



MA-401

4x1 HDMI Switcher and Amplifier with AV Control System

OPERATION MANUAL

HDMI®
HIGH-DEFINITION MULTIMEDIA INTERFACE

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Version 1.1

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SAFETY PRECAUTIONS

Please read all instructions before attempting to unpack, install or operate this equipment and before connecting the power supply. Please keep the following in mind as you unpack and install this equipment:

- Always follow basic safety precautions to reduce the risk of fire, electrical shock and injury to persons.
- To prevent fire or shock hazard, do not expose the unit to rain, moisture or install this product near water.
- Never spill liquid of any kind on or into this product.
- Never push an object of any kind into this product through any openings or empty slots in the unit, as you may damage parts inside the unit.
- Do not attach the power supply cabling to building surfaces.
- Use only the supplied power supply unit (PSU). Do not use the PSU if it is damaged.
- Do not allow anything to rest on the power cabling or allow any weight to be placed upon it or any person walk on it.
- To protect the unit from overheating, do not block any vents or openings in the unit housing that provide ventilation and allow for sufficient space for air to circulate around the unit.
- Please completely disconnect the power when the unit is not in use to avoid wasting electricity.

VERSION HISTORY

REV.	DATE	SUMMARY OF CHANGE
RDV1	2020/05/15	Preliminary release
RDV2	2021/04/01	Corrected Package Contents

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1. INTRODUCTION

This 4×1 HDMI Switch with Stereo Amplifier provides high performance audio and video support, including HDR and ARC, making it ideally suited for residential or corporate installations. Any of four high-bandwidth (18Gbps) HDMI sources may be routed to the HDMI output. 4K UHD HDMI video sources, up to and including 4K@60Hz (4:4:4, 8-bit) as well as 10/12-bit sources with HDR are supported, providing gorgeous video quality.

Pass-through of multiple digital audio formats such as LPCM 7.1, Bitstream and advanced HD Bitstream with audio sampling rates up to 192kHz are supported. Additionally, the integrated stereo amplifier provides up to 40 watts of power (20W per channel) for local speakers to output the audio from the currently selected source, or from the ARC audio coming back from the display connected to the HDMI output, offering a flexible sound experience (LPCM 2.0 sources only).

This unit also contains a specialised IR learning and smart-routing functionality. IR codes from each connected source's remote can be learned and then recalled using this unit's dedicated remote control, or the mobile device app. Intelligent IR routing ensures that only the IR signals appropriate to the source being viewed are used by the dedicated remote control while the mobile device app provides the ability to send IR commands to control any connected source. IR command sets may also be uploaded or downloaded to/from the unit via XML files.

This unit can be controlled in a wide variety of different ways including front panel buttons, RS-232, IR remote, Telnet, WebGUI and a mobile device app.

2. APPLICATIONS

- /// Conference room installation
- /// Meeting room connection
- /// Classroom display

3. PACKAGE CONTENTS

- /// 1× UHD⁺ 4×1 HDMI Switcher with Stereo Amplifier
- /// 1× 24V/2.7A DC Power Adapter
- /// 1× Power Cord
- /// 2× 2-pin Terminal Block
- /// 5× 3.5mm to IR Blaster Cable
- /// 1× Remote Control (CR-191)
- /// 1× Shockproof Feet (Set of 4)
- /// 1× Operation Manual

4. SYSTEM REQUIREMENTS

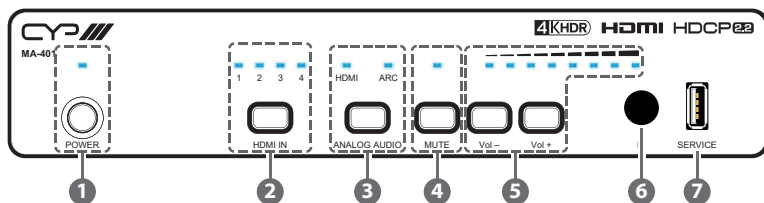
- /// HDMI source equipment such as media players, video game consoles or set-top boxes.
- /// HDMI receiving equipment such as an HDTV, monitor or audio amplifier.
- /// An active network connection from a switch or router is required for control of the unit via the mobile device app.
- /// HDMI cable distance can be impacted by the materials and design of the cable used. The use of Premium High Speed HDMI cables is highly recommended.

5. FEATURES

- /// HDMI with HDR, 3D & 4K@60Hz support, DVI 1.0 compatible
- /// HDCP 2.2 and HDCP 1.x compliant
- /// Routes four HDMI sources to one HDMI output with support for automatic input switching
- /// Supports up to 4K UHD⁺ (18Gbps, 4K@60Hz 4:4:4, 8-bit) video input and output
- /// Supports Deep Colour input and output up to 12-bit
- /// Supports 10-bit and 12-bit HDR (High Dynamic Range) input/output
- /// Supports pass-through of LPCM (up to 8 channels), Bitstream and advanced HD Bitstream audio formats
- /// Supports the ARC (Audio Return Channel) function to transmit digital audio from an ARC-enabled TV connected to the HDMI output (LPCM 2.0 only)
- /// Stereo analogue audio breakout mirrored to both amplified (20W per channel) and un-amplified (3.5mm headphone) connections. (LPCM 2.0 only)
- /// Support for learning IR remote codes for on-demand retransmission
- /// Advanced EDID management with 8 Internal, 1 external EDID, and 4 custom user provided EDIDs
- /// Controllable via front panel buttons, RS-232, IR remote, Telnet, WebGUI and a mobile device app

6. OPERATION CONTROLS AND FUNCTIONS

6.1 Front Panel



- 1 POWER Button and LED:** Press this button to power the unit on (green LED) or place it into standby mode (red LED).

Note: If the IR Auto Power Control function is turned on for any inputs/ outputs, this button will also turn on/off those devices that have IR commands stored.

- 2 HDMI IN and LEDs:** Press this button to sequentially switch through the available inputs. The LED will illuminate to indicate which source is currently selected.

- 3 Analogue AUDIO Button and LEDs:** Press this button to toggle between HDMI Out or ARC as the audio source for both analogue outputs. The LED will illuminate to indicate which source is currently selected.

Note: If the display connected to the HDMI output does not support ARC, no audio will be heard when the ARC source is selected.

- 4 MUTE Button and LED:** Press to toggle between muting and unmuting the analogue audio output. The LED will illuminate when mute is active.

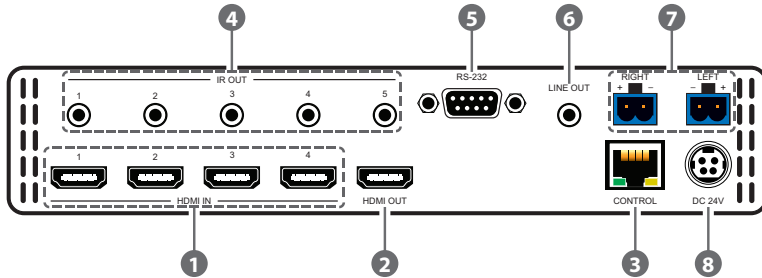
Note: By default, the mute button only controls the amplified output. This behavior can be adjusted via RS-232.

- 5 VOL- /VOL+ Buttons and LEDs:** Press or hold the +/- (plus/minus) buttons to increase or decrease the amplified analogue audio output volume. The LEDs will illuminate progressively to indicate the current volume level.

- 6 IR Window:** Accepts IR signals from the included IR remote for control of this unit, IR bypass, and to activate the transmission of learned IR codes.

- 7 SERVICE Port:** This port is reserved for firmware update use only.

6.2 Rear Panel



- ➊ **HDMI IN 1~4 Ports:** Connect to HDMI source equipment such as media players, game consoles or set-top boxes.
- ➋ **HDMI OUT Port:** Connect to an HDMI TV, monitor, or amplifier for digital video and audio output.
- ➌ **CONTROL Port:** Connect to the local network through a network switch or router to control the unit via Telnet, WebGUI, or mobile device app.
- ➍ **IR OUT 1~5 Ports:** Connect to the provided IR Blasters to transmit IR signals to devices within direct line-of-sight of the IR Blasters.
- ➎ **RS-232 Port:** Connect directly to a PC, laptop or other serial control device to send RS-232 commands to control the unit.
- ➏ **LINE OUT Port:** Connect to powered speakers, headphones, or an amplifier for stereo analogue audio output.
- ➐ **RIGHT/LEFT 2-pin Terminal Blocks:** Connect to unpowered 4Ω speakers for stereo analogue audio output. Up to 20W of power is provided to each speaker channel.
- ➑ **DC 24V Port:** Plug the 24V DC power adapter into this port and connect it to an AC wall outlet for power.

6.3 Remote Control

6.3.1 IR Remote (Unit Control)

This unit's IR remote provides control over the unit directly, as well as control over additional external devices through the assignment of learned IR commands.

The following buttons, in "Standard" mode provide direct control over the unit itself. Switching to "Advanced" mode allows these buttons to also be used to control external device functions.

- 1 POWER button:** Press and hold this button for over 3 seconds to power the unit on or place it into standby mode.

Note: A short press of this button will send a user defined IR command to the current source device.

- 2 ADV. Button:** Pressing this button toggles the unit between using the "Standard" and "Advanced" IR remote button definitions.

- 3 IN 1~4 Buttons:** Press any of these buttons to switch immediately to the corresponding input.

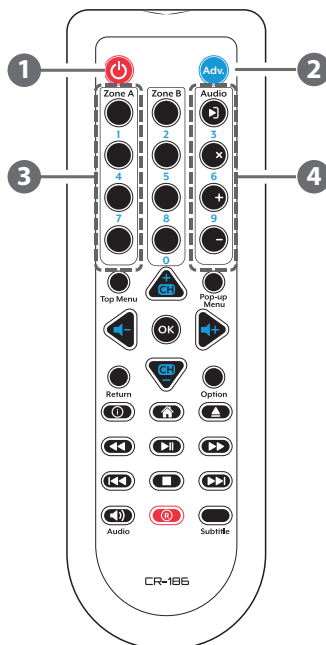
- 4 AUDIO Buttons**

SOURCE Button: Press this button to sequentially switch through the available audio sources for both analogue outputs.

MUTE Button: Press to toggle between muting and unmuting the analogue audio output.

Note: By default, the mute button only controls the amplified output. This behavior can be adjusted via RS-232.

VOL+/VOL- Buttons: Press these buttons to increase or decrease the amplified analogue audio output volume.

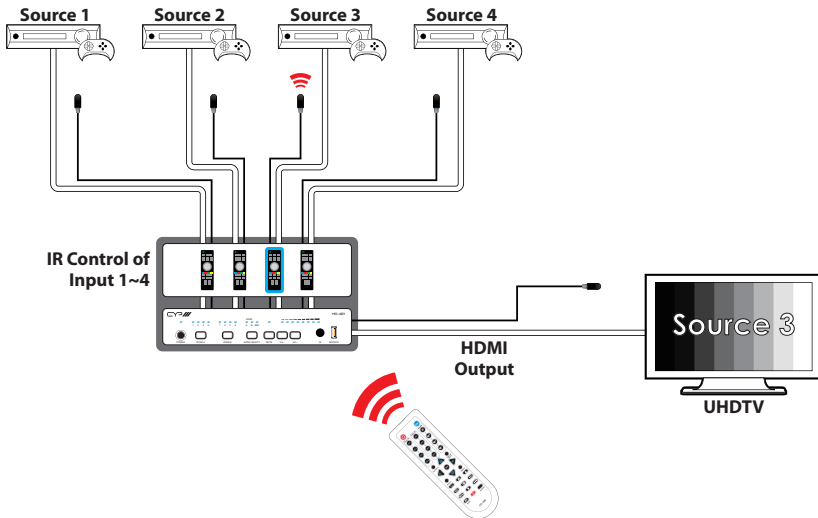
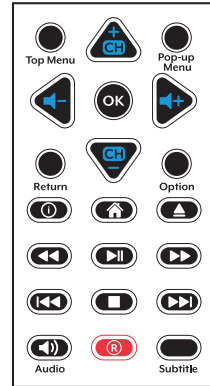


6.3.2 IR Remote (Assignable Buttons)

/// Standard Mode

The function of the buttons on the bottom half of the IR remote are user defined within the WebGUI. They are used to tell the unit to transmit IR commands to the source device currently being viewed.

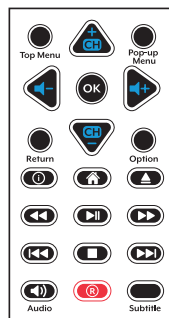
For example, if the user is watching input 3 then pressing any of these buttons will send the associated user-defined commands to the device connected to input 3 via the IR Blaster connected to IR output 3.



Advanced Mode

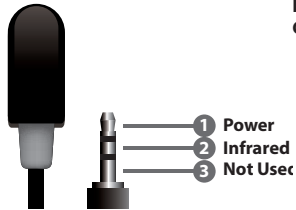
If the “Adv.” button is pressed, the unit will switch into the “Advanced” IR command mode, changing the functionality of these buttons to use additional IR commands that have been defined by the user within the WebGUI. Similar to the other user defined buttons, they are used to tell the unit to transmit IR commands to the source device currently being viewed. Buttons that have Advanced mode functionality are easily identified by their alternative colouring.

Note: For detailed information about assigning user defined IR commands within the WebGUI, please refer to Section 6.6.5.

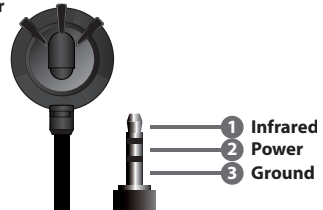


6.4 IR Cable Pinouts

IR Blaster Cable

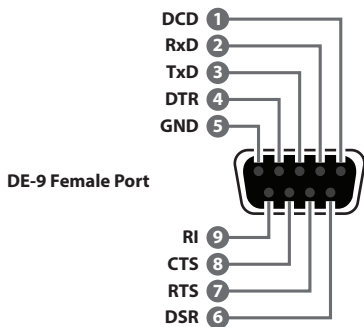


IR Extender Cable



6.5 RS-232 Pinout and Defaults

Serial Port Default Settings	
Baud Rate	19200
Data Bits	8
Parity Bits	None
Stop Bits	1
Flow Control	None



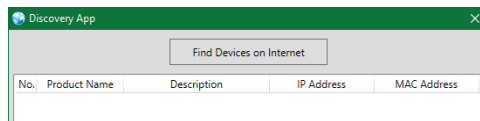
6.6 WebGUI Control

/// Device Discovery

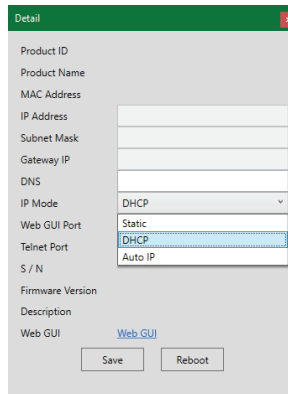
Please obtain the “Device Discovery” software from your authorised dealer and save it in a directory where you can easily find it.

Connect the unit and your PC/Laptop to the same active network and execute the “Device Discovery” software. Click on “Find Devices on Internet” and a list of devices connected to the local network will show up indicating their current IP address.

Note: The unit’s default IP address is 192.168.1.50.



By clicking on one of the listed devices you will be presented with the network details of that particular device.

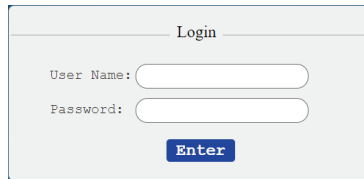


- 1) **IP Mode:** If you choose, you can alter the static IP network settings for the device, or switch the unit into DHCP mode to automatically obtain proper network settings from a local DHCP server. To switch to DHCP mode, please select DHCP from the IP mode drop-down, then click “Save” followed by “Reboot”.
- 2) **WebGUI Hotkey:** Once you are satisfied with the network settings, you may use them to connect via Telnet or WebGUI. The network information window provides a convenient link to launch the WebGUI directly.

/// WebGUI Overview

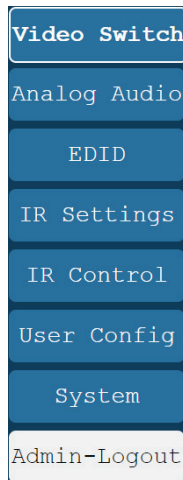
After connecting to the WebGUI's address in a web browser, the login screen will appear. Please enter the appropriate user name and password then click "Enter" to log in.

Note: The default user name and password is "admin".



The image shows a login form with a title bar that says "Login". Below the title bar, there are two input fields: "User Name:" followed by a text box, and "Password:" followed by a text box. Below the password field is a blue button with the text "Enter" in white.

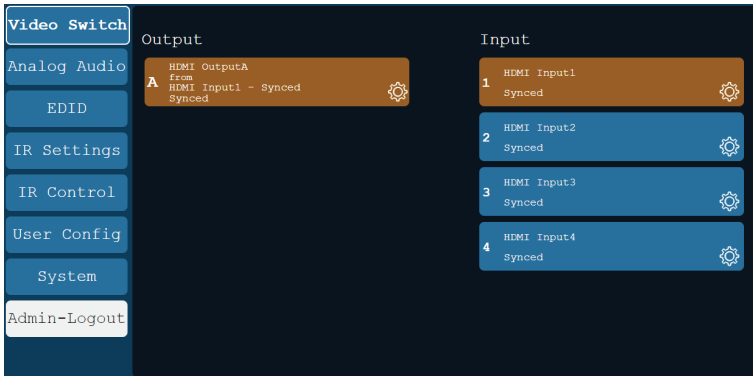
On the left side of the browser you will see the following menu tabs where all primary functions of the unit are controllable via the built in WebGUI. The individual functions will be introduced in the following sections.



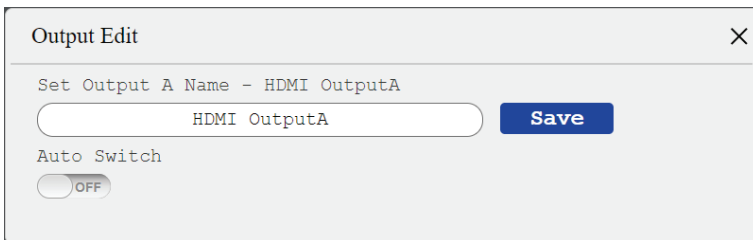
Clicking the "Logout" tab will automatically log the currently connected user out of the WebGUI and return to login page.

6.6.1 Video Switch Tab

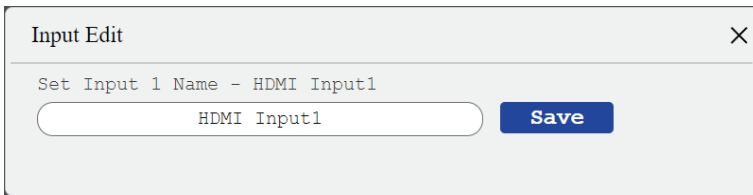
This tab provides A/V routing control, auto switch controls, and I/O renaming options. To assign a new A/V route, please click the output button on the left and then click on the button of the preferred input port on the right. As you select each button they will become outlined in white. The new route will become active immediately and the routing information displayed on the buttons will change accordingly.



- 1) **Output A:** The button for selecting the output to route A/V inputs to. Details about the output name and currently selected input are also displayed here. Clicking on the gear icon (⚙️) opens up the Output Edit window.
- 2) **Input 1/2/3/4:** Buttons for selecting the HDMI input (1 through 4) to route to the output. Details about the input names and current sync status are also displayed here. Clicking on the gear icon (⚙️) opens up the Input Edit window.
- 3) **Output Edit:** The output allows for Individual control over its name and the behavior of auto switching. To edit the settings of the output please click the “Edit” icon (⚙️).

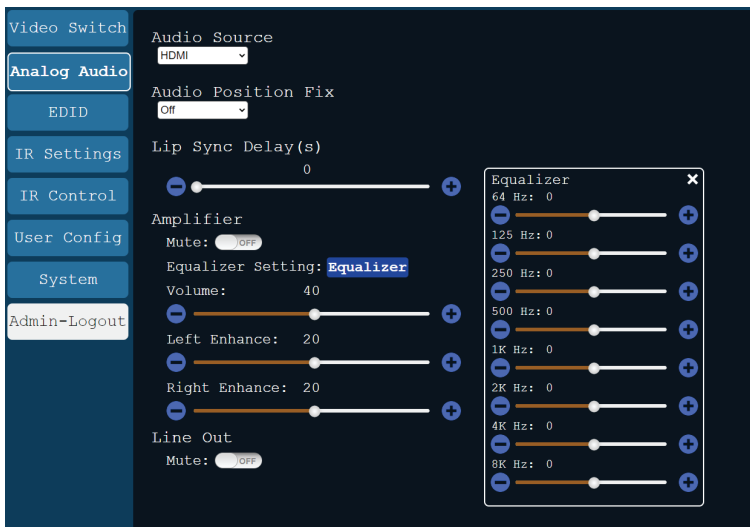


- **Set Output Name:** To rename the output, type the new name in the space provided in the Edit window. The name can be up to 32 characters long. Click the “Save” button to confirm the change.
 - **Auto Switch:** Auto switching may be enabled or disabled for the output. Click on the On/Off slider to toggle the behavior.
- 4) **Input Edit:** Each input allows for individual control over its name. To edit the name of an input please click the “Edit” icon (⚙️) then type the new name in the space provided in the Edit window. The name can be up to 32 characters long. Click the “Save” button to confirm the change.



6.6.2 Analogue Audio Tab

This tab allows for control over the amplified analogue output of this unit. This unit’s DSP allows control over features such as volume, muting, audio delay, equaliser, and L/R balance.



Note: Only LPCM 2.0 audio sources are supported by the analogue outputs.

- 1) **Audio Source:** Select the audio source type (HDMI or ARC) to route to the amplified analogue output from the dropdown.

Note: If the display connected to the HDMI output does not support ARC, no audio will be heard when the ARC source is selected.

- 2) **Lip Sync:** Allows the correction of lip sync issues by adjusting the audio delay from 0 to 150ms.

Note: The maximum amount of delay possible depends on the audio source's sample rate. The value provided here assumes a 48kHz stereo source.

- 3) **Amplifier:** This unit's amplified output provides a number of controls to fine tune the audio performance of connected analogue speakers.

- **Mute:** Mute or unmute the amplified analogue output independent of the current line out mute setting.

- **Equaliser Setting:** Clicking on this button opens up the Equaliser window which has adjustment sliders at a variety of commonly adjusted frequencies from 64Hz to 8kHz. Each slider has an adjustment range of -10 to 10 decibels.

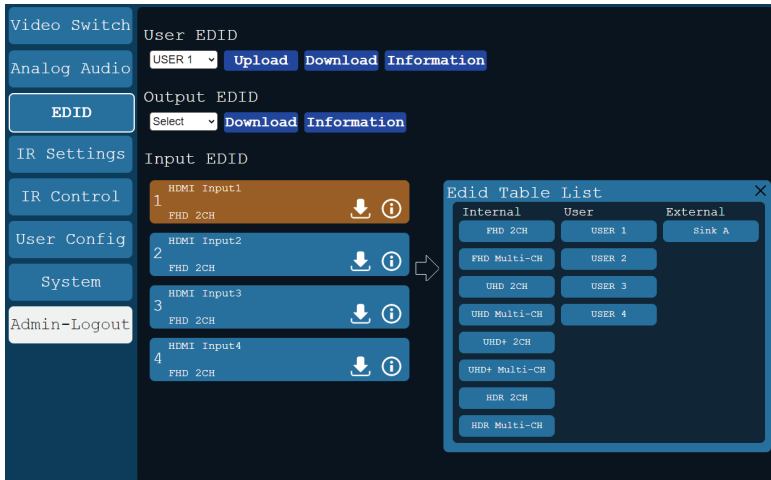
- **Volume:** Adjusts the volume of the amplified analogue audio output from 0 to 80. Each step is 0.5dB.

- **Left/Right Enhance:** Allows increasing the volume of the left and right amplified audio outputs independently. Each output can be increased by up to an additional 20dB in 0.5dB steps.

- 4) **Line Out Mute:** Mute or unmute the analogue headphone jack output. This setting is independent of the amplified analogue output mute setting.

6.6.3 EDID Settings Tab

This tab provides the option of eight standard EDIDs, one sink sourced EDID, and four customer uploaded User EDIDs that can be assigned to any or all of the HDMI input ports. Detailed information about any of these EDIDs may also be viewed here.



1) User EDID

- Upload:** To upload a User EDID, select the User EDID slot to upload into from the dropdown list and then click the “Upload” button. An EDID Upload window will appear, allowing you to locate and upload the preferred EDID file (*.bin format) from a local PC. Once the correct file has been selected, please click the “Upload” button in the window, and the file will be transferred to the unit.
- Download:** To save an existing User EDID to your local PC, select the User EDID slot from the dropdown list and then press the “Download” button. Depending on your browser settings you will either be asked where to save the downloaded file, or the file will be transferred to the default download location on your PC.
- Information:** To view detailed information about a User EDID, select the preferred User EDID slot from the dropdown list and then press the “Information” button.

2) Output EDID

- **Download:** To save the EDID from a connected HDMI display to your local PC, select the sink from the dropdown list then press the “Download” button. Depending on your browser settings you will either be asked where to save the downloaded file, or the file will be transferred to the default download location on your PC.
- **Information:** To view detailed information about a connected sink’s EDID, select the preferred sink from the dropdown list and then press the “Information” button.

3) Input EDID: Click on one or more input buttons to open the EDID Table List window. Select the new EDID source to use, from the choices on the right, and the change will occur immediately across all selected Inputs.

Note: In most cases, assigning a new EDID to an input will typically cause the affected input to briefly blink out while the source adapts to the new information.

This unit provides the following 8 default EDIDs:

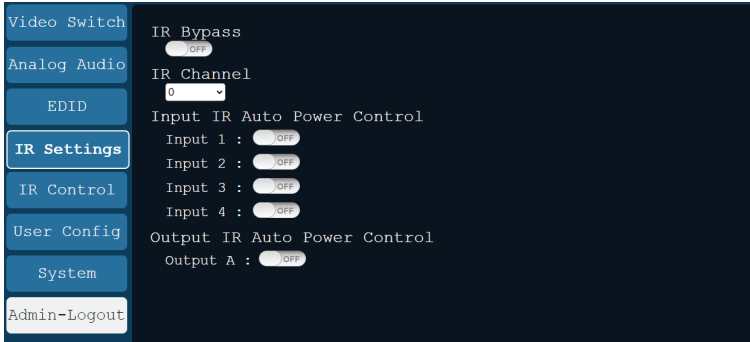
Unit's default EDIDs	
FHD 2CH	1920×1080p@60Hz (4.95Gbps) & 8-bit colour, LPCM 2.0
FHD Multi-CH	1920×1080p@60Hz (4.95Gbps) & 8-bit colour, LPCM 7.1 & Bitstream
UHD 2CH	3840×2160p@30Hz (10.2Gbps) & Deep Colour (8/10/12-bit), LPCM 2.0
UHD Multi-CH	3840×2160p@30Hz (10.2Gbps) & Deep Colour (8/10/12-bit), LPCM 7.1 & Bitstream
UHD+ 2CH	3840×2160p@60Hz (18Gbps) & Deep Colour (8/10/12-bit), LPCM 2.0
UHD+ Multi-CH	3840×2160p@60Hz (18Gbps) & Deep Colour (8/10/12-bit), LPCM 7.1 & Bitstream
HDR 2CH	3840×2160p@60Hz (18Gbps) & Deep Colour (8/10/12-bit) + HDR10, LPCM 2.0
HDR Multi-CH	3840×2160p@60Hz (18Gbps) & Deep Colour (8/10/12-bit) + HDR10, LPCM 7.1 & Bitstream

Note: In some rare cases it is possible for custom or external EDIDs to cause compatibility issues with certain sources. If this happens, it is recommended to switch to one of the 8 default EDIDs for maximum compatibility.

- **Download:** To save the EDID currently in use by an Input, press the “Download” button next to the preferred Input. Depending on your browser settings you will either be asked where to save the downloaded file, or the file will be transferred to the default download location on your PC.
- **Information:** To view detailed information about an EDID currently in use by an Input, click on the “Information” button next to the preferred Input.

6.6.4 IR Settings Tab

This tab provides control over the IR interfaces of the unit and how it interacts with the unit and with devices associated with each input and output.



- 1) IR Bypass:** Enable or disable basic IR bypass from the front IR window, to the currently selected input's IR blaster.

Note: When IR Bypass is enabled, unit-generated IR commands will be delayed by 100ms to avoid conflict with the bypassed IR command.

- 2) IR Channel:** Sets the IR channel to use with the unit's dedicated IR remote control.

Note: The IR channel of the unit and the dedicated IR remote control must match in order for the unit to be controlled.

- 3) Input IR Auto Power Control:** Enable or disable the Auto Power Control for the IR blaster associated with each input on the unit. When enabled, the unit will transmit the appropriate power button IR command, from the associated input's IR blaster, any time the unit is powered on or placed into standby mode.

Note: The device-specific power button IR command must be learned and stored in the unit for each input. The IR transmission will be delayed by 10 seconds to accommodate the warmup needs of certain devices.

- 4) Output IR Auto Power Control:** Enable or disable the Auto Power Control for the IR blaster associated with the output on the unit. When enabled, the unit will transmit the appropriate power button IR command, from the associated output's IR blaster, any time the unit is powered on or placed into standby mode.

Note: The IR transmission will be delayed by 10 seconds to accommodate the warmup needs of certain devices.

6.6.5 IR Control Tab

This tab provides control over the handling of all IR commands stored within the unit, including learning commands to be assigned to the buttons on the IR remote/App for each input and output, enabling the Advanced and Extension button sets, renaming each button, as well as saving/loading the IR configuration for each source or sink to/from a PC file. The app's behavior may also be simulated, allowing each button to be tested to ensure the proper IR signal is transmitted.



- 1) **Source 1~4/Sink A Buttons:** Press the button of the Source or Sink that you wish to configure the IR commands for.

Note: All settings below are individually set and stored for each Source or Sink.

- **APP Simulation:** Enable or disable simulating the app with the buttons below to allow for the convenient testing of learned codes. When enabled, pressing any of the remote buttons on this web page will transmit the IR command defined within that button to the current Source or Sink.
- **Name:** Allows renaming the current Source or Sink's remote for easy identification. Type the new name in the space provided. The name can be up to 32 characters long. Click the "Save" button to confirm the change.

- **Advance:** Enable or disable the availability of the “Advance” IR remote button set for the current Source or Sink.

Note: The “Advance” buttons are available on both the IR remote and the app.

- **Extension:** Enable or disable the availability of the “Extension” IR remote button set for the current Source or Sink.

Note: The “Extension” buttons are only available in the app.

- **Default:** Set the default button set to display when this Source or Sink is selected in the app.

- **IR Configuration file Upload:** Previously saved IR device configurations may be restored from a saved XML file. Click the “Choose File” button to locate the saved XML file, then click the “Restore” button to load the selected configuration.

Note: Only the IR command settings for a single Source or Sink are included in the file.

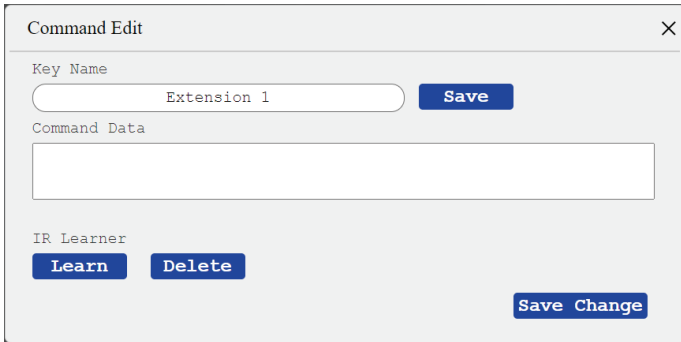
- **IR Configuration file Download:** The current IR device configuration, including all learned IR commands, may be saved as an XML file to a PC. Click the “Download” button to save the current IR device configuration to your local PC.

Note: Only the IR command settings for the currently selected Source or Sink are included in the file.

- **Normal/Advance/Extension:** Displays all available buttons for each IR Remote mode. Clicking on a button will open up its Command Edit window, allowing an IR command to be learned or manually entered and associated with the button.

Note: The “Extension” button set is only available in the app.

- 2) **Command Edit:** Clicking on any button from the Normal, Advance, or Extension IR button groups will open up its Command Edit window, allowing an IR command to be learned or manually entered and associated with the button. Click the “Save Change” button to confirm and store the current data to the button.



Command Edit

Key Name

Extension 1 Save

Command Data

IR Learner

Learn Delete

Save Change

Note: Only buttons that have IR codes associated with them will be visible in the mobile device app.

■ **Key Name (“Extension” and “Source Controller” buttons only):**

Allows renaming the current button for easy identification. Type the new name in the space provided. The name can be up to 32 characters long.

Note: The custom key name will also appear in the app.

■ **Command Data:** Contains the IR command data to be transmitted when the associated remote button is pressed. This data can be learned from an external remote or manually entered.

■ **IR Learner:** To learn an IR command from a physical IR remote click the “Learn” button. After selecting “Learn”, you have 15 seconds to point the IR remote at the appropriate IR Receiver and press the remote button to learn. After 15 seconds have passed, the learned IR command (if any) will be displayed in the Command Data space. To delete a previously learned IR command, press the “Delete” button.

- 3) **Command Edit (PLAY/PAUSE Button):** Clicking on the PLAY/PAUSE button from the Normal button group opens a special Command Edit window, allowing control over the behavior of the button in addition to assigning an IR command. Some remotes use separate buttons for “Play” and “Pause”. In those cases a second IR command for the “Pause” function may be assigned to this button. Click the “Save Change” button to confirm and store the current data to the button.

- **Play Key Command Data:** Contains the IR command data to be transmitted when the PLAY/PAUSE button is pressed. This data can be learned from an external remote or manually entered.

Note: If separate Play and Pause commands are defined, they will be transmitted alternately with each press of the button.

- **Play Key IR Learner:** To learn an IR command from a physical IR remote click the “Learn” button. After selecting “Learn”, you have 15 seconds to point the IR remote at the appropriate IR Receiver and press the remote button to learn. After 15 seconds have passed, the learned IR command (if any) will be displayed in the Command Data space. To delete a previously learned IR command, press the “Delete” button.

- **Pause Key the same with Play Key:** Enables or disables support for a single-command PLAY/PAUSE button. When enabled, only a single command is stored and transmitted when the PLAY/PAUSE button is pressed. When disabled, pressing the PLAY/PAUSE key will toggle between the Play and Pause IR commands with each press.
- **Pause Key Command Data:** Contains the IR command data to be transmitted when the PLAY/PAUSE button is pressed. This data can be learned from an external remote or manually entered.
- **Pause Key IR Learner:** To learn an IR command from a physical IR remote click the “Learn” button. After selecting “Learn”, you have 15 seconds to point the IR remote at the appropriate IR Receiver and press the remote button to learn. After 15 seconds have passed, the learned IR command (if any) will be displayed in the Command Data space. To delete a previously learned IR command, press the “Delete” button.

6.6.6 User Config Tab

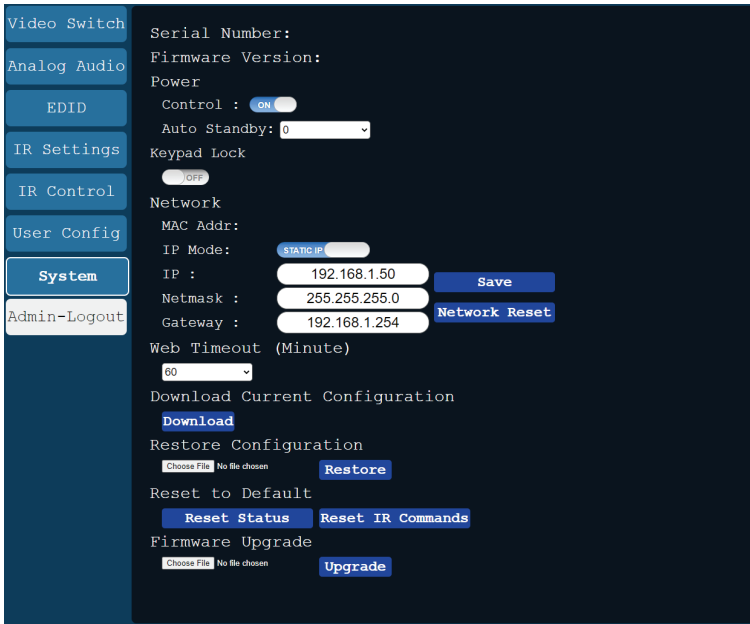
The WebGUI and Telnet username/password are set on this page. Two management levels are available: “Administrator” and “General User”. The usernames are pre-defined as “admin” and “user” and cannot be changed.

Video Switch	Administrator	Username	<input type="text" value="admin"/>
Analog Audio	Old Password	<input type="password"/>	
EDID	New Password	<input type="password"/>	
IR Settings	Confirm New Password	<input type="password"/>	
IR Control	<input type="button" value="Save"/>		
User Config	General User	Username	<input type="text" value="user"/>
System	Old Password	<input type="password"/>	
Admin-Logout	New Password	<input type="password"/>	
	Confirm New Password	<input type="password"/>	
	<input type="button" value="Save"/>		

Note: The “Administrator” user has access to all tabs and can change all settings. The “General User” has certain configuration functions disabled, such as IR Control, device renaming, etc.

6.6.7 System Settings Tab

This tab provides system information, power control, network configuration options, system configuration backup/restore/reset, and firmware update functions.



- 1) **Serial Number/Firmware Version:** Displays the unit’s serial number and current firmware version.
- 2) **Power:** Provides control over the unit’s power state.
 - **Control:** Press this switch to toggle the unit’s power between ON and OFF (standby mode).
Note: While in standby mode the unit’s WebGUI, Telnet and RS-232 controls are still active.
 - **Auto Standby:** Set the length of time (in minutes) to wait before automatically putting the unit into standby mode if there are no valid input signals detected. Setting this to “0” will disable the feature.
- 3) **Keypad Lock:** Enable or disable the front panel key lock. When enabled, the use of all front panel buttons will be disabled.

- 4) **Network:** IP mode may be switched between Static IP or DHCP. In Static IP mode the IP, netmask and gateway addresses may be manually set. When in DHCP mode, the unit will attempt to connect to a local DHCP server and obtain IP, netmask and gateway addresses automatically. Please press “Save” after making any changes to the IP configuration or mode. To return all network settings to their defaults, press the “Network Reset” button.

Note: If the IP address is changed then the IP address required for WebGUI/Telnet access will also change accordingly.

- 5) **Web Timeout:** Select the length of time to wait before logging the user out of the WebGUI due to inactivity. Available range is from 1 to 120 minutes.
- 6) **Download Current Configuration:** The current system configuration, including routing and settings, may be saved as an XML file to a PC. Click the “Download” button to save the current system configuration to your local PC.
- 7) **Restore Configuration:** Previously saved system configurations may be restored from a saved XML file. Click the “Choose File” button to locate the saved XML file, then click the “Restore” button to activate the selected configuration.
- 8) **Reset to Default:** Press the “Reset Status” button to reset the unit to its factory default state. After the reset is complete, the unit will reboot automatically into standby mode. Press the “Reset IR Commands” button to only reset and clear out the contents of all uploaded IR command sets stored in the unit.
- 9) **Firmware Upgrade:** To update the unit’s firmware, click the “Choose File” button to open the file selection window and then select the firmware update file (*.bin format) located on your local PC. After selecting the file, click the “Upgrade” button to begin the firmware update process. After the upgrade is complete, the unit will reboot automatically.

6.7 Mobile Device App

This unit may also be controlled via a dedicated mobile device control application which is available for download. Please contact your authorised dealer for details on how to obtain the app. The app provides flexible control over the unit, going beyond what the physical remote allows. It has a number of important advanced functions including source selection, IR control over both sources and displays, as well as customised button layouts for each controlled device. The app facilitates control over any source or display, that has IR commands assigned to buttons within the WebGUI, regardless of the user's current location.

Note: The exact appearance of the app's screens may vary depending on the OS of your mobile device and the resolution of the display.

/// Control App Overview

After successfully downloading and installing the Control App, connect the unit and your mobile device to the same active network and start the Control App.

Depending on your OS version, a splash screen may or may not appear. If a splash screen appears, tap on the Start icon and then the unit discovery process will begin. If no splash screen appears, the app will immediately start the discovery process.

Note: If no controllable unit exists on the local network, this app can be operated in a "demo" mode by pressing and holding the screen for 5 seconds.



6.7.1 App Main Page

The app's Main page provides access to all of the IR commands available for the currently selected video source or display as defined within the unit's WebGUI. This page also provides an easy way to switch inputs, change the amplified audio source, and control the amplified audio volume via the bottom Control Slider's row of buttons. Shortcut buttons to refresh the app's data or access the app's Selection Menu are also provided at the top.

Note: For detailed information about assigning user defined IR commands within the WebGUI, please refer to Section 6.6.5.

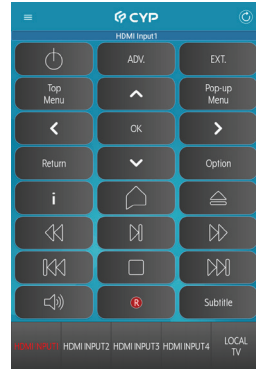


- 1) **Menu Icon** (☰): Pressing this button once will open the “Selection Menu” page. The Selection Menu page provides a way to search for other units within the local network and provides information about the software version, firmware version and manufacturer.
- 2) **App Data Refresh Icon** (🔄): Pressing this button will force the app to refresh the IR Remote button layout data from the unit.
- 3) **Input Identification Bar**: This informational bar at the top of the page identifies which input (HDMI 1~4) is currently selected for IR control. The input can be changed via the bottom slider buttons.
- 4) **IR Remote Control Buttons**: Up to three sets of IR control buttons are available for every device (Normal, Advance, Extension). The starting page and which button pages are available for each device is determined by the settings for that device in the unit's WebGUI.

Note: Only buttons that have IR codes associated with them will be visible.

■ Normal IR Remote Buttons:

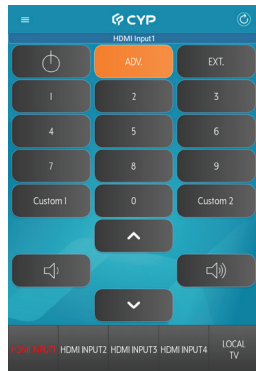
These buttons share their functions with the buttons at the bottom of the unit's physical remote, as defined within the unit's WebGUI. Pressing any of these buttons will send the defined IR command to the IR Blaster associated with the current input or local display.



■ Advance IR Remote Buttons:

These buttons share their functions with the "Advance Mode" buttons on the unit's physical remote, as defined within the unit's WebGUI. To access these buttons in the app, press the "ADV." button. To return to the Normal button set, press the button a second time. Pressing any of these buttons will send the defined IR command to the IR Blaster associated with the current input or local display.

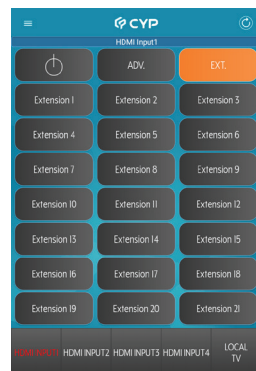
Note: If the Advance button set has been disabled in the unit's WebGUI for the current device, this page will not be available.



■ Extension IR Remote Buttons:

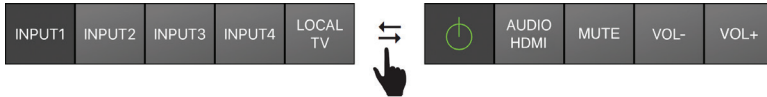
These buttons are only available within the app and are defined within the unit's WebGUI under the "Extension" set. To access these buttons in the app, press the "EXT." button. To return to the Normal button set, press the button a second time. Pressing any of these buttons will send the defined IR command to the IR Blaster associated with the current input or local display.

Note: If the Extension button set has been disabled in the unit's WebGUI for the device, this page will not be available.



6.7.2 App Unit Control Slider

This slider at the bottom of the app's main page provides an easy way to switch inputs, change the amplified audio source, control the amplified audio volume, or select the local display for IR control. To access the additional buttons on the slider, slide the menu bar to the left or right.



1) Control Slider (Left Set):

- **Input 1~4:** Pressing any of these buttons will switch the current source to the input selected. When a new input is selected, the IR Remote Control buttons available will also change to match the newly selected input.
- **Local TV:** Pressing this button will show the IR Remote Control buttons that have been defined for the connected display. Press the button a second time to return to showing the current input's IR Remote Control buttons.

Note: Selecting Local TV will not change the currently selected input.

2) Control Slider (Right Set):

- **Power Icon (⏻):** Press this button to turn the unit on or place it into standby mode.
- **Audio Source Selection:** Pressing this button will toggle between the 2 available audio sources for the analogue outputs (the HDMI output's source and ARC).

Note: If the display connected to the HDMI output does not support ARC, no audio will be heard when the ARC source is selected.

- **Mute:** Press this button to mute or unmute the analogue outputs.
- **Vol-/Vol+:** Press these buttons to increase or decrease the volume level of the amplified audio output.

6.7.3 App Selection Menu Page

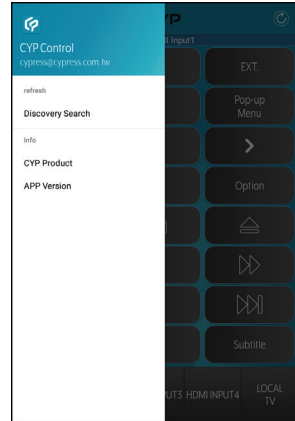
The Selection Menu page provides a way to search for other units within the local network. Links to information about the app and other products from the company are also available. This menu is accessed by pressing the Menu Icon (☰) from the main page.

1) Refresh

- **Discovery Search:** Select this to search for additional units within the local network. After selecting a new unit, the details from that unit will automatically be loaded into the app.

2) Info

- **CYP Product:** Links to a web page with information about other products available from the company.
- **APP Version:** Displays information about the App version and Unit firmware version.



6.8 Telnet Control

Before attempting to use Telnet control, please ensure that both the unit and the PC are connected to the same active networks.

Start your preferred Telnet/Console client, or use the built in client provided by most modern computer operating systems. After starting the client, connect by using the current IP address of the unit and port 23 (if the communication port number used by the unit has not been changed previously). This will connect us to the unit we wish to control and commands may now be entered directly.

Note 1: If the IP address of the unit is changed then the IP address required for Telnet access will also change accordingly.

Note 2: The default IP address is 192.168.1.50 and the default communication port is 23.

6.9 Serial and Telnet Commands

COMMAND
Description and Parameters
help ←
Show the full command list.
help N1 ←
Show details about the specified command. N1 = {Command}
? ←
Show the full command list.
? N1 ←
Show details about the specified command. N1 = {Command}
get model name ←
Show the unit's model name.

COMMAND
Description and Parameters
<p>get fw ver ←</p> <p>Show the unit's current firmware version.</p>
<p>set system reboot ←</p> <p>Reboot the unit.</p>
<p>set description N1 ←</p> <p>Set the description/name of the unit.</p> <p>N1 = {Name} [64 characters max]</p>
<p>get description ←</p> <p>Show the unit's current description/name.</p>
<p>set keylock N1 ←</p> <p>Enable or disable the front panel key lock.</p> <p>Available values for N1:</p> <p>ON [Lock front panel] OFF [Unlock front panel]</p>
<p>get keylock ←</p> <p>Show the current front panel key lock status.</p>
<p>set power N1 ←</p> <p>Power the unit on or place it into standby mode.</p> <p>Available values for N1:</p> <p>ON [Power on] OFF [Standby Mode]</p>

COMMAND	
Description and Parameters	
get power ↵	
Show the current power status.	
set auto standby timer N1 ↵	
Set the length of time to wait before placing the unit into standby mode when there is no detected live input.	
Available values for N1 :	
0	[Timer disabled]
1~255	[Minutes]
get auto standby timer ↵	
Show the current auto standby timer setting.	
set factory default ↵	
Reset all configurations to the factory defaults.	
get in port number ↵	
Report the number of inputs supported by the unit	
get in type list ↵	
List the interface supported by each input.	
set in N1 name N2 ↵	
Set the name of the specified input.	
N1 = 1~4	[HDMI Input]
N2 = {Name}	[32 characters max]
get in N1 name ↵	
Show the current name of the specified input.	
N1 = 1~4	[HDMI Input]

COMMAND	
Description and Parameters	
set in N1 hdcp mode N2 ↵	
Set the HDCP behavior of the specified input.	
N1 = 1~4	[HDMI Input]
Available values for N2 :	
0	[Disable HDCP]
1	[Refer to source]
2	[Refer to sink]
get in N1 hdcp mode ↵	
Show the current HDCP behavior used by the specified input.	
N1 = 1~4	[HDMI Input]
set in N1 edid N2 ↵	
Set the EDID to use on the specified input.	
N1 = 1~4	[HDMI Input]
Available values for N2 :	
1	[Internal FHD 2CH]
2	[Internal FHD Multi-CH]
3	[Internal UHD 2CH]
4	[Internal UHD Multi-CH]
5	[Internal UHD+ 2CH]
6	[Internal UHD+ Multi-CH]
7	[Internal HDR 2CH]
8	[Internal HDR Multi-CH]
9	[User EDID1]
10	[User EDID2]
11	[User EDID3]
12	[User EDID4]
13	[Copy Output A]

COMMAND	
Description and Parameters	
get in N1 edid data ↵	
Show the EDID currently used by the specified input as ASCII hex data.	
N1 = 1~4	[HDMI Input]
get in N1 edid information ↵	
Show English readable details from the EDID assigned to the specified input.	
N1 = 1~4	[HDMI Input]
set in N1 power control N2 ↵	
Enable or disable the auto power control feature for the specified input.	
N1 = 1~4	[HDMI Input]
Available values for N2 :	
ON	[Enable Power Control]
OFF	[Disable Power Control]
get in N1 power control ↵	
Show the current state of the auto power control setting for the specified input.	
N1 = 1~4	[HDMI Input]
get out port number ↵	
Show the total number of outputs on the unit.	
get out type list ↵	
List the port type of all outputs on the unit.	

COMMAND	
Description and Parameters	
set out A name N1 ↵	
Set the name of the HDMI output.	
N1 = {Name}	[32 characters max]
get out A name ↵	
Show the name of the HDMI output.	
set out A convert N1 ↵	
Set the 4K compatibility conversion behavior used by the HDMI output.	
Available values for N1 :	
0	[Bypass, no conversion]
1	[Convert the colour space to YUV
4:2:0]	
2	[Convert the resolution to 1080p]
3	[Automatic, based on sink EDID]
get out A convert ↵	
Show the current 4K compatibility conversion behavior used by the HDMI output.	
get out A hpd ↵	
Show the current hot-plug state of the HDMI output.	
get out A edid data ↵	
Show the EDID used by the output as ASCII hex data.	
get out A edid information ↵	
Show English readable details from the EDID of the HDMI output.	

COMMAND	
Description and Parameters	
set out A power control N1 ←	
<p>Enable or disable the auto power control feature for the HDMI output.</p> <p>Available values for N1:</p> <p>ON [Enable Power Control]</p> <p>OFF [Disable Power Control]</p>	
get out A power control ←	
<p>Show the current state of the auto power control setting for the HDMI output.</p>	
set zone A route N1 ←	
<p>Route the specified input to the HDMI output.</p> <p>N1 = 1~4 [HDMI Input]</p>	
get zone A route ←	
<p>Show the current input routed to the HDMI output.</p>	
set zone A auto route N1 ←	
<p>Enable or disable the automatic routing function.</p> <p>Available values for N1:</p> <p>ON [Auto routing enabled]</p> <p>OFF [Auto routing disabled]</p>	
get zone A auto route ←	
<p>Show the current automatic routing function state.</p>	
get user edid number ←	
<p>Report the number of user EDID supported by the unit.</p>	

COMMAND	
Description and Parameters	
set user N1 edid data N2 ↵	
Upload a new EDID (in ASCII hex format) for use as the specified User EDID.	
N1 = 1~4	[User EDID number]
N2 = {Comma delimited hex pairs}	[EDID data]
get user N1 edid data ↵	
Show the EDID used by the specified User EDID as ASCII hex data.	
N1 = 1~4	[User EDID number]
get user N1 edid information ↵	
Show English readable details from the specified User EDID.	
N1 = 1~4	[User EDID number]
set analog audio route N1 ↵	
Route the specified audio source to the analogue audio outputs.	
Available values for N1 :	
A	[Current HDMI input]
C	[HDMI output's ARC audio]
get analog audio route ↵	
Show the current analogue audio routing source.	
set analog audio mute purpose N1 ↵	
Define the functionality of the front panel and remote control's mute buttons.	
Available values for N1 :	
1	[Mutes amplifier only]
2	[Mutes line out only]
3	[Mutes both]

COMMAND	
Description and Parameters	
get analog audio mute purpose ←	
Show the current analogue audio mute button functionality setting.	
set amplifier mute N1 ←	
Enable or disable muting the amplified audio output.	
Available values for N1 :	
ON	[Muted]
OFF	[Unmuted]
get amplifier mute ←	
Show the current mute state of the amplified audio output.	
set amplifier volume N1 ←	
Set the volume level of the amplified audio output.	
Available values for N1 :	
0~80	[Volume in 0.5dB steps]
UP	[Increase volume 1 step]
DOWN	[Decrease volume 1 step]
get amplifier volume ←	
Show the current volume level of the amplified audio output.	
set amplifier left enhance N1 ←	
Increase the amplified audio output's left channel's volume level.	
N1 = 0~40	[Volume increase in 0.5dB steps]
get amplifier left enhance ←	
Show the current left channel volume enhancement amount.	
set amplifier right enhance N1 ←	
Increase the amplified audio output's right channel's volume level.	
N1 = 0~40	[Volume increase in 0.5dB steps]

COMMAND	
Description and Parameters	
get amplifier right enhance ← ↵	
Show the current right channel volume enhancement amount.	
set analog audio lineout mute N1 ← ↵	
Enable or disable muting the analogue audio line out.	
Available values for N1 :	
ON	[Muted]
OFF	[Unmuted]
get analog audio lineout mute ← ↵	
Show the current mute state of the analogue audio line out.	
set amplifier eq N1 gain N2 ← ↵	
Set the audio equaliser level at the specified frequency band for the amplified audio output.	
Available values for N1 :	
64	[64Hz band]
125	[125Hz band]
250	[250Hz band]
500	[500Hz band]
1000	[1kHz band]
2000	[2kHz band]
4000	[4kHz band]
8000	[8kHz band]
N2 = -10~10	[Gain in dB]

COMMAND	
Description and Parameters	
get netmask ←	Show the unit's current netmask.
set gateway N1 ←	Set the unit's static gateway address. N1 = X.X.X.X [X = 0~255, gateway address]
get gateway ←	Show the unit's current gateway address.
set http port N1 ←	Set the unit's WebGUI access port. N1 = 0~65535 [Network port]
get http port ←	Show the unit's current WebGUI access port.
set telnet port N1 ←	Set the unit's Telnet access port. N1 = 0~65535 [Network port]
get telnet port ←	Show the unit's current Telnet access port.
get ipconfig ←	Show the unit's current IP configuration information.
set webgui login timeout N1 ←	Set the WebGUI inactivity timeout value. Available values for N1 : 0 [No timeout] 1~65535 [Timeout in minutes]

COMMAND							
Description and Parameters							
get webgui login timeout ↵	Show the current WebGUI inactivity timeout value.						
set ethernet default ↵	Reset the Ethernet settings to their factory defaults.						
set ir N1 remote control name N2 ↵	<p>Set a name for the IR remote control used to control the device connected to the specified input/output port.</p> <p>Available values for N1:</p> <table> <tr> <td>1~4</td> <td>[HDMI Input device]</td> </tr> <tr> <td>A</td> <td>[HDMI Output device]</td> </tr> </table> <p>N2 = {Name} [32 characters max]</p>	1~4	[HDMI Input device]	A	[HDMI Output device]		
1~4	[HDMI Input device]						
A	[HDMI Output device]						
get ir N1 remote control name ↵	<p>Show the current name for the IR remote control used to control the device connected to the specified input/output port.</p> <p>Available values for N1:</p> <table> <tr> <td>1~4</td> <td>[HDMI Input device]</td> </tr> <tr> <td>A</td> <td>[HDMI Output device]</td> </tr> </table>	1~4	[HDMI Input device]	A	[HDMI Output device]		
1~4	[HDMI Input device]						
A	[HDMI Output device]						
set ir N1 learn to N2 func N3 ↵	<p>Set the IR receiver location to use when learning IR command N3 assigned to the device connected to input/output port N2 and activate the learning function.</p> <p>Available values for N1:</p> <table> <tr> <td>C</td> <td>[Front IR window]</td> </tr> </table> <p>Available values for N2:</p> <table> <tr> <td>1~4</td> <td>[HDMI Input device]</td> </tr> <tr> <td>A</td> <td>[HDMI Output device]</td> </tr> </table> <p>N3 = 1~60 [IR button function number]</p>	C	[Front IR window]	1~4	[HDMI Input device]	A	[HDMI Output device]
C	[Front IR window]						
1~4	[HDMI Input device]						
A	[HDMI Output device]						

COMMAND	
Description and Parameters	
set ir N1 emit with func N2 ↵	
Transmit the IR code stored in button N2 for the device located at IR blaster location N1 .	
Available values for N1 :	
1~4	[IR output 1~4]
A	[IR output 5]
N2 = 1~60	[IR button function number]
set ir N1 delete func N2 ↵	
Delete the IR code stored in button N2 for device N1 .	
Available values for N1 :	
1~4	[HDMI Input device]
A	[HDMI Output device]
N2 = 1~60	[IR button function number]
set ir N1 advance mode N2 ↵	
Enable or disable the “Advance mode” for the specified device’s remote control.	
Available values for N1 :	
1~4	[HDMI Input device]
A	[HDMI Output device]
Available values for N2 :	
ON	[Advance mode on]
OFF	[Advance mode off]
get ir N1 advance mode ↵	
Show the current “Advance mode” setting for the specified device’s remote control.	
Available values for N1 :	
1~4	[HDMI Input device]
A	[HDMI Output device]

COMMAND

Description and Parameters

set ir N1 extension mode N2 ←

Enable or disable the “Extension mode” for the specified device’s remote control.

Available values for **N1**:

1~4	[HDMI Input device]
A	[HDMI Output device]

Available values for **N2**:

ON	[Extension mode on]
OFF	[Extension mode off]

get ir N1 extension mode ←

Show the current “Extension mode” setting for the specified device’s remote control.

Available values for **N1**:

1~4	[HDMI Input device]
A	[HDMI Output device]

set ir N1 default mode N2 ←

Set the default mode screen to show in the app for the specified device’s remote control.

Available values for **N1**:

1~4	[HDMI Input device]
A	[HDMI Output device]

Available values for **N2**:

1	[Normal mode]
2	[Advance mode]
3	[Extension mode]

COMMAND									
Description and Parameters									
<p>get ir N1 default mode ←</p> <p>Show the current default mode screen shown in the app for the specified device's remote control.</p> <p>Available values for N1:</p> <table> <tr> <td>1~4</td> <td>[HDMI Input device]</td> </tr> <tr> <td>A</td> <td>[HDMI Output device]</td> </tr> </table>	1~4	[HDMI Input device]	A	[HDMI Output device]					
1~4	[HDMI Input device]								
A	[HDMI Output device]								
<p>set ir N1 toggle mode N2 ←</p> <p>Enable or disable the ability of the "Play/Pause" function button of the specified device's remote control to toggle between separate commands for "Play" and "Pause".</p> <p>Available values for N1:</p> <table> <tr> <td>1~4</td> <td>[HDMI Input device]</td> </tr> <tr> <td>A</td> <td>[HDMI Output device]</td> </tr> </table> <p>Available values for N2:</p> <table> <tr> <td>ON</td> <td>[Play/Pause uses two commands]</td> </tr> <tr> <td>OFF</td> <td>[Play/Pause uses a single command]</td> </tr> </table>	1~4	[HDMI Input device]	A	[HDMI Output device]	ON	[Play/Pause uses two commands]	OFF	[Play/Pause uses a single command]	
1~4	[HDMI Input device]								
A	[HDMI Output device]								
ON	[Play/Pause uses two commands]								
OFF	[Play/Pause uses a single command]								
<p>get ir N1 toggle mode ←</p> <p>Show the current "Play/Pause" toggle mode for the specified device's remote control.</p> <p>Available values for N1:</p> <table> <tr> <td>1~4</td> <td>[HDMI Input device]</td> </tr> <tr> <td>A</td> <td>[HDMI Output device]</td> </tr> </table>	1~4	[HDMI Input device]	A	[HDMI Output device]					
1~4	[HDMI Input device]								
A	[HDMI Output device]								

COMMAND

Description and Parameters

set ir N1 extension N2 name N3 ←

Set a name for the specified device's Extension mode remote control function button **N2**.

Available values for **N1**:

1~4	[HDMI Input device]
A	[HDMI Output device]

N2 = 32, 34, 39~60 [IR button function number]

N3 = {Name} [32 characters max]

get ir N1 extension N2 name ←

Show the current name for the specified device's Extension mode remote control function button **N2**.

Available values for **N1**:

1~4	[HDMI Input device]
A	[HDMI Output device]

N2 = 32, 34, 39~60 [IR button function number]

set ir bypass N1 ←

Enable or disable the IR bypass and auto-IR routing mode.

Available values for **N1**:

ON	[Bypass enabled]
OFF	[Bypass disabled]

Note: When IR Bypass is enabled, unit-generated IR commands will be delayed by 100ms to avoid conflict with the bypassed IR command.

COMMAND**Description and Parameters****set osd font color N1 ↵**

Set the colour of the font used by the OSD banner.

Available values for **N1**:

1	[Black]
2	[White]
3	[Red]
4	[Green]
5	[Blue]
6	[Yellow]
7	[Cyan]
8	[Magenta]

get osd font color ↵

Show the current colour of the font used by the OSD banner.

set osd background color N1 ↵

Set the colour of the background of the OSD banner.

Available values for **N1**:

1	[Black]
2	[White]
3	[Red]
4	[Green]
5	[Blue]
6	[Yellow]
7	[Cyan]
8	[Magenta]

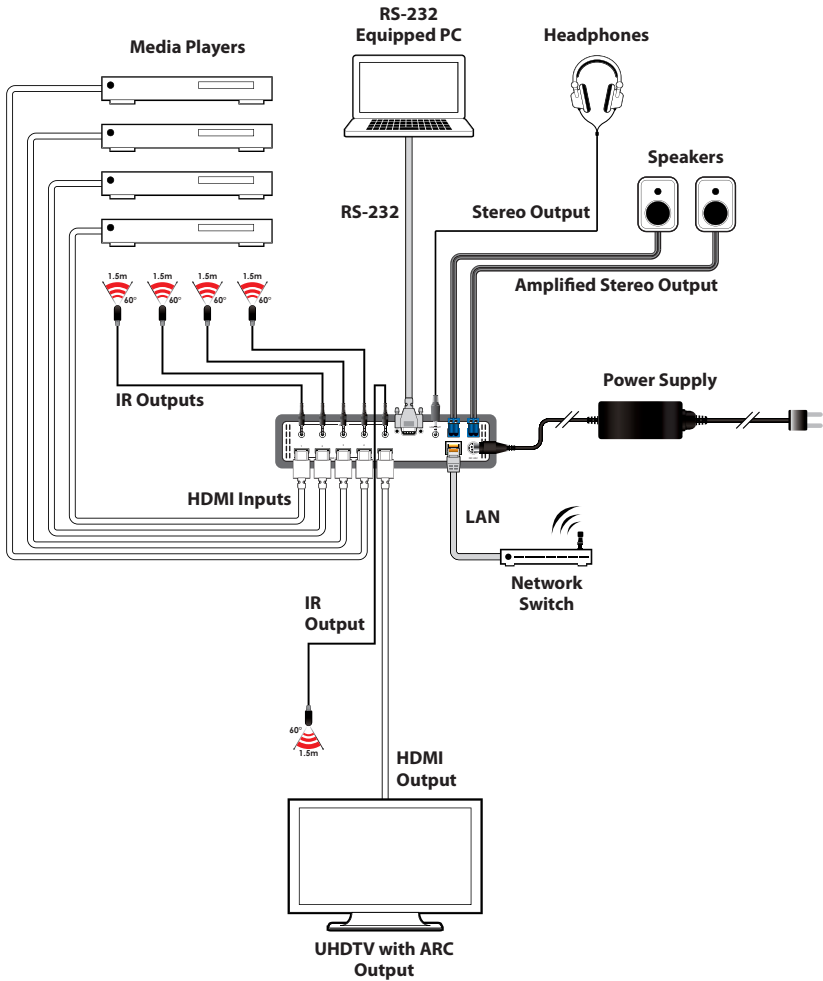
get osd background color ↵

Show the current colour of the background of the OSD banner.

COMMAND	
Description and Parameters	
set osd freerun color N1 ←	
Set the freerun colour to use when the current input does not have a valid source.	
Available values for N1 :	
0	[Disable freerun]
1	[Red]
2	[Green]
3	[Blue]
4	[Black]
5	[Colour bars]
get osd freerun color ←	
Show the current freerun colour.	
set osd default ←	
Reset the OSD settings to their factory defaults.	

Note: Commands will not be executed unless followed by a carriage return. Commands are not case-sensitive.

7. CONNECTION DIAGRAM



8. SPECIFICATIONS

8.1 Technical Specifications

HDMI Bandwidth	18Gbps
Input Ports	4×HDMI (Type-A)
Output Ports	1×HDMI (Type-A) 1×Analogue Stereo (2× 2-pin Terminal Block) 1×Analogue Stereo (3.5mm)
Pass-through Ports	5×IR Blaster (3.5mm)
Control Ports	1×RS-232 (DE-9) 1×IP Control (RJ-45)
Service Port	1×USB 2.0 (Type-A)
IR Frequency	30 ~ 50kHz (30 ~ 60kHz under ideal conditions)
Baud Rate	19200
Power Supply	24V/2.7A DC (US/EU standards, CE/FCC/UL certified)
ESD Protection (HBM)	±8kV (Air Discharge) ±4kV (Contact Discharge)
Dimensions (W×H×D)	219mm×43mm×156mm [Case Only] 219mm×54mm×163.5mm [All Inclusive]
Weight	1172g
Chassis Material	Metal (Steel)
Chassis Colour	Black
Operating Temperature	0°C – 40°C/32°F – 104°F
Storage Temperature	-20°C – 60°C/-4°F – 140°F
Relative Humidity	20 – 90% RH (Non-condensing)
Power Consumption	12.85W

8.2 Video Specifications

Supported Resolutions (Hz)	Input	Output
	HDMI	HDMI
720×400p@70/85	✓	✓
640×480p@60/72/75/85	✓	✓
720×480i@60	✓	✓
720×480p@60	✓	✓
720×576i@50	✓	✓
720×576p@50	✓	✓
800×600p@56/60/72/75/85	✓	✓
848×480p@60	✓	✓
1024×768p@60/70/75/85	✓	✓
1152×864p@75	✓	✓
1280×720p@50/60	✓	✓
1280×768p@60/75/85	✓	✓
1280×800p@60/75/85	✓	✓
1280×960p@60/85	✓	✓
1280×1024p@60/75/85	✓	✓
1360×768p@60	✓	✓
1366×768p@60	✓	✓
1400×1050p@60	✓	✓
1440×900p@60/75	✓	✓
1600×900p@60RB	✓	✓
1600×1200p@60	✓	✓
1680×1050p@60	✓	✓
1920×1080i@50/60	✓	✓

Supported Resolutions (Hz)	Input	Output
	HDMI	HDMI
1920×1080p@24/25/30	✓	✓
1920×1080p@50/60	✓	✓
1920×1200p@60RB	✓	✓
2560×1440p@60RB	✓	✓
2560×1600p@60RB	✓	✓
2048×1080p@24/25/30	✓	✓
2048×1080p@50/60	✓	✓
3840×2160p@24/25/30	✓	✓
3840×2160p@50/60 (4:2:0)	✓	✓
3840×2160p@24, HDR10	✓	✓
3840×2160p@50/60 (4:2:0), HDR10	✓	✓
3840×2160p@50/60	✓	✓
4096×2160p@24/25/30	✓	✓
4096×2160p@50/60 (4:2:0)	✓	✓
4096×2160p@24, HDR10	✓	✓
4096×2160p@50/60 (4:2:0), HDR10	✓	✓
4096×2160p@50/60	✓	✓

8.3 Audio Specifications

8.3.1 Digital Audio

HDMI Input / Output	
LPCM	
Max Channels	8 Channels
Sampling Rate (kHz)	32, 44.1, 48, 88.2, 96, 176.4, 192
Bitstream	
Supported Formats	Standard & High-Definition

8.3.2 Analogue Audio

Analogue Output (Amplified)	
Max Power Level	20W+20W
THD+N	< -66dB@0dBFS 1kHz (A-wt)
SNR	> 100dB@0dBFS
Frequency Response	< ±3dB@20Hz~20kHz
Crosstalk	< -80dB@10kHz
Impedance	4-16Ω
Type	Balanced

Analogue Output (3.5mm)	
Max Audio Level	2Vrms
THD+N	< -84dB@0dBFS 1kHz (A-wt)
SNR	> 104dB@0dBFS
Frequency Response	< ±0.5dB@20Hz~20kHz
Crosstalk	< -76dB@10kHz
Impedance	500Ω
Type	Unbalanced

8.4 Cable Specifications

Cable Length	1080p		4K30	4K60
	8-bit	12-bit	(4:4:4) 8-bit	(4:4:4) 8-bit
High Speed HDMI Cable				
HDMI Input	15m	10m	5m	3m
HDMI Output	15m	10m	5m	3m

Bandwidth Category Examples:

/// 1080p (FHD Video)

- Up to 1080p@60Hz, 12-bit colour
- Data rates lower than 5.3Gbps or below 225MHz TMDS clock

/// 4K30 (4K UHD Video)

- 4K@24/25/30Hz & 4K@50/60Hz (4:2:0), 8-bit colour
- Data rates higher than 5.3Gbps or above 225MHz TMDS clock but below 10.2Gbps

/// 4K60 (4K UHD+ Video)

- 4K@50/60Hz (4:4:4, 8-bit)
- 4K@50/60Hz (4:2:0, 10-bit HDR)
- Data rates higher than 10.2Gbps

9. ACRONYMS

ACRONYM	COMPLETE TERM
ARC	Audio Return Channel
ASCII	American Standard Code for Information Interchange
AV	Audio/Video
Cat.5e	Enhanced Category 5 cable
Cat.6	Category 6 cable
Cat.6A	Augmented Category 6 cable
Cat.7	Category 7 cable
CEC	Consumer Electronics Control
CLI	Command-Line Interface
DAC	Digital-to-Analogue Converter
dB	Decibel
DHCP	Dynamic Host Configuration Protocol
DVI	Digital Visual Interface
EDID	Extended Display Identification Data
Gbps	Gigabits per second
GUI	Graphical User Interface
HDCP	High-bandwidth Digital Content Protection
HDMI	High-Definition Multimedia Interface
HDR	High Dynamic Range
IP	Internet Protocol
IR	Infrared
kHz	Kilohertz
LAN	Local Area Network
LED	Light-Emitting Diode

ACRONYM	COMPLETE TERM
LPCM	Linear Pulse-Code Modulation
MHz	Megahertz
OSD	On-Screen Display
SNR	Signal-to-Noise Ratio
TCP	Transmission Control Protocol
THD+N	Total Harmonic Distortion plus Noise
4K UHD	4K Ultra-High-Definition (10.2Gbps max)
4K UHD⁺	4K Ultra-High-Definition (18Gbps max)
USB	Universal Serial Bus
WUXGA (RB)	Widescreen Ultra Extended Graphics Array (Reduced Blanking)
XGA	Extended Graphics Array
Ω	Ohm



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