User Manual

Model 1398C
4K/2K Video Distribution Amplifier

Audio Authority®

Liability Statement

Every effort has been made to ensure that this product is free of defects. Audio Authority® cannot be held liable for the use of this hardware or any direct or indirect consequential damages arising from its use. It is the responsibility of the user of the hardware to check that it is suitable for his/her requirements and that it is installed correctly. All rights reserved. No parts of this manual may be reproduced or transmitted by any form or means electronic or mechanical, including photocopying, recording or by any information storage or retrieval system without the written consent of the publisher.

Audio Authority reserves the right to revise any of its hardware and software following its policy to modify and/or improve its products where necessary or desirable. This statement does not affect the legal rights of the user in any way.

Warnings

Please read all instructions before attempting to unpack or 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 module openings or empty slots, as you may damage parts
- Do not attach the power supply cabling to building surfaces
- Do not allow anything to rest on the power cabling or allow it to be abused by persons walking on it
- To protect the equipment from overheating, do not block the slots and openings in the module housing that provide ventilation

Model 1398C

HDMI®

4K/2K Distribution Amplifier

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Introduction

Thanks for purchasing the Model 1398C UHD distribution amplifier from Audio Authority®. The 1398C is designed to split a 4K HDMI® signal from one source to a wide spectrum of HDMI displays in retail demo environments. It is the ideal solution for merchandising HD displays using the latest content at the highest resolutions, and even 3D. Display-source compatibility is ensured by the 1398C's multiple EDID options. Daisy-chain multiple 1398Cs or create a hub-and-spoke layout for large distribution systems.

Features

- Supports HDMI Deep Color & 3D / DVI 1.0 compliant
- HDCP 1.3 compliant
- Wide frequency range: 25MHz~340MHz
- Video bandwidth: 10.2Gbps
- Resolution up to 4K2K @30MHz
- Supports default EDID and has ability to learn the EDID of displays
- Supports xvYCC, x.v.Color & Deep Color
- Mini-USB firmware update for expanding compatibility
- Supports Dolby Digital®, DTS-HD® and Dolby TrueHD® audio
- Easy installation

Checking Package Contents

Before attempting to use this DA, please the packaging and make certain the following items are contained in the shipping carton:

- 1398C
- 5VDC Power Adapter
- User Manual

Note: Please keep the original packing material in case the unit needs to be returned. If you find any items are missing, contact Audio Authority immediately at 800-322-8346. Have the model number and invoice available for reference when you call.

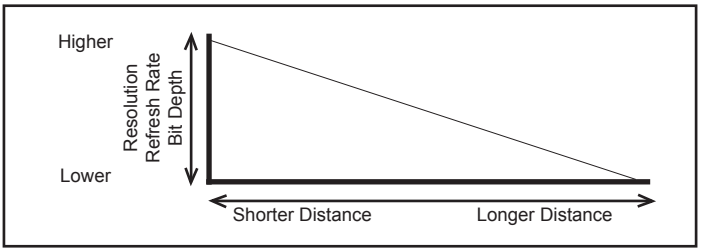
Getting the Best Results

Many factors influence the quality and reliability of HDMI signal distribution installations. The following are the main factors to consider, and basic precautions that will ensure the best possible performance.

- **Resolution tracking -** Set the source to output the best resolution that all TVs are capable of displaying. Utilize the following instructions to ensure that all TVs connected to the DA receive video signal. If the TVs have a wide range of resolution capabilities, the highest resolution sets may not be shown to their best advantage.

- **Source resolution and video/sound quality -** Sources, such as satellite receivers or cable boxes can output at low resolutions or deliver extremely compressed video material that may yield poor results. Consider the source when planning and troubleshooting your system.

- **Output display devices -** The quality of the video image depends upon the type and quality of the HDMI display devices used. The device with the lowest resolution will be the reference standard for the rest of the HDMI displays connected to the DA.



- **Distance between the DA source and the displays -** Long distances are possible, but premium quality cables and advanced HDMI extenders may be necessary for the longest runs.

- **Connection cables -** HDMI cable design and quality are extremely important in long cable runs where capacitance can severely degrade performance. Use high speed premium cables designed to handle video resolutions such as 1080p, 4K, 3D and Deep Color; low quality cables are susceptible to interference. Always use good strain relief methods to prevent cables from becoming loose over time.

- **Interference from nearby electrical devices -** This can have an adverse effect on signal quality. For example, older computer monitors often emit very high electromagnetic fields that can interfere with the performance of nearby video equipment.

Planning a Distribution System

- Each display should be tested with the source(s) being used to ensure basic compatibility before connecting them to a distribution amp and/or switcher. Not all HDMI components and displays are compatible.
- Since all of the displays will be receiving the same video signal resolution and format from the source, make sure the source is set to output the highest resolution that **all of the displays can accept.** For instance, if one of the displays connected to the distribution system can only accept a maximum input resolution of 1080p, all of the displays will receive only 1080p video signals. You may consider creating two or three separate distribution systems with different sources and different output resolutions so that you can adequately demonstrate the highest resolution HDTV sets.
- Since HDMI connectors can sometimes become loose, mount the switcher or distribution amplifier to a flat surface and add strain relief tie-downs a few inches away from every HDMI cable connector.

Large HDMI Distribution Systems

If you plan to install a very large HDMI signal distribution network, you should be aware of system limitations related to content protection. Audio Authority can help you design a distribution system that suits your needs and is easy to install and operate.

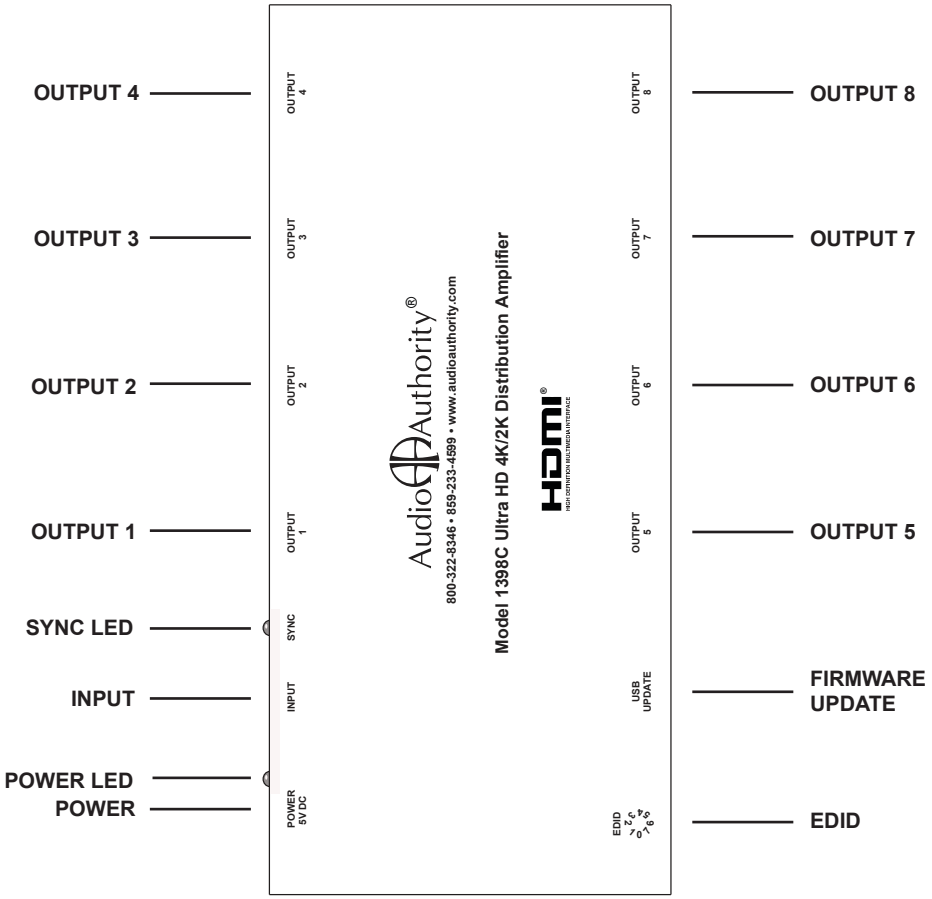
- Each system is limited to 128 Rx “nodes” including the first Rx node.
- Every device with an Rx chip counts as one node, including TVs, distribution amps, and switchers.
- The number of “layers” is limited to seven. This means the number of switchers and/or distribution amps between a source and any TV must be six or fewer. For this reason, a “hub and spoke” system architecture may be more appropriate than a “daisy chained” architecture.
- A distribution system feeding the highest number of displays allowable using two, four, and eight output distribution amps has a capacity of 108 TVs. The distribution amplifiers add up to 17 Rx nodes, and the source is one node, so the total number of downstream nodes in this system is 126.

About 3D Content Distribution

- When the input signal contains 3D data all connected displays must support 3D content in order to display an image.
- Distributing 3D content also implies that all viewers have the 3D glasses available for the appropriate TV. If this is not the case, 3D content may not be a good choice for general signal distribution.

Installation

Study the drawing below and become familiar with the controls, signal input, outputs and power input.



1398C

Wiring the System

- Switch off all devices, including monitors.
- Connect an HDMI approved high speed cable from the HDMI source to the input of the 1398C. Cable lengths should be kept as short as possible.
- Connect the outputs of the 1398C to their displays or other devices.
- Make certain that the HDMI cables are securely plugged into the source and display devices as well as the 1398C. Always use high speed quality cables, and the shortest length possible, for best results.
- Connect the power adapter to the AC source and then to the 1398C.
- The unit begins to function as soon as the AC adapter is connected to the unit and AC power. There is no power switch.
- Turn on the HDMI source and HDMI destination devices and observe the source signal on the inputs of all of the destination devices.

Note: Proper operation of HDMI distribution amplifiers depends on the use of high speed quality HDMI cables with low loss, high bandwidth signal handling capabilities.

Operation

MODE - EDID* Switch:

EDID	DESCRIPTION	SPECIFICATION
0	Firmware Update mode	
1	Full-HD (1080p@60)	24bit 2D video & 7.1ch audio
2	Full-HD (1080p@60)	24bit 2D video & 2ch audio
3	Ultra-HD (4K@30)	24bit 2D video & 7.1ch audio
4	Ultra-HD (4K@30)	24bit 2D video & 2ch audio
5	HD	(1080p@30) (1080i@60) (720p@60) - 24bit 2D video & 2ch audio
6	Auto EDID analysis learning mode	
7	EDID learning mode - use **OUTPUT 1** port for learning EDID from the displays	

* Extended Display Identification Data

Notes:

A. *Automatic EDID learning will detect all of the connected HDMI equipped displays and analyze the content of EDID. The display that has the lowest resolution support will be the reference EDID for incoming HDMI sources.*

B. *While connecting a new monitor to the 1398C under mode 6 (Auto EDID) & mode 7 (EDID learning mode), you may experience a short period of time without any program material viewed on the display. The splitter will do Automatic EDID learning which analyzes the newly connected monitor to see if the EDID for the HDMI input must be updated.*

Firmware Updates

Contact Audio Authority Technical Support at 800-322-8346 for information regarding Firmware Updates.

Troubleshooting

- For 4K resolution, first make certain that the input cable is as short as possible. HDMI cable design and quality are extremely important in long cable runs where capacitance can severely effect performance. Use a quality high speed HDMI cable or high speed HDMI Extender that supports Ultra- HD.
- Make certain that the distribution amplifier is receiving power by looking at the power LED. It should be illuminated and not flickering on and off. Intermittent operation generally means a problem with the DC power adapter or low AC voltage being applied to the DC adapter's input.
- If some lower resolution TVs do not display a picture, you may need to divide your distribution system into separate 1080p, and 4K systems with a source for each system.
- If some displays are not receiving video signal, or lose signal, check to see if they are on the wrong input.
- If you still experience problems using the distribution amplifier, troubleshoot by first attaching the source device directly to each of the destination devices in turn using the same cables you are using with the expanded system. This is a way of determining if the problem is due to bad cables or a problem with the other devices. If you are unable to obtain a signal using this simplified path, suspect the cables, the source device or the destination device.

If a problem still persists after trying the above suggestions, contact the Audio Authority Technical Service department via email: support@audioauthority.com, or call 800-322-8346 or 859-233-4599.

Specifications

Model 1398C	1x8 Distribution Amplifier (Splitter)
HDMI Compliance	HDMI Deep Color, 3D & 4K/2K
DVI Compliance	DVI 1.0
HDCP Compliance	HDCP 1.3
Video Bandwidth	Single-link 340MHz (10.2Gbps)
Video Support	Up to 4K @30
Audio Support	DTS-HD Master Audio, Dolby TrueHD Dolby Digital, DTS, DVD-Audio, LPCM, SACD, MPCM
ESD Protection	(1) Human body model — ±19kV (air-gap discharge) & ±12kV (contact discharge) (2) Core chipset — ±2kV
Firmware Update	via Mini-USB port
Input	1x HDMI (7.1ch audio & 4K video)
Output	8x HDMI (7.1ch audio & 4K video)
HDMI Connector	Type A (19-pin female)
Rotary Control Switch	EDID mode selection
Dimensions (L x W x H)	328 x 102 x 26mm (12.9” x 4” x 1”)
Weight	880 g (31 oz)
Shipping Weight	1.58 kg (3.5 lbs)
Power Supply	5V DC 4A
Power Consumption	10 watts (max)
Regulatory Approvals	US/EU standards, CE, FCC/UL certified
Operation Temperature	0~40°C (32~104°F)
Storage Temperature	-20~60°C (-4~140°F)
Relative Humidity	20~90% RH (no condensation)

Limited Warranty

If this Audio Authority® product fails due to defects in materials or workmanship within one year from the date of the original sale to the end-user, Audio Authority guarantees that we will replace the defective product at no cost. Freight charges for the replacement unit will be paid by Audio Authority® (Ground service only). A copy of the invoice showing the item number and date of purchase (proof-of-purchase) must be submitted with the defective unit to constitute a valid in-warranty claim.

Units that fail after the warranty period has expired may be returned to the factory for repair at a nominal charge, if not damaged beyond the point of repair. All freight charges for out-of-warranty returns for repair are the responsibility of the customer. Units returned for repair must have a Return Authorization Number assigned by the factory.

This is a limited warranty and is not applicable for products which, in our opinion, have been damaged, altered, abused, misused, or improperly installed. Audio Authority makes no other warranties either expressed or implied, including limitation warranties as to merchantability or fitness for a particular purpose. Additionally, there are no allowances or credits available for service work or installation performed in the field by the end user.

Warranty Service Procedures

If you suspect a product defect, contact Audio Authority's Technical Service Department at 800-322-8346 or 859-233-4599 for assistance in verifying the problem. If a defect or potential defect is suspected, a replacement unit will be shipped immediately on a defect-exchange basis and a Return Authorization Number will be issued for the return of the defective product. Replacement units are sent out at the Manufacturer's Suggested Retail Price which is charged to the Customer's Credit Card at the time of shipment. Once we receive the defective unit back at the factory, it will be evaluated under the conditions of this warranty and if found to be in-warranty, a full credit will be issued to the Customer's Credit Card. Return freight charges for the defective unit are the customer's responsibility. Please contact our Technical Service Department for complete details concerning all in and out of warranty service matters.

We appreciate your confidence in our products and services and will always strive to meet or exceed your needs.

Regulatory Compliance

Model 1398C distribution amplifiers have been tested for compliance with appropriate FCC and CE rules and regulations and are also RoHS compliant.

The power adaptor has been tested for compliance with UL, CE and CSA rules and regulations and is also RoHS compliant.

Audio Authority®

2048 Mercer Road, Lexington, KY 40511-1071 USA
800-322-8346 • 859-233-4599 • Fax: 859-233-4510
support@audioauthority.com • www.audioauthority.com

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