

ASP-442A

4x4 Series HDMI 2.0a Matrix



SAFETY INSTRUCTIONS

Please review the following safety precautions. If this is the first time using this model, then read this manual before installing or using the product. If the product is not functioning properly, please contact your local dealer or Aurora for further instructions.



The lightning symbol in the triangle is used to alert you to the presence of dangerous voltage inside the product that may be sufficient to constitute a risk of electric shock to anyone opening the case. It is also used to indicate improper installation or handling of the product that could damage the electrical system in the product or in other equipment attached to the product.



The exclamation point in the triangle is used to alert you to important operating and maintenance instructions. Failure to follow these instructions could result in injury to you or damage to the product.



Be careful with electricity:

- **Power Outlet:** To prevent electric shock, be sure the electrical plug used on the product power cord matches the electrical outlet used to supply power to the Aurora product. Use the power adapter and power connection cables designed for this unit.
- **Power Cord:** Be sure the power cord is routed so that it will not be stepped on or pinched by heavy items.
- **Lightning:** For protection from lightning or when the product is left unattended for a long period, disconnect it from the power source.



Also follow these precautions:

- **Ventilation:** Do not block ventilation slots, if applicable, on the product, or place any heavy object on top of it. Blocking airflow could cause damage. Arrange components so that air can flow freely. Ensure that there is adequate ventilation if the product is placed in a stand or cabinet. Put the product in a properly ventilated area, away from direct sunlight or any source of heat.
- **Overheating:** Avoid stacking the Aurora product on top of a hot component, such as a power amplifier.
- **Risk of Fire:** Do not place unit on top of any easily combustible material, such as carpet or fabric.
- **Proper Connections:** Be sure all cables and equipment are connected to the unit as described in this manual.
- **Object Entry:** To avoid electric shock, never stick anything in the slots on the case, or remove the cover.
- **Water Exposure:** To reduce the risk of fire or electric shock, do not expose to rain or moisture.
- **Cleaning:** Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.
- **ESD:** Handle this unit with proper ESD care. Failure to do so can result in failure.

FCC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two (2) conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.



Trademarks

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PACKAGE CONTENTS

Please make sure the following items are included within your package. Contact your dealer if any items are missing or damaged.

- ASP-442A x 1
- Rack Ears x 2
- 12v DC Desktop Power Supply x 1

***Note:** Go to www.auroramm.com for latest manual and firmware.

INTRODUCTION

About

The ASP-442A is a 4x4 4K HDMI Matrix offering the power and flexibility you need at a cost-effective price. Route Ultra High Definition video sources and multi-channel digital audio from any of the 4 HDMI inputs to the any of the 4 HDMI outputs at the same time. The front keypad and LCD display are designed for easy operation and quick status of. LAN and RS-232 ports have advanced protocols allowing hot plug detection, signal detection, EDID table loading/recalling, presets, and more.

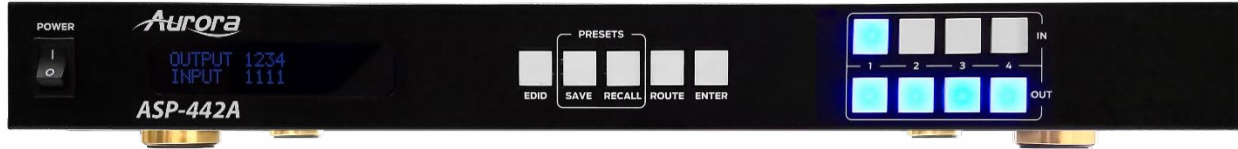
The advanced protocol features make the ASP-442A perfect for commercial applications with auto switching, digital signage with device detection, or residential systems with home automation.

Features

- ◆ HDMI 2.0a/HDCP 2.2
- ◆ Resolutions up to 4K2K 60Hz 4:4:4
- ◆ HDR High Dynamic Range
- ◆ HDMI 3D Compliant
- ◆ HDCP 2.2 Compliant
- ◆ Allows Any Source to be Displayed on Multiple Displays at the Same Time
- ◆ Allows any HDMI Display to View any HDMI Source at Any Time
- ◆ Supports 7.1 Channel Digital Audio
- ◆ Advanced EDID Functions
- ◆ Remote Setup Functions via Windows Application
- ◆ Easy Installation with Rack Mounting
- ◆ Front LCD Status Display
- ◆ Labeling of Inputs, Outputs, and Presets on Front Display



ASP-442A Front



Front

- **Power:** Power switch for turning the unit on or off. When first turned on all Input and Output LEDs will light for 1 second to show operation of LED working.
- **LCD Display:** Top row shows the input routed to relative Output number below.
- **EDID:** Utilized for setting up the EDID management.
- **Save:** Preset save function. Press Save for 3 seconds then an Input or Output number to store a preset into one of the 8 locations of the current routing setup.
- **Recall:** Preset recall function to restore a saved preset from one of the 8 stored presets.
- **Route:** When pressed a user can set up any input to any outputs followed by enter for all the routes to happen at the same time.
- **Enter:** Used to confirm entries. Also, if pressed with nothing selected, it will show the units Output connected status, Input connected status, IP address, Subnet Mask, Gateway, MAC, and Firmware on the LCD.
- **Input 1-4:** Input source selections and used with various modes of operation.
- **Output1-4:** Output source selections and used with various modes of operation.

** Note: Make certain you have the latest firmware for optimal performance and features listed in manual.*

ASP-442A Rear

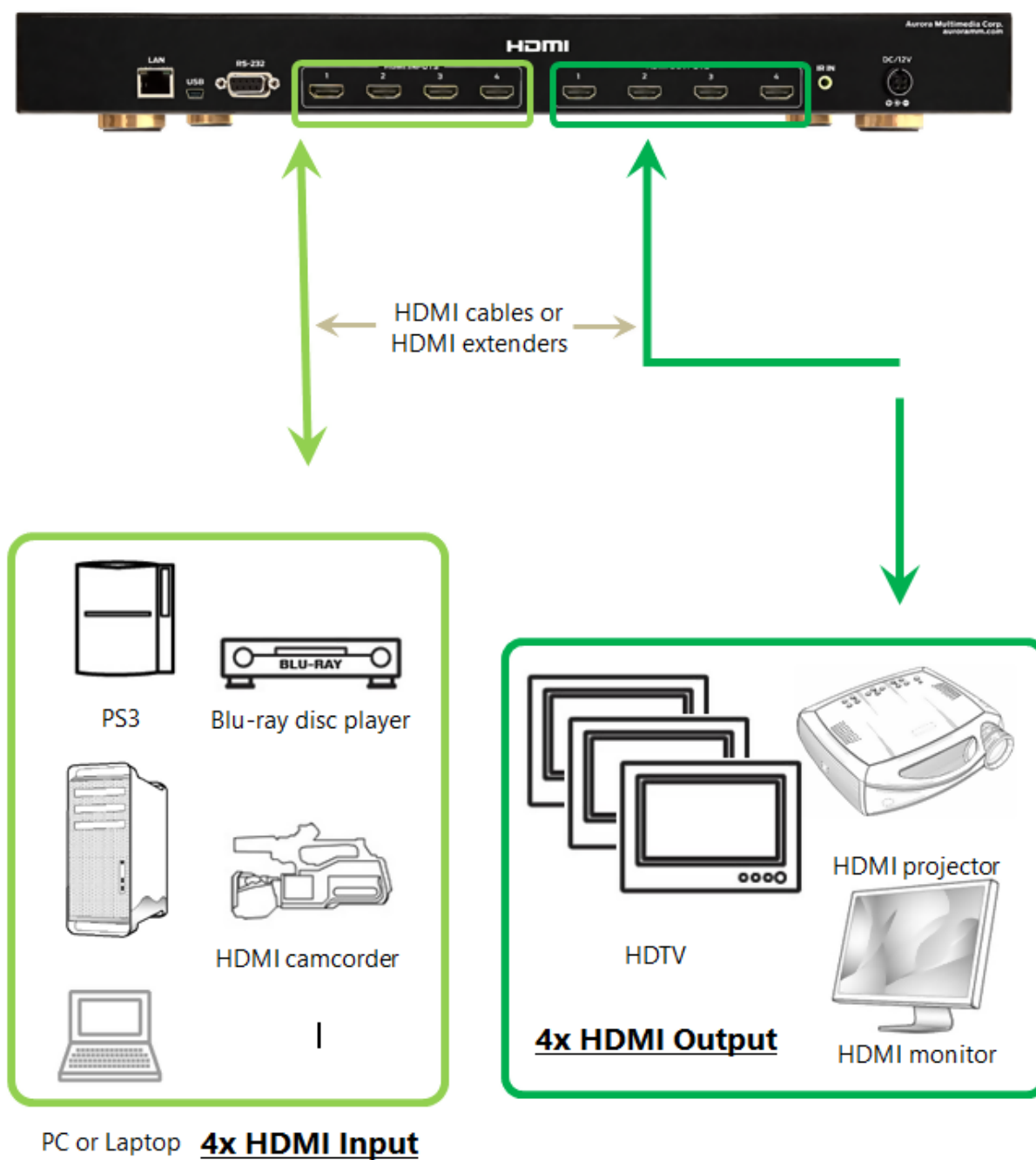


Rear

- **Inputs 1-4:** 4 HDMI 2.0a inputs for a variety of sources up to 4K60Hz resolutions.
- **Outputs 1-4:** 4 HDMI 2.0a outputs for a variety of destinations up to 4K60Hz resolutions.
- **LAN:** Control remotely using Telnet.
- **RS232:** Connect RS-232 device up at 9600 baud for remote control.
- **USB:** For PC control.
- **IR IN:** Remote control via IR remote with IR receiver unit.
- **DC12V:** Connect the included 12v DC desktop style power supply.

APPLICATION

ASP-442A Application



OPERATION

LCD Readout



The LCD will reflect what Output is routed to which input when in an idle state. The ASP-442A (4x4) will only show 1, 2, 3, and 4 on the LCD unlike the ASP-442A, which will show 1-4 since it is a 4x4.

1-1 If the input/output is not routed, will show "0".

1-2 Press ENTER will turn to next page to check other status as per 1-3 to 1-4.

1-3 Output Connections shows each output with active connected display. If a slash is underneath, then nothing is connected. If a destination like a display is present a "D" will show.



1-4 Input Connections shows each input with active connected source. If a slash is underneath, then nothing is connected or powered. If a source like a PC is disconnected, an "S" will show.



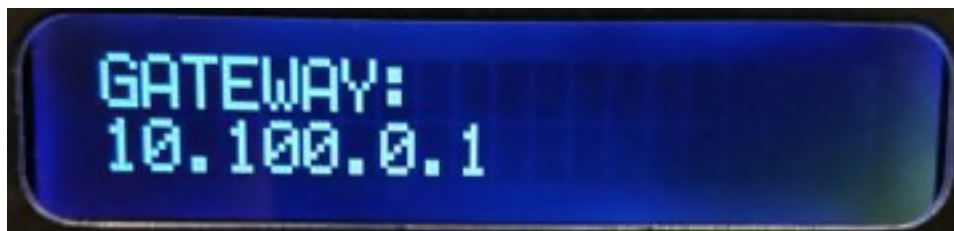
1-5 IP Address



1-6 Subnet Mask



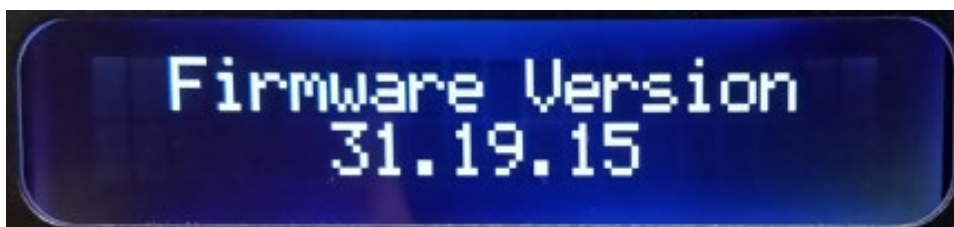
1-7 Gateway



1-8 MAC Address



1-9 Firmware Revision



1-10 Will revert to mapping if you do not press any button for 3 seconds.

The LCD will also show various states of operation and displaying information depending on the mode of operation.

Routing

The ASP-442A has 3 ways of making a route for optimal flexibility.

Technique 1

- Press ROUTE, all the input / output buttons will light for connected HDMI inputs.
- Press desired input, then the output(s) will light that it is routed to.

- Select the Output(s) to associate the Input accordingly. To unroute press the already lit Output(s).
- Press ENTER to complete the operation and make the routes all at once.
- Press ROUTE again to do another input setting followed by 1) to 3).

****Note: If want to discontinue the ROUTE setting, please press the ROUTE again. The operation will be canceled when no active button pushes for more than 3 seconds from last button press.***

Technique 2

- Press an input and it will light along with any output it is currently routed to.
- Press desired output(s) and it will be routed or unrouted to the selected input immediately.

****Note: The operation will be cleared when no active button pushes for more than 5 seconds from last button press.***

Technique 3

- Press an output and it will light along with any input it is currently routed to.
- Press desired input and it will be routed or unrouted to the selected output immediately.

****Note: The operation will be cleared when no active button pushes for more than 5 seconds from last button press.***

EDID

Select AUTO or MANUAL

- Press EDID, the LCD will state current mode of operation.
- Press EDID for 3 seconds, to toggle mode between Auto mode/Manual.

To Learn EDID in Manual Mode

- Press EDID Button (LCD will show current mode Auto/Manual).
- Press the output that needs to be learned.
- The LCD will show "Device ID" of the output.
- Press the input(s) which you want to learn the EDID from the pressed output.
- Press ENTER, the LCD will show "Success" or "Fail" to indicate the learning status.

To Set DEFAULT EDID in Manual Mode

- Press EDID button (LCD will show current mode Auto/Manual).
- Press the OUTPUT 1~4 button for 3 seconds as default 1~4 EDID.
- The LCD will show "Default + mode number".
- Press the input(s) which you want to learn the default EDID from the pressed output (default).

- Press ENTER, the LCD will show “Success” or “Fail” to indicate the learning status.

In Manual Mode – Check Input EDID Status

- Press EDID button (LCD will show current mode Auto/Manual).
- Press the input.
- The learned EDID output number and device ID will show on the LCD.

****Note: To discontinue the EDID setting, please press the EDID again. The operation will be canceled when there is no activity for more than 3 seconds from last button press.***

Presets

SAVE

- Press SAVE for 3 seconds, the button will light, and the operation will be started.
- Select from input and output number 1-4 as customized mapping 1-8 sets. The LCD will show the mapping status of the pressed button.
- Press ENTER to complete the operation. The current mapping will be saved.

****Note: To discontinue the SAVE setting, please press the SAVE again. The operation will be canceled when there is no activity for more than 3 seconds from last button press.***

RECALL

- Press recall, the button will light, and the operation will be started.
- Select from input and output number 1~4 as customized mapping 1~8 sets. The LCD will show the mapping status of the pressed button.
- Press ENTER to complete the operation. The mapping you have chosen will be recalled.

****Note: If want to discontinue the RECALL setting, please press the RECALL again. The operation will be canceled when there is no activity for more than 3 seconds from last button press.***

Lock Mode

- Press ENTER for 3 seconds will enable front panel locked.
- Holding another 3 seconds will unlock.
- If locked and any button is pressed, LCD will state “Keypad Locked”.
- During the lock mode, the LCD will show the mapping status.

Show Network Address

Press ENTER to see units IP Address and Subnet Mask on the front LCD. It will show for 3 seconds or until a user selects another function.

Firmware Update

Firmware can be updated by the ASP Matrix Manager software through RS-232.

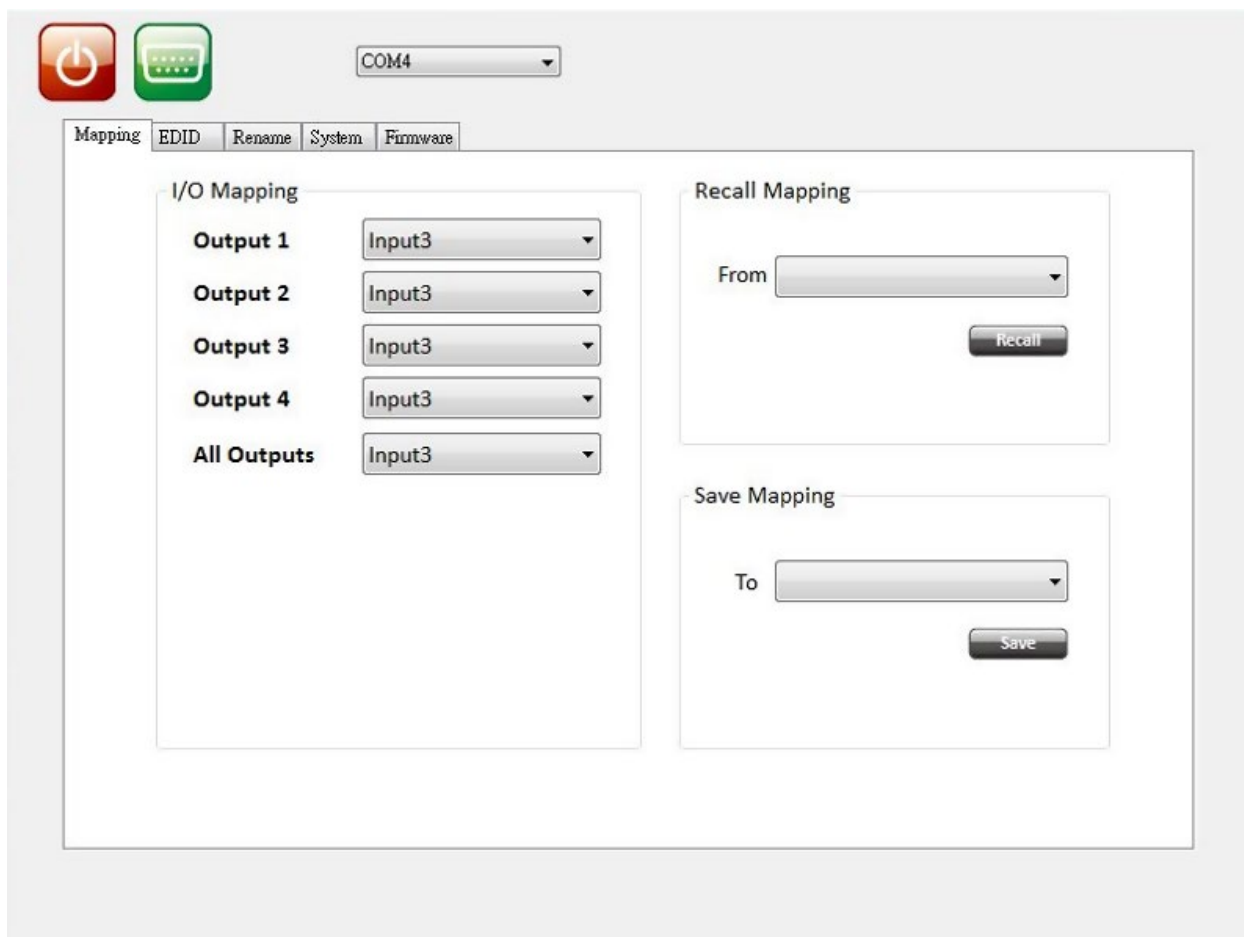
PC CONTROL SOFTWARE

ASP Matrix Manager

The ASP-442A has a utility called ASP Matrix Manager which allows the setup via RS-232 and Ethernet Mapping (Routing) of Outputs to Inputs, EDID management, Rename (Labeling displayed on LCD), System (IP Address Setup), and Firmware (Updating). Note for the ASP-442A only 4 inputs and outputs will be available and 8 preset locations. It is available for download from the Aurora customer portal www.auroramm.com.

Mapping

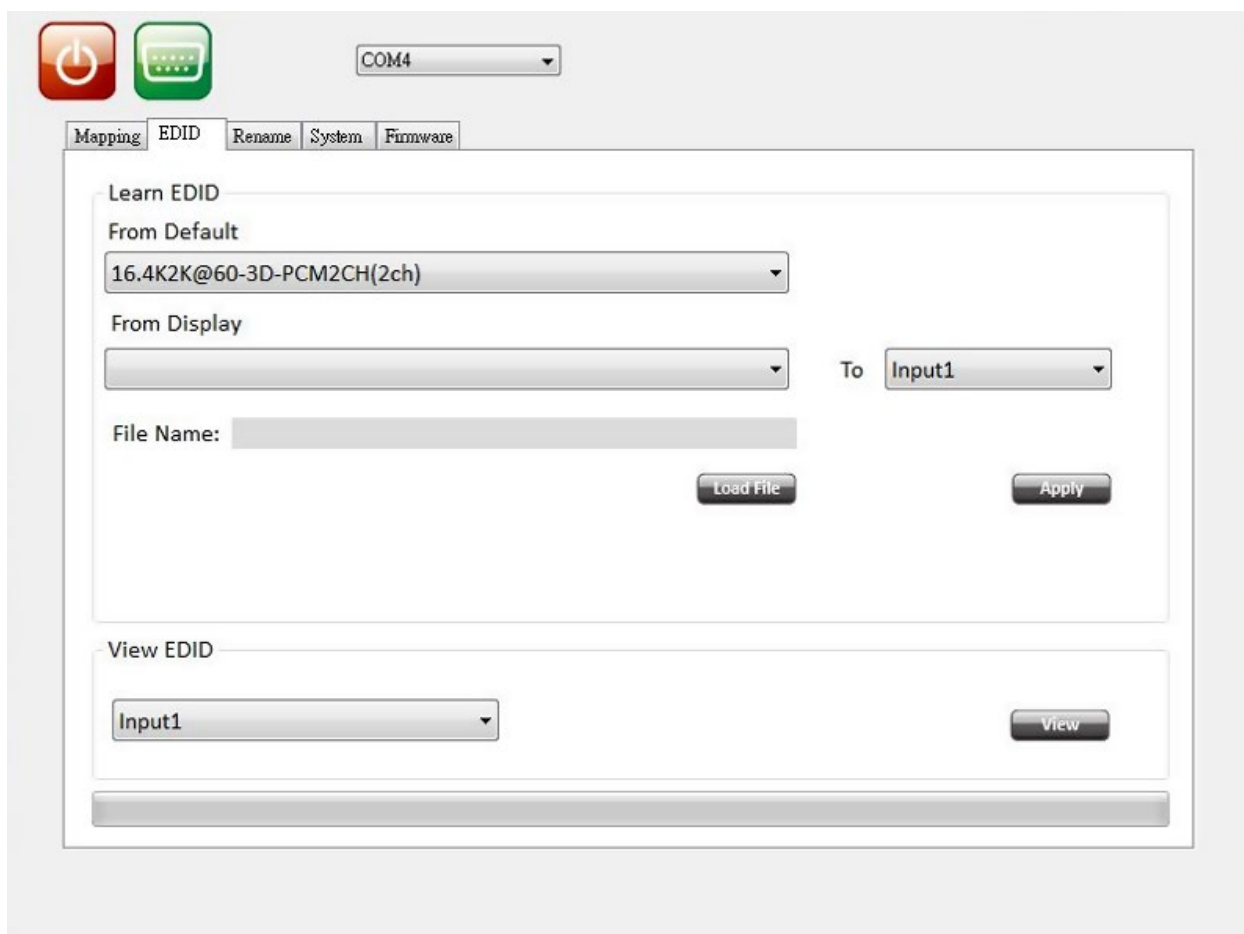
The Mapping tab allows the routing of Outputs to the designated input. It also will allow for presets to be saved and recalled.



The screenshot shows the 'Mapping' tab of the ASP Matrix Manager software. At the top, there are two icons: a red power button and a green network icon. To their right is a dropdown menu set to 'COM4'. Below these are four tabs: 'Mapping' (selected), 'EDID', 'Rename', 'System', and 'Firmware'. The main area is divided into two panels. The left panel, titled 'I/O Mapping', contains five rows: 'Output 1', 'Output 2', 'Output 3', 'Output 4', and 'All Outputs'. Each row has a dropdown menu currently showing 'Input3'. The right panel contains two sections. The top section, 'Recall Mapping', has a 'From' dropdown menu and a 'Recall' button. The bottom section, 'Save Mapping', has a 'To' dropdown menu and a 'Save' button.

EDID

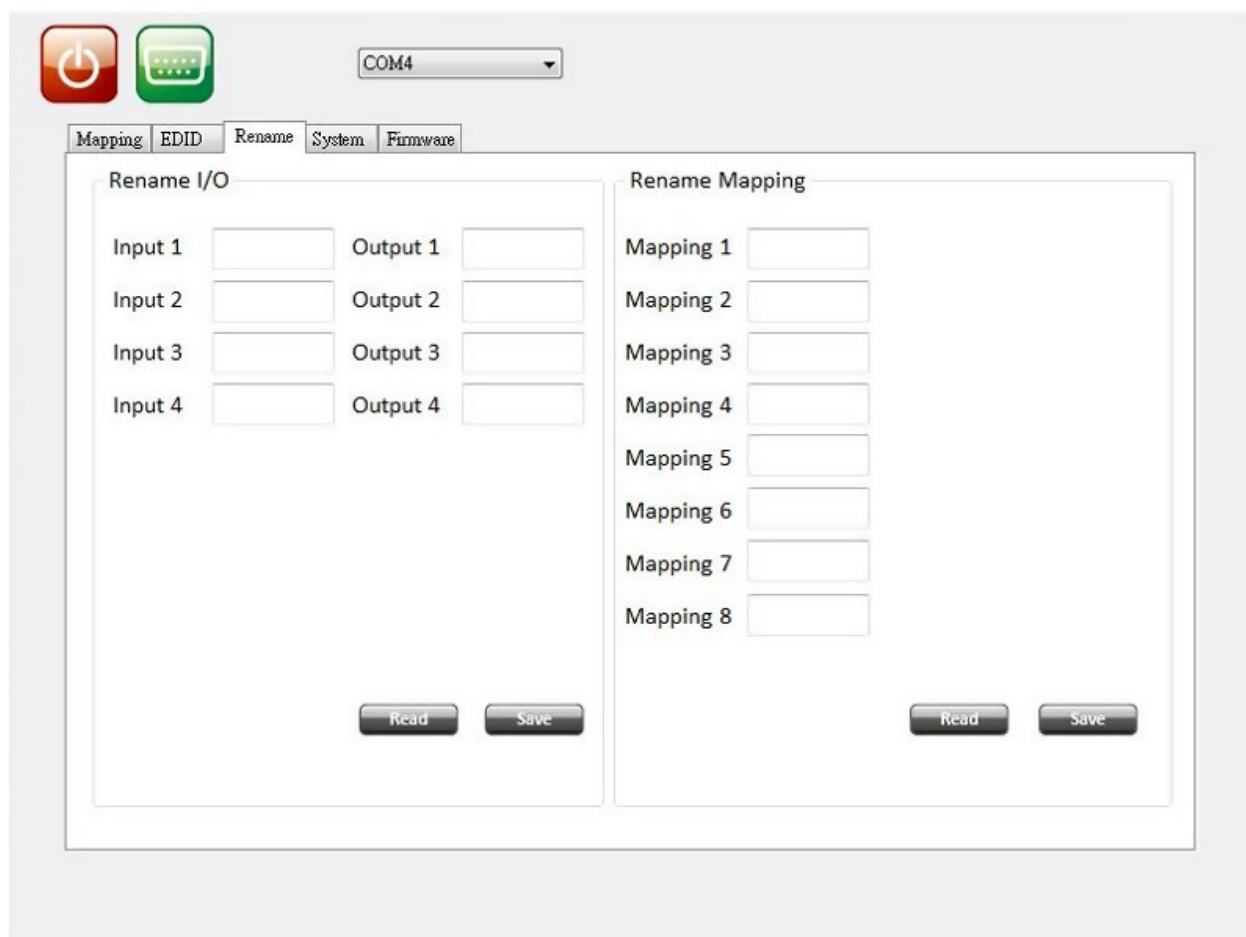
The EDID tab allows for full EDID management to all the inputs. Custom EDID files can be loaded from this tab or pulled from a device to be saved for other units.



The screenshot shows the Aurora EDID management interface. At the top, there are two icons: a red power button and a green EDID icon. To the right of these icons is a dropdown menu set to "COM4". Below the icons is a tabbed interface with five tabs: "Mapping", "EDID", "Rename", "System", and "Firmware". The "EDID" tab is currently selected. The "Learn EDID" section contains three options: "From Default" with a dropdown menu showing "16.4K2K@60-3D-PCM2CH(2ch)", "From Display" with an empty dropdown menu, and "To" with a dropdown menu showing "Input1". Below these is a "File Name:" label followed by an empty text input field. At the bottom of this section are two buttons: "Load File" and "Apply". The "View EDID" section contains a dropdown menu showing "Input1" and a "View" button. Below the "View EDID" section is a long, empty horizontal bar.

Rename

The Rename tab allows the labeling of Input, Output and Preset buttons on the front LCD.



COM4

Mapping EDID **Rename** System Firmware

Rename I/O

Input 1	<input type="text"/>	Output 1	<input type="text"/>
Input 2	<input type="text"/>	Output 2	<input type="text"/>
Input 3	<input type="text"/>	Output 3	<input type="text"/>
Input 4	<input type="text"/>	Output 4	<input type="text"/>

Read Save

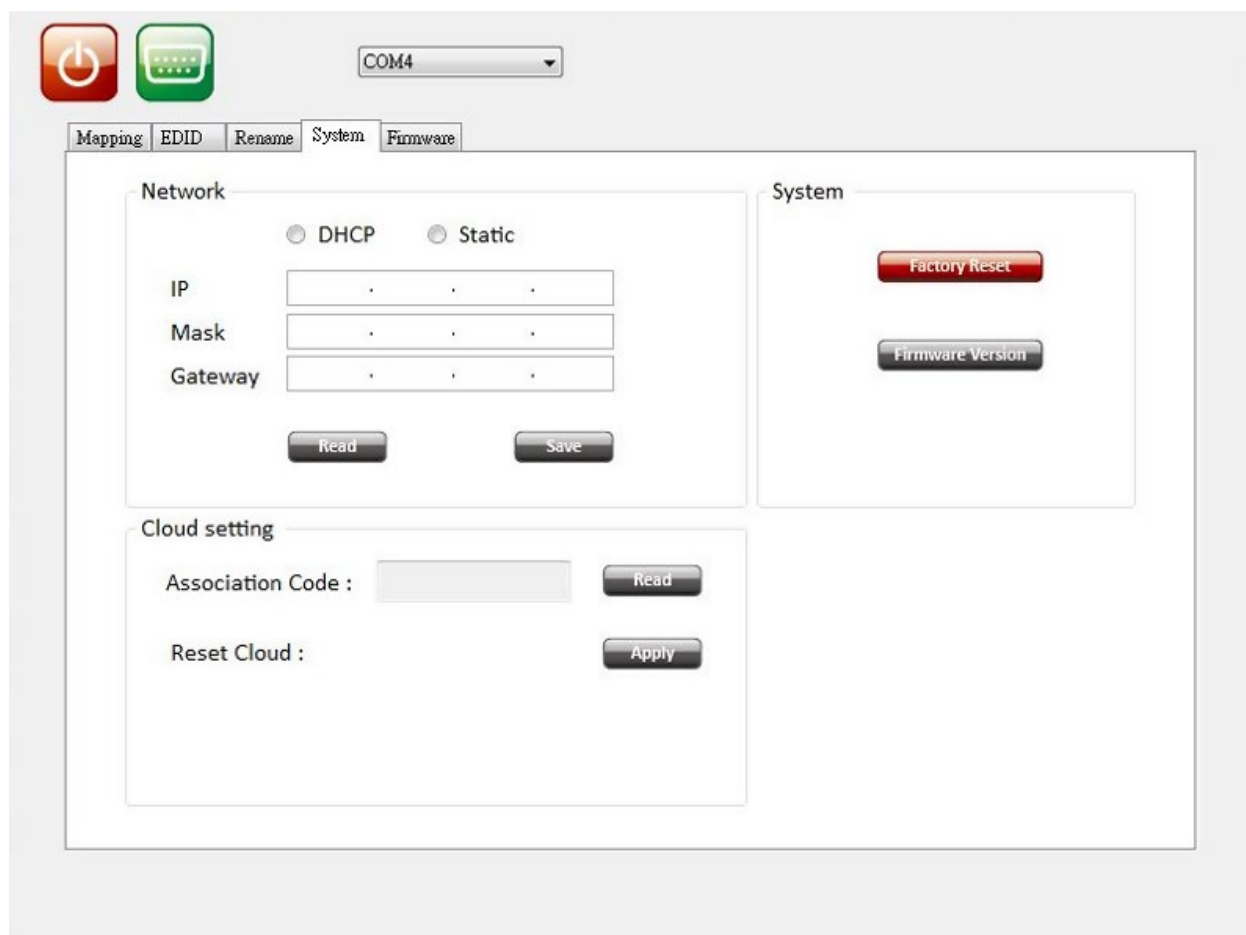
Rename Mapping

Mapping 1	<input type="text"/>
Mapping 2	<input type="text"/>
Mapping 3	<input type="text"/>
Mapping 4	<input type="text"/>
Mapping 5	<input type="text"/>
Mapping 6	<input type="text"/>
Mapping 7	<input type="text"/>
Mapping 8	<input type="text"/>

Read Save

System

The System tab is for the setup of the units IP settings, factory defaults, and firmware versions.

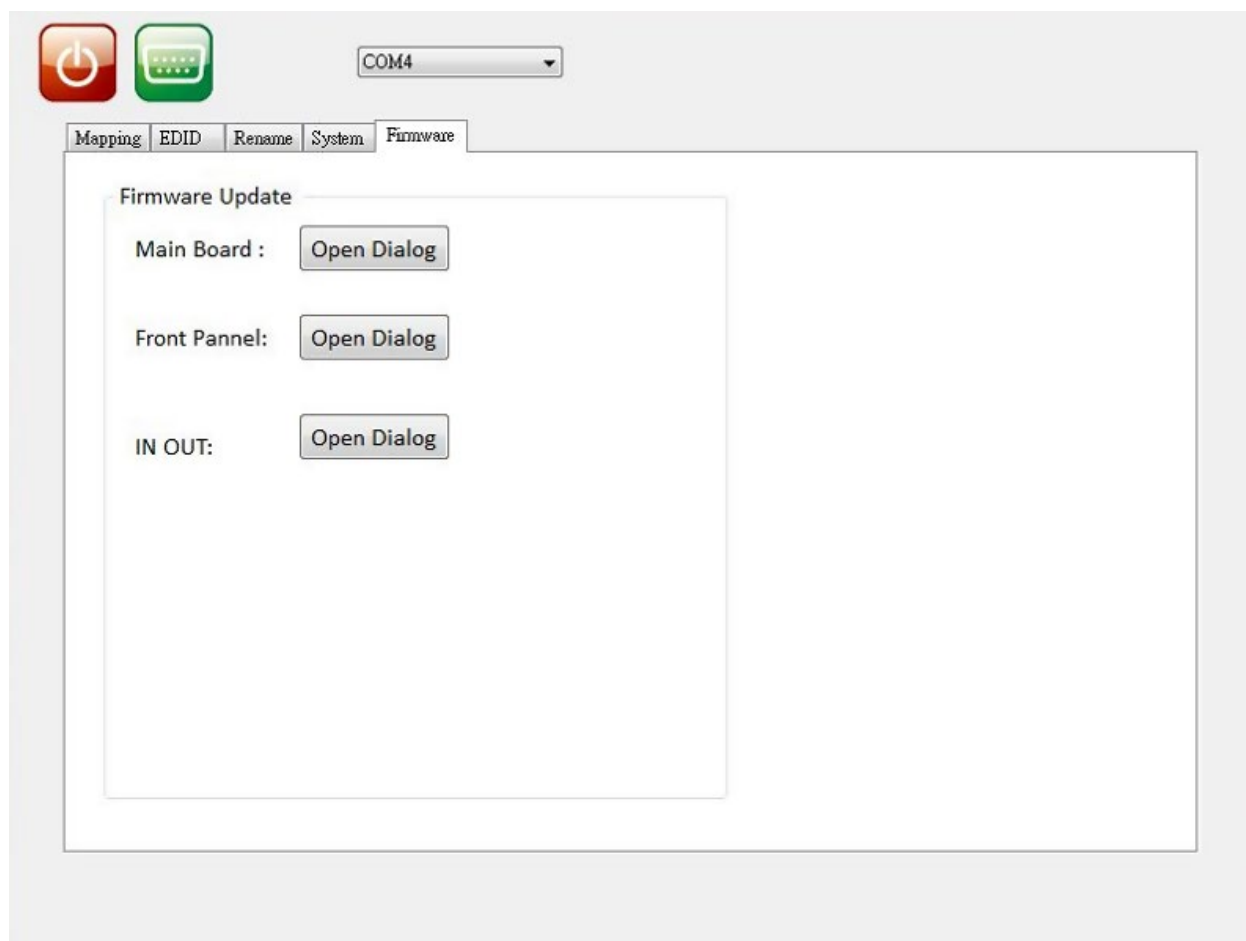


The screenshot displays the Aurora System configuration interface. At the top, there are two icons: a red power button and a green USB icon, followed by a dropdown menu set to 'COM4'. Below these are five tabs: 'Mapping', 'EDID', 'Rename', 'System' (which is selected), and 'Firmware'. The 'System' tab is divided into three main sections. The 'Network' section on the left contains radio buttons for 'DHCP' and 'Static', with 'DHCP' selected. Below these are input fields for 'IP', 'Mask', and 'Gateway', each with a 'Read' button underneath. The 'Cloud setting' section at the bottom left has an 'Association Code' input field with a 'Read' button, and a 'Reset Cloud' input field with an 'Apply' button. The 'System' section on the right contains two buttons: 'Factory Reset' and 'Firmware Version'.

Firmware

The Firmware page allows the updating of firmware from the LAN or USB. Latest firmware can be found on the Aurora customer portal located at www.auroramm.com.

Important! Make certain unit has valid IP address if using Update from Net. If unit is set to DHCP make certain there is a DHCP server connected or set to a static. If updating from USB memory stick, only one update file can reside in the root directory. Early firmware may require to files to be updated (ALL and MB). If it is 2 files the one with ALL in the name must be loaded first.



SERIAL COMMANDS

RS-232 Telnet Commands

Baud Rate: 9600 8N1 DB9 Female (Pins 2-TX, 3-RX, 5-GND), Straight through Cable to PC

! Is the start character to active command.

? Is the start character to query status.

~ Is the start character of the response.

/x0D (<cr> aka carriage return) is the end character.

***Note: In the protocol table, lower-case “x” is a placeholder for the available parameters. Capital “X”, is an actual parameter which equates to ‘ignore / do nothing’ for a route command.**

Command	String Format	Information
Route Command	!RTx1 x2 x3 x4<cr>	<p>x1-x8 = output relative to input. Example: !RT315X<cr> 0 = Unroute X = ignore (do nothing) In this example Output 1 is routed to 3 Output 2 is routed to 1 Output 3 is routed to 5 Output 4 is ignored and left alone</p> <p>Additional examples: (In-to-Out) !RTXX2X<cr> (2to3) !RT4X4X<cr> (4to1, 4to3) !RT0001<cr> (0to1-2-3, 1to4)</p> <p>Response: ~RTx1 x2 x3 x4<cr></p>
Preset Recall	!PRx<cr>	<p>x = 1-8 Responds: ~PRx<cr></p>
Preset Store	!PSx<cr>	<p>x = 1-8 Responds: ~PSx<cr></p>
Query Route	?RT<cr>	<p>Responds with ~RTx1 x2 x3 x4<cr> x1-x4 = output relative to input. Example: Output 1 is routed to input 3 so position x1 would equal 3. If nothing is routed to an output then the value will be 0 (zero).</p>
Firmware Version	?VR<cr>	<p>Responds with the current firmware version number Example ~VR1.00<cr></p>
Factory Default	!FD<cr>	<p>Responds with ~FD<cr></p>
IP Address	!IPA-xxx.xxx.xxx.xxx<cr>	<p>x= IP Address ex. 192.168.1.13 Responds with ~IPA-xxx.xxx.xxx.xxx<cr></p>
EDID Write	!EDWx-y0 y1...y255<cr>	<p>x= HDMI Input 1-4 y0-y255 = EDID Data in ASCII HEX representation</p>

Command	String Format	Information
EDID Read	?EDRx<cr>	x= HDMI Input 1-4 y0-y255 = EDID Data in ASCII HEX representation Response: ~EDIDx-y0 y1...y255<cr> y0-y255 = EDID Data in ASCII HEX representation
EDID Learn	!EDLx1 x2 x3 x4 x5 x6 x7 x8<cr>	x1-x4 = output relative to input. Example: !EDL315x80F2<cr> 0 = Clear EDID X = ignore (do nothing) F = Factory EDID default In this example Input 1 gets output 3 EDID Input t 2 gets output 1 EDID Input 3 gets output 5 EDID Input 4 is ignored and left alone Input t 5 gets output 8 EDID Input 6 is cleared Input 7 is Set to factory default EDID Input 8 gets output 2 EDID Response: ~EDLx1 x2 x3 x4<cr> Factory default EDID should be 1080p 24bit stereo
Front Keypad Lockout	!KLx<CR>	x = (1=ON, 0=OFF) Response: ~KL<cr>
HDCP Input On/Off	!HDCPIN x1 x2 x3 x4 <CR>	x1-x4 = Input relative to HDCP function. 0 = HDCP is forced off. This helps with devices that always have HDCP on unless it sees there is no key to exchange. 1 = HDCP is available Note: Default is HDCP Available
Hotplug Input Detect	?HPIN<cr>	Detects and reports back if a signal is present at a specific input. It will also send the response back automatically if there is a change in state. Response: ~HPIN x1 x2 x3 x4<cr> 0 = nothing 1 = signal
Hotplug Output Detect	?HPOUT<cr>	Detects and reports back if a device present at a specific output. It will also send the response back automatically if there is a change in state. Response: ~HPOUT x1 x2 x3 x4<cr> 0 = nothing 1 = signal
VCC Output Toggle	!VCCOUTx<cr>	1 = Toggle Output VCC5V 100ms Response: ~VCCOUTx <cr>
Input Label	!LINx-y<cr>	x = 1-4 y = Label Name Response: ~LINx-y<cr>
Input Label Query	?LINx<cr>	x = 1-4 y = Label Name Response: y<cr>
Output Label	!LOUTx-y<cr>	x = 1-4 y = Label Name Response: ~LINx-y<cr>

Command	String Format	Information
Output Label Query	?LOUTx<cr>	x = 1-4 y = Label Name Response: y<cr>
Preset Label	!LPRx-y<cr>	x = 1-4 y = Label Name Response: ~LINx-y<cr>
Preset Label Query	?LPRx<cr>	x = 1-4 y = Label Name Response: y<cr>

***Note 1:** Upon power up or detection of a new device on an output the port should read the EDID to see if it is DVI connected and if so remove the audio automatically for proper compatibility. This way if the input EDID is HDMI the HDMI will still work with ports that have DVI connected.

***Note 2:** If change is made from front panel the appropriate response command should be sent out. For example if a route was made then the ~RTx1 x2 x3 x4<cr> should be sent automatically. This way polling is not required.

***Note 3:** If an input has no HDCP then the output should not have HDCP either unless the force HDCP command is enable.

APPENDIX 1

Troubleshooting

Problem	Solution
1. LED is not lit on any LEDs or buttons	<ul style="list-style-type: none">a. Check 12v power supply is plugged in rear of unit.b. Check to see if Wall supply is plugged into wall outlet.c. Make certain wall outlet has power.d. Make certain switch on rear of unit is on.
2. RS-232 does not work	<ul style="list-style-type: none">a. Check connection on RS-232 port. Make certain TX goes to RX and RX goes to TX of the device to be connected. Do not forget about ground.b. Check baud rate.c. Verify commands being sent are correct protocol.
3. Some functions do not work	<ul style="list-style-type: none">a. Make certain unit has latest firmware.

APPENDIX 2

Technical Specifications

Model Name	ASP-442A
Technical	
RS-232 Baud Rate	9600 8N1 DB9 Female (Pins 2-TX, 3-RX, 5-GND), Straight through Cable to PC
Front Panel	Blue Backlit LCD and Selection Keys
Bandwidth	600MHz
Resolutions	480i / 480p / 720p / 1080i / 1080p60 8-12 bit color / 3840x2160 @ 30Hz / 4Kx2K @ 30Hz / 4Kx2K @ 60Hz
HDCP Compliant	1.4 and 2.2
HDMI Output Distance	1080p up to 20m, 4K30Hz up to 10m, 4K60Hz up to 5m *Note: Cable quality may impact distance.
HDMI Connector	Type A (19 Pin Female)
RS-232 Connector	DB-9 Female
LAN Port	RJ-45 (Telnet Communications)
Mechanical	ASP-442A
Housing	Metal Case
Dimensions [L x W x H]	17.3" x 6.9" x 1.7" [440 x 176.3 x 42mm]
Weight	5.1lbs (2.315kg)
Mounting	1RU Rack Mount 19" x 1.75"
Power supply	12v 5A DC
Power consumption	25 Watts
Operation temperature	0~40°C [32~104°F]
Storage temperature	-20~60°C [-4~140°F]
Relative humidity	20~90% RH [no condensation]
Package Contents	1x ASP-442A 1x 12v Desktop Power Supply 2x Rack Mount Ears

***Note: Specifications subject to change without notice.**

APPENDIX 3

Warranty

Limited 3 Year Warranty

Aurora Multimedia Corporation ("Manufacturer") warrants that this product is free of defects in both materials and workmanship for a period of 3 years as defined herein for parts and labor from date of purchase. This Limited Warranty covers products purchased in the year of 2009 and after. Motorized mechanical parts (Hard Drives, DVD, etc.), mechanical parts (buttons, doors, etc.), remotes and cables are covered for a period of 1 year. Touch screen displays are covered for 1 year; touch screen overlay components are covered for 90 days. Supplied batteries are not covered by this warranty. During the warranty period, and upon proof of purchase, the product will be repaired or replaced (with same or similar model) at our option without charge for parts or labor for the specified product lifetime warranty period.

This warranty shall not apply if any of the following:

- A. The product has been damaged by negligence, accident, lightning, water, act-of-God or mishandling; or,
- B. The product has not been operated in accordance with procedures specified in operating instructions; or,
- C. The product has been repaired and or altered by other than manufacturer or authorized service center; or,
- D. The product's original serial number has been modified or removed; or,
- E. External equipment other than supplied by manufacturer, in determination of manufacturer, shall have affected the performance, safety or reliability of the product; or,
- F. Part(s) are no longer available for product.

In the event that the product needs repair or replacement during the specified warranty period, product should be shipped back to Manufacturer at Purchaser's expense. Repaired or replaced product shall be returned to Purchaser by standard shipping methods at Manufacturer's discretion. Express shipping will be at the expense of the Purchaser. If Purchaser resides outside the contiguous US, return shipping shall be at Purchaser's expense.

No other warranty, express or implied other than Manufacturer's shall apply.

Manufacturer does not assume any responsibility for consequential damages, expenses or loss of revenue or property, inconvenience or interruption in operation experienced by the customer due to a malfunction of the purchased equipment. No warranty service performed on any product shall extend the applicable warranty period. This warranty does not cover damage to the equipment during shipping and Manufacturer assumes no responsibility for such damage. This product warranty extends to the original purchaser only and will be null and void upon any assignment or transfer.



Aurora Multimedia Corporation

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