

User Manual

WOXCON

IPA400TR/ IPA400TR-P

4K IP Streaming Extender (with Preview)



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Version: IPA400/ IPA400TR-P_2020V1.0

Preface

Read this user manual carefully before using the product. Pictures shown in this manual are for reference only. Different models and specifications are subject to real product.

This manual is only for operation instruction, please contact the local distributor for maintenance assistance. The functions described in this version were updated till March, 2020. In the constant effort to improve the product, we reserve the right to make functions or parameters changes without notice or obligation. Please refer to the dealers for the latest details.

FCC Statement

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. It has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial installation.

Operation of this equipment in a residential area is likely to cause interference, in which case the user at their own expense will be required to take whatever measures may be necessary to correct the interference.

Any changes or modifications not expressly approved by the manufacture would void the user's authority to operate the equipment.



SAFETY PRECAUTIONS

To ensure the best performance from the product, please read all instructions carefully before using the device. Save this manual for further reference.

- Unpack the equipment carefully and save the original box and packing material for possible future shipment.
- Follow basic safety precautions to reduce the risk of fire, electrical shock and injury to persons.
- Do not dismantle the housing or modify the module. It may result in electrical shock or burn.
- Using supplies or parts not meeting the products' specifications may cause damage, deterioration or malfunction.
- Refer all servicing to qualified service personnel.
- To prevent fire or shock hazard, do not expose the unit to rain, moisture or install this product near water.
- Do not put any heavy items on the extension cable in case of extrusion.
- Do not remove the housing of the device as opening or removing housing may expose you to dangerous voltage or other hazards.
- Install the device in a place with fine ventilation to avoid damage caused by overheat.
- Keep the module away from liquids.
- Spillage into the housing may result in fire, electrical shock, or equipment damage. If an object or liquid falls or spills on to the housing, unplug the module immediately.
- Do not twist or pull by force ends of the optical cable. It can cause malfunction.
- Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.
- Unplug the power cord when left unused for a long period of time.
- Information on disposal for scrapped devices: do not burn or mix with general household waste, please treat them as normal electrical wastes.

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1. Product Introduction

The IPA400TR/ IPA400TR-P is a network AV Transceiver with HDMI input and output up to resolution 4K@60Hz 4:4:4, HDR. It is designed for HDMI transmission over IP network with external audio and control signals at distances up to 300m over OM3 fiber optic cable. It works with one control PC (Wake on LAN) and one 10GbE Switch to control a variety of functions.

The IPA400TR/ IPA400TR-P provides one of the most advanced IP Streaming solutions on the market utilizing AptoVision BlueRiver™ NT+ technology, which synergizes various IP/AV standards to work together as one. It combines a variety of 4K IP technologies and features under one unified protocol using a simplified topology.

The IPA400TR/ IPA400TR-P features uncompressed video with zero-latency from transmitter to receiver, seamless switching, Video wall, Multi-view, 1G Ethernet, IR, RS232, audio embedding/de-embedding, audio down-mixing, etc. It can be controlled by the IPA Manager software.

Compares with traditional HDBaseT matrix AV Switching, IPA400TR/ IPA400TR-P features low cost, easy installation, more interoperability and flexibility. It is ideal for distributing AV over 10 Gigabit Ethernet in enterprises and other large-scale installations.

1.1 About 10G Network

Unlike traditional AV extension technology, such as HDBaseT, where transmitters and receivers are connected point to point or joined together using custom matrix switches, the IPA400TR/ IPA400TR-P is based on the inter compatible BlueRiver™ NT+ technology and connected using standard, off the shelf 10G Layer 2/3 network switches.

This architecture makes use of data packages that can be easily and independently routed to the desired unit. A variety of transmission modes is possible this way, from one unit to another unit (point to point) or one unit to many units (point to multipoint) or many units to many units (multipoint to multipoint) with a software controllable video wall integration.

An added benefit of packet data transmission is that each signal type (video, audio, RS232, etc.) is routed independently and not necessarily to the same destination. For example, the HDMI video from a particular unit is routed to other 4 units, while the audio goes to all receivers in the setup.

This unlimitedly scalable and independent signal routing enables multiple, scalable applications, including signal extension, splitting, switching, matrixing, and video wall functionality.

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1.2 Features

- BlueRiver™ NT+ technology. Flexible used as either transmitter or receiver.
- Streams uncompressed video with zero-latency, audio, and control, with the flexibility of transmitting them together or to separate network destinations.
- Supports HDMI input and output video resolution up to 4K@60Hz 4:4:4 8bit, 1080P 3D.
- 18Gbps high bandwidth and supports HDR 10 and Dolby Vision.
- Transports RS232 and IR signal to any units by using Unicast or Broadcast IPV4 protocol or local control by API server.
- IPA400TR/ IPA400TR-P series are configurable HDCP 2.2 compliant.
- Supports arbitrary Multi-view layout.
- Supports Video Wall mode up to 5x5 screens.
- Selectable output resolutions up to 4K scaling ability.
- Transmitter route HDMI audio, external audio as an independent streaming for receiver embedding.
- BlueRiver NT+ Series is compatible with SDVoE, offering zero-latency AV-over-IP with true 4K@60 and video processing.
- IPA400TR-P supports video preview on the IPA manager software, while IPA400TR can't.

1.3 Package List

IPA400TR/ IPA400TR-P:

- 1x IPA400TR/ IPA400TR-P
- 2x Mounting Ears with 2 Screws
- 4x Plastic Cushion
- 1x 3-pin Terminal Block
- 1x Power Adaptor (12V DC 2A)
- 1x Multi-mode Modular
- 1x User Manual

Note: Please contact your distributor immediately if any damage or defect in the components is found.

2. Specification

Input	
Video Input	(1) HDMI
Video Input Connector	(1) Type-A female HDMI
HDMI Input Resolution	Up to 4Kx2K@60Hz 4:4:4 8bit
Audio Input	(1) AUDIO
Audio Input Connector	(1) 3.5mm jack
Output	
Video Output	(1) HDMI
Video Output Connector	(1) Type-A female HDMI
HDMI Output Resolution	Up to 4Kx2K@60Hz 4:4:4 8bit
Audio Output	(1) AUDIO
Audio Output Connector	(1) 3.5mm jack
General	
Control	(1) 10G LAN, (1) IR IN, (1) IR OUT, (1) RS232, (1) ETHERNET
Control Connector	(1) RJ45, (1) SFP+, (2) 3.5mm jack, (1) 3-pin terminal block
Power Consumption	18W (Max);
Operation Temperature	-10°C ~ +55°C
Storage Temperature	-25°C ~ +70°C
Relative Humidity	10%-90%
Dimension (W*H*D)	230.0mm x 25mm x 120.0mm
Net Weight	0.85KG

3. Panel Description

3.1 IPA400/ IPA400TR-P Front Panel



① **POWER LED:** The LED illuminates green when power is applied.

LINK LED: The LED indicates if data are transmitted.

- LED on: Packets are not transmitted
- LED blinking: Packets are transmitted

VIDEO LED: The LED illuminates green when the stable video signal is detected.

ETHERNET LED: The LED illuminates green if data are transmitted.

② **HDMI IN LED:** The LED illuminates green when video signal is detected.

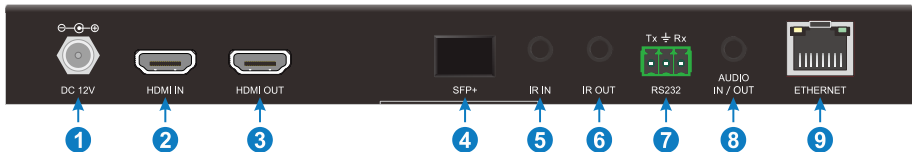
HDMI OUT LED: The LED illuminates green when video signal is detected.

TX LED: The LED illuminates green when the unit is deemed as transmitter.

RX LED: The LED illuminates green when the unit is deemed as receiver.

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3.2 IPA400/ IPA400TR-P Rear Panel



- ① **DC 12V:** DC port for AC power adapter connection.
- ② **HDMI IN:** Type-A female HDMI port to connect HDMI video source device.
- ③ **HDMI OUT:** Type-A female HDMI port to connect HDMI display device.
- ④ **SFP+:** LC port to connect Network Switch with fiber module.
- ⑤ **IR IN:** 3.5mm jack to connect an IR receiver for IR routing control.
- ⑥ **IR OUT:** 3.5mm jack to connect an IR emitter for IR routing control.
- ⑦ **RS232:** 3-pin terminal block for RS232 routing control. Supports point to point unicast and point to multipoint broadcast configuration.
- ⑧ **AUDIO IN/OUT:** 3.5mm jack to connect an audio source or output device.
- ⑨ **ETHERNET:** RJ45 port to connect control devices (such as PC) for system control via software and Ethernet pass-through. The PC can also be indirectly connected to the network switch.

4. System Connection

4.1 Usage Precaution

- Make sure all components and accessories are included before installation.
- The system should be installed in a clean environment with proper temperature and humidity.
- All of the power switches, plugs, sockets, and power cords should be insulated and safe.
- All devices should be connected before being powered on.

4.2 Connection Type

There are three types of possible applications:

Extender (Point-to-Point)

In a point-to-point configuration, there is no need for a switch. Distribute full, uncompressed data up to 4K@60Hz 4:4:4 resolution as well as 1G Ethernet, audio and control signals over a single copper cable.

Splitter (One-to-Many)

With only one IPA400TR/ IPA400TR-P as transmitter and one 10G Ethernet switch, any A/V signal can be flawlessly and instantly distributed to a near limitless number of receivers and screens, any number of times.

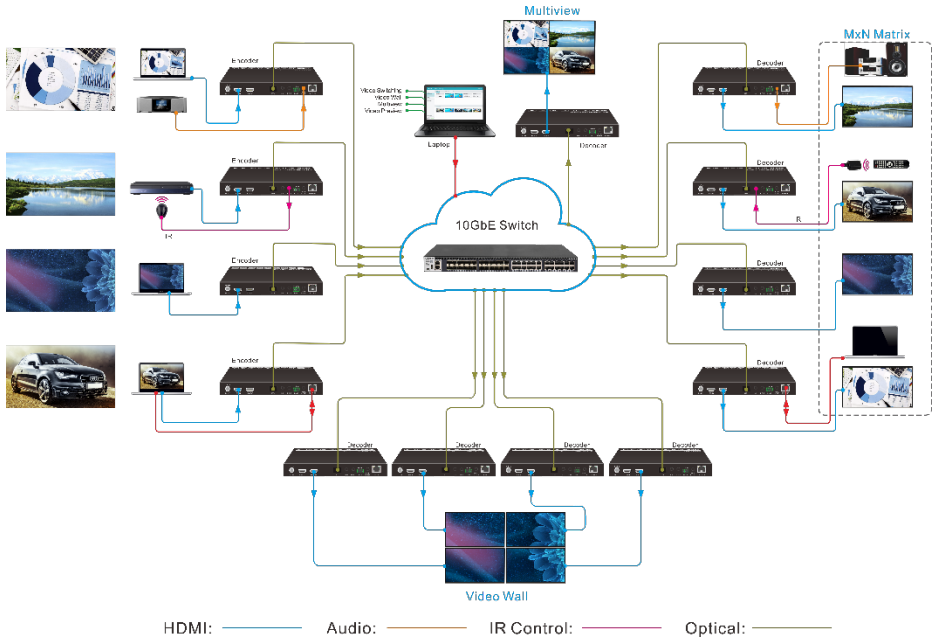
Matrix Switcher (Many-to-One, Many-to-Many)

The combination of switching and splitting enables a completely scalable matrix system. Independently route video, audio and control signal from any source to any endpoint.

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4.3 System Diagram

The following diagram illustrates typical input and output connections that can be utilized with the IPA400TR/ IPA400TR-P:



Matrix System

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4.4 Hardware Setup

Please follow the steps below to complete the system installation:

- 1) Connect the power supply (12V DC) to the power connectors.
- 2) Connect the video/graphics source device to the HDMI input connector on each TX unit.
- 3) Connect the video display device to the HDMI output connector on each RX unit.
- 4) (Optional) Connect audio sources to the audio input connector of the TX if you want to test additional audio extension.
- 5) (Optional) Connect audio output device (e.g. speaker or headphone) to the audio output connector of the RX if you want to test additional audio extension.
- 6) (Optional) Connect RS232 devices as needed if you want to test RS232 serial extension between TX and RX units.
- 7) (Optional) Connect GbE compatible Ethernet devices as needed for testing the 1 Gig Ethernet ports of any TX or RX units.
- 8) (Optional) Connect compatible IR emitter modules to the IR output connectors of any TX or RX.
- 9) (Optional) Connect compatible IR receiver modules to the IR input connectors of any TX or RX.
- 10) Connect a 10G Ethernet cable (Cat-6a recommended) from the 10GbE port each TX and RX unit to any available 10GBaseT port.
- 11) Connect the control PC to the GbE port of any IPA400TR/ IPA400TR-P device or to a Cat-x port of the 10GbE switch (except the management/console port of the switch).
- 12) The hardware setup is now complete.
 - *Note that any unit can also be connected directly to each other without the 10GbE switch in the middle using Cat-x cable to test point to point functionality.*
 - *Note that in order to test switching functionality through a 10GbE switch; you must use a 10GbE layer 2, layer 3 switch with IGMP snooping capabilities. Ensure that*

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the IGMP snooping setting is enabled and broadcast setting is disabled using the appropriate configuration software provided the switch manufacturer.

5. Operation of IPA Manager

5.1 General Information

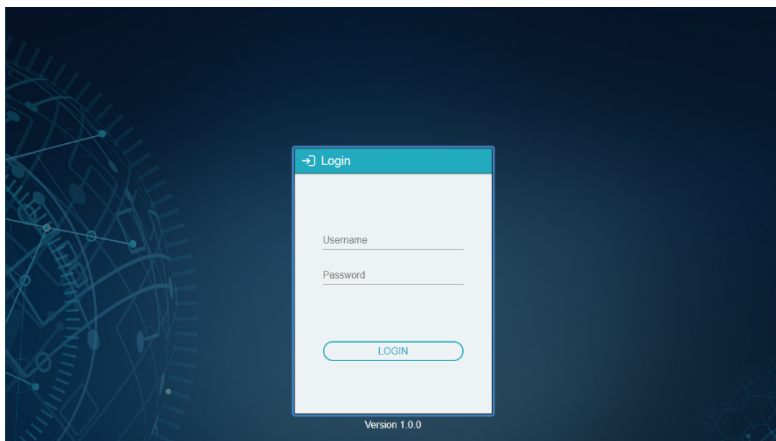
The IPA Manager is a demonstration control software used to configure and control signal extension, routing and switching between IPA400TR/ IPA400TR-P units.

The IPA Manager includes Web GUI version and Windows PC version.

The control PC can be connected to the ETHERNET port of any device or to any RJ45 port of the 10GbE switch except the management/console port of the switch which is not part of the network.

Before proceeding, make sure all the units are powered ON. Then ensure that the IP addresses of PC and all the units are on the same local area network (LAN).

Start the application by double clicking on **IPA Manager.exe** file. If you receive a pop-up asking for network access confirmation, make sure that both Private and Public networks are allowed.



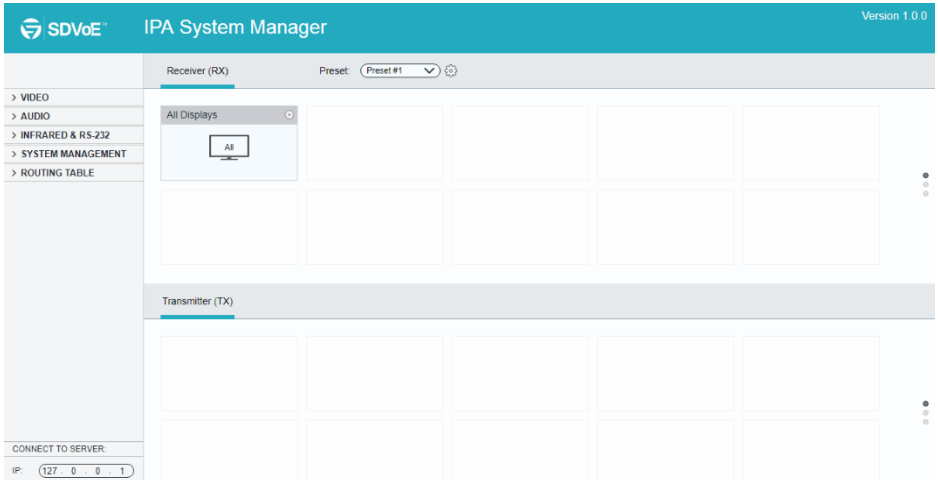
Username: admin

Password: admin

Please type the username and password, and then click **Login**.

Upon launch, the IPA Manager's main interface will appear as shown in the picture below:

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5.2 Device Configuration

Before starting the IPA Manager application, make sure it is connected either directly to the network switch or to the Gigabit Ethernet port on one of the devices. Now launch the application. Upon launch, the IPA Manager main window will open up in the “Video Switching” tab. It will discover all the devices on the network and display them inside the application.

All connected devices on the network will appear as a gray tiles within the application window.

Each tile will identify the “Hostname” of the device. The default device “Hostname” is the MAC address. Note that the “Hostname” can be updated at any time. The “IP Address” of the device is also indicated within the tile. Click the ^ icon to gather more information about the device.

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5.3 Start IPA Manager

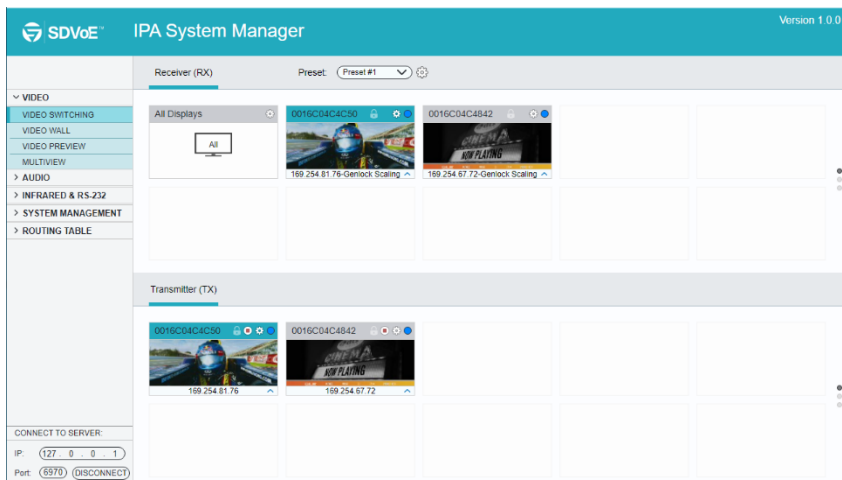
Start the evaluation by launching the Manager Client.

The application will start and appear as illustrated below.

First, connect to the Control Server by entering the IP address of the device running the NT Control Server and click **CONNECT**.

Note:

- If the Control Server is running on the same machine, as the client, use the IP address 127.0.0.1, which is the IPV4 loop-back address for "localhost".
- Do not modify the default port number of 6970. The Control Server currently only listens to port 6970.



After connecting to the Control Server, the IPA Manager will show discovered devices as tiles. There are few things to take note of:

- The application features many different tabs to control the HDMI routing, as well as routing of other signals such as analog audio, RS232 control, etc. The default current tab should be "Video Switching", meaning that the video source displayed by an RX device (Receiver).
- The top area of the user interface is labeled "Receivers". All devices detected on the network will appear here.
- The bottom area of the user interface is labeled "Transmitters". All devices detected on the network will appear here.

5.4 Video Routing Tab

The "Video Routing" tab is used to manage signal routing between TX and RX devices. There are different video modes available:

Genlock Mode

This mode simulates a cable connection. When Genlock is selected, the output is a byte-by-byte replication of what was received from the source.

The primary benefit is a very low (zero-frame) latency between source and displays. The display is genlocked to the source as if it is directly connected.

In cases of the input video having a too large bandwidth to fit into a 10G network link (e. g. 4K @60Hz, 4:4:4) the video is slightly compressed to bring the stream down below the 10G limitation of the network.

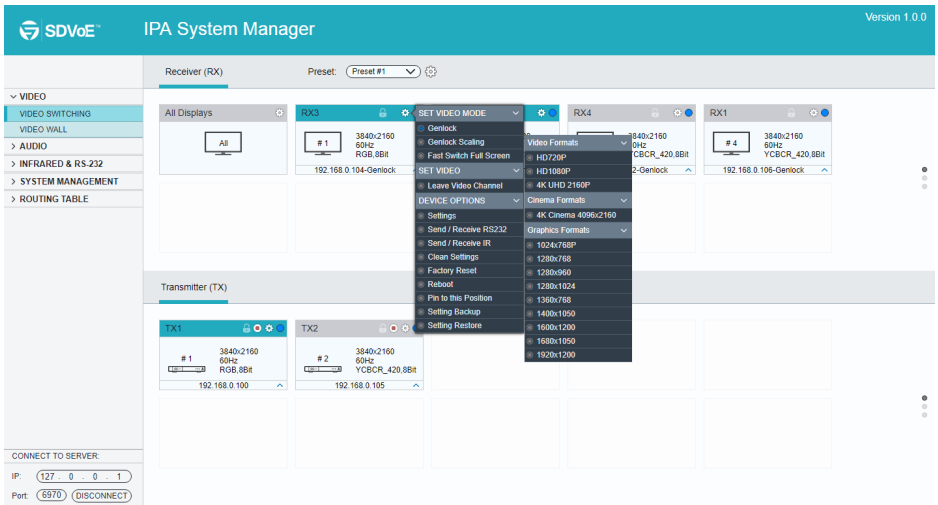
Fast Switch Mode

Fast source switching, seamless to the human eye with about 1-2 frames transmission delay as well as output scaling of resolution and frame rate.

Genlock Scaling Mode

This mode combines the low latency and source locking benefits of the Genlock Mode with the output resolution (not frame rate) scaler found in the Fast Switch Mode.

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5.4.1 Video Switching

This is an example of joining TX and RX devices in "Genlock Mode":

- 1) Verify that the RX tile is displaying that the device is currently in "Genlock Mode". If Genlock is not the currently active mode, apply the setting as described:
 - a) Right mouse click the gear icon on the respective Receiver (RX) tile.
 - b) In the appearing menu, select "Genlock" as Video Mode.
- 2) Joining the RX to TX.
 - a) In the Transmitter (TX) section, select a TX by clicking on its associated active tile using the left mouse button.
 - b) Hold down the left mouse button and drag the TX tile over the RX tile it is to be joined with. Then release the mouse button to drop the TX tile onto the RX tile.
 - c) TX and RX are now joined.

The video source connected to the Transmitter (TX) now appears on the display connected to the respective Receiver (RX).

If the video is not being displayed, please verify the following:

- Ensure that the network switch has been properly configured.
- Confirm that the display can support the input source resolution.
- Verify that the HDMI cable being used is of good quality. This is particularly

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important for high-bandwidths of up to 18Gbps with 4K@60Hz resolution, requiring a "HDMI Premium High Speed" cable.

To assign a different input source to a Receiver (RX), repeat the steps mentioned above, dragging a different TX over an RX to associate the receiver itself to the new source device.

Note: For "Fast Switch Mode" and "Genlock Scaling", please refer to "Genlock Mode".

5.4.2 Sending Single Source to All RX Devices

To send the same source signal input to all receivers at the same time, simply drag and drop the TX unit that the desired source is connected to onto the blue tile in the Receiver (RX) section, labeled "All Displays".

Comment: To verify, which RX and TX are joined together, left-click on the Receiver (RX) or Transmitter (TX) tile you want to see the connection status for. All the joined tiles will be highlighted in blue.

5.4.3 Stopping/Starting Video

To stop video being transmitted from a Transmitter (TX), right click the gear icon of the respective Transmitter (TX) and select "Stop Video".

To start or restart a video transmission, right click the gear icon of the respective Transmitter (TX) and select "Start Video".

5.4.4 Disconnecting Source from RX

To disconnect a Receiver (RX) from a Transmitter (TX) source, right click the gear icon of the respective RX tile and select "Leave Video Channel".

5.4.5 Preset Management

To rename a preset, delete a stored preset or save the current video switching setting, recall a saved preset by selecting **preset #1~9** and click the gear icon to select the desired option: Rename, Clear Preset, Save Preset, Recall Preset.

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The screenshot displays the SDVoE IPA System Manager interface, Version 1.0.0. The interface is divided into several sections:

- Header:** SDVoE IPA System Manager (Version 1.0.0)
- Left Navigation Menu:**
 - VIDEO
 - VIDEO SWITCHING
 - VIDEO WALL
 - VIDEO PREVIEW
 - MULTIVIEW
 - AUDIO
 - INFRARED & RS-232
 - SYSTEM MANAGEMENT
 - ROUTING TABLE
- Receiver (RX) Section:**
 - Receiver (RX):** Preset: Preset #3
 - PRESET OPTIONS:** Rename, Clear Preset, Save Preset, Recall Preset
 - All Displays:** A dropdown menu showing "All".
 - Display 1:** 0016C04C4C50, 199.254.81.76, Genlock Scaling
 - Display 2:** 199.254.67.72, Genlock Scaling
- Transmitter (TX) Section:**
 - Display 1:** 0016C04C4C50, 199.254.81.76
 - Display 2:** 0019C04C4842, 199.254.67.72
- CONNECT TO SERVER:**
 - IP: 127.0.0.1
 - Port: 6970 (DISCONNECT)

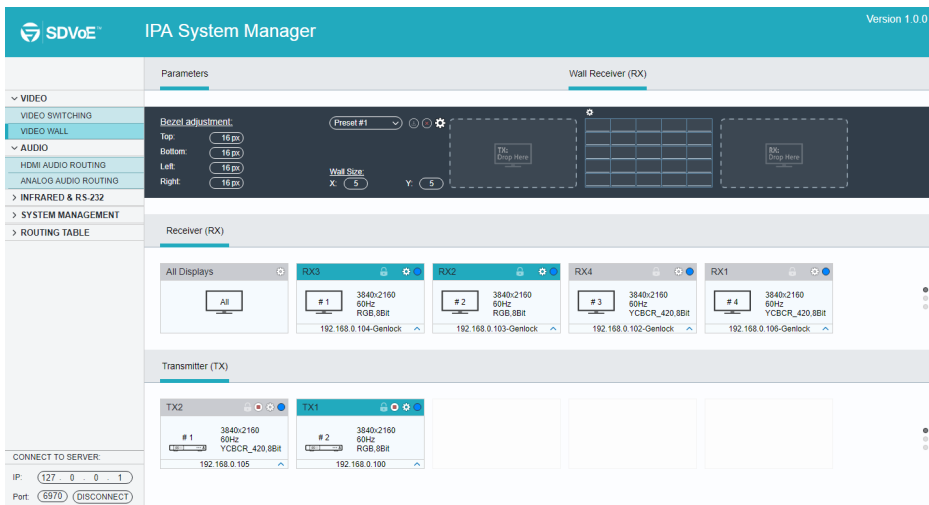
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5.5 Video Wall Routing Tab

The tab "Video Wall" allows for a single source signal (TX) to be assigned to multiple Receiver (RX) units and displayed across multiple screens, appearing as a single video wall. The figure below illustrates the "Video Wall" routing tab inside the IPA Manager. The top portion is reserved for configuring and setting up the video wall, while the bottom half lists all available TX (Transmitter) and RX (Receiver) units.

The video wall size can be adjusted by changing the number of rows and columns. The values for "bezel correction" represent the absolute amount of pixels. The default value is set to 16 pixels. Increase this value to adjust for thicker bezels while a value of zero would indicate no bezel correction at all is to be applied.

Note: The source signal must be progressive scan.



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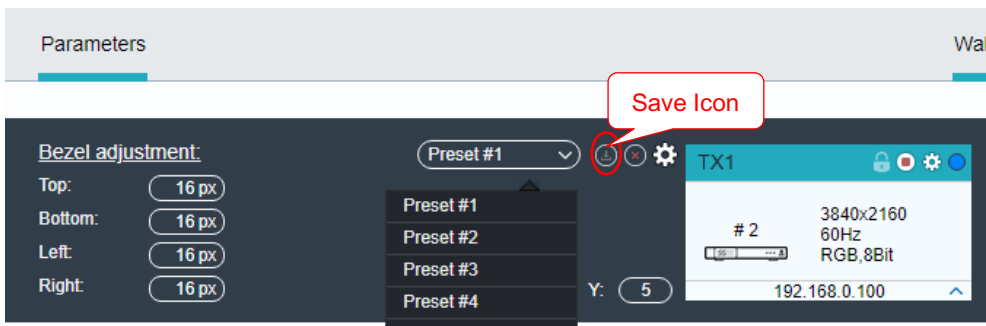
5.5.1 Configuring a Video Wall

- 1) Set the Video Wall size
 - a) Enter the number of rows and columns for the video wall (max. 5x5) in the section "Parameters"
- 2) Drag and drop Receiver (RX) units individually onto the video wall receiver tile.
 - a) Left click on a tile in the "Video Wall" section to select it.
 - b) Drag and drop the desired Receiver (RX) devices onto the tile labeled "RX: Drop Here".
- 3) Next, drag the desired Transmitter (TX) source tile and drop it onto the tile labeled "TX: Drop Here".
- 4) The source will now be visible across the whole Video Wall matrix, according to your configuration.
- 5) Adjust the bezel correction values (top-right-bottom-left), to fit the bezel thickness of the connected displays.

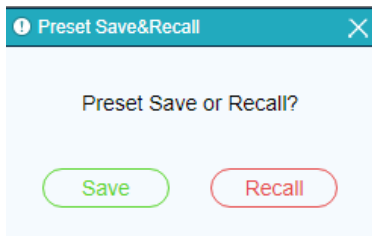
Comment: To apply new bezel values, it may be necessary to allocate the Transmitter (TX) again to the video wall.

5.5.2 Preset Management

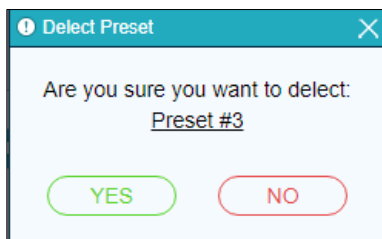
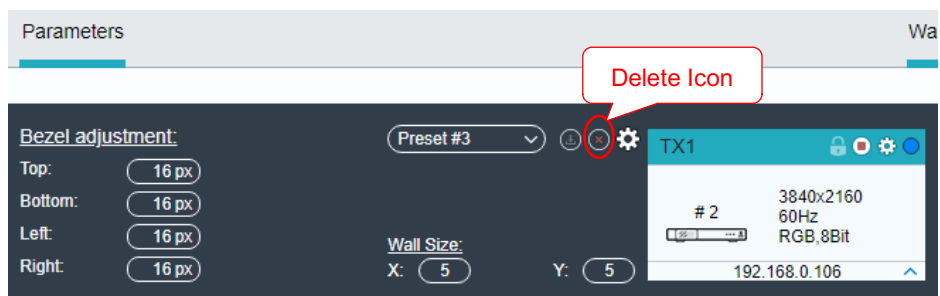
To save the current video wall settings or recall the previously stored setting, select **Preset #1~9** and click the save icon to save or recall a preset.



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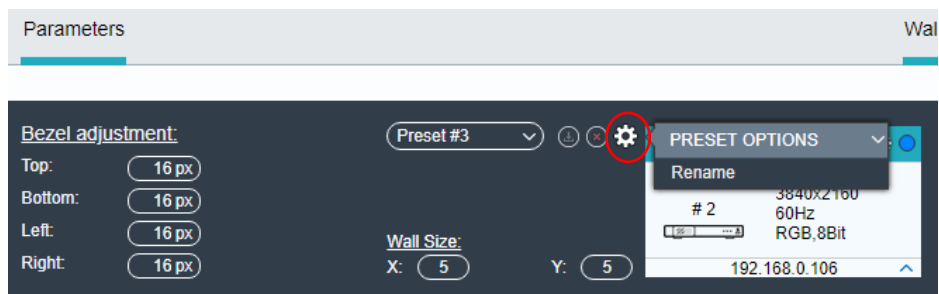


To delete a preset, select one and then click the delete icon to delete it.



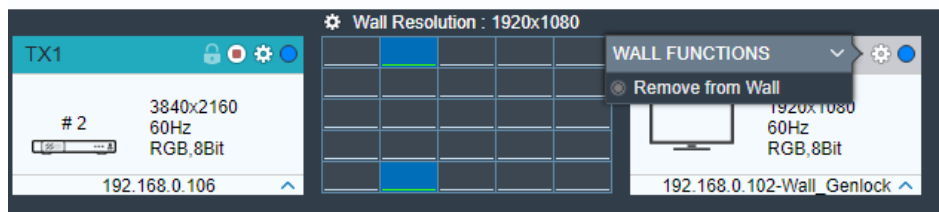
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To rename the desired preset, select it and click the gear icon, then type the new name in the textbox and click "Y" to save.



5.5.3 Removing Receiver (RX) from Video Wall

To remove a Receiver (RX) from the Video Wall, click the gear icon on the receiver tile that is to be removed and select the option "Remove from Wall".



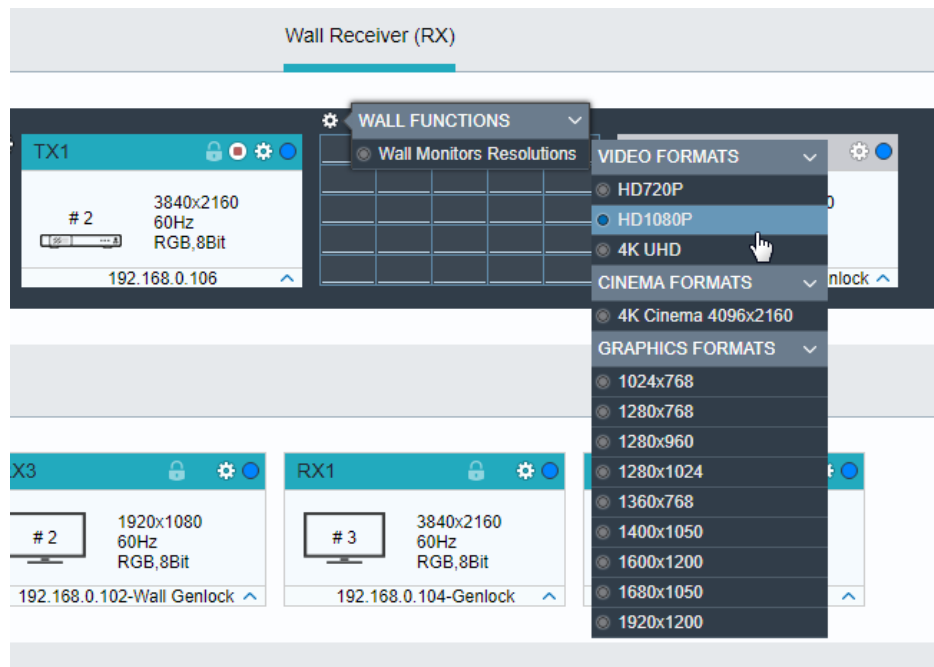
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5.5.4 Changing Output Resolution for Video Wall Receivers

To control the receiver's output resolutions, click the gear icon on the video wall selection.

Select "Wall Monitors Resolutions" and choose the desired resolution from list of available resolutions.

The selected output resolution is applied to all receivers being part of the video wall.

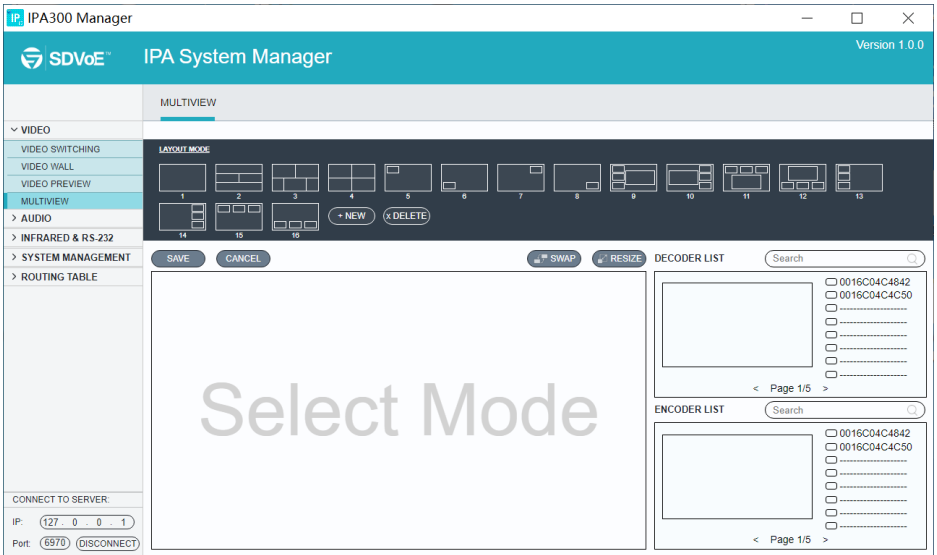


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5.6 Multi-View Routing Tab

The tab "Multi-View" allows a single display (RX) to show multiple source signal (TX) as Multi-View. The figure below illustrates the "Multi-View" routing tab inside the IPA Manager.

The top portion is reserved for selecting Multi-View mode, while the bottom half is for selecting TX (Transmitter) and RX (Receiver) units.



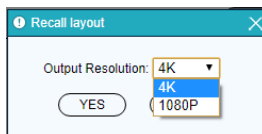
5.8.1 Configuring a Multi-View

1) Select a Multi-View mode

- a) Click a layout mode showed on the top portion.



- b) Select the output resolution (4K or 1080p).



- c) Drag and drop the RX (Decoder) you want to configure from the Decoder list.

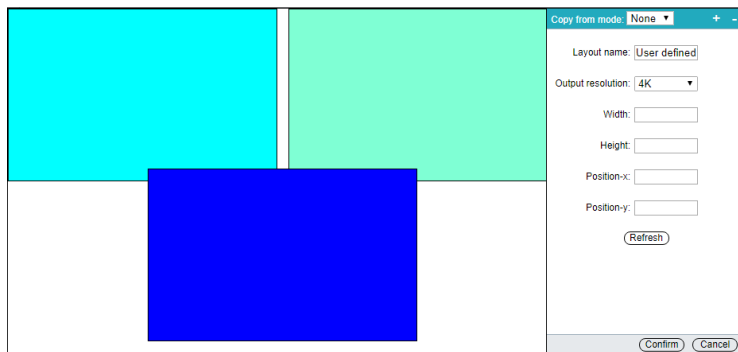
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d) Drag and drop the TX (Encoder) to fill the Multi-View mode.

5.8.2 Create user-defined Multi-view mode.

a) Click the "+NEW" button.

b) Click the "+" to add screen and each screen can be configured.



c) Click the "Confirm" button to save the mode.

5.7 HDMI Audio Routing Tab

IPA routes HDMI audio separately from the video signal, e. g. for routing the audio to additional or different Receivers (RX).

Exception:

In "Genlock Mode", the HDMI audio follows the video when one or more Receivers (RX) are joined with one Transmitter (TX) from any of the video routing tabs ("Video Wall", etc.). Simply put: When an RX device is in "Genlock Mode", it receives both the HDMI video and the HDMI audio signals from a single source. The same also applies for all video switching modes, when no separate HDMI audio stream is enabled.

To route the HDMI audio signal, select the tab "HDMI AUDIO ROUTING".

All RX devices are listed in the top half of the Receiver (RX) section. Similarly, all TX devices are listed in the bottom half in the Transmitter (TX) section.

First, verify if appropriate TX and RX units are joined together to route their HDMI audio signal:

- 1) Verify, if the Receiver (RX) is currently joined to an appropriate Transmitter (TX).
 - a) Click on the RX to highlight the TX it is joined to in blue.
 - b) Selecting the respective TX will highlight all the receivers joined to the same TX.

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- 2) If the respective Transmitter (TX) is currently not joined to the Receiver (RX), proceed to join them:
 - a) In the Transmitter (TX) section, select a TX by left-clicking on its associated active tile.
 - b) Drag and drop the TX tile over the RX tile to join them.
 - c) TX and RX are now joined together.
 - d) Repeat above steps, if additional receivers are to be joined to the same TX.

To control, if the HDMI audio is being delivered on the HDMI or the analog output port, complete the following steps:

- 1) Right click the gear icon on a Receiver (RX) tile and select "Settings" in the menu.
- 2) To route audio to the HDMI output, select the "HDMI Audio Output" tab and then choose one of the following options:
 - a) Analog Audio: Select the stream from the analog audio input of the TX to embed it into the HDMI output signal.
 - b) HDMI Audio (Stereo Downmix): Select the audio stream from the HDMI input of any TX to embed it into the HDMI output signal. If the HDMI audio stream is multichannel PCM audio, it will be downmixed to 2-channel PCM audio.
 - c) HDMI Audio (All Available Channels): Select the audio stream from the HDMI input of any TX to embed it into the HDMI output signal. The multichannel HDMI audio will not be downmixed.
- 3) To send the audio to the analog output connector (mini XLR), select the "Analog Audio Output" tab and choose "HDMI Audio (Downmix)" from the pull-down menu.
- 4) Click "Save" to apply changes.
- 5) The sound device connected to the analog audio output of the RX will now play out the HDMI audio stream.

Tipp: If no audio is playing, confirm that the TX device is actually streaming. Also, verify the RX audio output settings are correct.

Note: Downmixed 2-channel audio is not available for proprietary Dolby or DTS audio formats.

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SDVoE™
IPA System Manager
Version 1.0.0

Receiver (RX)
Preset: Preset #1

All Displays	0016C04C4842	0016C04C4C50		
All	Hostname: 0016C04C4842 IP: 169.254.87.72 MAC: 00-16-C0-4C-48-42 Firmware: v1.1.1.0	0x0 0Hz RGB 8Bit 169.254.81.76-Multiview		

Transmitter (TX)

0016C04C4842	0016C04C4C50			
Hostname: 0016C04C4842 IP: 169.254.87.72 MAC: 00-16-C0-4C-48-42 Firmware: v1.1.1.0	1920x1080 60Hz YCBCR_444.88Bit 169.254.81.76			

CONNECT TO SERVER:

IP: 127.0.0.1

Port: 6970 DISCONNECT

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5.8 Analog Audio Routing Tab

The "Analog Audio" tab is used to setup and manage analog audio routing between TX and RX devices.

All the RX devices are listed in the top half of the Receiver (RX) section. Similarly, all the TX devices are listed in the bottom half in the Transmitter (TX) section.

First, verify if appropriate TX and RX devices are joined:

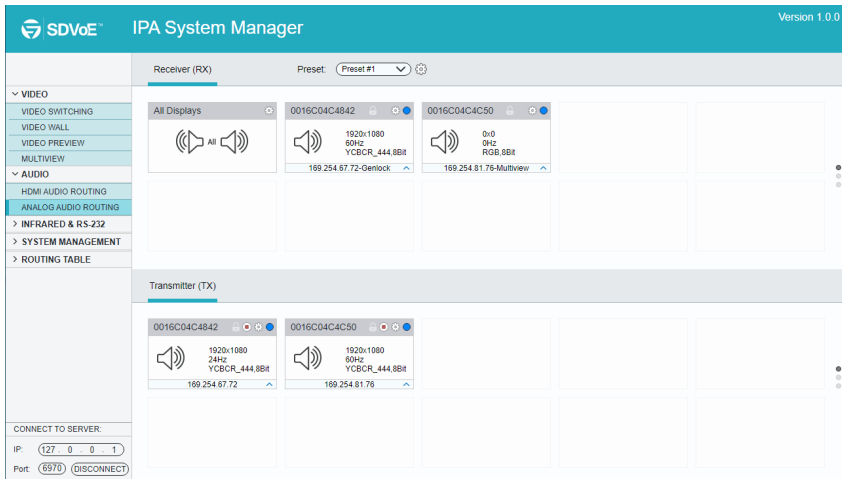
- 1) Verify, if the Receiver (RX) is currently joined with the desired Transmitter (TX).
 - a) Click on the RX and the Transmitter (TX) it is joined to will be highlighted blue.
 - b) Selecting the respective transmitter will highlight all the receivers joined to the same TX.
- 2) If the respective Transmitter (TX) is currently not joined to the Receiver (RX), join them together:
 - a) In the Transmitter (TX) section, select a TX by left-clicking on its associated active tile.
 - b) Drag and drop the TX tile over the RX tile it is to be joined with.
 - c) TX and RX are now joined together.
 - d) Repeat above steps if additional receivers are to be joined to the same TX.

To control where and how analog audio is transmitted, complete the following steps:

- 1) Connect a speaker or any type of analog audio receiver to the RX device.
- 2) Right click the gear icon on a Receiver (RX) and select "Settings" from the menu.
- 3) Choose, how the audio is being sent to the analog (mini XLR) output connector:
 - a) Click on the "Analog Audio Output" tab.
 - b) Choose the desired audio output option from the drop-down list:
 - HDMI Audio (Downmix)
 - Analog Audio
- 4) Click "Save" to apply changes.
- 5) The sound device connected to the RX will now play out the analog audio stream.

Tipp: If no audio is playing, confirm that the TX device is streaming. Also verify the RX audio output settings are correct.

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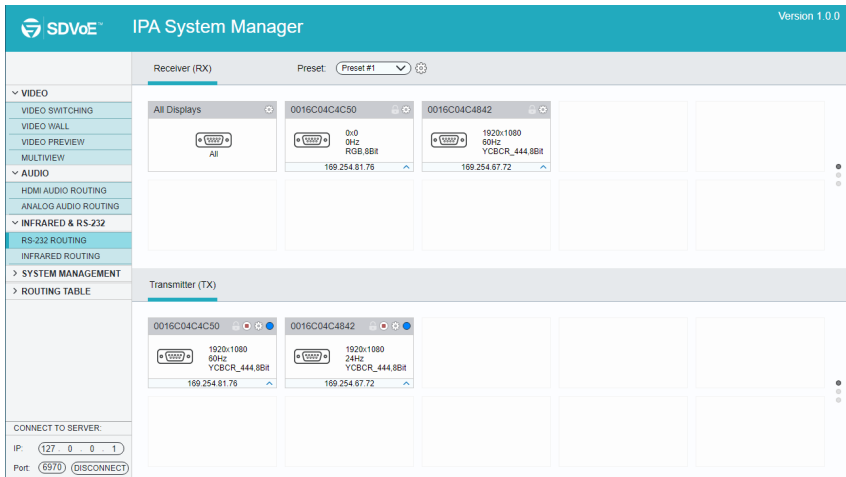
5.9 RS-232 Routing Tab

The "RS-232 Routing" tab is used to setup and manage RS-232 data distribution for devices.

There are two sections provided in the IPA Manager interface, "Transmitters (TX)" and "Receivers (RX)". Each device discovered on the network is listed in both groups, because each can both send and receive RS-232 data.

- 1) Select the "RS-232 Routing" tab in the IPA Manager interface.
- 2) Verify, which Transmitters and Receivers are joined together. Left-click on the device tile you want to see the connection status of. All joined together tiles will be highlighted blue.
- 3) To pair devices, drag the tile representing the Transmitter (TX) and drop it over the desired Receiver (RX) to create one-way communication.
- 4) To create a bi-directional RS-232 path between two devices, two separate pairings are required. Repeat the step above, but in reverse (drop TX on RX) to create the second pairing.

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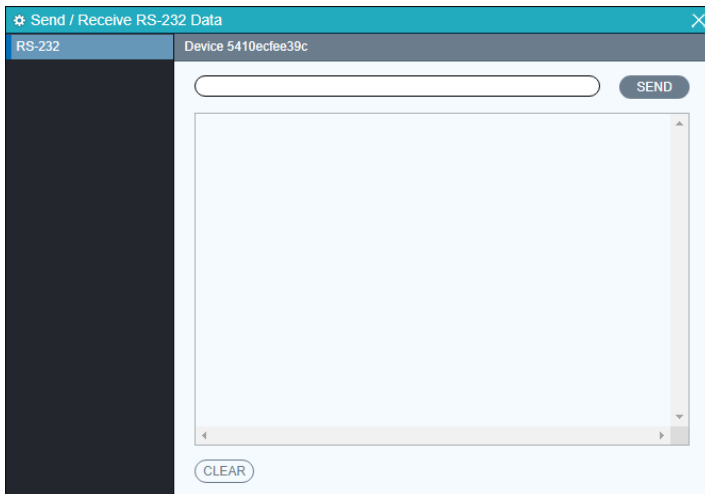
5.9.1 Assign Transmitter to all Receivers

To distribute RS-232 data from a single transmitter to all receivers, drag and drop the respective transmitter's tile onto the tile labeled "All Displays" in the "Receivers" section of the "RS-232 Routing" tab.

5.9.2 Sending RS-232 Data from IPA Manager to a Device

- 1) Click gear icon of the respective transmitter or receiver tile.
- 2) Select "Send/Receive RS-232".
- 3) A dialog box opens.
- 4) Enter the RS-232 string you want to send.
- 5) Click the "Send" button to send out the string.
- 6) Paired devices will receive the RS-232 command.

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Note: API Server is used to device debug.

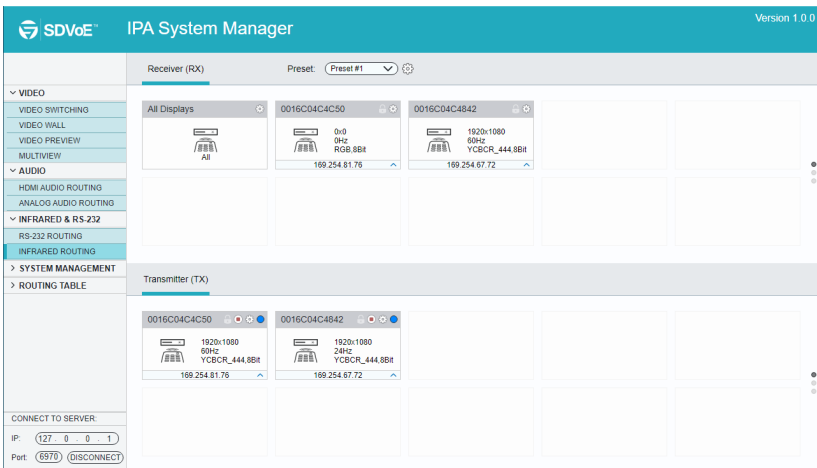
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5.10 Infrared Routing Tab

The "Infrared Routing" tab is used to setup and manage IR data distribution for devices.

There are two sections provided in the IPA Manager interface, "Transmitters (TX)" and "Receivers (RX)". Each device discovered on the network is listed in both groups, because each can both send and receive IR data.

- 1) Select the "Infrared Routing" tab in the IPA Manager interface.
- 2) Verify, which Transmitters and Receivers are joined together. Left-click on the device tile you want to see the connection status of. All joined together tiles will be highlighted blue.
- 3) To pair devices, drag the tile representing the Transmitter (TX) and drop it over the desired Receiver (RX) to create one-way communication.
- 4) To create a bi-directional IR path between two devices, two separate pairings are required. Repeat the step above, but in reverse (drop TX on RX) to create the second pairing.



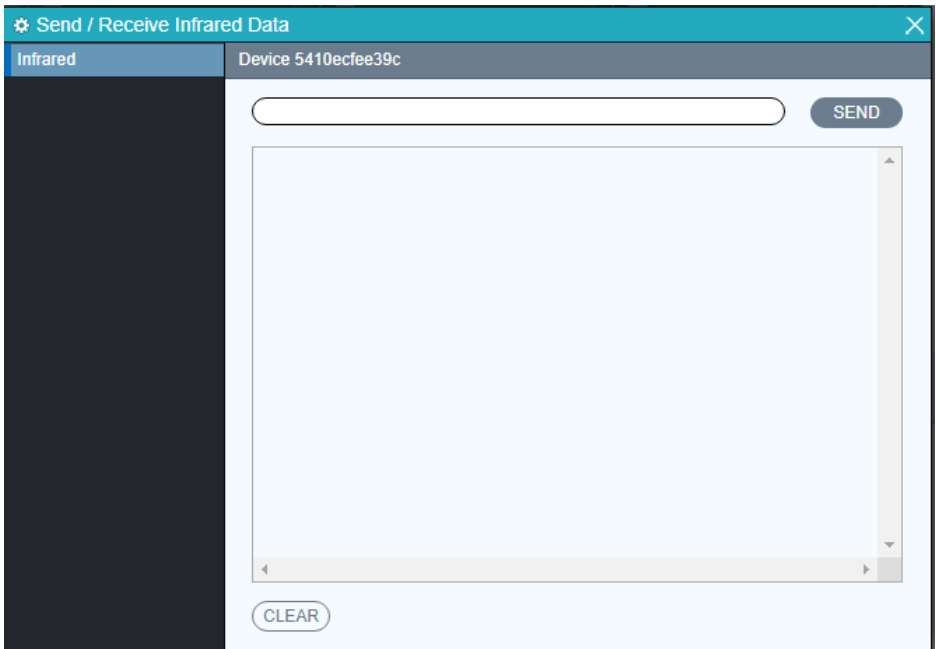
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5.10.1 Assign Transmitter to all Receivers

To distribute RS-232 data from a single transmitter to all receivers, drag and drop the respective transmitter's tile onto the tile labeled "All Displays" in the "Receivers" section of the "RS-232 Routing" tab.

5.10.2 Sending IR Data from IPA Manager to a Device

- 1) Click gear icon of the respective transmitter or receiver tile.
- 2) Select "Send/Receive IR".
- 3) A dialog box opens.
- 4) Enter the IR string you want to send.
- 5) Click the "Send" button to send out the string.
- 6) Paired devices will receive the IR command.



Infrared Limitations

A Sender can either send IR data to a specific device (unicast) or broadcast to all

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devices active on the network (broadcast). Should be noted however, that a sender cannot send data simultaneously to a range of devices using multi-unicast

The data format used when sending IR data from control layer to a device is 'Pronto'. The link below points to a good description of Pronto format definition with examples.

<http://www.remotecentral.com/features/irdisp1.htm>

The pronto format is a series of hex numbers that describe everything that is needed to generate the required waveform. It includes the carrier frequency, the ON/OFF period along with data and error checksum.

Large libraries of Pronto IR codes are publicly available and easy to find on the Web. The code below is a Pronto string to turn Sony BlueRay player ON and OFF

```
0000 0067 0000 0015 0060 0018 0030 0018 0018 0018 0030 0018 0018 0018 0030  
0018 0018 0018 0018 0018 0018 0018 0030 0018 0018 0018 0030 0018 0030 0018  
0018 0018 0030 0018 0018 0018 0018 0018 0018 0018 0030 0018 0030 0018 0030  
01FE.
```

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5.11 Global Command Options and Settings

To access a device's options, left-click the gear icon of any connected TX or RX

Note: Device options can be accessed from any detected device and from any of the interface tabs, "Video Switching", "HDMI Audio", etc.

5.11.1 Receiver (RX) Settings Options

The following section illustrates the Receiver (RX) device settings dialog box.

5.11.1.1. Analog Audio Output Settings

Use this tab to select the audio source to be sent to the analog audio output port.

There are two audio source options:

- HDMI Audio (Downmix): 2-channel downmix of the original HDMI audio from a TX.
- Analog Audio: Analog audio stream, directly coming from the analog input on a TX.



5.11.1.2. HDMI Audio Output Settings

Use this tab to control, which audio source is output via HDMI. There are four options.

- HDMI Audio (from HDMI, "Genlock Mode"): The original HDMI audio stream received with the video is used, if the RX device is in "Genlock Mode" or if the RX device does not receive a separate HDMI audio stream (in any video mode).
- Analog Audio: Select the analog audio stream of the TX to embed it into the HDMI output.
- HDMI Audio (Stereo Downmix): Select the HDMI audio stream of any TX as separate HDMI audio stream and embed it into the HDMI output signal. If the HDMI audio stream is a multichannel PCM format, it will be downmixed to 2-channel stereo audio at the output.
- HDMI Audio (All Available Channels): Select the HDMI audio stream of any TX as separate HDMI audio stream and embed it into the HDMI output signal. The multichannel HDMI audio will not be downmixed.

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⚙ Decoder 5410ecff1d94 Configuration		✕
Analog Audio Output	HDMI Audio Output:	
HDMI Audio Output	<input checked="" type="radio"/> HDMI Audio(from HDMI Video in Genlock)	
Display EDID	<input type="radio"/> Analog Audio	
Network Setting	<input type="radio"/> HDMI Audio(Stereo Downmix)	
RS232	<input type="radio"/> HDMI Audio(All Available Channels)	

5.11.1.3. Display EDID

Use this tab to access and store the EDID coming from the display, connected to the RX unit. Use the "Save" button to save the EDID to a file. It is also possible to select and copy the EDID Hex values directly and paste them into an editor such as Notepad. When no display is connected, the EDID view is blank.

Display EDID:

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5.11.1.4. Network Setting

Use this tab to modify the device's host name and configure the IP address.

By default, the device's host name equals the device's MAC address.

The device's MAC address is also used as device host name by the IPA Manager software. To rename a device, enter a name (e. g. "RX1") into the "Hostname" edit box. Press the "Save" button to save the new host name. The host name is persistent and kept until the device is forced back to factory defaults.

The IP address can be set to be either "DHCP" or "Manual".

- Select "DHCP" to receive the IP address from a DHCP server or to be auto-assigned with an IP from the 169.254.X.X range, in case there is no DHCP server on the network.
- Select "Manual" to set a static IP address (IPV4 address, subnet mask and gateway address).

Press "Save" to save the new IP address. The new IP mode settings are stored in non-volatile memory and kept, until the device is forced back to factory defaults.

Note: Special attention is required, when assigning a manual IP address. The address has to be both unique and reachable. Any mistake when entering the IP address, subnet mask or gateway address can render the device unreachable.

⚙ Decoder 5410ecff1d94 Configuration
✕

- Analog Audio Output
- HDMI Audio Output
- Display EDID
- Network Setting
- RS232

00d1c081808140950f9500630081c001014dd000a0f0703e80302035006d5521000011aa36600a0f0701f80302035006d552100001a000000fc0050484c2032383850364c0a202000000fd0017501e633c000a2020202020200105020333f14c9004031f1301125d5e5f606123090707830100006d030c001000397820006001020367d85dc401788003e30f000c011d007251d01e206e2855006d552100001e8c0ad08a20e02d10103e996006d55210000184d6c80a070703e8030203a006d552100001a04740030f2705

Save

Network Settings:

Hostname:

IP Mode:

IP Address:

Subnet Mask:

Default Gateway:

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5.11.1.5. RS232

Use the RS232 tab to modify / edit the RS232 settings.

Select the desired port configuration (Baud Rate, Data Bit, Stop Bit and Parity). Click the "Save" button to save the updated RS232 configuration. New RS232 settings are kept until the device is forced to factory defaults.

The screenshot shows the configuration interface for a decoder. The left sidebar contains a menu with the following items: Analog Audio Output, HDMI Audio Output, Display EDID, Network Setting, and RS232. The main area displays the RS232 configuration. At the top, there is a large text field containing a long hexadecimal string. Below it is a "Save" button. The "Network Settings:" section includes fields for Hostname (RX1), IP Mode (DHCP), IP Address (192.168.0.113), Subnet Mask (255.255.255.0), and Default Gateway (192.168.0.1). The "RS232:" section, which is highlighted with a red box, includes fields for Baud Rate (57600), Data Bit (8), Stop Bit (1), and Parity (None). A green "SAVE" button is located at the bottom left of the interface.

Decoder 5410ecff1d94 Configuration	
Analog Audio Output	00a1c081808140950f9500630081c001014dd000a0f0703e80302035006d55210000
HDMI Audio Output	1aa36600a0f0701f80302035006d552100001a000000fc0050484c2032383850364c
Display EDID	0a2020000000fd0017501e633c000a20202020200105020333f14c9004031f1301
Network Setting	125d5e5f606123090707830100006d030c001000397820006001020367d85dc4017
RS232	88003e30f000c011d007251d01e206e2855006d552100001e8c0ad08a20e02d1010
	3e96006d55210000184d6c80a070703e8030203a006d552100001a04740030f2705
<input type="button" value="Save"/>	
Network Settings:	
Hostname:	<input type="text" value="RX1"/>
IP Mode:	<input type="text" value="DHCP"/>
IP Address:	<input type="text" value="192.168.0.113"/>
Subnet Mask:	<input type="text" value="255.255.255.0"/>
Default Gateway:	<input type="text" value="192.168.0.1"/>
RS232:	
Baud Rate:	<input type="text" value="57600"/>
Data Bit:	<input type="text" value="8"/>
Stop Bit:	<input type="text" value="1"/>
Parity:	<input type="text" value="None"/>

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5.11.2 Transmitter (TX) Settings Options

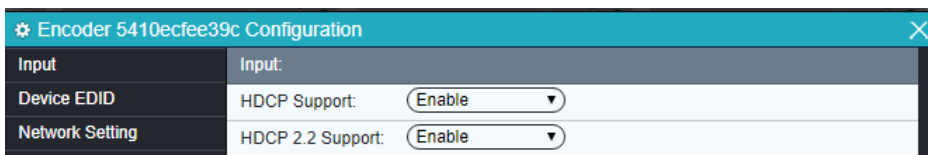
The following section illustrates the Transmitter (TX) device's settings dialog box.

5.11.2.1. Input

Use this to enable or disable HDCP support.

If HDCP support is disabled, streaming a video from an HDCP protected source to a screen will result in a black image displayed on screen.

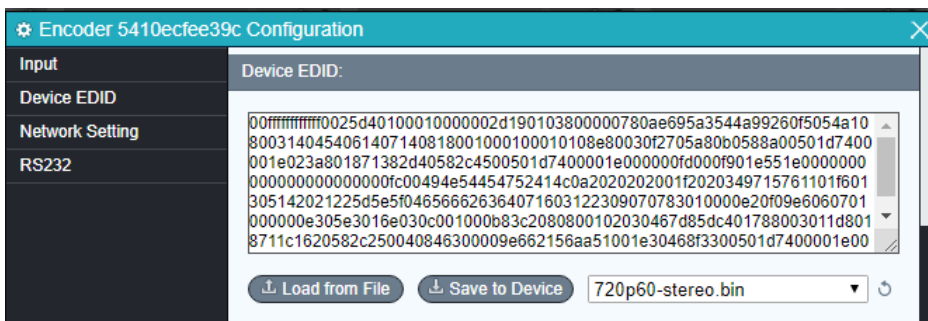
It is also possible to only enable HDCP 1.4 by checking the "Disable HDCP 2.2" support.



5.11.2.2. Device EDID

This tab is used to access and manipulate the EDID data of the source device connected to the TX.

Select the EDID data from the display and save it into a file or load EDID data directly from a file.



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5.11.2.3. Network Setting

Use this tab to modify the device's host name and configure the device's IP address. By default, the device's host name equals the device's MAC address.

The MAC address is also used as device host name by the IPA Manager software. To rename a device, enter a name (e. g. "TX1") into the hostname edit box. Press the "Save" button to save the new host name. The host name is persistent and kept until the device is forced back to factory defaults.

The IP address can be set to either "DHCP" or "Manual":

- Select "DHCP" to receive the IP address from a DHCP server or to be auto-assigned an address within the 169.254.X.X range, in case there is no DHCP server on the network.
- Select "Manual" to set a static IP address (IPv4 address, subnet mask and gateway address).

Press "Save" to save the new IP address. New IP mode settings are stored in non-volatile memory and kept until the device is forced back to factory defaults.

The screenshot shows the configuration interface for an encoder. The title bar reads "Encoder 5410ecfee39c Configuration". On the left, there is a navigation menu with options: "Input", "Device EDID", "Network Setting" (which is selected), and "RS232". The main area displays a long hexadecimal MAC address. Below the MAC address are two buttons: "Load from File" and "Save to Device", followed by a dropdown menu showing "720p60-stereo.bin". A red rectangular box highlights the "Network Settings" section, which contains the following fields:

Network Settings:	
Hostname:	<input type="text" value="TX1"/>
IP Mode:	<input type="text" value="DHCP"/>
IP Address:	<input type="text" value="192.168.0.115"/>
Subnet Mask:	<input type="text" value="255.255.255.0"/>
Default Gateway:	<input type="text" value="192.168.0.1"/>

Note: Special attention is required, when assigning a manual IP address. The address has to be both unique and reachable. Any mistake when entering the IP address, subnet mask or gateway address can render the device unreachable.

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5.11.2.4. RS232

Use the "RS232" tab to modify / edit the RS232 settings.

Select the desired port configuration (Baud Rate, Data Bit, Stop Bit and Parity). Click the "Save" button to save the updated RS232 configuration. New RS232 settings are kept until the device forced to factory defaults.

The screenshot displays the configuration interface for an encoder. The left sidebar shows navigation options: Input, Device EDID, Network Setting, and RS232. The main area is titled "Encoder 5410ecfee39c Configuration" and contains a hexadecimal EDID string, "Load from File" and "Save to Device" buttons, and a file name field set to "720p60-stereo.bin". Below this is the "Network Settings" section with fields for Hostname (TX1), IP Mode (DHCP), IP Address (192.168.0.115), Subnet Mask (255.255.255.0), and Default Gateway (192.168.0.1). The "RS232" section, highlighted with a red border, includes fields for Baud Rate (57600), Data Bit (8), Stop Bit (1), and Parity (None). A green "SAVE" button is located at the bottom left of the interface.

Encoder 5410ecfee39c Configuration	
Input	00ffffffff0025d40100010000002d190103800000780ae695a3544a99260f5054a108003140454061407140818001000100010108e80030f2705a80b0588a00501d740001e001e023a801871382d40582c4500501d7400001e000000fd000f901e551e000000000000000000fc00494e54454752414c0a20202001f2020349715761101f601305142021225d5e5f046566626364071603122309070783010000e20f09e6060701000000e305e3016e030c001000b83c2080800102030467d85dc401788003011d8018711c1620582c250040846300009e662156aa51001e30468f3300501d7400001e00
Device EDID	
Network Setting	
RS232	
⬇ Load from File ⬇ Save to Device 720p60-stereo.bin ↻	
Network Settings:	
Hostname:	TX1
IP Mode:	DHCP
IP Address:	192.168.0.115
Subnet Mask:	255.255.255.0
Default Gateway:	192.168.0.1
RS232:	
Baud Rate:	57600
Data Bit:	8
Stop Bit:	1
Parity:	None
SAVE ↻	

5.12 System Management Tab

5.12.1 Device Firmware Upgrade

Apply device firmware updates directly over the network. IPA has implemented a special update protocol to update an individual device or consecutively update all devices discovered on the local network with only a single command.

The first step is to place the respective update .zip file in a "update" folder inside the directory, where the IPA Manager software is installed. The IPA Manager is then instructed to update devices from a selected file archive.

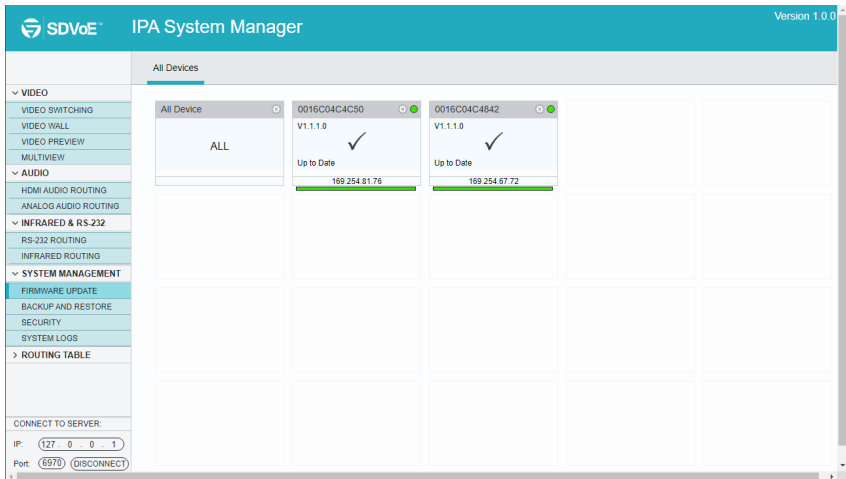
Example of update folder location:

C:\Program Files (x86)\IPA Manager\update

Follow the step by step procedure below to update the firmware:

- 1) By default, the update folder is in the same directory as the IPA Manager executable and named "\update". If the "\update" folder does not exist, it is necessary to create it.
- 2) Copy the new firmware update (*.zip file) into the "update" folder.
- 3) The system automatically detects the devices compatible with the new firmware update archive and displays them as orange bars. Devices, not available on the network earlier will be shown as "DISCONNECTED".
- 4) Begin the update process: To trigger the upgrade of an individual device, click the gear icon on the respective device's tile and select "Update Device".
- 5) The selected device(s) will immediately update their firmware. The respective tiles will show the progress of the update.
- 6) When the firmware update is complete, the devices will provide a message to automatically reboot all updated units.

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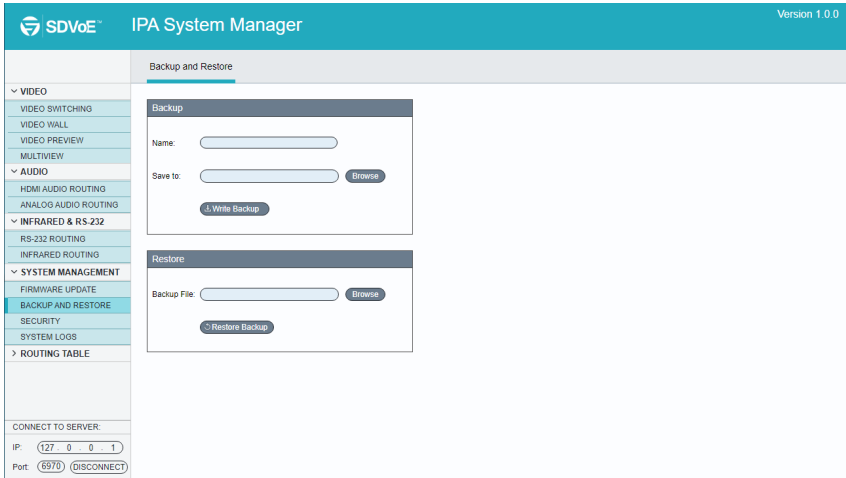


5.12.2 System Backup and Restore

Follow the step by step procedure below to backup and restore firmware versions:

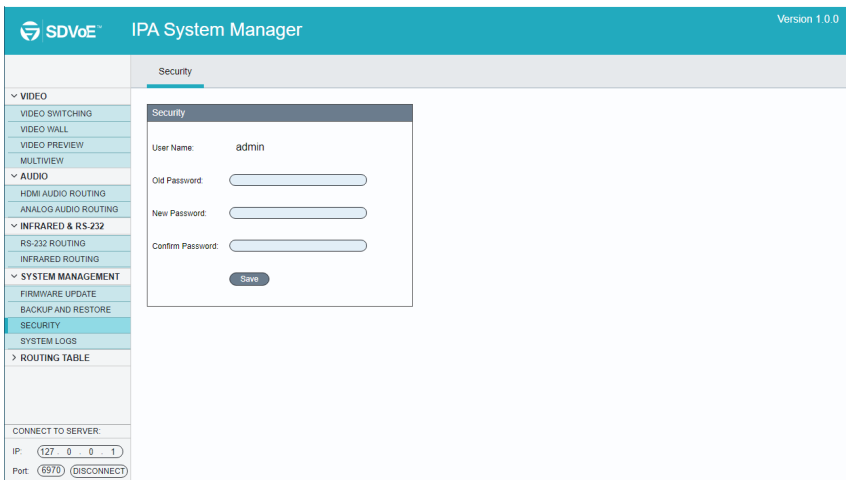
- 1) Select the "Backup and Restore" tab in the IPA Manager interface.
- 2) Type in the backup file name and click "Browse" to select the destination path.
- 3) Click "Write Backup" to save the system configuration data into the specified file.
- 4) Click "Browse" on the "Restore" tile to select the backup file and click "Restore Backup" to restore the selected system configuration.

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5.12.3 Security Settings

Select the Security tab in the IPA Manager interface to enter the section for modifying the password.



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5.12.4 System Logs

Select the System Logs tab in the IPA Manager interface to enter the section for inquiring the system logs.

The screenshot shows the 'IPA System Manager' interface. The top header includes the SDVoE logo and 'Version 1.0.0'. The left sidebar contains a tree view with the following items: VIDEO (expanded), VIDEO SWITCHING, VIDEO WALL, VIDEO PREVIEW, MULTIVIEW, AUDIO (expanded), HDMI AUDIO ROUTING, ANALOG AUDIO ROUTING, INFRARED & RS-232 (expanded), RS-232 ROUTING, INFRARED ROUTING, SYSTEM MANAGEMENT (expanded), FIRMWARE UPDATE, BACKUP AND RESTORE, SECURITY, SYSTEM LOGS (selected), and ROUTING TABLE. The main content area is titled 'System Logs' and contains a table with the following columns: Type, Date & Time, Event ID, User, and Details. The table is currently empty. At the bottom of the interface, there is a 'CONNECT TO SERVER' section with an IP address field set to '127.0.0.1' and a Port field set to '6976'. There is a 'DISCONNECT' button next to the port field. Below these fields are two buttons: 'Save Log' and 'Clear Log'.

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5.13 Routing Table

The routing table allows to gather info about the video, HDMI audio, analog audio and RS232 routing status.

Video Routing Table:

SDVoE IPA System Manager Version 1.0.0

Video Routing Table Hostname

Transmitter (TX)	Receiver (RX)
0016C04C4C50	0016C04C4842
0016C04C4842	NULL

CONNECT TO SERVER:
 IP:
 Port:

HDMI Audio Routing Table:

SDVoE IPA System Manager Version 1.0.0

HDMI Audio Routing Table Hostname

Transmitter (TX)	Receiver (RX)
0016C04C4C50	0016C04C4C50:0016C04C4842
0016C04C4842	NULL

CONNECT TO SERVER:
 IP:
 Port:

Analog Audio Routing Table:

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SDVoE™ IPA System Manager Version 1.0.0

Analog Audio Routing Table Hostname

Transmitter (TX)	Receiver (RX)
0016C04C4C50	NULL
0016C04C4842	0016C04C4C50,0016C04C4842

CONNECT TO SERVER:
 IP:
 Port:

RS232 Routing Table:

SDVoE™ IPA System Manager Version 1.0.0

RS232 Routing Table Hostname

Transmitter (TX)	Receiver (RX)
0016C04C4842	NULL
0016C04C4C50	NULL

CONNECT TO SERVER:
 IP:
 Port:

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Infrared Routing Table:

SDVoE™
IPA System Manager
Version 1.0.0

Infrared Routing Table
Hostname ▼

- ▼ VIDEO
- VIDEO SWITCHING
- VIDEO WALL
- VIDEO PREVIEW
- MULTIVIEW
- ▼ AUDIO
- HDMI AUDIO ROUTING
- ANALOG AUDIO ROUTING
- ▼ INFRARED & RS-232
- RS-232 ROUTING
- INFRARED ROUTING
- > SYSTEM MANAGEMENT
- ▼ ROUTING TABLE
- VIDEO ROUTING
- HDMI AUDIO ROUTING
- ANALOG AUDIO ROUTING
- RS-232 ROUTING
- INFRARED ROUTING

Transmitter (TX)	Receiver (RX)
0016C04C4842	NULL
0016C04C4C50	NULL

CONNECT TO SERVER:

IP:

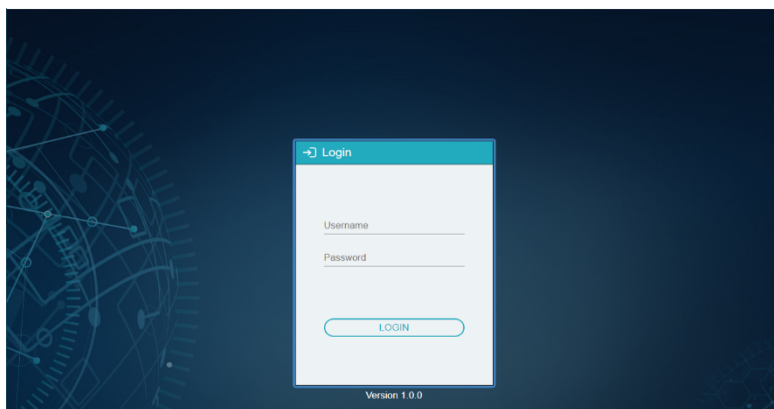
Port: DISCONNECT

6. Operation of GUI Control

The web-based GUI is used to configure and control signal extension, routing and switching between units.

Before proceeding GUI, make sure all IPA units are powered ON. Then ensure that the IP addresses of PC and all IPA units are on the same local area network (LAN). If this is not the case, please manually set IP address mode as DHCP.

Please type **the IP Address of the control PC** in the internet browser, and it will enter the below log-in webpage:



Username: admin

Password: admin

Please type the user name and password, and then click **LOGIN**.

Before starting the GUI control, make sure the control PC is connected either directly to the network switch or to the Gigabit Ethernet port on one of the devices. Upon launch, the main window will open up in the “Video Switching” tab. It will discover all the TX and RX devices on the network and display them inside the application GUI.

The first step is to connect to the Server. Enter the IP address and click “CONNECT”.

The default Server setting is:

IP Address: 127.0.0.1

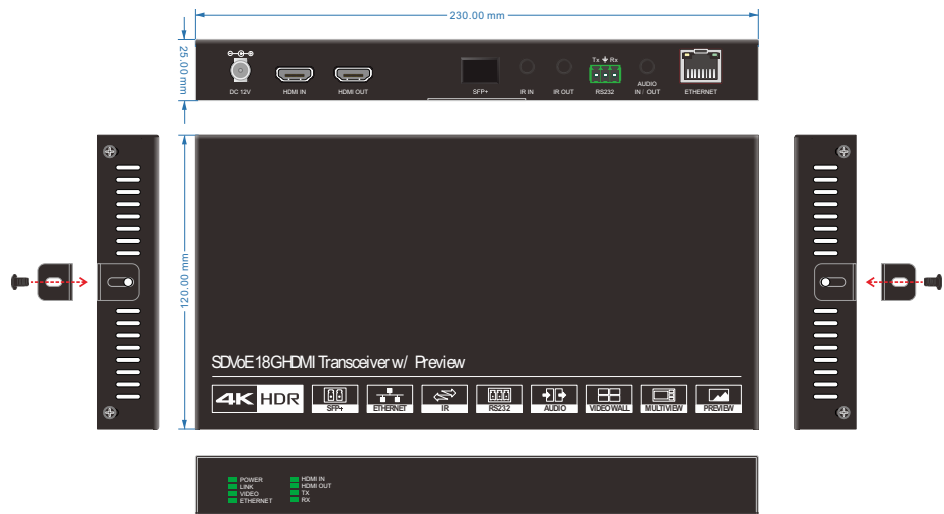
Port Number: 6970

All connected devices on the network will appear as a blue tiles within the GUI window.

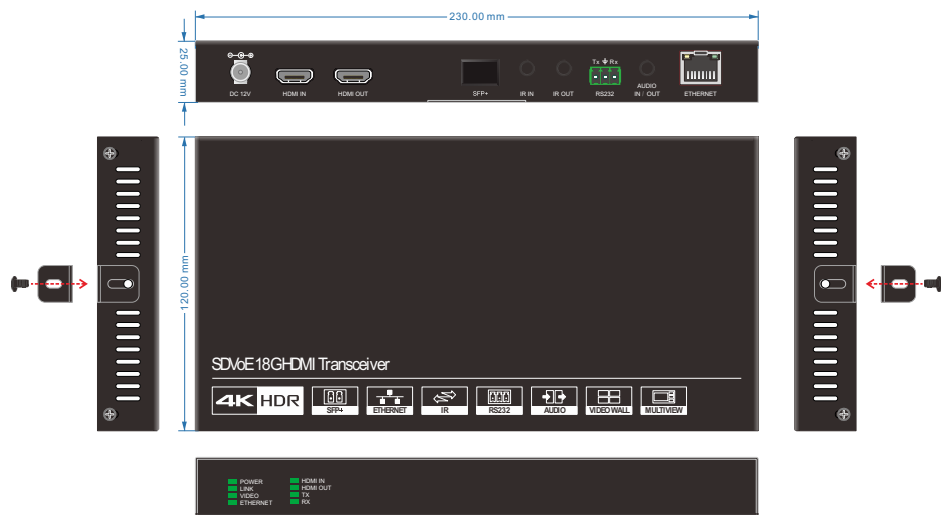
Note: *The operation of Web GUI is same as the IP Manager’s, please refer to the above chapter for more details*

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7. Panel Drawing



IPA400TR-P



IPA400TR

8. Troubleshooting & Maintenance

- 1) If the IPA Manager does not detect any Transmitters/Receivers, please make sure:
 - Whether the IP address is configured correctly. Please ensure the IP of the connected control PC is set to the same network segment as the TX / RX.
 - Whether there is an IP address conflict with another device in the same network. Please make sure, each device has a different IP address in the same LAN.
 - Power supply is normal and as specified.
 - The connection cables are of high-quality and the link has been established successfully.

- 2) If the IPA Manager detects the connected TX/RX units correctly, please confirm whether the video source is selected correctly and that the connection cable functions as specified.

Note: *If your problem still remains after following the troubleshooting steps above, please contact your local dealer or distributor for further assistance.*

9. Customer Service

The return of a product to our Customer Service implies the full agreement of the terms and conditions hereinafter. These terms and conditions may be changed without prior notice.

1) Warranty

The limited warranty period of the product is fixed three years.

2) Scope

These terms and conditions of Customer Service apply to the customer service provided for the products or any other items sold by authorized distributor only.

3) Warranty Exclusion

- Warranty expiration.
- Factory applied serial number has been altered or removed from the product.
- Damage, deterioration or malfunction caused by:
 - ✓ Normal wear and tear.
 - ✓ Use of supplies or parts not meeting our specifications.
 - ✓ No certificate or invoice as the proof of warranty.
 - ✓ The product model showed on the warranty card does not match with the model of the product for repairing or had been altered.
 - ✓ Damage caused by force majeure.
 - ✓ Servicing not authorized by distributor.
 - ✓ Any other causes which does not relate to a product defect.
- Shipping fees, installation or labor charges for installation or setup of the product.

4) Documentation:

Customer Service will accept defective product(s) in the scope of warranty coverage at the sole condition that the defeat has been clearly defined, and upon reception of the documents or copy of invoice, indicating the date of purchase, the type of product, the serial number, and the name of distributor.

Remarks: Please contact your local distributor for further assistance or solutions.