IPX-UC1 ULTRA

The Ultimate Unified Communication Processor

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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. Go to www.auroramm.com for latest manual and firmware.

IPX-UC1-Ultra

- 1 QTY IPX-UC1-Ultra 10G RJ-45 Copper/Fiber Transceiver Unit. SFP+ module sold separately.
- 2 QTY Antennas
- 2 QTY Mounting Ears and screws
- ICS-H4 – Four HDMI Input Card

Ordering Information:

IPX-UC1-ULTRA-1-i512-1T16G All-in-one UC platform with integrated Intel i5 based PC ICS-H4 Input Card with Intel 12th Gen Core i5 processor, 16GB RAM and 1TB SSD 90W PoE++

IPX-UC1-ULTRA-1-i713-1T32G All-in-one UC platform with integrated Intel i7 based PC ICS-H4 Input Card with Intel 13th Gen Core i7 processor, 32GB RAM and 1TB SSD 90W PoE++

Power supplies are sold separately. ***(PS0107-1 USB-C 100-Watt Power Supply for USA, Europe, UK, & Australia)***

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

OPTIONAL ACCESSORIES

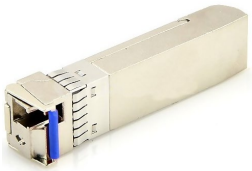
- **PS0107-1**
  (USB-C 100-Watt Power Supply for USA, Europe, UK, & Australia)
- **RK7-1-K**
  (1RU Rack Mount Holds 1 Unit)

- **IR Receiver CA0026-1**

- **IR Emitter CA0061-1**

- **IPA-SFP-10GMM-1**
  (10G SFP+ Multi-Model LC 50/125 Module)

- **IPA-SFP-10G32C1**
  (10G SFP+ BIDI Single Mode 1330/1270nm Module 10KM)



- **IPA-SFP-10G20**
  (10G SFP+ Single Mode Dual Module 1310nm 20KM)

- **IPA-SFP-PPC-1**
  (SFP+ 10G Passive Patch Cable 1M (3ft)

- **IPA-SFP-OM3DXLC-1**
  (OM3 Fiber 50/125 Multi-Mode LC Patch Cable 1M)

INTRODUCTION

About

The IPX-UC1 ULTRA is the most advanced unified communication IP Streaming solution on the market utilizing SDVoE™ technology and more. It is the industry's first 4K transceiver capable of simultaneously encoding and decoding over a single cable with zero compression or lossless compression with zero frame latency. What really separates the IPX-UC1 is the ability to stream 10G, 1G, and 10/100 at the same time in both directions. Advanced compression CODECs for H.264, and H.265 are all part of the highly integrated Ultra platform.

The internal Intel Core™ processor with 1TB SSD allows for Zoom™, Teams™, WebEx™, and more. This enables the ability to deliver high quality locally while providing remote content for others. The processor can also do an optional WIFI (future capability) for BYOD applications of wireless laptop and mobile connections as a source.

The input card slot provides choices of cards depending on the application needs. These inputs in addition to the SDVoE output and processor output can be routed to either of the two external HDMI outputs or the SDVoE and Processor inputs. This is made possible with a quad scaler processor with advanced features. These features consist of contrast edge blending for side-by-side projectors, image rotation for portrait and jigsaw puzzle mode videowalls, chroma keying for overlaying of sources on top of others, vector scope and pattern generation for signal integrity diagnosing, localized seamless switching and windowing opens new capabilities of encode side processing and the bitmap OSD engine can enhance content on input and outputs.

Audio, video, data, and control can be sent securely to one or many units using off-the-shelf 10G and 1G Ethernet switches. The Ultra has many ports for control and communication. 10G LAN, 1G LAN, SFP+, USB 2.0 extension over LAN, USB 3.1 for processor expansion, and RS-232/IR for device control, are some of these capabilities.

Choice is important. That's why the IPX-UC1 Ultra is the ultimate Unified Communication product on the market today.

Features

- Simultaneous Transmitter (Encoder) and Receiver (Decoder) over single CAT cable
- 4K60 4:4:4 Over 10G Fiber or Copper
- 1.3:1 Lossless Compression and Zero Frame Latency (100us) for 4K60 4:4:4
- Zero Compression/Frame Latency (22us) for 4K60 4:2:0 and below
- Secure Content Encryption
- 128x128 Capable with HDCP, Larger for Non-Encrypted Sources
- Windows or Linux OS with Ability to Run Zoom, Teams, and More.
- Dual Internal HDMI Graphics Output for Processor
- One USB 3.1, Two USB2.0 Available for Processor
- Two Internal LAN for Processor
- 1TB Internal SSD
- Neural Processing Unit (NPU) Option. People Counting, Emotion Detection, Facial Recognition, & More.
- SFP selectable for 10G or 1G use with Processor for Secondary External Port
- Encode and Decode H.264/H.265
- Video Wall Capability (16x16), Image Rotation, Edge Blending, Chroma Keying
- Waveform Monitoring, Histogram, & Vector scope Display
- Built-in Pattern Generator
- Bitmap & Character Based OSD for Inputs and Output Channels
- Windowing/Multi-viewer up to 16 windows (SDVoE)
- Local Windowing of Sources up to 4
- Multi-Input Mode Can Transmit up to 4 1080p Signals over Single 10G Cable
- Two HDMI Outputs with Independent Scaling & Two Internal Scalers for Internal PC and SDVoE
- 3ms Scaling
- Seamless Switching including local inputs & Break-away Switching
- Audio DSP
- SFP+ for Multi/Single Mode Fiber
- 10/100/1000Mbps LAN PoE++ (PD)
- Input Boards (4 HDMI, Multi-Input 1 USB Type-C, DisplayPort, 2 HDMI or 1 HDMI and 12G SDI)
- Line In/Out Stereo
- RS-232 Serial Port and IR (Bidirectional)
- Integrated Web Server for Custom Control Pages
- USB 1.1 (HID) or USB 2.0 480Mbps IP Extension
- Dante®/AES67 IP 2Ch Included and 8Ch Audio (Optional)
- Front Keypad with OLED Display
- Auto Sense Switching
- Rack and Under Table Mounting
- 4K Auto-Framing USB 3.1 Camera Option

Benefits

The IPX-UC1 Ultra has many devices in one product providing the ultimate experience and the ultimate value.

Here is why:

1. SDVoE 10G Encoder
2. SDVoE 10G Decoder
3. SDVoE Server (Eliminates need for external server PC)
4. H.264/H.265 Encoder (10/100Mbps)
5. H.264/H.265 Decoder (10/100Mbps)
6. 12th Gen Intel Core™ processor for Windows or Linux with 1TB SSD (Zoom, Teams, & WebEx meetings)
7. Control System (Integrated ReAX for full room automation)
8. USB 2.0 Extender
9. Video Effects Processor (Contrast Edge Blending, Chroma Keying, Image Rotation, Bitmap OSD)
10. Windowing up to 4 sources locally to any of the 4 outputs
11. Presentation 7x4 Seamless Switching Scaler Matrix with two external HDMI Outputs
12. Videowall Processor with Image Rotation
13. Audio DSP with Dante
14. Diagnostic Tools (Vector Scope, Waveform Analyzer, Histogram, Pattern Generator)

Front

LEDs

- **Power/Status:** Power will light green when unit is on or in standby. Status will blink at a normal pace during regular operation and slower pace when in standby.
- **OLED:** 128x64 pixel OLED. Will display status of the following in addition to IP Address and Serial number.

1. **PC Control:** Allows for soft power control of the built in NUC PC.
2. **USB Configuration:** Displays currently configured USB mode as well as the presence of an IPE-USB-2 card.
3. **Source to Destination Routing:** Will indicate source input to destination routing.
4. **232 TX/RX:** Will indicate when RS-232 data is being sent or received.
5. **IR TX/RX:** Will indicate when IR signal is being sent or received.

Buttons

- **Menu Button:** Cycles through the OLED Menu.
- **Enter Button:** Selects the current menu option.
- **Up Button:** Select next input source for selected destination.
- **Down Button:** Select previous input for selected destination.
- **Up/Down Button:** Press and hold for 5 seconds to output IP info at 9600 baud rate on RS-232 port.

Miscellaneous

- **USB:** Dual Stack Type A 480Mbps USB 2.0 for device (ex. Mouse, keyboard, etc.) extension. Two USB 3.1 for the internal NUC PC.
- **IR Input:** IR input 30kHz-60kHz. Photo Receiver must be stereo 3.5mm TRS.

Note: It is important to use 5V only photo receiver which is with carrier and inverted.

- **IR Window:** Future use for IR remote.

Special Functions

- **Factory Default:** Press and hold Enter and Up together for 4 seconds.
- **Firmware Update Mode**: Press and hold Enter while applying power to enter firmware update mode.

Note: Default Settings – 115K baud rate; default IP is auto and displayed on OLED; autosense off.

Rear

ICS-H4 – Four HDMI Input Card

- **10G LAN:** RJ-45 10G network connection for SDVoE connectivity. Unit can be powered with 90W 10G PoE++ injector.
- **1G LAN:** 10/100/1000Mbps LAN. Can power the unit with 90W PoE++ from injector or switch.
- **1G/10G SFP+:** Multi-mode or single mode SFP+ 1G/10G modules for the SDVoE connectivity. This connector can be used for 1G internal processor or 10G SDVoE.
- **HDMI 2.0 Out 1 & 2:** HDMI Output to Display.
- **RS-232:** Serial port pass-through and control up to 115Kbps.
- **IR Out:** IR output 30kHz-60kHz.
- **Audio Line In/Out:** Stereo audio input/Stereo de-embedded output.
- **USB:** 480Mbps USB 2.0 Type-C to be connected to a host PC. USB Type-C Processor for USB 3.1 for NUC.

Note: The MAC address for the Dante or USB option will be on the internal card label & bottom side of unit.

Rear Input Card Slot

- ICS-H4 – Four HDMI Input Card

HARDWARE INSTALLATION

Basic Understanding

The IPX-UC1-ULTRA is multiple products merged into one. It is a NUC PC with dual monitor outputs and a capture input (RXS-2), SDVoE 10G simultaneous AV over IP (IPX-TS3A-CF), and a Quad Scaler windowing engine with various video processing features (DIDO X4). Together they make a clean all in one solution capable of being the foundation for any conference room.

Power Connection

Both the 1G and 10G LAN ports are capable of and require 90 Watt PoE++ for proper PoE operation. Lower powered PoE should not be utilized. Keep in mind the distance of a PoE++ cable and quality will determine how much power the 90 Watt PoE++ PS specification will reach the IPX-UC1 ULTRA. Higher grade cable like CAT 6a or 7 with a lower copper gauge will go further for example than a CAT 5e or 6. The cable will have less power drop over distance. If power hungry USB devices are to be connected, or the additional M.2 port is used it is highly recommended to use the Aurora 100 Watt USB-C power supply (PS0104-1). If connecting to LAN ports in a PoE capable switch with less than 90 watts of PoE++ power, the PoE **MUST** be disable on those ports. Failure to do so will result in constant reboots due to insufficient power.

Mounting and Cabling

1. Mount the IPX-UC1 ULTRA according to the application. The IPX-UC1 ULTRA comes with mounting ears for under the table or on the wall. Aurora also offers a 1RU rack mount.
2. Connect CAT cable RJ-45 accordingly to the network switch and to the IPX-UC1 ULTRA. The IPX-UC1 ULTRA has 2 LAN ports which are independent. One is a 10Gbps and the other 1Gbps. Either can allow PoE++ to power the unit.
3. Connect HDMI Output connectors to one or two monitors. The outputs are capable of 4K60 4:4:4.
4. Connect HDMI input if required for HDMI cameras or other sources. Note: Capture input into PC is capable of 4K30 4:4:4 with no HDCP.
5. Connect any additional requirements to the audio, RS-232, or USB connectors.
6. Plug in the USB-C 100-Watt power connector if PoE++ is not to be utilized.

SDVoE Network Setup

1. Connect a 10GbE network switch to the RJ-45 or SFP+ label 10G and make certain the network switch has been set up as per the recommended network section.

2. Connect the IPX-UC1-ULTRA to the network switch and power on. Use the IPBaseT Manager which is preloaded into the IPX-UC1-ULTRA to set up the SDVoE related functions and to also identify and setup other SDVoE related products on the network.

SDVoE Encoder/Decoder Setup

1. The Ultra can simultaneously encode and decode over a single 10G network cable. Plug HDMI source(s) into one or more of the 4 inputs or destination(s) into HDMI outputs. The SDVoE can also route the internal PC display out 1 and 2 and the SDVoE can also send its signal to the input capture of the PC as well. Connect any other RS-232, IR, or audio accordingly. If USB is to be connected, it will by default use the Extreme USB and can be independently set to Host or Device. Internal PC or external USB connector can be selected as well for the use of extension.

2. Every IPX unit has 3 MAC and 3 IP addresses. One is for the IPBaseT video engine. The second is for the internal web server. The third is for the integrated PC. The internal web server has been set to DHCP by default, falling back to the 169.254.x.x IP range so it will not conflict with other units. It can be changed using IPBaseT Manager.

Control Setup

1. In a web browser, connect to the IPX-UC1-ULTRA Server IP Address/port number. The units on the network will populate into the encoder and decoder fields accordingly. You will then be able to change settings, save EDID, route, and more. If a control system is to be used, make certain it is connected to the same network and follows the Aurora IPX API protocol.

Important:

- ***Take note of the SDVoE MAC Address of every unit. It can be found on the OLED screen of the unit. The MAC Address is how you will identify the unit relative to its location.***
- ***Make certain all units are using the latest firmware.***
- ***Remember to set up EDID for proper operation.***

UNDERSTANDING THE BASICS

Direct Connection with No Ethernet Switch

The IPX Ultra is designed to automatically tunnel the video, audio, USB, RS-232, and IR if they are connected without an Ethernet switch to another unit.

10GbE Ethernet Switch

It is important to use a non-blocking IGMP 10GbE switch with IGMP snooping. The size of the switch is based on the requirements of the project. Keep this in mind if extra port capacity is required for future expansion. If you run out of port capacity, you can always add another 10GbE switch in the future. The IPX, when set to encoder (TX), determines the bandwidth that will be multicast across the network. 24bit 4k@30Hz will use about 6Gbps and 3Gbps for 24bit 1080p@60Hz (Data Rate in bits per second = Color Depth x Horizontal Resolution x Vertical Resolution x Frame Rate). If the bandwidth is higher the 1.3:1 compression will be utilized so a 4K60 4:4:4 will be around 9Gbps. The IPX also can enable the 1.3:1 lossless compression for any resolution allowing 1080p60Hz to be about 1.5Gbps. This does not include the 1G LAN, 480Mbps, RS-232, IR over the same transmission if required. If 10 units are set as encoders, and 4K@30Hz is the desired video resolution, then 64Gbps of bandwidth will be required if uplinked to another switch. If the available bandwidth between the 2 10GbE switches is less than 64Gbps, then packets will drop, and information will be lost. It is also a good idea to consider overhead and assume 15% bandwidth loss to play it safe. Since each port is bi-directional 10Gbps, it enables any port to be used as an encoder or decoder. The AV industry is used to standard distribution topology limitations of 4x4, 8x8, 16x16, etc. With networked based video distribution, a 48 port 10GbE switch as an example can be 24x24, 1x47, 47x1, 12x36, etc.

10GbE Ethernet Port Usage

The 1GbE LAN port on each Aurora IPX unit is a full bandwidth independent port that is part of the 10GbE switch. For every IPX unit added to the 10GbE network, it is the same as adding another 1GbE LAN port to a switch. Every IPX 1GbE LAN port is part of a 1GbE switch, relative to the number of IPX units on the network. This allows for using the IPX in place of a secondary 1GbE Ethernet infrastructure to each location and even using it as a low bandwidth video streaming, within the high bandwidth streaming. It is important not to connect more than one IPX unit into the same 1GbE network or there will be communication issues. If more than one IPX unit is connected into the same 1GbE network, it would be the same as taking 2 Ethernet switches and connecting multiple ports to each other, as an action that will totally disrupt the network (it will cause a broadcast/network storm). Connecting computers or other LAN peripherals throughout the IPX 1GbE LAN ports will work the same as any other Ethernet switch typically used. A more advanced usage would be to use the IPX 1GbE LAN port to have a local H.264 encoder send lower bandwidth content over the IPX 10GbE infrastructure. This way local AV content is sent real time uncompressed using the 10GbE IPX infrastructure and then for distant learning, computer viewing, or internet usage the H.264/H.265 compressed stream using the same 10GbE infrastructure to other low bandwidth destinations.

Network Infrastructure

The raw network cabling as well as the patch cables are as important as the switch. For 10GbE networks fiber cable is preferred. If using copper, unshielded cable is preferred for optimal performance and is important to follow the standard rules for running Ethernet cables. No sharp bends, coiling, putting near power lines, grouping tightly together with other LAN cables, etc. The grade of the copper cable is important too as it will determine the distance. CAT6A will reach 100m, CAT6 55m, and CAT5e 40m. Fiber can achieve substantially greater lengths and does not have the issues of copper with running together, power line interference, etc. OM3 multi-mode fiber (MMF) will go almost 1000ft/300m. Single-mode fiber (SMF) can go tens of miles if required.

Isolated Network or Users Network

When discussing a networked based video solution, many times it is assumed it must be on the client's network. This is not true. The application determines the type of network to be used. For example, if it is simply being used as a typical AV matrix switch with no distribution throughout the facility, then a 10GbE switch can be used just for that room. Just because it is Ethernet based does not mean it has to be used on the main network. The Ethernet switch is simply used as the end point for all the cables and the glue that holds everything together. In other words, it takes the place of the standard AV matrix switch topology. If only remote control is required from the main network, then connect the 10GbE switch to the main network and allow the control data between the 10GbE switch VLAN and the main network. Even if the VLAN is part of the main network it does not mean you will use all the bandwidth. The purpose of IGMP is to only send the multicast data to the ports specified, which would be where the IPX units are connected to. Non-blocking switch assures full bandwidth is available for all ports as required.

Controlling the IPX

To simplify control of the IPX-UC1 Ultra and other IPX units connected to the network, the IPX-UC1 Ultra has the control server integrated. Note there should be only one control server active on the network at any given time.

EDID and its Importance

One of the most forgotten setup procedures in AV systems is EDID. The EDID comes from the destination (display, VTC, recorder, etc.) and must be saved into the encoder and decoder HDMI input ports. This allows the source (Blu-ray, computers, etc.) to know the capabilities of the destination. This includes the audio type if any, video resolution and timing, color space, color depth, and more. If no EDID is present an HDMI device will revert to lowest resolution in DVI mode which also means no audio. If the wrong EDID is used, the image may look pink, green, or have no image at all. To make matters more complex, if different destinations/displays are in use in a matrix configuration, then it is important to use an EDID with a common denominator or only one or the other destination may work. In an ideal installation all the destinations should have the same capabilities for optimal performance. I this is not possible a scaler may have to be implemented to assist in the compatibility.

For example, there are 2 displays one 1080p the other 4k UHD. If the EDID of the 4K display is used, the 1080p will not see an image if the source is capable of 4K. If the 1080p EDID is used, then both will see the image but the 4K will never benefit from 4K content. In a situation where this is unacceptable, a 4K scaler can be used on the 1080p screen to down scale the 4K content so the 4K EDID can be used, and the better screen can have a benefit. Note scalers do add frame latency and can affect image quality based on the quality of the scaler. Therefore, it is always ideal to use destinations with similar capabilities for optimal performance.

Audio can be impacted just as easily. If a destination is 6-channel surround sound capable and the other destination is not, then the EDID from the 5.1 destination cannot be used, or there will be no audio on the other destination. In most commercial installations it should not be an issue to choose the lowest common denominator, which is 2-channel audio, but in cases where you must have surround sound then a down-mixer for the 2-channel destination must be used.

In some cases, a custom EDID could be created, as the audio and video are mismatched between the destinations. This can occur for example, when one destination has 4K 2-channel audio and the other 1080p with multichannel surround sound. If the EDID of the 1080p destination is used, audio will not be present on the 4K destination. If the 4K EDID is used, there will be no video present on the 1080p destination. The only way to solve this issue, is a new EDID combining the common features. In this case an EDID which is set at 1080p with 2-channel audio is the solution.

Video Wall Capabilities

The IPX-UC1 Ultra video wall mode can take in a 4K60 signal and create a low latency high quality video wall. With its internal low latency 3ms scaler, video walls can be created up to 16x16 for basic or advanced video wall configuration. With the rotation engine, portrait and jigsaw puzzle walls can be created in the highest of quality.

APPLICATIONS

Example 1: Unified Communication Video Call with Local Display and H.264 Streaming

In this application, the Ultra uses the integrated ReAX control system to control the room and to initiate the call. Locally SDVoE is utilized to deliver full image quality to the display with no latency while the Ultra simultaneously encodes the source into H.264 for remote viewing in addition to the video call (Zoom, WebEx, Teams, etc.). The camera source can be USB, HDMI, or NDI for maximum flexibility. Remotely the user can watch the presenter through the video call full screen while viewing the content in a browser in a high-quality stream. If a browser like Microsoft Edge is utilized, recording and annotating (whiteboard features) can be used to take notes and save locally. Normally with typical videocall applications it is either full screen with the presenter or the content but not both. It becomes difficult to get the full experience of watching the presenter and full content at the same time as if in the room. The IPX Ultra solves this issue and even allows the recording of the streaming content for playback later.

Example 2: Dual Projectors

The IPX Ultra has two HDMI outputs in addition to the SDVoE extension. With the contrast edge blending feature, two projectors can be positioned side by side for one large seamless image without bleed over effect that will normally happen in the middle without the feature. The Ultra can switch between one large image or two separate images.

Example 3: Video Wall

The IPX-UC1 Ultra is capable of 4K 16x16 video walls. The rotation feature allows for portrait and jigsaw puzzle videowalls to further enhance the experience.

Example 4: KVM Utilizing USB 2.0

Command and Control and NOC centers are perfect for the IPX Ultra, especially with the advanced break-away switching and USB 2.0 running at a full 480Mbps. With the IPX it is no longer just keyboard and mouse, but full USB peripheral routing as well.

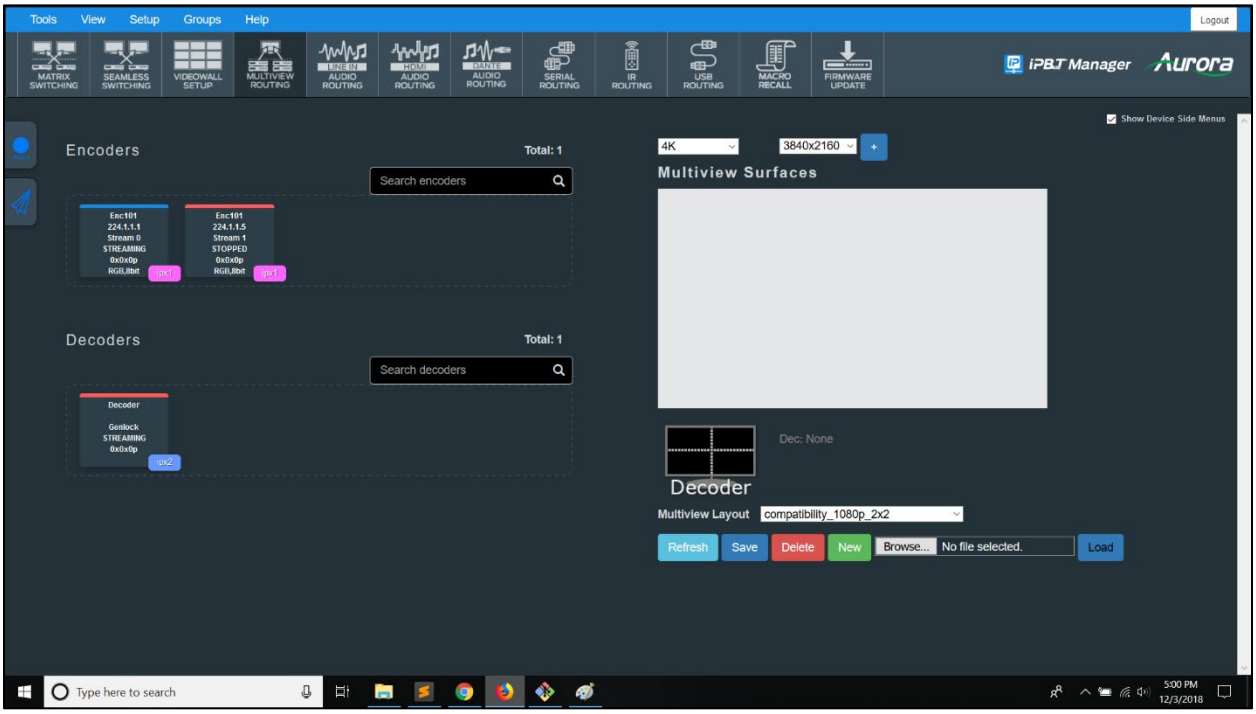
Example 5: Digital Signage

The IPX Ultra has a built-in Intel Core processor with 1TB SSD. This allows loading of content and the use of media playback programs. When used with the ReAX control system, content can be scheduled and displays controlled. The Ultra allows for a single device to be the video player, video processor, and extender matrix.

MANAGEMENT SOFTWARE

IPBaseT Manager

The IPBaseT Manager is integrated into the IPX-UC1 Ultra. Below is a list of features.



Features

- Matrix Switching
- Seamless Matrix Switching
- Multi-view
- Video Wall Setup and Control
- Audio Break-away Routing
- RS-232 Routing and Control
- IR (Infrared) Remote Control Routing
- USB Routing
- Horizontal and Vertical Viewing
- Preset Store and Recall
- Connection Manager
- Advanced Debug Logging

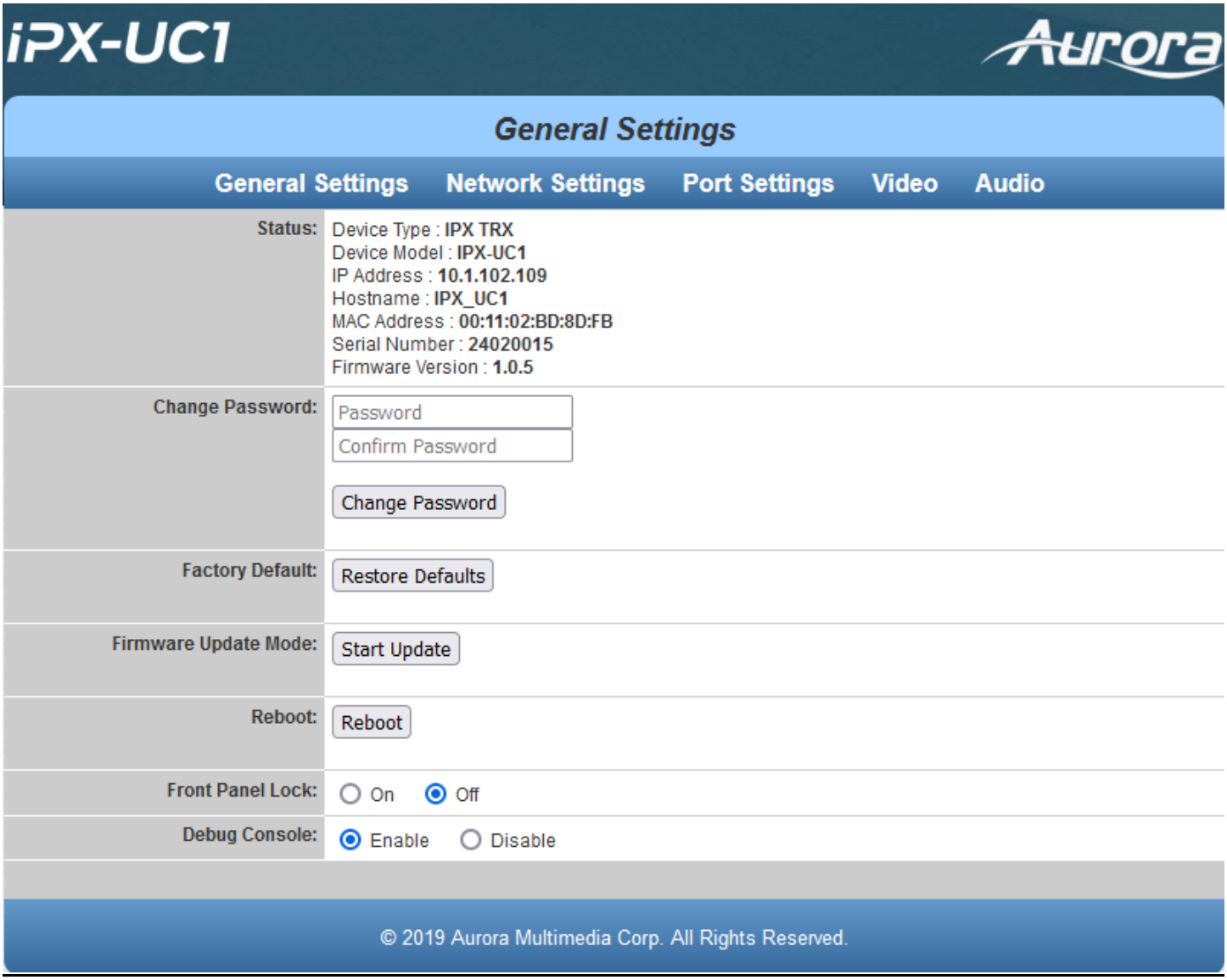
- Touch Screen Friendly Layout
- Configuration File for Cloning Presets and Connections on Other PCs
- Multi-Server connections
- Mobile Friendly
- Firmware Update
- Unlimited Users
- Statistics
- Email Alerts
- Video Wall Multiview Configurations

For full detail of the IPBaseT Manager Software tool and setup, the manual can be found at the Aurora website www.auroramm.com.

WEB SETUP PAGES

Web Setup pages can be accessed by typing in the webserver IP address of the unit (example: 192.168.1.100/setup). You will then be prompted for a username and password. The default username and password are “admin.” It is highly advisable to change the units to a unique username and password for security reasons. Make certain the IPX-UC1 is connected to the network, and the webserver has a unique IP Address or there will be communication issues. The images below may change with firmware revisions as we are always enhancing the capabilities.

General Settings



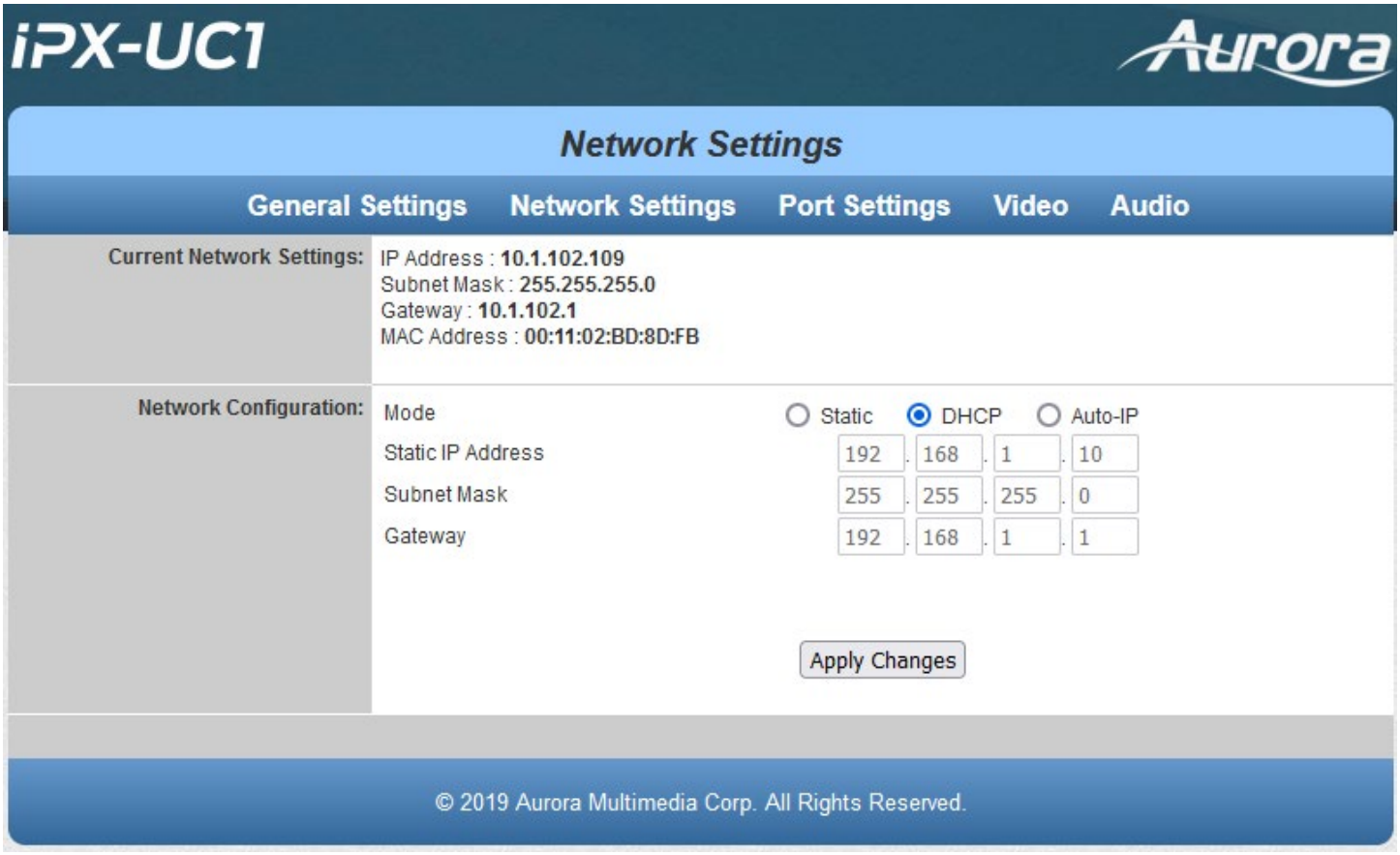
Status shows the units IP Address MAC Address, Serial Number and Firmware Version.

Factory Default will restore default settings to the unit.

Firmware Update Mode allows the user to update the unit's firmware over TFTP.

Front Panel Lock disables the unit's front buttons to prevent tampering or accidental changes.

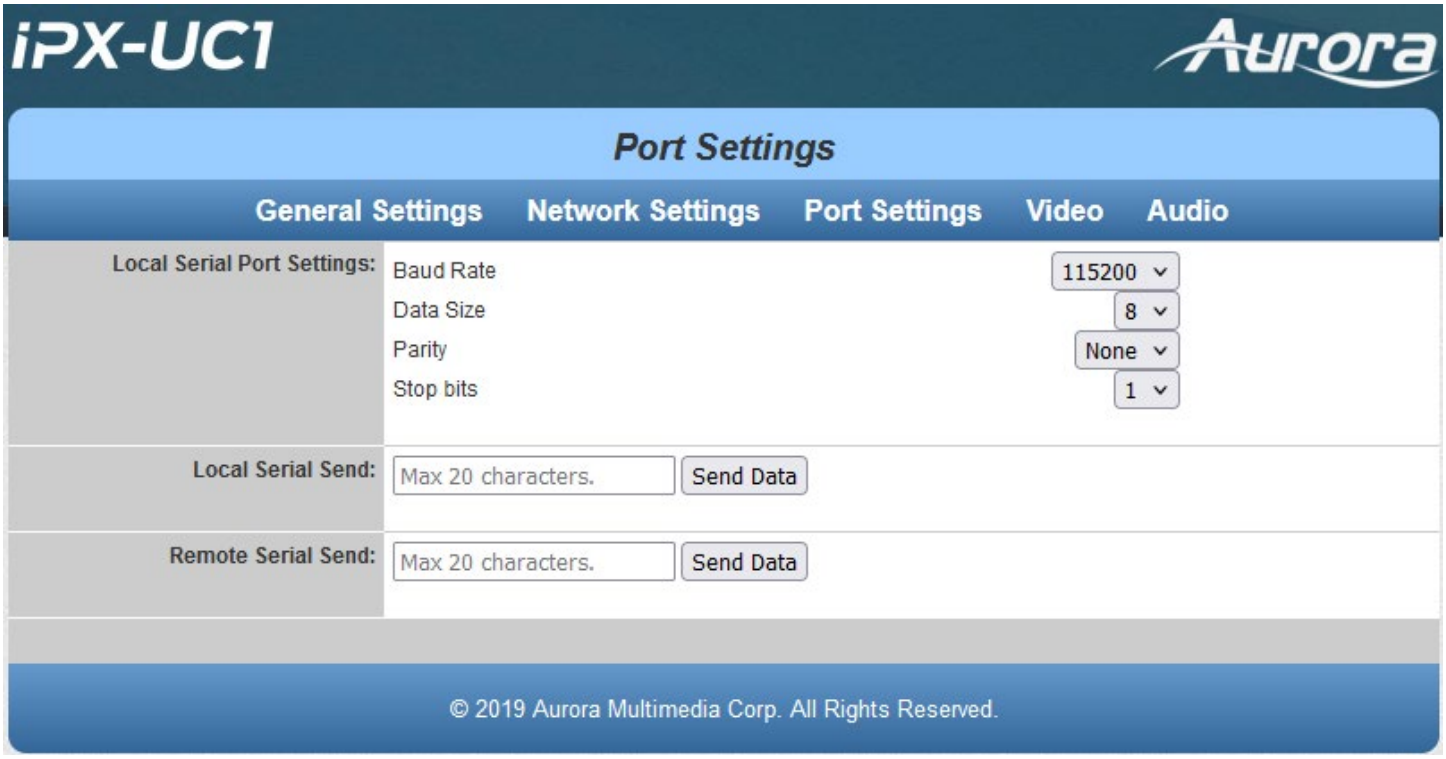
Network Settings



Current Network Settings will display the unit's current IP Address, Subnet Mask, and Gateway.

Network Configuration allows the user to set the unit's IP Addressing mode. If set to static, the user can set a static IP Address, Subnet Mask, and Gateway.

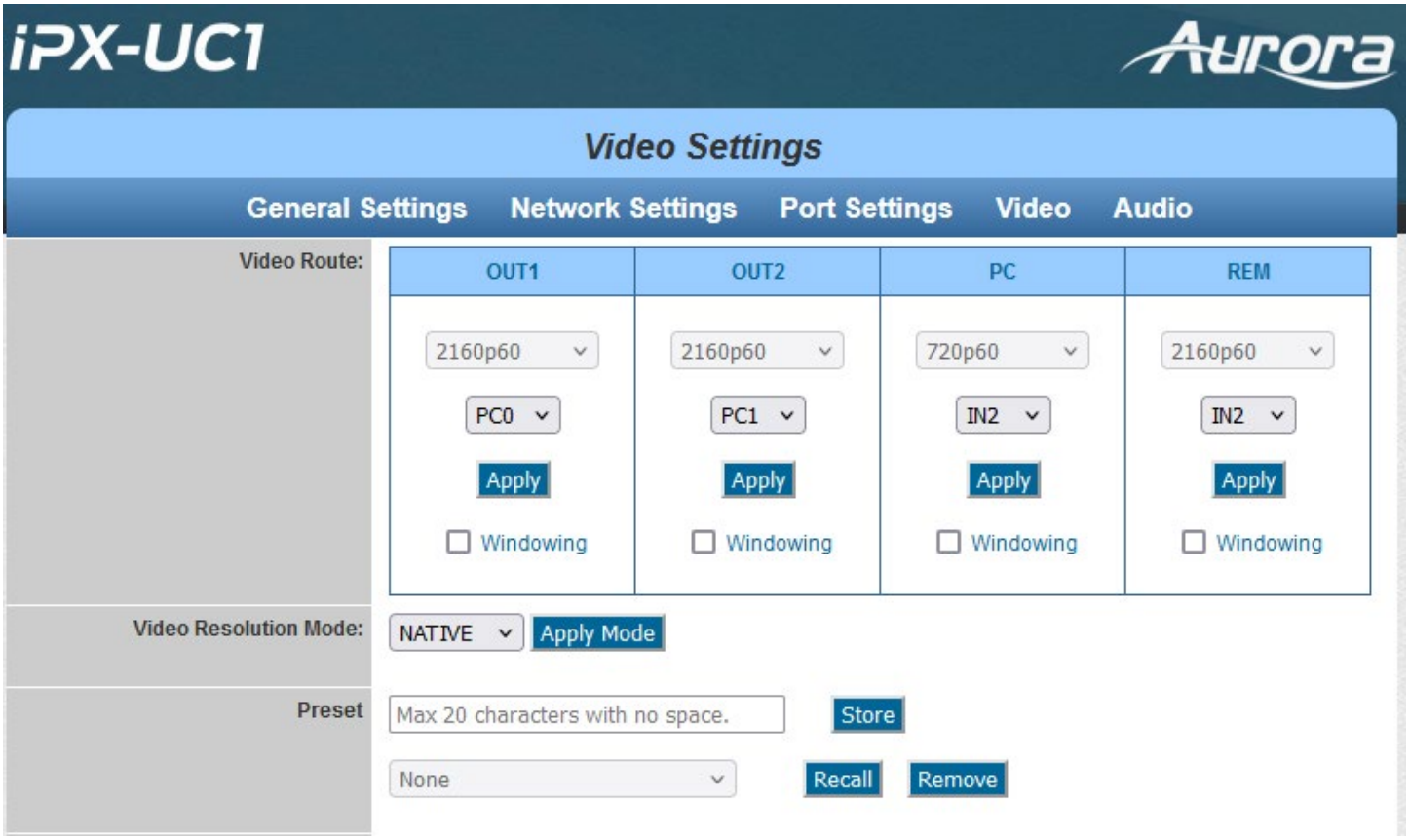
Port Settings



Local Serial Port Settings allow the user to set the Baud Rate, Data Size, Parity, and Stop Bits of the unit's RS-232 port.

Local Serial Send allows the user to send an up to a 20 character string out of the unit's RS-232 port.

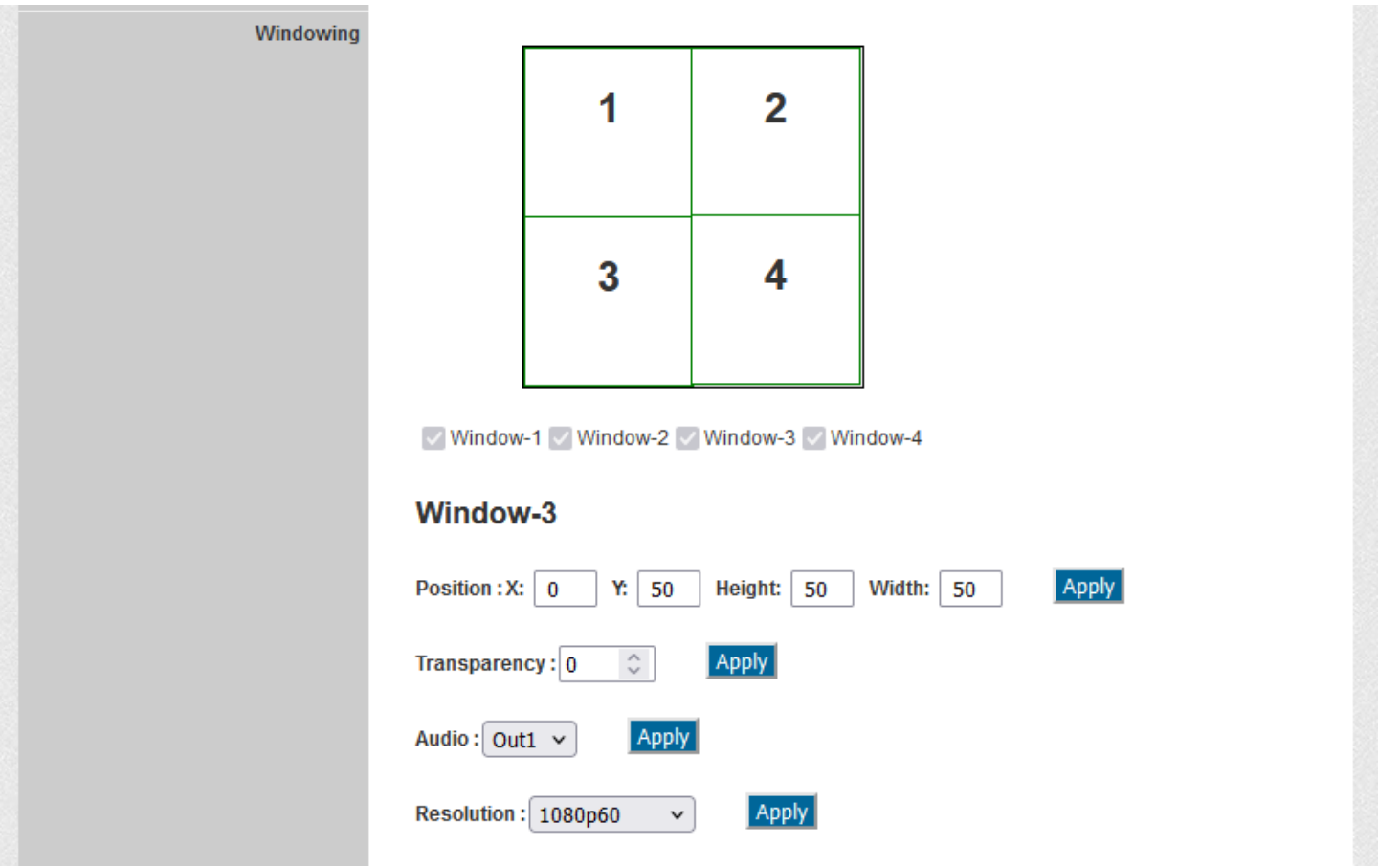
Video



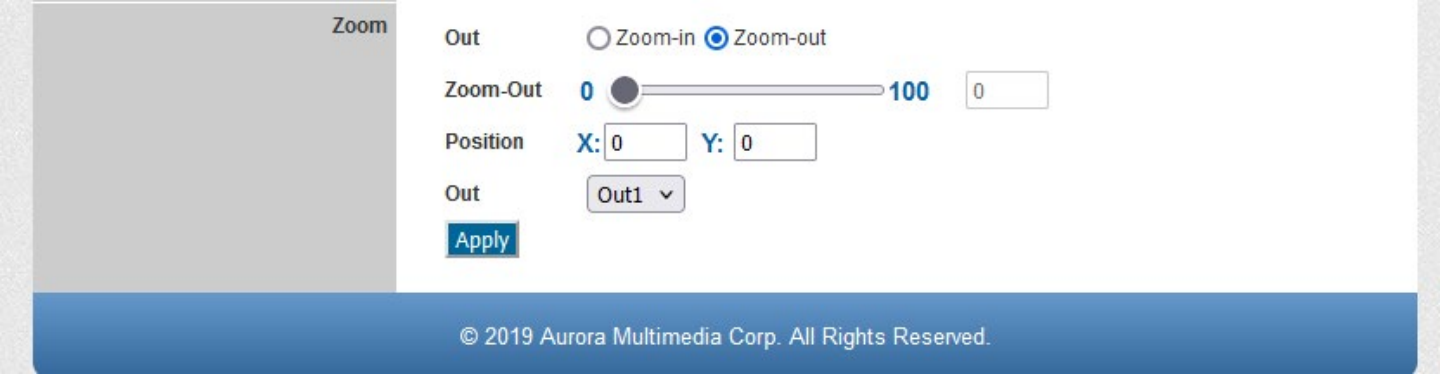
Video Route allows the user to set the input sent to each output, scaling, and if it is to be windowed.

Video Resolution Mode can select bypass, manual, and native.

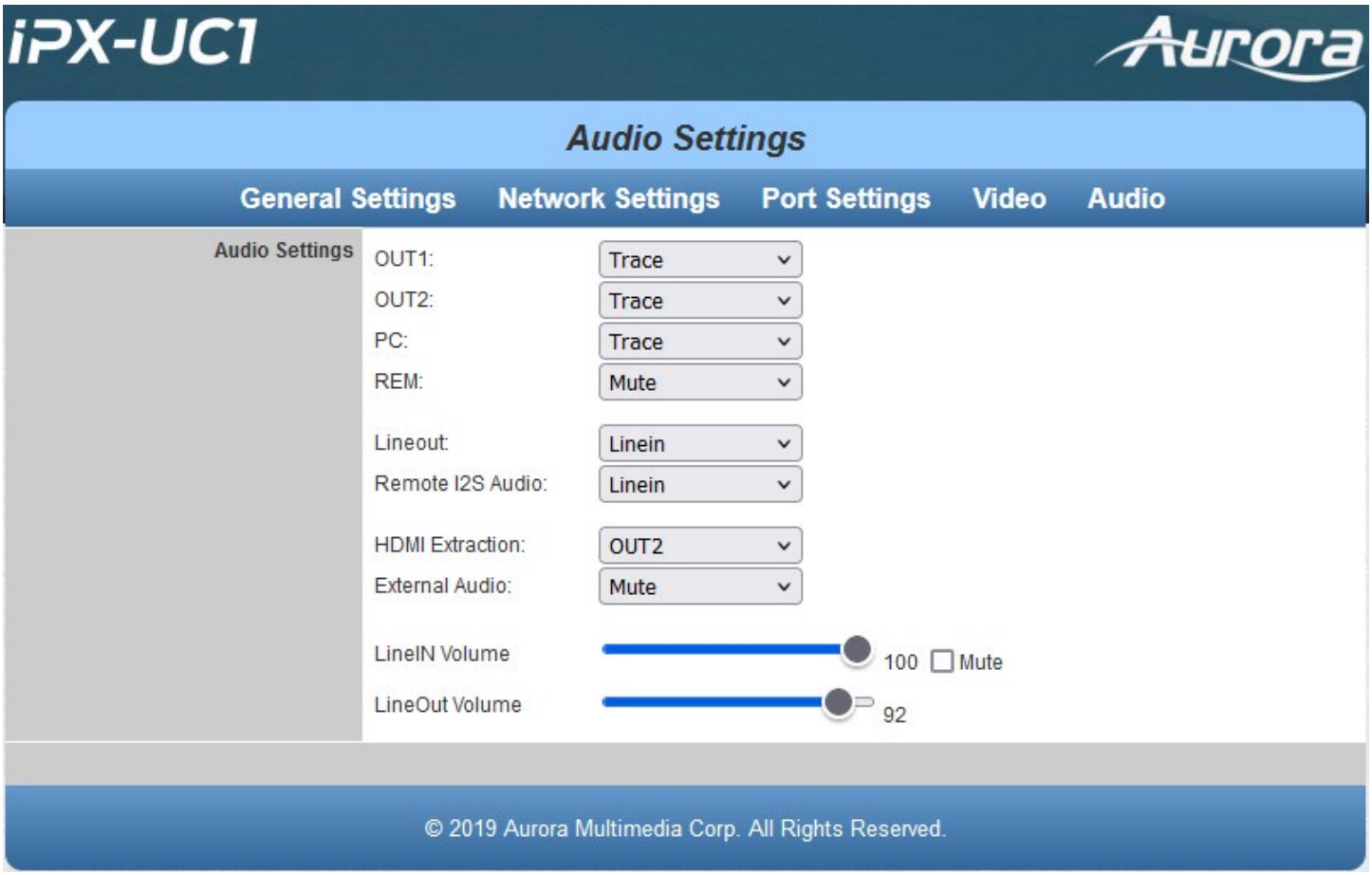
Preset selects a saved signal configuration of the IPX-UC1.



Windowing allows the positioning of each window, transparency, audio selection, and resolution.



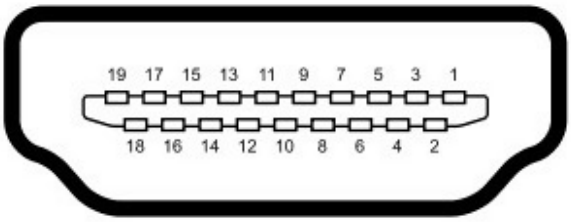
Zoom allows control of the output to zoom in or out and the XY position of the zoom.



Audio Settings allow selection and routing of the audio sources. It also controls the volume levels as well.

CONNECTOR PIN DEFINITION

HDMI

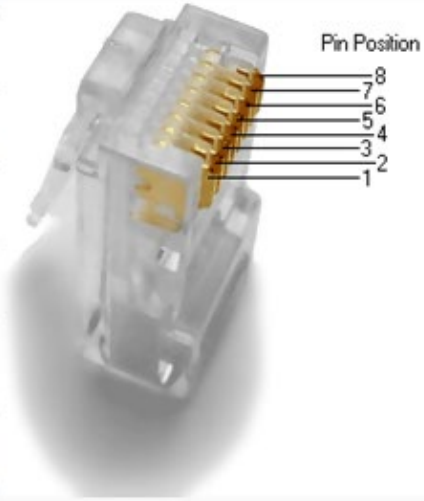


Type A (Receptacle) HDMI

Pin 1	TMDS Data2+	**Pin 8**	TMDS Data0 Shield	**Pin 15**	SCL
Pin 2	TMDS Data2 Shield	**Pin 9**	TMDS Data0–	**Pin 16**	SDA
Pin 3	TMDS Data2–	**Pin 10**	TMDS Clock+	**Pin 17**	DDC/CEC Ground
Pin 4	TMDS Data1+	**Pin 11**	TMDS Clock Shield	**Pin 18**	+5 V Power
Pin 5	TMDS Data1 Shield	**Pin 12**	TMDS Clock–	**Pin 19**	Hot Plug Detect
Pin 6	TMDS Data1–	**Pin 13**	CEC		
Pin 7	TMDS Data0+	**Pin 14**	Reserved (N.C. on device)		

CAT5e/6/6A

T568A and T568B Wiring

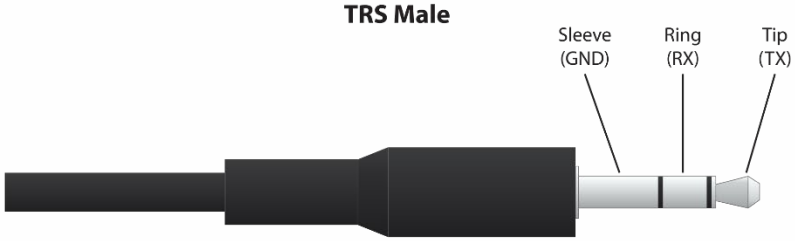
Pin	T568A Pair	T568B Pair	Wire	T568A Color	T568B Color	Pins on plug face (socket is reversed)
1	3	2	tip	white/green stripe	white/orange stripe	
2	3	2	ring	green solid	orange solid	
3	2	3	tip	white/orange stripe	white/green stripe	
4	1	1	ring	blue solid	blue solid	
5	1	1	tip	white/blue stripe	white/blue stripe	
6	2	3	ring	orange solid	green solid	
7	4	4	tip	white/brown stripe	white/brown stripe	
8	4	4	ring	brown solid	brown solid	

RS-232

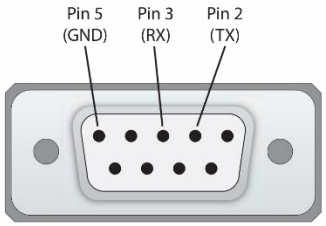
The RS-232 is a 3.5mm TRS connector. Tip is TX (output), ring is RX (input), and Sleeve is ground. To simplify connections Aurora offers pre-molded RS-232 cables in null and none nulled in male and female DB9.

CA0052 Selection Guide

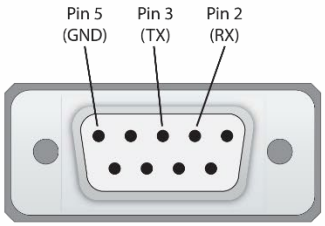
CA0052 (all versions)
TRS Male



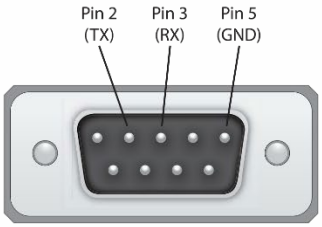
CA0052-F2T3R
DB9 Female (Crossover)



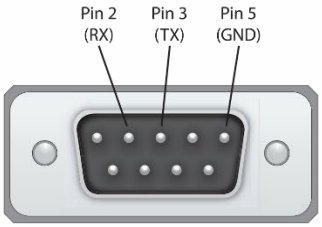
CA0052-F3T2R
DB9 Female (Straight)



CA0052-M2T3R
DB9 Male (Crossover)



CA0052-M3T2R
DB9 Male (Straight)



IR (Infrared)

It will autosense a TS or a TRS connector to determine if an IR emitter (TS) or IR receiver (TRS) is inserted. The IR receiver must be with carrier inverted to work. The tip is signal, ring is 5V, and sleeve is ground.

IR Receiver CA0026-1 (30kHz – 60kHz)

IR Receiver CA0026-1 (30kHz – 60kHz)

APPENDIX 1

Firmware Update & Protocol

For the latest firmware updates and protocol, please go www.auroramm.com.

You must sign up to the Customer Portal to download firmware with instructions on how to update. The protocol is only available to authorized Aurora dealers.

APPENDIX 2

Recommended Cabling

The IPX series uses industry standard cabling for both fiber and copper and should abide by network infrastructure standards. For the copper, unshielded cable is preferred for optimal performance. While any properly made cable will work with the IPX series the models below have been tested by Aurora with the IPX at full bandwidth and distance.

Fiber with Copper for Remote Power

Manufacturer: West Penn Wire

FI-GIG-GIDY-xx (Dual OM3 Multi-Mode Terminated Fiber with LC Connectors + 18/2 Power Cable) Giggidy Fiber Cables are pre-terminated with LC Connectors and have a Pulling Eye for easy pull and connectivity. Plenum Rated.

Note: Replace xx:75,100,125,165,230,330'). Comes with Pulling Eye!

Copper

When using copper, you should not have any tight bends and make certain excess is spooled as a figure 8. CAT6A will achieve a distance of 100m (330') with CAT6A, 55m with CAT6, and 40m with CAT5e.

Manufacturer: West Penn Wire

4246A (4 Pair 23AWG Cat6A 10G Rated (UTP) Unshielded Twisted Pair .309" O.D CMR Rated.

254246A (4 Pair 23AWG Cat6A 10G Rated (UTP) Unshielded Twisted Pair .308" O.D CMP Rated.

APPENDIX 3

Recommended Network Switches

The IPX will work with most non-blocking, IGMP 10G network switch. Layer 3 will allow more control; however, Layer 2 will work as well. It is highly recommended to communicate with the representative of the desired network switch brand to confirm configuration and capabilities. Below are some models that have been tested with the IPX Series. For a more complete listing, the IPX Series Network Switch Recommendations and Configuration guide can be found on the Aurora website. www.auroramm.com.

Switch Speed

The IPX Series requires the switch to be a 10GbE for the SDVoE operation.

IPX Series technology is used to transmit uncompressed video up to 4K along with other AV signals such as audio, USB, and control signals. For video alone, it means raw bandwidth of about 4 Gb/sec for HD and 8 Gb/sec for 4K mean a bandwidth of around 6 GB/s, and that just for video. It is therefore easy to understand why the IPX requires 10GbE network switches.

Packets Routing

To enable the transmission of a source to multiple destinations, IPX devices make use of Multicast. The default behavior of layer 2 Ethernet switch is to broadcast those packets which means that every packet will be transmitted to all possible destinations. Therefore, any network switch used with IPX Series has to support IGMP Snooping. IPX end points use IGMP protocol to assign the end points into multicast groups and the router uses IGMP snooping to efficiently route multicast packets only to receivers that want to receive them.

Many switches have the IGMP Snooping feature disabled by default and manual configuration is required. Often, a simple check mark near “Enable IGMP Snooping” is the only thing needed to enable IGMP Snooping. However, the implementation of IGMP Snooping is vendor specific and additional configuration is often needed.

An Ethernet switch can be informed that a device wants to leave a multicast channel by sending it an IGMP LEAVE GROUP packet. Once received, the time it takes for the switch to apply the new configuration may vary from one switch to the other. Most switches implement and include FASTLEAVE configuration option. When enabled, it takes much less time for a particular port to leave a multicast group to assign the port to a different multicast group. The end results are a noticeably shorter video switching time. Aurora recommends always enabling the FASTLEAVE option when available. With FASTLEAVE option, seamless switching is possible for 4K video sources. Without FASTLEAVE option, 'seamless' switching is limited to 1080P 60 Hz video signals.

Ethernet Switch Configuration

The following list includes all network switch configuration options that Aurora Engineers have come across so far. Look for these or similar options when configuring your switch.

1. Enable IGMP Snooping
    a. Must be enabled.
2. Enable IGMP Snooping on VLAN 1
    a. Must be enabled when all ports default to VLAN1.

3. Filter/Drop Unregistered Multicast Traffic
    a. If not applied, the behavior of the switch will be to broadcast multicast packets if the switch has no known destination for that packet.
    b. Must be enabled if found.
4. Unregistered Multicast Flooding
    a. Must be disabled if found.
5. Filter Unregistered Multicast (different wording than number 4 above)
    a. Must be enabled if found.
6. Enable IGMP Query
7. Enable IGMP Query on VLAN1
8. Set IGMP Version to IGMP V2
    a. Must be set if found.
9. Enable FASTLEAVE on Port X
    a. This is optional. Should be enabled, if found.
10. Enable FASTLEAVE for VLAN1
    a. This is optional. Should be enabled if found.

Ethernet Switch Models

The IPX Series Network Switch Recommendations and Configuration guide can be found on the Aurora website www.auroramm.com.

APPENDIX 4

Technical Specifications

Model Name	IPX-UC1-ULTRA
Technical	
Compression	Zero (4K30 4:4:4/4K60 4:2:0), 1.3:1(4K60 4:4:4)
Latency	Zero Frame Latency (100us without Scaling, 3ms with Scaling)
HDMI Outputs	Two HDMI 2.0 External & Two Internal (SDVoE & Capture)
Audio Analog	Stereo Line In/Out
SFP+	1G for Processor or 10G for SDVoE (Single Mode or Multi-Mode)
10G Copper Ethernet	RJ-45 330ft(100m) with CAT 6A PoE
1G LAN	RJ-45 10/100/1000M PoE
Video Bandwidth	600MHz
Video support	Up to 4K2K 4:4:4 @60Hz
Audio support	Up to 32 channels & Break-away Capable
RS-232	Up to 115k Baud
IR	30KHz-60KHz
USB Function	USB 1.1 Standard 10Mbps or USB 2.0 480Mbps
USB Connectors	ExtremeUSB 2 x USB 2.0 Type A, 1 x USB 2.0 Type-C Processor USB 2.0 Type A, USB Type-C 3.1
Expansion Ports	Processor, ExtermeUSB® & Dante®, (Populated for Ultra)
Interface	IR or Keypad for OSD and OLED, Webserver, IPBaseT Manager
Scaler	
Bandwidth	4K60 4:4:4
Scaling Processors	Quad Scaler Processors
Effects	Image Rotation, Videowall, Windowing, OSD, Edge Blending, Chroma Keying

Pattern Generator	Color Bar, Moving Pattern, Hash, & More
Processor	
Processor	Intel® NUC Element 12th Gen (Core i5-1325U, Core i7-1255U)
Memory	16GB(i5)/32GB(i7) RAM
Storage	1TB
Graphics	Intel® Iris® Xe (12th Generation)
HDMI Output	2 HDMI 4K60 4:4:4 Connected to internal Switch for Selection
HDMI Input	1 HDMI 4K60 4:2:0/4K30 4:4:4 Connected Internally to Output of Scaler
Audio	Internally Connected
Wi-Fi	Intel Wi-Fi 6e AX211 (802.11ax)
USB 3.1	2 Type A, 1 Type-C

Mechanical	
Housing	Black Aluminum Enclosure
Dimensions [L x W x H]	10.5" x 8" x 1.22"
Weight	4.3lbs
Mounting	Rack mount (optional) and included under table/wall mount
Power supply	100 Watt USB-C or PoE++ 85W (LAN)
Max Power consumption	100 Watts
Operation temperature	0~40°C [32~100°F]
Storage temperature	-20~60°C [-4~140°F]
Relative humidity	20~90% RH [no condensation]

Note: Specifications subject to change without notice.

APPENDIX 5

Warranty

Limited 5 Year Warranty

Aurora Multimedia Corporation (“Manufacturer”) warrants that this product is free of defects in both materials and workmanship for a period of 5 years as defined herein for parts and labor from date of purchase. This Limited Warranty covers products purchased in the year 2019 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 the 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, the 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.

The 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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