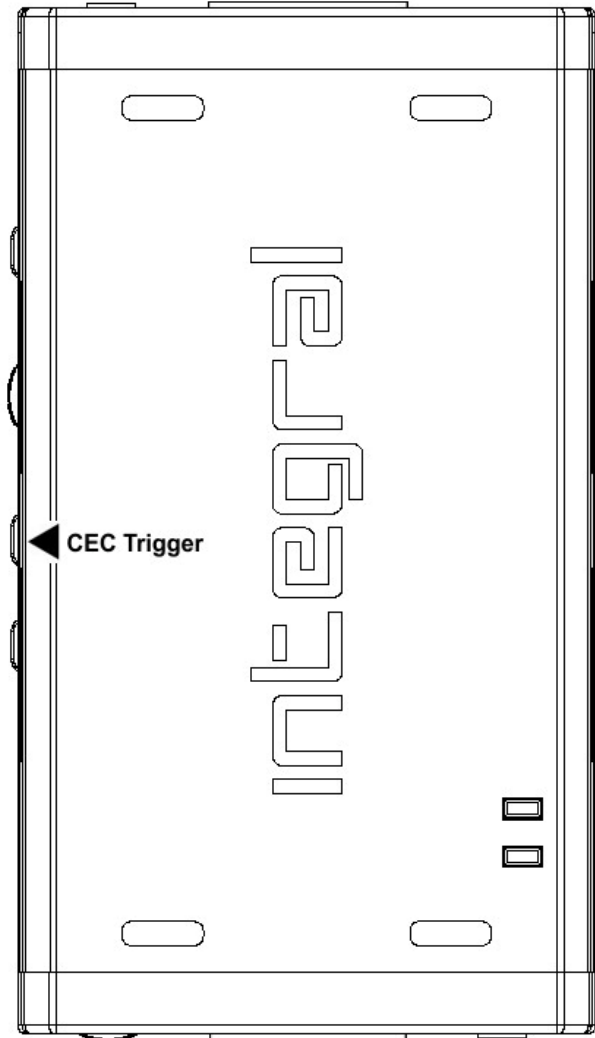
EDID Automix Mode: Create EDID based on mutual least capabilities so both displays will always show a picture and audio. Use this mode for 4K60 4:4:4 TVs.

Custom Use [BT]: this can be updated via BT or via USB. By default, it's a 4K60 4:2:0 with Full Audio capabilities.

Fixed EDID with L/R Audio: This mode is a 1080p60 2channel stereo basic table.

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CEC Trigger Button



CEC Trigger Button allows you to send two custom CEC commands on the HDMI/CEC network. Integral TOP output port is the CEC master output.

Short Press on CEC Trigger Button will send **CEC1** command.

Long Press (over 2sec) on CEC Trigger Button will send **CEC2** command.

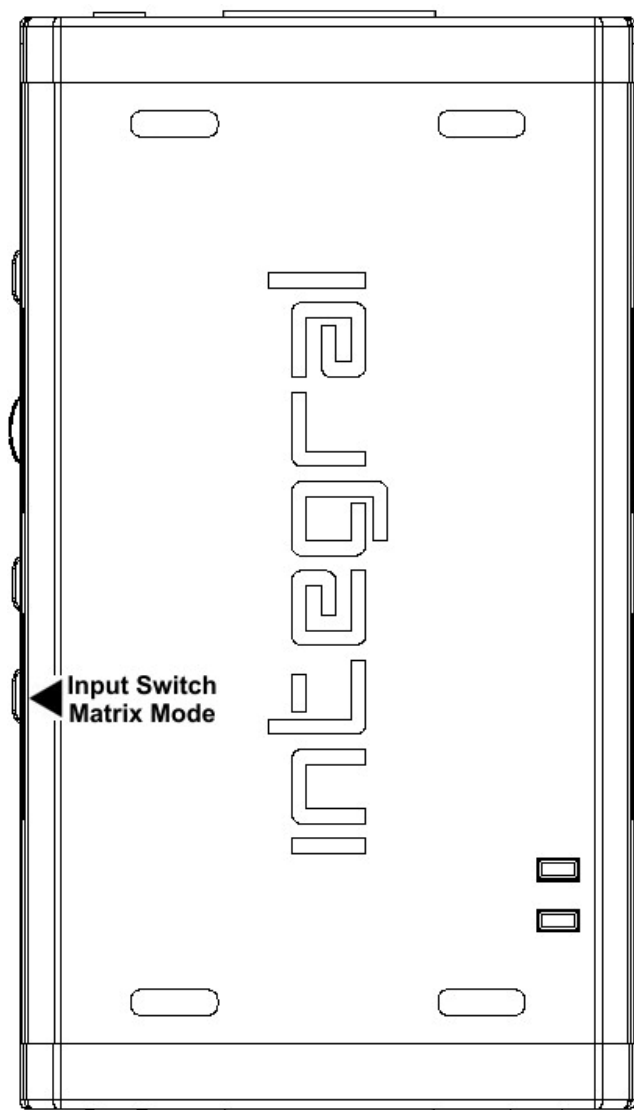
By default **CEC1 is 0F:04** (Display View On, it will turn ON HDMI/CEC capable unit)

By default **CEC2 is 0F:36** (Standby, it will turn OFF HDMI/CEC capable device)

Note: To send LIVE CEC commands or to update the default CEC commands please refer to the USB GUI for Windows software at page ?? or the smartphone/tablet APP for Android (iOS support underway) at page ??.

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Input Switching and Matrix mode



Input Switch / Matrix Mode Button allow you to switch active inputs or enter Matrix mode.

Short Press will switch the active input channels.

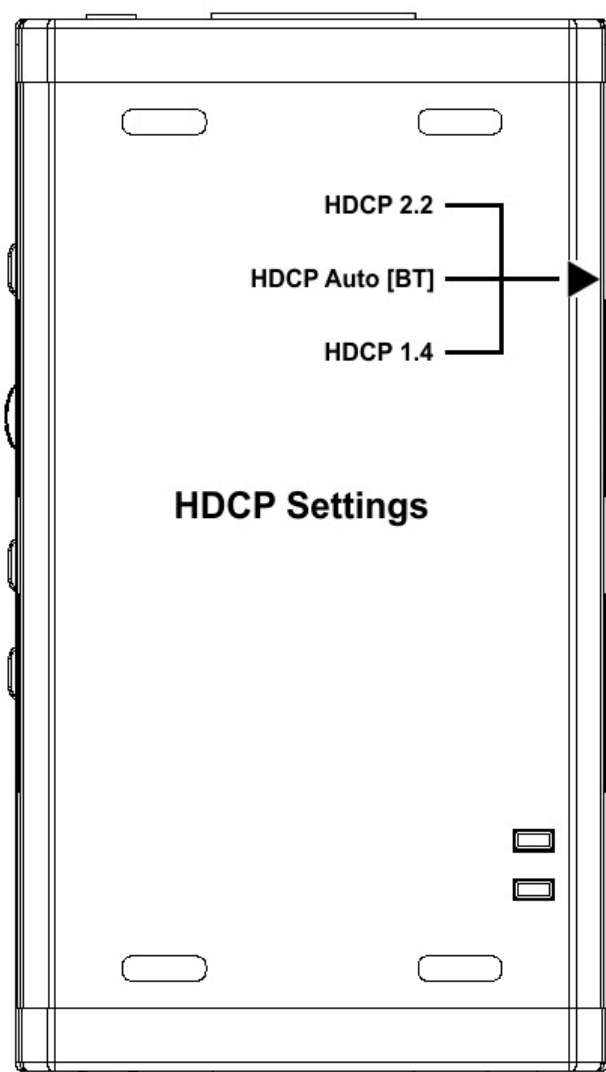
Long Press (over 2sec) will enter the Matrix Mode (only available up to 4K30/300MHz).

Blue LEDs on the unit are showing active input channel (when one LED is ON) or Matrix Mode (when both LEDs are ON).

Note: You can switch channel from USB GUI for Windows software, see page ?? or via smartphone/tablet APP for Android (iOS support underway) at page ??.

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

HDCP Settings



HDCP slide switch have 3 positions.

Switch should be set to middle position to allow control via USB, IR or Bluetooth device.

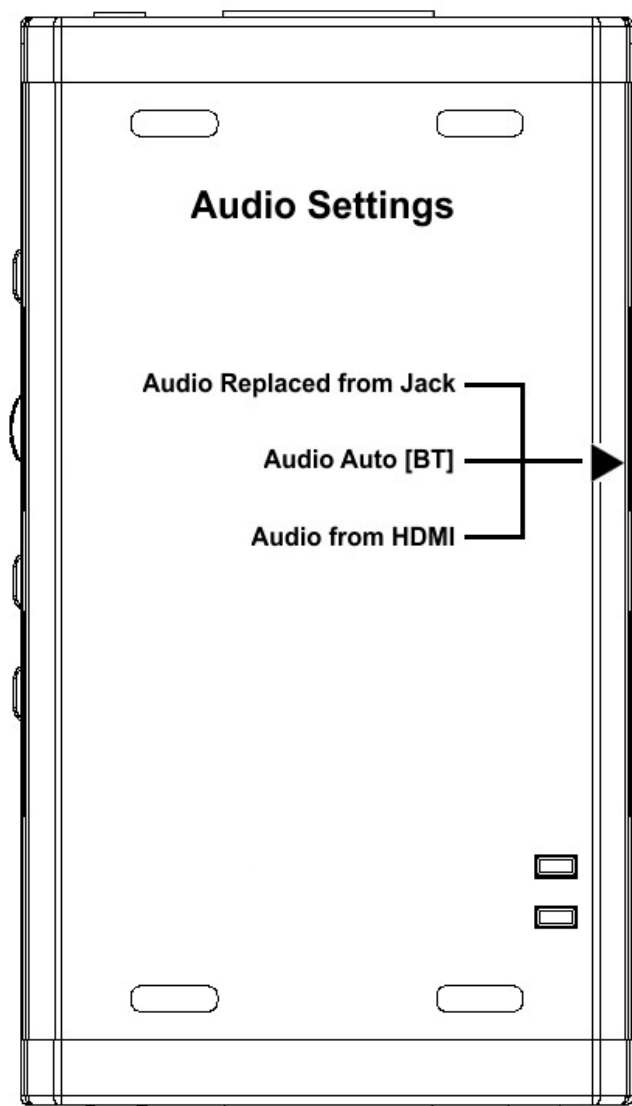
HDCP 2.2 Mode: In this mode you always have HDCP 2.2 on TOP output port and HDCP 1.4 on bottom output port.

HDCP Auto [BT]: In this mode the Integral unit undertakes dynamically all HDCP conversion to always output a working signal. The bottom output is always HDCP 1.4, the top output is dynamic.

HDCP 1.4: In this mode, you always have a HDCP1.4 signal on both output ports.

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Audio Settings



Audio slide switch have 3 positions.
Switch should be set to middle position to allow control via USB, IR or Bluetooth device.

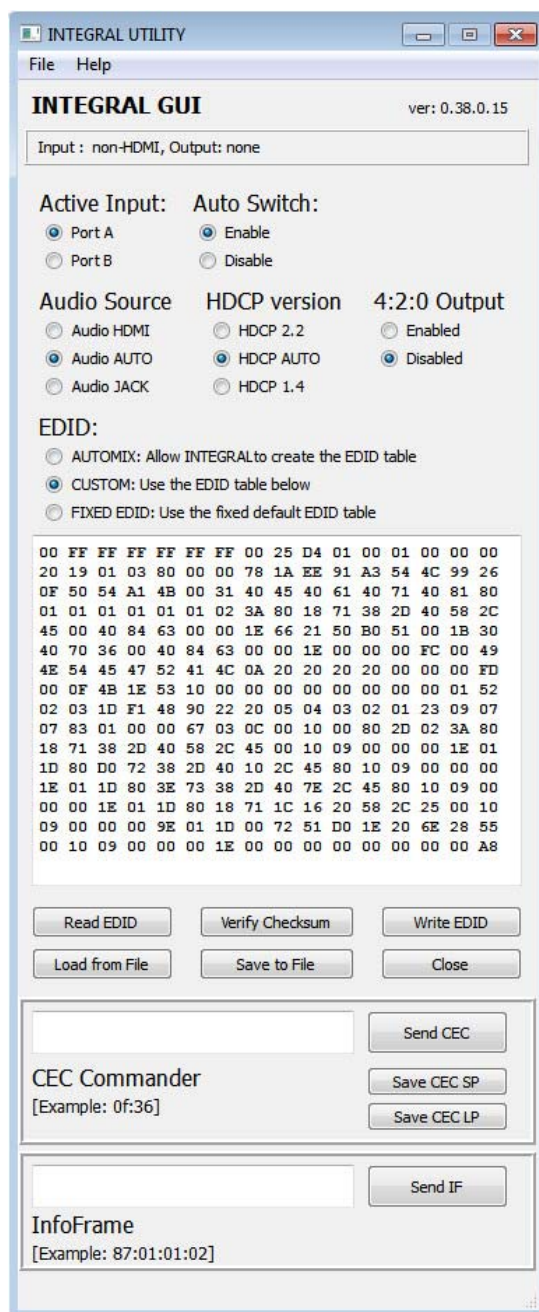
Audio Replaced from Jack: HDMI output sound replaced by 44.1kHz (or 48kHz) audio from Jack input. In splitter mode both HDMI outputs will offer the new replaced audio from Jack. The S/PDIF and L/R outputs continue to output the original HDMI audio normally

Audio Auto [BT]: This slide switch position allows change via BT or via USB. By default, it's set to HDMI.

Audio from HDMI: HDMI audio pass-through mode.

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Integral USB GUI (PC Windows Software)



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

The USB GUI for Windows PC allows you the following control:

- Display Firmware revision
- Display Active input and output link information (such as resolution, bandwidth, etc..)
- Allow to switch active input
- Turn on/off autoswitch feature.
- Select Audio source.
- Select HDCP rules
- Enable/Disable 4:4:4 > 4:2:0 conversion
- Select EDID table, Read, Write, Load, Save, Checksum.
- Send Live HDMI CEC command.
- Save CEC1 SP/ CEC2 LP commands.
- Send Live HDR and InfoFrame Metadata.

Grab it from the Download Tab on the Integral product page: [here](#).

Please note that the 4K60 4:4:4 > 4:2:0 conversion only affect TOP output. Bottom output will still offer a 4K60 4:4:4 direct path.

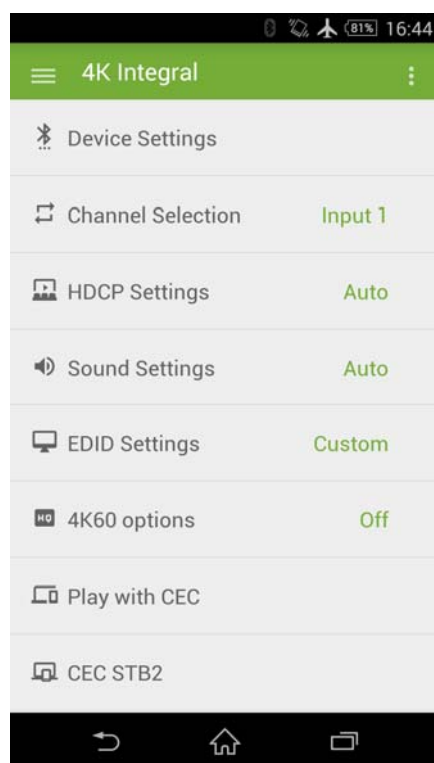
When activated, the autoswitch feature will let the Integral unit autoswitch to active signal when current signal is lost.

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

Integral Total Control APP for Android



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Main Features of the Android Total Control APP for Integral

This APP request Bluetooth authorization and SD card/file writing permission. It will allow you to control and operate your HDFury Integral and your Home Theater setup.

It can perform the following:

- Reset/HPD.
- Read/Modify and Upload Configuration.
- Switch Input channel.
- Set Auto switching mode.
- Enter/Exit Matrix mode.
- Define HDCP rules and fix HDCP error.
- Sound input/output selection.
- Mute/Unmute all sound output from Integral
- EDID table selection.
- Convert 4K60 4:4:4 > 4K60 4:2:0
- Send live CEC command to the HDMI/CEC network.
- Setup CEC rules and access CEC customs commands.
- Define CEC press button (Short and Long press)
- Display current link speed and infoframe information.
- Display active link(s).

Grab it from Google Play Market: [here](#).

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You can create your own menu and add custom commands at any time through an editable XML menu file. You can pair, connect and use the Bluetooth APP even when no signals is going through the Integral, in such conditions, the Bluetooth range is over >20m. However, the Bluetooth range will be highly affected by the resolution in use because of EMI, below you can find the average working distance for Bluetooth based on the processed signal resolution and refresh rate.

1080p60 and below: Bluetooth working range is about 10 meters.

4K60 4:2:0 and below: Bluetooth working range is about 5 meters.

4K60 4:4:4: Bluetooth working range is about 2 meters. (We recommend using IR for wireless control in 600MHz)

Known issues:

- Sony Z serie devices have issue with BT range, there is not much we can do about it as it is a global issue affecting mostly all Sony Z serie devices as you can read/find on google. The Google Play market offers APK that claims to solve the Bluetooth issue on Sony but we did not see any noticeable improvement using them. Current working range for Sony Z serie devices is about 5 or 6 meters.

FAQ

Can we pass-through 4K60 4:4:4 and have one output at 4K60 4:2:0 ?

Yes, when activated, the 4K60 4:4:4 > 4K60 4:2:0 conversion will only affect the TOP output, BOTTOM output will stay a direct path at 4K60 4:4:4.

What is the Bluetooth working range ?

You can pair, connect and use the Bluetooth APP even when no signals is going through the Integral, in such conditions, the Bluetooth range is over >20m. However, the Bluetooth range will be highly affected by the resolution in use because of EMI, below you can find the average working distance for Bluetooth based on the processed signal resolution and refresh rate.

1080p60 and below: Bluetooth working range is about 10 meters.

4K60 4:2:0 and below: Bluetooth working range is about 5 meters.

4K60 4:4:4: Bluetooth working range is about 2 meters. (We recommend using IR for wireless control in 600MHz)

My display is supposed to accept 4K60 4:4:4 signal 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 trick is require on most UHD TV. Additionally, most UHD TV only have certain specific ports that are 600MHz capable.

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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 WQSXGA, QUXGA, QFHD, WQUXGA, 4K.

What output resolution does the Integral support in HDTV mode ?

All known SD, HD, Full HD and UHD formats are supported including: 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 Integral work with? Do I need HDMI 1.3/1.4a/2.0a? Does it matter?

It does not matter. HDfury Integral 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 resolution correctly?

No. The HDfury Integral will be detected as 2160p60 4:4:4 capable device by your source and 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 is the USB port for?

To supply power from the supplied USB power unit and for firmware upgrades when new (additional) functions and enhancements are offered.

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

For 600MHz user must use "high speed" cables, or 600MHz/18Gbps certified. For 4K30, 1080p or less almost all cables are ok. HDfury Integral acts as an HDMI repeater device. So having a HDfury Integral in the path will amplify and recover the signal. You should not need any passive (or active) HDMI amplifiers, especially if you put HDfury Integral in the middle of your cable run. If you previously had to use an amplifier, the HDfury Integral can most likely take its place. The HDfury Integral has been used with 50 foot (and longer) HDMI cables without issues.

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 ?

Lossless audio is transmit through HDMI output only. HDfury Integral does not compress or otherwise create loss to the incoming audio. Only stereo and 5.1 sound can be output via SPDIF output and analog output.

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How do I hook up the audio from the Integral ?

The Integral has both analog and digital (TOSLINK) audio output in one connector labeled "D/A" along with a headphone symbol. It's a 2-in-1 connector meaning that you can plug in either a 3.5mm stereo analog jack or a digital mini-TOSLINK (3.5mm mini-jack) cable and get stereo analog sound or 5.1 Dolby/DTS digital sound out of the Integral. See further below for pictures of both types of connectors/cables.

Integral 3.5mm mini-TOSLINK digital audio cable:



If you'd like to use a "regular" TOSLINK cable, use a 3.5mm Mini-TOSLINK to regular TOSLINK adapter:



A 3.5mm stereo audio cable can be used for connecting the Integral to a TV if you do not have a home theater setup (you only have 2 speakers in your TV):



Do I need to use the Hdfury4 power supply?

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

Yes. Due to the advanced features, the HDfury4S draws more power than previous HDfury models. The HDfury4 power supply must be used at all times.

Is the Integral power supply the same as that used by the HDfury1, HDfury2, and GammaX?

No. The power supply for the HDfury1, HDfury2 and GammaX kits are 0.5A max current. The HDfury3 is 1A max current. The Integral power supply can supply up to 2.0A. Do not use an HDfury1, HDfury2, or GammaX power supplies with the Integral.

What sort of power supply does the Integral use?

Integral power supply adheres to these requirements:

- Provides REGULATED (+/- 5%) 5VDC power with 2.0A min DC current
- Delivers the power through a mini usb connector.

Trying to use an AC/DC adaptor that doesn't adhere to these three requirements may destroy the Integral. Do not use the power supply from the HDfury1, HDfury2, or GammaX with the Integral.

Highlight Features:

HDR and Infoframe Metadata Live Injector

Integral is capable of injecting live Infoframe and HDR metadata at any resolution and in real time.

Proof of concept is already available from the USB GUI PC windows software available.

Further software solution for a complete live and real time handling of infoframe and HDR metadata will be offered and announced shortly through an exclusive partnership underway.

Unique HDCP Doctor

Providing a total of 6 HDCP 1.4 and 2.2 engines for decryption/encryption, Hdfury Integral offers a total HDCP workaround solution including HDCP 1.4 > HDCP 2.2 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.

Each RX block decrypts the input first whether its 1.x or 2.x. Then each output port can individually encrypts it to 1.4(both) or 2.2(only top port) or not encrypt it at all.

Dual conversion can be operated on both channels simultaneously.

Display HDCP 2.2 Content with Non-Compliant Devices

HDCP 2.2 is the new copy-protection scheme for 4K UHD content. Not only it is not backward compatible but many recent 4K devices don't even support it.

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.

Bad news for consumers who have purchased expensive, high-bandwidth, processor-rich switchers and receivers to accommodate 4K. While the newer products may support the bandwidth needs of 4K, they won't play copy-protected works until Integral is an active part of the setup.

2x2 Splitter up to 4K60 4:4:4 600MHz 18Gbps

Splitting any signal up to 4K60 4:4:4 600MHz signal is now a reality, thanx to IR/BT or push button, you can easily switch between 2 inputs that will be replicated to 2 outputs. HDCP conversion can be configured and applied on the fly in order to always output the type of signal that your display or sink device is expecting.

4K60 4:4:4 600MHz 18Gbps > 4K60 4:2:0 300 MHz 10.2Gbps conversion

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Mostly all UHD TV sold until recently can only accept 4K60 when it comes in the form of a 4K60 4:2:0 300MHz signal, However upcoming sources and current high end graphics cards are outputting 4K60 4:4:4 (600MHz – 18 Gbps). Integral is solving that arising issue.

HDMI Audio Extracting

HDfury Integral can extract HDMI audio and has a simultaneous output of analog L/R stereo and optical S/PDIF via 3.5mm combo jack connector.

External Audio Replacing

Mini jack input connector (or Mic/Line IN) option is available to replace the audio in any HDMI/DVI-D stream up to 4K60 4:4:4 600MHz 18Gbps.

Audio replacing only work on one channel, the secondary channel is a direct path from HDMI to HDMI.

Useful in presentation areas or for simply streaming your phone/tablet music to your HDMI amp.

EDID Management

Improved EDID Management solution with either a Custom uploaded EDID, Self generated Automix EDID or a Fixed basic EDID.

AutoMix EDID feature will create a custom EDID by mixing both sink EDID connected to the splitter output ports.

Custom and manual EDID utility available from the download section.

HDMI/CEC TOTAL COMMANDER

HDfury Integral offers an unique CEC commands manager, with CEC compatible equipment. CEC commands allow a HDMI source to send instructions and operate check on connected HDMI devices.

Using the Integral's Android/Apple APP for smartphone/tablet, user can configure custom CEC commands and send them LIVE or based on trigger event.

As a practical use case example: it is capable of turning your display OFF when the source device is turned OFF.

Concretely, it could turn off your HDTV when you power off your PS4.

TOTAL CONTROL

HDfury Integral APP is available for mobile and tablet running Android or iOS.

You can control HDfury Integral using your mobile phone or tablet via a bluetooth connection.

IR control and various physical buttons for configurations are also available.

2x2 Matrix up to 4K30 4:4:4 300MHz

Matrix solution is available for HDMI stream up to 4K30 4:4:4 300MHz 10.2Gbps.

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Main Specifications

- 2x Input / 2x Output Splitter (HDMI2.0a/HDMI1.4/DVI1.0 compatible)
 - 4K60 4:4:4 600MHz 18Gbps Pass through
 - 4K60 4:4:4 600MHz 18Gbps > 4K60 4:2:0 300MHz 10.2Gbps conversion
- 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 HDMI2.0a & HDMI 1.4 combined
- Dual HDCP 1.4 & HDCP 2.2 combined
- CEC Support: For inter-device control between both inputs and the primary output (TOP) HDMI channel.
- CEC command: USB configuration for automation, trigger via events, push button or via IR/Bluetooth
- External Audio Replacing : input external sound or switch sound between input
- Audio Extracting: Audio De-Embedder of Optical & Analog L/R
- EDID management via USB or BT*
 - Improved EDID Management solution with either a Custom uploaded EDID, Self generated Automix EDID or a Fixed basic EDID.
 - AutoMix EDID feature will create a custom EDID by mixing both sink EDID connected to the splitter output ports.
 - Custom and manual EDID utility available from the download section.
- HDR & InfoFrame Live Injector.
- HDMI Booster/Extender: Capable of extending 1080p resolution up to 15m. in and 15m. out (30m. total for 1080p), UHD resolution up to 10m.
- HDMI Doctor: Solves most HDMI integration issues such as HDCP, EDID, HPD, and audio breakout.
- HDMI Equalevel: Precise signal equalization towards both input and output signals perfectly delivers the best possible picture quality.
- Hot-Plug control: Force the input device to always see an active connection.
- Licensing: Fully licensed and compatible with all HDMI and HDCP technologies.
- Deep Color Support
- Flexible/Portable/Plug'n Play
- 3D Ready: Capability to pass 3D stereoscopic signal formats.
- Just like any recent Hdfury hardware, it comes with USB upgradable firmware that allow you to unleash furious features.

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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
- Support all VESA mode video format (PC Resolutions) up to ultra high resolution such as WQSXGA, 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 and HBR.

Technical Specifications

- Optical S/PDIF output
- Analog stereo mini jack output.
- Audio: PCM at up to 192kHz, compressed audio (IEC61937), DSD, DST,DTS,DTS-HD, Dolby True HD, DTS-MA and HBR.
- Mic In (Line In) sampling at 44.1/48kHz
- DDC Signal: 5V p-p (TTL)
- Power Supply: External 5 Volt 2 Amp USB (same as most smartphone/tablet PSU)
- Power Consumption: <2Watts
- Product Dimensions: 3.6" x 2.5" x 1", Weight: 4 oz
- Shipping Dimensions: 6.3" x 4.2" x 3.3", Weight: 16 oz
- Enclosure: Black PVC/Gold metal with Green/Blue Led
- Regulation: CE, FCC, RoHS, WEEE

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

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.

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

Note: 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 following measures:

- 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/TV technician for help.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

Team HDfury thanks you for your support

For help visit: <http://www.HDfury.com>

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