

# PureLink

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## BEYOND 4K

### SX-4400

4x4 HDMI 2.0 Matrix Switcher



#### **PureLink™**

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## Introduction

SX-4400 provides Don't Blink™ seamless switching of up to (4) HDMI 2.0 inputs and outputs and incorporates the latest technologies available on the market including HDR and HDCP 2.2 compliance. The SX-4400 matrix switchers also feature a built-in web page interface/software allowing convenient set-up, user access, control, and operation. It also features audio extraction as well as audio insertion. The SX-4400 provides manual and auto CEC control, along with Crestron modules available and a complete API for controlling and status/diagnostics using any other control automation systems such as QSYS, SAVI, Extron, AMX, Control4 and more. Together with video wall function/advanced EDID management and added security features, the SX series delivers a true, first-in-class Ultra HD multi-zone signal distribution solution ideal for corporate conferencing, education, and hospitality environments, to name a few.

## Features

- HDMI 2.0 and HDCP 2.2 compliant
- Support 18 Gbps video bandwidth
- Support video resolution up to 4K60 4:4:4
- Color space: RGB, YCbCr 4:4:4, YCbCr 4:2:2
- Support seamless switching, video wall function
- Support CEC management
- Support audio matrix and IR matrix function
- Support external L/R audio insert on HDMI stream
- Support EDID management
- Support front panel, RS232, TCP/IP (LAN 10M/100M) control

## Package Contents

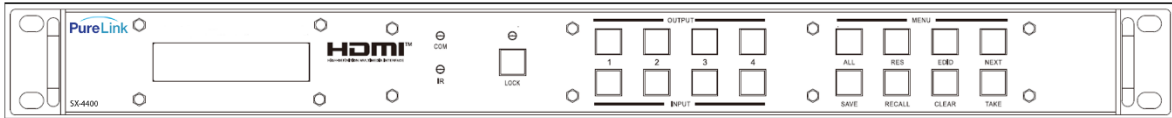
- 1x AC Power Cord
- 1x Matrix IR Remote
- 4x IR Receiver cable (1.5 meters)
- 4x IR Blaster cable (1.5 meters)
- 1x 3-pin Phoenix Connector
- 1x CAT6 cable
- 1x USB to RS232 Cable

## Specifications

<b>Technical</b>	
HDMI Compliance	HDMI 2.0
HDCP Compliance	HDCP 2.2
Video Bandwidth	18Gbps
Video Resolution	Up to 4K60 4:4:4
Color Space	RGB, YCbCr 4:4:4/4:2:2
HDMI Amplitude	T.M.D.S +/- 0.4Vpp
Differential Impedance	100±15ohm
ESD Protection	Human-body Model: ±8kV (Air-gap discharge) , ±4kV (Contact discharge)
<b>RS232/Ethernet Control</b>	
Baud rate and Protocol	Baud rate: 9600, data bit: 8 Stop bit: 1, no parity checking
Ethernet	IE10.0+,HTML5
<b>Mechanical</b>	
Housing	Metal Enclosure
Color	Black
Dimensions	430mm (W)×220mm (D)×44mm (H)
Weight	5Kg
Power Supply	AC 110 - 240V
Power Consumption	60W (Max)
Operating Temperature	0°C ~ 40°C / 32°F ~ 104°F
Storage Temperature	-20°C ~ 70°C / -4°F ~ 158°F
Relative Humidity	10%~50% RH (non-condensing)

## Operation Controls and Functions

### Front Panel



Item	Description
<b>LCD Panel</b>	Displays the current video selections
<b>COM</b>	Power LED (also indicates control commands)
<b>LOCK</b>	Front panel lock/unlock
<b>OUTPUT</b>	Output selection buttons 1~4
<b>INPUT</b>	Input selection buttons 1~4
<b>ALL</b>	Set all outputs to the next input selection
<b>RES</b>	Set the output scaler resolution
<b>EDID</b>	Set the EDID options for the next input selection
<b>NEXT</b>	Select the next available option
<b>SAVE</b>	Save the current matrix setting as a preset
<b>RECALL</b>	Set the matrix setting from a saved preset
<b>CLEAR</b>	Cancel the current command function
<b>ENTER</b>	Set the displayed option

- Press buttons ALL + INPUT m + TAKE by sequence, to switch input m to all the outputs.
- Press buttons SAVE + OUTPUT n to save current routing/video wall scene as scene n. Up to 8 scenes can be saved.
- Press buttons RECALL + OUTPUT n to recall routing scene n as the current routing.
- Press buttons RES + OUTPUT n + NEXT + TAKE, to change the output resolution of OUTPUT n.

Resolution options:

Number	Output Resolution Setting	Number	Output Resolution Setting
1	3840x2160p 60Hz	9	1440x1050 60Hz
2	3840x2160p 50Hz	10	1366x768 60Hz
3	3840x2160p 30Hz	11	1360x768 60Hz
4	3840x2160p 25Hz	12	1280x1024 60Hz
5	1920x1200 60Hz	13	1280x768 60Hz
6	1920x1080p 60Hz	14	1280x720p 60Hz
7	1920x1080p 50Hz	15	1280x720p 50Hz
8	1600x1200 60Hz	16	1024x768 60Hz

Press buttons EDID + INPUT m + NEXT + TAKE, change the EDID mode of port INPUT m EDID options:

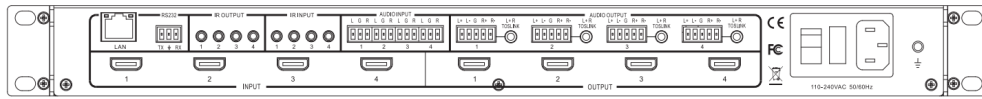
Number	Output Resolution Setting	Number	Output Resolution Setting
1	Manual	5	1920x1080 60Hz
2	3840x2160 60Hz	6	1280x1024 60Hz
3	3840x2160 30Hz	7	1280x720p 60H
4	1920x1200 60z	8	1024x768 60Hz

Manual EDID is loaded by PC Tool

**Front Lock button**

- The front panel control buttons can be locked to prevent accidental use or operation by unauthorized persons. Press and hold the LOCK button for two seconds to lock or unlock the front panel. When the panel is locked, all buttons (except the LOCK button) will not function until the front panel is unlocked. The LOCKED/UNLOCKED state is shown on the LCD panel and by the LED above the LOCK button, which is lit when the front panel is fully LOCKED. When the unit is UNLOCKED, press and hold the LOCK button for six seconds - The LCD panel will show the following (any exiting numbers indicates that those buttons are already locked):
- Pressing any of the numbered Output or Input buttons will toggle the lock status of that button. The button will become locked when the respective button number is shown on the LCD panel.
- When all selection are done, press the ENTER button to set the new LOCK/UNLOCK states of those buttons.
- Whenever a locked Output or Input button is activated, the LCD panel will show that the button is locked. In this mode, the LOCK LED is not lit.
- To unlock those buttons, repeat the above steps to remove the button numbers from the LCD panel before pressing ENTER to accept the changes.

## Rear Panel



- LAN(10M/100M), RS232 for PC control
- Analog Audio IN/OUT ports bind to corresponding HDMI ports.

Example:

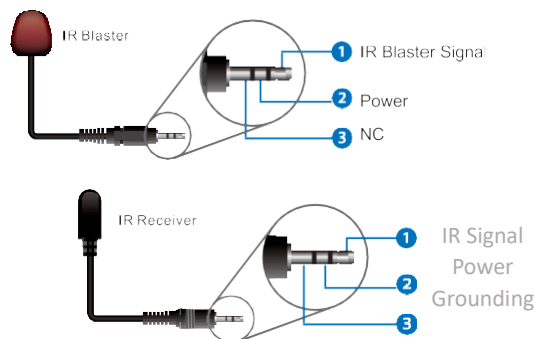
If the HDMI 1 audio source is selected with External LR by PC Tool, then analog AUDIO IN LR1 (with  $\phi 3.5\text{mm}$  jacket) will be selected to replace the embedded audio of the HDMI input 1 data stream. If HDMI 1 audio source is selected with AUTO by PC TOOL, then it will use the original embedded audio of input HDMI 1 as its audio data stream.

If input is DVI signal, no matter how it is set up, system will get external analog audio input. Analog AUDIO OUT n will always output the same audio content with HDMI OUTPUT n Analog Audio IN/OUT

### Connection

- IR IN and IR OUT  
IR IN/OUT routing follows the video matrix routing, no need to separately control IR matrix.

#### IR extender connectors (not as accessories)



- Audio Input

4 3-pin Phoenix connectors to input external analog LR audio, user can select this audio to replace the corresponding embedded HDMI audio.

- Audio Output

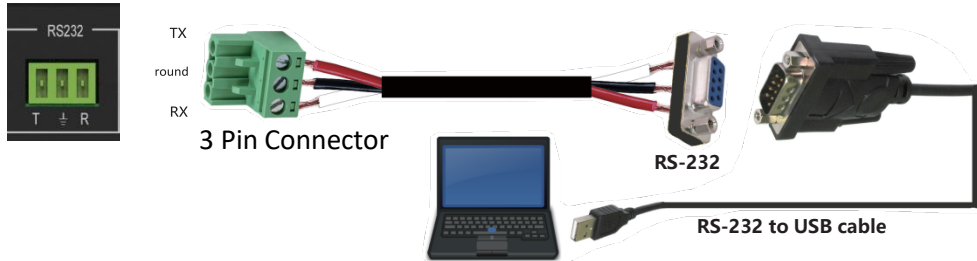
4 5-pin Phoenix connectors to output balanced LR audio, and 4 mini Toslink jackets to output analog LR audio and digital Spdif audio.

The 4 sets of Audio output (LR and Toslink) channels can be independent of video and switched by PC Tool or commands.

## RS232/LAN Control Connection

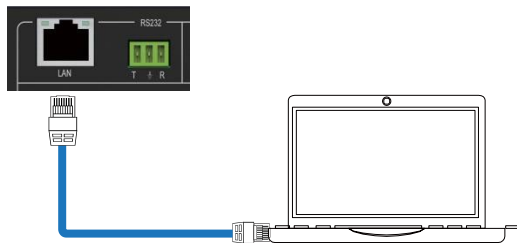
### RS232 Control Connection

The product supports RS232 control. Connect the RS232 port of the product to a PC via a serial cable, as shown in the following figure:



### Network Control Connection

The product also supports Network control. Connect the LAN port of the product to a PC via an UTP cable, as shown in the following figure:



Note: Factory default network settings

IP Type	Static IP
Static IP	192 . 168 . 0 . 247
Subnet Mask	255 . 255 . 255 . 0
Gateway	192 . 168 . 0 . 1



## PC Tool User Guide

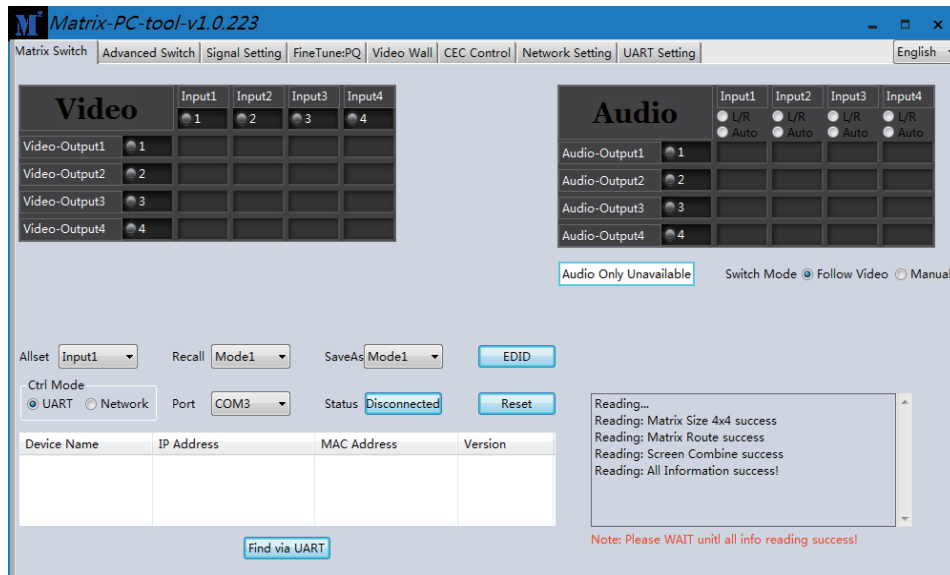
### Account's Authentication

Before running the PC tool, the password is needed for authentication. Default password of Administrator (access to all features: 111111)

Default password of User (access to all features, except OSD function) : 000000

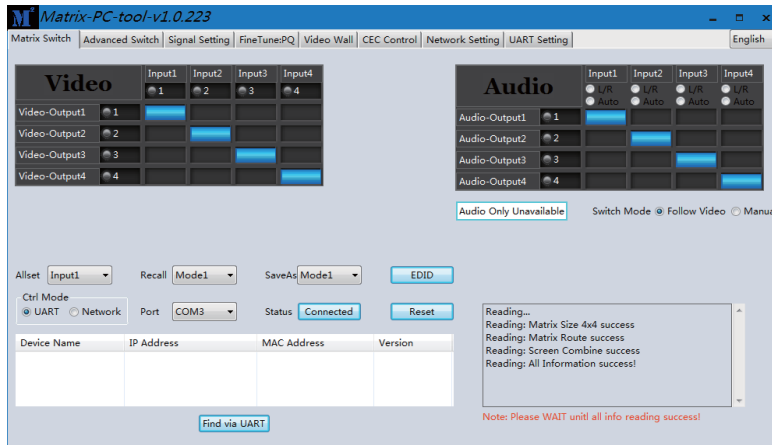
### Connect with PC Tool

1. The default PC tool's UI style is as below.

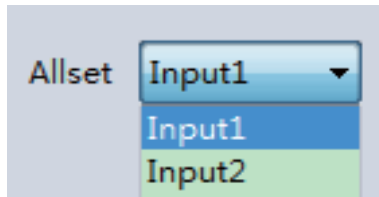


2. You can select UART (with RS-232 cable) or Network to connect, baud rate is 9600 bps.
3. Default IP address: 192.168.0.247.

Matrix Switch Page



1. There is a shortcut button to switch one input port to all output ports, that is Allset, For example, switch input 1 to all outputs, user can select



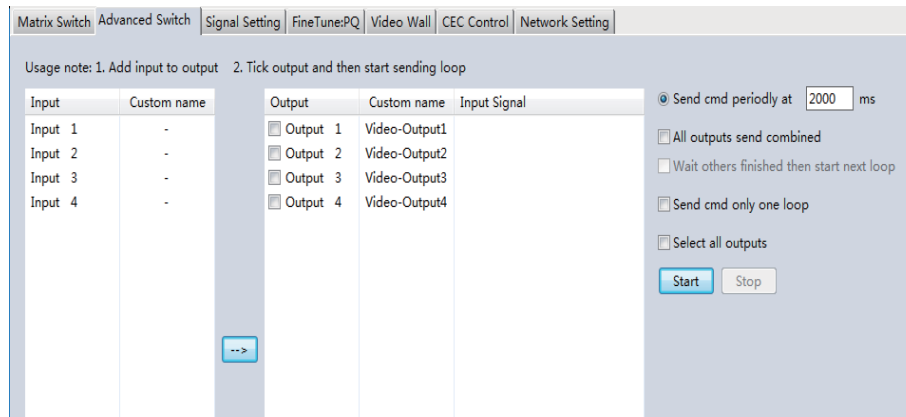
2. Recall mode: Recall a input/output routing scene which already be saved before. The device supports maximum 8 scenes.
3. Save mode: Save the current input/output routing in one index. Maximum 8 modes supported.  
Note: Save/Recall button here works the same with front panel save/recall control and also the same with Save/Load function on video wall page.
4. System reset: The PC tool supports reset system to recover to factory configuration.
5. Audio Switch mode: Follow Video mode or Manual mode

When selecting Manual mode, user can separately switch L/R(Phoenix interface) and Toslink output.

User also can select to use HDMI embedded or corresponding external LR audio.

6. EDID Control: Click the “EDID” button on Matrix Switch page, there will be a pop-up EDID control window. User can do following operations:
  - a. Read EDID of one output port
  - b. Open one existing EDID file
  - c. Write EDID to one input port

## Advanced Switch Page



The Advanced Switch page will repeatedly send a batch of matrix selection commands at the interval specified in the value box after **Send cmd periodically** at text.

1. Select one or more outputs.
2. Select one input.
3. Use the arrow button "-->" to assign that input to the selected output or outputs.
4. After completing all required selections, click the "Start" button to run the commands.

The available options are:

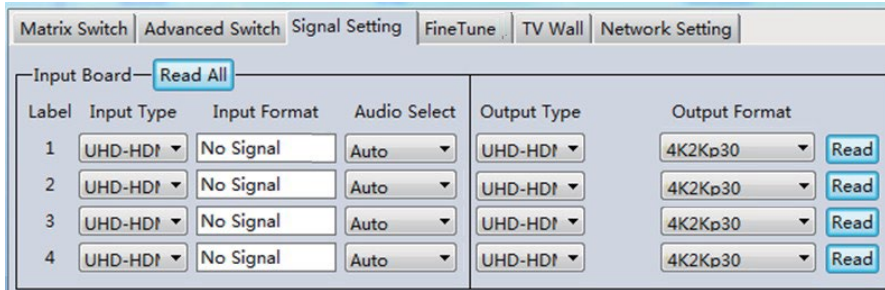
**All outputs send combined** – Combine all outputs that have the same input number as a single command.

**Wait others finished the start next loop** – Wait for all commands in the previous pass to complete before sending the next batch of commands.

**Send cmd only one loop** – Only send a single batch of commands. **Select all outputs** – Select all outputs when the option is checked. **Start** – Begin the command cycles.

**Stop** – Stop the command cycles.

## Signal Setting Page



### 1. Audio Select

There are two options for input Audio Select.

- a) Auto: If the input source is HDMI signal, system will get the embedded audio; if the input source is DVI signal, the system will get the corresponding analog audio.
- b) External: System will get the corresponding analog audio.

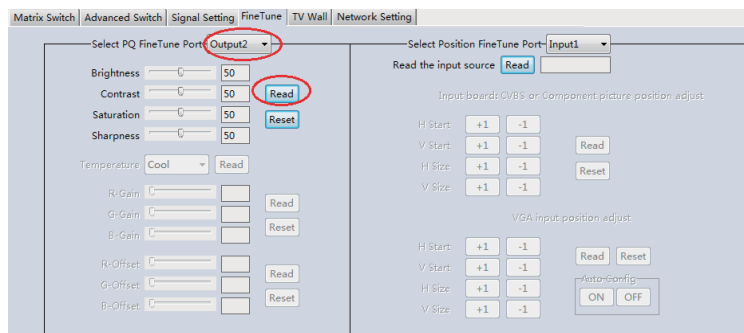
### 2. Output Type

There are four options for input Output Type: UHD-HDMI (HDCP OFF), UHD-DVI, UHD-HDCP-1.4, UHD-HDCP-2.2.

3. Output Resolution: The same as the description on Front Panel page.

## FineTune Page

You can read and set the Brightness/Contrast/Saturation/Sharpness of each output.



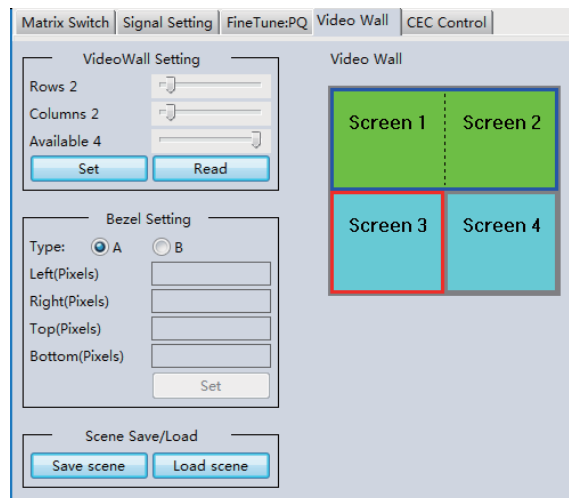
**Note:** Do not change the default settings without special conditions;

If there is a problem after changing, click “Reset” to return to the factory settings.

## Video Wall Page

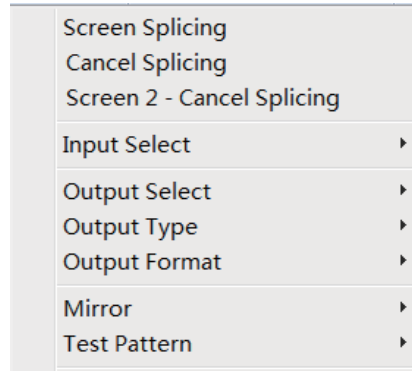
This page is used to configure a group of outputs to function as a video wall.

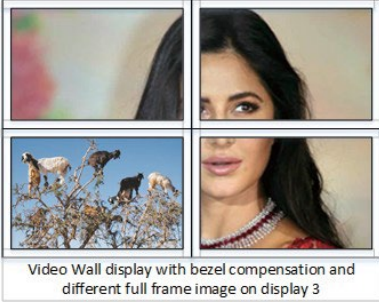
1. Use the Video Wall Setting controls to change how the displays are arranged on the Video Wall page:
  - a. Adjust the Rows and Columns sliders to change the displayed screen arrangement to permit proper Drag-and-Select of the desired screens for the video wall.
  - b. Change the Available slider to set how many outputs will be used for the Video Wall.
  - c. Click the “Set” button to change the Screen configuration.
2. Use the left mouse button to drag-select the screens that will be set for video wall mode. The selected screens will be shown as bright blue.
3. Use the right mouse button to open a menu.
4. Select “Screen Stitching” from the menu to program the video wall mode. The selected screens will now be shown as bright green.
5. To change the displayed image: right-click to open the pop-up menu and select the desired input from the “Input Select” menu option.
6. Repeating steps 2 ~ 5 above with a different set of outputs allows the creation of a second video wall. However, changing the Rows, Columns and Available sliders will automatically delete the current video wall set up when the “Set” button is clicked. The following example shows a more unusual video wall set-up of two video walls with two 2x1 configurations:



### Video Wall Context Menu

Right clicking on any of the screen icons will display the following context menu:



<b>Screen Stitching</b>	This option connects the selected screens into a video wall configuration.
<b>Cancel Stitching</b>	Return the Video Wall configuration to normal outputs.
<b>Screen x – Cancel Stitching</b>	<p>Remove the single screen x from the video wall to allow the displaying another full frame image within the video wall configuration, as shown in this example:</p> 
<b>Input Select</b>	Use the sub-menu to select the input to display on the video wall or the secondary input image shown in the above example.
<b>Output Select</b>	This option is only available for any screen that is not assigned to a video wall mode.
<b>Output Type</b>	This option is only available for any screen that is not assigned to a video wall mode.
<b>Output Format</b>	This option is only available for any screen that is not assigned to a video wall mode. It allows setting of the output resolution for the selected screen output.
<b>Mirror</b>	<p>Two sub options : OFF ( default ), ON ( H+V Mirror)</p> <p>When select “ON”, you can make 180° rotation with the selected screen.</p>
<b>Test Pattern</b>	When Test Pattern is enabled, the output will display Color Bar pattern.

## Bezel Setting

The Bezel Setting section allows the entry of values to compensate for the display bezel thickness. These values may be entered either as pixels (Type A) or as milli metre (Type B).

### Type A Bezel Settings

The image size will be adjusted to allow for the number of pixels entered in each of the entry boxes. Click the “Set” button to view the effect of the new values.

### Type B Bezel Settings

The image size will be adjusted to allow for the Inner and Outer display dimensions as entered in each of the entry boxes. Click the “Set” button to view the effect of the new values.

## Bezel Compensation

The following images demonstrate the effect of not having bezel compensation and what a correctly configured bezel compensation settings should produce:



No Bezel Compensation

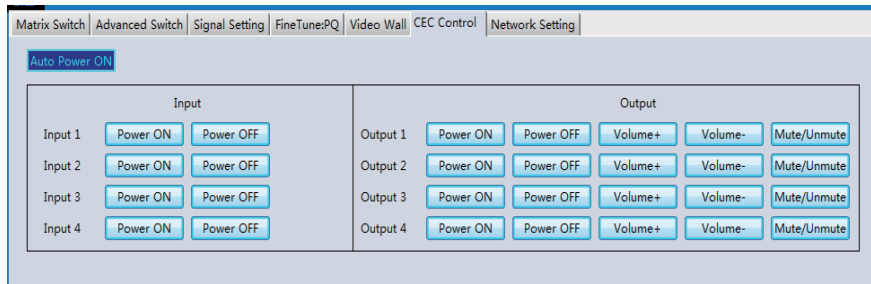


Correct Bezel Compensation

## Layout Save/Load

The Save Scene/Layout and Load Scene/Layout buttons allow a video wall configuration to be saved or recalled at any time. Up to 10 configurations, each with their own name can be saved or recalled. When saving, each Scene can optionally be given a name to identify that video wall scene setup.

## CEC Control Page

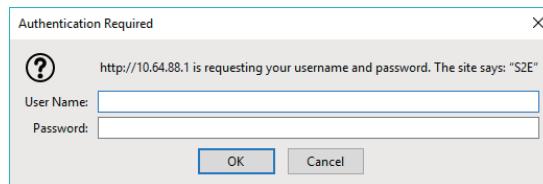


If Auto Power On is enabled, every time when the product is turned on, it will turn on all the sources and displays which are connected to it.

The product supports CEC function, including Power on/off, Volume+/-, Mute/Un-mute.

## Control via Web

The built-in Web GUI interface provides only basic control of the matrix switcher and access to the network settings. The following will be displayed when the web interface is accessed each time:

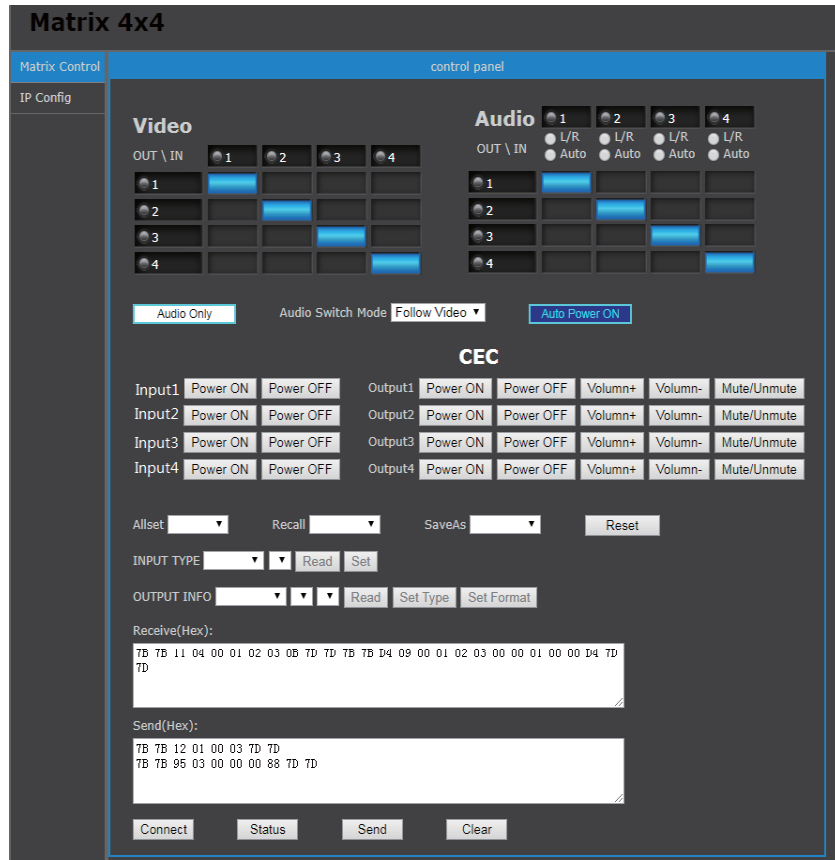


The default Username is: admin

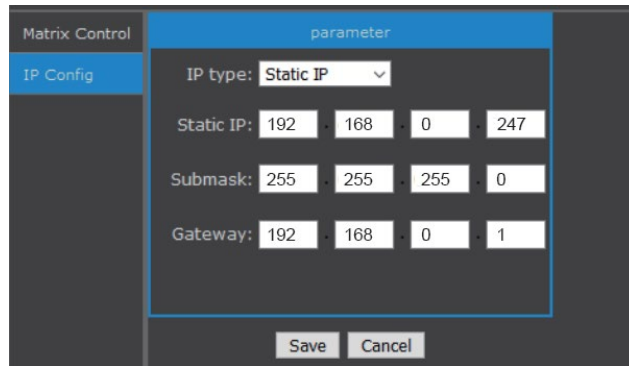
The default Password is: admin

After entering the Username and Password, an interface similar to the following will be displayed:





### IP Configuration



The IP Config tab is used to change the IP settings of the matrix switcher. Enter any necessary changes and click “Save” to program the switcher to the new settings, or click “Cancel” to reject the changes.

## Warranty

### **PureLink Three (3) Year Limited Warranty for PureStream™ Branded Products Only**

Dtrovision, LLC. (hereinafter “PureLink”) warrants its HDTools and PureStream™ branded products (hereinafter “Product”) purchased directly from PureLink or Dealer shall be free from defects in workmanship and materials, under normal use and service, for a period of three (3) years on parts and three (3) years on labor. Any repaired or replaced equipment related to Product shall be covered only under the remaining portion of the warranty. This warranty has no relationship to and exists independently of any warranty offered by Dealer. This warranty is a limited warranty and gives you specific legal rights. You may also have other rights which vary from state to state.

#### **TERMS & CONDITIONS**

PureLink shall repair or replace the Product if it develops a material fault during the period of warranty, on condition that i) the Product has only been subject to normal use in a domestic or commercial environment in a manner consistent with its specification and functionality, ii) the Product has been cared for reasonably and only subjected to reasonable wear and tear, iii) the defect has not been caused by willful or negligent abuse or neglect, or any accident or improper installation procedure, iv) the serial number of the Product has not been altered or removed.

This warranty only applies to the original purchaser, and shall be the exclusive remedy to the original purchaser. PureLink shall not be liable for any damages whatsoever caused by Product or the failure of Product to perform, including incidental or consequential damages. PureLink shall not be liable for any claim made by a third party or made by the purchaser for a third party.

Except as expressly set forth in this warranty, PureLink makes no other warranties, expressed or implied, including any implied warranties of merchantability and fitness for a particular purpose. PureLink expressly disclaims all warranties not satisfied in this limited warranty. Any implied warranties that may be imposed by law are limited to the terms of this limited warranty. This warranty statement supersedes all previous warranties.

#### **WARRANTY RETURNS/REPAIRS/EXCHANGES**

No merchandise may be returned without prior authorization from PureLink, and a Return Materials Authorization (RMA) number. Failure to comply with these conditions will result in rejection of the returned merchandise.

Any warranty service on Products must be arranged through Dealer. Authorized returns must be shipped freight prepaid and fully insured to PureLink, Ramsey, NJ USA, with the RMA number clearly marked on the outside of all shipping boxes and containers. PureLink reserves the right at its sole discretion to refuse any shipments arriving freight collect or without an RMA number. Any authorized returned merchandise must be accompanied by a note describing the reason for return, along with contact information including name, phone number, return mailing and shipping addresses, e-mail address, and RMA number.

On any products returned and accepted with an RMA number, return freight charges following repair of items under warranty shall be paid by PureLink, shipping by the standard ground carrier of its choice.

#### **ADVANCE WARRANTY REPLACEMENTS**

PureLink’s advance replacement service offers a Replacement Unit upon request - free of charge for eligible products purchased less than one (1) year of the warranty claim. Products purchased more than one (1) year prior to the warranty claim do not qualify for advance replacement services.

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Advance replacement requests must be validated by a member of PureLink's Technical Support Team. Replacement units may be new or refurbished and is subject to availability. PureLink is responsible for shipping the Replacement Unit to your designated location by standard ground service. All other shipping methods will be responsibility of the Dealer.

Original Unit Return – the Original Unit must be returned within thirty (30) calendar days of the return authorization date. Failure to return the Original Unit within this period will be subject to a minimum 15% re-stocking fee. Dealer is solely responsible for the shipping of the Original Unit to PureLink.

### **TO MAKE A WARRANTY CLAIM**

To make a warranty claim, promptly notify PureLink within the warranty periods described above by calling PureLink's Technical Support Department at 1-201-488-3232. PureLink, in its sole discretion, will determine what action, if any, is required under this warranty.

Most problems can be corrected over the phone through close cooperation between Customer and a PureLink technician. To better enable PureLink to address a warranty claim, please have the Product's serial and model numbers. If PureLink, in its sole discretion, determines that an on-site visit or other remedial action is necessary, PureLink may send a representative to Customer's site.

### **CUSTOMER SERVICE**

Technical support inquiries can be submitted electronically through the PureLink website at [www.purelinkav.com](http://www.purelinkav.com). For immediate assistance please contact PureLink's Customer Care Team at

+1 (201) 488-3232