AC-AVDM-V3

18 Gbps (4K60 4:4:4 & HDR) Audio Down-mixer with Video Downscaling
Dolby Atmos® and DTS:X® Support

User Manual

Contents

Important Safety Instructions

Before installing, configuring, and operating this device and other vendor equipment, AVPro Edge strongly recommends that each dealer, integrator, installer, and all other necessary personnel access and read all the required technical documentation, which can be located by visiting AVProEdge.com.

Read and understand all safety instructions, cautions, and warnings in this document and the labels on the equipment.

Safety Classifications in this Document

Note:	Provides special information to correctly install, configure, and operate the devices or associated equipment.
Tip:	Provides suggestions and considerations to correctly install, configure, and operate the devices or associated equipment.
Important:	Provides special information that is critical to correctly install, configure, and operate the devices or associated equipment.
Caution:	Provides special information to avoid situations that may cause damage to the devices or associated equipment.
Warning:	Provides special information to avoid situations that may cause physical danger to installers or end-users.

Electrical Shock Prevention

Electric Shock:	Provides special information that is critical to correctly install, configure, and operate the devices or associated equipment.
Electrical Disconnect:	Provides special information to avoid situations that may cause damage to the devices or associated equipment.

Weight Injury Prevention

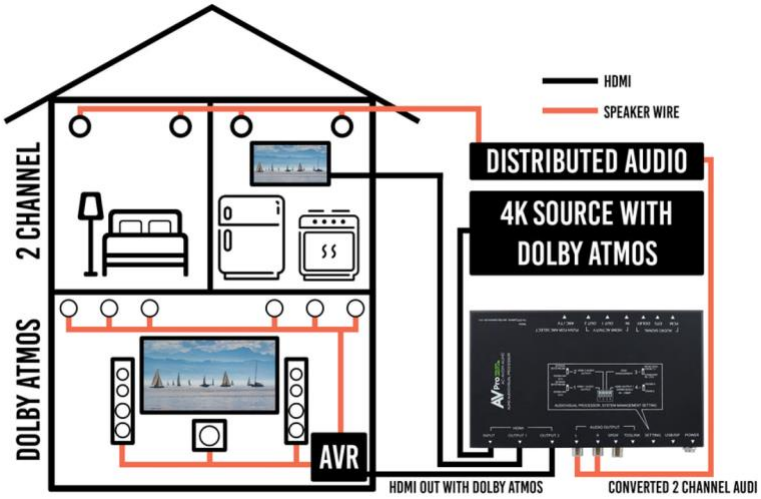
Weight Injury:	Installing some devices or associated equipment requires two installers to ensure safe handling during installation. Failure to use two installers may result in injury.

Introduction

In the AVPro Edge AC-AVDM-V3, the multichannel bitstream of an HDMI signal is decoded, then combined to create a downmixed secondary output for distribution by 2-channel audio systems.
Downmixing is necessary when a multichannel signal is required to be sent through as few as two speakers, with no subtraction of the original content. For example, eight discrete channels of audio information can be “collapsed” into two channels, creating a stereo signal for distribution.
The original purpose of downmixing was to enable playback of multichannel movie sound over television speakers. Stereo downmixing for television is called Lo/Ro (Left only/Right only) and is often referred to as the *ITU Downmix*. The downmix is created by combining Left, Center, and Left surround information together from an original 5.1 multichannel signal. 3D immersive soundtracks are downmixed in a different manner, however, no from the original multichannel mix is discarded. As most bass information is non-directional, a degree of LFE content is steered into the downmix, but not overly so that it would impact small speakers. Like the Left channels, the Right channels are also combined, enabling the downmix to maintain stereo compatibility.

The AC-AVDM-V3 supports decoding of Dolby® and DTS® formats, outputting single-ended analog stereo audio, digital (LPCM 2.0) over HDMI or S/PDIF (optical and coaxial).

The diagram below illustrates how content may be viewed in a home theater with Dolby Atmos® and enjoyed in secondary zones by the AC-AVDM-V3 converting bitstream audio into 2 channels from the extracted analog ports.



Key Benefits

- **Downscaling & Dual Output:** The AC-AVDM-V3 built-in scaler can input 4K signals including HDR, then downscale the output into 1080p, enabling retained use of legacy HDMI AVRs incapable of supporting higher bandwidth video while passing the full video signal to the display from the HDMI 2 output.
- **Audio Downmixing:** The AC-AVDM-V3 is perfect for downmixing/extracting audio from formats such as LPCM 7.1CH, DTS®, DTS® ES, DTS:X®, AC3, Dolby Digital™, Dolby Digital Plus™, Dolby® TrueHD, and Dolby Atmos®.
- **EDID Management:** Use the on-board 4K EDID or use EDID READ to copy a downstream EDID.
- **ARC Management:** With ARC (Audio Return Channel) management, audio returning on the ARC Channel may be downmixed for use by a legacy AVR, a 2-channel system, or for distribution.
- **Detection Indicators:** Front panel LEDs illuminate to indicate signal type.

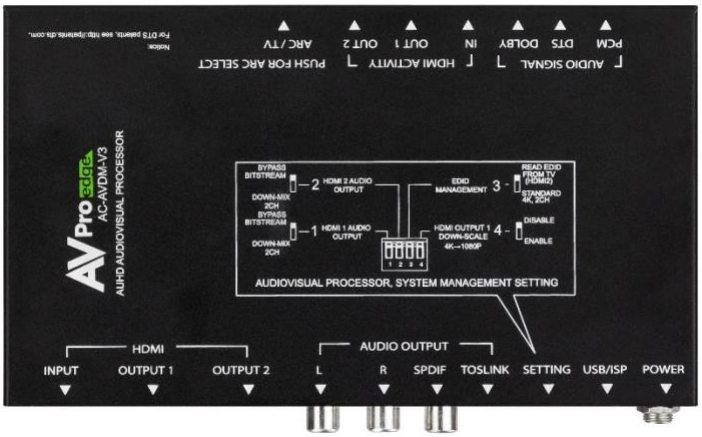
Features

- HDMI 2.0 (a/b)
- Up to 4K60 4:4:4 Support (with ICT)
- Supports static and dynamic HDR metadata, including HLG
- Dolby Vision™ Support
- 4K to 1080p Downscaling for mixed systems
- Supports PCM 2-Channel, LPCM 5.1 & 7.1, AC3, Dolby Digital™, Dolby Digital Plus™, Dolby® TrueHD, Dolby Atmos®, DTS®, DTS-ES®, DTS:X®
- Downmix available from analog RCA outputs, S/PDIF (coaxial and TOSLINK), or HDMI.
- EDID Management and EDID Copy
- ACR Support (HDMI)
- HDCP 2.2 (all earlier versions supported)
- CEC (ARC) Support
- 3D Support
- LED Status, Link, and ARC indicator lights
- Toggle Switches for simple EDID Management, Downmixing, and Scaling.
- Micro-USB ISP for field firmware updates

Product Overview

Box Contents

(1x) AC-AVDM-V3 (Unit)
(1x) 5V/2A Locking Barrel Power Supply
(1x) Type A Plug-in Outlet Attachment
(2x) Mounting Brackets
(4x) Mounting Screws
(4x) Rubber Feet

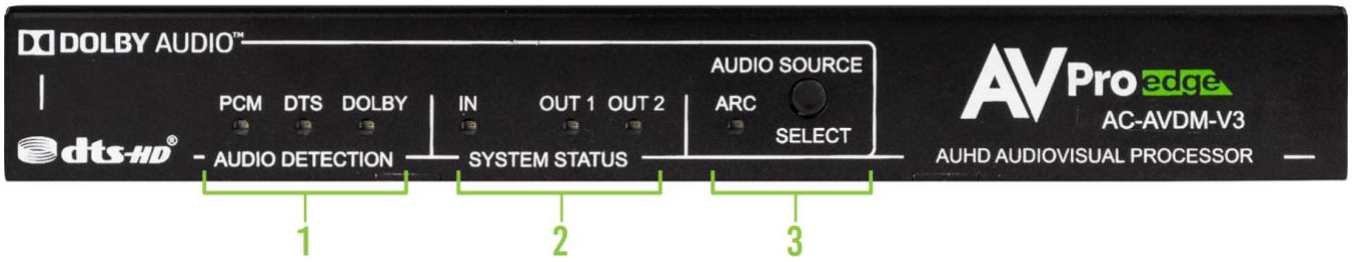


Technical Specifications

Video	
Video Resolutions	Up to 4K 60Hz 4:4:4
VESA Resolutions	Up to DCI 4K (4096 x 2160)
HDR Formats/Resolutions	4:2:0, 4:2:2, 4:4:4 (10- and 12-bit deep color) HDR10, HDR10+, HLG, Dolby Vision™
Color Space	YUV (Component), RGB (CSC: Rec. 601, Rec. 709, BT2020, DCI, P3 D6500)
Chroma Subsampling	4:4:4, 4:2:2, 4:2:0 Supported
Deep Color	Up to 16-bit (1080p, Up to 12-bit (4K)
Audio	
Supported Audio Formats (HDMI Pass-through)	PCM 2.0 Ch, LPCM 5.1 & 7.1, Dolby Digital™, DTS® 5.1, Dolby Digital Plus™, Dolby® TrueHD, DTS-HD® Master Audio™, DTS:X®, Dolby Atmos®
Supported Downmixed Audio Formats (2-Ch, TOSLINK, S/PDIF, HDMI)	PCM 2.0 Ch, LPCM 5.1 & 7.1, Dolby Digital™, DTS® 5.1, Dolby Digital Plus™, Dolby® TrueHD, DTS-HD® Master Audio™, DTS:X®, Dolby Atmos®
Other	
Bandwidth	18 Gbps
HDCP	HDCP 2.2 and earlier
Ports	
HDMI (Tx & Rx)	Type A (1 input and 2 outputs)
Audio (Extracted Analog)	L/R Stereo Phono (single-ended)
Audio (Extracted S/PDIF Coaxial)	Phono RCA
Audio (Extracted TOSLINK)	Optical TOSLINK
USB	Micro-USB
Power	Locking Barrel Type Connector
Environmental	
Operating Temperature	23°F (-5°C) to 125°F (51°C)
Storage Temperature	-4°F (-20°C) to 140°F (60°C)
Humidity Range	5% to 90% RH (no condensation)
Power	
Power Consumption (Total)	6 Watts Maximum
Power Supply	Input: AC 100-240V ~ 50/60Hz Output: DC 5V/2A
Dimensions	
Mounting	Furniture Mount Support
Length x Width x Height (Single Unit)	Millimeters: 192 x 92 x 12 Inches: 5.05 x 3.62 x 0.47
Length x Width x Height (Packaged Unit)	Millimeters: 203 x 165 x 91 Inches: 8 x 6.5 x 3.6
Weight (Single Unit)	0.3 lbs (0.136 kg)
Weight (Packaged Unit)	1.01 lbs (0.46 kg)
Product Warranty	10 Years
*Specifications are subject to change without notice. Mass and dimensions are approximate.	

Front and Rear Panels

Front Panel



Rear Panel

1	Audio Detection LEDs	• When illuminated each blue LED shows the incoming audio signal type: **PCM:** indicates an active audio signal is being detected/decoded **DTS:** indicates DTS bitstream audio is being detected/decoded **DOLBY:** indicates Dolby® bitstream audio is being detected/decoded
2	System Status LEDs	• When illuminated each blue LED shows the HDMI source device is connected and which ports are active/connected: **IN:** Indicates the source device is connected to the HDMI INPUT port **OUT 1:** Indicates HDMI OUTPUT 1 is active/connected **OUT 2:** Indicates HDMI OUTPUT 2 is active/connected
3	Audio Source Select Button & LED	• Button toggles Audio Extraction Mode (with adjacent blue LED): **LED On:** Audio is extracted/decoded from the HDMI 2 (ARC) output port **LED Off:** (Default) Audio is extracted from the HDMI INPUT source device
4	HDMI Input	• (1x) 19-pin HDMI Type A female connector port • Source device input for HDMI connection
5	HDMI Outputs	• (2x) 19-pin HDMI Type A female connector ports • Output device ports for HDMI connections: **HDMI 1:** Selectable downscaling from 4K to 1080p output (no ARC) **HDMI 2:** Selectable audio extraction via ARC (no downscaling)
6	Analog Audio Output	• Left/Right Stereo extracted audio outputs (single-ended 2-channel) • Output always mirrored with Digital Audio Outputs (Coaxial and TOSLINK)
7	Digital Audio Output	• (1x) S/PDIF Coaxial RCA phono extracted audio port • (1x) TOSLINK Optical extracted audio port • Always mirrored with Analog Audio Outputs
8	Settings Switches	• (4x) Dipswitches to set downscaling, down-mixing, and ARC options
9	USB ISP	• Micro-USB connector port for servicing and serial communication
10	Dc/5V Power	• DC 5V/2A locking barrel power port

Installation

Connecting the Devices

1 Connect the provided 5V/2A power supply to the **DC/5V POWER port** on the AC-AVDM-V3. All front panel LED indicators will flash once, indicating the AC-AVDM-V3 has powered on.

2 Power on the source device. Connect an HDMI cable to the **HDMI INPUT port** on the AC-AVDM-V3. The front panel SYSTEM STATUS IN LED will illuminate solid blue, indicating an active source is connected.

3 Connect the HDMI output device(s) to the **HDMI OUTPUT port(s)** with an HDMI cable.

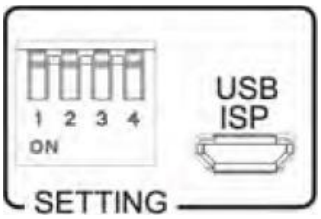
4 Connect the distributed audio device(s) to the **DOWNMIXED ANALOG** or **DIGITAL AUDIO OUTPUT ports** using RCA, digital coaxial, or optical cables (depending on application).

5 Depending on the application, use the SETTINGS DIPSWITCHES on the rear panel or the AUDIO SOURCE SELECT button on the front panel to adjust downscaling, downmixing, and ARC options.

Dipswitch Settings

Each dipswitch located on the AC-AVDM-V3 front panel corresponds to one control setting.

Dipswitch UP position = OFF
Dipswitch DOWN position = ON



status / DIP switch	OFF	ON
1	Output1 HDMI Audio Bypass Bitstream	Output1 HDMI Audio Down-Mix 2Ch
2	Output2 HDMI Audio Bypass Bitstream	Output2 HDMI Audio Down-Mix 2Ch
3	EDID Use Read From TV(Only Output2)	EDID Use Standard 4K 2CH EDID
4	Down-Scale OFF	Down-Scale ON

Audio Source Select Button Operation

The AUDIO SOURCE SELECT button, located on the front panel, controls the extracted audio modes as indicated by the solid blue adjacent LED:

Short (quick) Press:

LED is ON = Audio is extracted/decoded from the ARC (Audio Return Channel) HDMI OUT 2 port
LED is OFF = Audio is extracted from the input source device on the HDMI INPUT port (default mode)

Long (3 seconds) Press:

Press and hold for 3 seconds to toggle on Dolby® DRC (Dynamic Range Compression). The ARC LED will blink once to indicate the DRC mode is enabled and remains in this mode after power cycling. To disable DRC mode, press and hold the button for 3 seconds.

Front Panel Indicator Lights

Audio Detection

Each blue LED indicates the incoming audio signal type and format, based on the AUDIO SOURCE setting located on the front panel:

PCM: Indicates an active audio signal is being detected/decoded
DTS: Indicates DTS® bitstream audio is being detected/decoded
DOLBY: Indicates Dolby® bitstream audio is being detected/decoded

System Status

Each blue LED indicates the HDMI source device is connected and which port/s are active/connected:

IN: Indicates the source device is connected to the HDMI INPUT port
OUT 1: Indicates HDMI OUTPUT 1 is active/connected
OUT 2: Indicates HDMI OUTPUT 2 is active/connected

If the LEDs are flashing or not illuminating, and there is no image on the display, verify the following:

- Bypass the AC-AVDM-V3 and plug the source directly into the display to confirm both are functioning properly.
- Try a different HDMI cable (2 meters or longer). HDMI.ORG stipulates that 2-meter or longer cables be used to connect *any* two HDMI devices. This is to ensure HDCP handshaking is given the necessary time to complete its sequence (cable length factors into this timing process; shorter cables may hamper full data exchange). HDCP handshaking is repeated every 2-3 seconds during operation.
- Use DIPSWITCH 3 to read the EDID from the display.

Serial Communication

For communication with the AC-AVDM-V3, connect a micro-USB data cable to the USB ISP port located on the rear panel. The Serial-to-USB is internal and the required drivers (universal CH340 driver) will automatically install once plugged in.

Set the Serial Communication protocols to:

Baud Rate: 57600
Bit Number: 8
Checksum/Flow Control/Parity: None
Stop Bits: 1

Serial Commands

Command	Action
H	Help
STA	Show global system status
SET RST	Reset to factory defaults
SET RBT	System reset to reboot
SET LAN RBT	Set LAN MCU reset to reboot
SET ADDR xx	Set System Address to xx {xx=[00-99](00=single)}
SET BAUDR x	Set System Baudrate to x {x=[0~5] (0=9600, 1=14400, 2=19200, 3=38400, 4=57600, 5=115200)}
SET ARC ON/OFF	Set Audio Return Channel ON/OFF
GET ADDR	Get System Address
GET INx SIG STA	Get Input x Signal Status {x=[0~1](0=ALL)}
GET INx AUD FMT INF	Get Input x Audio Information {x=[0~1](0=ALL)}
GET BAUDR	Get System Baudrate
Output Setup Commands	(Note:output number(x)=HDMI(x),x=1-2)
SET OUTx EXA EN/DIS	Set Ex-Audio Output Enable/Disable {x=[0](0=all)}
SET OUTx STREAM ON/OFF	Set Output x Stream ON/OFF {x=[0~2](0=ALL)}
GET OUTx EXA	Get Ex-Audio Output Enable/Disable Status {x=[0](0=all)}
GET OUTx EDID DATA	Get Output x EDID DATA{x=[1~2]}
GET OUTx STREAM	Get Output x Stream ON/OFF Status{x=[0~2](0=ALL)}
Ex-Audio Commands	(Note:output number(x)={x=[0](0=ALL)}
SET OUTx EAUD VVy	Set Outputx Ex-Audio Volume Value y {x=[0](0=All),y=[0-207]} [0: 0dB (Default)] [1: -0.5 dB] [2: -1 dB] [3: -1.5 dB] [...] [207: -103.5 dB]
SET OUTx EXMX MODEy	SET Output x Ex-Audio Matrix Mode y{x=[0](All output),y=Matrix Mode[0-7],Mode:[0-Matrix Mode Close],[1-STD FX,Default Mode],[2-Low Center+],[3-Mid Center+],[4-High Center+],[5-Middle FX],[6-Full FX],[7-Voice FX]}
GET OUTx EAUD VV	Get Outputx Ex-Audio Volume Value {x=[0]{0=All}}
GET OUTx EXMX MODE	GET Output x Ex-Audio Matrix Mode Status{x=[0](All output)}

Troubleshooting

- Verify Power – Confirm the power supply is properly connected and is outputting 5V.
- Verify Connections – Confirm all cables are properly connected and/or terminated where applicable.
- Verify Source Device – Confirm the source device is powered on and all mute settings are disabled.

Maintenance

To ensure the reliable operation of this device as well as protect the safety of any person using or handling this device when powered on, observe the following instructions:

- Use the provided power supply. If an alternative power supply is required, check the voltage and polarity to ensure it has sufficient power to supply the connected device.
- Do not operate this device beyond the specified temperature and humidity range given in the above specifications.
- Ensure there is adequate ventilation to allow the device to operate efficiently.
- Repair of the equipment should only be carried out by qualified professionals as the device contains sensitive components that may be damaged from unorthodox procedures.
- Only use this device in a dry environment. Never allow liquids or harmful chemicals to come into contact with this device.
- Clean this unit with a soft, dry cloth. Never use alcohol, paint thinner, or benzene to clean the device.

Damage Requiring Service

This device should be serviced by qualified personnel when:

- The DC power supply cord or AC adapter has been damaged
- Objects or liquids have breached the device's interior
- The device has been exposed to rain or moisture
- The device does not operate normally or exhibits a marked change in performance
- The device has been dropped or the housing is damaged

Support

Should you experience any problems using this product, first refer to the Troubleshooting section of this manual before contacting AVPro Technical Support. When calling in, the following information should be provided:

- Product name
- Model number
- Serial number
- Place of purchase
- Details of the issue and any conditions under which the issue is occurring

Warranty

The Basics

AVPro Edge warranties products it manufactures and sells when purchased directly from AVPro Edge or an authorized AVPro Edge reseller. Products are guaranteed to be free from manufacturing defects and in sound physical and electronic condition when shipped by AVPro Edge.

AVPro Edge has developed a warranty everyone can get behind. We wanted to remove all warranty "red tape" to make it simple. Our 10-Year, NO BS Warranty is based on these 3 fundamentals:

- If you are experiencing trouble, please call us. Our Tech Support specialists will make every troubleshooting attempt at a remedy while you are on the phone.
- If it is determined the product has experienced an uncorrectable failure, we will provide an advanced replacement free of shipping charges, including no-charge return shipping for the unit on site.
- We are confident that you know what you are doing and will never make you go through unnecessary troubleshooting steps with one of our products.

Coverage Details

AVPro Edge will replace or repair (at the customer's choosing) any defective product. If the failed unit is out of stock or on backorder, replacement with a comparable product of equal value or feature set, if available, may be a viable solution. In rare circumstances, it may be determined repair is the only available option.

Warranty starts upon receipt of the product (determined by confirmed delivery via tracking). Should tracking information be unavailable for any reason, the warranty will have a start date coinciding with a thirty-day interval after receipt of the order (ARO).

Red Tape

AVPro Edge is not responsible to provide a warranty for untraceable purchases, or those made outside of authorized distribution channels.

If AVPro Edge determines a product has been modified or internally tampered with (as identified by a warranty seal violation and/or physical examination) or has an altered serial number, the warranty will be declared void. Additionally, physical misuse or damage incurred beyond normal installation standards and practices may violate the warranty. Warranties may also be prorated as a mutual means of reconciliation, after examination by an AVPro Edge representative.

Damage caused by "acts of God" (including, but not limited exclusively to): Natural disasters, power surges, electrical storms, earthquakes, tornadoes, sinkholes, typhoons, tidal waves, hurricanes, or other uncontrolled and unforeseen events related to unnatural weather conditions) are not covered.

Damage caused by incorrect installation will not be covered. Abnormal over- or under-voltage, inadequate cooling, improper cabling, lack of appropriate protection, and static discharge are many examples of improper installation, but warranty exclusions are not solely limited to these examples.

Warranty service for products installed or sold by an authorized AVPro Edge third-party reseller will be provided by that authorized AVPro Edge reseller. Accessories (items included in the original purchase, such as IR cables, RS-232 cables, power supplies, etc.) are not included in the warranty unless identified as the point of failure or the cause of performance that differs from that intended by design.

We will make acceptable efforts to source and supply replacements for defective accessories at a discounted rate as needed.

Obtaining an RMA

Dealers, resellers, and installers can request an RMA (Returned Merchandise Authorization) from an AVPro Edge Technical Support rep or Sales Engineer. Or you may email support@avproedge.com or fill out the general contact form at www.avproedge.com/contact.

End users may not request an RMA directly from AVPro Edge and will be referred back to the dealer, reseller, or installer.

Shipping

For the USA (not including Alaska and Hawaii), shipping is covered for advance replacements using FedEx Ground (some Express exceptions may apply). Defective product return shipping is covered by AVPro Edge, using a return label issued via email. Items must be returned within 30 days from receipt of the replacement product. At 40 days, the customer account will be billed. Other return shipping methods will not be covered.

For international (and Alaska and Hawaii) return shipping costs will be the responsibility of the returnee. Once the unit is scanned for return shipping AVPro Edge will ship the new replacement unit.

Limitation on Liability

The maximum liability of AVPro Global Holdings LLC under this limited warranty shall not exceed the actual purchase price paid for the product. AVPro Global Holdings LLC is not responsible for direct, special, incidental, or consequential damages resulting from any breach of warranty or condition, or under any other legal theory to the maximum extent permitted by law. Taxes, Duties, VAT, and other freight forwarding service charges are not covered or paid for by this warranty.

Obsolescence or incompatibility with newly invented technologies (after the manufacture of the product) is not covered by this warranty. Obsolescence is defined as:

“Peripherals are rendered obsolete when current technology does not support product repair or re-manufacture. Obsolete products cannot be re-manufactured because advanced technologies supersede original product manufacturer capabilities. Because of performance, price, and functionality issues, product re-development is not an option.”

Discontinued or out-of-production items will be credited at fair market value towards a current product of equal or comparable capabilities and cost. Fair market value is determined by AVPro Edge.

Exclusive Remedy

To the maximum extent permitted by law, this limited warranty and the remedies set forth above are exclusive and instead of all other warranties, remedies, and conditions, whether oral or written, express or implied. To the maximum extent permitted by law, AVPro Global Holdings LLC specifically disclaims any implied warranties, including, without limitation, warranties of merchantability and fitness for a particular purpose. If AVPro Global Holdings LLC cannot lawfully disclaim or exclude implied warranties under applicable law, then all implied warranties covering this product, including warranties of merchantability and fitness for a particular purpose, shall apply to this product as provided under applicable law.

This warranty supersedes all other warranties, remedies, and conditions, whether oral or written, express or implied.

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