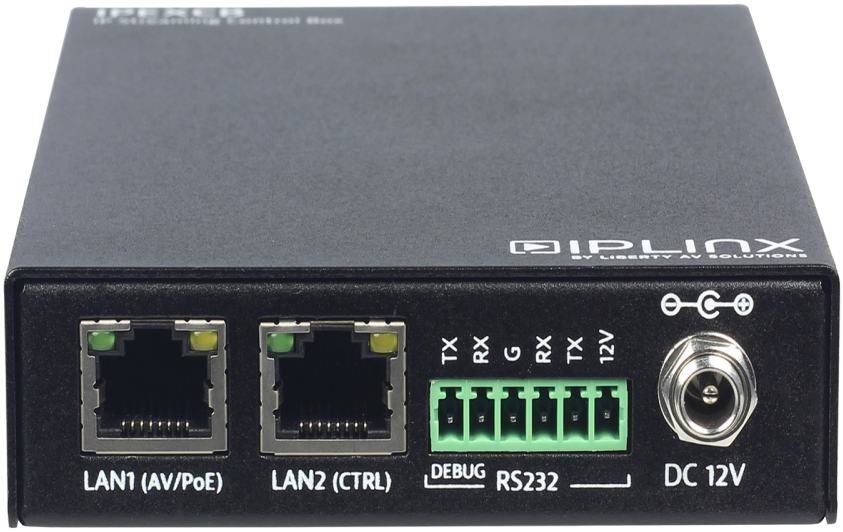
IPEXCB Installation and Configuration Guide



Rev 170629

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Important Safety Instructions

1. Read these instructions – All the safety and operating instructions should be read before this product is operated.

2. Keep these instructions – The safety and operating instructions should be retained for future reference.

3. Heed all warnings – All warnings on the appliance and in the operating instructions should be adhered to.

4. Follow all instructions – All operating and use instructions should be followed.

5. Do not use this apparatus near water – The appliance should not be used near water or moisture – for example, in a wet basement or near a swimming pool, and the like.

6. Clean only with a dry cloth.

7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.

8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

9. Do not defeat the safety purpose of the polarized plug. A polarized plug has two blades with one wider than the other. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

10. Protect the power cord from being walked on or pinched particularly at the plugs, convenience receptacles, and at the point where it exits from the apparatus.

11. Only use attachments/accessories specified by the manufacturer.

12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart or rack is used, use caution when moving the cart/ apparatus combination to avoid injury from tip-over.

13. Unplug the apparatus during lighting storms or when unused for long periods of time.

14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as; the power-supply cord or plug is damaged, liquid has been spilt or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

15. CAUTION: Servicing instructions are for use by qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

16. Do not install this equipment in a confined or built-in space such as a book case or similar unit. The equipment must remain in well ventilation conditions. Ventilation should not be impeded by covering the ventilation openings with items such as newspaper, table-cloths, curtains etc.

17. WARNING: Only use attachments/accessories (such as the battery etc.) specified or provided by the manufacturer.

18. WARNING: Refer to the information on the underside of the enclosure for electrical and safety information before installing or operating the apparatus.

19. WARNING: To reduce the risk of fire or electric shock do not expose this apparatus to rain or moisture. The apparatus shall not be exposed to dripping or splashing and objects filled with liquids, such as vases, shall not be placed on apparatus.

20. CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type.

21. WARNING: The battery shall not be exposed to excessive heat such as sunshine, fire or the like.

22. WARNING: The all-pole mains switch located on rear panel is used as the disconnect device, the switch shall remain readily operable.

23. WARNING: DO NOT INGEST BATTERY. CHEMICAL BURN HAZARD.

24. Keep new and used batteries away from children. If the battery compartment does not close securely, stop using the product and keep it away from children.

25. If you think batteries might have been swallowed or placed inside any part of the body, seek immediate medical attention.

26. When the apparatus is not in use or during its relocation, take care of the power cord and plugs; e.g. tie up the power cord with cable tie or similar. The tie must be free from sharp edges and the like that might cause abrasion of the power cord. When put into use again ensure the power cord and plugs are not damaged. If any damage is found the power cord and plugs should be replaced by items either specified by the manufacturer or that have same characteristics as the original items.

27. This lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of non-insulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock.

28. WARNING: To reduce the risk of electric shock, do not remove cover (or back) as there are no user-serviceable parts inside. Refer servicing to qualified personnel.

29. The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance instructions in the literature accompanying the appliance.

30. Protective earthing terminal. The apparatus should be connected to a mains socket outlet with a protective earthing connection.

31. CAUTION: To prevent electric shock hazard, replace grille. (CSA 60065, clause 5.3A)

Table of Contents

Product Overview

The IPLinx IPEXCB is an IP based control interface used to configure, manage and control IPLinx encoders and decoders on a 1Gb managed Ethernet switch. Configuration files for IPLinx systems are stored directly on the IPECXB and is designed to work in conjunction with the IPLinx iPad and Windows control APP for basic system control. The IPEXCB offers a single point of connection and control for third party IP or serial control systems and is required for any IPLinx system that requires a video matrix or video wall system layout.

The IPEXCB integrates two Ethernet ports and two RS232 ports, offering integration-friendly control features, including a web GUI. LAN1 port (AV/PoE) is connected directly to the A/V network where all IPLinx devices reside. LAN2 port (CTRL) can be connected to a control system network allowing the entire IPLinx matrix system to be controlled by a third party IP control system. With the ability to assign separate IP addresses and subnets for the two IPEXCB LAN ports, the A/V network traffic is not forced to reside on a shared LAN that may compromise bandwidth and data flow. The RS232 ports on the IPEXCB are also designed to offer a single point of control for serial based control systems.

The IPEXCB can be configured with either the web browser graphical user interface (GUI) or *IPLinx Configurator* which is a software program that is used to configure IPLinx encoders / decoders on a 1Gb managed Ethernet switch. The IPEXCB can automatically search and display encoders and decoders on the A/V network when using the configuration tool or web GUI. ***IPLinx Configurator*** can be downloaded from our website at www.libav.com on the IPLinx IPEXCB product page under the *SOFTWARE* tab. Instructions for using *IPLinx Configurator* are included in this manual.

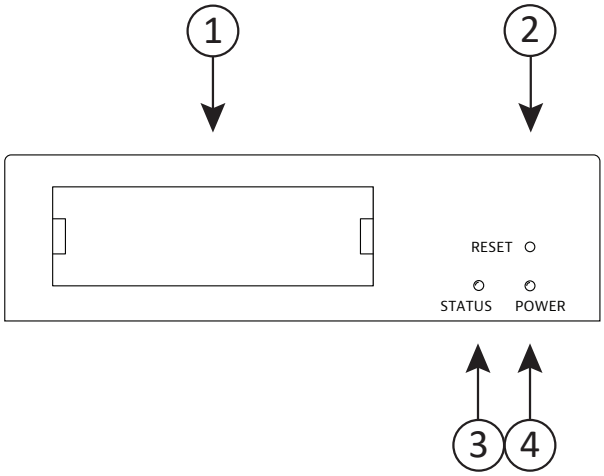
The IPEXCB is compatible with all IPLinx 2000 and 5000 series IP devices.

Package Contents

1. Installation Guide
2. Power Supply with US, UK, EU, and AU adapters
3. 6-pin Removable Screw Terminal
4. Device Labels

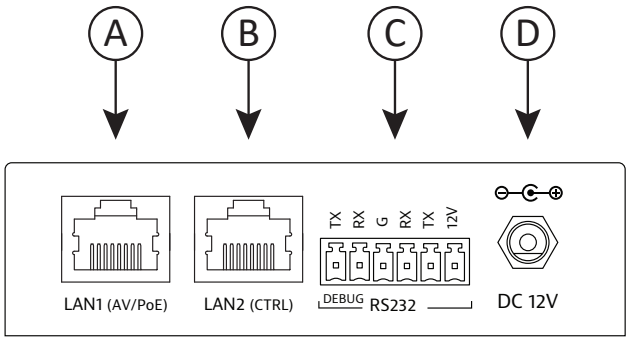
Front and Rear Panels

Front Panel



1. Label insert
2. Reset button
3. Status indicator
4. Power indicator

Rear Panel



A. LAN1 (AV/PoE)
B. LAN2 (CTRL)
C. RS232 connections
D. 12V DC power input

Reset Button

If a factory reset is required for the IPEXCB, press and hold the reset button for five seconds to restore the IPEXCB to factory settings. This reset will change the default IP address of the IPEXCB back to the factory default IP address.

LAN Connections

LAN1(AV/PoE) is used to connect the IPEXCB to the Ethernet switch. The default IP address for LAN1 of the IPEXCB is 169.254.1.1.

LAN2(CTRL) is used to connect the IPEXCB to a third party control system. The default IP address for LAN2 of the IPEXCB is 192.168.11.243.

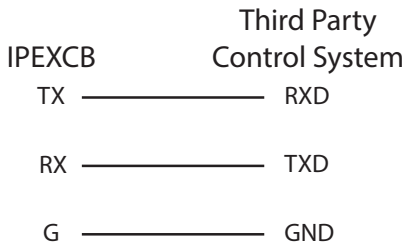
12V Connection

The 12V connection on the right side of the RS232 connector can provide up to 500 mA of 12V DC to an external device.

RS232 Connections

The IPEXCB features two RS232 connections: Debug and Control. The Debug connection will only communicate with the IPEXCB and will not control any encoders or decoders. The Control connection will communicate with IPLinx devices on the A/V network switch.

To use the RS232 control transport capabilities of the IPEXCB, connect the TX, RX, and ground control signal wires to the middle RS232 connections on the removable 6-pole terminal block. Consult the manual of the control device to determine which pins the TX and RX signals are carried on. Be sure to always connect TX to RX and RX to TX.



The RS232 control ports require a standard straight-through serial cable for operation. The default settings for the RS232 ports are:

- Debug connection: 115200 baud, 8 Data Bits, 1 Stop Bit, Parity = none
- Control connection: 9600 baud, 8 Data Bits, 1 Stop Bit, Parity = none

While the IPEXCB requires RS232 commands to be sent to it at 9600 baud through the control connection, multiple baud rates are available to communicate with the remote devices.

Installation Instructions

Basic Installation

1. Configure a managed 1Gb Ethernet network switch for IPLinx video operation.

   NOTE: An IPLinx network switch configuration guide has been built to assist with configuring network switches from a variety of manufacturers. The network switch configuration guides are located on the IPLinx IPEXCB product page on the Liberty website (www.libav.com) under the *DOCUMENTATION* tab.

2. Turn off power and disconnect the audio/video equipment by following the manufacturer's instructions.
3. Turn off power to the configured network switch.
4. Connect Category 5E or greater twisted pair cable with the TIA/EIA-568B crimp pattern between the LAN1 port on the IPEXCB and the configured network switch.

   NOTE: If the network switch cannot provide power or enough power to the IPEXCB, connect the included power supply to the 12V DC power input of the control box. If the gigabit switch cannot provide enough power, disable the PoE function of the connected LAN port on the switch.

5. Connect the IPLINX encoder(s) and decoder(s) to the network switch using Category 5E or greater twisted pair cable with the TIA/EIA-568B crimp pattern and per the instructions for those device
6. Connect all sources and displays to the respective IPLinx encoders and decoders.
7. Apply power to the configured network switch.
8. The IPEXCB will fully boot after five minutes.
9. Apply power to the attached audio/video devices.

To control the IPEXCB and IPLinx system by a third party control system, connect a Category cable between the LAN2 port on the IPEXCB to an IP based third party control system network or use the RS232 connection on the IPEXCB to connect to a third party serial based control system according to the manufacturers system instructions. For proper serial connectivity to the IPEXCB please see ***RS232 Connections*** on page 9.

For a comprehensive list of IP and serial system commands for the IPEXCB and IPLinx systems, please refer to the ***IPLinx Programming Guide*** which is located under the ***DOCUMENTATION t***ab on the IPEXCB product page online at ***www.libav.com***

Pre-written control system drivers are also available online on the IPEXCB product page under the ***DRIVERS*** tab

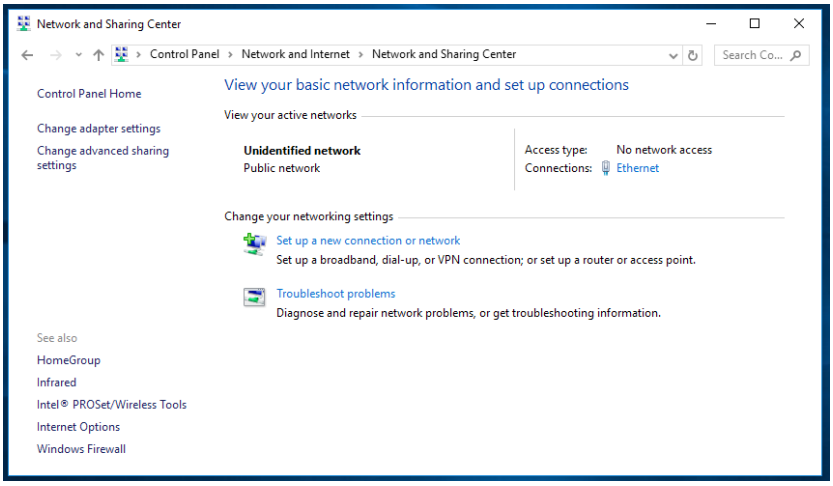
IPEXCB Web Browser Usage

Logging into the web browser Graphical User Interface (GUI)

Connect a Windows PC to an open port on the configured A/V network switch with a Cat 5e patch cable and set a static IP address for the Windows PC that is within the IP range of the IPLinx IPEXCB Controller (*169.254.1.xxx, where xxx = any number between 2-254*) and set the subnet mask to *255.255.0.0*.

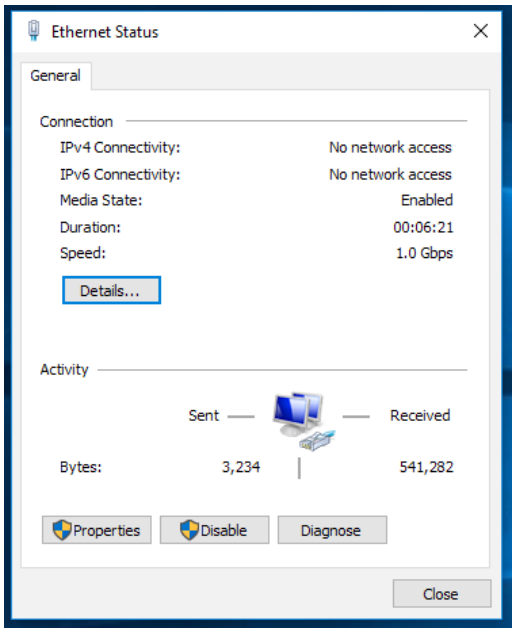
Please contact an IT administrator if the PC cannot be assigned a static IP address in this range.

To change your computers IP address in Windows, navigate to *Control Panel > Network and Internet* and then click on *Network and Sharing Center.* From there you will see the network that you are connected to. Typically the network will be labeled as *Unidentified network.*



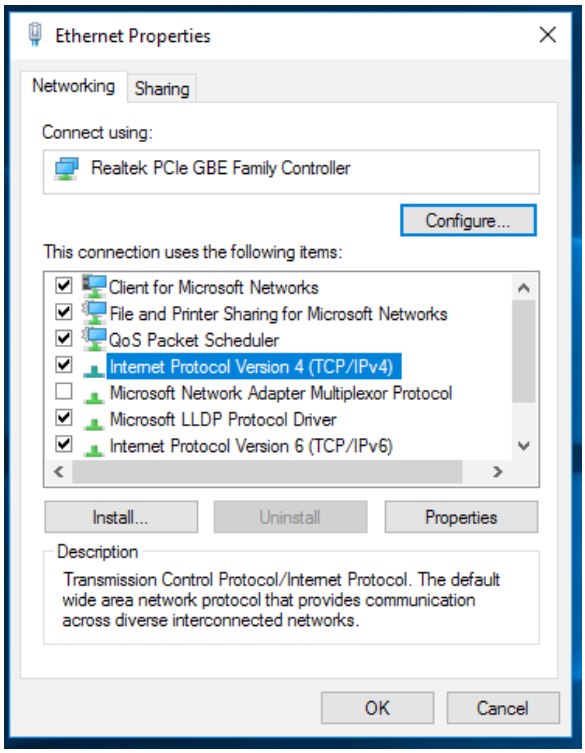
Click on Connections: Ethernet

A pop window will appear labeled *Ethernet Status*



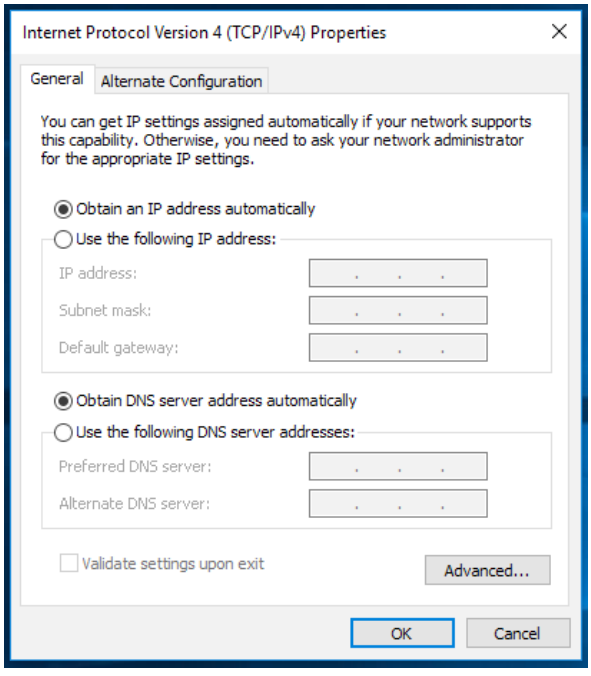
Click on Properties

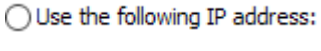
A pop window will appear labeled *Ethernet Properties*



Select *Internet Protocol Version 4 (TCP/IPv4)* from the item list and then click 

A pop window will appear labeled *Internet Protocol Version 4 (TCP/IPv4) Properties*

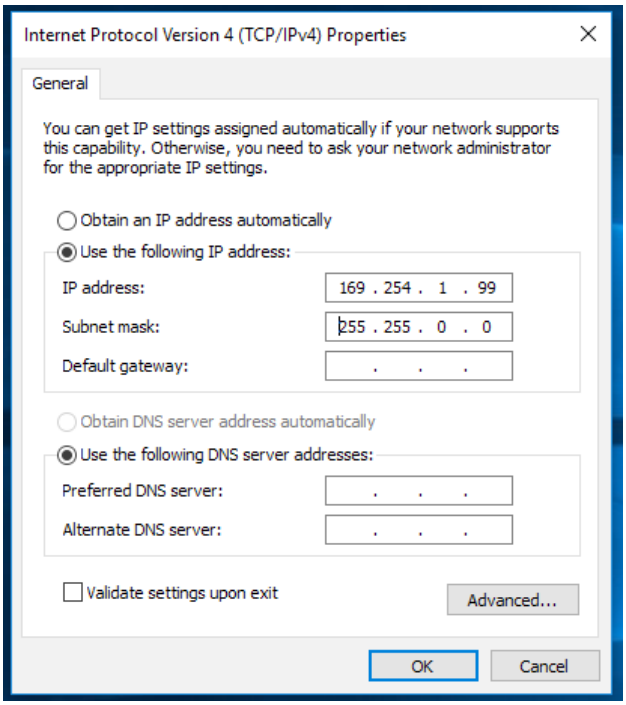


Select the button labeled 

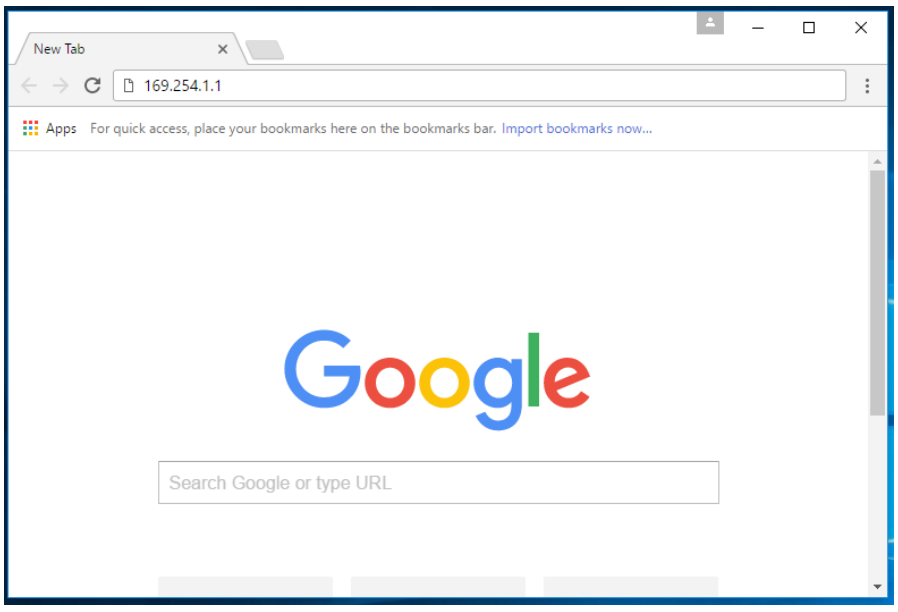
Enter in an IP address for the computer in the same range as the IPEXCB in the *IP Address* field, set the subnet mask to 255.255.0.0 and click OK

In this example we used the IP address of 169.254.1.99 with a subnet mask set at 255.255.0.0

Note: If you change the IP address of the IPEXCB or the IPLinx devices that reside on the A/V network, be sure to reset your computers IP address to the correct IP range of the IPEXCB in order to access the control interface and the IPLinx system components.



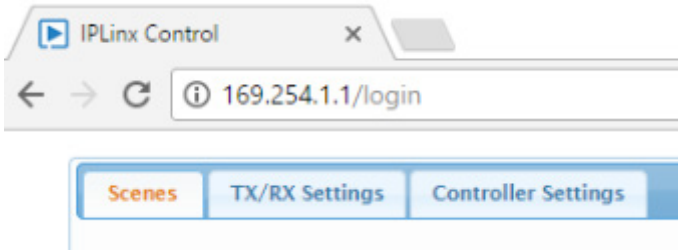
Close the *Ethernet Properties* and *Ethernet Status* windows and then open a web browser on the computer and enter the IP address of the IPEXCB into the address bar of the browser and hit the enter key on the keyboard. The default IP address of the IPEXCB is 169.254.1.1



The login window for the web GUI will then appear, enter in the user name and password for the portal and click *LOGIN*.

The default user name and password is *admin*

After logging into the web GUI, you will notice three tabs located at the top left of the page labeled; *SCENES*, *TX/RX SETTINGS* and CONTROLLER SETTINGS



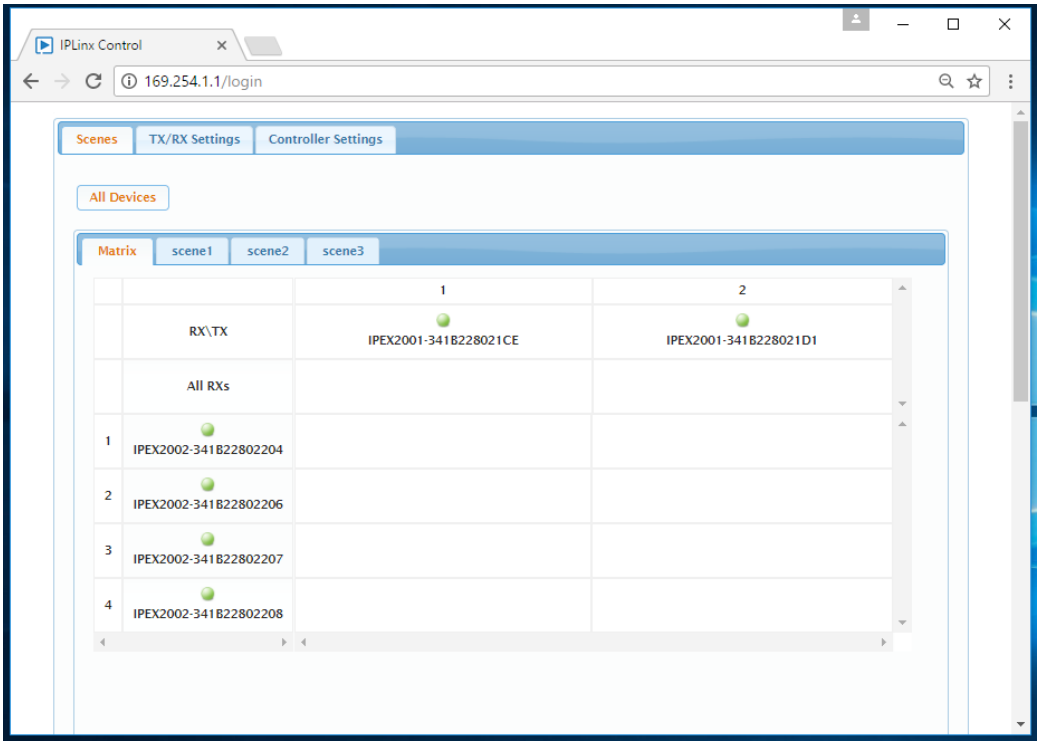
SCENES; allows you to route encoders to decoders, save up to three matrix scenes and test API commands.

TX/RX SETTINGS; allows you to change IP addresses of individual encoders and decoders on the IPLinx system as well as test API commands

CONTROLLER SETTINGS; allows you to change the default IP addresses of the LAN1 (AV/PoE) and LAN2 (CTRL) ports of the IPEXCB. You can also load system configurations, change passwords for admin login, establish user name and password for up to 5 users, upgrade software version and test API commands.

Routing Video Signals

Using the web GUI, video signals can be routed from IPLinx encoders (TX) to decoders (RX) using the *SCENES* menu. When the *SCENES* menu is highlighted, click on *ALL DEVICES*, this will show all of the active IPLinx encoders and decoders on the A/V network switch as well as four submenus labeled *MATRIX*, *SCENE1*, *SCENE2*, and *SCENE3*.



NOTE: By default encoders (TX) and decoders (RX) aliases are assigned in the system based on the following;

[MANUFACTURER PART NUMBER-MAC ADDRESS].

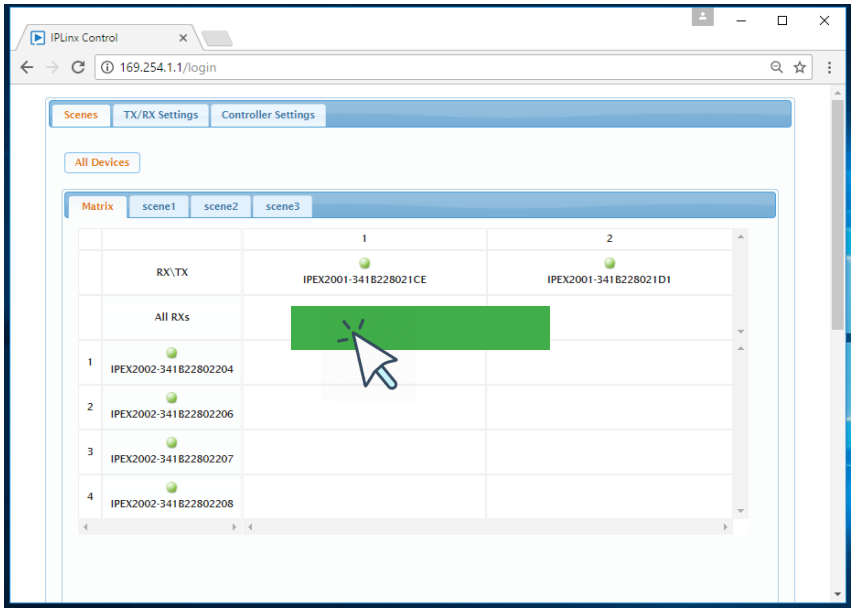
Example; *IPEX2002-341B22802204*
IPEX2002 is the manufacturers model number
341B22802204 is the assigned MAC address of that device

These assigned aliases can be changed by using IPLinx Configurator so they can be more easily identified.
See *Renaming IPLinx Encoders and Decoders* located on page 22

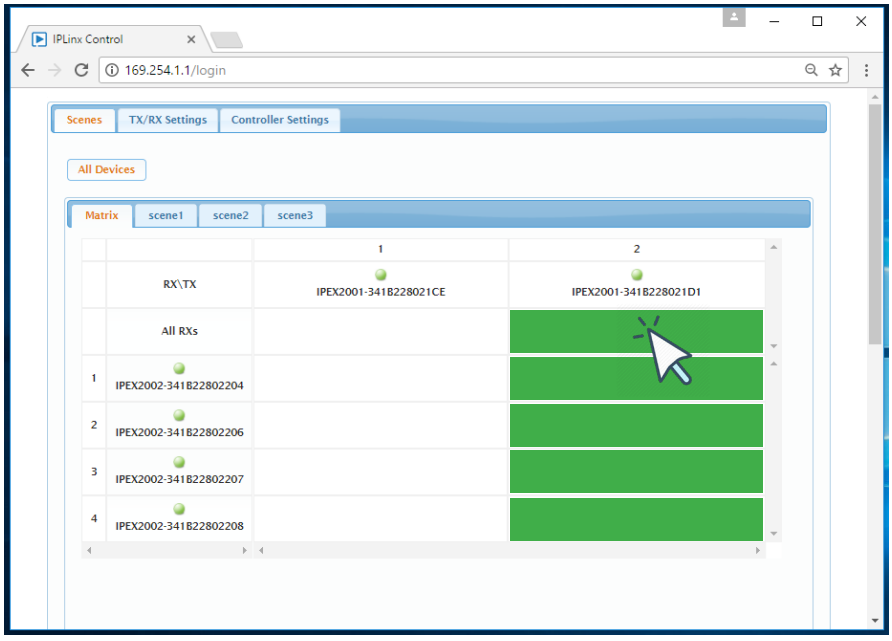
The *MATRIX* submenu allows you to route video signals from encoders to decoders in real time using a simple spread sheet layout.

Encoders (transmitters) are labeled as *TX* and located on the top row, decoders (receivers) are labeled as RX and located to far left column. Simply use your mouse and click on the appropriate cell that links the desired TX source to the desired RX location. Once your selection is made and video is successfully routed to the desired decoder, the cell will turn solid green. To remove that video source from the decoder, click the cell again and the cell will go blank indicating no video is present at that decoder location.

NOTE: If video is not successfully routed to the decoder location or the decoder is offline, the cell selected will turn solid RED.

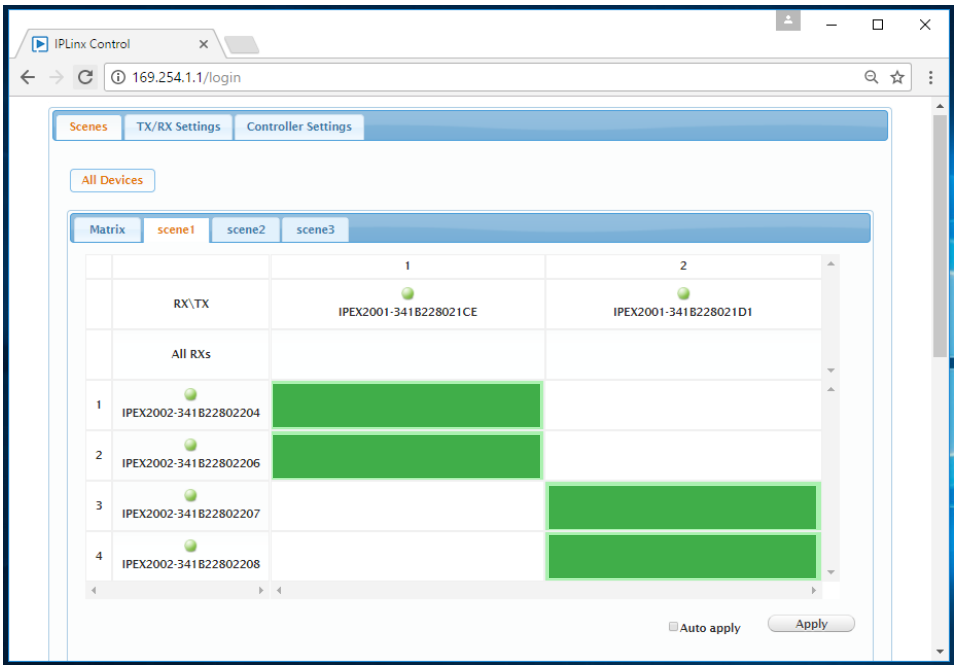


To route video from one TX to ALL RX's, click on the desired *ALL RXs* cell located underneath the TX of choice. All cells underneath the TX will turn solid green indicating that video is successfully being routed to all decoders.



SCENE1, *SCENE2* and *SCENE3* submenus allows you to build and save pre-set scenes that routes video from encoders to decoders in a particular order. These adjustments are not made in real time unless *Auto apply* box is checked.

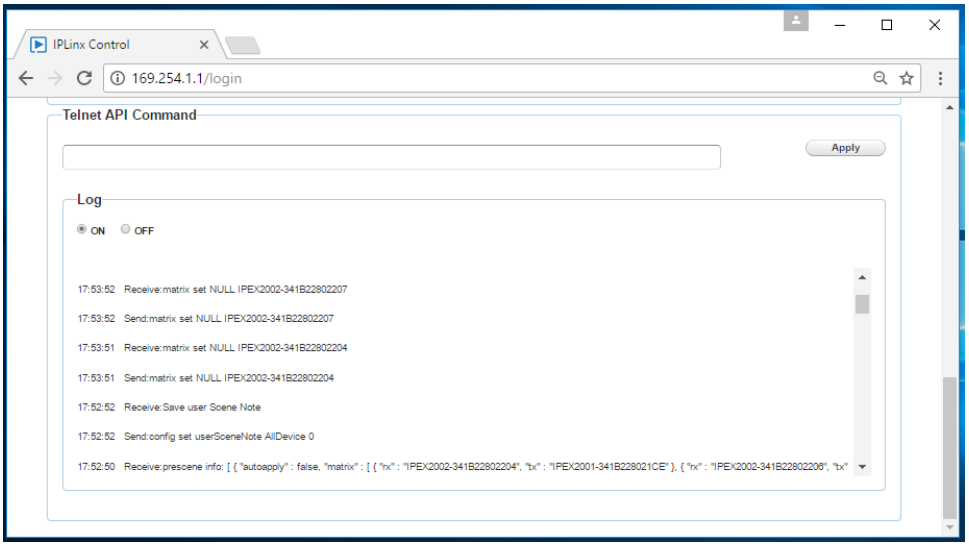
To apply the scene to the system click *APPLY*



Testing Telnet API Commands

API telnet commands can be sent to the IPLinx system from the web GUI under the SCENES, TX/RX SETTINGS and CONTROLLER SETTINGS menu tab. This is a useful tool to determine if telnet commands sent to the system invokes the appropriate system response. An API command log is also available to monitor system responses which can be turned ON or OFF. If you want a comprehensive list of telnet and serial commands please refer to the *IPLinx Programming Guide* which can be downloaded from the IPEXCB product page under the DOCUMENTATION tab online at www.libav.com

To test a command enter the command into the blank form under *Telnet API Command* and click *Apply*.

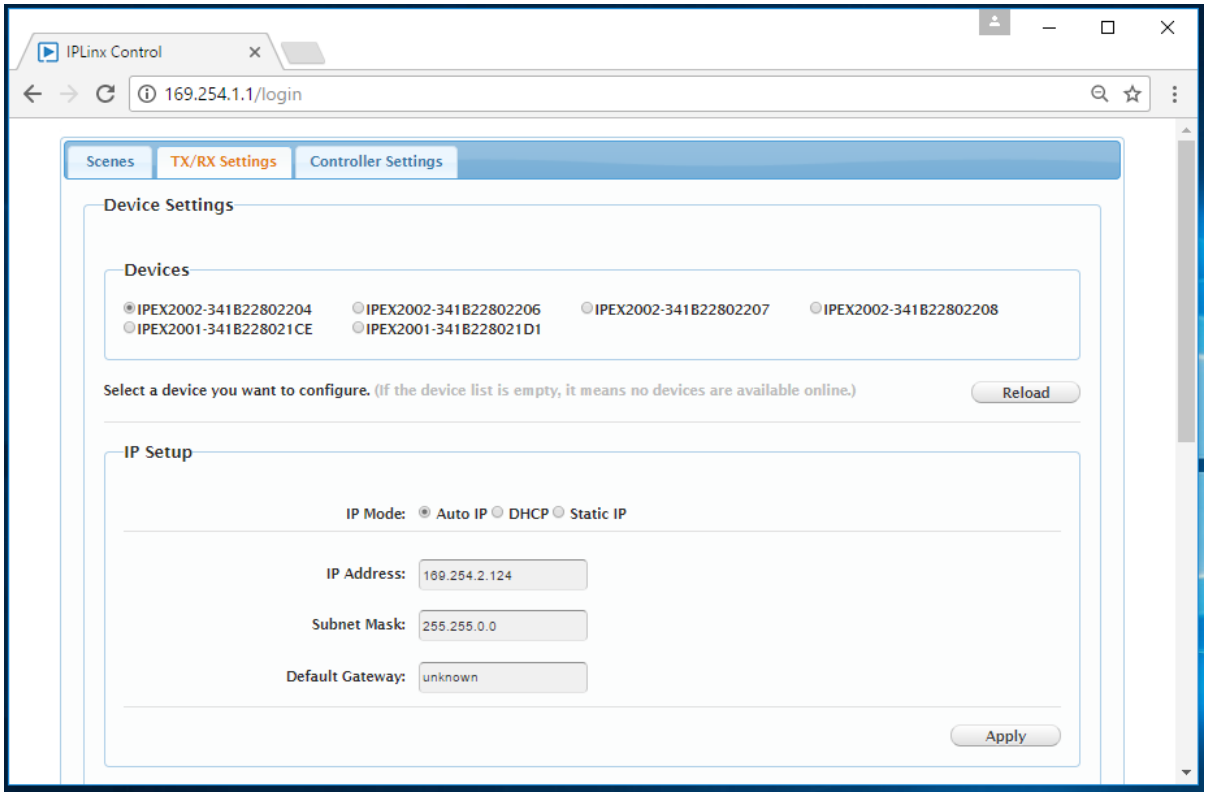


Changing IPLinx Encoder and Decoder IP Addresses

The IPLinx IPEXCB control interface automatically assigns IP addresses to encoders and decoders in an IPLinx system when they are discovered by the IPEXCB. You can change these auto assigned IP addresses to an address scheme of your choice by accessing the *TX/RX SETTINGS* menu.

Note: The web browser GUI only offers manual changes to encoder and decoder IP addresses individually. If you have several encoders and decoders on an A/V network that need to be changed, it would be advised to make a batch change in IPLinx Configurator. Instructions for batch changes, see *Batch Commands* on page 50.

To select an encoder or decoder on the A/V network check the button next to the appropriate device under *DEVICE SETTINGS*. To refresh this list click *RELOAD*.

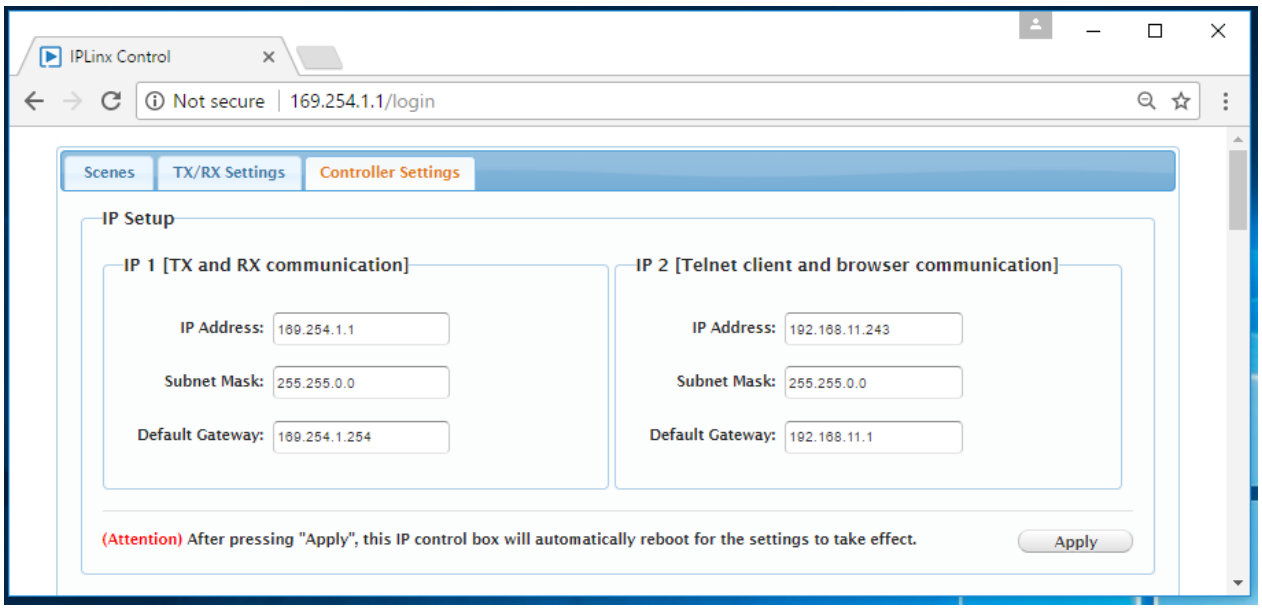


To change the IP address of the selected device, check the appropriate *IP MODE* option then enter in the *IP address*, *Subnet Mask* and *Default Gateway* as desired, then click *APPLY*

BEST PRACTICE: It is a best practice to physically label the IPLinx encoder or decoder with the newly changed IP address so it can be located easily on an A/V network for future use and service. If you do not remember the newly changed IP address of the IPLinx device and cannot find it on the A/V network, you will have to perform a factory reset on the device.

Changing IPEXCB IP Addresses

The IPLinx IPEXCB control interface is assigned with two default IP addresses; one for encoder (TX) / decoder (RX) communication and one for telnet client / browser communication. To access the IP information for the IPEXCB click on the *CONTROLLER SETTINGS* menu tab.



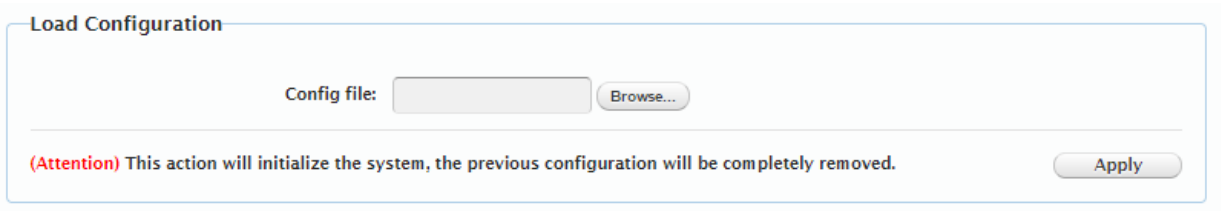
To change the IP address of either *IP 1[TX and RX communication]* and *IP 2 [Telnet client and browser communication]*, enter in the desired *IP Address*, *Subnet Mask* and *Default Gateway* then click *APPLY*. After pressing *APPLY* the IPEXCB will reboot.

Best Practice: It is a best practice to reboot the network switch after IP addresses have been changed on the IPEXCB.

Loading IPLinx Configurator Files

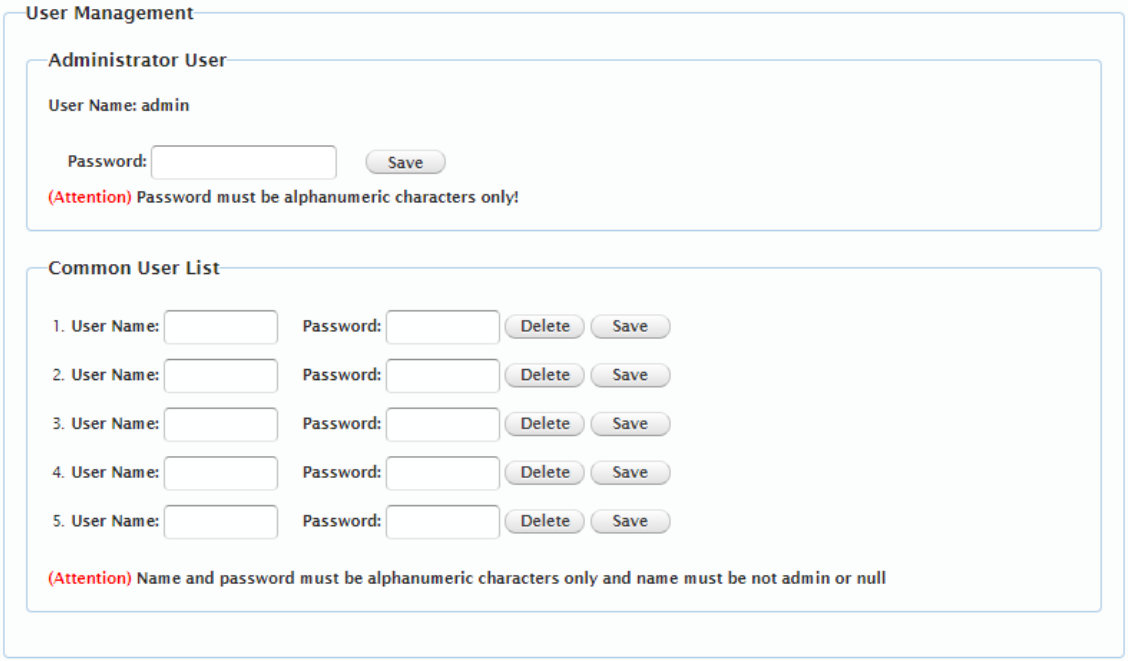
Configuration files that have been built with *IPLinx Configurator* can be uploaded to the IPLinx system by using *Load Configuration* option under *CONTROLLER SETTINGS* menu.

To load a configuration file, select *BROWSE* to locate the file located on your computer or hard disk. Click *APPLY* to initialize. Once a configuration file has been loaded the previous configuration file will be removed.



User Management

The *User Management* section of the *CONTROLLER SETTINGS* menu will allow you to change your administrative password as well as establishing up to five user logins that can only access the IPLinx video system matrix. This is ideal for users that need to route video signals from encoders to decoders but don't need administrative login to change system parameters.



To change the administrative password, type in the desired password in the *PASSWORD* field under *Administrative User* and click *SAVE*.

To create a user login, type in desired user name and password in the *User Name* and *Password* fields under *Common User List* and click *SAVE*.

IPLinx Config Software Usage

Downloading IPLinx Configurator Software

The IPLinx Configuration software tool can be found on the IPEXCB product page under the *SOFTWARE* tab at www.libav.com. Download the zip file and extract all files, then run the setup file (*IPLinxConfig_Setup.exe*) on the Windows PC that will be used to configure the IPEXCB and associated encoders and decoders.

Making a PC Connection

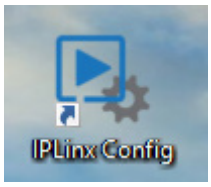
Connect a Windows PC to an open port on the A/V network switch with a Cat 5e patch cable.

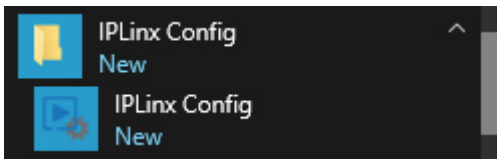
Set a static IP address for the Windows PC that is within the IP range of the IPEXCB (*169.254.1.xxx*) and set the subnet mask to *255.255.0.0*. See *Logging into the web browser Graphical User Interface (GUI)* on page 9.

Please contact an IT administrator if the PC cannot be assigned a static IP address in this range.

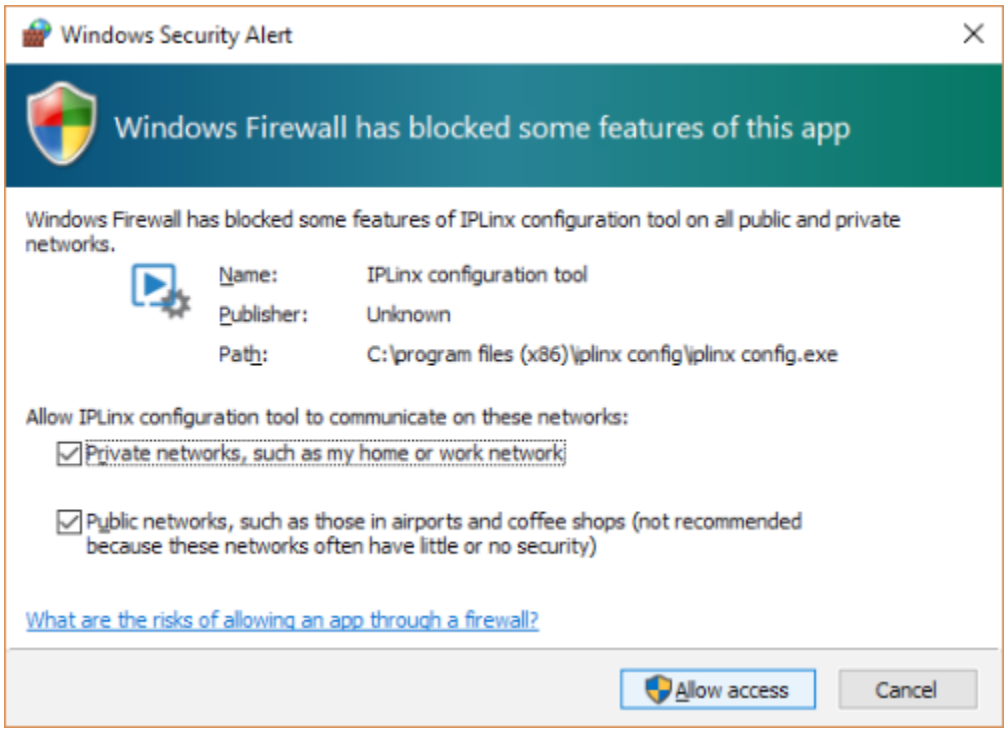
Running IPLinx Configurator Software

Open the IPLinx Configurator software. The link to the software can be found in the Windows Start menu or on the desktop if the option was enabled during setup.





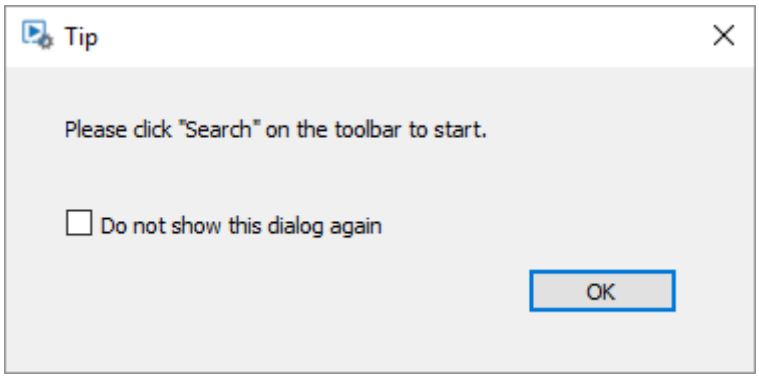
If a firewall warning pops up, tick the check boxes for private and public networks.



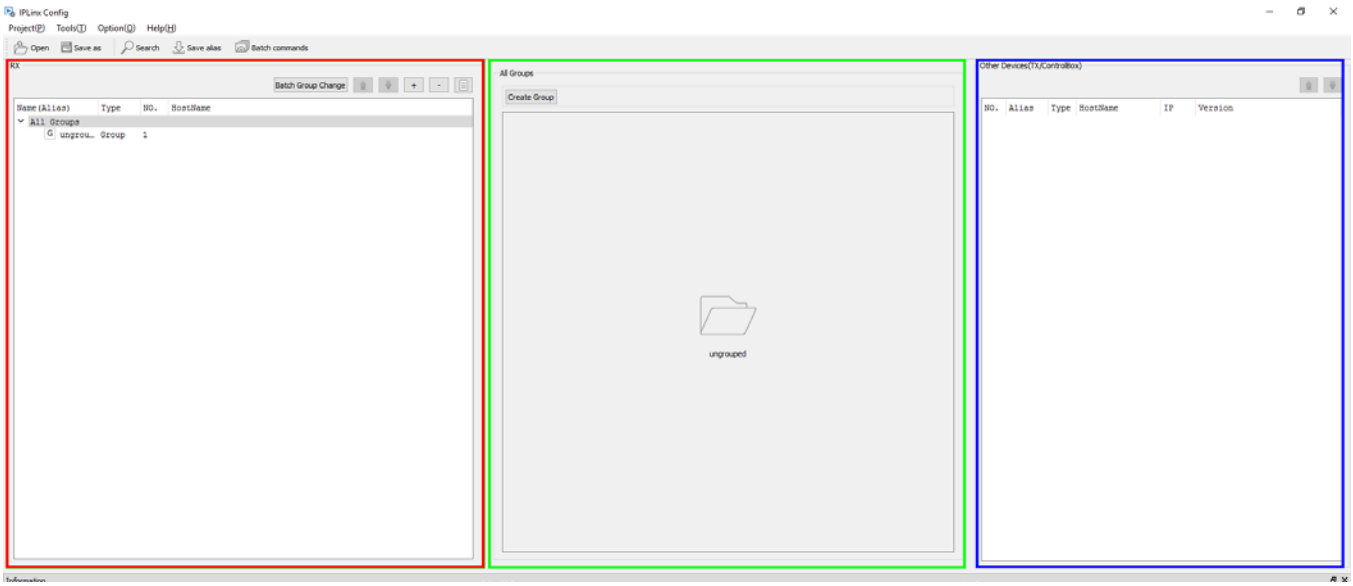
Some IT administrators may prevent the IPLinx Config software from accessing the IP video network even though the firewall permissions were approved. Please make sure that UDP ports 1234, 3333, 3334 and TCP ports 55000 through 56999 are open for proper access to the IP video network.

IPLinx Configurator Software Overview

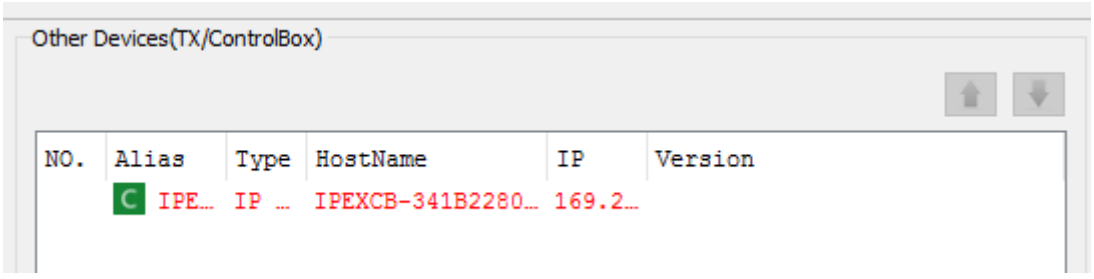
The IPLinx Config software will typically present a pop-up reminding the user to press the *Search* button to find attached devices on the network. Ticking the check box will prevent this from opening in the future.



The IPLinx Configurator software is split into three primary zones: RX on the left (decoders), TX and other on the right (IPEXCB and encoders), and the Group area in the middle.

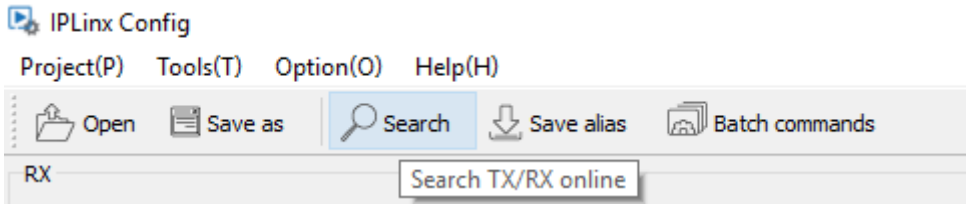


The IPEXCB should be the first device that is discovered by the software if the PC is correctly connected to the A/V network switch and within the IP range of the control box.

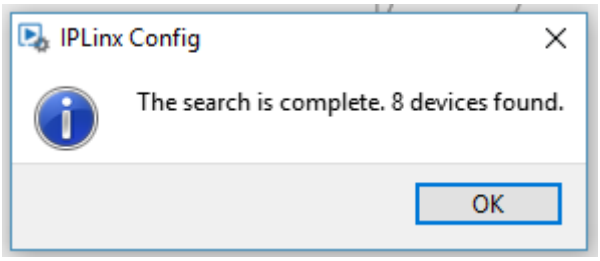


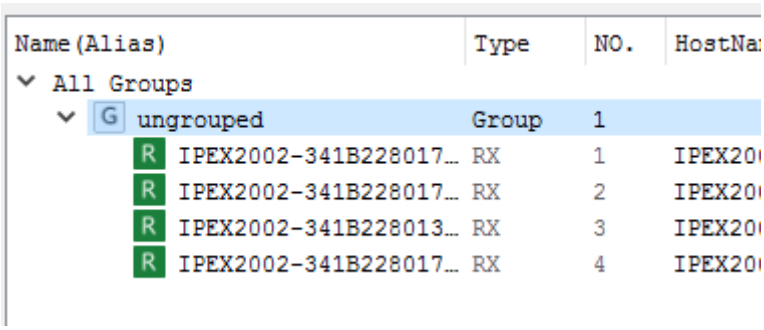
Search for IPLinx Devices on the Network

Clicking the *Search* button will tell the IPEXCB to scan the network for compatible encoders and decoders.



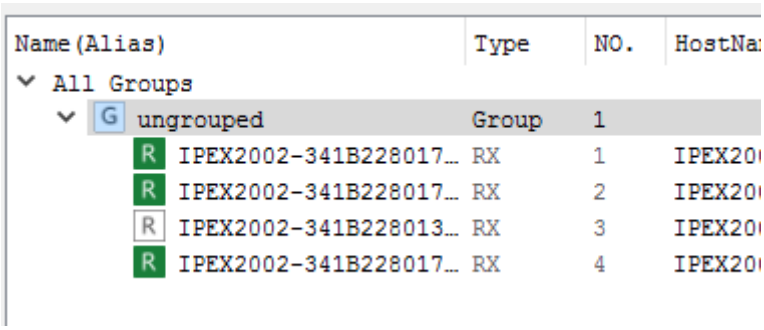
After the search is complete, a pop-up window will display the number of total devices found on the network, including the IPEXCB.





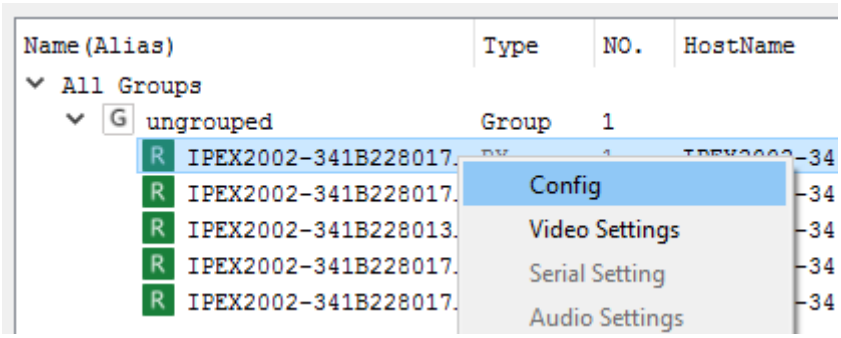
If a discovered device loses the connection to the network, the green box will change to white.

Temporarily disconnecting an encoder or decoder can help determine which device is at which location in an installation or when providing an alias for the device.



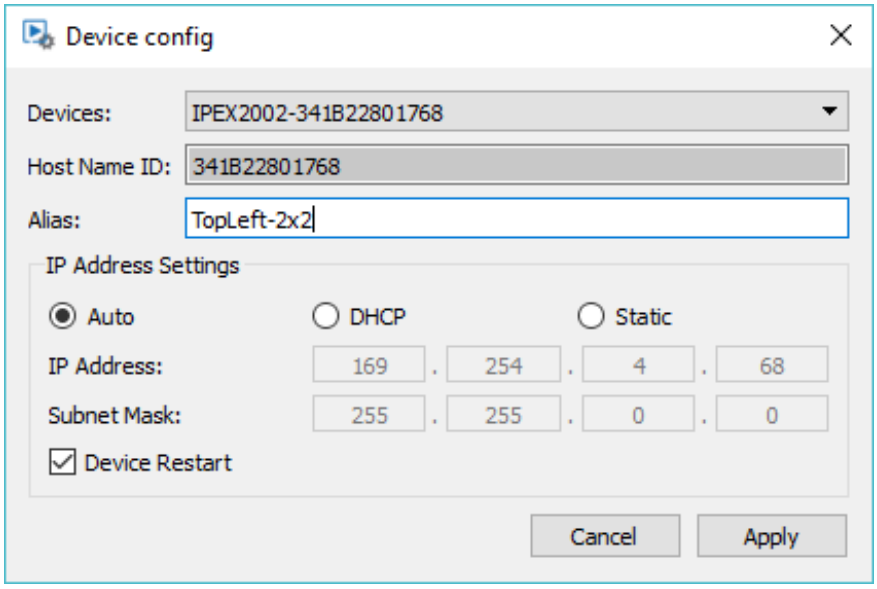
Renaming IPLinx Encoders and Decoders

To rename a device, except for the IPEXCB, right click the device and select *Config*.

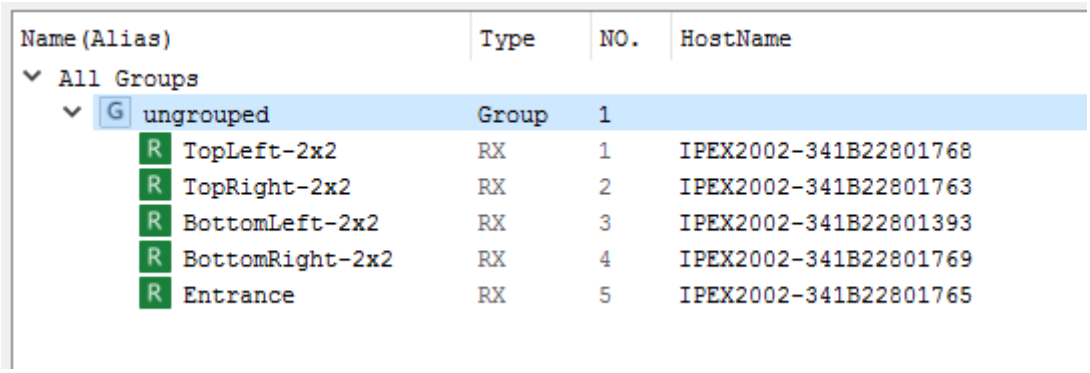


The default Alias is the [MANUFACTURERS MODEL NUMBER - MAC ADDRESS OF THE DEVICE]. Enter a new Alias for the device, then click *Apply*. Clicking the *X* will close the pop-up.

To prevent any switching issues, only alphanumeric characters and hyphen (-) are allowable characters.



When the encoders and decoders have an Alias applied, the Alias will show up in the device listings.

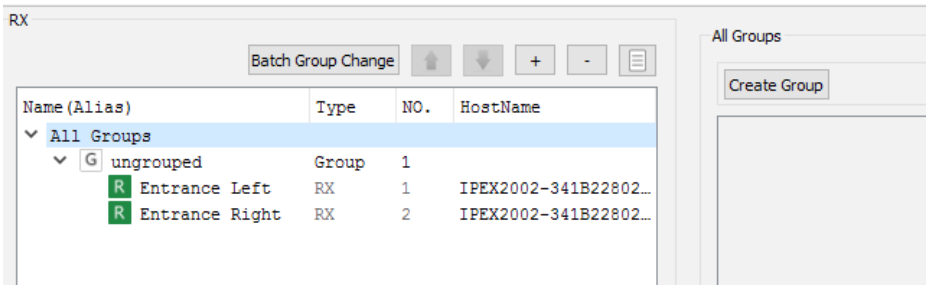


Creating Decoder Groups

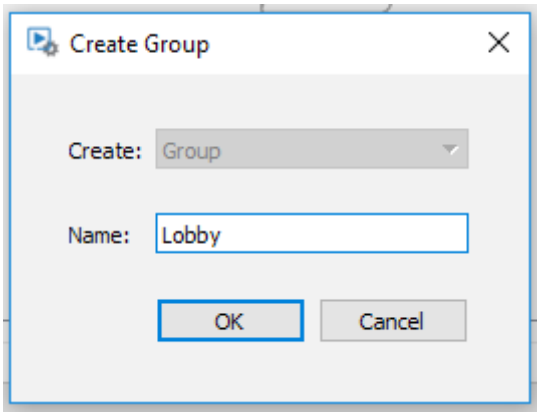
It may be useful to categorize decoders into groups so they can be identified more easily by their location. When using IPLinx with a third party control system, it is not necessary to create and use groups however for servicing purposes it may be useful to do so. When using the IPLinx iPad or Windows APP, groups are used to navigate to various locations with ease. See *Using iPad or Windows Control APP with IPEXCB* on page 55.

Create a New Group

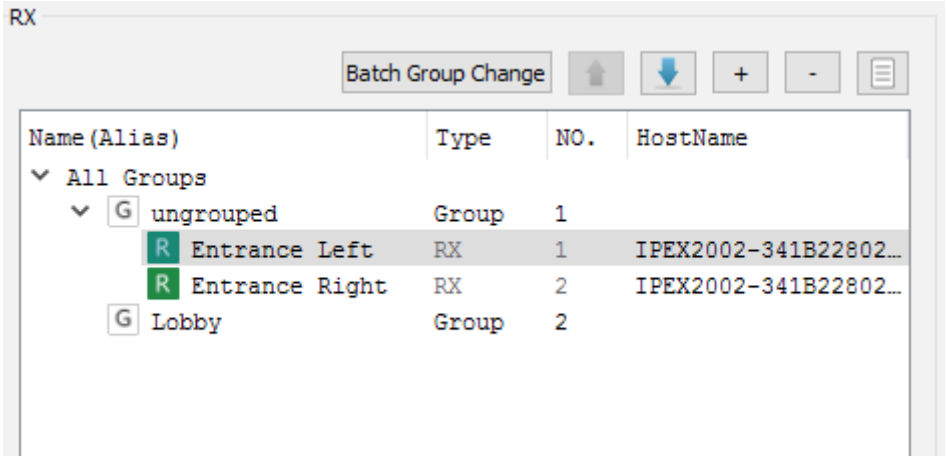
With *All Groups* selected on the left panel, click *Create Group* at the top of the middle panel.



Provide a name for the new group, then click *OK*.

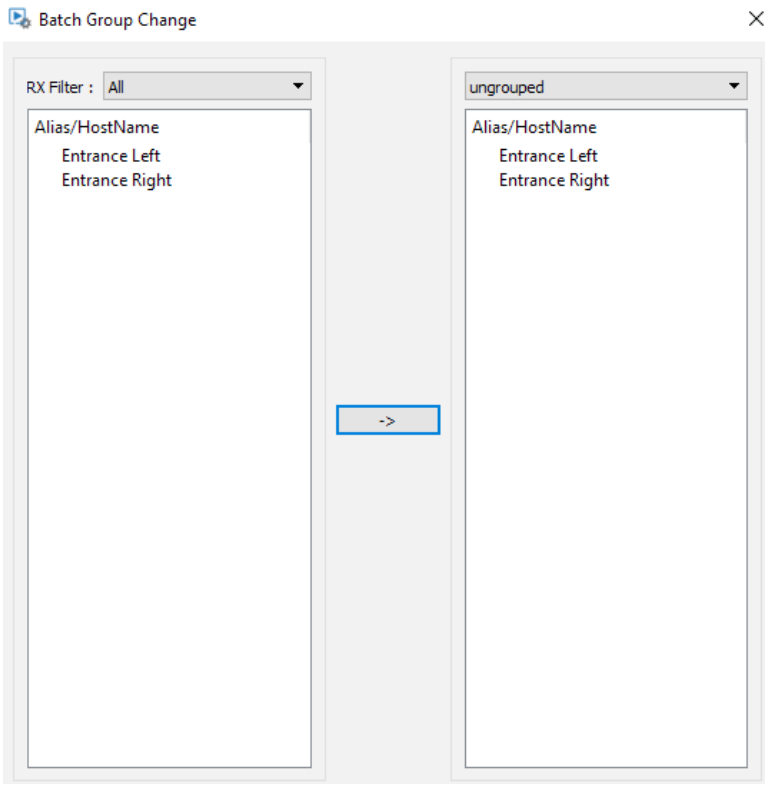


With the new group created you can now assign decoders to the group. To make this change click on *Batch Group Change* button.

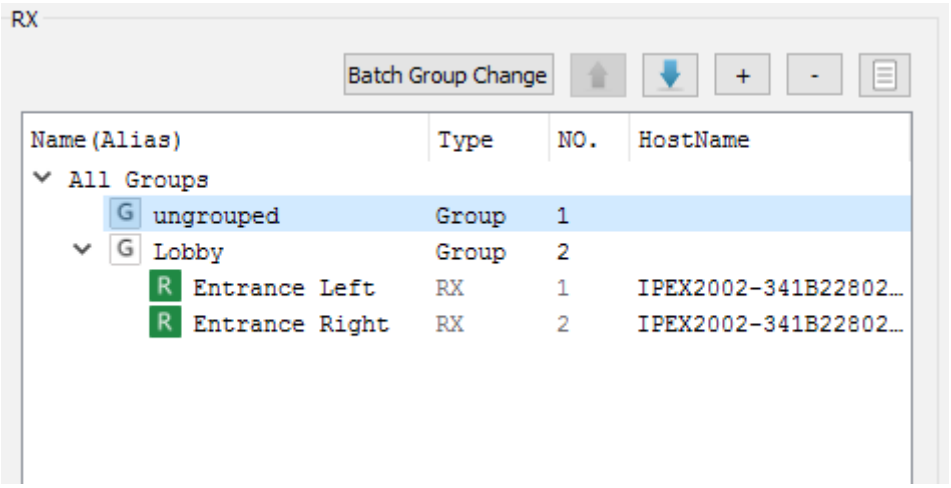


Assigning an IPLinx Encoder or Decoder to a Group

To assign decoders to the desired group location, choose the appropriate decoder group on either side of the Batch Group Change menu using the *RX Filter* drop down menus on either side. Selections will be adjusted from the left menu to the right. Use the -> button to then send a decoder from one group to the next.

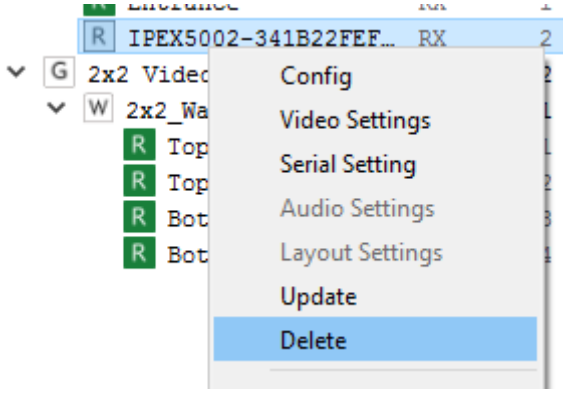


The decoders will now appear in the new group in the RX window.

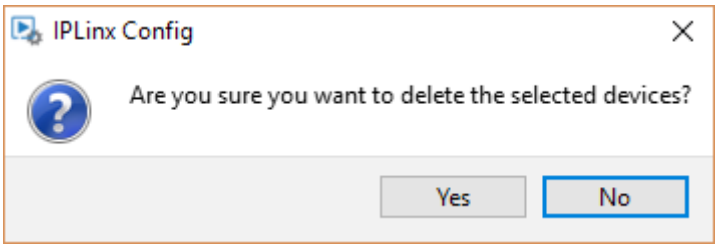


Removing an IPLinx Encoder or Decoder

To remove an encoder or decoder from the configuration of the AV system, right click on the name of the encoder or decoder, then click *Delete*.



A confirmation window will open to confirm the deletion of the encoder or decoder.

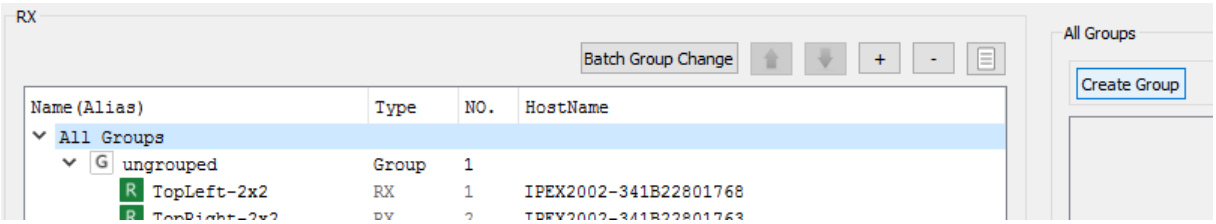


Create a Video Wall Group

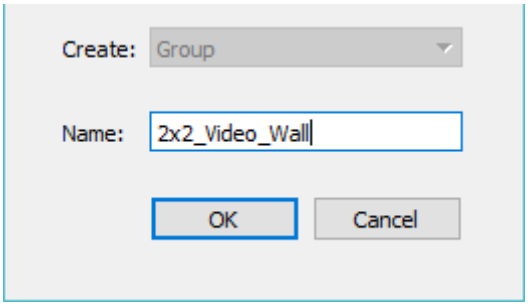
When building video wall systems in IPLinx, use proportional horizontal and vertical video wall system layout to avoid video stretching and image distortion. *For example* 2x2, 3x3, 4x4 etc. To create a video wall system in IPLinx assign a decoder for each display in the video wall display system.

Create a New Group

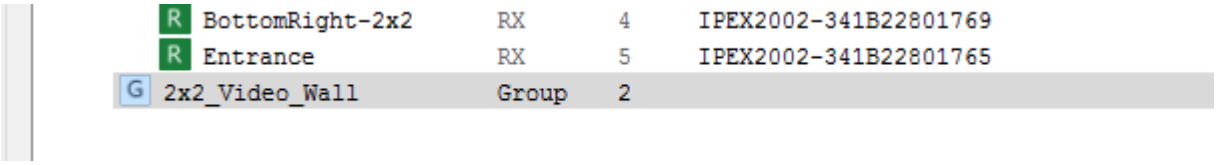
With *All Groups* selected on the left panel, click *Create Group* at the top of the middle panel.

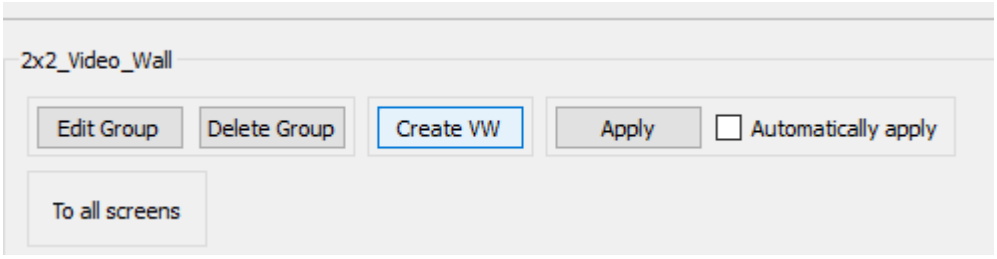


Provide a name for the new group, then click *OK*.

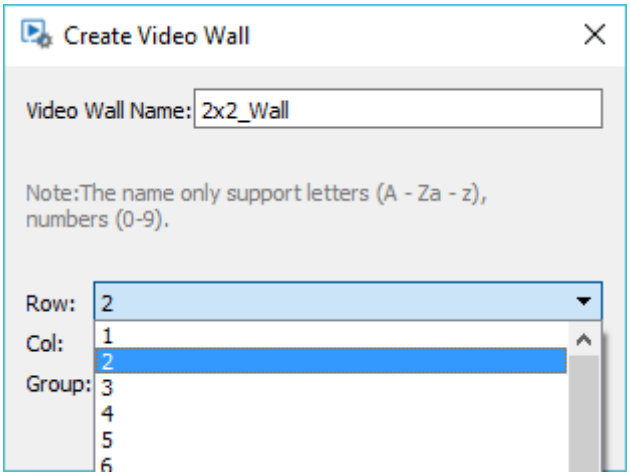


With the new group selected in the left panel, click the *Create VW* button at the top of the middle panel. This will create a new video wall configuration.

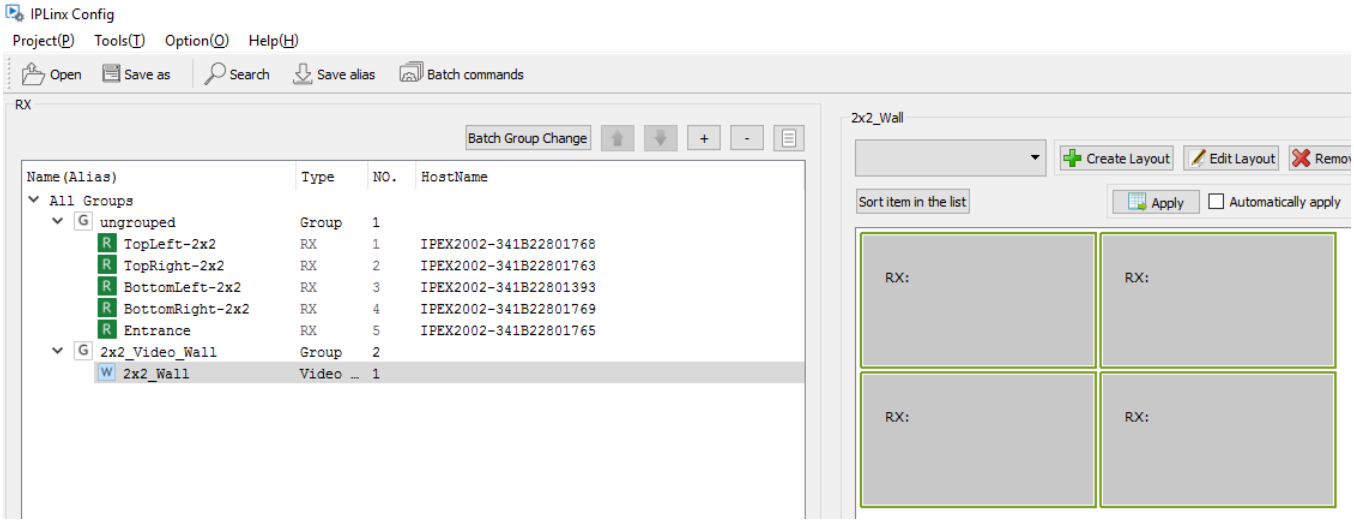




Select the number of rows and columns to be used in the matrix output or video wall configuration. There is a maximum of 16 rows and 16 columns per group. When naming the video wall, spaces are not allowed, but an underscore (_) may be used.

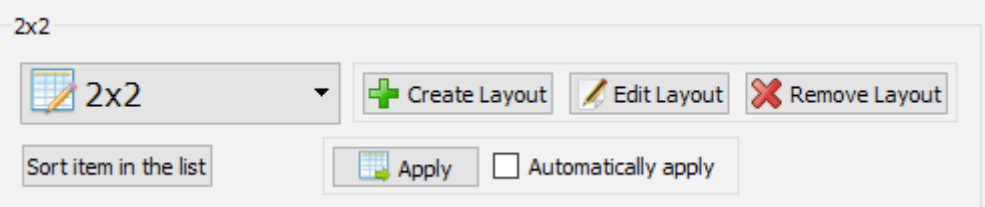


Click *OK* to create the video wall. The configuration will show up beneath the group that was just created and a visual representation will appear in the middle section of the IPLinx Config software.

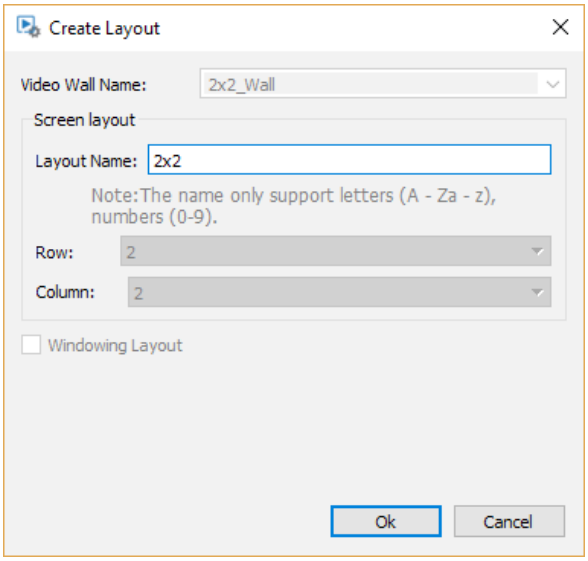


Create a Video Wall Layout

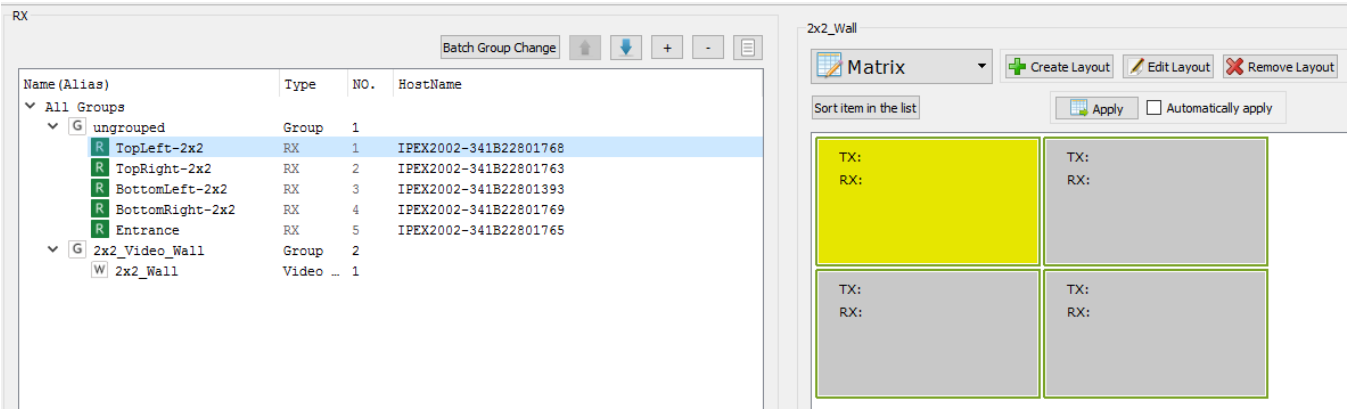
With the newly created video wall sub-group selected on the left panel, click C*reate Layout* at the top of the middle panel. The video wall visual representation should also be seen in the middle panel.



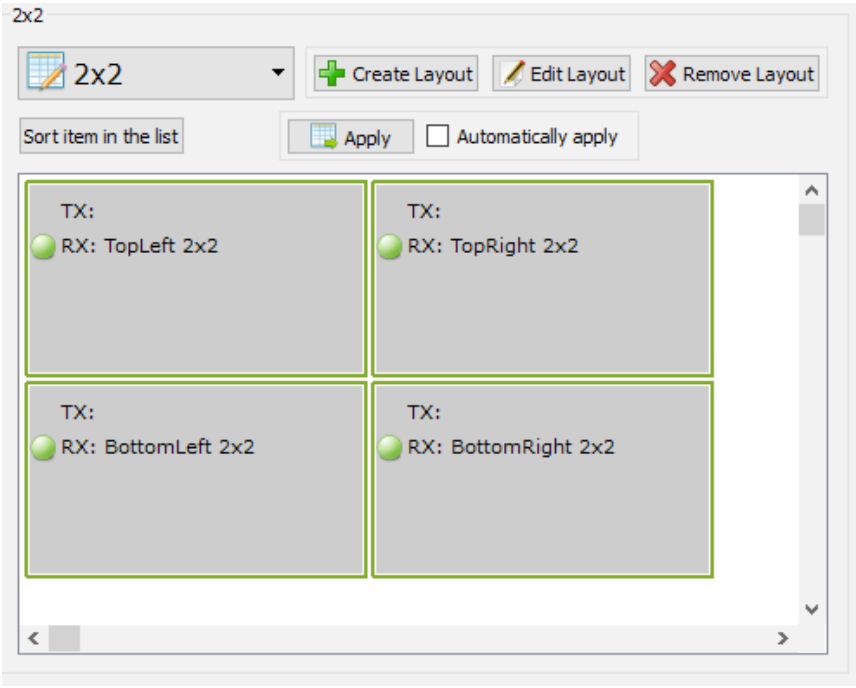
Enter a name for the layout, such as *2x2*, then click *OK*.



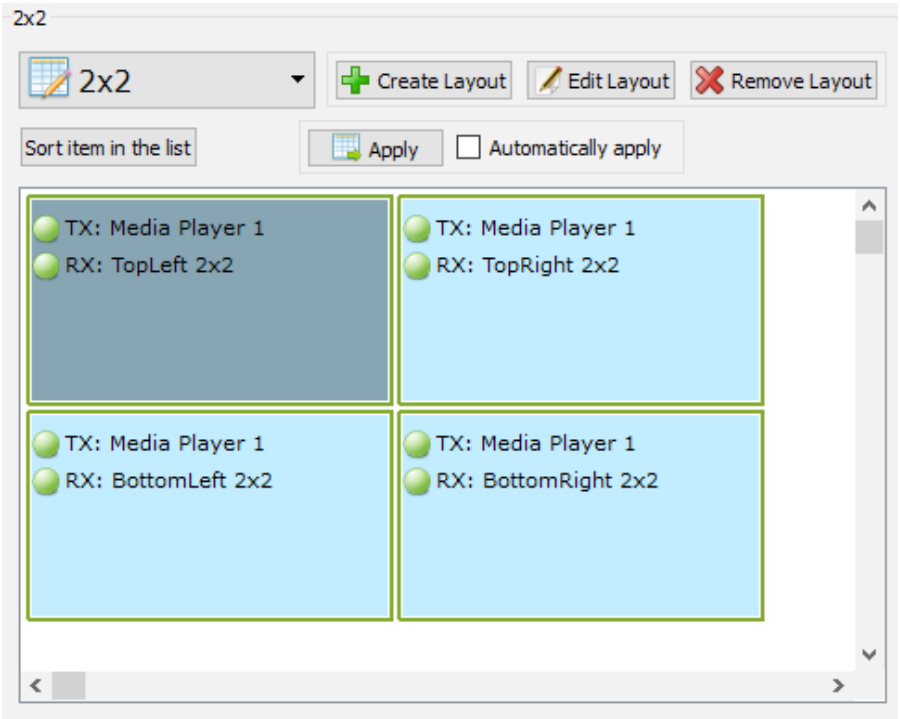
Drag the decoders in the ungrouped section of the left panel to the respective display locations within the matrix layout. As each decoder is assigned to a location, it will disappear from the upgrouped section and will then be re-assigned to the video wall group.



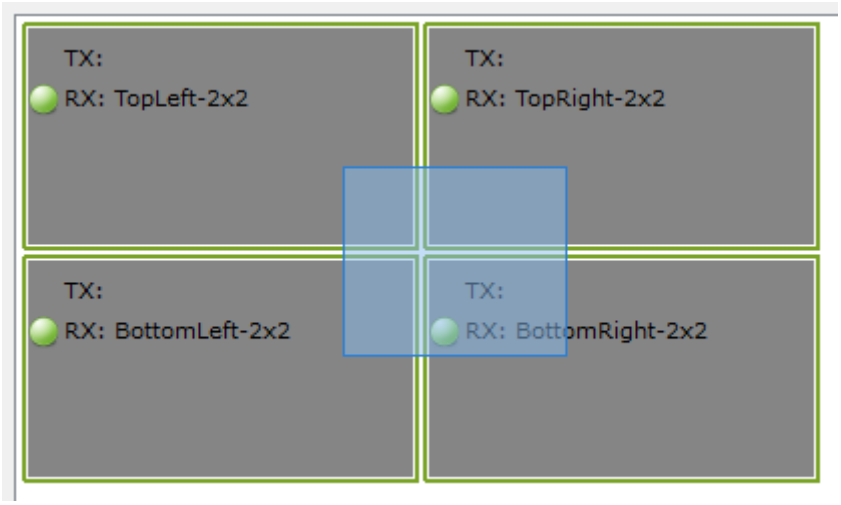
The RX portion of the visual representation will show the assigned decoders in each display slot.



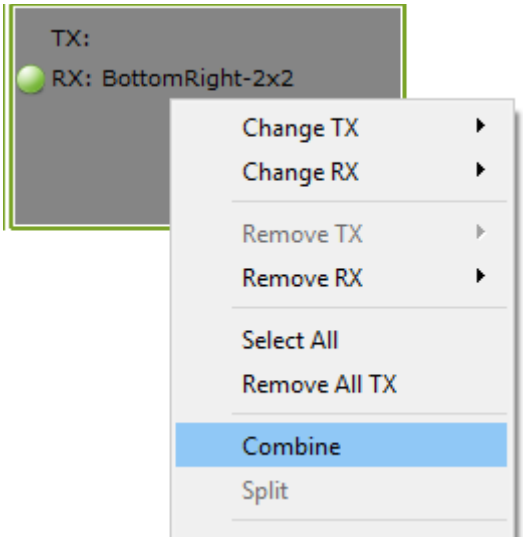
Repeat the process with the encoders to assign a predefined AV route whenever the current layout is selected. This step is optional.



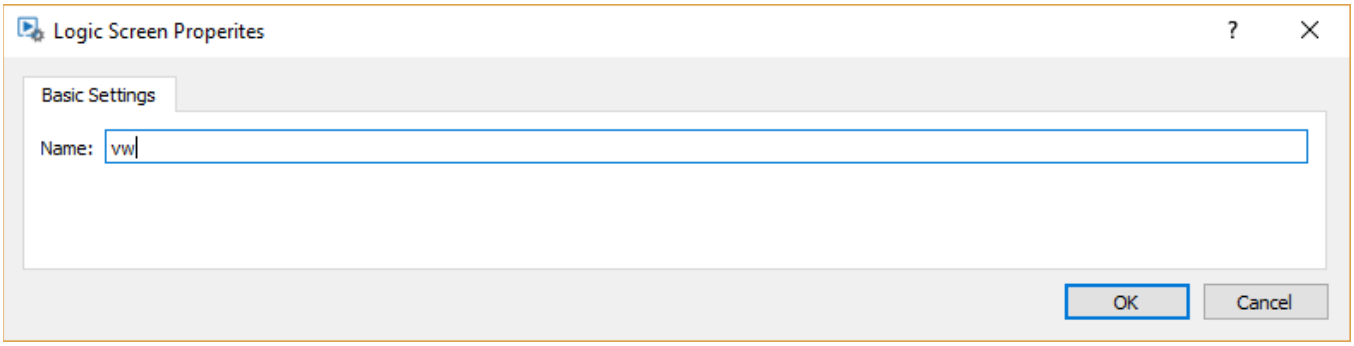
To adjoin the video wall display so one image will displayed proportionally across the video wall, click and hold down the right mouse button over the upper far left display in the groups section and drag it to the bottom right display quadrant of the video wall.



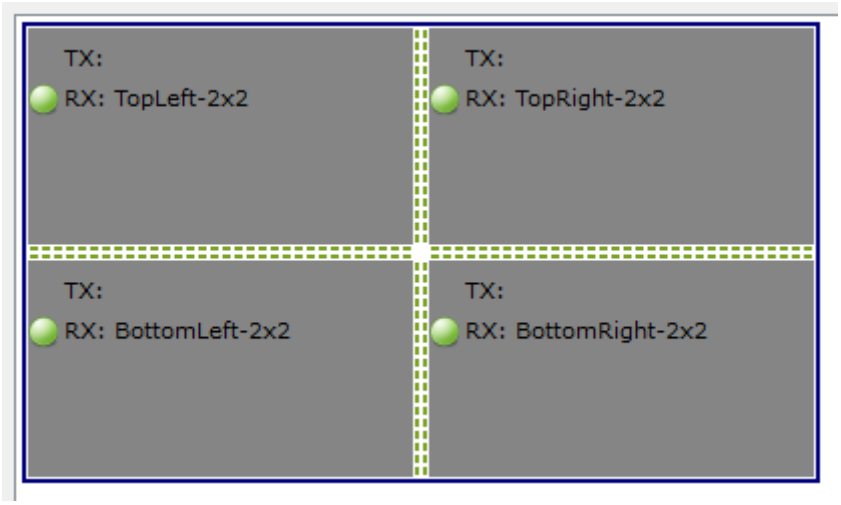
Release the right mouse button and click *Combine*.



Provide a simple name, such as *vw*, in the *Logic Properties* window, then click *OK*.

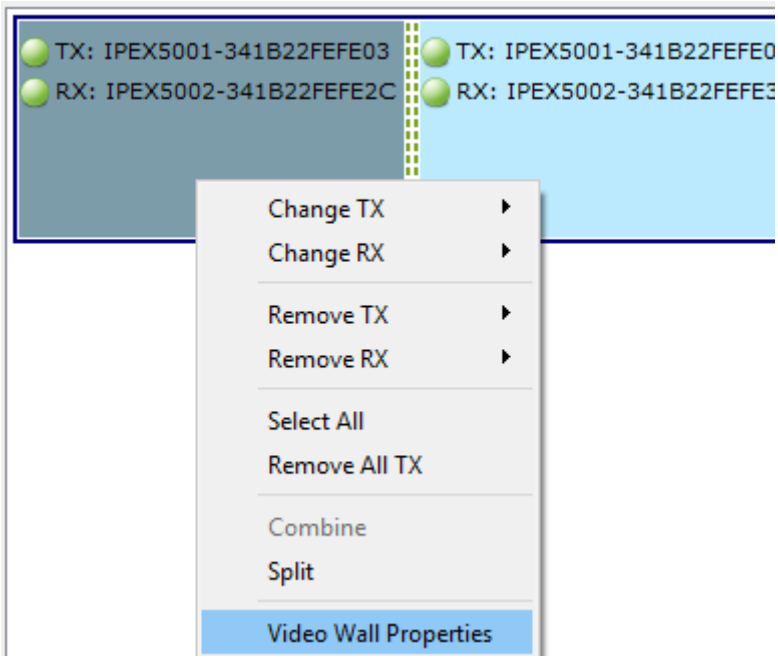


A blue line will surround the visual representation of the displays and a dotted line will separate each display, which indicates the configuration is a logical video wall.



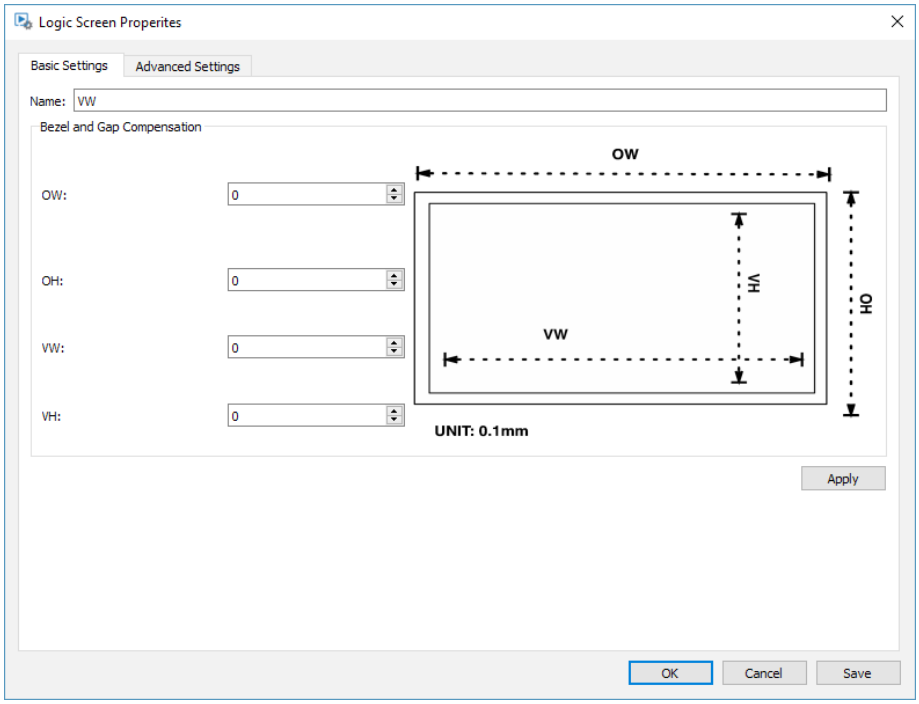
Video Wall Bezel Compensation (5000 series only)

To compensate for bezel size in a video wall, right click on the video wall group and select *Video Wall Properties* from the menu.



The *Basic Settings* tab allows the outside and viewable dimensions of the display to be configured to offset the image in order to maintain proper aspect ratios of the source content. The number values are referring to 0.1 mm increments.

Suppose a 43 inch LED TV has an 8 mm bezel with outside dimensions of 970 mm x 569 mm. The following values would be entered into the tab: OW = 9700, OH = 5690, VW = 9540, and VH = 5530.



The *Advanced Settings* tab allows correcting the video output on an individual display.

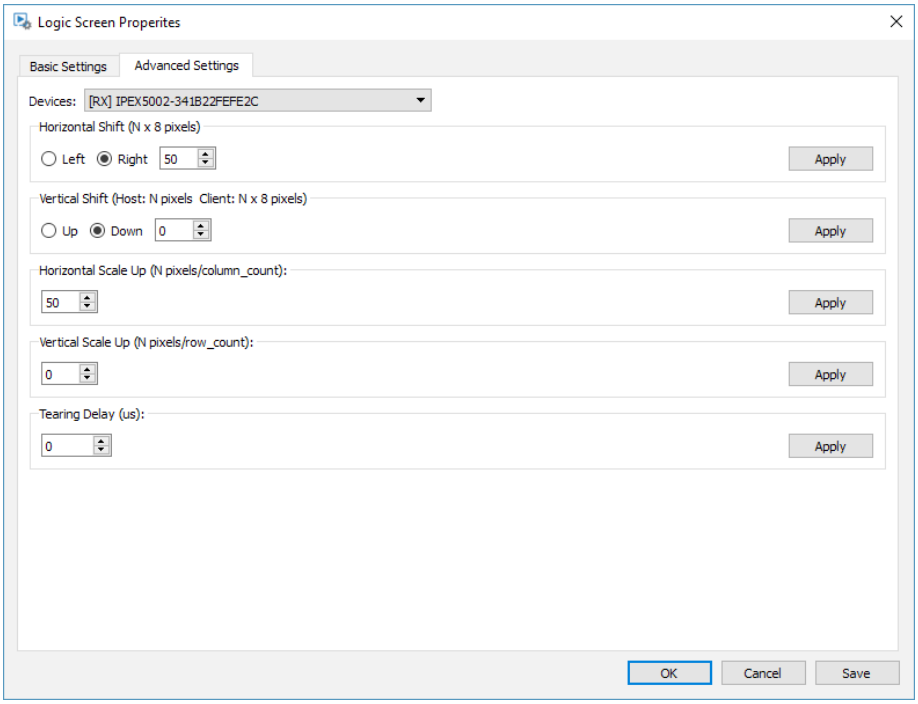
Horizontal Shift will shift the video image to the left or right. If the display is on the left edge of the video wall, the image cannot be shifted to the right. A single unit is 8 pixels.

Vertical Shift will shift the video image up or down. If the display is on the top edge of the video wall, the image cannot be shifted down. A single unit is 8 pixels.

Horizontal Scale Up will stretch or shrink the video image horizontally. The scale is one pixel per number of columns in the video wall.

Vertical Scale Up will stretch or shrink the video image vertically. The scale is one pixel per number of rows in the video wall.

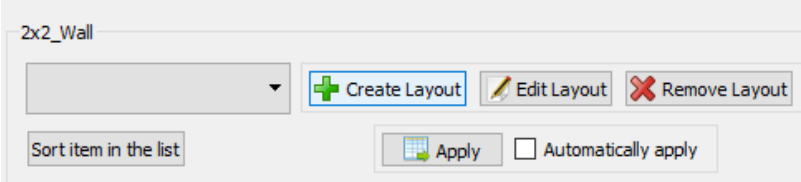
Tearing Delay is used to compensate for screen tearing and is applied when the source content covers the entire video wall. In a 3 x 3 video wall, the tearing delay would only affect a 3x3 video wall image. A 2 x 2 video wall image on the 3 x 3 wall will ignore the tearing correction. The values are defined in microseconds with typical values ranging between 10000 and 16000.



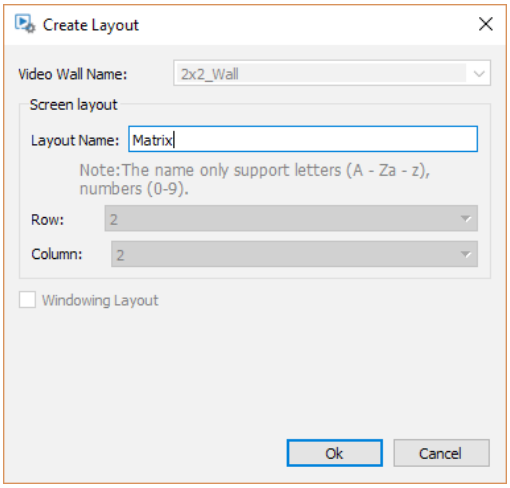
Create a Matrix Layout within Video Wall Group

When a video wall group is created and a decoder is assigned to each display within the video wall, you have the ability to build a matrix system layout within the video wall group.

With the video wall sub-group selected on the left panel, click *Create Layout* at the top of the middle panel. The video wall visual representation should also be seen in the middle panel.

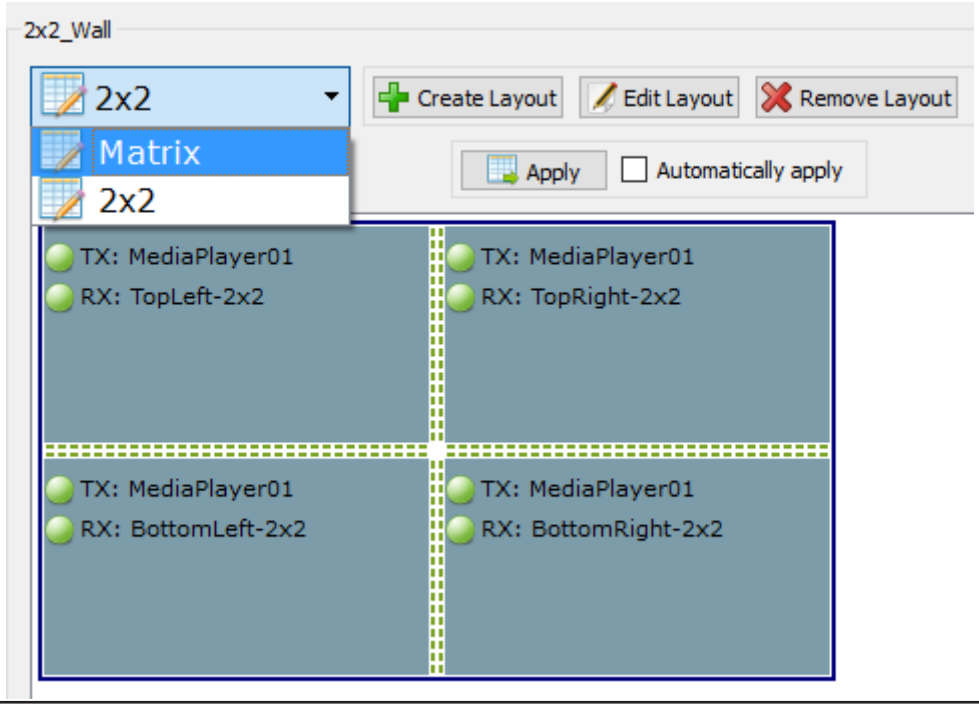


Enter a name for the matrix, such as *Matrix*, then click *OK*.



Verify Group Layouts

Clicking the dropdown list at the top of the middle section with the video wall group selected will show all layouts that have been created.

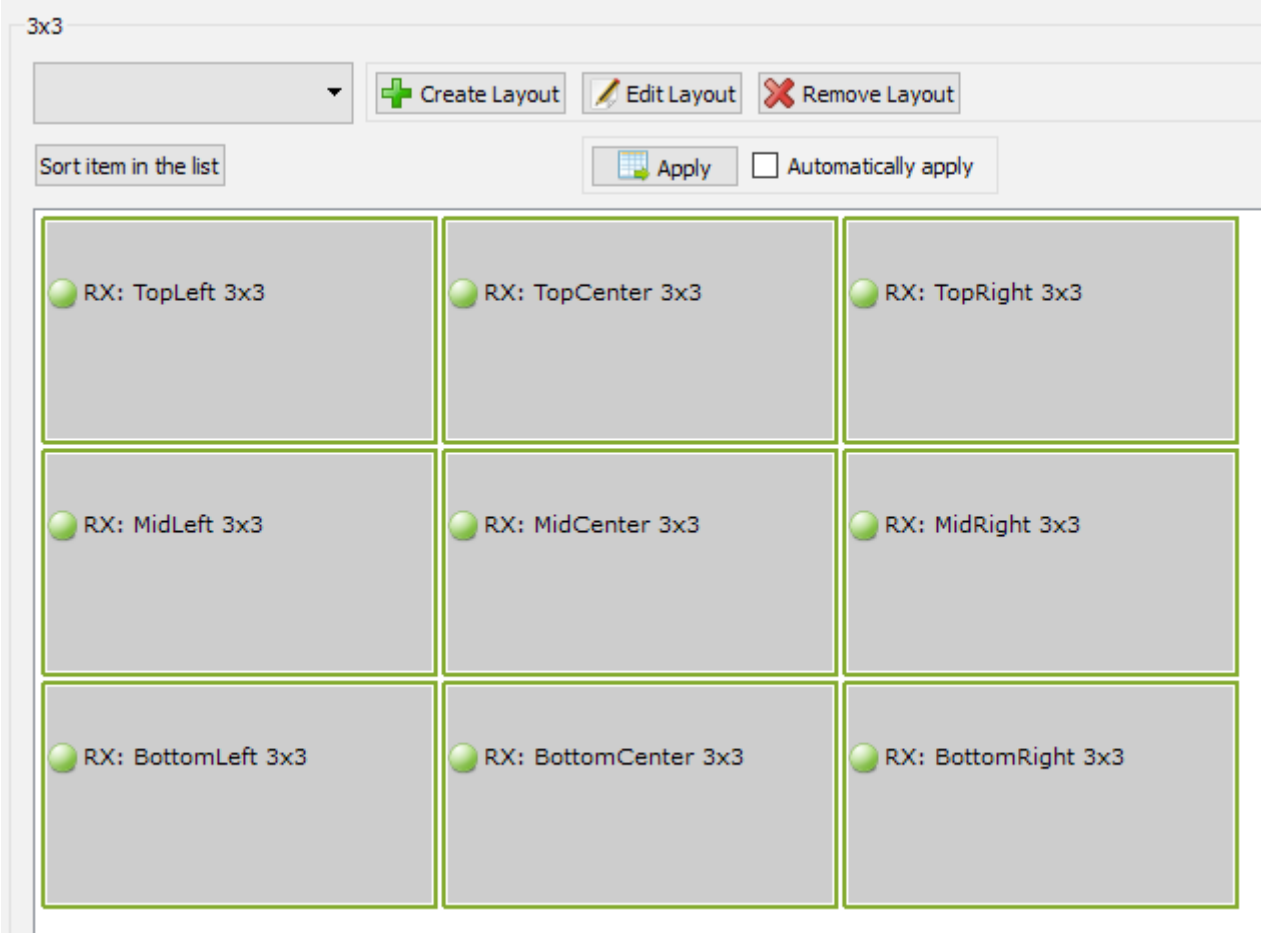


Creating Combination Layouts for Large Video Wall Groups

When a video wall group is created and a decoder is assigned to each display within the video wall, you have the ability to build a combination video wall / matrix system layout within larger video wall systems such as 3x3, 4x4 and beyond.

In our example we will create a 2x2 video wall quadrant to the upper right of the 3x3 video and designate the remainder of the displays in the video wall system for matrix video routing.

Create a video wall group labeled 3x3 and assign the appropriate decoders to the appropriate video wall quadrant locations. For instructions on creating a video wall configuration, see page 25 *Creating a Video Wall Group*

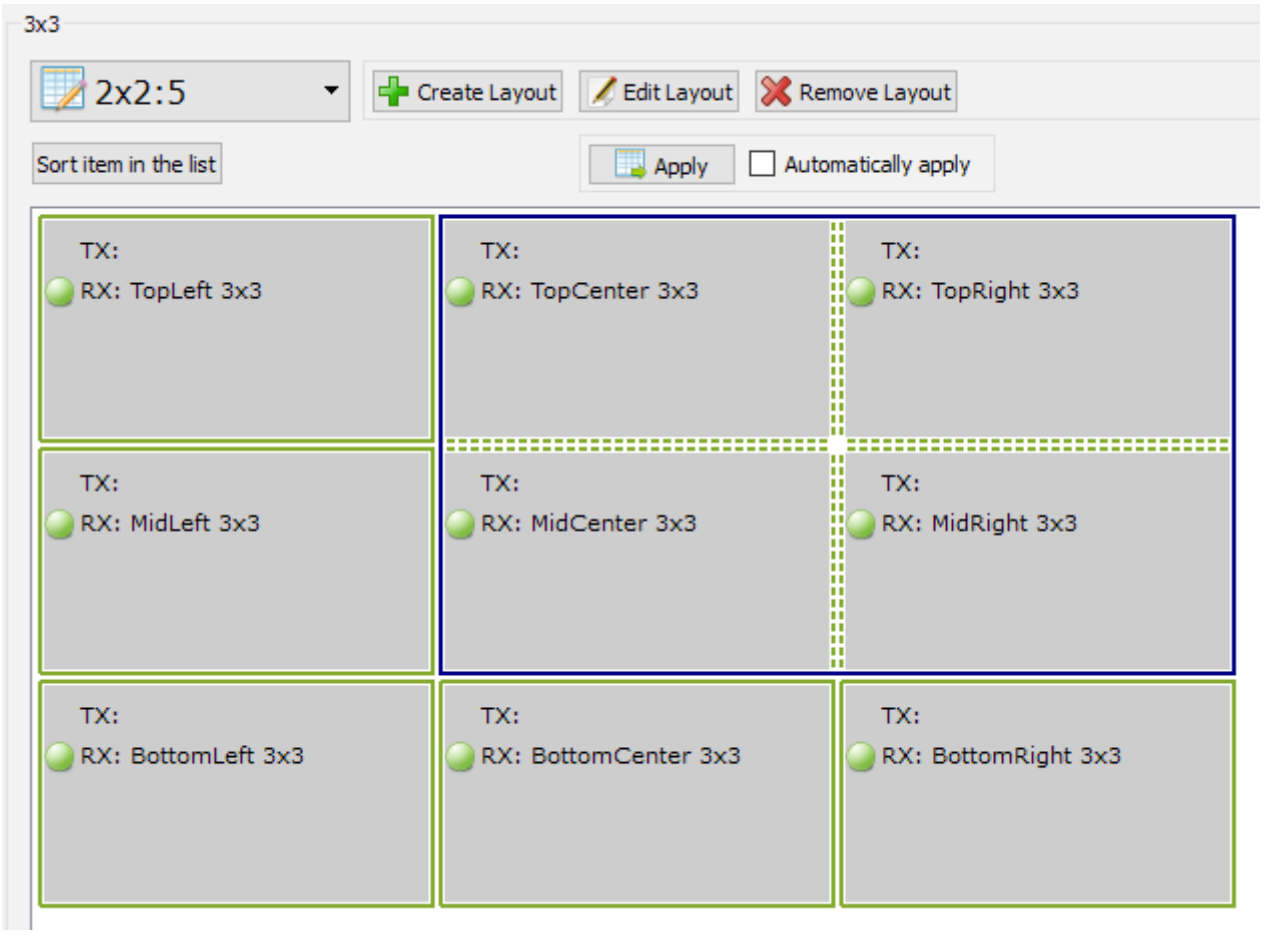


With the video wall sub-group selected on the left panel, click *Create Layout* at the top of the middle panel. The video wall visual representation should also be seen in the middle panel.

Create a video layout labeled 2x2:5. For instructions on creating a video wall group, see *Create a Video Wall Layout* on page 27.

Combine the top four displays in upper right hand corner of the video wall configuration in the groups section. For instruction on how to combine displays for a video wall configuration see page 29.

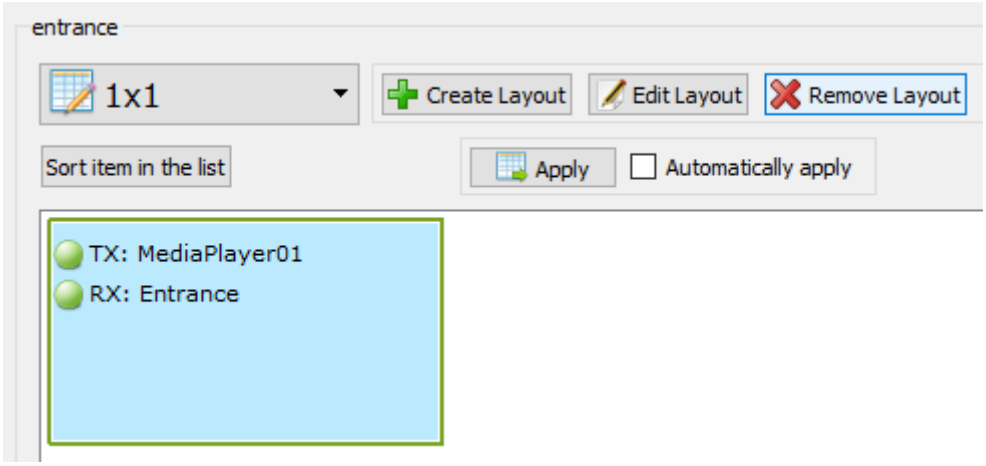
You know have a 2x2 system with 5 displays operating in matrix mode within the 3x3 video wall configuration.



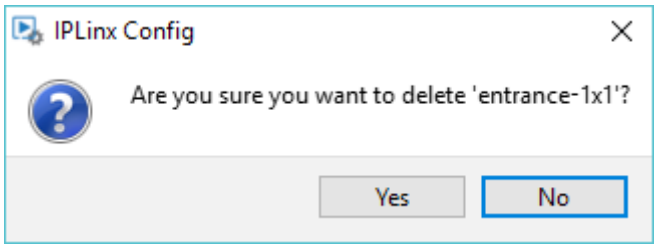
Remove a Matrix or Video Wall Layout

Remove a Layout

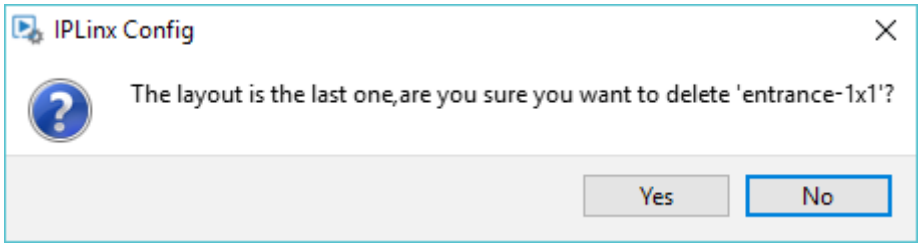
To remove a layout, click the *Remove Layout* button with a valid video wall selected.

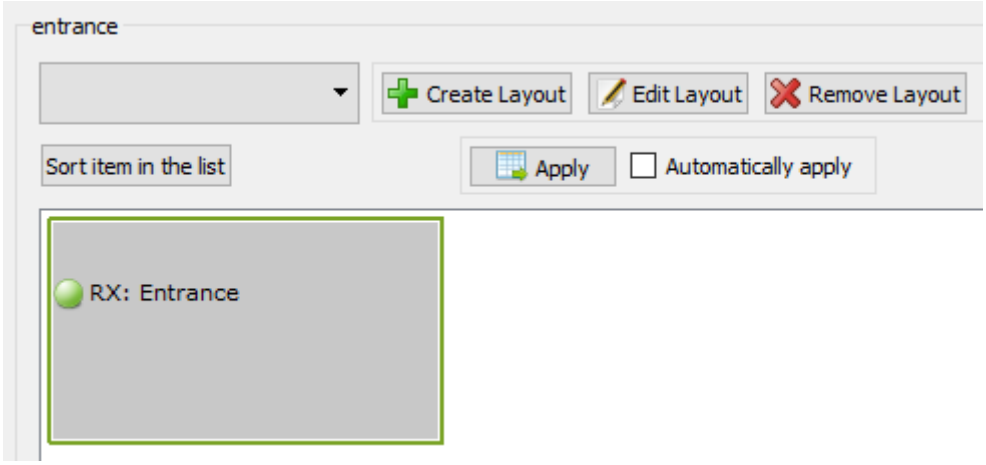


A confirmation window will open to confirm the deletion of the layout.



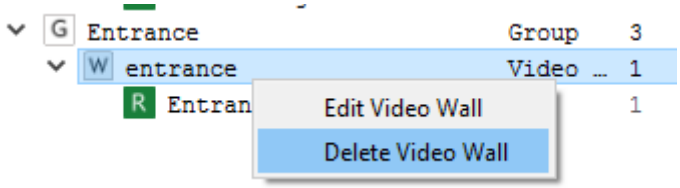
If this is the last layout for the video wall, another confirmation window will open to confirm the final deletion.



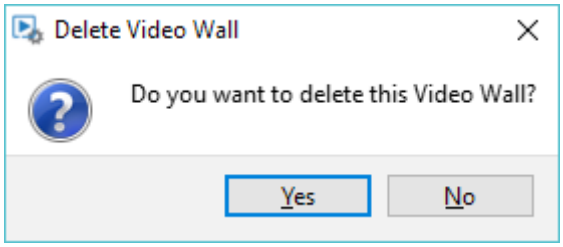


Remove a Video Wall

To remove a video wall layout, right click on the name of the video wall, and click *Delete Video Wall*.



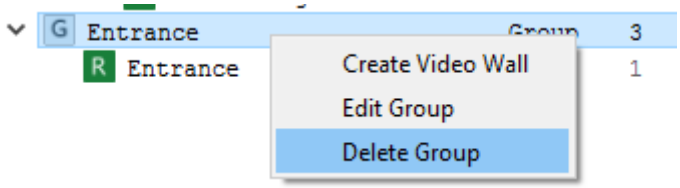
A confirmation window will open to confirm the deletion of the video wall.



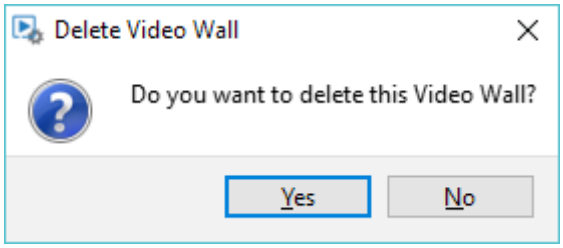
After the video wall is deleted, the video wall reference will be removed from the group.

Remove a Group

To remove a video group, right click on the name of the group, and click *Delete Group*.



A confirmation window will open to confirm the deletion of the video group.

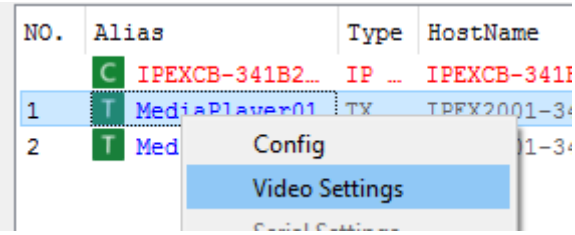


After the group is deleted, all assigned encoders will be moved to the *ungrouped* group.

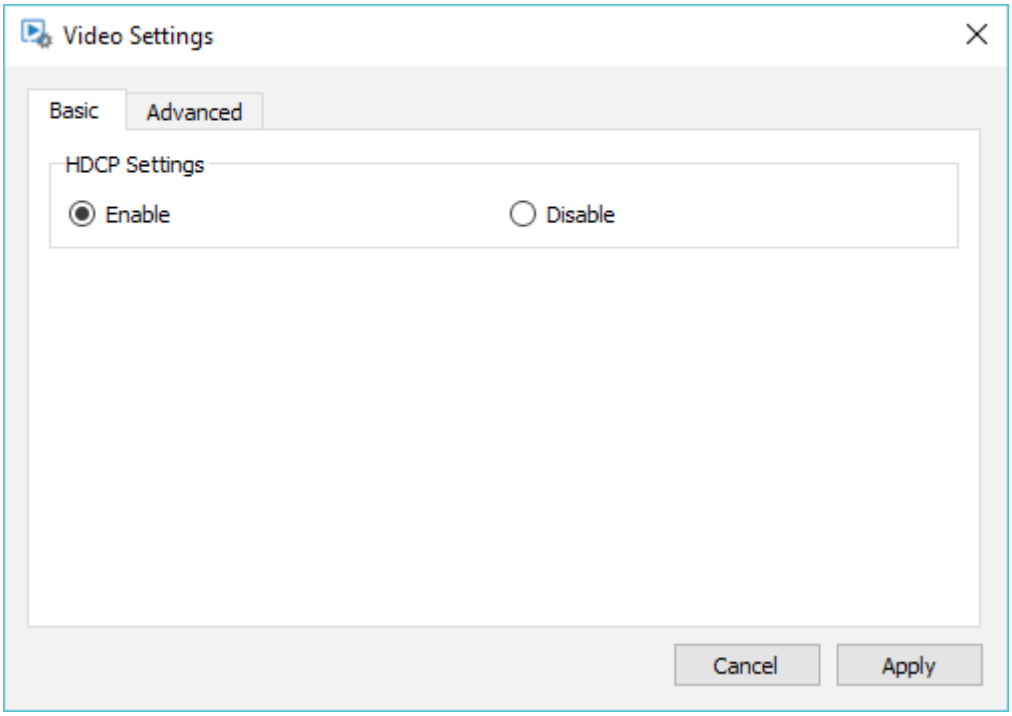
2000-series Device Settings

IPEX2001 Video Settings

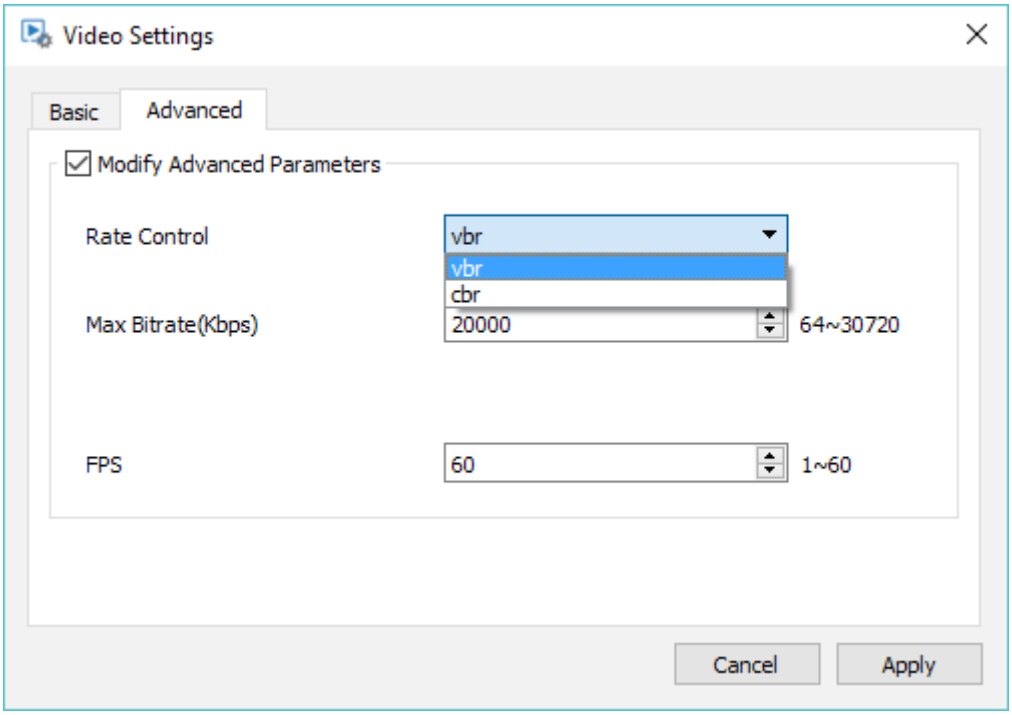
To configure the video settings of an IPEX2001, right click on the name of the encoder and select *Video Settings*.



In the *Basic* tab, tick the *Enable* or *Disable* radio button under *HDCP Settings* to change the video encryption mode of the source device.

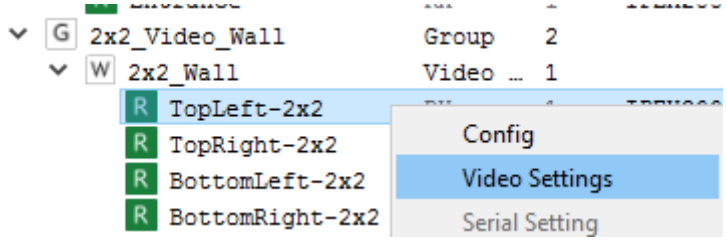


In the *Advanced* tab, tick the *Modify Advanced Parameters* box to access different methods to adjust the bandwidth and quality of the source signal.

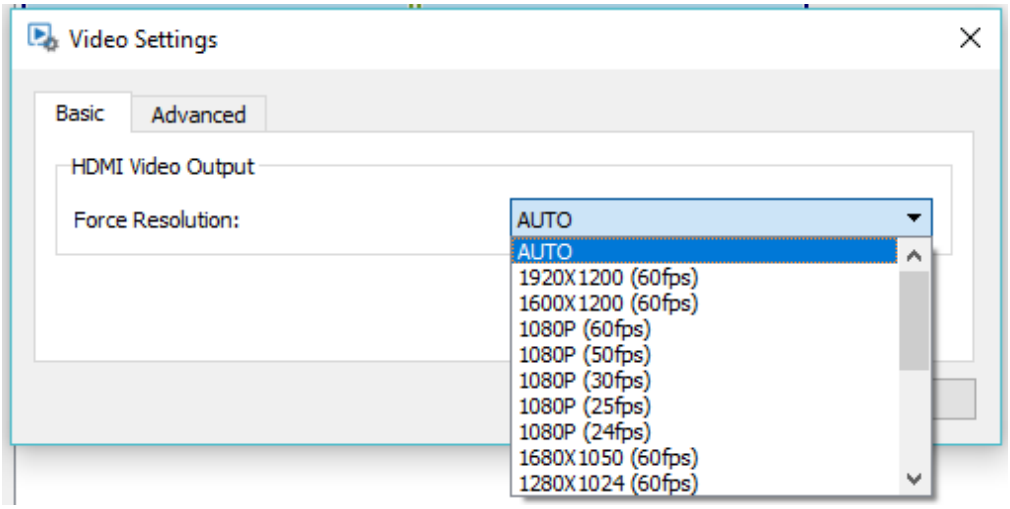


IPEX2002 Video Settings

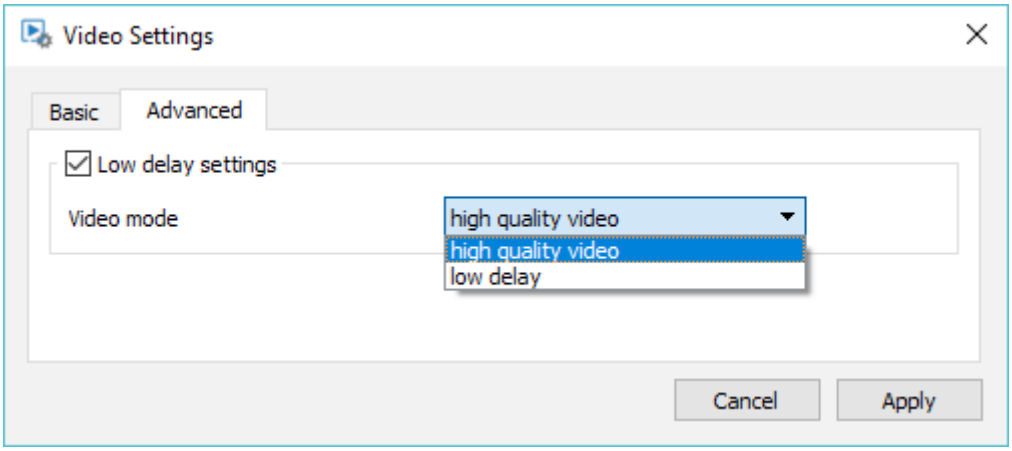
To configure the video settings of an IPEX2002, right click on the name of the encoder and select *Video Settings*.



The *Basic* tab allows specifying a specific output resolution for a connected display.



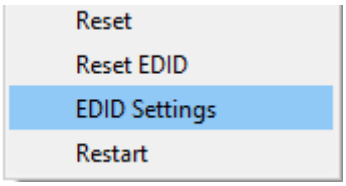
In the *Advanced* tab, tick the Low delay settings box to choose between high quality video with a longer delay or low delay with lower video quality.



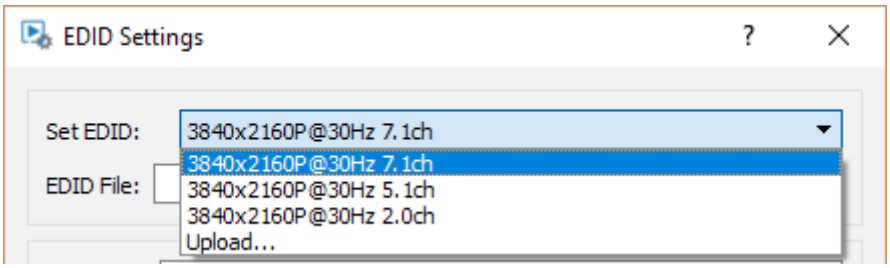
5000-series Device Settings

IPEX5001 EDID Settings

To define the EDID settings of an IPEX5001, right click on the name of the encoder and select *EDID Settings* at the bottom of the options list.

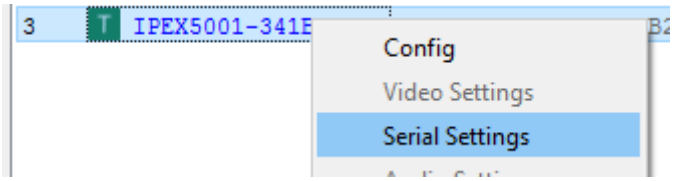


Select one of the built-in EDIDs to determine the audio settings for the source. The 2160p EDID tables also include support for 1080p24 and 1080p60.

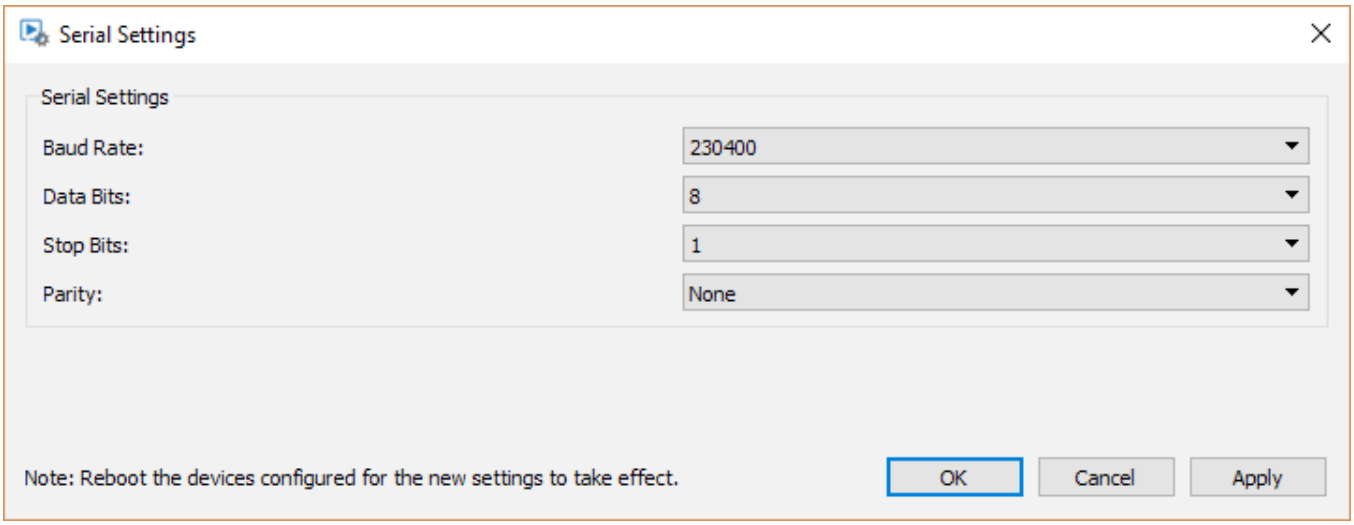


IPEX5001 RS232 (Serial) Settings

To configure the serial settings of an IPEX5001, right click on the name of the encoder and select *Serial Settings*.

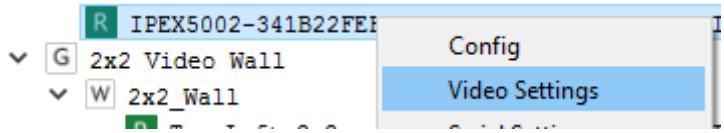


The IPEX5001 can connect to devices with baud rates between 50 baud and 230400 baud.

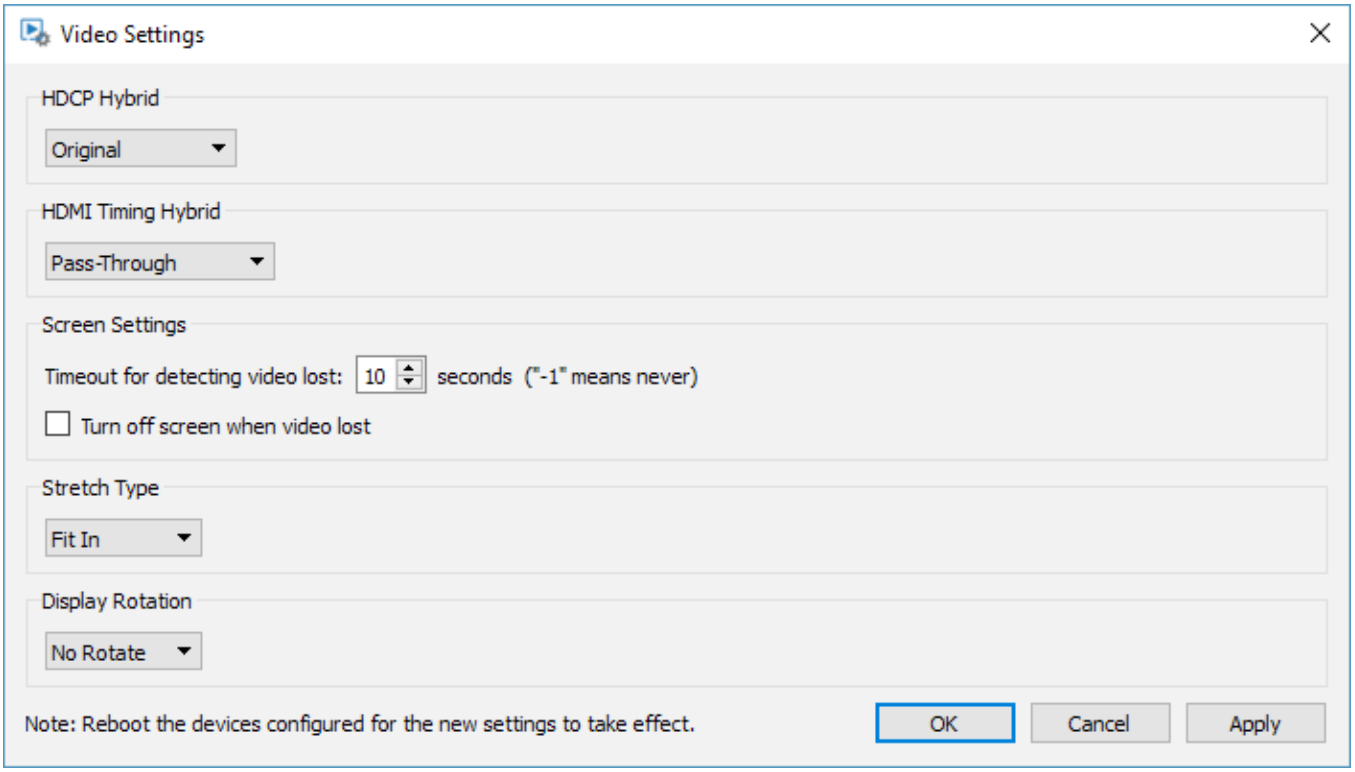


IPEX5002 Video Settings

To configure the video settings of an IPEX5002, right click on the name of the decoder and select *Video Settings*.



Some of the options in the *Video Settings* window are HDCP output type, video output resolution, no video behavior, and screen rotation. In order for the changes to take effect, the IPEX5002 must be restarted.



The *HDCP Hybrid* options allow setting the output HDCP settings to match the original content, force HDCP 1.x mode, or force HDCP 2.2 mode.

The *HDMI Timing Hybrid* options define the output video resolution of the IPEX5002. Pass-Through will bypass the scaling function of the decoder.

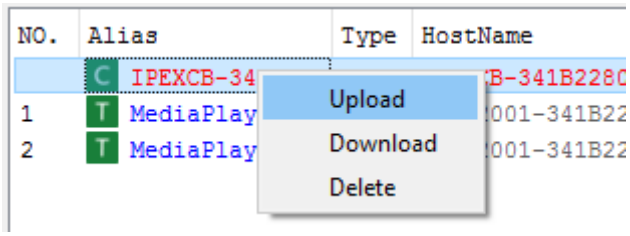
The *Screen Settings* options define timeout out for lost video, video stretch type and display rotation orientation.

Once menu has been defined, click *Apply* then *OK*

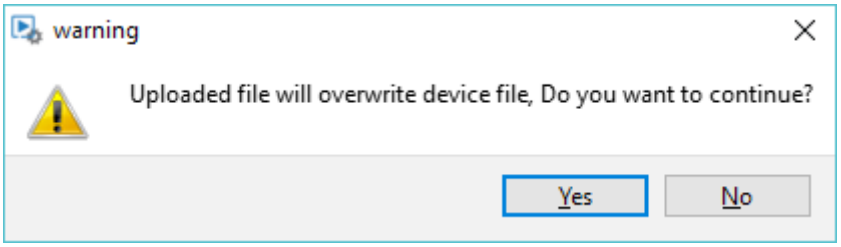
Saving and Loading Settings

Upload Settings to IPEXCB

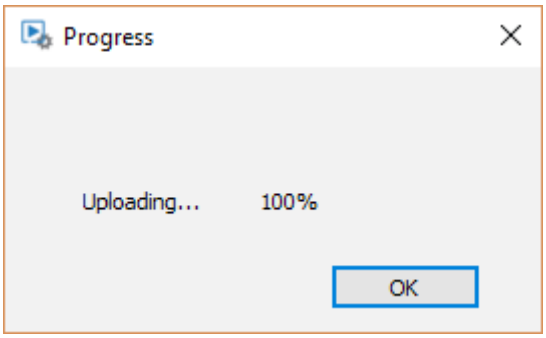
In order for the configuration to be used in a live system, it must be uploaded to the connected IPEXCB. Right click on the IPEXCB in the right panel and click *Upload*.



Click *Yes* in the upload confirmation window.

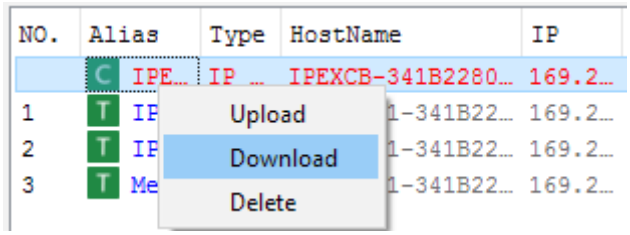


After a few seconds, the progress window will show the upload is complete. Click *OK* once the button is no longer grayed out.

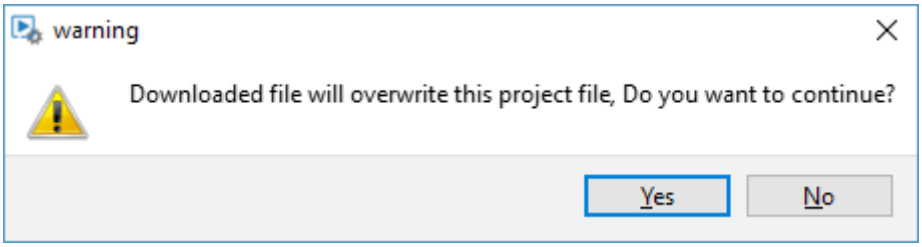


Download Settings from IPEXCB

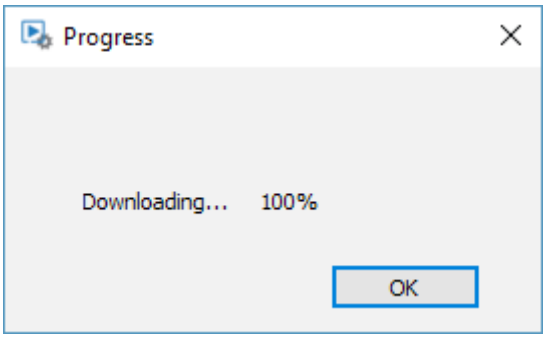
To access the current system configuration, it must be downloaded from the IPEXCB. Right click on the IPEXCB in the right panel and click *Download*.



Click *Yes* in the download confirmation window.

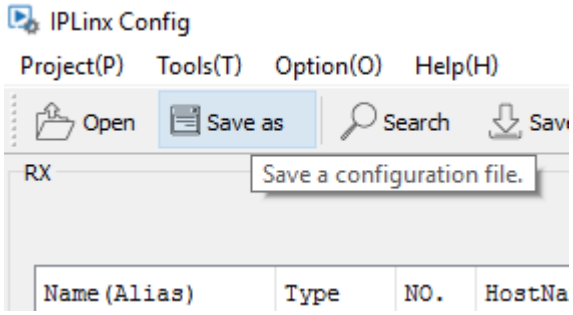


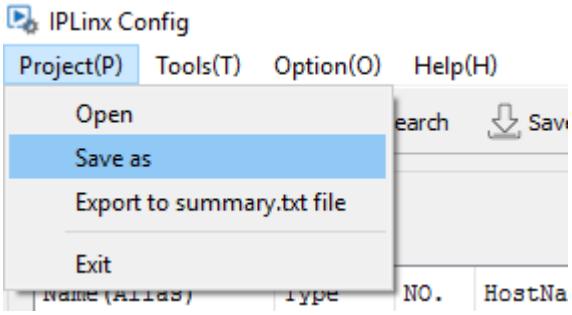
After a few seconds, the progress window will show the download is complete. Click *OK* once the button is no longer grayed out.



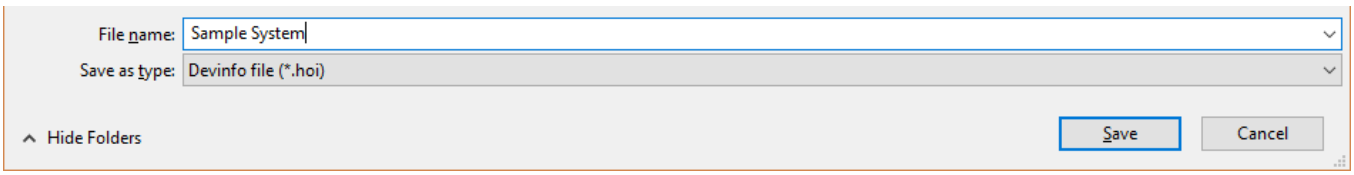
Save Settings to a File

Click the *Save as* button or navigate to *Project* > *Save as* to save the current system to a file in case the IPEXCB becomes damaged or must be reset to factory defaults.

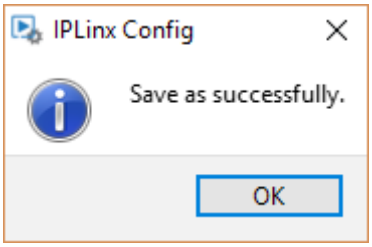




Provide a name for the save file, then click *Save*.

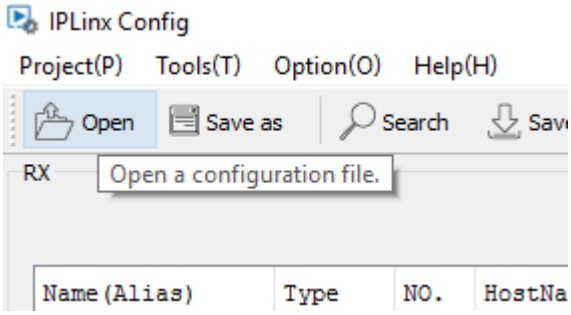


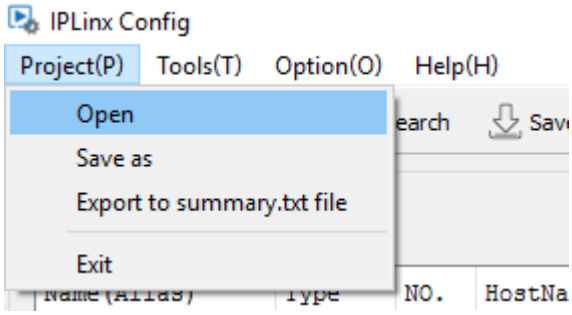
A status window will show the save is complete. Click *OK*.



Load Settings from a File

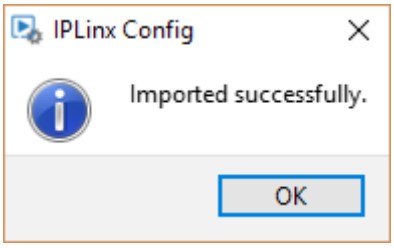
Click the *Open* button or navigate to *Project > Open* to load a saved system file in case the IPEXCB became damaged or was reset to factory defaults.





Select the name for the previously saved file, then click *Open*.

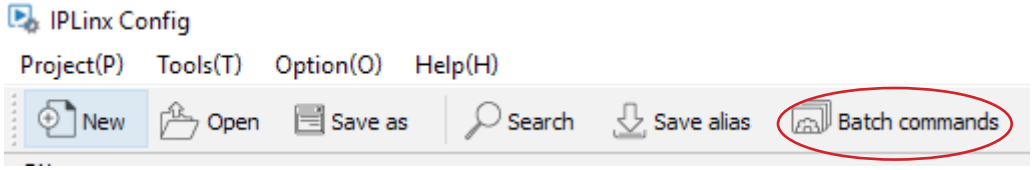
A status window will show the file has been imported successfully. Click *OK*.



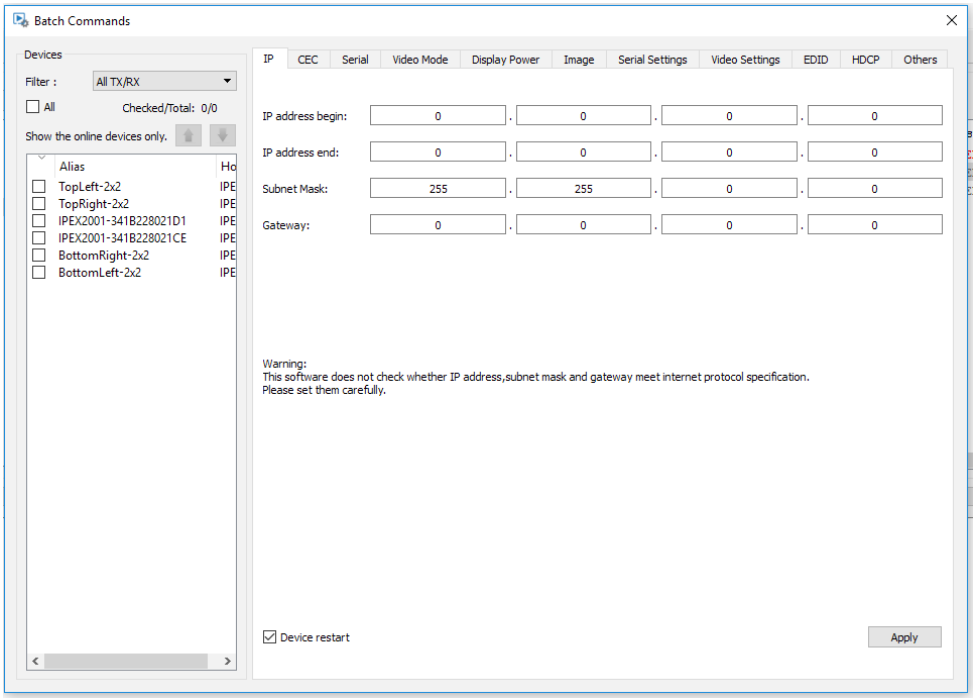
Batch Commands

The *Batch Commands* menu allows you to configure settings of multiple encoders and decoders in large batches rather than one at a time. This is a much more efficient way of configuring multiple devices.

To access, click on the *Batch Commands* menu



To apply changes to devices, select the desired encoders and decoders on the device list to the left, select the desired batch menu and then apply settings to the selected devices according to the selected menu.



Explanation of Menu

IP - Changes IP addresses of multiple IPLinx devices
CEC - Tests CEC ON/OFF for displays connected to decoders
Serial - Tests serial port communication of an encoder / decoder
Video Mode - 2000 Series only; allows changes to latency settings for 2000 series system
Display Power - Defines discrete power ON/OFF commands for displays connected to IPLinx decoders
Image - Allows for upload of a custom system boot up or background picture
Serial Settings - This menu is reserved for future use
Video Settings - 5000 Series only; allows for changes to HDCP and video scalar settings
EDID - 5000 Series only; allows for change to and upload of EDID tables
HDCP - 2000 Series only; enables or disables HDCP on an encoder or decoder
Others - Allows for reboot / factory default reset of IPLinx devices

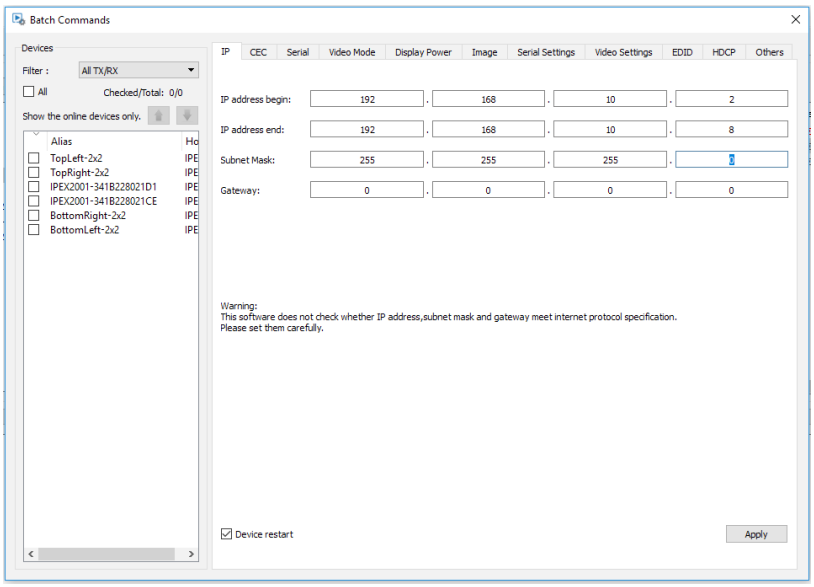
Changing IP Address Schemes on IPLinx Systems

When deploying IPLinx systems, it may be desired to change the IP address scheme for the entire system to a different IP range or IP class. To do this you will need to change the IP addresses of the IPLinx devices first then change the IP address of the LAN1 port of the IPEXCB.

Note: when changing IP addresses, ALL newly given addresses must be in range with one another and the IPEXCB Control Interface

Changing the IP addresses of IPLinx encoders and decoders can be done individually by right clicking on the IPLinx encoder or decoder and selecting *Config* or by using *Batch Commands*. When using multiple IPLinx devices *Batch Commands* is the preferred method.

Click on *Batch Commands*, by default the IP menu will be the default submenu



Select the desired IPLinx device(s) on the device list to the left.

Choose a starting IP address for the devices in the *IP Address begin* field

Choose an ending IP address for the devices in the *IP Address end* field

Fill in the appropriate subnet for the class of IP addresses being used on the *Subnet Mask* field

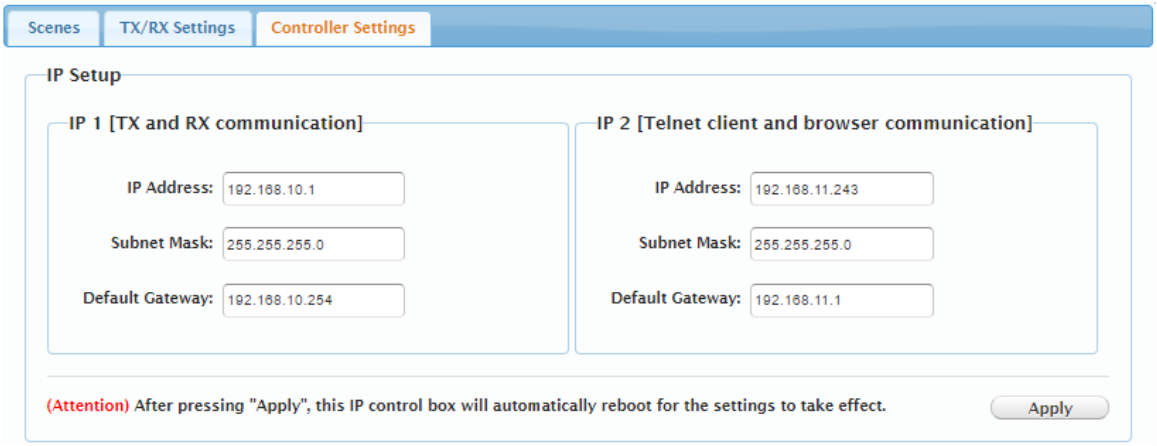
Fill in the appropriate gateway in the *Gateway* field (optional)

Click *Apply* - Devices will now reboot with the new IP

In our example above we are changing the IPLinx system address scheme from a Class B to a Class C address starting with 192.168.10.xxx with a subnet mask of 255.255.255.0. Since there are 6 total devices with will use 192.168.10.2 as our starting range and 192.168.10.8 as our ending range, reserving 192.168.10.1 for the IPEXCB

Note: Once the IPLinx device addresses have been changed, they may fall of the network in IPLinx Configurator if the newly changed IP addresses are not in the same range of the IPEXCB or the computer connected to the network running IPLinx Configurator. They will reappear after the IPEXCB and computer running IPLinx Configurator has been changed to that IP range.

Login to the IPEXCB web GUI and navigate to *CONTROLLER SETTINGS* menu. Instructions for logging into web GUI are located on page 9.



Enter the desired IP address in the *IP Address field* in the *IP 1 [TX and RX communication]* section.

In our example we are changing from a Class B to a Class C address using the 192.168.10.xxx range, therefore we will need to change the subnet mask to 255.255.255.0 in the *Subnet Mask* field in the *IP 1 [TX and RX communication]* section. Make sure your subnet mask' on IP1 and IP2 sections match, in this example we changed the *Subnet Mask* for *IP2 [Telnet client and browser communication]* to 255.255.255.0 to match IP1 subnet.

Change the *Default Gateway* field in the *IP 1 [TX and RX communication]* section to match the new IP range with a local address ending in 254. For this example our default gateway is now 192.168.10.254.

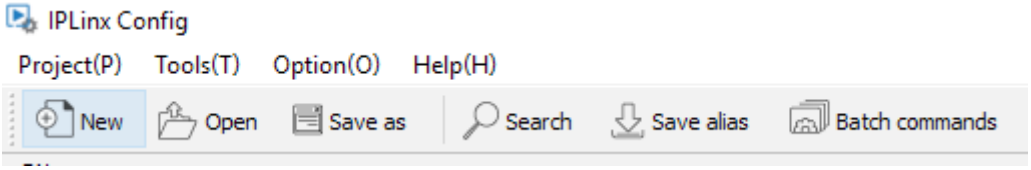
Click *Apply*

Note: After you change the IP range to your IPEXCB and the IPLinx devices be sure to change your computers IP range to match the newly changed IP range. For instructions on changing an IP address on a computer see page 9

CEC Display Power Configuration

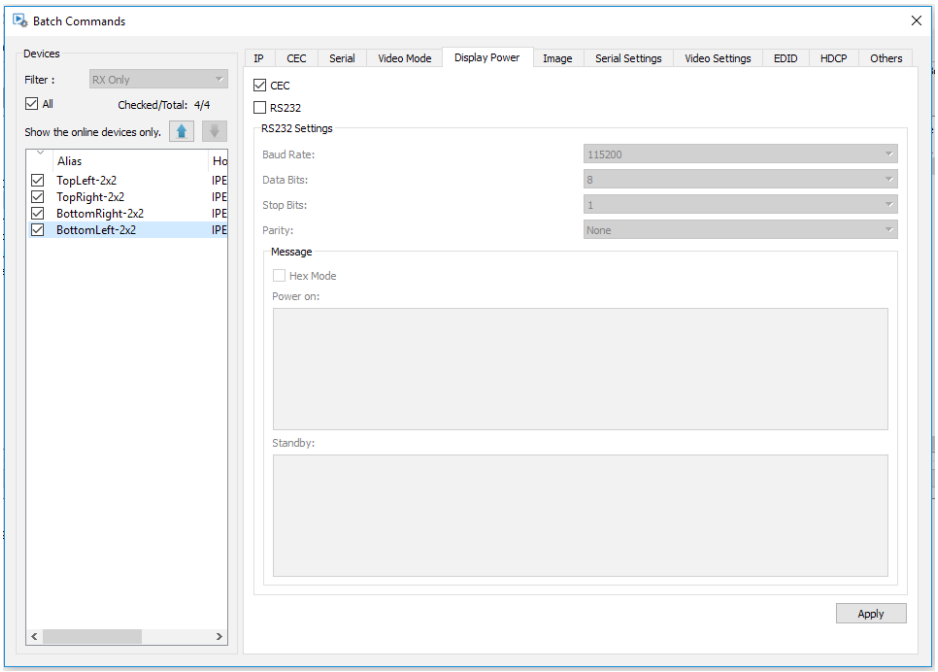
In IPLinx Configurator you can configure ON/OFF power commands for displays connected to IPLinx decoders using either CEC or RS232 so they can be powered ON/OFF through a 3rd party IP or serial based control system.

To configure display power using CEC, click on the Batch Commands menu.



Click on *Display Power* submenu

Check the *CEC* box located at the top right



Use the following API commands to turn display ON/OFF in a 3rd party control system.

config set device sinkpower on RECEIVER NAME
config set device sinkpower off RECEIVER NAME

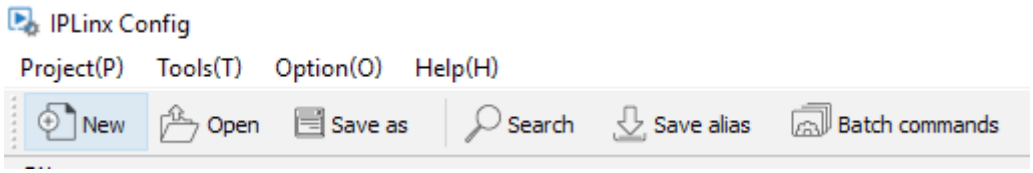
> *RECEIVER NAME* is the name of the decoder. Use the default name of the decoder given by the IPLinx system or the alias that was assigned to the decoder. If using an alias to identify encoders and decoders in a session be sure to use the *config set session alias on* command.

For a comprehensive list of API commands please refer to the *IPLinx Programming Guide* located on the IPEXCB product page under the *DOCUMENTATION* tab at www.libav.com

RS232 Display Power Configuration

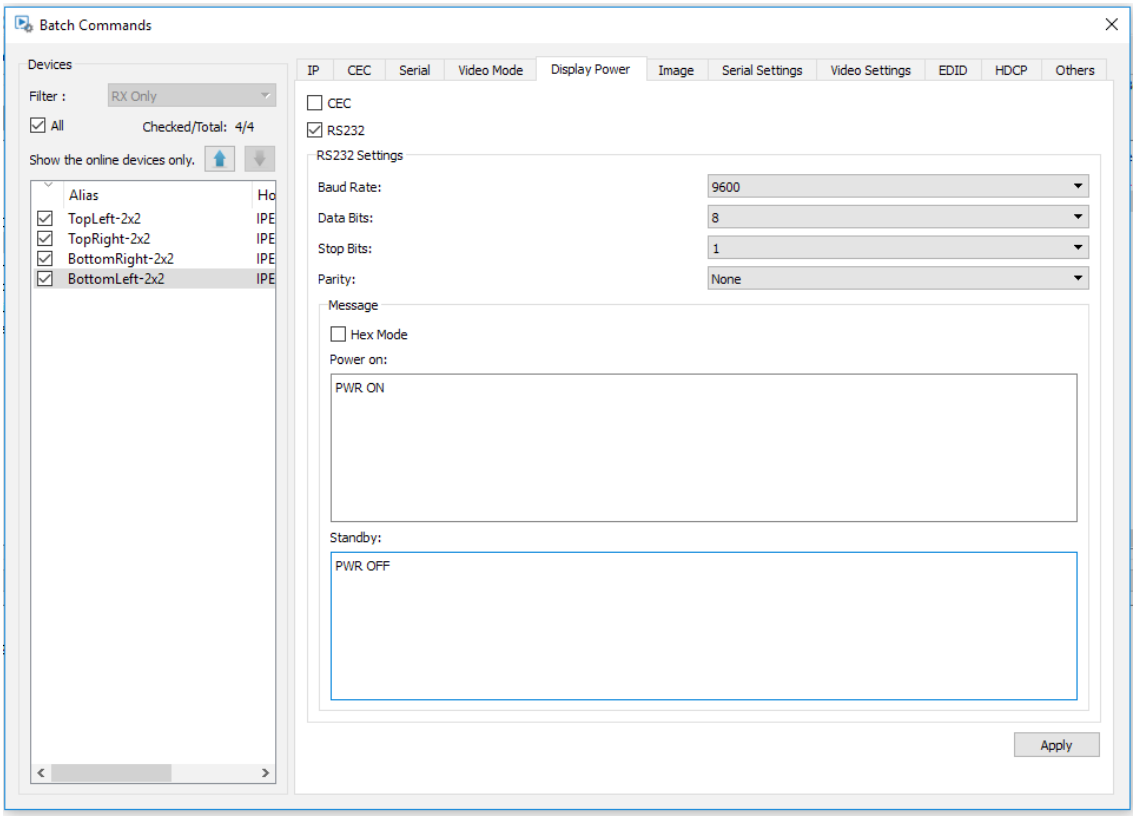
NOTE: To properly send power ON/OFF serial commands to displays connected to encoders, connect the RS232 port of the IPLinx decoder to the display. Be sure to connect TX from IPLinx decoder to RX of the display and RX from IPLinx decoder to TX.

To configure display power using RS232, click on the *Batch Commands* menu.



Click on *Display Power* submenu

Check the *RS232* box located at the top right



Enter the correct RS232 communication settings for your display in the *RS232 Settings* section. For correct settings for the display that is connected to the decoder, you will need to consult the displays owners manual. Be sure to use the correct command terminators per the displays instructions.

Enter the power ON/OFF commands sets for the display in the *Power On* and *Standby* field in the *Message* section. By default commands entered in the *Power On* and *Standby* field are ASCII based, check the Hex Mode box to enter Hex based commands.

Use the following API commands to turn display ON/OFF in a 3rd party control system.

config set device sinkpower on RECEIVER NAME
config set device sinkpower off RECEIVER NAME

> *RECEIVER NAME* is the name of the decoder. Use the default name of the decoder given by the IPLinx system or the alias that was assigned to the decoder. If using an alias to identify encoders and decoders in a session be sure to use the *config set session alias on* command.

For a comprehensive list of API commands please refer to the *IPLinx Programming Guide* located on the IPEXCB product page under the *DOCUMENTATION* tab at www.libav.com

Using iPad or Windows Control APP with IPEXCB

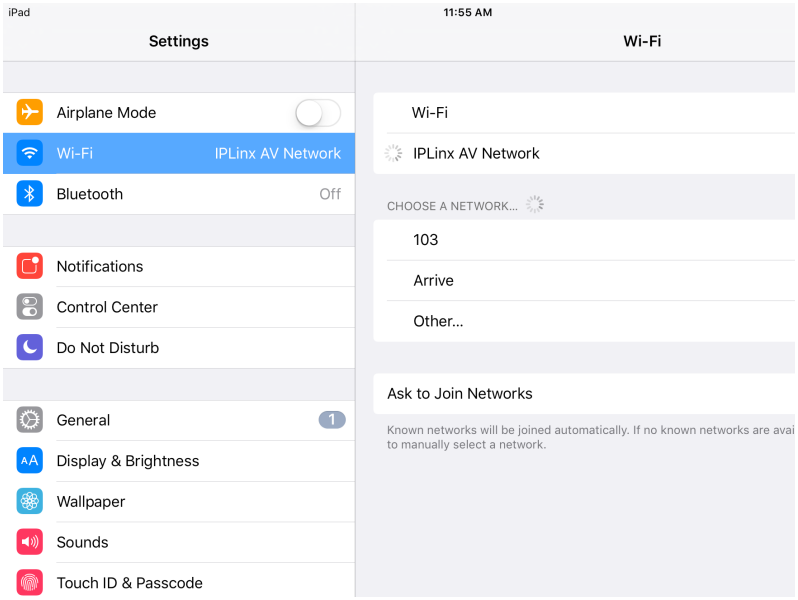
An iPad and Windows based control APP is available for IPLinx simple system control. The APP communicates with the IPLinx Configurator file that is saved directly onto the IPEXCB, therefore the APP cannot make changes to IPLinx system settings.

The iPad APP can be downloaded on the Apple APP Store and the Windows applications is available for download on the IPEXCB product page online at www.libav.com under the *SOFTWARE* tab.

Connecting Apple iPad to IPLinx System

To connect an Apple iPad to the IPLinx A/V network, connect a wireless access point to the A/V network switch where the IPLinx system resides. Once you've decided on an SSID for the WiFi connection, join the WI-Fi network in the iPad's Settings portal.

In our example below we created a WI-Fi connection labeled *IPLinx A/V Network*.

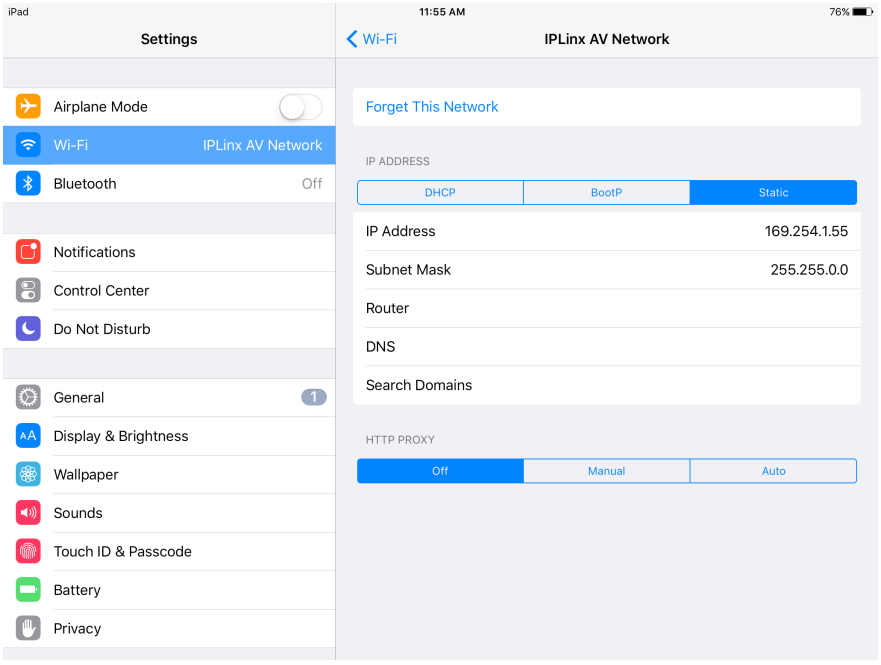


If you do not have an Internet connection or a DHCP server connected to the A/V network you may notice a spinning wheel next to the network SSID that you are trying to connect to in the iPad settings portal. This is because a DHCP server is not connected to the system therefore an auto IP is not automatically assigned to the iPad

If this is the case, keep in mind that as long as the network SSID populates to the blue section to the left in the WI-Fi settings you are connected. If you would like to assign an IP in the range of the IPLinx A/V network follow the steps below.

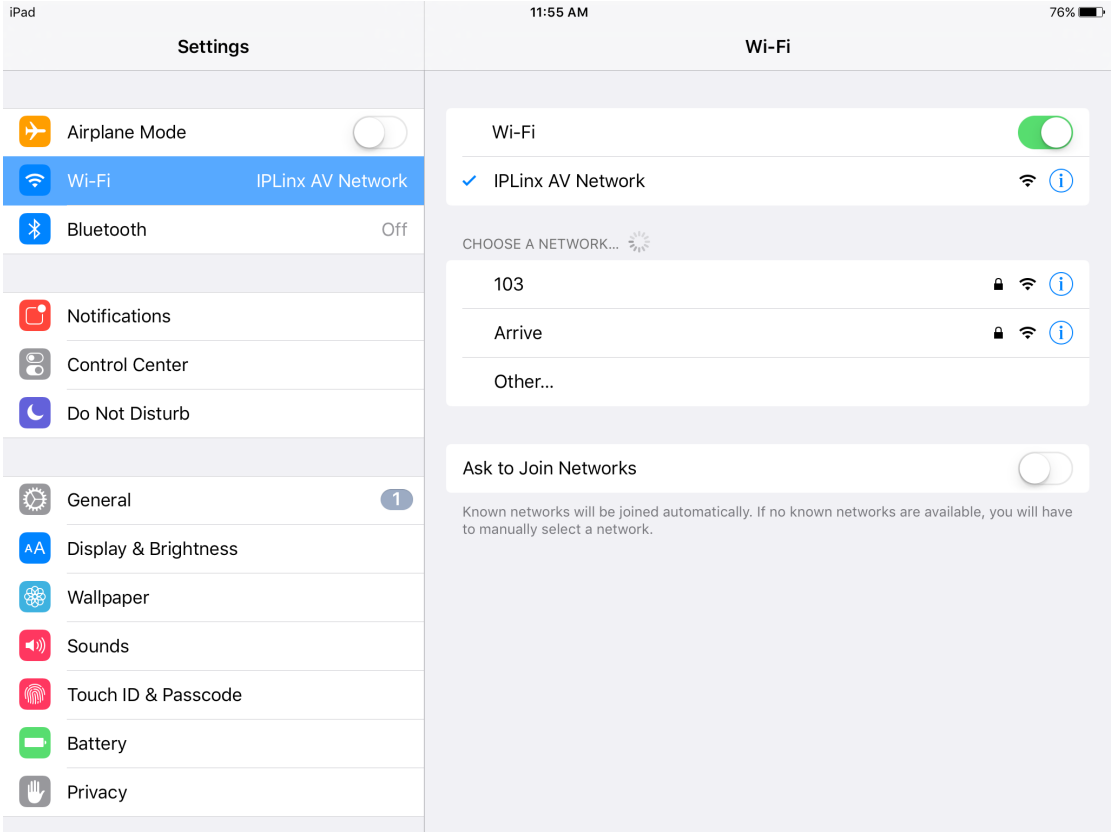
Click on the ⓘ button next to the SSID in the Wi-Fi settings window in the iPad.

Then choose the *Static* submenu to enter in a static IP Address and Subnet Mask that is in range of the IPLinx A/V network

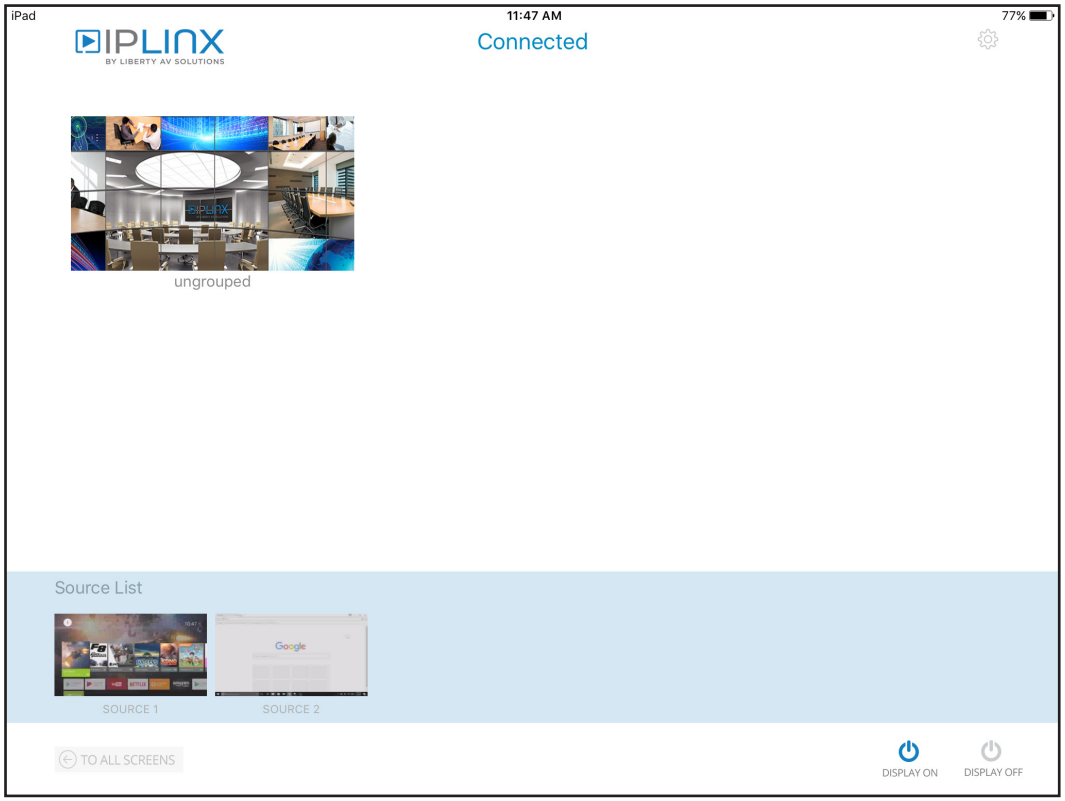


In our example above we entered in an IP Address and Subnet Mask in the default range of the IPLinx A/V network.

After entering in a static IP Address and Subnet Mask in the range of the IPLinx A/V network, a check mark will now appear next to the SSID name in the iPads settings portal.



Click on the IPLinx APP icon on your iPad to launch the APP. Once you are connected to the IPLinx network the APP will show that it is *CONNECTED* at the top of the APP home page.

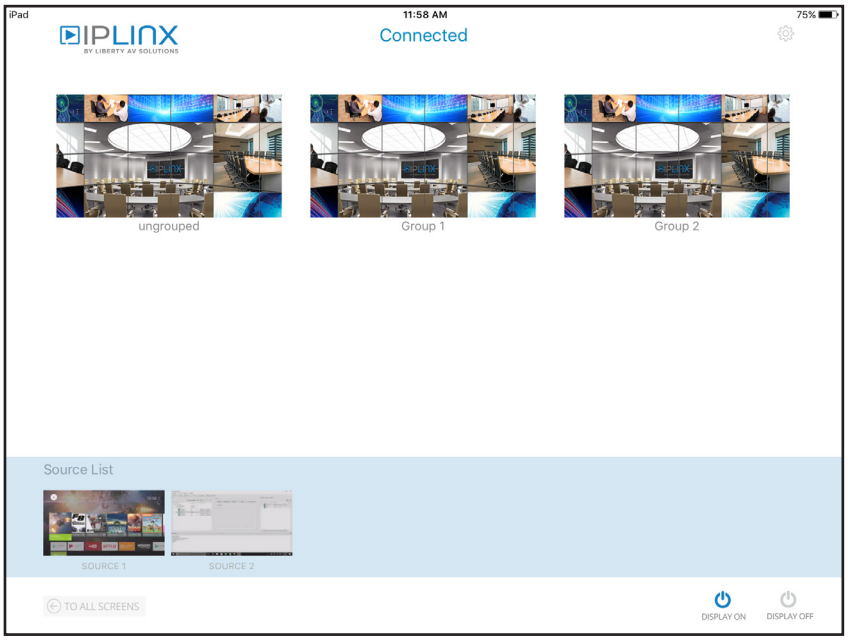


Groups (groups of displays, video wall configurations and their respective layouts) will be located in the upper half of the APP and sources will be located at the bottom half of the APP. Thumbnail previews of live sources in the A/V network will also appear in the respective source and displays lists in the APP.

To expand a group simply click on a group in the list to show the display layout within that group. To route video selections, simply drag and drop source thumbnails into the desired display location. To turn displays ON or OFF in a group, simply press Display On or Display Off in the bottom right corner of the APP. For this function to work on a display, that display must be CEC capable and the CEC must be turned ON in the displays setting menu.

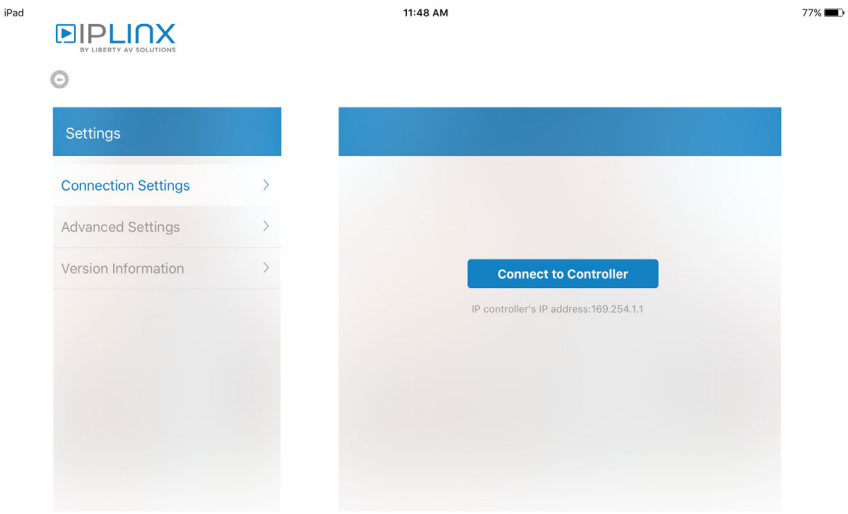
Hiding Groups

Groups that are configured in IPLinx Configurator will always appear in a list on the home page of the APP. In the example below, two groups have been created; *Group 1* and *Group 2* which each group containing displays that has been assigned to the group in IPLinx Configurator.

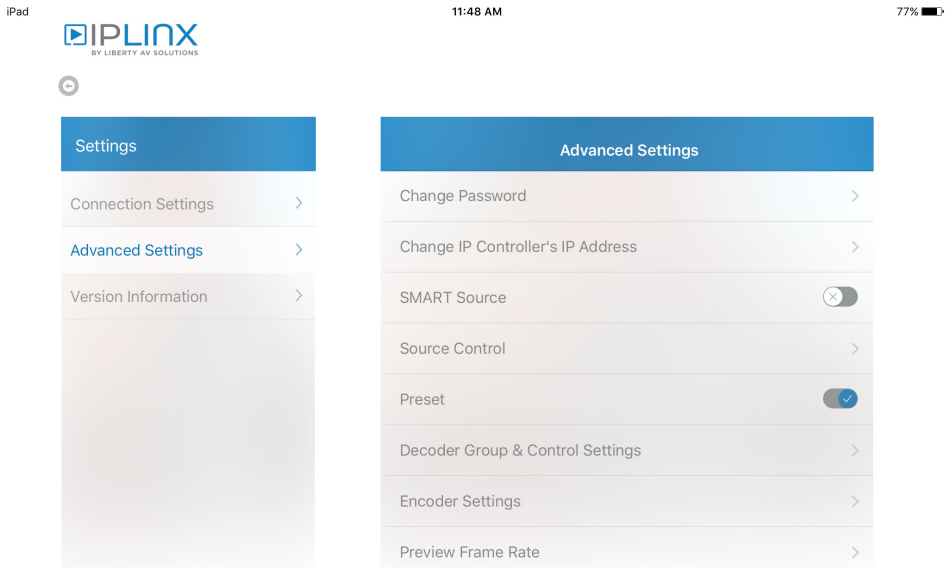


The group labeled *ungrouped* is a default group where all devices are originally stored before custom groups are made in IPLinx Configurator, therefore *ungrouped* cannot be deleted. However you can hide the group in the APP if there is no active displays located in that group. Hiding groups will also allow for multiple iPads to control multiple zones and only have access to the displays or groups of displays in that respective zone.

To hide a group, click on the settings cog in the upper right hand corner of the APP, then click *Advanced Settings*. It will prompt you for a password, the default password is *admin*.

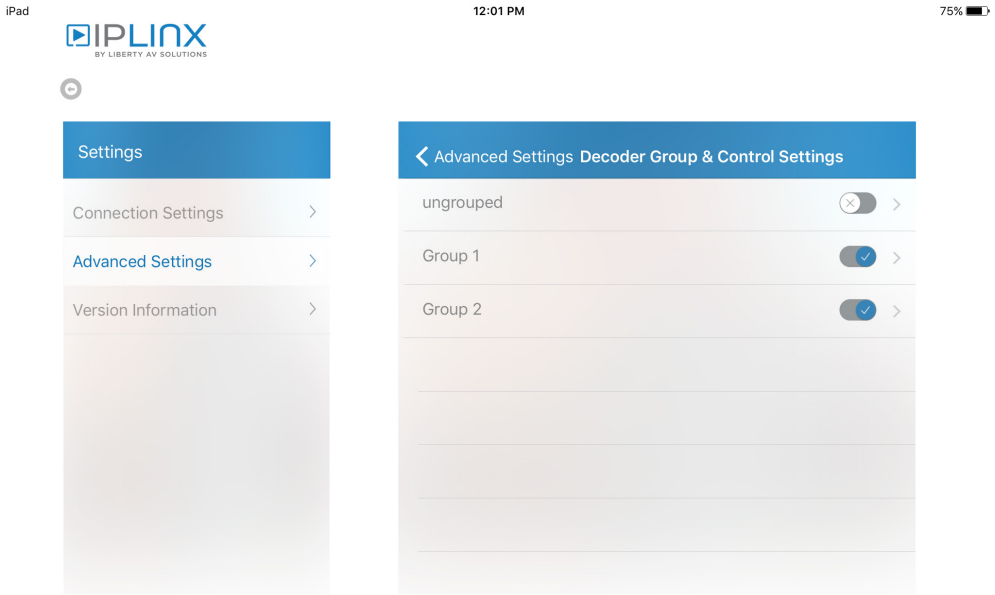


Click on *Decoder Group* and *Control Settings*



Uncheck the button to the right for *ungrouped*.

Click the back arrow above the *Settings* menu to return the home page of the APP. You will then notice that *ungrouped* will no longer appear in the group list.



Connecting Windows Computer to IPLinx System

The Windows application can be downloaded on the IPEXCB product page under the *SOFTWARE* tab at www.libav.com. Extract all files and install the setup file. It will direct you to installing the control APP on your computer.

In order to control the IPLinx system with the Windows APP either, connect a computer directly to the A/V network switch with a Cat5e or better cable or connect to the A/V network through a wireless access point that is connected to the A/V network.

When connecting a computer directly to the IPLinx A/V network be sure to change the IP address of the computer to the range of the IPLinx network. *For instructions on how to change an IP address on a computer see page 9.*

Note: User interface and application settings are exactly the same as the iPad APP version. *Please refer to page 57 for iPad APP usage.*

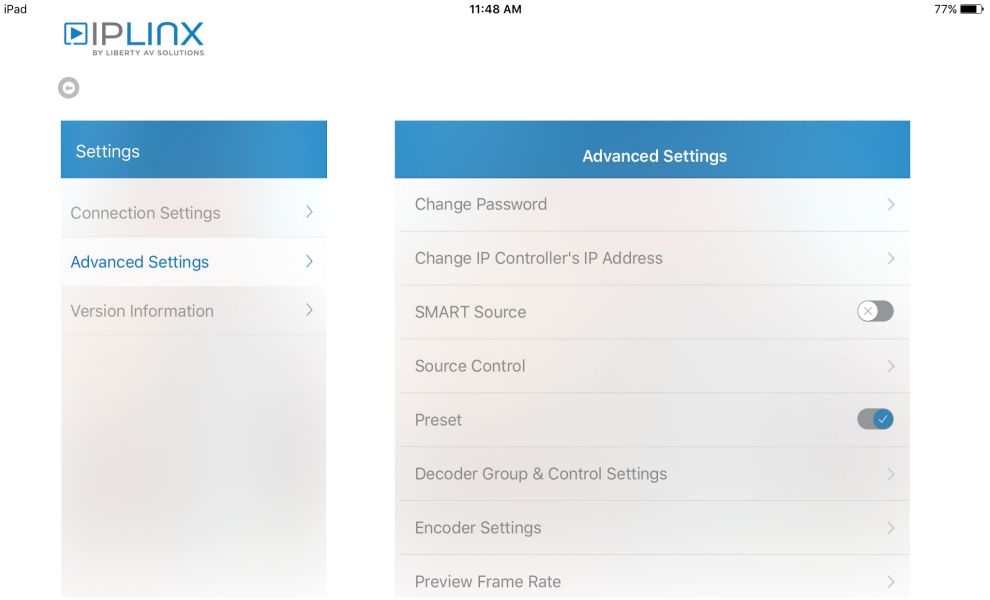
Syncing APP to IPEXCB IP Address

The control APP must be synced to the IPEXCB IP address on the A/V network IP address in order to communicate with the IPLinx A/V system. The default address for the IPEXCB as well as the APP is 169.254.1.1. If you have changed the default IP of the IPEXCB to another IP address then you will need to enter that IP address into the APP settings.

Click on the settings cog in the upper right hand corner of the home page of the APP.

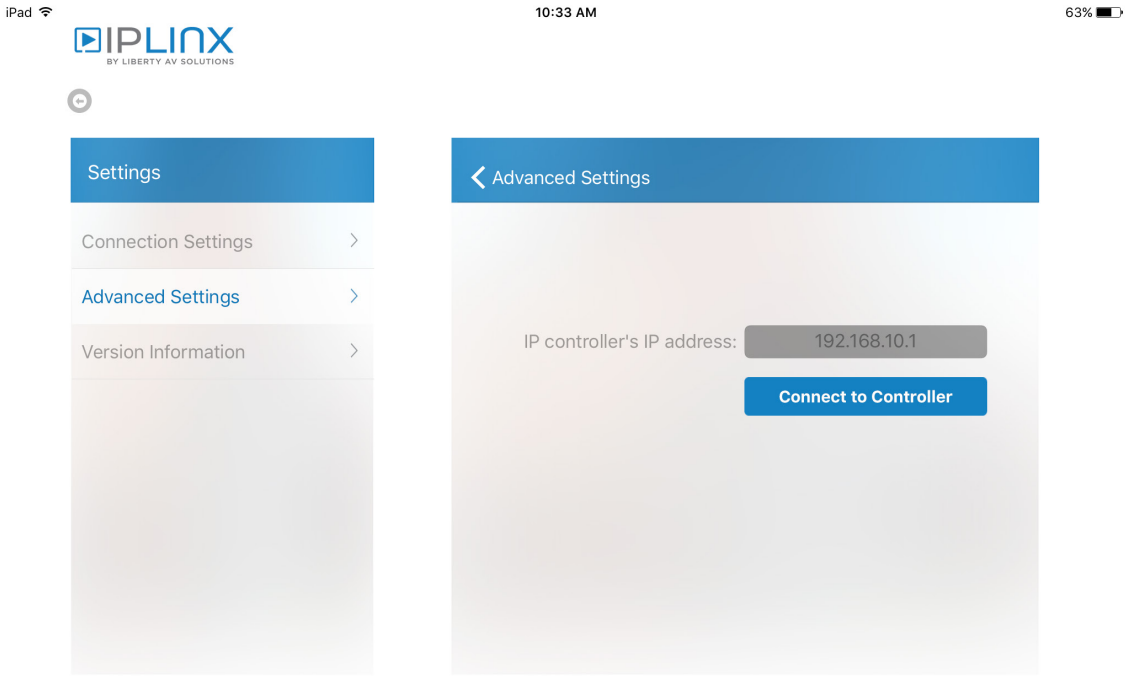
Click on *Advanced Settings*

Click on *Change IP Controller's IP Address*

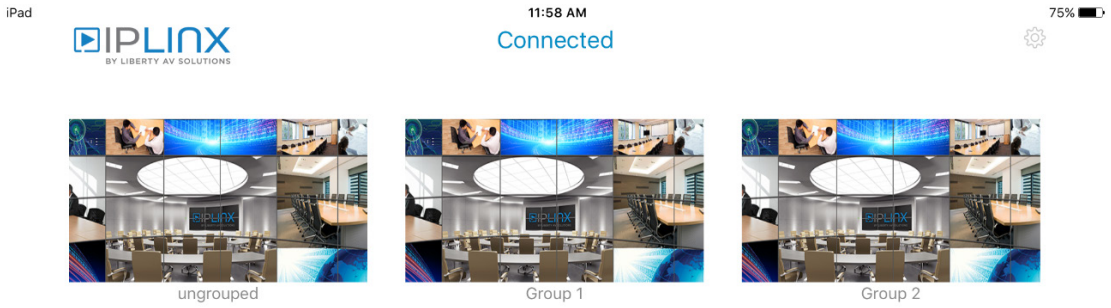


Then enter the IP address of the IPEXCB and click *Connect to Controller*

Then click the back arrow located above *Settings* menu to go back to the home page of the APP.



When you have successfully connected to the IPLinx A/V network with the APP, it will state that you are **CONNECTED** at the top of the home page of the APP



Technical Specifications

Input/Output Connections	
LAN	Two (2) 8P8C port (Shielded RJ45)
Power	One (1) 5.5 mm OD, 2.6 mm ID Threaded Barrel
RS232 Port	One (1) 6-pin Removable Terminal Block Connector
Reset Button	One (1) Recessed Microswitch
Supported Control	
Supported Baud Rates	9600 (control) and 115200 (debug)
Ethernet	100BaseT
LAN Maximum Distance	100 m (328 ft)
LAN Cable Requirements	Category 5e or greater with TIA/EIA-568B crimp pattern
Chassis and Environmental	
Construction	Black Steel
Dimensions (H x W x D)	26 mm x 93.2 mm x 138.7 mm (1.02 in x 3.67 in x 5.46 in)
Operating Temperature	0° to +40° C (+32° to +104° F)
Operating Humidity	20% to 90%, Non-condensing
Storage Temperature	-10° to +60° C (+14° to +140° F)
Storage Humidity	20% to 90%, Non-condensing
Power and Regulatory	
Power Input	12V DC 1A or 48V DC PoE (Power over Ethernet)
Power Output (RS232 port)	12V DC 0.5A
Power over Ethernet (PoE) Compatibility	802.3af Alternative B
Power Consumption	4.5 watts (10.5 watts when using 12V on RS232 port)
ESD Protection	8kV air, 4kV contact
Regulatory	FCC, CE, RoHS
Other	
Warranty	2 years
Diagnostic Indicators	Status and Power
Included Accessories	Installation Guide, Power Supply, 6-pin Removable Screw Terminal
Compatible Encoders	IPEX2001, IPEX5001
Compatible Decoders	IPEX2002, IPEX2003MV, IPEX5002

IPLinx is a brand of:

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