User's Manual

Virtual Matrix A/V Extender over IP w/ KM

Version 1.0 | September | 2024

HX-143T/HX-143R/HX-143AVC

HX-143T/HX-143R/HX-143AVC

User's Manual

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We provide customers with total-solution technical supports. Users may contact our nearest local sales office or service center, or directly contact our Corporate.

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Chapter 1 Product Overview

The **HX-143 A/V Extender over IP System** includes at least a transmitter unit, **HX-143T**, a receiver unit, **HX-143R**, and an A/V controller unit, **HX-143AVC**, to manage all transmitter and receiver units within the same Gigabit LAN. This system enables the setup of a Master-slave Replication Failover Configuration. The A/V controller HX-143AVC is a software-hardware integrated unit for managing and controlling all A/V extenders via a web-based management interface ***AVoIP Manager***. The HX-143AVC has two independent network interfaces (**CONTROL NETWORK**/**AV NETWORK**). The HX-143AVC controller and all the HX-143T/HX-143R devices are configured on the same Gigabit (1000Mbps) Ethernet AV NETWORK. Media players or computers can be connected to this A/V extender over IP system via transmitter units. The HX-143AVC controller further supports 3-tier security levels of user roles, 128-bit SSL for encrypted data transmission, User/TX/RX group setup, video thumbnail live view, drag-and-drop TX/RX connection for all A/V extender units on the ***AVoIP Manager***, RX I/O port enable/disable control, log history records, etc.

System Configuration Diagram

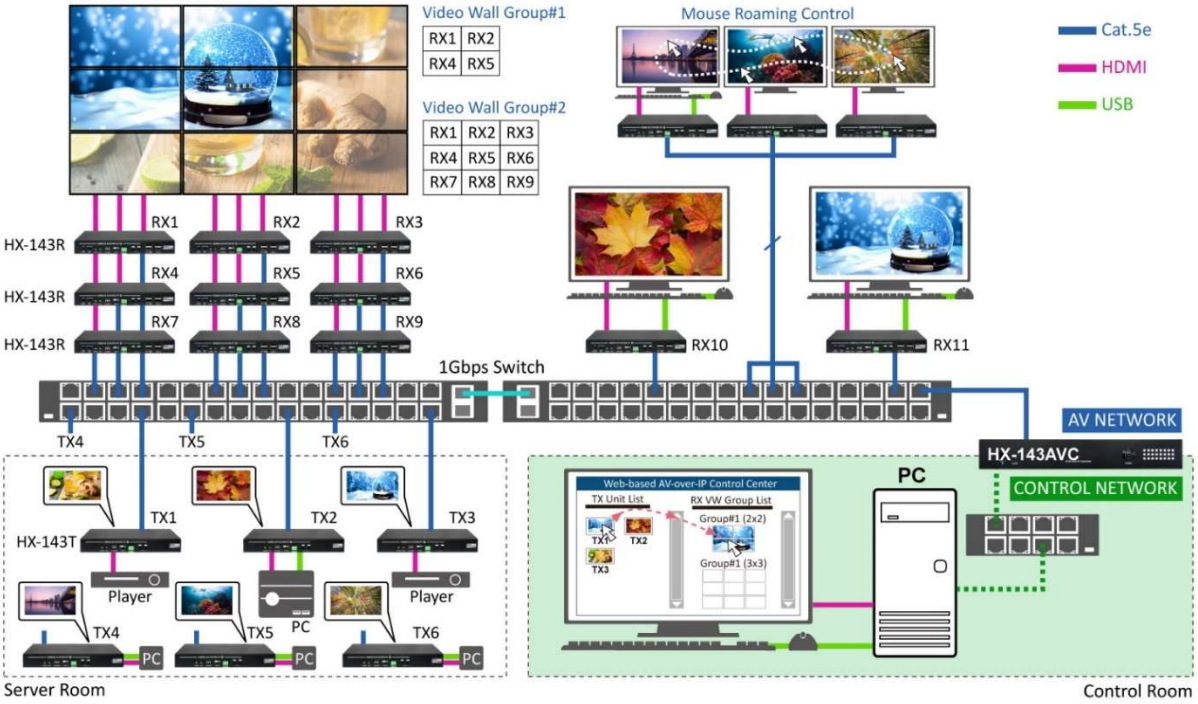


Figure 1-1 System Configuration Diagram

Chapter 2 Product Features

[HX-143AVC]

1. Allow enabling automatic failover recovery, redundant unit database backup, and single unit manual backup/restoration.
2. Add and configure compatible A/V extender TX/RX units (HX-143T/HX-143R).
3. Support two independent network interfaces for connecting to a CONTROL NETWORK and an AV NETWORK, ensuring the highest level of information security.
4. The A/V Controller supports managing connection between transmitter and receiver devices over Gigabit Ethernet.
5. Support a web-based management interface accessible through a browser at the A/V controller console.
6. Record logs of all events, login history, and delete/sort event lists.
7. Enable three application levels of user roles: Administrator, Super User, and Simple User.

- **Administrator:** Authorized with full rights to configure the master controller unit and slave controller unit, configure the TX/RX devices, and manage user accounts.
- **Super User:** Authorized with partial rights to change configurations, excluding user account management.
- **Simple User:** Authorized with permissions to access basic functions only.

8. View the video sources of transmitter units live and assign TX video sources to receiver units intuitively.
9. Access to the receiver unit I/O ports (HDMI, USB, RS-232, Audio, Infrared) can be enabled or disabled separately.

[HX-143T/HX-143R]

1. Support one Hot-plug SFP optical module socket.
2. LAN port supports PoE (Power over Ethernet) functionality.
3. USB 2.0 over IP for K/M applications.
4. Support UHD video streaming quality up to 3840x2160@60Hz.
5. Integrated RS-232 port for distributed remote control.
6. Near-zero latency.

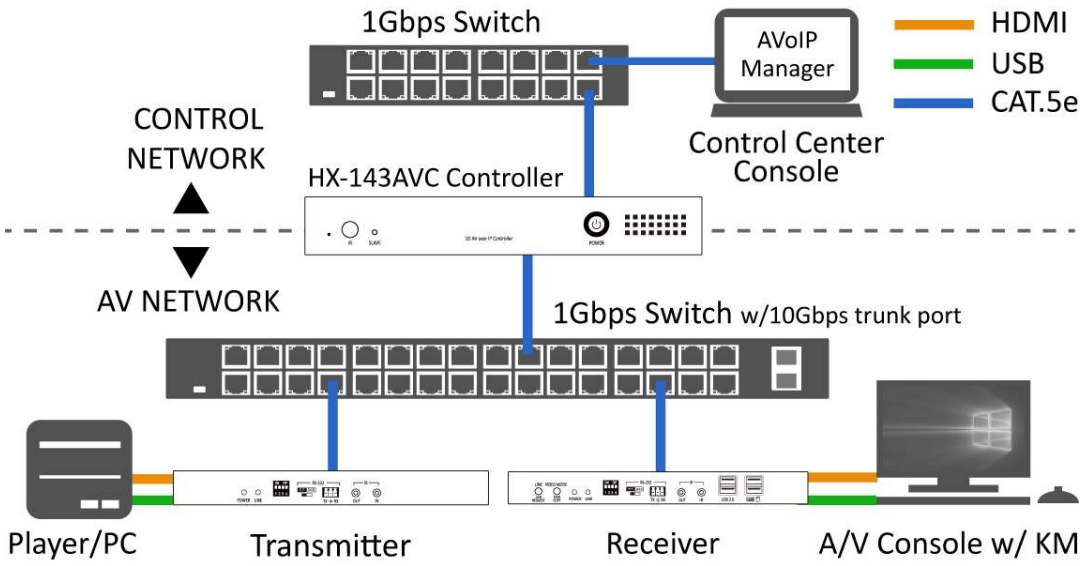


Figure 2-1 Connection Diagram of A/V Controller HX-143AVC and A/V Extenders HX-143T/HX-143R

2.1 Product Specification

Table 2-2 Specification Table

Model No.	**HX-143AVC (A/V Controller)**	
Power ON/OFF Button	1 x LED Backlit Pushbutton (Blue)	
Recessed Button	2 x Tact Switch (Front Panel: Reserved / Rear Panel: Resume Factory Default)	
Network Port	2 x RJ-45 Socket (AV NETWORK / CONTROL NETWORK)	
USB Port	2 x USB 2.0 Type-A Female Socket	
Video Connector	1 x HDMI Female (OUT)	
RS-232 Connector	1 x 3P Phoenix Connector	
Trigger Input Connector	1 x 10P Phoenix Connector (5V/GND/1/2/3/4/5/6/7/8)	
Control Connector	1 x 5P Phoenix Connector (Reserved)	
IR Extension Connector	1 x 3.5mm Phone Jack	
Power Adapter	DC 12V/3A	
Temperature	0 ~ 40°C (Operation) / -20 ~ 60°C (Storage)	
Humidity	0~90% RH, Non-condensing	
Weight	1215 g	
Dimensions	300(W) x 164(D) x 44(H) mm	
Housing Material	Metal	
Safety / Emission	FCC, CE	
Model No.	**HX-143T (A/V Transmitter)**	**HX-143R (A/V Receiver)**
Video Connector	1 x HDMI Female (IN), 1 x HDMI Female (Loop-back OUT)	1 x HDMI Female (OUT)
Audio Connector	2 x 3.5mm Phone Jack (Audio IN/Mic. OUT)	2 x 3.5mm Phone Jack (Audio OUT/Mic. IN)
USB Connector	1 x USB 2.0 Type-B Female	2 x USB 1.1 Type-A Female 2 x USB 2.0 Type-A Female
RS-232 Connector	1 x 3P Phoenix Connector	1 x 3P Phoenix Connector
Channel Switch	1 x 4P DIP Switch (Reserved)	1 x 4P DIP Switch (Reserved)
Debug Switch	1 x 2P Slide Switch	1 x 2P Slide Switch
Recessed Button	1 x Tact Switch (Rear Panel: Reboot)	1 x Tact Switch (Rear Panel: Reboot)
TOSLINK Connector	N/A	1 x TOSLINK (OUT)
TX/RX Link Connector	1 x LAN Port (w/PoE), 1 x SFP Cage	1 x LAN Port (w/PoE), 1 x SFP Cage
IR Connector	2 x 3.5mm Phone Jack (IN/OUT)	2 x 3.5mm Phone Jack (IN/OUT)
Push Buttons	N/A	2 x Tact Switch (LINK/VIDEO MODE)
LED Indicators	1 x POWER (Orange), 1 x LINK (Green)	1 x POWER (Orange), 1 x LINK (Green)
Max. Video Resolution	3840 x 2160@60Hz (IN) 4:4:4	3840 x 2160@60Hz (OUT)
Power Adapter	DC 12V/3A	
Temperature	0 ~ 40°C (Operation) / -20 ~ 60°C (Storage)	
Humidity	0~90% RH, Non-condensing	
Weight	570 g	
Weight	213.5(W) x 105(D) x 30(H) mm	
Housing Material	Metal	
Safety / Emission	FCC, CE	

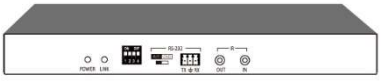
*Note: This specification is subject to change without prior notice.

Chapter 3 Package Content

- **HX-143AVC A/V over IP Controller Unit** x 1
- **HX-143T A/V Transmitter Unit** x M
  (M=TX order quantity)
- **HX-143R A/V Receiver Unit** x N
  (N=RX order quantity)
- **12V/3A Power Adapter** x (1+M+N)
- **HX-143 A/V over IP System Manual** x 1

Package Content

HX-143AVC A/V over IP Controller x1



HX-143T A/V Transmitter xM

HX-143R A/V Receiver xN

Power Adapter x(1+M+N)

User's Manual x1

Chapter 4 System Overview and Getting Started

4.1 Hardware Appearance

4.1.1 HX-143AVC Controller Unit Front & Rear Panels

Figure 4-1 HX-143AVC Front & Rear Panels

4.1.2 HX-143T Transmitter Unit Front & Rear Panels

Figure 4-2 HX-143T Front & Rear Panels

4.1.3 HX-143R Receiver Unit Front & Rear Panels

Figure 4-3 HX-143R Front & Rear Panels

4.2 Hardware Overview

4.2.1 HX-143AVC Controller Unit Interface and Connectors

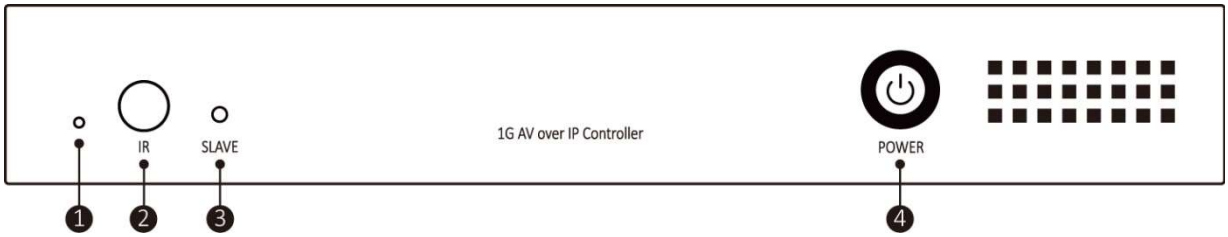


Figure 4-4 HX-143AVC Front Panel Interface

Table 4-1

No.	Item	Specification Description
1	Recessed Button	Reserved
2	IR Receiver	Controlled by the optional IR Remote Control to act as the TRIGGER Inputs of the HX-143AVC.
3	SLAVE LED Indicator (Orange)	OFF: No Replication Mode Controller or Replication Mode MASTER Controller.
		ON: Replication Mode SLAVE Controller.
4	Power LED Indicator (Green)	OFF: Power Adapter is not plugged or the Controller is shut down.
		Constantly ON: Controller is ready, with <**Replication Mode**> set as <**No Replication**>.
		Flashing: Controller is ready, with <**Replication Mode**> set as <**Replication**>.

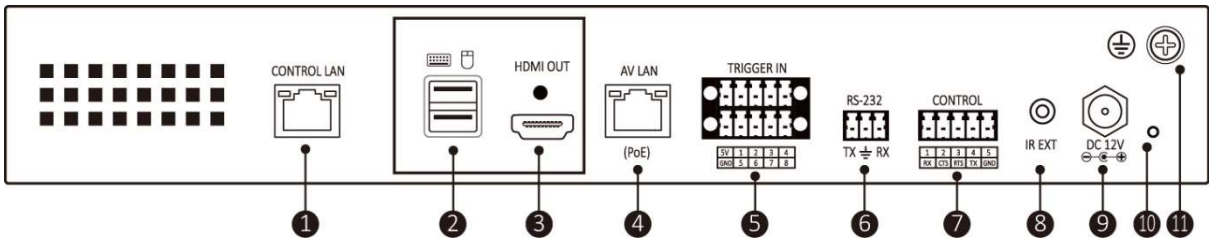


Figure 4-5 HX-143AVC Rear Panel Interface

Table 4-2

No.	Item	Specification Description
1	CONTROL LAN Port	Connect to an RJ-45 Network Port of a first Gigabit Switch. Use the PC web browser to access the Web-based Management Interface ***AVoIP Manager*** of the HX-143AVC.
2	Keyboard/Mouse Port	Connect to a set of keyboard and mouse to access the ***AVoIP Manager*** of the HX-143AVC.
3	HDMI Monitor Port	Connect to an HDMI monitor to access the ***AVoIP Manager*** of the HX-143AVC.
4	AV LAN Port	Connect to an RJ-45 Network Port of a second Gigabit Switch. The AV LAN Port can be connected to a PoE (Power over Ethernet) Gigabit switch to power the controller unit HX-143AVC when the power adapter is not connected.
5	TRIGGER Input	8 External Inputs to trigger the GPIO Macros set by the ***AVoIP Manager*** users.
6	RS-232 Port	Serial control for the controller unit HX-143AVC.
7	CONTROL Port	Reserved.
8	IR Extension Port	Connect to an IR receiver cable.
9	Power Jack	Use the attached DC 12V/3A Power Adapter to power the controller unit HX-143AVC.
10	Recessed Button	Press and hold it for at least 15 seconds then release it, to reset the controller unit to factory default.
11	Grounding Terminal	Use a grounding wire to connect the controller unit HX-143AVC and a suitable grounded object.

*Note: The specification is subject to change without notice.

4.2.2 HX-143T Transmitter Unit Interface and Connectors

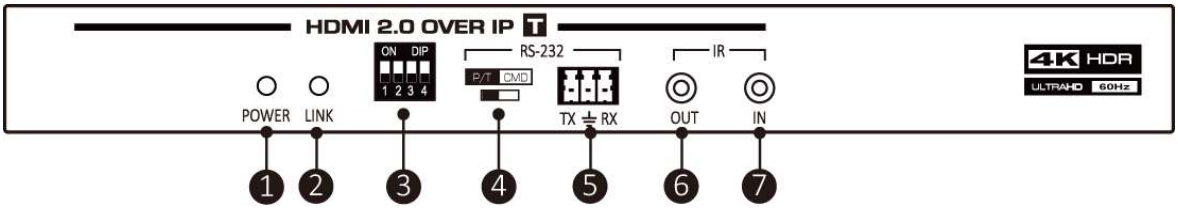


Figure 4-6 HX-143T Front Panel

Table 4-3

No.	Item	Specification Description
1	POWER LED Indicator (Orange)	Lights when the TX unit is powered on.
2	LINK LED Indicator (Green)	Lights when the connection between transmitter and receiver is active.
3	DIP Switch	Reserved.
4	P/T(Passthrough)/CMD 2P Slide Switch	P/T: The host PC sends RS-232 commands to the Serial Device through connected TX and RX units. CMD: The host PC sends RS-232 commands to the connected TX unit for parameter setup.
5	RS-232 Phoenix Connector	Connect to a host PC through an RS-232 cable.
6	IR Transmitter Jack	Connect to an IR transmitter to control devices located at the TX Unit site.
7	IR Receiver Jack	Connect to an IR Receiver to receive IR signals at the TX Unit site.

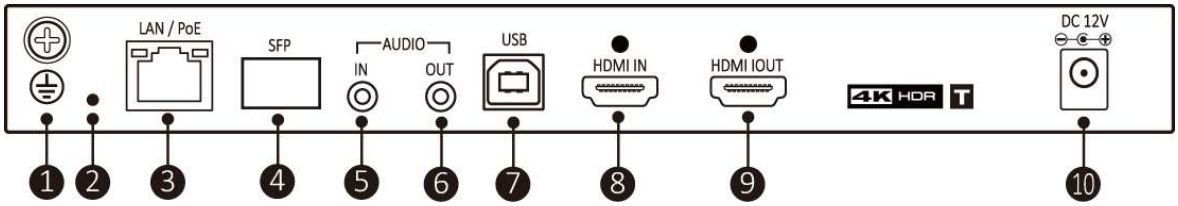


Figure 4-7 HX-143T Rear Panel

Table 4-4

No.	Item	Specification Description
1	Grounding Terminal	Use a grounding wire to connect the TX unit HX-143T to a suitable grounded object.
2	Recessed Button	Use an awl-like object to briefly press this button to reboot the TX unit.
3	LAN Port w/ PoE	Connect to an RJ-45 Network Port of the second Gigabit Switch. This LAN Port can be connected to a PoE (Power over Ethernet) Gigabit Switch to power the transmitter unit HX-143T when the power adapter is not connected to it.
4	SFP Fiber Socket	Connect to a SFP Optical Module to connect the TX unit to the AV NETWORK.
5	Audio Input Jack	Connect to the audio output of a host PC.
6	Audio Output Jack	Connect to the microphone input of a host PC.
7	USB Connector	Connect to an USB 2.0 hub port of a host PC.
8	HDMI video input port	Connect to the HDMI video output of a host PC.
9	HDMI video output port	Connect to an HDMI monitor.
10	Power Input Jack	Use the attached DC 12V/3A Power Adapter to power the TX unit HX-143T.

4.2.3 HX-143R Receiver Unit Interface and Connectors

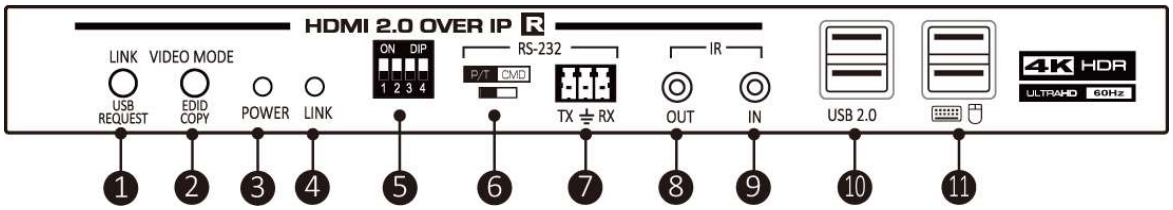


Figure 4-8 HX-143R Front Panel

Table 4-5

No.	Item	Specification Description
1	LINK button (monitor display w/o OSD menu)	Press it briefly to disconnect/connect between the transmitter and receiver. Press & hold it to prioritize the USB device access to the connected PC host in Matrix Operation Mode.
2	VIDEO MODE button (monitor display w/o OSD menu)	Press it briefly to toggle the ***TX Video Quality*** between [**Video Mode**] and [**Graphic Mode**]. Press & hold it to cycle the ***TX Anti-Dither*** between [**Anti-Dither 1**], [**Anti-Dither 2**], and [**OFF**].
3	POWER LED Indicator (Orange)	Lights when the RX unit is powered on.
4	LINK LED Indicator (Green)	Lights when the connection between transmitter and receiver is active.
5	DIP Switch	Reserved
6	P/T(Passthrough)/CMD	P/T: The host PC sends RS-232 commands to the Serial Device through connected TX and RX units CMD: The host PC sends RS-232 commands to the connected RX unit for parameter setup.
7	RS-232 Phoenix Connector	Connect to a serial device through an RS-232 cable.
8	IR Transmitter Jack	Connect to an IR transmitter to control devices located at the RX Unit site.
9	IR Receiver Jack	Connect to an IR Receiver to receive IR signals at the RX Unit site.
10	USB Type-A connector	Connect to USB 2.0 peripherals.
11	USB Type-A connector	Connect to a USB keyboard and mouse.

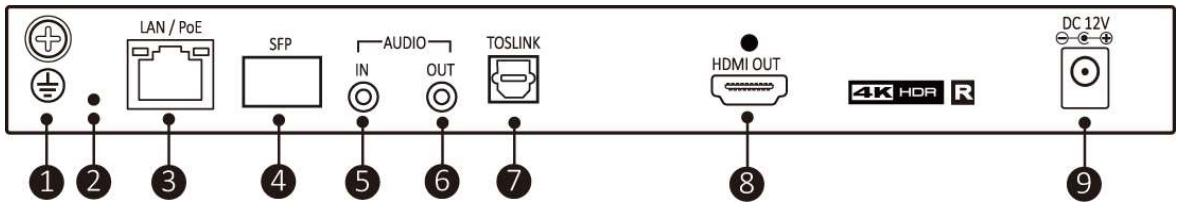


Figure 4-9 HX-143R Rear Panel

Table 4-6

No.	Item	Specification Description
1	Grounding Terminal	Use a grounding wire to connect the RX unit HX-143R to a suitable grounded object.
2	Recessed Button	Use an awl-like object to briefly press this button to reboot the RX unit.
3	LAN Port w/ PoE	Connect to an RJ-45 Network Port of the second Gigabit Switch. This LAN Port can be connected to a PoE (Power over Ethernet) Gigabit Switch to power the receiver unit HX-143R when the power adapter is not connected.
4	SFP Fiber Socket	Connect to a SFP Optical Module to connect the RX unit to the AV NETWORK.
5	Audio Input Jack	Connect to a microphone.
6	Audio Output Jack	Connect to a set of speakers/headphones.
7	TOSLINK Digital Audio Output Jack	Connect to a digital audio device through a TOSLINK optical cable.
8	HDMI video output port	Connect to an HDMI monitor.
9	Power Input Jack	Use the attached DC 12V/3A Power Adapter to power the RX unit HX-143R.

4.3 System Deployment

The diagram illustrated here is only an example; actual applications may vary. All illustrated computers, switches, accessories, and monitors are for reference only and are not included in the package. Make sure all the devices and peripherals are connected appropriately before using the HX-143 A/V over IP system.

The A/V controller unit HX-143AVC provides two independent networks, respectively connected to the 1Gbps AV NETWORK and the 1Gbps CONTROL NETWORK. The AV NETWORK is where the AV over IP extender units connect. The HX-143AVC user can use the browser on a computer (as a control center console) connected to the CONTROL NETWORK to manage all TX/RX units within the AV NETWORK. Note that the Gigabit AV NETWORK to which the TX/RX devices are connected and the CONTROL NETWORK are in different network segments, thus ensuring the information security of the AV NETWORK.

Following diagrams respectively shows Systems deployed by a single A/V controller and two A/V controllers.

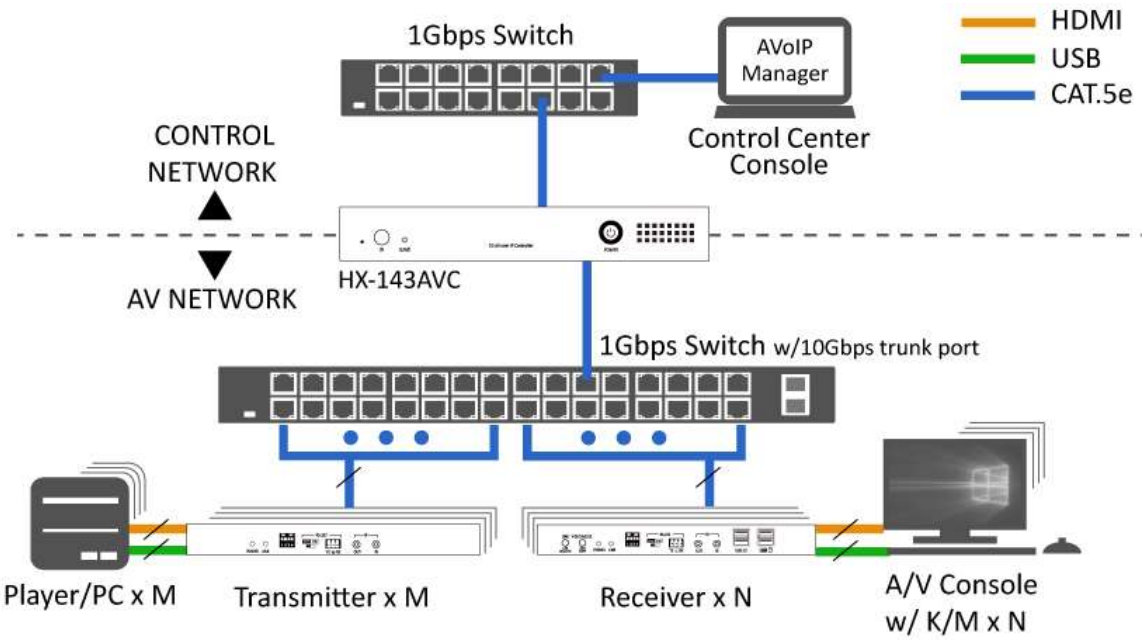


Figure 4-10 Single A/V Controller System Configuration

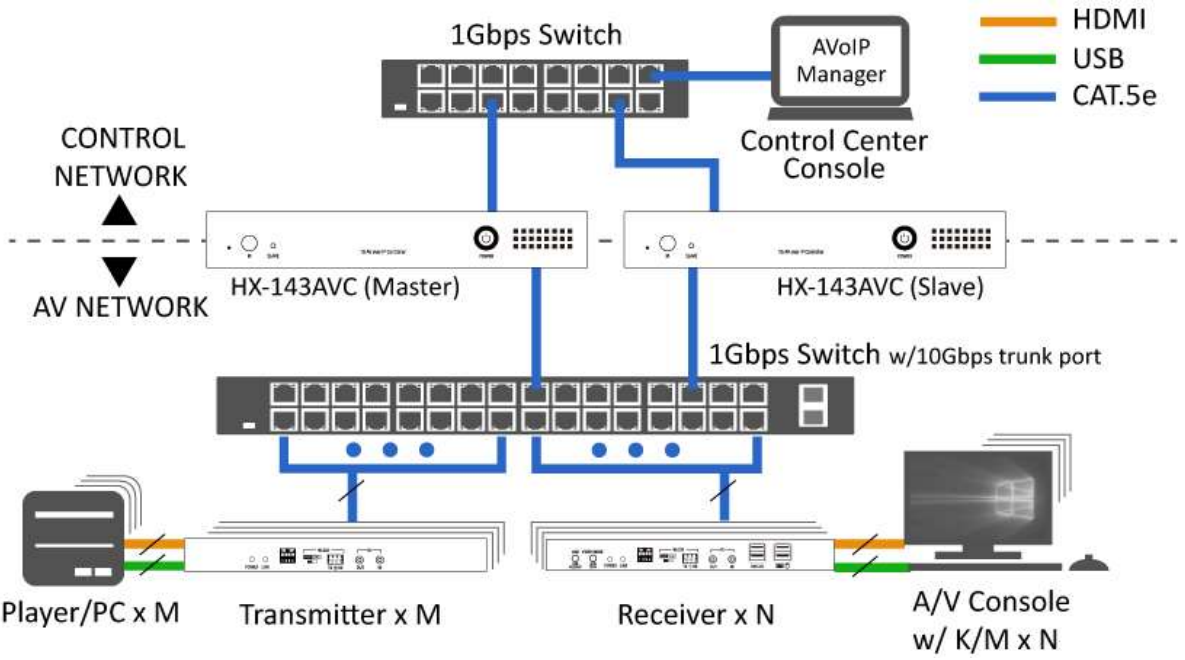


Figure 4-11 Dual A/V Controller System Configuration

4.4 Quick Installation Guide

Please follow the steps below to complete installation.

4.4.1 HX-143AVC Hardware Installation

1. Connect the power adapter to the power jack of the HX-143AVC A/V controller. Check if the power jack is well inserted and the nut is locked.
2. Press and release its power switch to turn on the HX-143AVC. After 30 seconds, the green Power LED will light up indicating the HX-143AVC is ready.
3. Connect the left-side CONTROL LAN port on the HX-143AVC's rear panel to a first 1Gbps switch (e.g., CONTROL NETWORK) which also connects with the computer running its Web-based Management Interface ***AVoIP Manager***.
4. Connect the right-side AV LAN port on the HX-143AVC's rear panel to a second 1Gbps switch (e.g., AV NETWORK) which also connects to all managed TX/RX units.
5. Connect a second HX-143AVC slave controller, if needed, to the CONTROL NETWORK and the AV NETWORK according to the same procedure as described. Please note that the CONTROL NETWORK segment (192.168.**x**.**x**) and the AV NETWORK segment (169.254.**x**.**x**) are independent to each other.
6. Start to use the HX-143AVC controller.

Hardware Configuration

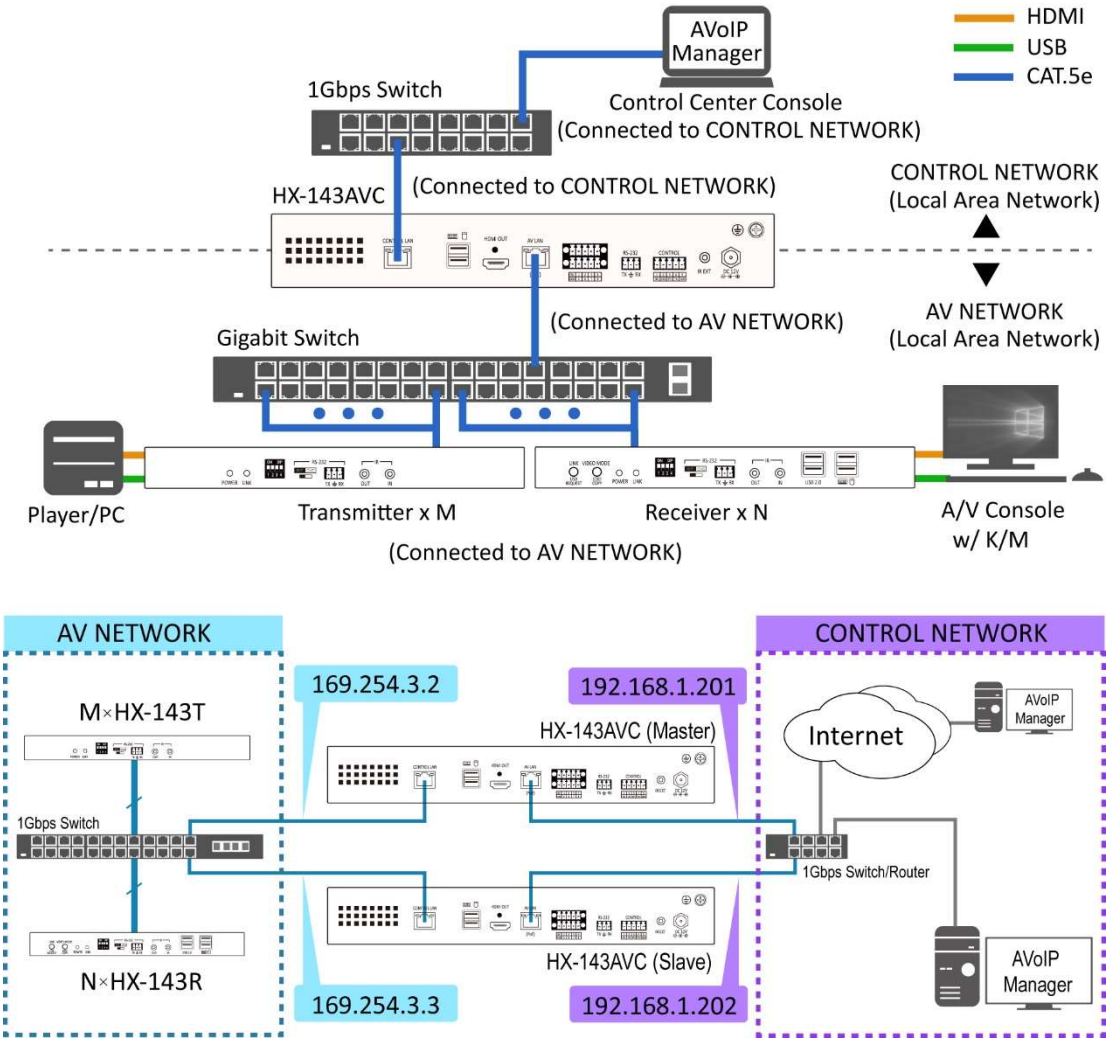


Figure 4-12 Hardware Configuration and Two Separate Network Settings

4.4.2 TX/RX Hardware Installation

[**One-to-one Connection/EXTENDER Operation Mode**]

1. Connect the attached power adapter plugs to the power jacks of the TX/RX units. Ensure the power jacks are securely inserted. The orange POWER LED will start flashing and then turn solid, indicating the unit is ready.
2. Connect a TX unit and an RX unit with a Cat.5 network cable or an optical fiber cable, and then connect their peripherals.
3. The TX unit and RX unit will automatically connect to each other.
4. The console user at the RX unit site can begin operating the player/PC at the TX unit site.

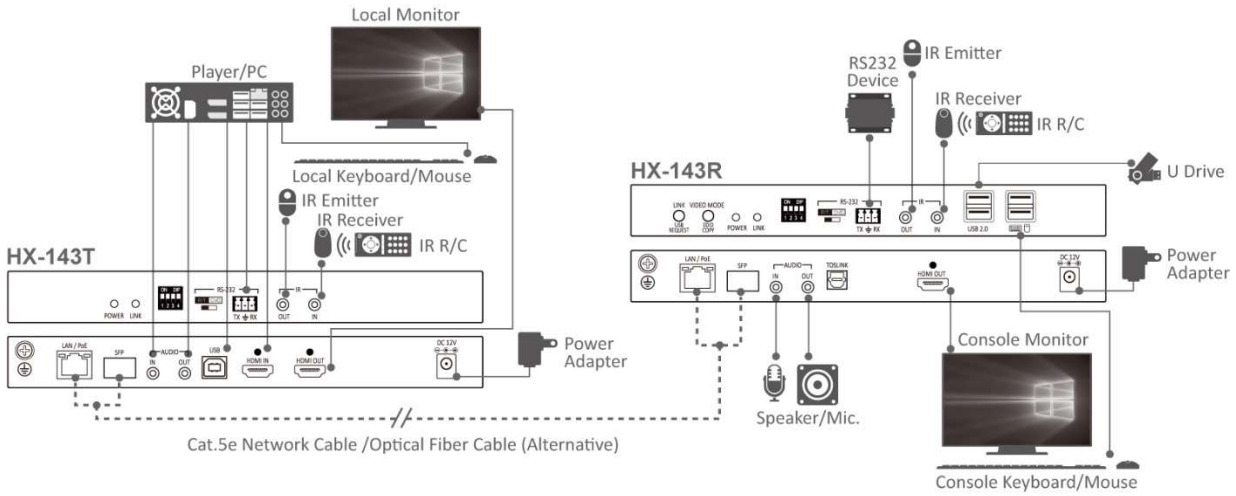


Figure 4-13 One-to-one TX/RX unit Connection

[**Any-to-any Connection/MATRIX Operation Mode**]

1. Connect the attached power adapter plugs to the power jacks of the TX/RX units. Ensure the power jacks are securely inserted. The orange POWER LED will start flashing and then remain constantly ON, indicating the unit is ready.
2. Connect all TX and RX units to a Gigabit switch using Cat.5e network cables, and then connect their peripherals.
3. Bring up the OSD menu on any RX unit to select the preferred TX unit to connect to.
4. The console user at the RX unit site can start remotely operating the player/PC at the TX unit site.

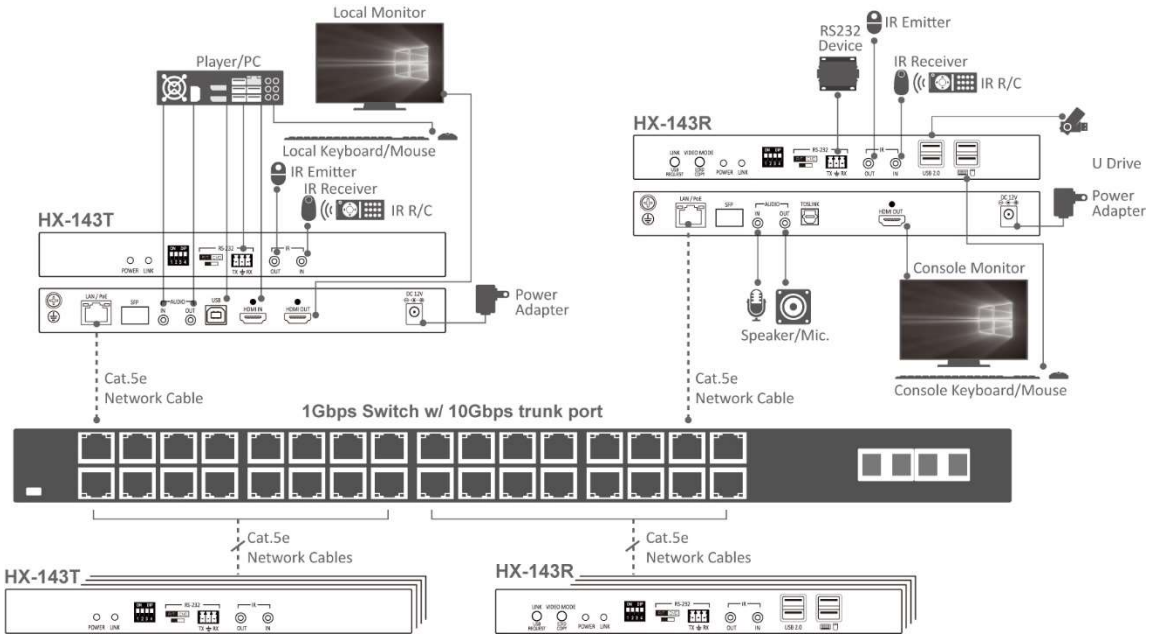


Figure 4-14 Any-to-any TX/RX unit Connection

*Note: To configure the operation modes of the RX and TX units, bring up the RX unit's OSD menu to set their operation mode to the same one (EXTENDER or MATRIX) for all RX and TX units that are planned to be connected to each other.

4.4.3 HX-143AVC Web-based Management Interface Setup

1. Launch the web browser on a PC (used as the control center console) connected to the CONTROL NETWORK. Enter the factory default management interface login IP address (**https://192.168.1.200**) into the browser to access the web-based management interface, ***AVoIP Manager***.
2. When the login page appears, enter the factory default Administrator username (***admin***) and password (***adminpass***) to log in with the Administrator role. (Note: After your first login with the factory default Administrator account, we strongly recommend that you immediately create a new Administrator username (e.g., ***admin123***) and a stronger password (including

special characters is recommended). Log in again with the new Administrator account and promptly delete the factory default Administrator account. Please also securely store this new Administrator account information to ensure the safety of your system.)

3. Use the new Administrator account to set up Super-user and Simple-user user accounts.

4. Continue by setting up Super-user groups and Simple-user groups with the new Administrator account.

5. Navigate to **Dashboard**>**Detected Devices** to locate the HX-143T/HX-143R units on the AV NETWORK. These detected devices will be automatically managed. You may set up TX groups and RX groups according to your needs.

6. Configure the allowed TX groups and RX groups for the Super-user groups and Simple-user groups.

7. At HX-143R consoles, use default hotkey <**ScrLk**>, <**ScrLk**>, <**Space**> to bring up the receiver OSD menu. After entering the username and password on the login page, the receiver OSD menu will display a TX list page, including all connectable TX units within the same AV NETWORK, based on the user's authority.

8. From the TX list in the RX OSD menu, double-click any desired transmitter name to connect it to the currently operated receiver.

9. Once the connection between any transmitter unit and receiver unit is successful, you can begin using the receiver console to remotely access the player/PC connected to the transmitter unit.

For more details, such as user group or TX/RX group settings, please refer to the online <Help> tab in the upper-right corner of each HX-143AVC management interface webpage.

4.4.4 Access the HX-143AVC Web-based Management Interface

The factory default CONTROL NETWORK settings for HX-143AVC are as follows:

IPv4 Address: 192.168.1.200

Subnet Mask: 255.255.255.0

Gateway: 192.168.1.254

DNS Server: 192.168.1.254

The factory default administrator username and password:

Username: ***admin*** Password: ***adminpass***

1. Connect a PC to the CONTROL NETWORK having the same network segment as the HX-143AVC master unit. Use the PC browser to enter the HX-143AVC web-based management interface ***AVoIP Manager***.

2. Enter the factory default management interface login IP address (**https://192.168.1.200**) in the browser's address bar. Since the HX-143AVC uses a non-CA self-signed certificate, on your first login attempt, the web browser will display a warning about an insecure connection. However, the HX-143AVC is simply a hardware controller, not a website. Click the <**Advanced**> button and allow the login procedure to continue. On the login page, enter the factory default Administrator username (***admin***) and password (***adminpass***) as shown below.

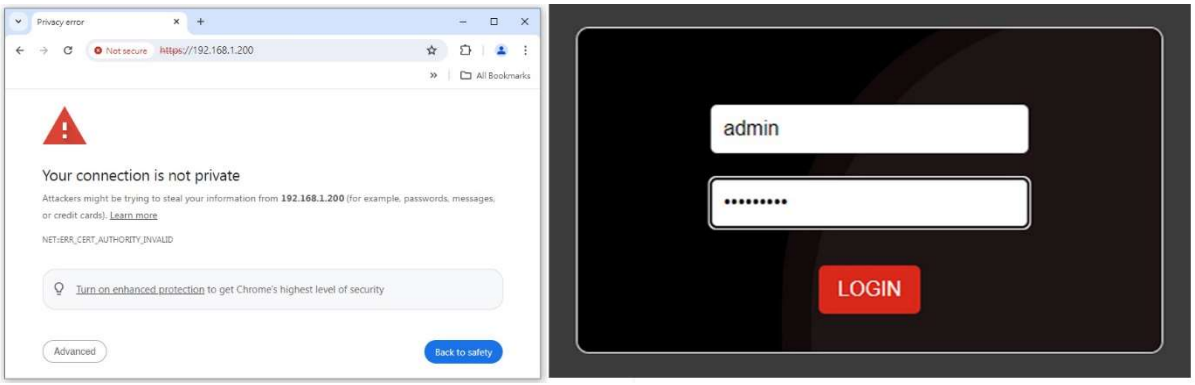


Figure 4-15

3. Refer to the instructions in section 4.4.3, create a set of new Administrator username and password then log in the HX-143AVC master unit web-based management interface.

4. Change the HX-143AVC master unit CONTROL NETWORK IP to 192.168.1.**201** and the AV NETWORK IP to 169.254.3.**2**. Go to **System**>**Replication**, set <**Replication Mode**> as <**Master**>.

5. Connect an HX-143AVC slave unit to the CONTROL NETWORK/AV NETWORK, ensuring it shares the same network segments as the HX-143AVC master unit. Using the same PC browser, enter the factory default management interface login IP address (**https://192.168.1.200**). Then, input the factory default Administrator username (***admin***) and password (***adminpass***) to access the HX-143AVC web-based management interface. Next, create a new Administrator username and password (which can either be the same as or different from those of the master unit), then log in to the HX-143AVC slave unit web-based management interface with the new credentials. Change the HX-143AVC slave unit's CONTROL NETWORK IP to 192.168.1.**202** and the AV NETWORK IP to 169.254.3.**3**.

6. Navigate to **Dashboard**>**Detected Devices**, where you will find that all transmitters and receivers within the same AV NETWORK have been automatically managed.

7. Go to **Devices**>**TX Groups**/**RX Groups** to set up TX groups and RX groups. Then, go to **Users**>**Group** to configure the allowed TX groups and RX groups for user groups.

4.4.5 Access the HX-143R Receiver OSD Menu

When a user at an RX console wants to connect the currently operating receiver to a transmitter, they can use the OSD launch hotkey: <**ScrLk**>, <**ScrLk**>, <**Space**> to prompt the OSD menu, or press the left Ctrl key twice <**Ctrl**>, <**Ctrl**> for a quicker launch.

As shown in Figure 4-16, when the HX-143AVC controller is managing the RX/TX units, the user will need to enter their credentials (username and password) to log in to the RX unit's OSD menu. As illustrated in Figure 4-17, if the RX/TX units are not managed by the HX-143AVC controller, the OSD menu will open directly after the specified keyboard hotkeys have been pressed. A TX list page will then display all available TX units that the RX unit can access.

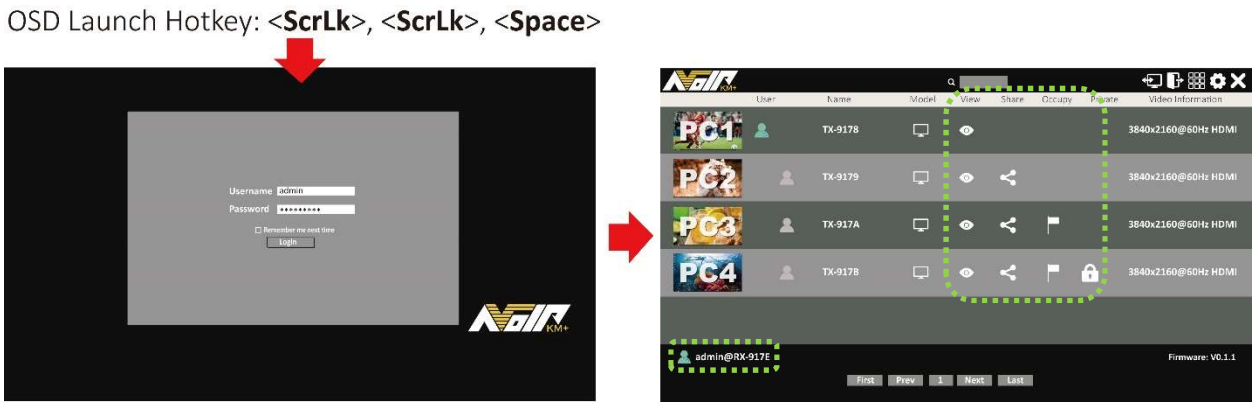


Figure 4-16 Process to Bring up an OSD Menu of a RX unit with HX-143AVC controller management

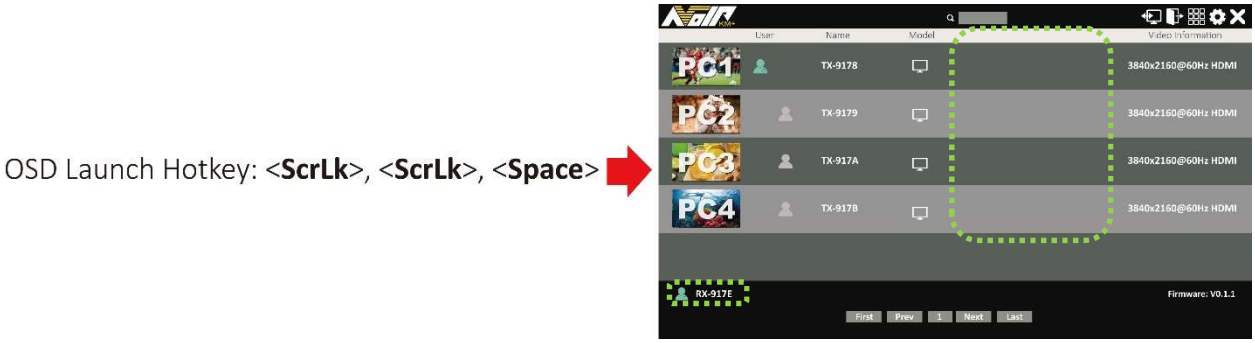


Figure 4-17 Process to Bring up an OSD Menu of a RX unit without HX-143AVC controller management

Chapter 5 Web-based Management Interface AVoIP Manager

AVoIP Manager is the Web-based Management Interface of the HX-143AVC controller unit. The administrator can use a PC connected to the same CONTROL NETWORK as the HX-143AVC controller to deploy the system. Please enter the factory default management interface login IP address (**https://192.168.1.200**) and log in using the factory default Administrator username (***admin***) and password (***adminpass***) as shown below. **[WARNING]: To ensure system security, after your first login with the factory default Administrator username and password, we highly recommend that you create a new Administrator username and password. Log in again with the new Administrator account and delete the default Administrator account. Please keep this information private and secure to prevent unauthorized access (refer to section 5.4.1 for user information changes).** After successfully logging into the control center interface, the user can select a preferred interface language (Traditional Chinese/English) from the <**language**> drop-down menu. The default interface language is English. The user can click on the ***AVoIP Manager*** icon in the upper-left corner of any page at any time to change the interface language, as shown below.

Figure 5-1 AVoIP Manager Interface Homepage>Language Selection

5.1 Main Menus

The drop-down Main Menus of the ***AVoIP Manager*** vary by different logged-in user roles, for example:

>> Administrator: [**Dashboard**], [**Devices**], [**Users**] and [**System**].

>> Super User: [**Dashboard**], [**Devices**], and [**System**].

>> Simple User: [**Dashboard**].

Select any of them to continue operation.

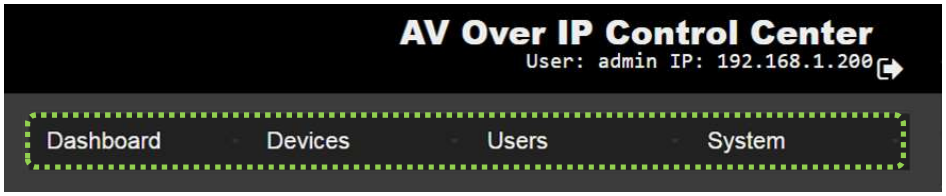


Figure 5-2 AVoIP Manager Interface Homepage > Main Menus

Submenus of each Main Menu

The submenus of each Main Menu are respectively as below:

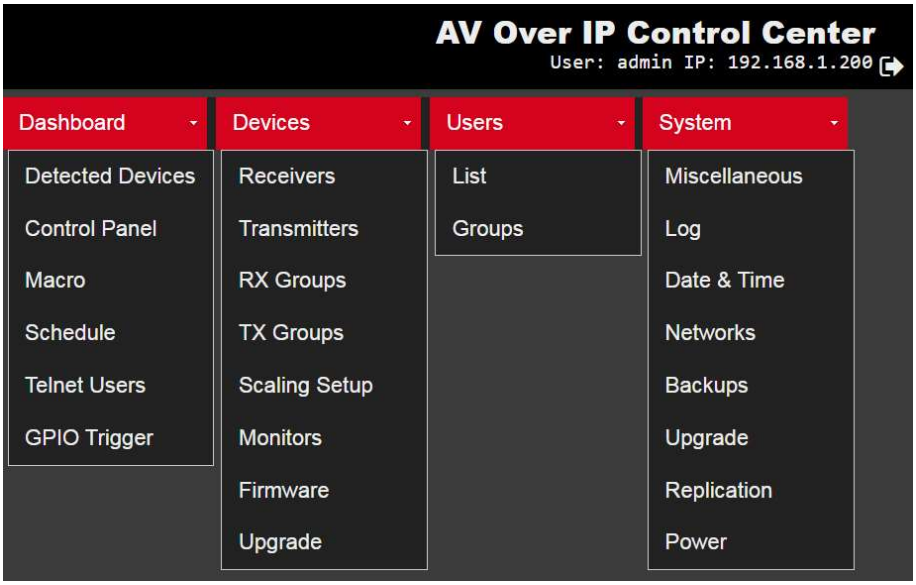


Figure 5-3 Submenus of each Main Menu

Logout Button

To exit the ***AVoIP Manager***, click the upper-right logout icon to enter the logout confirmation page.

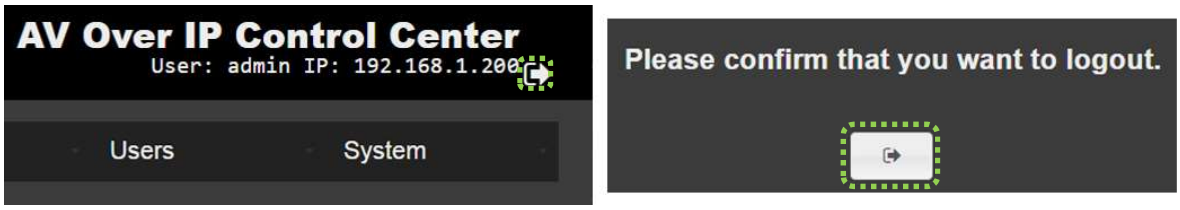


Figure 5-4 Logout Button and the Confirmation Page

Online <Help> Tab

After entering any functional pages <**Dashboard**>, <**Devices**>, <**Users**>, <**System**>, click the <**Help**> tab to read online instructions.

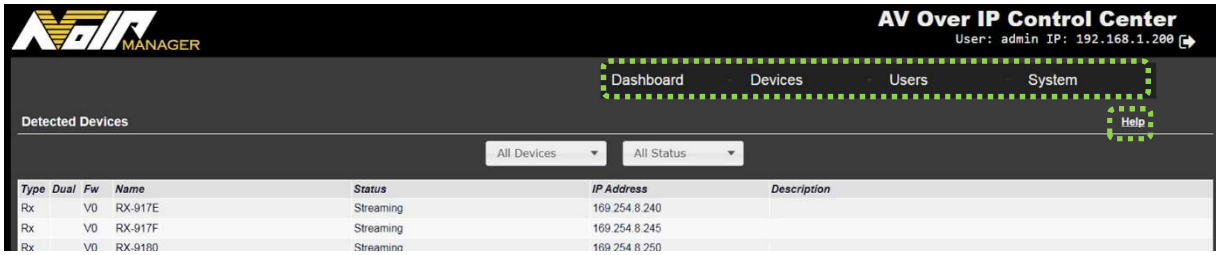


Figure 5-5 Main Menu and Online Help

Configuration Buttons

Configuration buttons are located at the bottom of each functional page. Hover the mouse cursor over these buttons, and their functional tooltips will display for your reference. Click any of them to open corresponding configuration windows.

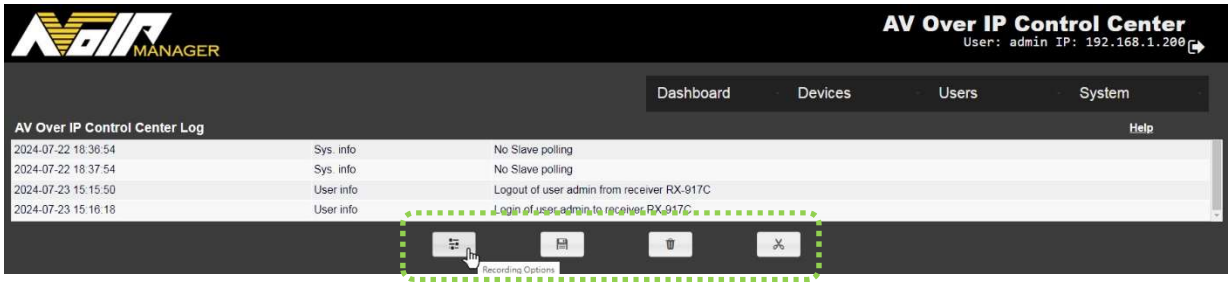


Figure 5-6 Configuration Buttons

5.2 Dashboard

Click the <**Dashboard**> drop-down menu at the top of the interface to access the following options: <**Detected Devices**>, <**Control Panel**>, <**Macro**>, <**Schedule**>, <**Telnet Users**>, and <**GPIO Trigger**>.

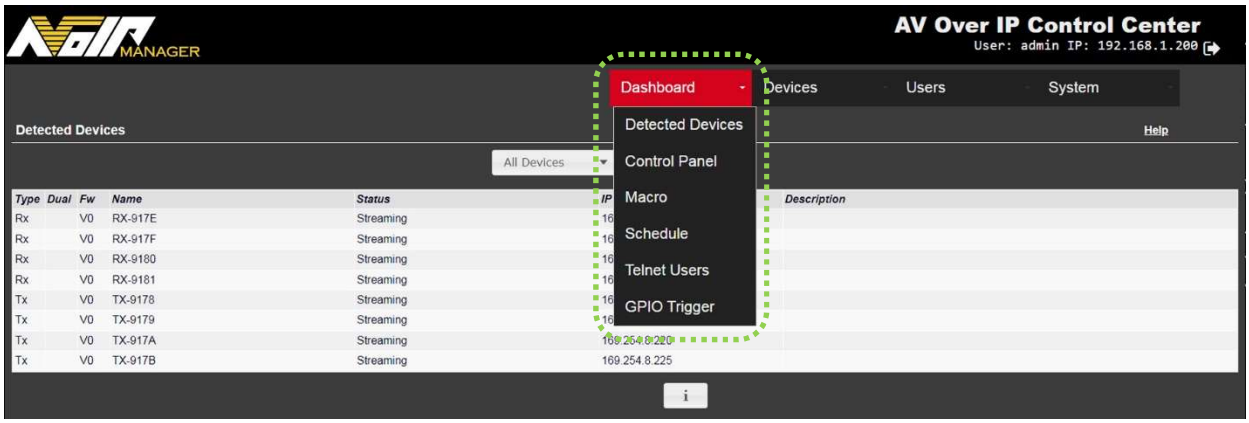


Figure 5-7 Main Menu>Dashboard

5.2.1 Detected Devices

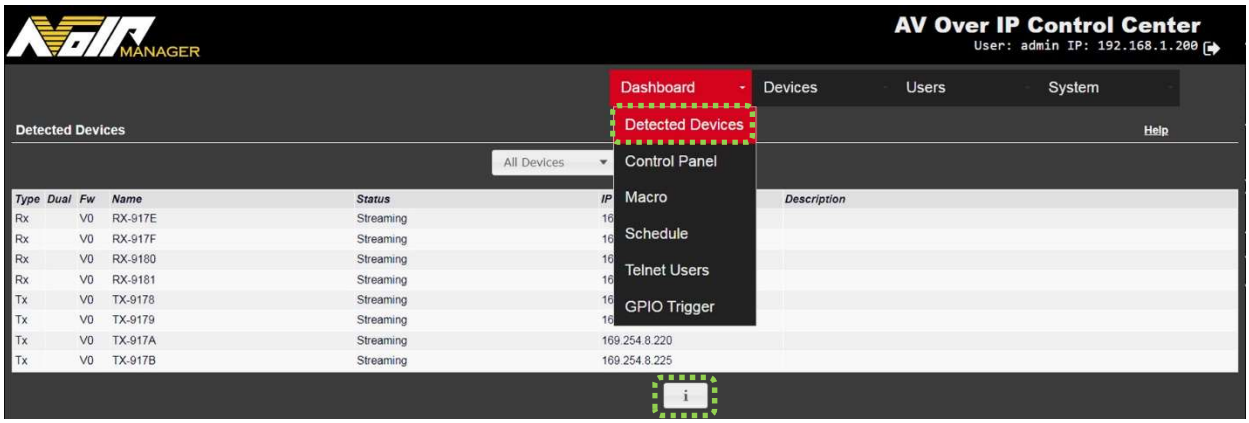


Figure 5-8 Main Menu>Dashboard>Detected Devices

The <**Detected Devices**> page lists all A/V over IP extender devices (receiver units and transmitter units) that the HX-143AVC can manage over the AV NETWORK. Extender devices connected to the same AV NETWORK as the HX-143AVC will be automatically registered in the HX-143AVC database.

Get Global Information of all devices:

As no device is selected, click the <**Global Information**> button i to get global information of all devices.

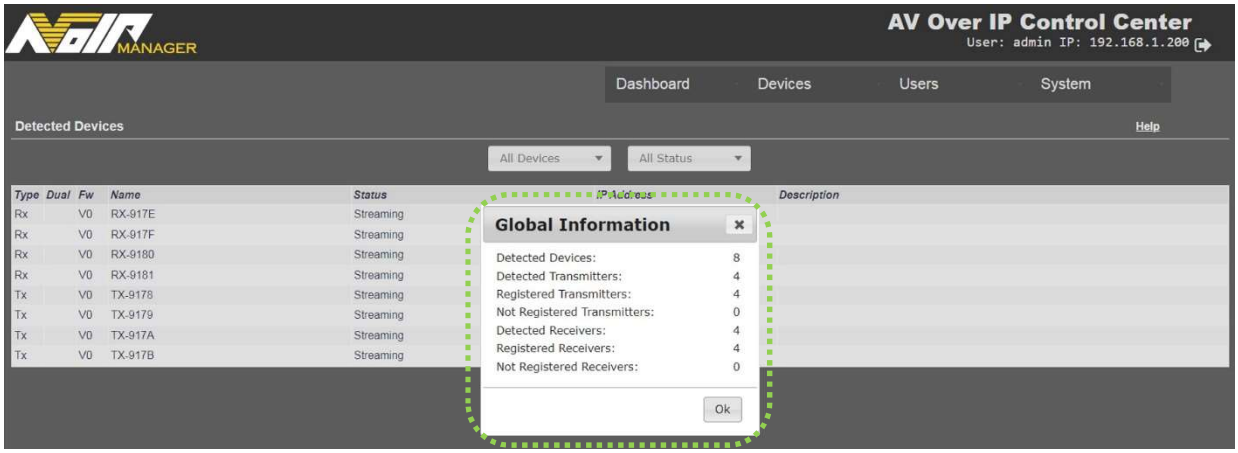


Figure 5-9 Main Menu>Dashboard>Detected Devices>Global Information

Get Device Information of a Specific Device

Click the <**Device Information**> button to get a specific device information.

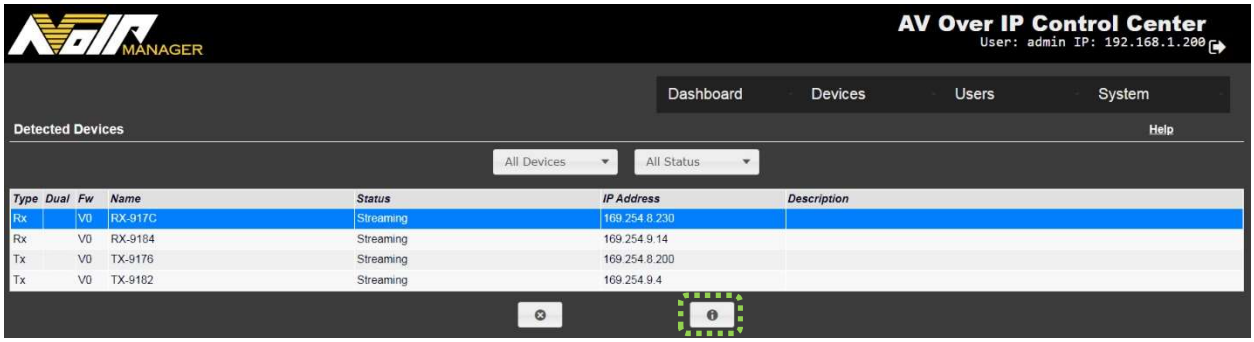


Figure 5-10 Main Menu>Dashboard>Detected Devices>Device Information

Figure 5-11 Main Menu>Dashboard>Detected Devices>Device Information

Cancel managing a device when it has been removed from the AV NETWORK

The device list on this page displays every extender unit that has been previously connected to the AV NETWORK. Even if an extender has been removed from the AV NETWORK, its record will remain in this device list. To delete this record after removing the extender unit (Status: Offline), select the device and click the <**unregister**> button. When you need to add the extender unit back to the AV NETWORK, simply reconnect its power supply and network cable, and it will be automatically managed in the device list again.

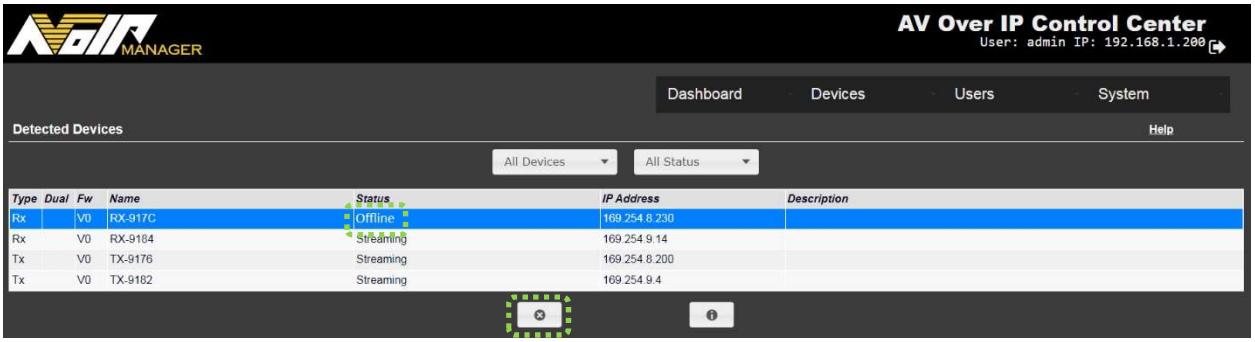


Figure 5-12 Main Menu>Dashboard>Detected Devices>Unregister

5.2.2 Control Panel

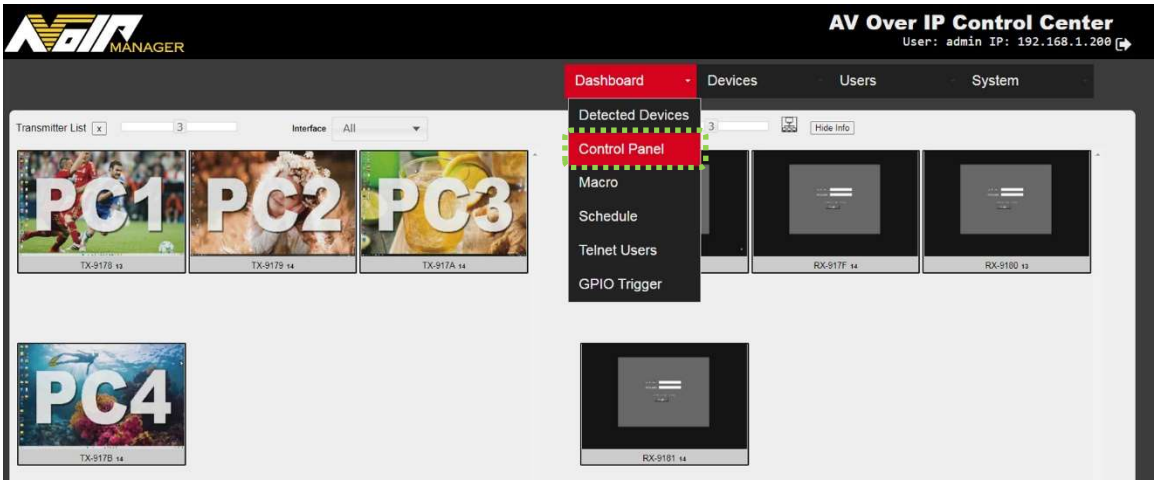


Figure 5-13 Main Menu>Dashboard>Control Panel

The <**Control Panel**> page provides a regular real-time preview of all transmitter and receiver units connected within the same AV NETWORK. Figure 5-13 shows that the receivers' OSD menus have not been logged in.

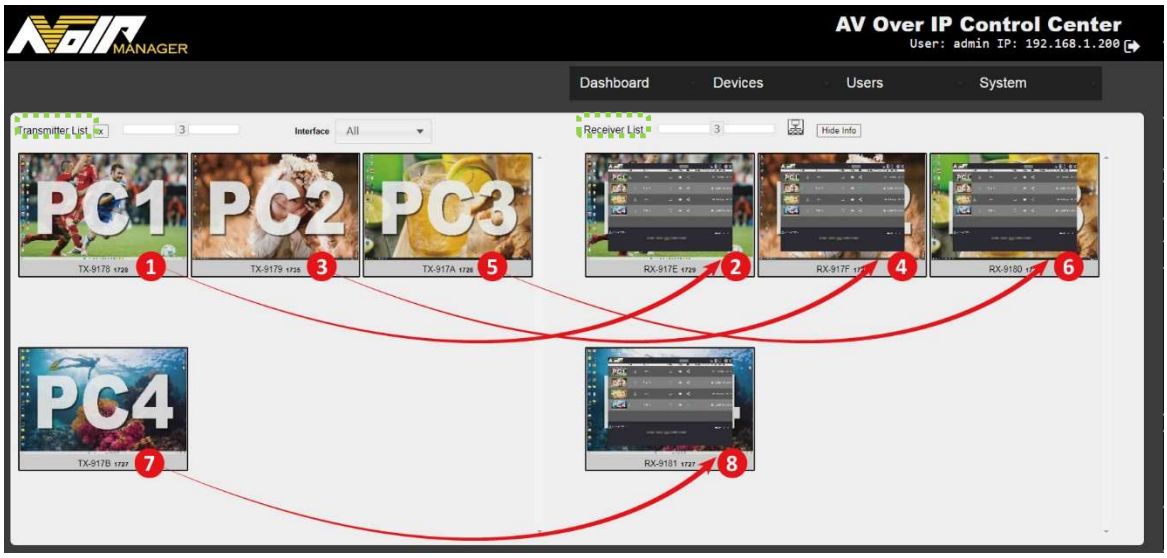


Figure 5-14 Main Menu>Dashboard>Control Panel>TX-to-RX Switching

Users can intuitively drag any transmitter unit thumbnail from the left and drop it onto any receiver unit thumbnail on the right, as illustrated from steps (**1**) through (**8**) of Figure 5-14. Figure 5-14 shows the receivers' OSD menus have been logged in.

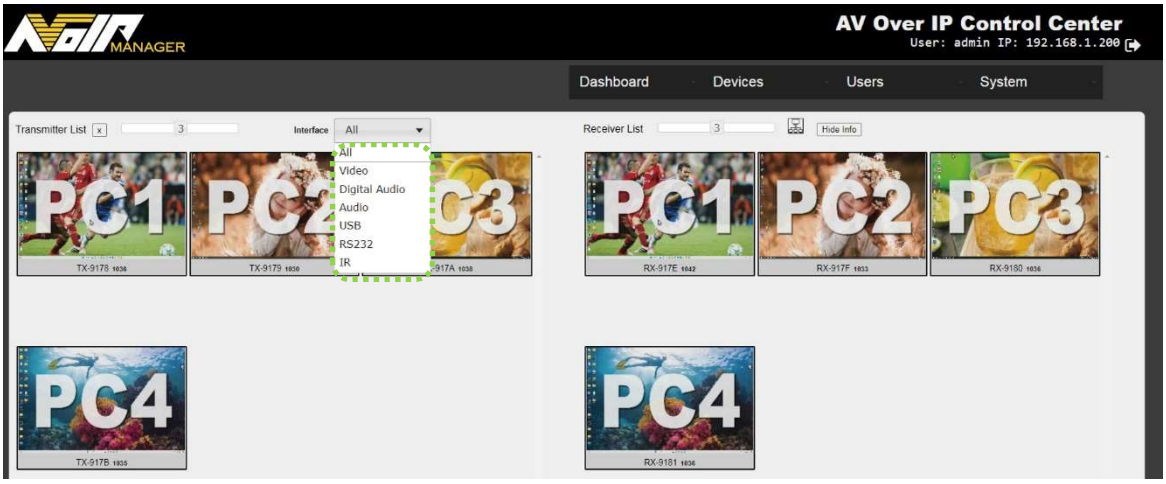


Figure 5-15 Main Menu>Dashboard>Control Panel>Interface Selection

Figure 5-15 shows that the receivers' OSD menus have been logged out or closed. The default behavior of the TX-to-RX switching operation includes Video, Digital Audio, Analog Audio, USB, RS232, and IR signals. However, users can also select a specific signal from the drop-down list in the Interface item to switch only the chosen signal during the TX-to-RX operation.

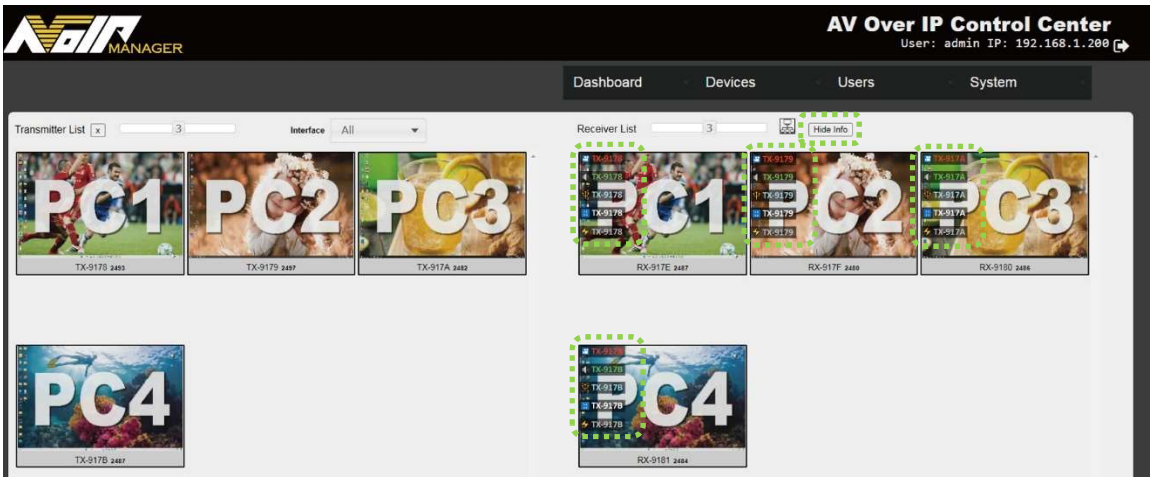


Figure 5-16 Main Menu>Dashboard>Control Panel>Hide Info

In the Receiver List on the right-hand side, click the <**Hide Info**> button Hide Info, and it will toggle hiding/displaying the Interface Information of the above TX-to-RX switching operation referred in the previous section. The displayed icons represent signals as follows: : Video / : Audio / : USB / : RS232 / : IR.

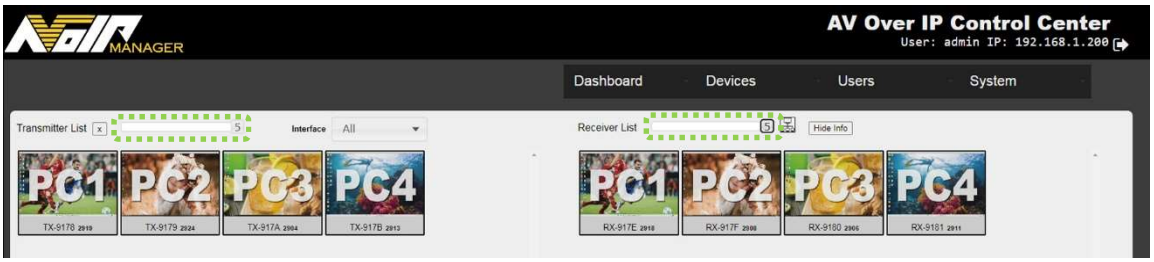


Figure 5-17 Main Menu>Dashboard>Control Panel>Thumbnail Number Adjustment

Users can adjust the bars at the top of the transmitter list and the receiver list to adjust the number and size of the video thumbnails.

5.2.3 Macro

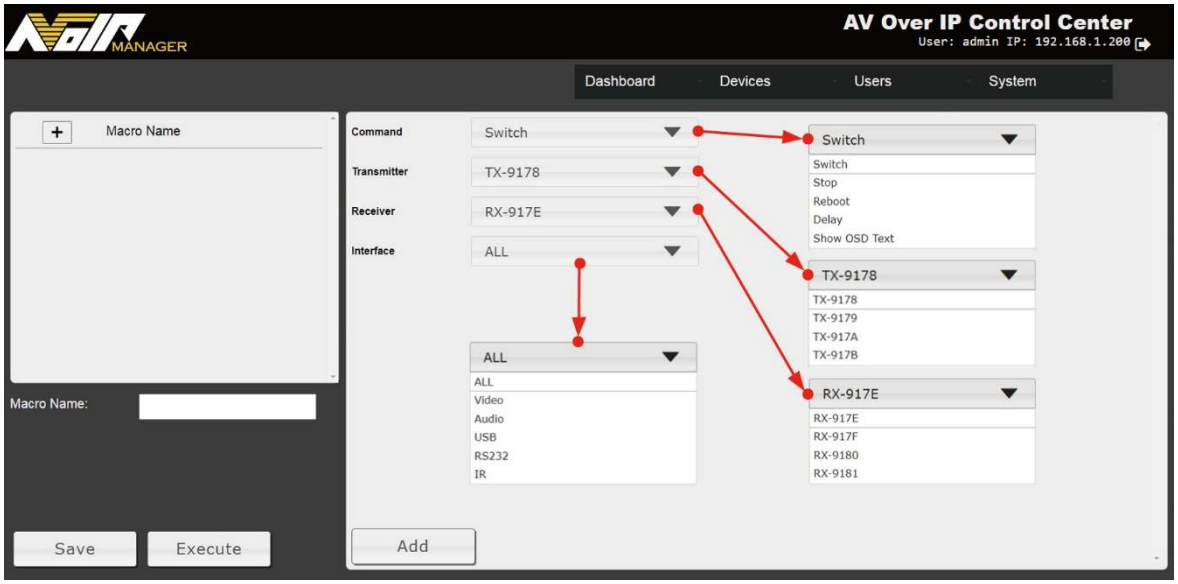


Figure 5-18 Main Menu>Dashboard>Macro

The <**Macro**> page allows users to arrange a series of unit operations such as [**Switch**], [**Stop**], [**Reboot**], [**Delay**], or [**Show OSD Text**].

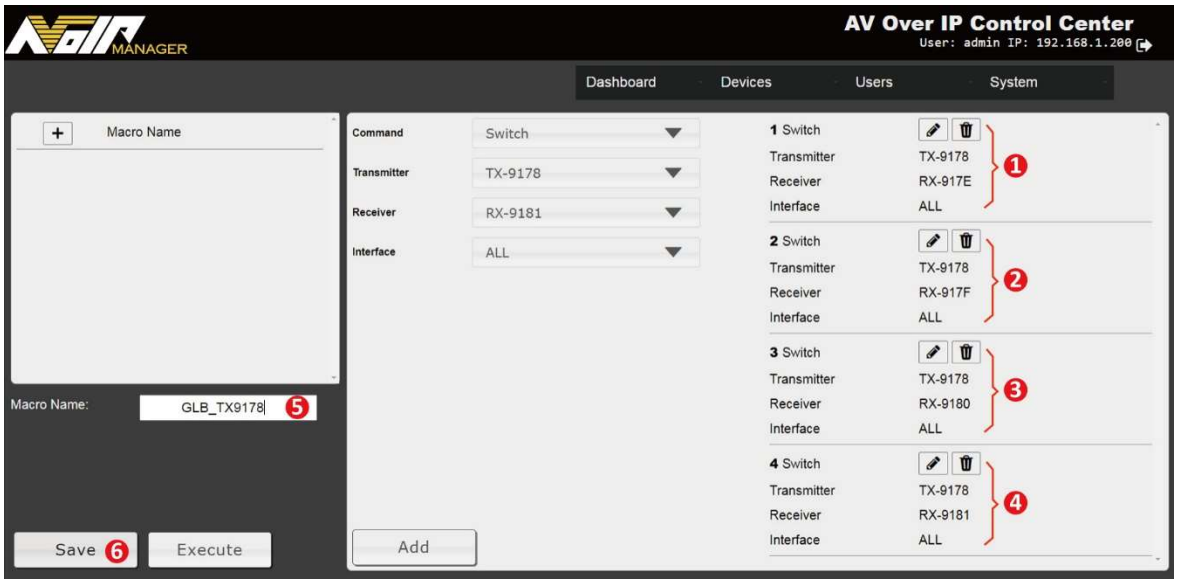


Figure 5-19 Main Menu>Dashboard>Macro Setup

As all unit operations have been set up (steps 1~4), enter a Macro name (step 5), and click the <**Save**> button to store it for later use.

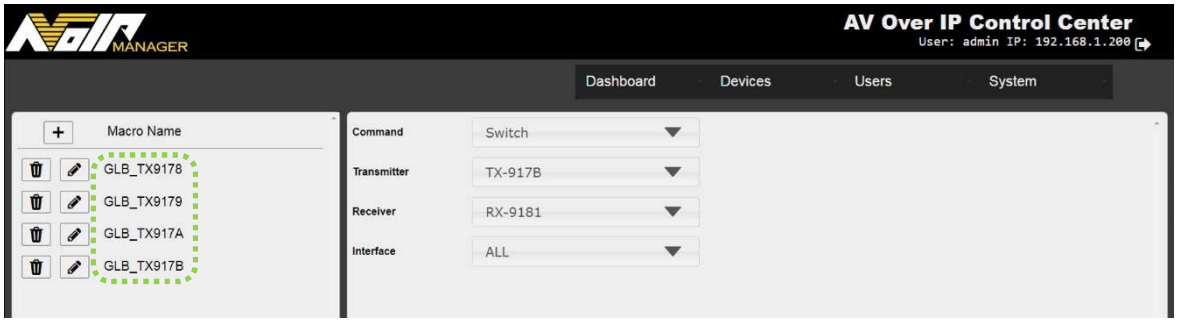


Figure 5-20 Main Menu>Dashboard>Created Macros

In Figure 5-20, Macros **GLB_TX9178 ~ GLB_TX917B** have been created by repeating similar steps as above mentioned.

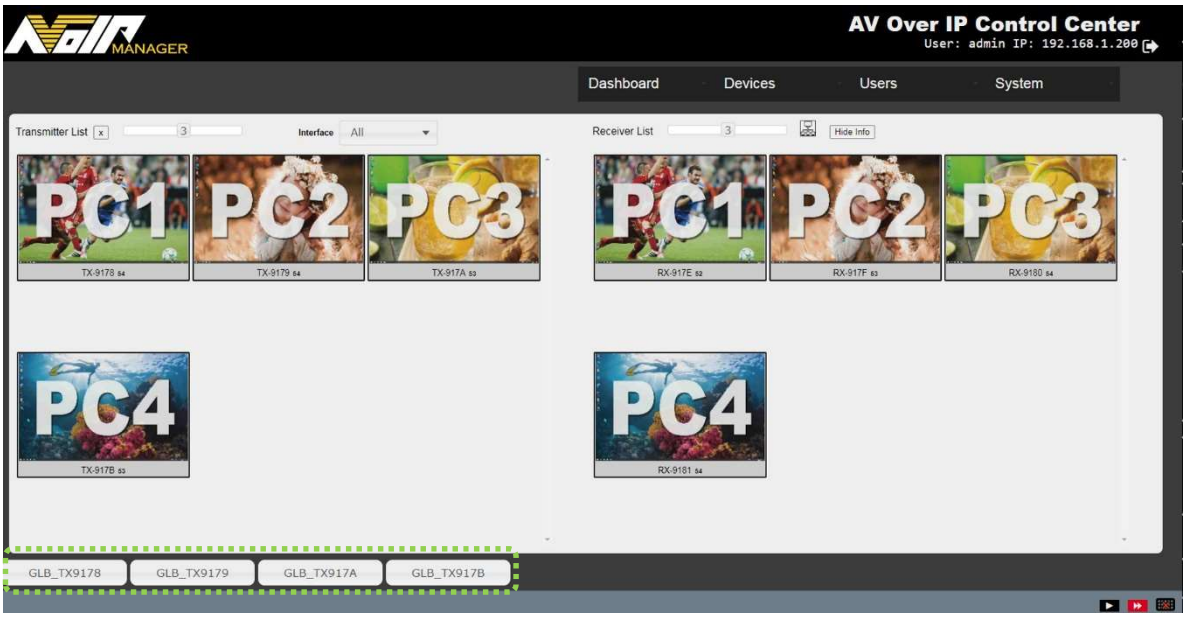


Figure 5-21 Main Menu>Dashboard>Created Macros

Then go to **Dashboard**>**Control Panel** as the following Figure 5-21 shows, the shortcuts of all Macros will be displayed at the bottom of the **Control Panel** page for easy one-click operation.

5.2.4 Schedule

The <**Schedule**> page allows users to execute any selected Macro at specified intervals that have been previously set.

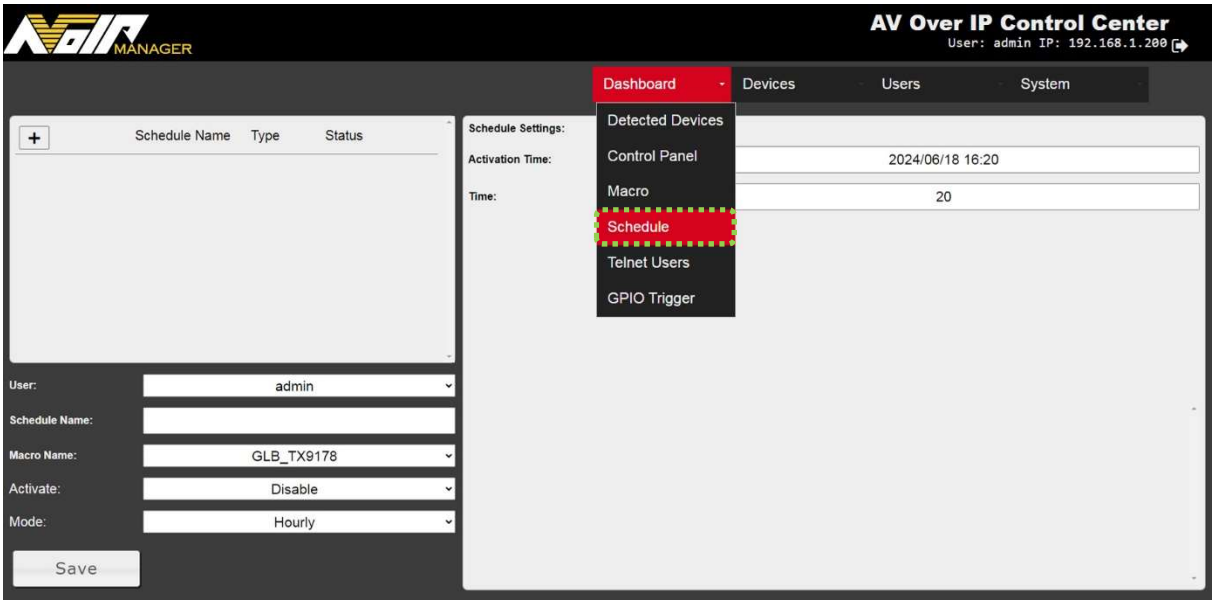


Figure 5-22 Main Menu>Dashboard>Schedule

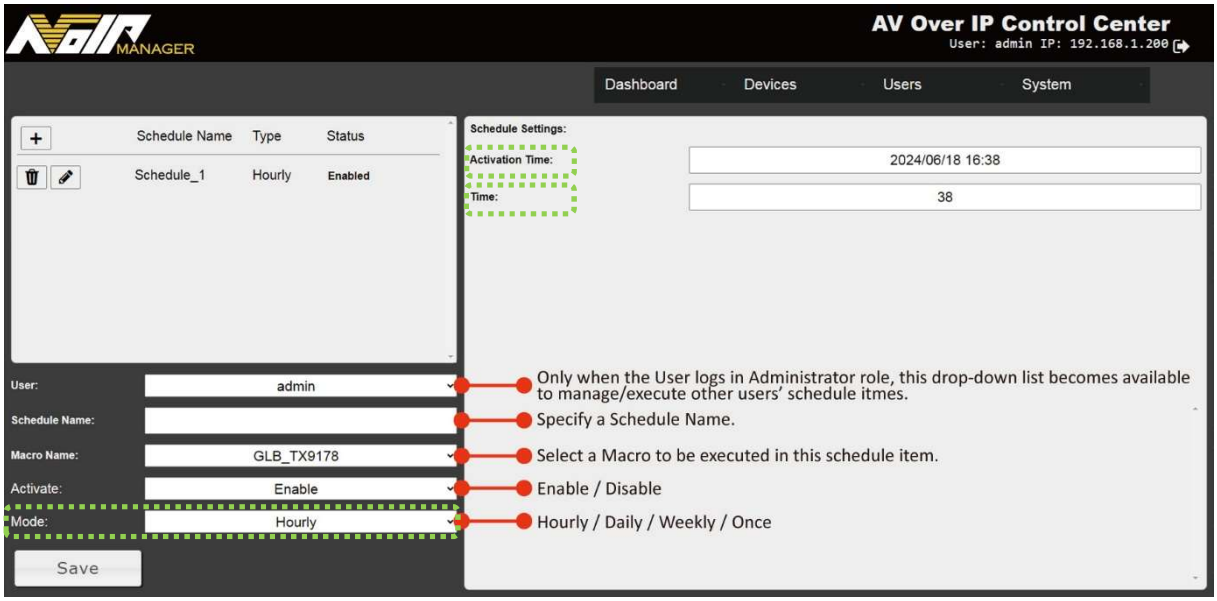


Figure 5-23 Main Menu>Dashboard>Schedule>Item Descriptions

The [**Mode**] item includes four frequency options: [**Hourly**] / [**Daily**] / [**Weekly**] / [**Once**]. The [**Activation Time**] item specifies when a specific schedule starts, provided the **Activate** option is enabled. The [**Time**] item denotes the exact time when the schedule is executed. Figure 5-24 shows examples for the four frequency options.

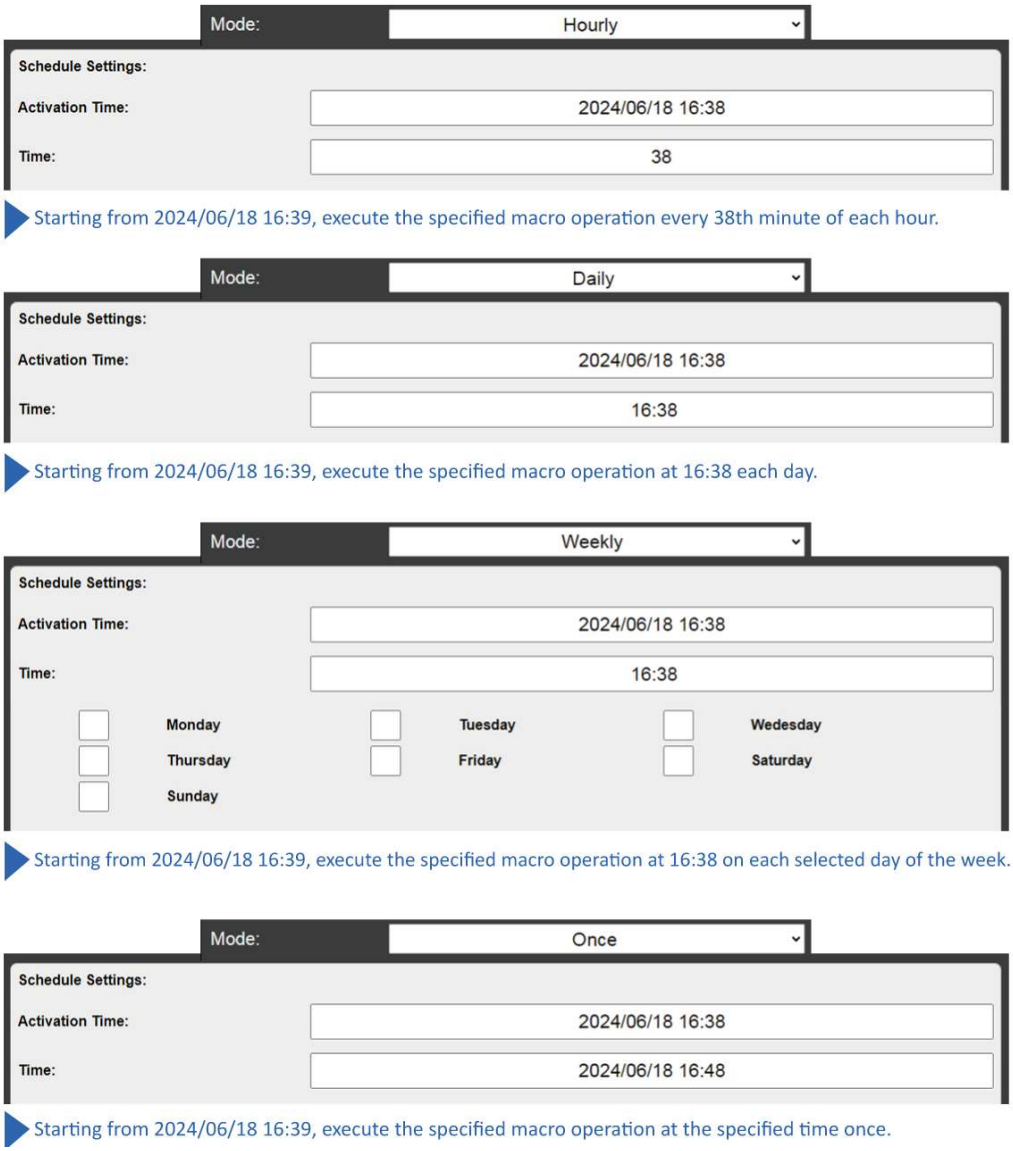


Figure 5-24 Main Menu>Dashboard>Schedule>Examples of each Mode

5.2.5 Telnet Users

The <**Telnet Users**> page allows users from different IP addresses to configure their own command sets. Each command set can include user-defined commands to execute Macro operations over IP. Follow steps (**1**) to (**10**) to create a command set named **COMDSET_1**, which includes the two commands **CMD1** and **CMD2**. As shown in Figure 5-27, when a PC running a telnet application, such as ***Terminals***, sends the command **CMD2** from its IP address **192.168.1.30** and port no. **10032**, the ***AVoIP Manager*** will execute the macro-operation **Macro_A** according to the records on the <**Telnet Users**> page.

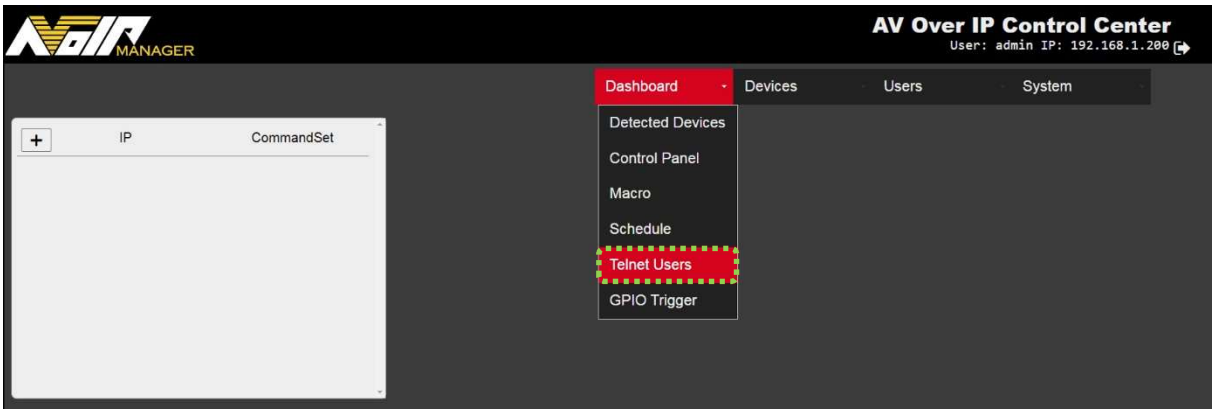


Figure 5-25 Main Menu>Dashboard>Telnet Users

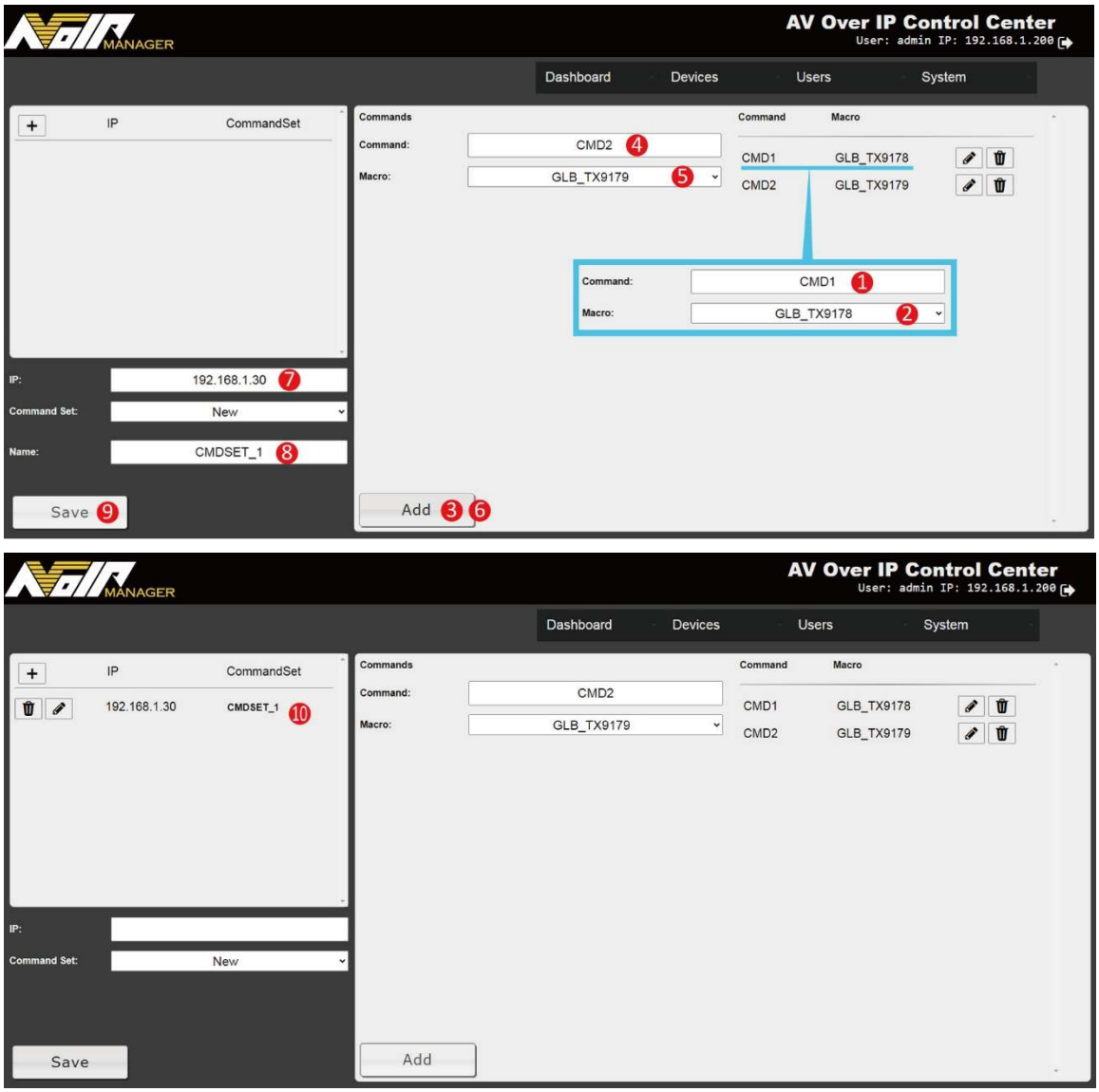


Figure 5-26 Main Menu>Dashboard>Telnet Command Set Configuration

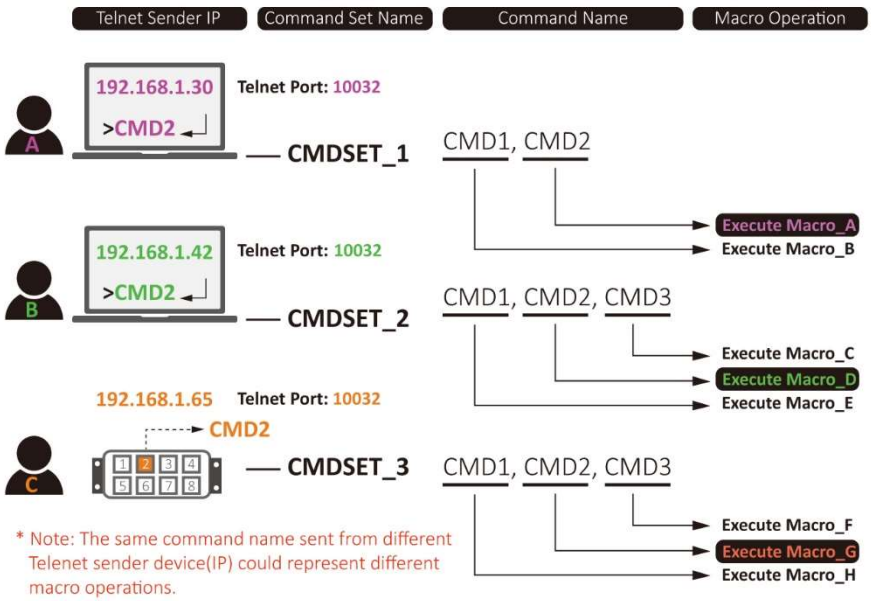


Figure 5-27 Main Menu>Dashboard>Telnet Command Set Configuration

Following RS-232 commands can not only be sent via the RS-232 connector of the HX-143AVC controller but also be sent via Telnet protocol. The telnet port number used to send RS-232 commands to the HX-143AVC controller is **20022**.

No.	RS-232 Command Name	Description	Command Format
1	getrx	Get Receivers list	**getrx** ↵
2	getrg	Get Receivers group list	**getrg** ↵
3	gettx	Get Transmitter list	**gettx** ↵
4	getmacro	Get macro list	**getmacro** ↵
5	runmacro	Run macro	**runmacro** <**MACRO_ID**> ↵
6	getipinfo	Get network settings	**getipinfo 0** ↵ (display **CONTROL NETWORK** IP settings) **getipinfo 1** ↵ (display **AV NETWORK** IP settings)
7	swvideo	Switch video	**swvideo** <**TX_ORDER_ID**> <**RX_ORDER_ID**> ↵
8	swaudio	Switch audio	**swaudio** <**TX_ORDER_ID**> <**RX_ORDER_ID**> ↵
9	swaudiod	Switch digital audio	**swaudiod** <**TX_ORDER_ID**> <**RX_ORDER_ID**> ↵
10	swusb	Switch USB	**swusb** <**TX_ORDER_ID**> <**RX_ORDER_ID**> ↵
11	swrs232	Switch RS232	**swrs232** <**TX_ORDER_ID**> <**RX_ORDER_ID**> ↵
12	swir	Switch IR	**swir** <**TX_ORDER_ID**> <**RX_ORDER_ID**> ↵
13	swall	Switch all interfaces	**swall** <**TX_ORDER_ID**> <**RX_ORDER_ID**> ↵
14	swvgrp	Switch video group	**swvgrp** <**TX_ORDER_ID**> <**RX_GROUP_ORDER_ID**> ↵
15	swagrp	Switch audio group	**swagrp** <**TX_ORDER_ID**> <**RX_GROUP_ORDER_ID**> ↵
16	swugrp	Switch USB group	**swugrp** <**TX_ORDER_ID**> <**RX_GROUP_ORDER_ID**> ↵
17	swsgrp	Switch RS232 group	**swsgrp** <**TX_ORDER_ID**> <**RX_GROUP_ORDER_ID**> ↵
18	swrgrp	Switch IR group	**swrgrp** <**TX_ORDER_ID**> <**RX_GROUP_ORDER_ID**> ↵
19	swallgrp	Switch all interfaces group	**swallgrp** <**TX_ORDER_ID**> <**RX_GROUP_ORDER_ID**> ↵
20	help	List all RS-232 commands	

5.2.6 GPIO Trigger

The <**GPIO Trigger**> page allows users to configure which Macro operation will be executed when the HX-143AVC's external phoenix connector **TRIGGER IN** receives a high-level (e.g., 5V) trigger signal from any of its 8 input terminals. Figure 5-29 shows the configuration of four Macro operations for input terminal 1 of the HX-143AVC's external phoenix connector **TRIGGER IN**.

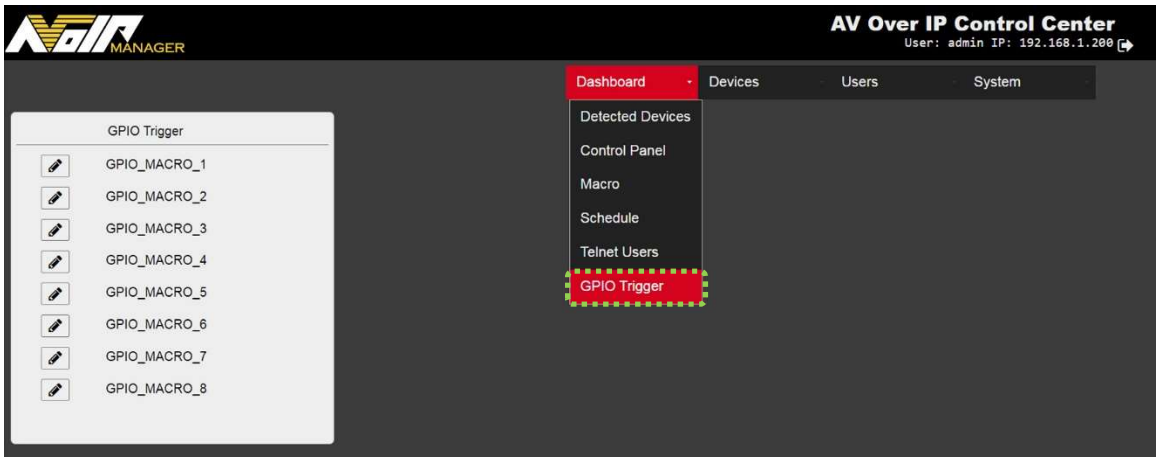


Figure 5-28 Main Menu>Dashboard>GPIO Trigger

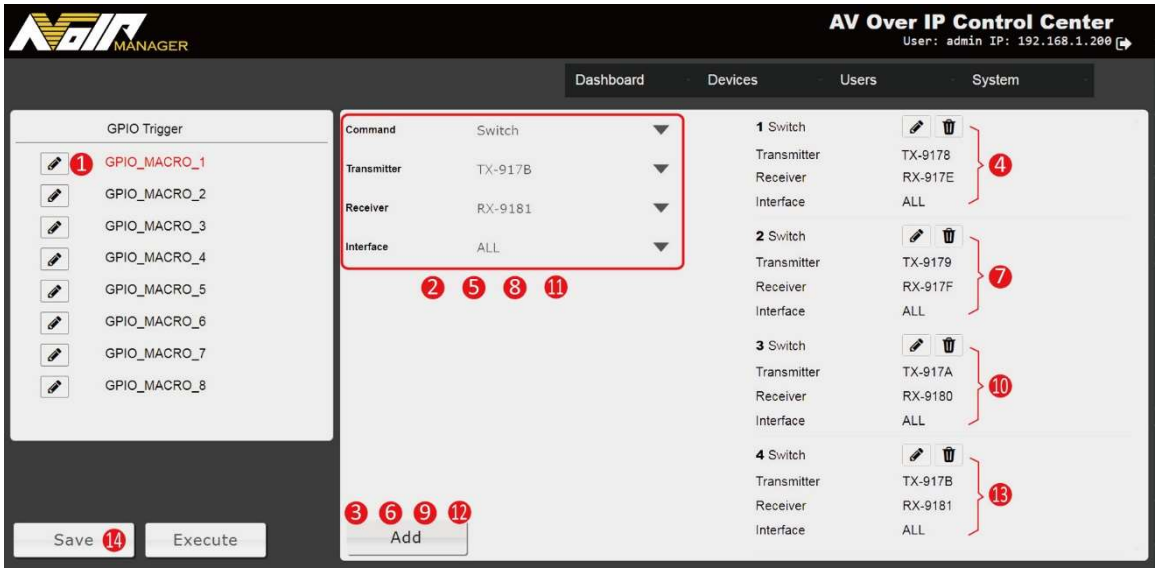


Figure 5-29 Main Menu>Dashboard>GPIO Trigger

The eight pushbuttons of the optional IR Remote Control can function the same as the eight trigger terminals **1**/**2**/**3**/**4**/**5**/**6**/**7**/**8** of the **TRIGGER IN** Phoenix connector on the rear panel of the HX-143AVC controller. To trigger any of the eight trigger terminals, short circuit it to the **5V** terminal of the **TRIGGER IN** phoenix connector.

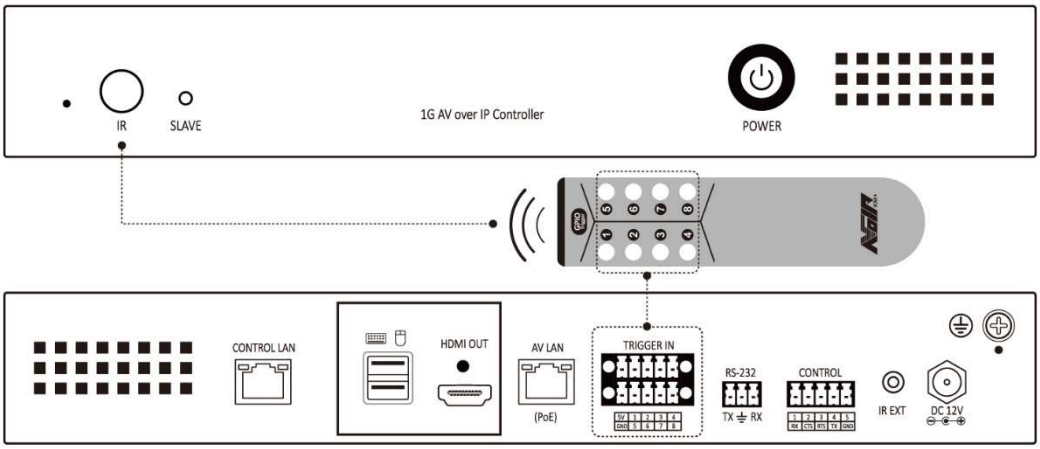


Figure 5-30 Main Menu>Dashboard>GPIO Trigger

5.3 Devices

Click the <**Devices**> drop-down menu at the top of the interface to access the following options: <**Receivers**>, <**Transmitters**>, <**RX Groups**>, <**TX Groups**>, <**Scaling Setup**>, <**Monitors**>, <**Firmware**>, and <**Upgrade**>.

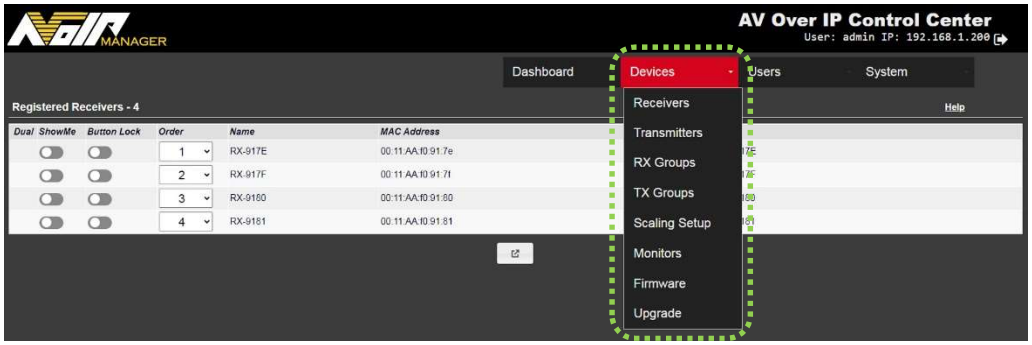


Figure 5-31 Main Menu>Devices

5.3.1 Receivers

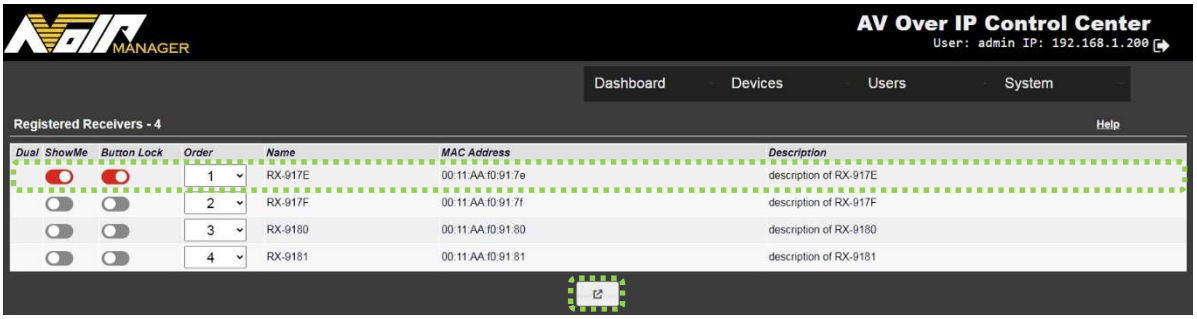


Figure 5-32 Devices>Receivers

The <**Receivers**> page lists all HX-143R receivers in an AV NETWORK that the controller HX-143AVC is also connected to. Each row corresponds to a receiver, displaying its Name, MAC Address, and Description. The <**ShowMe**> toggle button is used to display or hide the selected receiver's name on the monitor it is connected to and flash its panel LED indicators to identify the receiver's location. The <**Button Lock**> toggle button is used to disable or enable the receiver's physical panel pushbuttons. The <**Order**> drop-down list is used to arrange the sequence of the receivers according to the user's preference.

*Note: The [**Order**] column corresponds to the **RX_ORDER_ID** that is used in the RS232 commands.

Global Actions

When no receiver is selected the <**Global Actions**> button will be available. Click it to open <**Global Receiver Settings**> window to set up all listed receivers simultaneously.

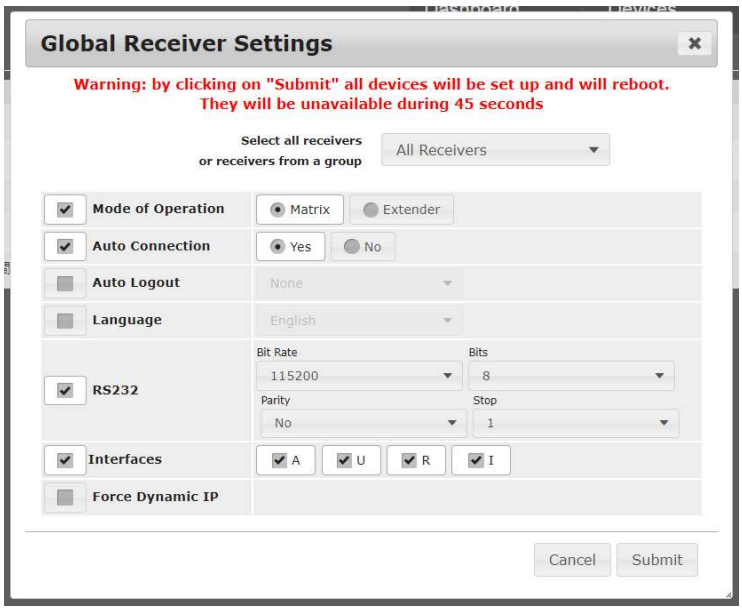


Figure 5-33 Devices>Receivers>Global Receiver Settings

Set up a Single Receiver

Select a specific receiver. Click the <**Set up Receiver**> button to set up its parameters. In the [**General**] tab, the [**Auto Login**] option enables the configured RX unit to automatically log in its OSD menu with the assigned user account.

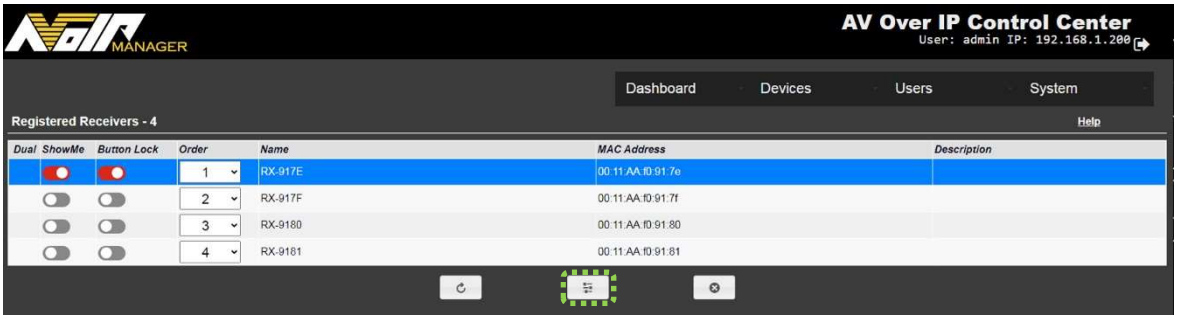


Figure 5-34 Devices>Receivers>Set up a Specific Receiver

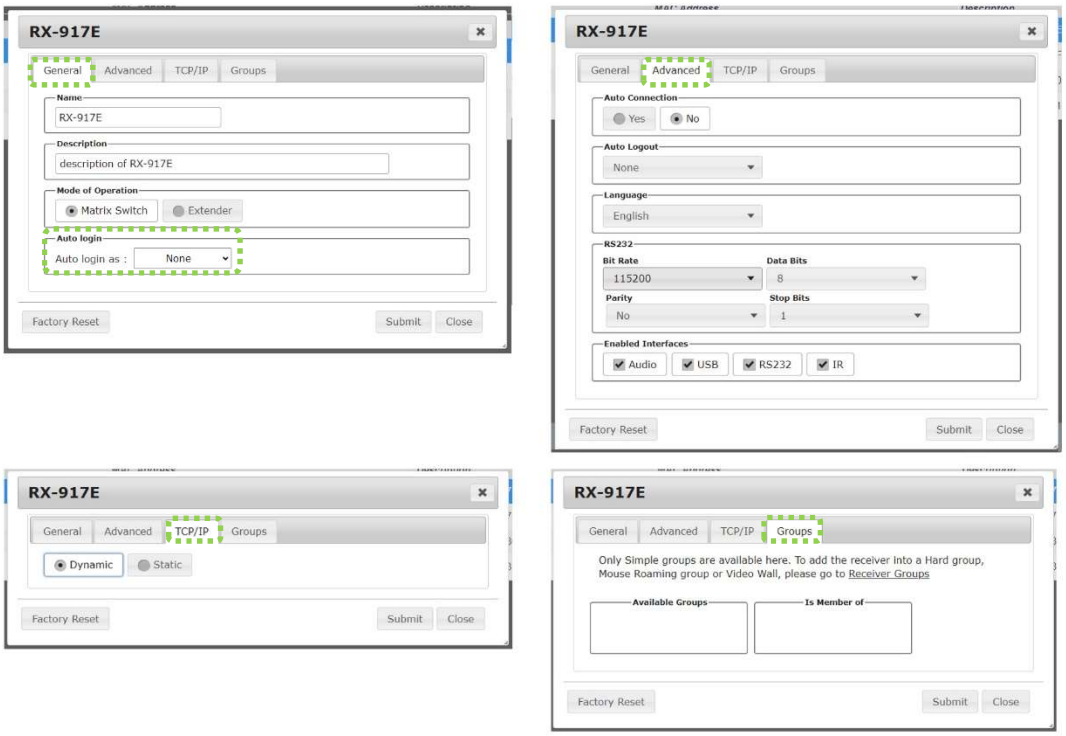


Figure 5-35 Devices>Receivers>Set up a Specific Receiver

5.3.2 Transmitters

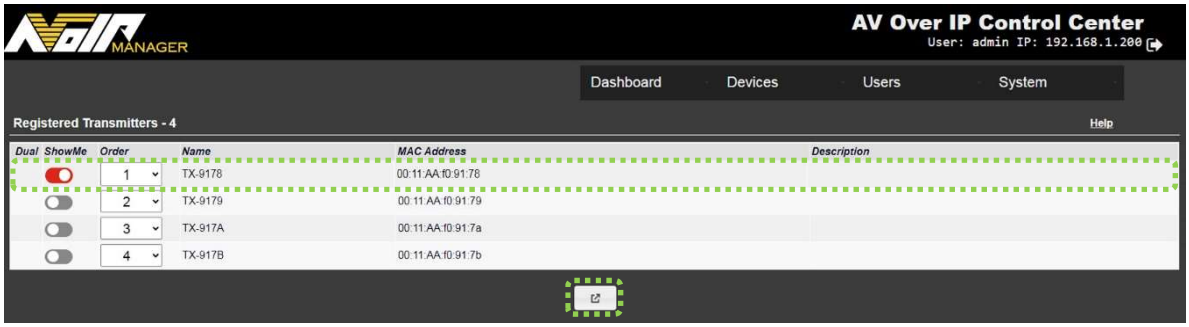


Figure 5-36 Devices>Transmitters

The <**Transmitters**> page lists all HX-143T transmitters in the AV NETWORK that the HX-143AVC controller is connected to. Each row corresponds to a transmitter, displaying its Name, MAC Address, and Description. The <**ShowMe**> toggle button is used to locate the selected transmitter by flashing its panel LED indicators. The <**Order**> drop-down list allows users to arrange the sequence of transmitters according to their preference.

*Note: The [Order] column corresponds to the **TX_ORDER_ID** that is used in the RS232 commands.

Global Actions

When no transmitter is selected the <**Global Actions**> button will be available. Click it to open <**Global Transmitter Settings**> window to set up all listed transmitters simultaneously.

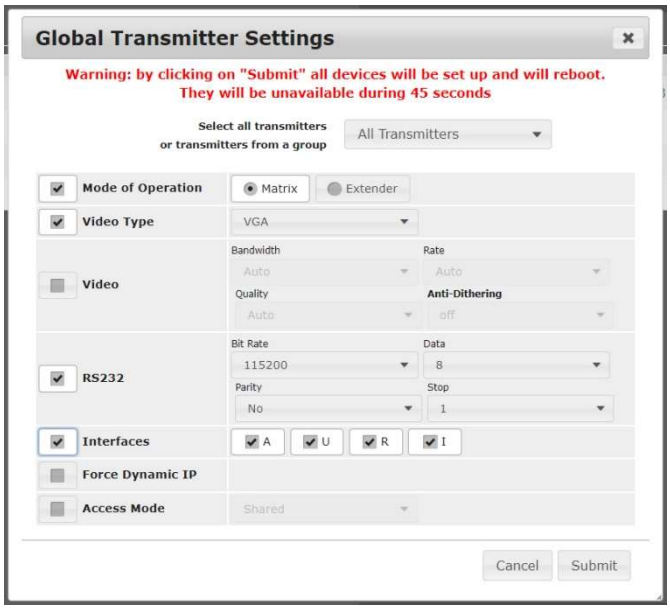


Figure 5-37 Devices>Transmitters>Global Transmitter Settings

Set up a Single Transmitter

Select a specific transmitter. Click the <**Set up Transmitter**> button to set up its parameters.

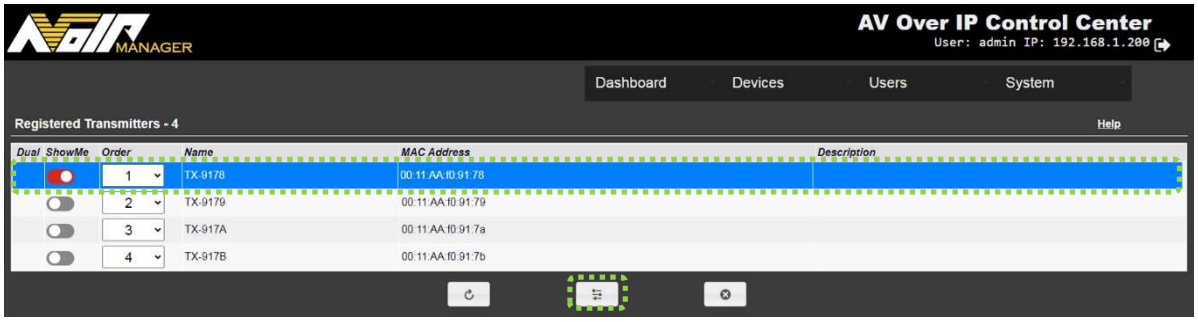


Figure 5-38 Devices>Transmitters>Set up a Specific Transmitter

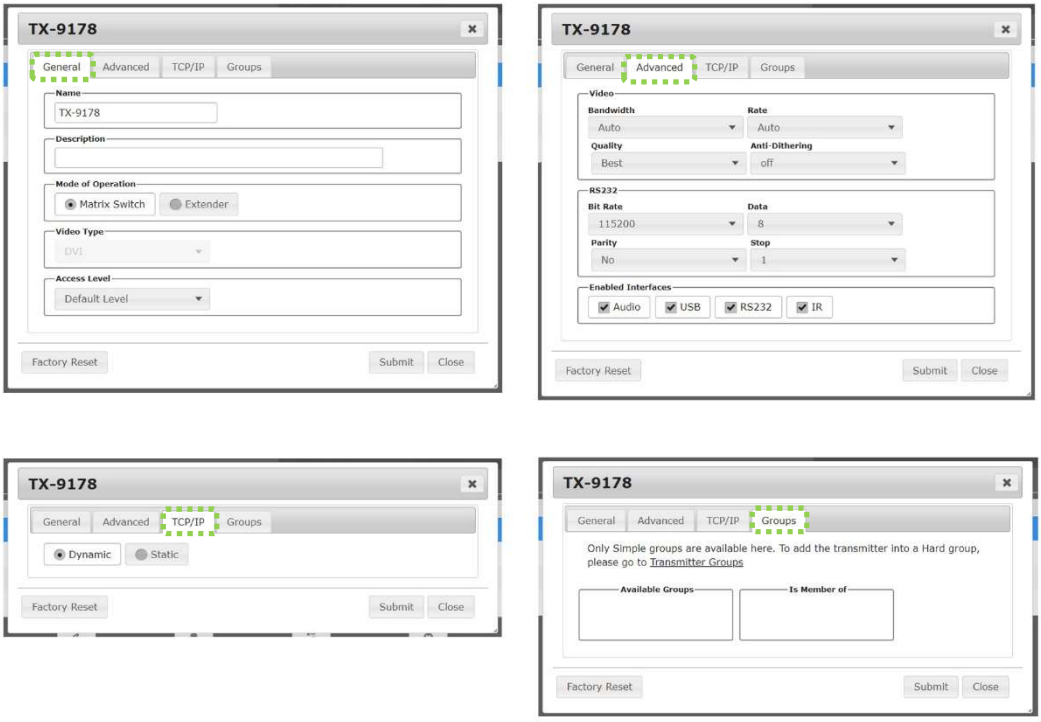


Figure 5-39 Devices>Transmitters>Set up Transmitter

Anti-Dithering

1. As there is any abnormal display on the monitor connected to the receiver, try to adjust the **Anti-dithering** parameter to **Mode 1** or **Mode 2** to fix the display issue.

2. As shown below, go to **Devices**>**Transmitters**, select the abnormal TX unit (such as TX-9178) and click the <**Set up Transmitter**> button . In the <**Advanced**> tab, set the **Anti-dithering** parameter to **Mode 1** or **Mode 2**, then click the <**Submit**> button.

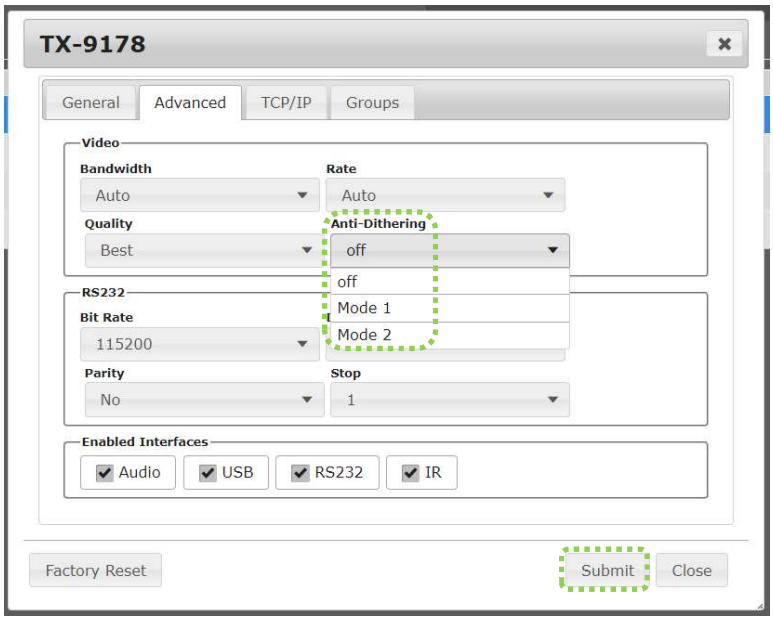


Figure 5-40 Anti-Dithering Configuration of a Transmitter

2. The selected transmitter (e.g., **TX-9178**) will reboot and should resume normal. If the video display is still abnormal, repeat the same process to apply the other **Anti-Dithering** mode.

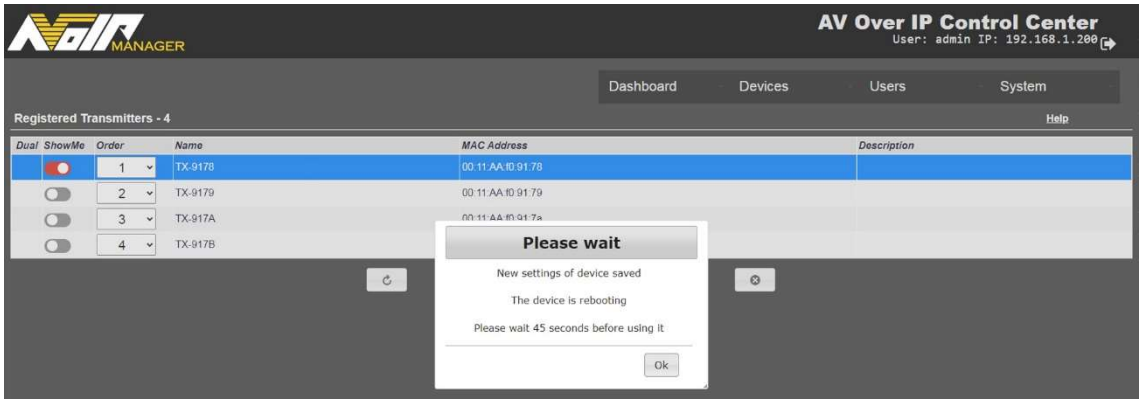


Figure 5-41 Reboot the Transmitter after changing Anti-Dithering Parameter

5.3.3 RX Groups

The <**RX Groups**> page lists all receiver groups in the HX-143AVC database. Each row corresponds to a receiver group showing its Name, Description, and Group Type.

Click the <**New Group**> button . The <**Group Type**> including <**Simple Group**>, <**Hard Group**>, <**Mouse Roaming**>, and <**Video Wall**>. Each of them will be briefly introduced as follows:

- <**Simple Group**>: Bind multiple receivers into a Simple Group. The system can have multiple Simple Groups, and a single receiver can belong to different Simple Groups as a member.
- <**Hard Group**>: Bind multiple receivers into a Hard Group. The system can have multiple Hard Groups, and a single receiver can belong to only one Hard Group as its member.
- <**Mouse Roaming (Group)**>: Bind multiple receivers into a Mouse Roaming Group to allow one set of keyboard and mouse connected to the master unit of the group to simultaneously control multiple computers or players across different screens.
- <**Video Wall (Group)**>: Bind multiple receivers into a Video Wall Group. You can use a mouse connected to any receiver in the video wall group to specify which transmitter video source the video wall should display through its OSD menu. The Video Wall Group can be configured in the ***AVoIP Manager*** of the HX-143AVC controller or through the web-based interface of each receiver.

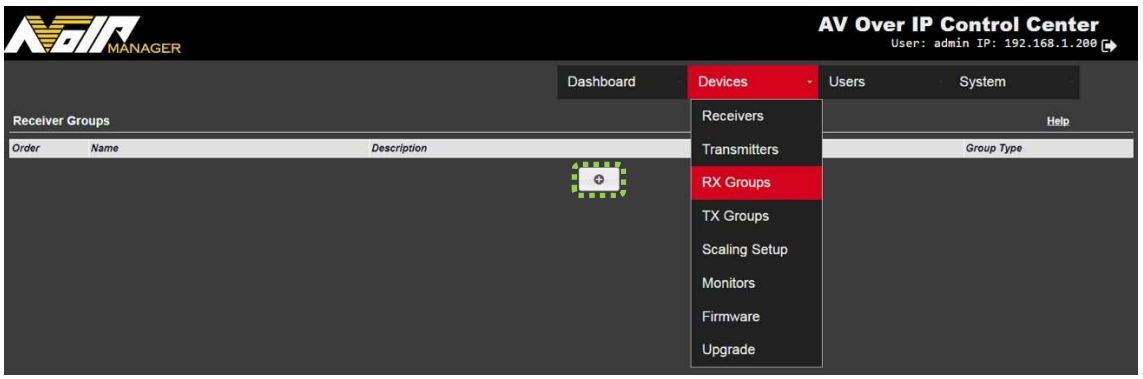


Figure 5-42 Devices>RX Groups

Figure 5-43 shows a configuration diagram that forms a basis for explaining the following sections: <**Simple Group**>, <**Hard Group**>, <**Mouse Roaming**>, and <**Video Wall**>. The exemplary system configuration includes 4 receivers (**RX-917E**/**RX-917F**/**RX-9180**/**RX-9181**) and 4 transmitters (**TX-9178**/**TX-9179**/**TX-917A**/**TX-917B**).

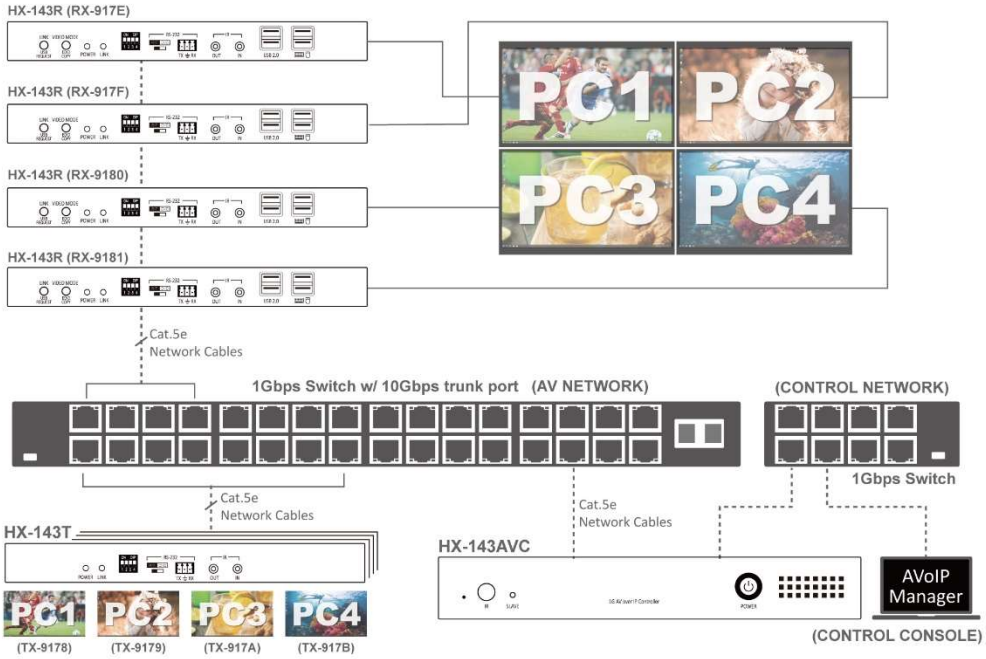


Figure 5-43 Devices>RX Groups>Exemplary System Configuration

(1) Simple Group

This example demonstrates how to create two sets of RX Simple Groups (**SG_RXA** and **SG_RXB**) and two sets of TX Simple Groups (**SG_TXA** and **SG_TXB**).

a. Go to **Devices**>**RX Groups**; click the <**New Group**> button ; select <**Simple Group**> in <**Group Type**> menu; enter the name **SG_RXA**; and then click the <**Submit**> button.

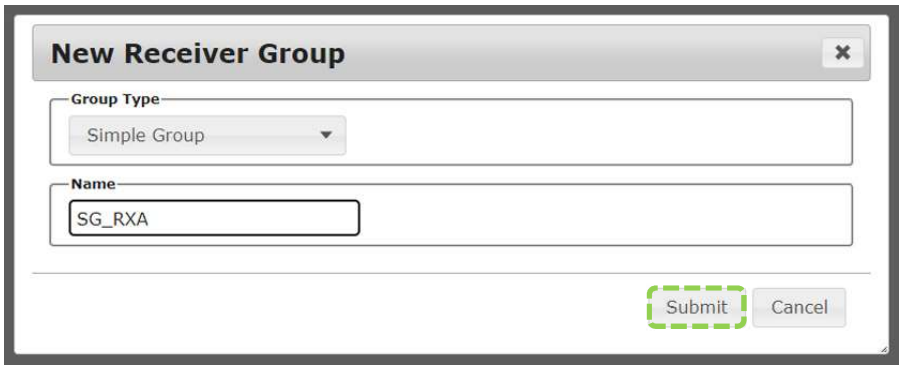


Figure 5-44 Create a First RX Simple Group

b. Select the **SG_RXA** item, click the <**Edit Group**> button . In the <**Receivers**> tab, drag **RX-917E**/**RX-917F**/**RX-9180** into the <**Group Members**> column, then click the <**Submit**> button. The three RX units **RX-917E**, **RX-917F**, and **RX-9180** are now assigned as members of the **SG_RXA** Simple Group.

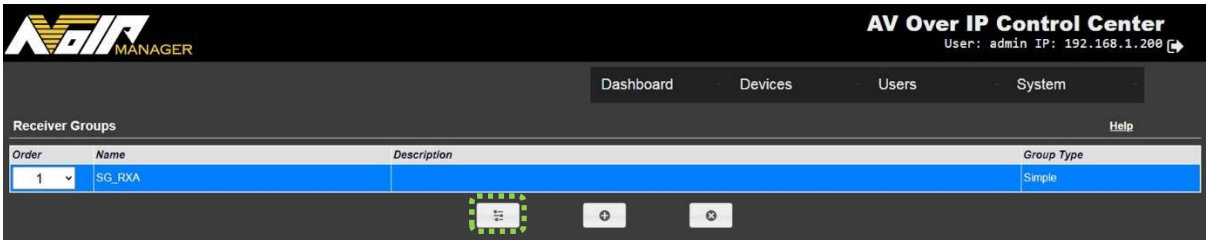


Figure 5-45 Configure the First RX Simple Group

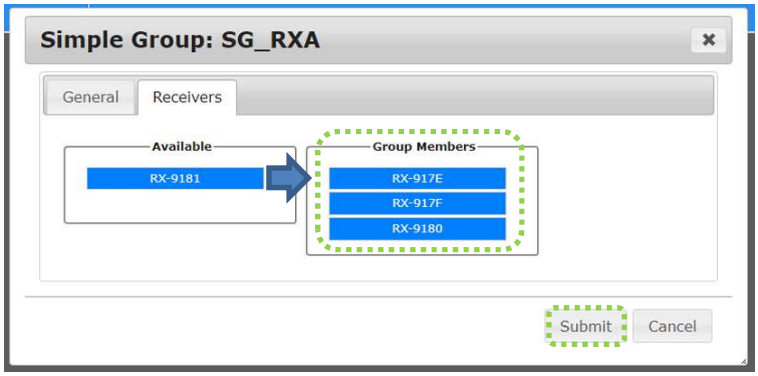


Figure 5-46 Configure the First RX Simple Group

d. Repeat the same process to create the second RX simple group **SG_RXB** which includes **RX-917F**, **RX-9180**, and **RX-9181** units.

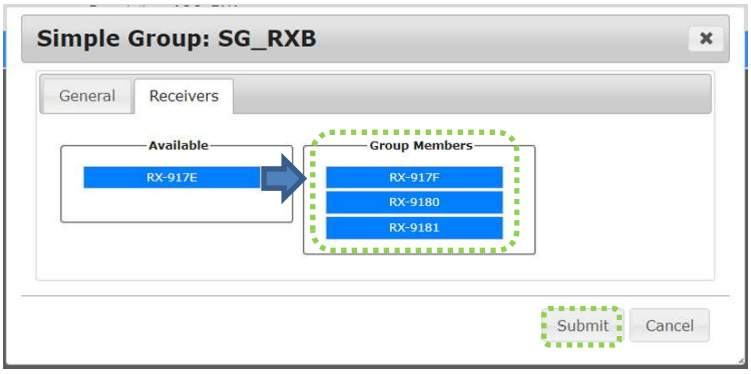


Figure 5-47 Configure a Second RX Simple Group

e. Go to **Devices**>**TX Groups**; click the <**New Group**> button ; select <**Simple Group**> in <**Group Type**> menu; enter the name **SG_TXA**; and then click the <**Submit**> button.

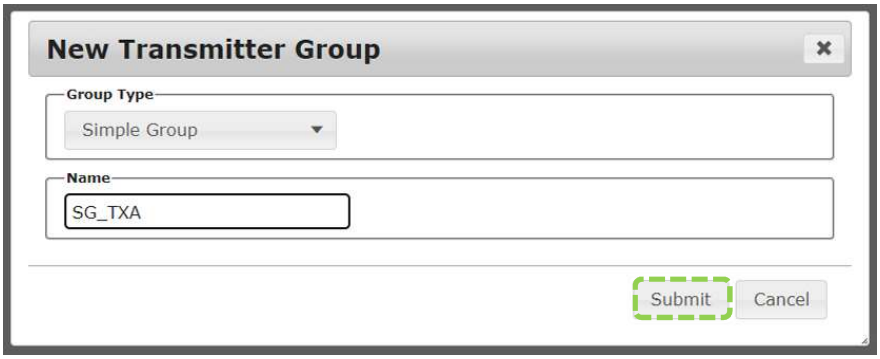


Figure 5-48 Create a first TX Simple Group

f. Select the **SG_TXA** item, click the <**Edit Group**> button . In the <**Transmitters**> tab, drag **TX-9178/TX-9179/TX-917A** into the <**Group Members**> column, then click the <**Submit**> button. The three RX units **TX-9178**, **TX-9179**, and **TX-917A** are now assigned as members of the **SG_TXA** Simple Group.

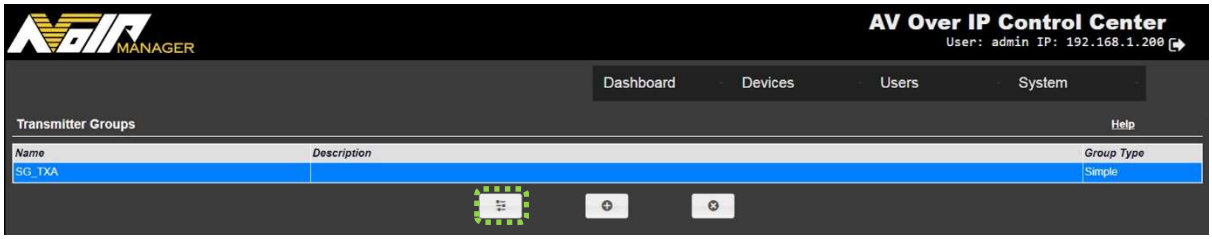


Figure 5-49 Configure the first TX Simple Group

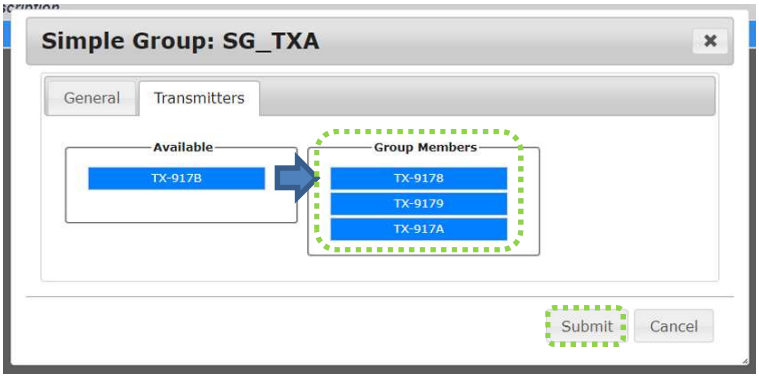


Figure 5-50 Configure the First TX Simple Group

g. Repeat the same process to create the second TX simple group **SG_TXB** which includes **TX-9179**, **TX-917A**, **TX-917B** units.

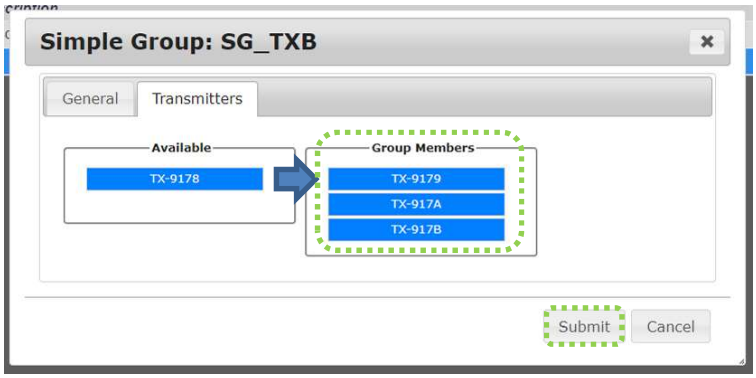


Figure 5-51 Configure a Second TX Simple Group

h. Please note that in the <**Simple Group**> setting, all the available RX and TX units can be assigned in different simple groups. (e.g., **RX-9180** and **TX-917A** in this example)

(2) Hard Group

This example demonstrates how to create two sets of RX Hard Groups (**HG_RXA** and **HG_RXB**) and two sets of TX Hard Groups (**HG_TXA** and **HG_TXB**).

a. Go to **Devices**>**RX Groups**; click the <**New Group**> button ; select <**Hard Group**> in <**Group Type**> menu; enter the name **HG_RXA**; and then click the <**Submit**> button.

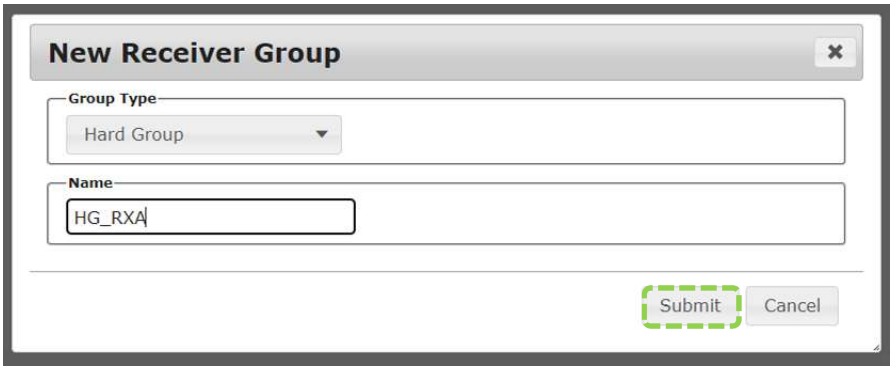


Figure 5-52 Create a First RX Hard Group

b. Select the **HG_RXA** item and click the <**Edit Group**> button . In the <**Receivers**> tab, drag **RX-917E** and **RX-917F** into the <**Group Members**> column, then click the <**Submit**> button. The two RX units, **RX-917E** and **RX-917F**, are now assigned as members of the **HG_RXA** Hard Group. **RX-917E** will be defined as the Master unit of this RX Hard Group, while **RX-917F** will be the Slave unit.

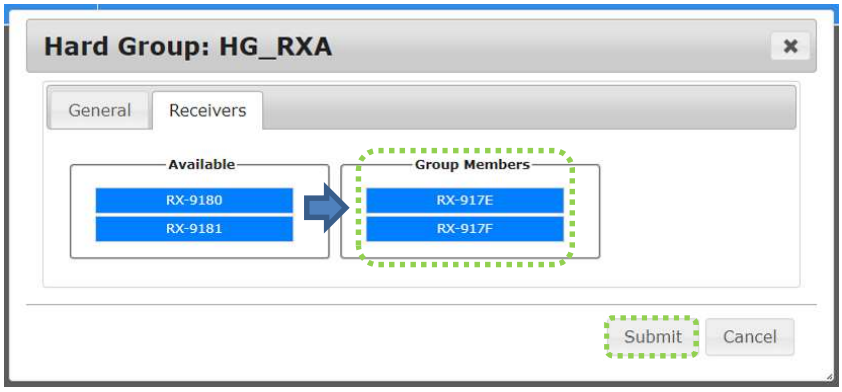


Figure 5-53 Configure the First RX Hard Group

d. Repeat the same process to create the second RX hard group **HG_RXB** which includes **RX-9180** and **RX-9181** units. **RX-9180** will be defined as the Master unit of this RX hard group. **RX-9181** will be the slave unit of this RX hard group.

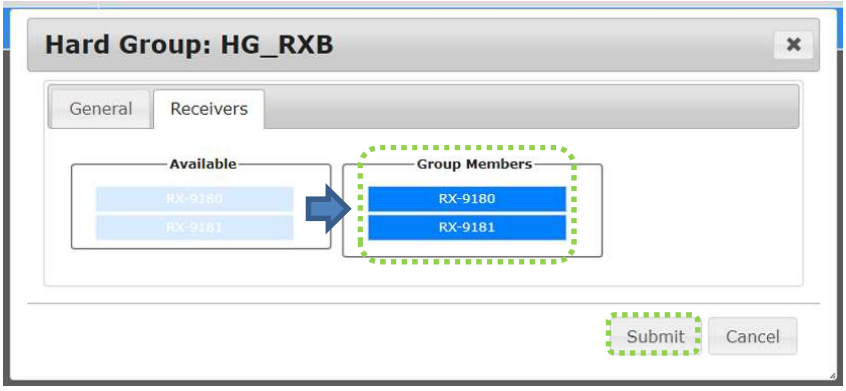


Figure 5-54 Configure the Second RX Hard Group

*Note: In the Hard Group setting, the system will only display available RX units that haven't been assigned yet. Unlike in the Simple Group setting, any RX unit can be assigned to different RX groups.

e. Go to **Devices**>**TX Groups**; click the <**New Group**> button ; select <**Hard Group**> in the <**Group Type**> menu; enter the name **HG_TXA**; and then click the <**Submit**> button.

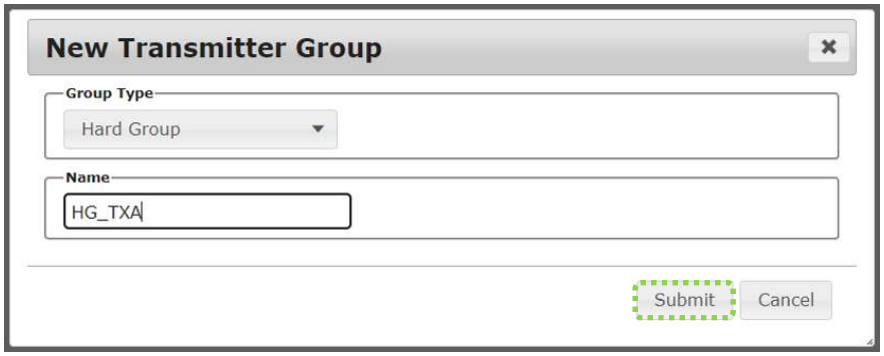


Figure 5-55 Create a First TX Hard Group

f. Select the **HG_TXA** item, click the <**Edit Group**> button . In the <**Transmitters**> tab, drag **TX-9178**/**TX-9179** into the <**Group Members**> column, then click the <**Submit**> button. Now those two RX units **TX-9178** and **TX-9179** have been assigned as members of the **HG_TXA** hard group. **TX-9178** will be defined as the Master unit of this TX hard group, while **TX-9179** will be the slave unit.

*Note: Hard Group function supports up to 8-TX-source to 8-RX-monitor switching at a time.

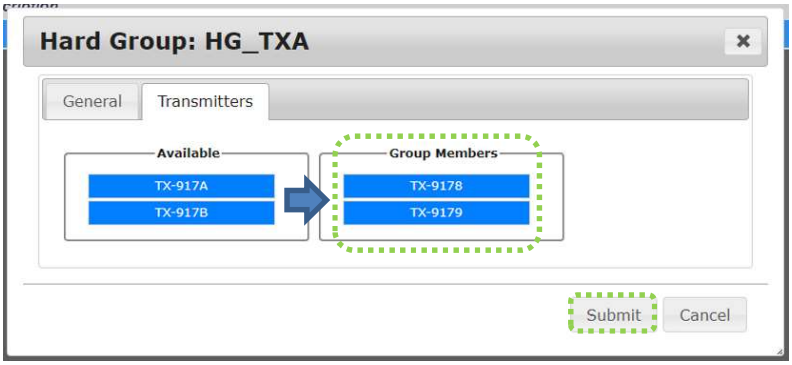


Figure 5-56 Configure the First TX Hard Group

g. Repeat the same process to create the second TX hard group **HG_TXB** which includes **TX-917A** and **TX-917B** units.

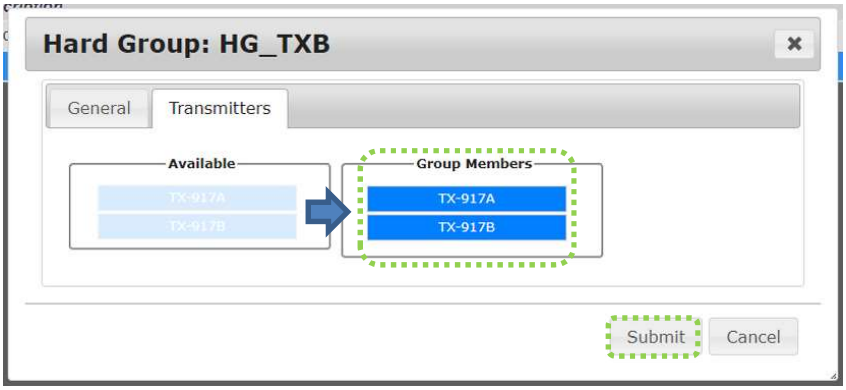


Figure 5-57 Configure the Second TX Hard Group

*Note: In the Hard Group setting, the system will only display available TX units that haven't been assigned yet. Unlike in the Simple Group setting, any TX unit can be assigned to different TX groups.

h. Input Administrator account information to log into the master receiver unit **RX-917E** of the RX hard group **HG_RXA** and the master receiver unit **RX-9180** of the RX hard group **HG_RXB**, respectively. In **RX-917E** unit's OSD menu, double clicking the Name of **HG_TXA** will connect the **RX-917E** unit to the **TX-9178** unit and connect the **RX-917F** unit to the **TX-9179** unit simultaneously. Or, double clicking the Name of **HG_TXB** will connect the **RX-917E** unit to the **TX-917A** unit and connect the **RX-917F** unit to the **TX-917B** unit simultaneously. This achieves a batch connection from 2 TX units to 2 RX units.

You can also double-click the icon ⊞ to expand a list showing the transmitter units belonging to the selected TX hard group.

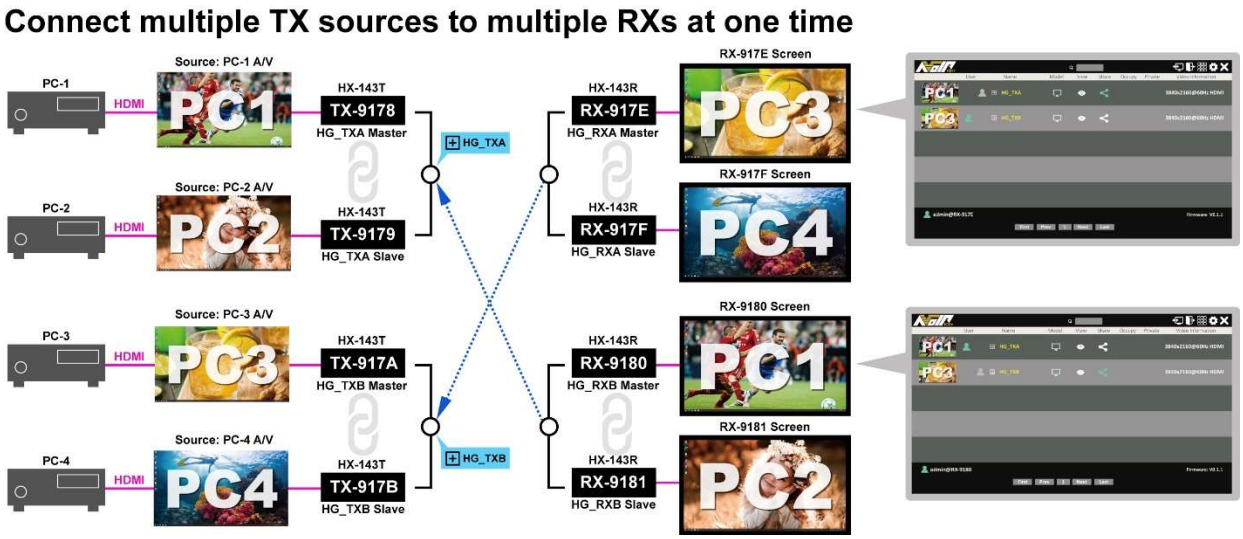


Figure 5-58 Hard group Switching

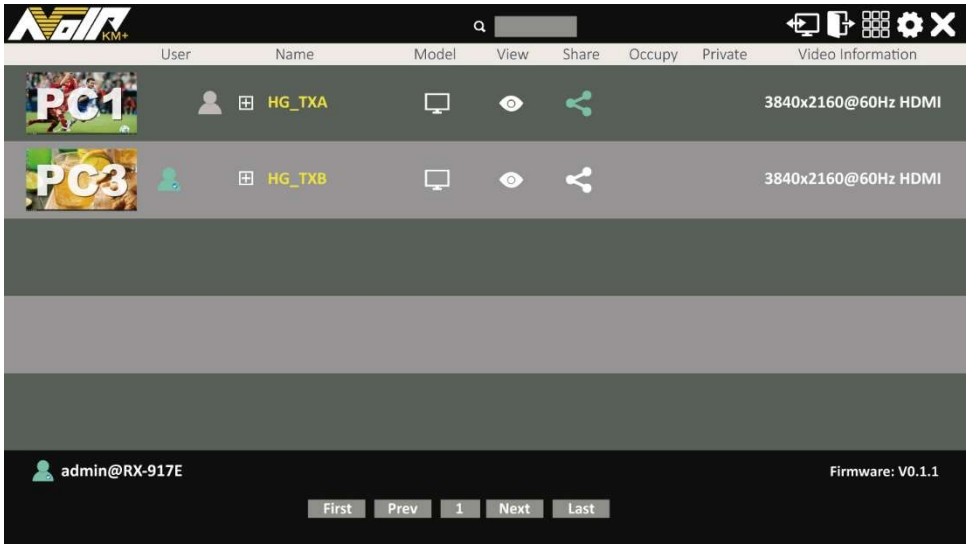


Figure 5-59 The OSD Menu of the Master Unit RX-917E of the RX Hard Group HG_RXA

(3) **Mouse Roaming**

The main goal of the Mouse Roaming function is to enable a user to use a single set of mouse and keyboard attached to the master unit of a mouse roaming RX group, allowing the mouse cursor to move freely across all viewable screen areas of all RX units performing the mouse roaming task. With this function, a user can control multiple PCs/players that are connected to those receivers via transmitters. The maximum mouse roaming area setting is 16 (H) x 16 (V), totaling 256 monitors.

The following example will demonstrate how to implement the mouse roaming function on 3 monitors connected to 3 receivers that belong to a mouse roaming RX group.

a. Input Administrator account information to log into the three RX units respectively. Connect these RX units to their corresponding TX units in the RX OSD menus, as shown in the connections below:

Figure 5-60 Connect 3 RX units to 3 TX units with the OSD menus of the RX units

b. Go to **Devices**>**RX Groups**, click the <**New Group**> button , select <**Mouse Roaming Group**> in the <**Group Type**> menu. Input the name **MR_A**, then click the <**Submit**> button.

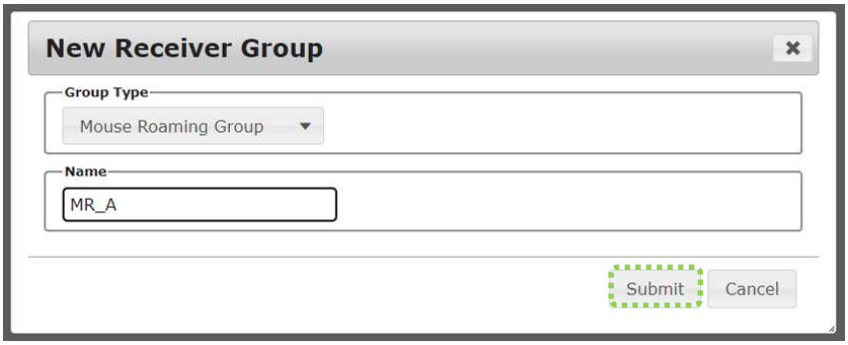


Figure 5-61 Create a New Mouse Roaming RX Group

c. Select the **MR_A** item, then click the <**Edit Group**> button to enter its setting page.

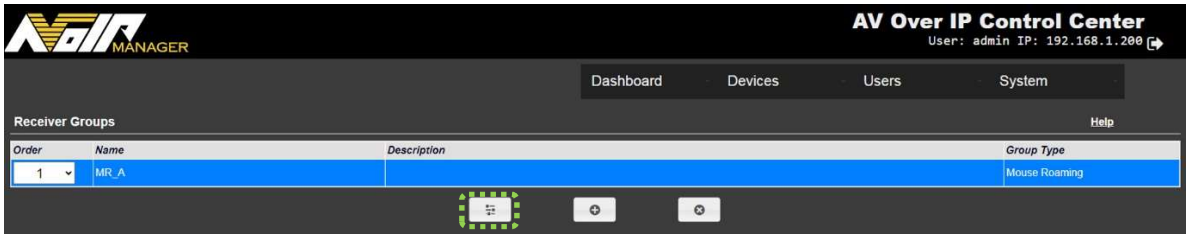


Figure 5-62 Configure the Selected Mouse Roaming RX Group

First, drag **RX-917E** into the <**Group Layout**> column. **RX-917E** will be defined as the Master unit for Mouse Roaming task since it is the first RX unit dragged into the <**Group Layout**> column. Continue by dragging the other two RX units **RX-917F** and **RX-9180**, according to the following coordinate plan: **RX-917E** (0, 0); **RX-917F** (1, 0); **RX-9180** (2, 0). Finally, click the <**Submit**> button to confirm the Group Layout.

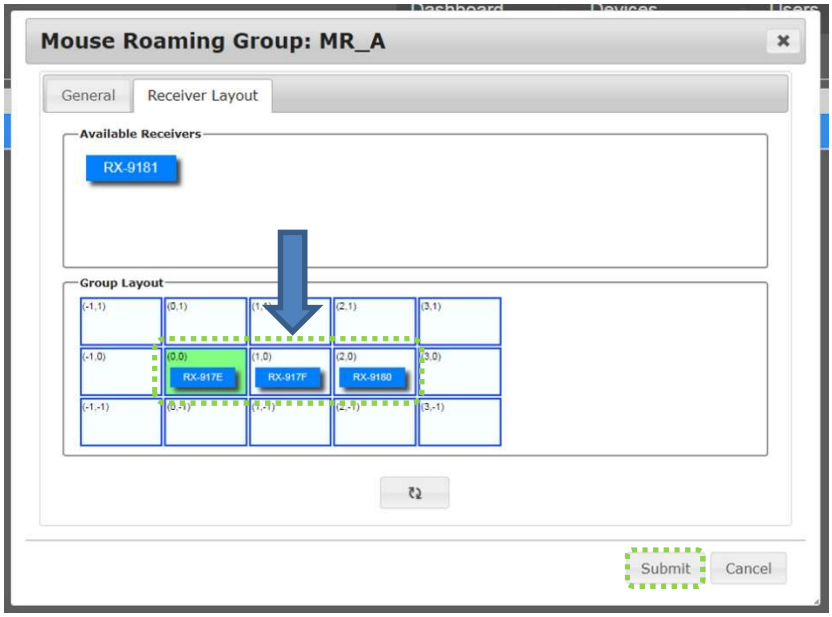


Figure 5-63 Configure the Group Layout of a Mouse Roaming RX Group

*Note: As shown below, system will not allow a group layout with any isolated RX unit arrangement (not adjacent to any other RX units) for mouse roaming task.

Figure 5-64 Illegal Group Layout of the Mouse Roaming RX Group

d. When there is no illegal isolated RX unit arrangement, click the <**Submit**> button and the system will reboot the Mouse Roaming Master unit **RX-917E**.

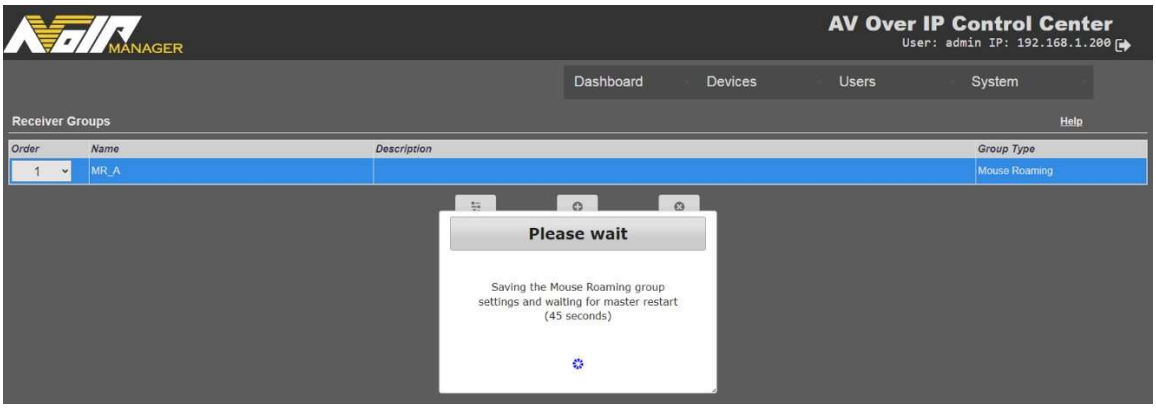


Figure 5-65 The Master Unit of the Mouse Roaming Group Reboots to Take Effect

e. After the Mouse Roaming Master unit **RX-917E** reboots and resumes its service, input the Administrator account information to log into **RX-917E**. Then, select a desired transmitter source (e.g. **TX-9178**) to connect to. When the user moves the mouse cursor, it will now roam across all viewable screen areas of the 3 monitors. In Mouse Roaming operation, if a keyboard and mouse are connected to any slave RX units, the mouse and keyboard will be disabled, and the connected monitors will display a <**Slave Mode**> message if any keyboard key is pressed. Only the keyboard and mouse connected to the master RX unit of the Mouse Roaming RX group can access all connected PCs/players. Regardless of where the mouse cursor is (whether on the master RX unit monitor or slave RX unit monitors), the OSD menu can only be accessed on the master RX unit monitor.

Figure 5-66 Mouse Roaming Operation on 3 Monitors

Note: For those slave RX units that were previously assigned to perform the mouse roaming task and were connected to specific TX units, after the Mouse Roaming Master unit **RX-917E reboots, those slave RX units will automatically reconnect to the previously connected TX units without needing to log in to these slave RX units again.*

- **Cursor Hopping Function of Mouse Roaming**

As all receivers carrying out Mouse Roaming task operate normally, the user can freely move the cursor across all viewable screen areas of all receivers. However, if any of the receivers or the transmitters connected to these receivers becomes offline or failed, as shown at the position 07 of Mouse Roaming layout (4) in Figure 5-67, the user will not be able to move the cursor out of the corresponding viewable screen area of the failed receiver once it enters, thus losing cursor control. To resolve this problem, the user can use the **Cursor Hopping Hotkey** (Right **Ctrl,** Right **Ctrl**, **2-digit number**) to instantly move the cursor to a preferred viewable screen area of any other receiver that is functioning normally, thereby regaining cursor control. Meanwhile, the user should notify a technician to replace the failed TX/RX units as soon as possible to keep the system running smoothly. The cursor hopping function can also be used to increase working efficiency by instantly moving the cursor to the desired viewable screen area of the receiver. The definition of the 2-digit number for the Cursor Hopping Hotkey is shown in the following mouse roaming layout examples, moving from left to right and top to bottom.

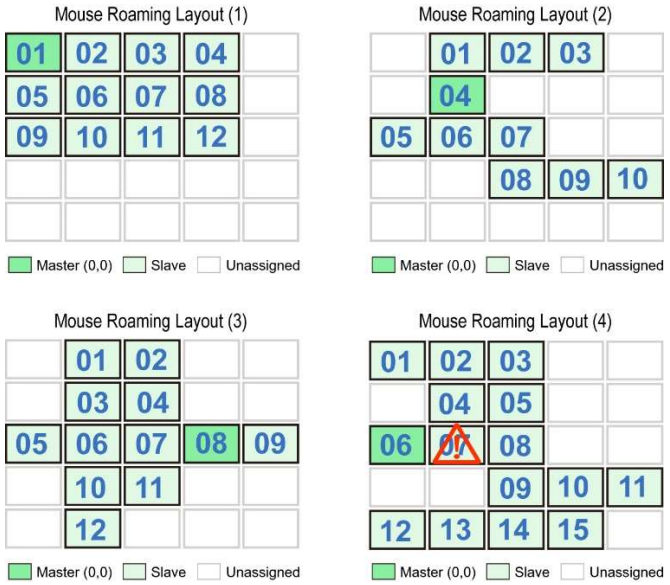


Figure 5-67 Mouse Roaming Group Layout Examples

(4) Video Wall

The Video Wall function allows the user to use a keyboard and mouse attached to any video wall task receiver to access its OSD menu. This function enables the collective display of any single transmitter video source across the monitors attached to the video wall task receivers. The maximum size setting of the video wall is 8 (horizontal) x 8 (vertical), totaling 64 monitors.

This example will demonstrate how to build a video wall with four monitors.

a. Input Administrator account information to log into 4 RX units, respectively. Connect these RX units to their corresponding TX units in the RX OSD menus, as shown in the connections below:

Figure 5-68 Connect 4 RX Units to 4 TX Units with the OSD Menus of the RX Units

b. Go to **Devices**>**RX Groups**, click the <**New Group**> button , select <**Video Wall Group**> in <**Group Type**> menu. Input the name **VW_2x2**, and then click the <**Submit**> button.

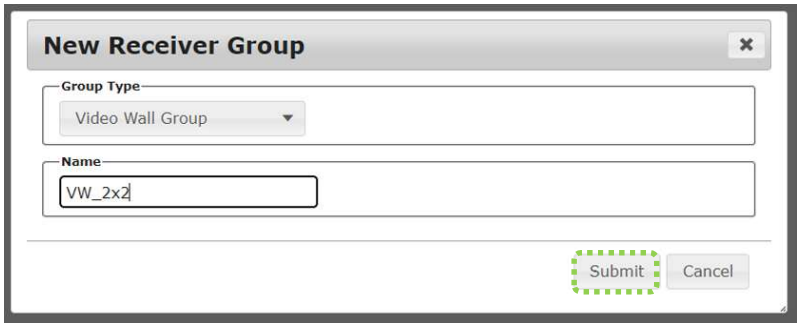


Figure 5-69

c. Click the **VW_2x2** item, click the <**Edit Group**> button to enter its setting page. In the <**General**> tab, set the Group Size as Horizontal=2 and Vertical=2. (Note: Video Wall maximum configuration: Horizontal=16; Vertical=16).

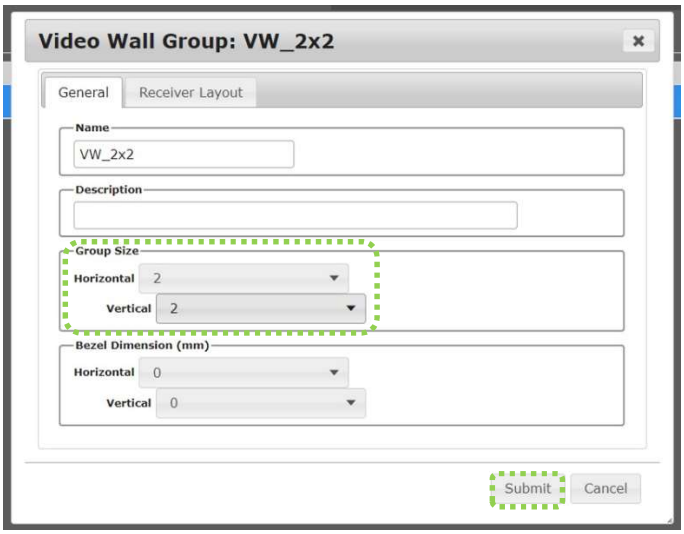


Figure 5-70 Configure the Size of the Video Wall Group

d. In the <**Receiver Layout**> tab, first drag **RX-917E** receiver into the <**Group Layout**> column, followed by **RX-917F**, **RX-9180**, and **RX-9181**, as shown below. Finally, click the <**Submit**> button to confirm the Group Layout.

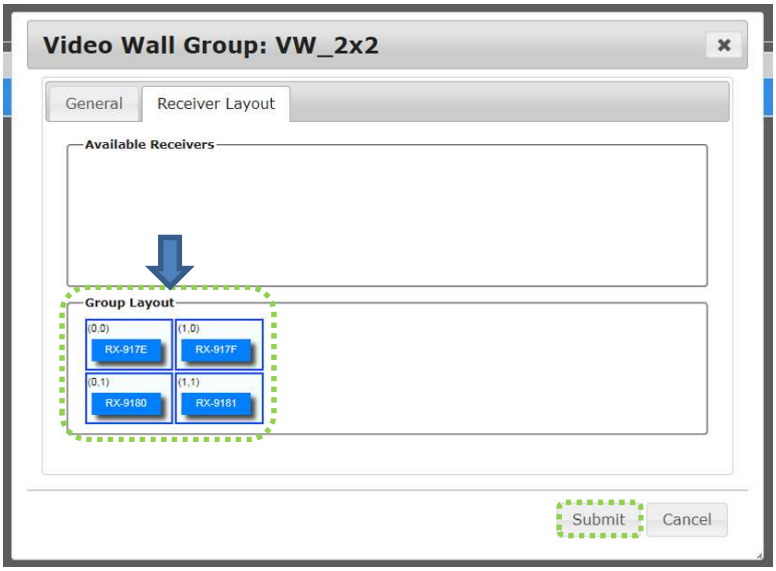


Figure 5-71 Configure the Group Layout of the Video Wall Group

e. Unlike the Mouse Roaming function, after the Video Wall Group settings are configured, the system will not reboot the **RX-917E** unit. User can press the OSD hotkey in any receiver (e.g. **RX-917F**) that was assigned to perform Video-wall task. Then connect it to any desired transmitter source (e.g., **TX-9178**). After the user presses the <**Esc**> key on the keyboard to close the OSD menu of **RX-917F**, other receivers **RX-917E**, **RX-9180**, and **RX-9181** will collaborate with **RX-917F** to display a complete **TX-9178** video source, demonstrating the video wall function.

*Note: In a video wall task, a Master-slave hierarchy doesn't exist, so the user can press the OSD hotkey on any keyboard attached to any video wall task receiver and assign any desired TX sources.

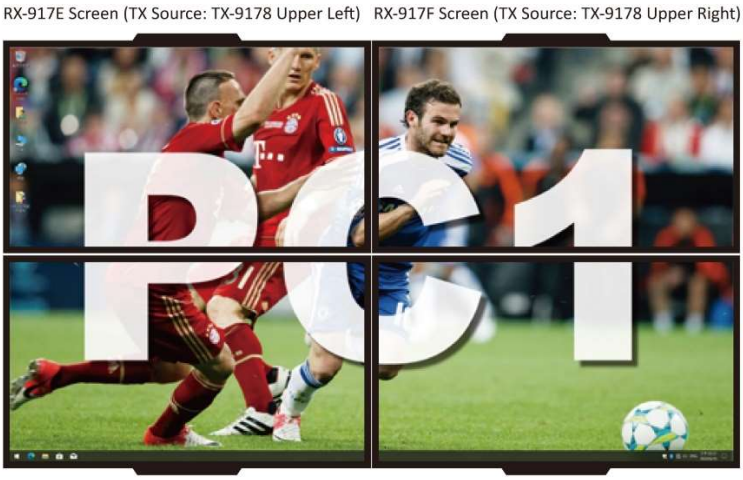


Figure 5-72 Four RX unit's Monitors Collaboratively Display the TX-9178 source

5.3.4 TX Groups

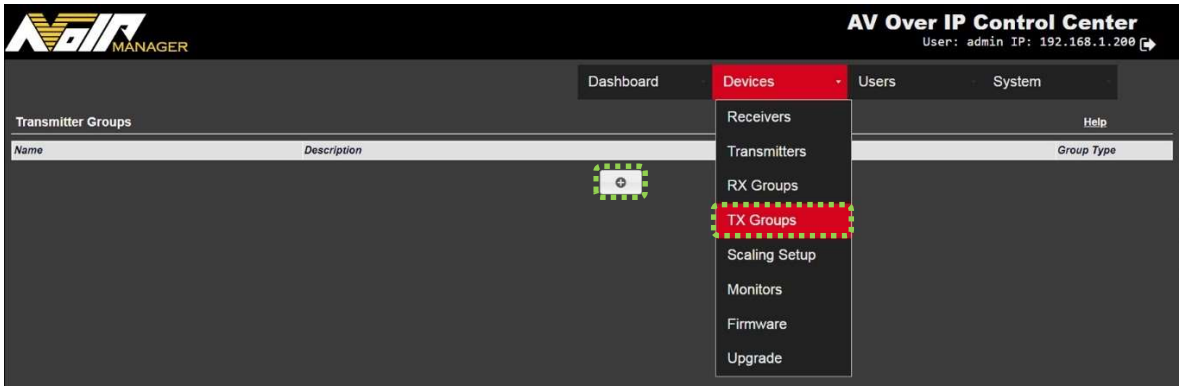


Figure 5-73 Devices>TX Groups

This <**TX Groups**> page lists all transmitter groups in the HX-143AVC database. Each row corresponds a transmitter group showing its Name, Description, and Group Type.

Add a New Transmitter Group

Click the <**New Group**> button, to define new transmitter groups. In TX Groups setting page, the Group Type option includes only <**Simple Group**> and <**Hard Group**>. The detailed process for creating TX groups has been introduced in the previous section and will therefore be omitted.

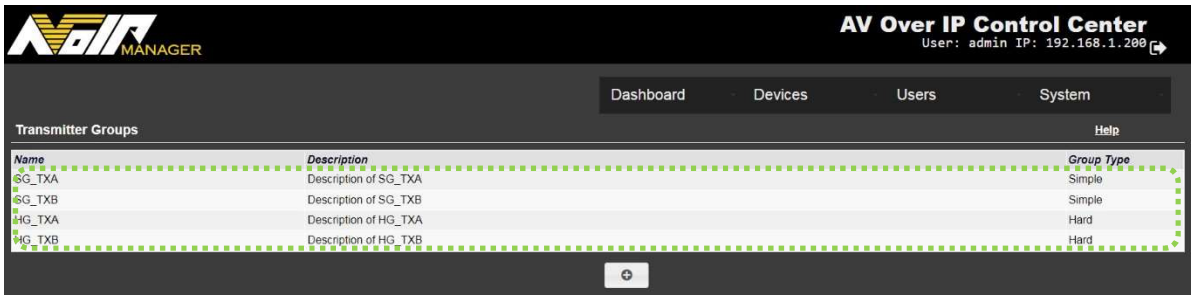


Figure 5-74 Devices>TX Groups>Create New TX Groups

Edit a Transmitter Group

Select a transmitter group in the above list and click the <**Edit Group**> button to setup transmitter unit members in the selected transmitter group.

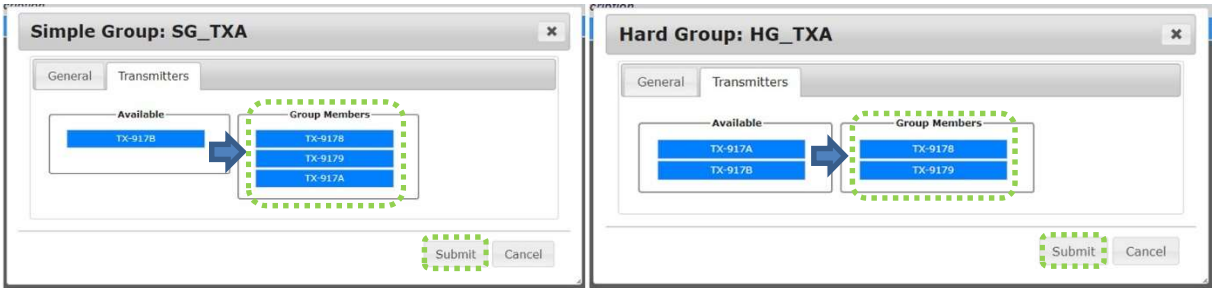


Figure 5-75 Devices>TX Groups>Edit TX Simple Group and Hard Group

5.3.5 Scaling Setup

The <**Scaling Setup**> page lists several popular display resolutions that can be applied to the monitors connected to the detected RX units. To configure, drag a Scaling Parameter Block from the left-hand side and drop it onto a specified RX Preview Block on the right-hand side. This action forcibly applies a fixed display resolution (e.g., **1920x1200p60**) to the specified RX (e.g., **RX-9180**) monitor, preventing a black screen when the TX source resolution changes.

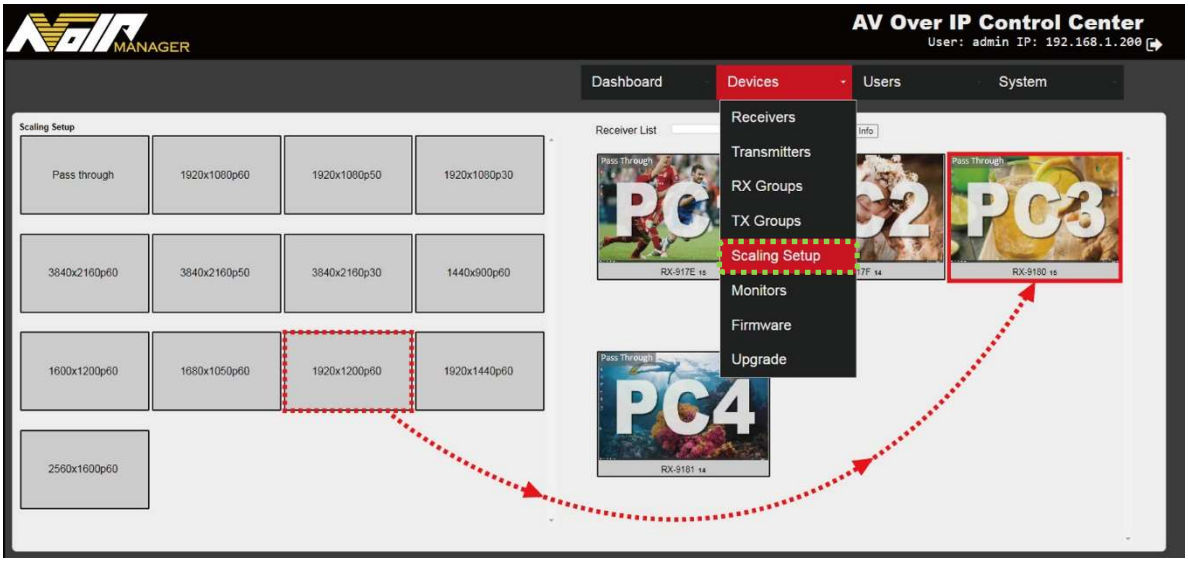


Figure 5-76 Devices>Scaling Setup>Apply a Fixed Display Resolution onto a Specified RX Monitor

5.3.6 Monitors

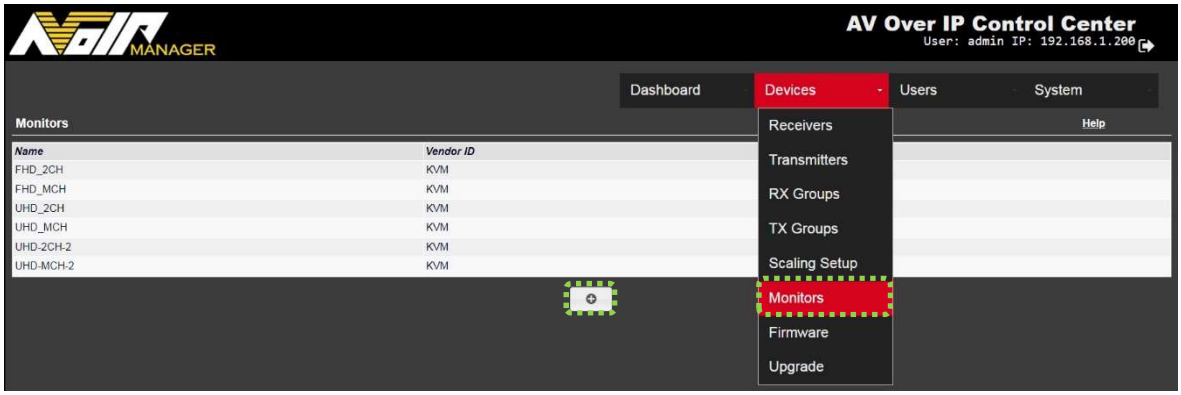


Figure 5-77 Devices>Monitors

The <**Monitors**> page lists several built-in and user-uploaded monitor EDID information. Each row corresponds to an EDID file showing its Name, Vender ID, and Model. The HX-143AVC can read the EDID information from the monitors attached to the receivers and send the EDID information to the transmitters, allowing them to provide proper monitor emulations.

Add a New Monitor EDID Information from a Receiver

Click the <**Add New Monitor to List**> button . Select <**From Receiver**> and specify a receiver to read its monitor EDID. Enter a name (e.g., **Monitor_1**) and click the <**Get Monitor**> button.

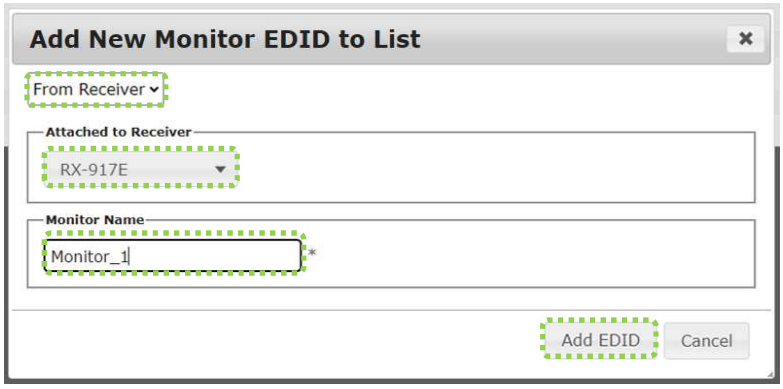


Figure 5-78 Devices>Monitors>Add a New Monitor EDID Information from a Receiver

Add a New Monitor EDID Information from a File

Click the <**Add New Monitor to List**> button . Select <**Upload EDID**> and choose an EDID file from your computer. Enter a name (e.g. **Monitor_2**) and click the <**Get Monitor**> button.

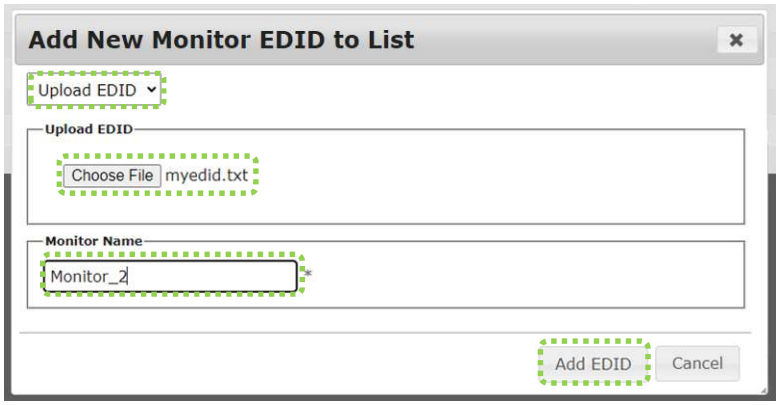


Figure 5-79 Devices>Monitors>Add a New Monitor EDID information from an EDID File

Update a Monitor EDID of a Receiver Monitor to a Connected Transmitter

Connect a keyboard to the receiver unit and press the keyboard hotkey <**ScrLk**>, <**ScrLk**>, <**M**> to send the EDID of the monitor attached to the receiver unit to the transmitter unit connected to the receiver.

Send an Existing Monitor EDID to a Transmitter

Select an EDID information from the list and click the <**Send Monitor EDID to Transmitter**> button . Choose the desired transmitter and click <**Send EDID**> button to send the selected EDID information to that transmitter.

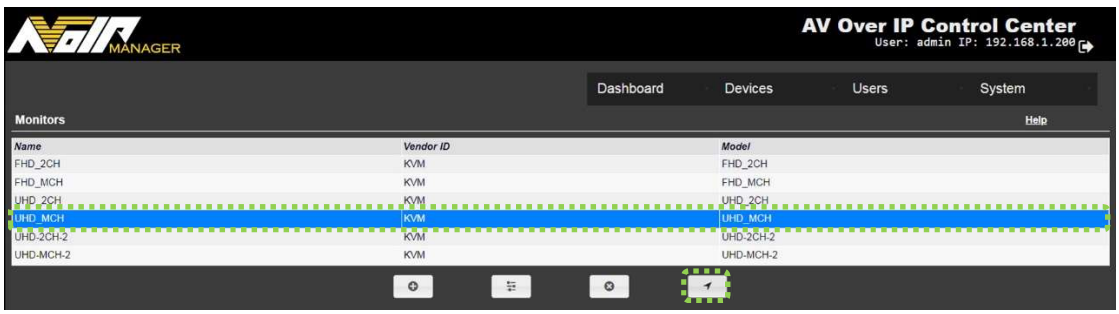


Figure 5-80 Devices>Monitors>Send an Existing Monitor EDID to a Transmitter

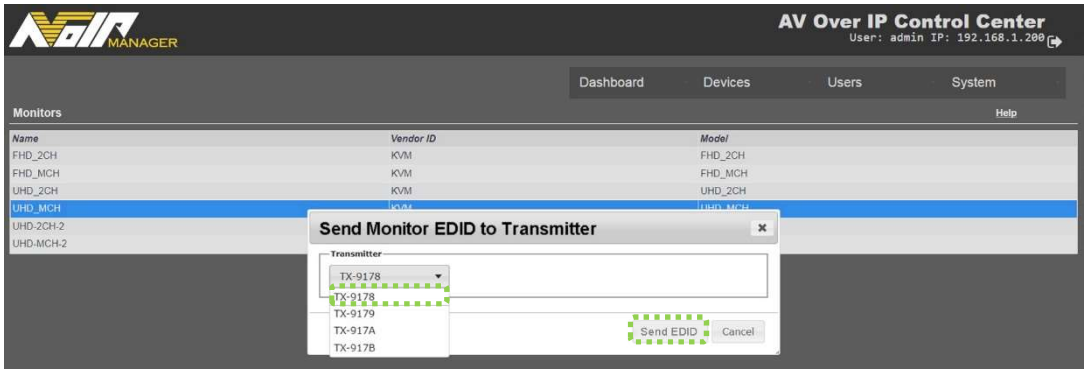


Figure 5-81 Devices>Monitors> Send an Existing Monitor EDID to a Transmitter

5.3.7 Firmware

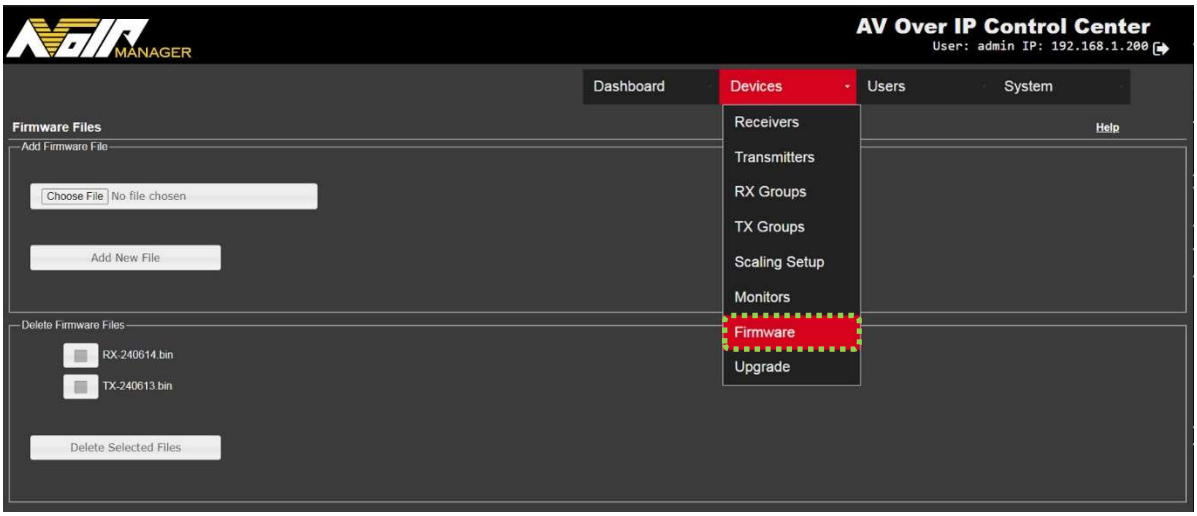


Figure 5-82 Devices>Firmware

The <**Firmware**> page allows you to add or delete the firmware files for TX/RX units already managed by the HX-143AVC controller. These *.bin firmware files stored here can be used for later upgrade procedures. To add a firmware file to the HX-143AVC database, click the <**Choose File**> button to select a firmware file, and then click the <**Add New File**> button. To delete one or more firmware files, first select files you want to delete, and then click the <**Delete Selected Files**> button.

5.3.8 Upgrade

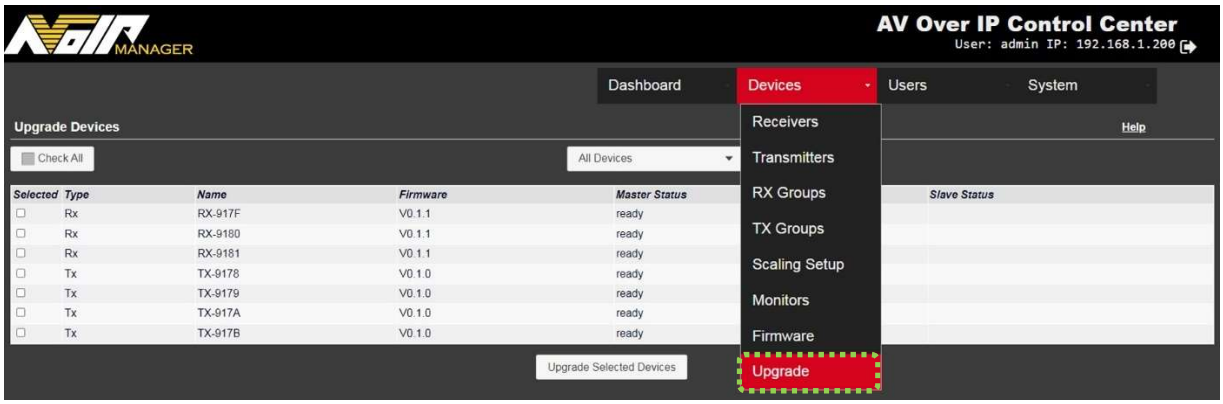


Figure 5-83 Devices>Upgrade

The <**Upgrade**> page allows you to upgrade the firmware of transmitters and receivers. It displays information of all managed devices, including type, name, firmware version, upgrade (master/slave) status. After selecting the specific devices or all devices, click the <**Upgrade Selected Devices**> button to start the upgrade process.

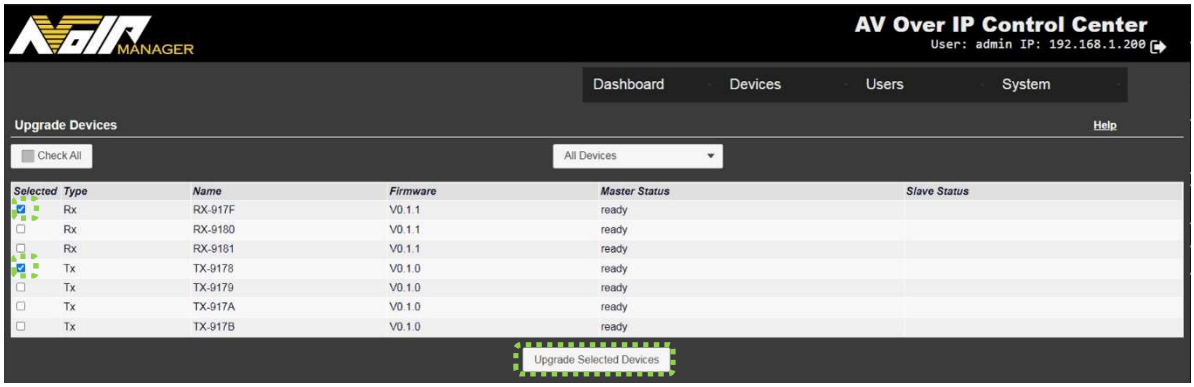


Figure 5-84 Devices>Upgrade>Select Devices to Be Upgraded

Start TX/RX Firmware Upgrade Process

First, refer to the <**Delete Firmware File**> column of Figure 5-82, please ensure that the TX and RX firmware files (e.g., **RX-240616.bin** and **TX-240613.bin**) are the most up-to-date versions. If they are not, go to **Devices**>**Firmware,** choose the latest firmware files, and click the <**Add New File**> button to upload them for TX/RX units. Remember to remove all previous old firmware versions from the <**Delete Firmware File**> column.

Next, go to **Devices**>**Upgrade**. Select the devices you want to upgrade and click the <**Upgrade Selected Devices**> button to start the upgrade process. You can monitor the update status of each device in the <**Master Status**/**Slave status**> columns.

The upgrade process will take approximately 15 minutes (*Note: The duration may vary depending on network activity. It is recommended to perform the upgrade during off-peak network time). Click the <**Yes**> button to continue or the <**Cancel**> button to abort the upgrade process.

Wait for the process to complete, including <**writing to Flash**> and <**rebooting**>, until the selected devices finish rebooting and show as <**ready**>.

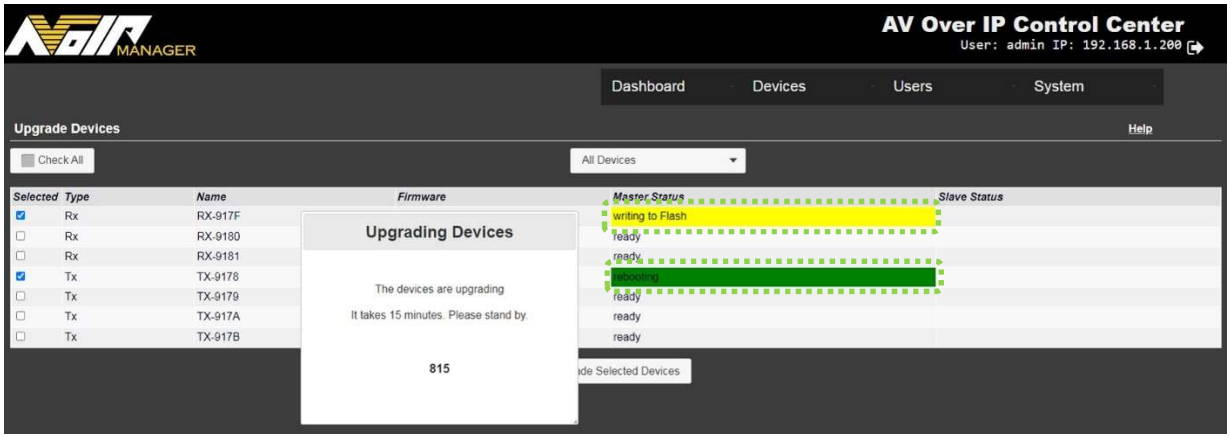


Figure 5-85 Devices>Upgrade>Select Devices to be upgraded

Online <Help> Tab

For Online help regarding the <**Devices**> sections, please go to **Main Menu**>**Devices**, select any items, and click the <**Help**> tab at the upper-right corner to access detailed instructions.

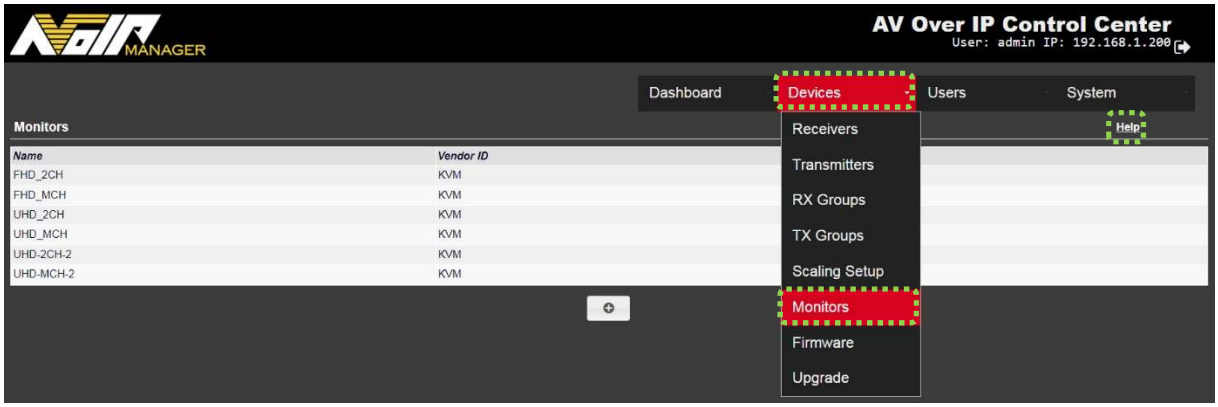


Figure 5-86 Devices>Monitors>Online Help

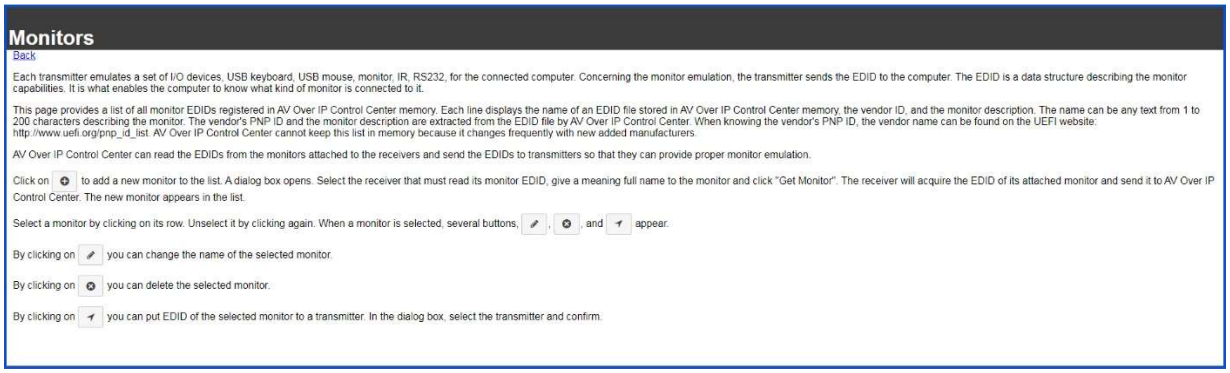


Figure 5-87 Devices>Monitors>Online Help

5.4 Users

Click the drop-down menu <**Users**> at the top of the interface to access the following options: <**List**>, and <**Groups**>.

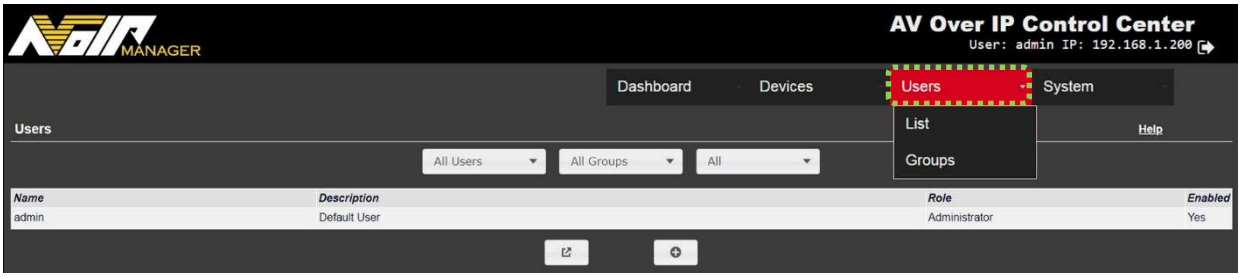


Figure 5-88 Main Menu>Users

5.4.1 (User) List

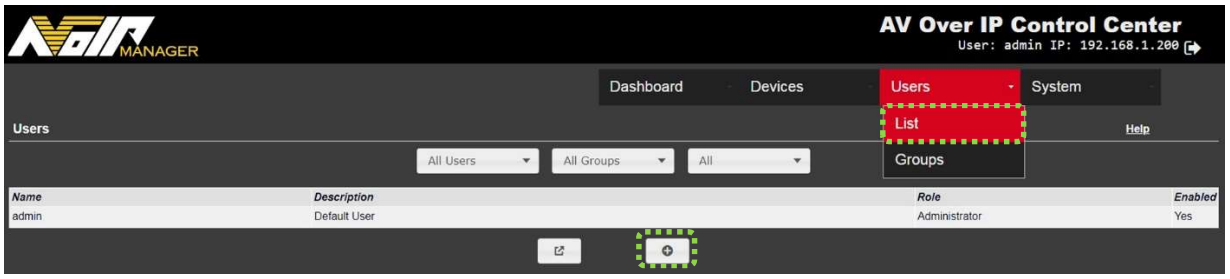


Figure 5-89 Main Menu>Users>(User) List

This <**List**> page displays a user list in the HX-143AVC database. Each row shows the **Name, Description, Role,** and **Enabled** properties. Figure 5-90 provides an example of the **User List, User Group,** and **Device Group** to explain the configuration of the <**User**> tab.

In this configuration example:

Jensen has the role of Administrator, the same as the Administrator **admin**, and belongs to the **Management Group (MGNT_GP)**. Jensen can access all extender devices, all RX/TX groups and a video-wall RX group.

Paul has the role of Super User and belongs to the **RD Division Group (RD_GP)**.

He and his division members **Peter** and **Potter** can access all extender devices and all RX/TX groups.

Mike has the role of Super User and belongs to the **TEST Division Group (TEST_GP)**.

He and his division members **Matt** and **Martin** can access extenders units **RX-917E/RX-917F/TX-9178/TX-9179/SG_RXA** RX group/**SG_TXA** TX group.

Hank has the role of Super User and belongs to the **SALES Division Group (SALES_GP)**.

He and his division members **Helen** and **Hebe** can access extenders units **RX-9180/RX-9181/TX-917A/TX-917B/SG_RXB** RX group/**SG_TXB** TX group.

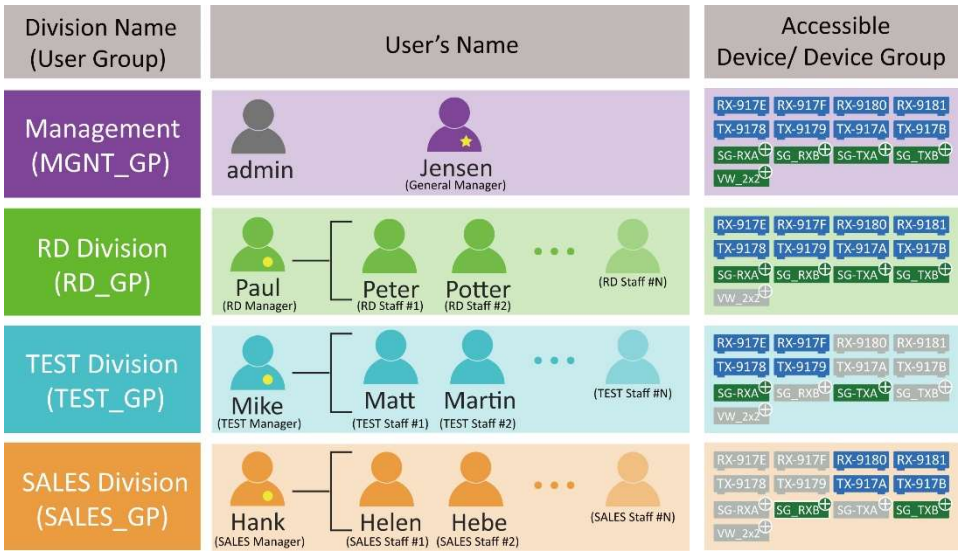


Figure 5-90 An Exemplary Configuration Showing the Relationship of User Account, User Group, and Device Group

Add User Accounts

Whether any user row is selected or not, click the available <**New User**>button to add a new user. In the <**New User**> configuration window, set up the **Identification** and **User Role** columns and click on <**Submit**> button to create all the above 10 user accounts as below:

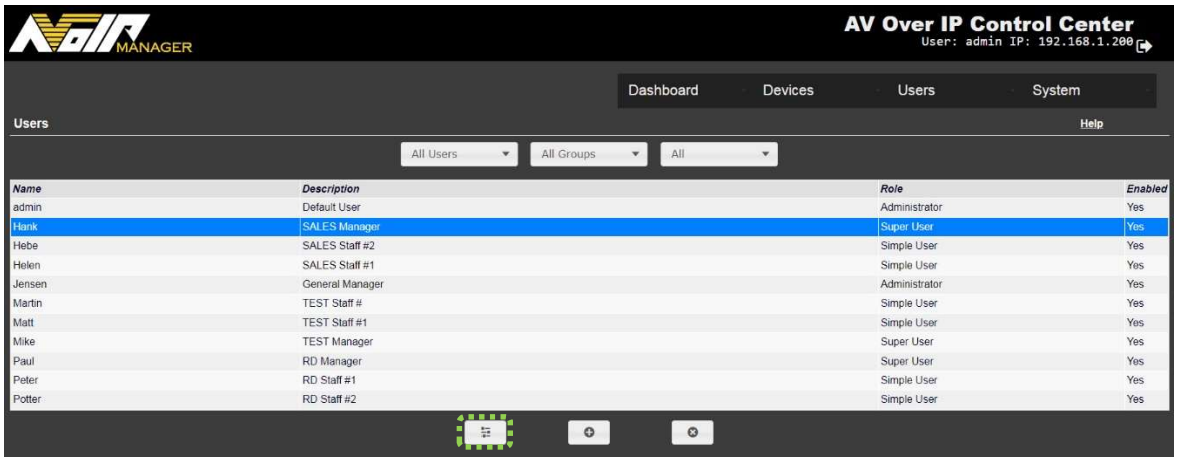


Figure 5-91 Users>(User) List>Add User Accounts

Select any row of a Name (e.g., **Hank**) and click the <**Edit User**> button to enter its respective configuration window.

The functional tabs in the configuration window vary depending on the User Role:

Administrator – [**Main**] / [**Groups**] / [**Hot Keys**]

Super User – [**Main**] / [**Groups**] / [**Receivers**] / [**Transmitters**] / [**Hot Keys**]

Simple User - [**Main**] / [**Groups**] / [**Receivers**] / [**Transmitters**] / [**Hot Keys**] / [**Read Only Password**]

[**Main**] Tab

Select any row of a Name (e.g., **Hank**) and click the <**Edit User**> button to enter its respective configuration window.

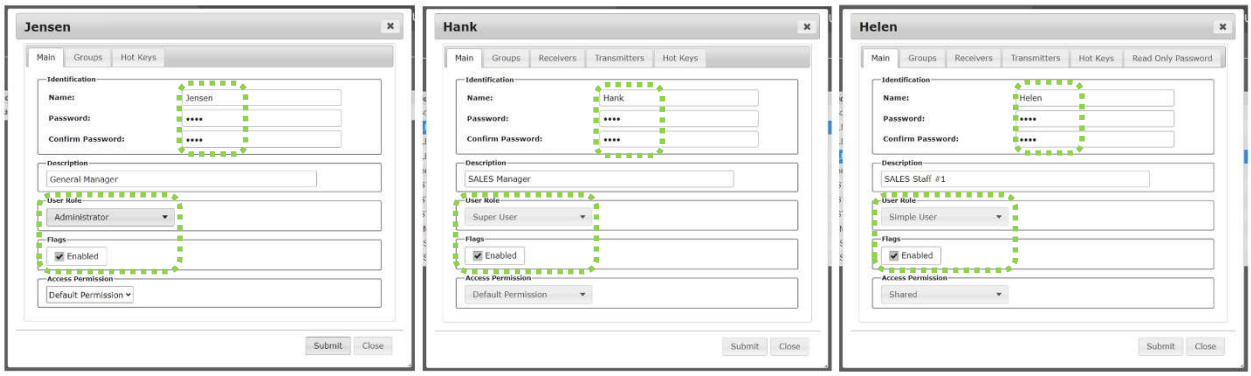


Figure 5-92 Users>(User) List>[Main] Tab Configuration

[**Groups**] Tab

Assign each user to their belonging User Group (e.g. **MGNT_GP**, **RD_GP**, **TEST_GP** or **SALES_GP**).

*Note: Refer to the next section **5.42 (User) Groups** for instructions on creating these User Groups.

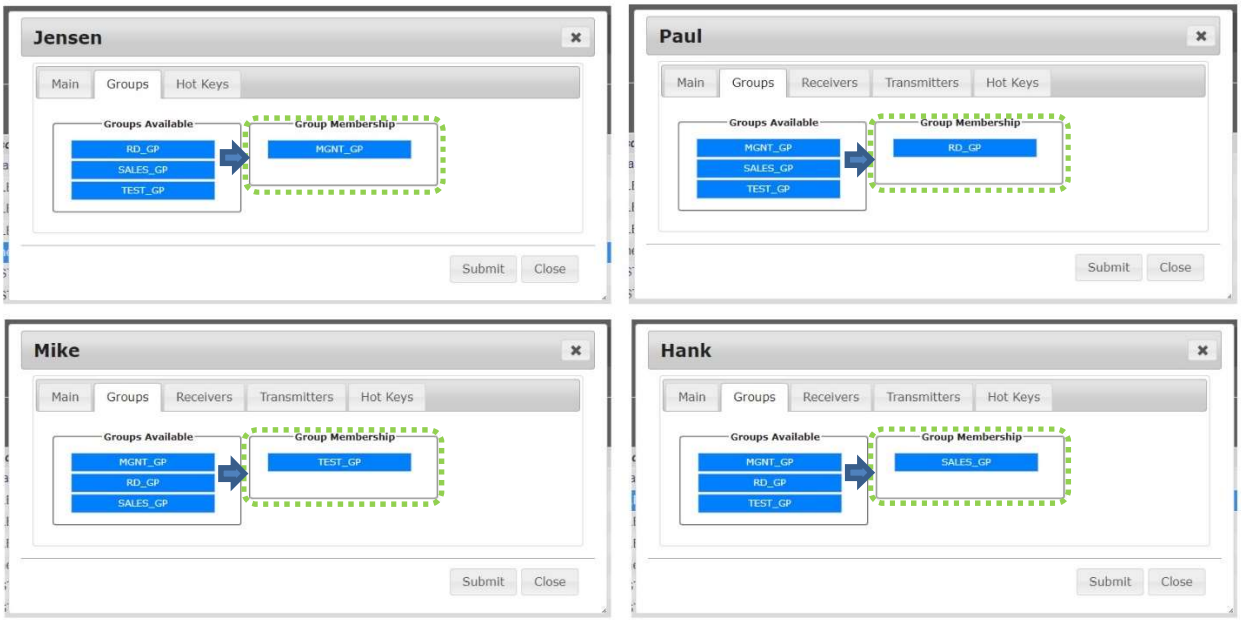


Figure 5-93 Users>(User) List>[Groups] Tab Configuration

[**Receivers**] and [**Transmitters**] Tabs

Assign Receivers/RX groups by drag-and-drop operation in the [**Receivers**] tab and assign Transmitters/TX groups by drag-and-drop operation in the [**Transmitters**] tab.

*Note: Since users with the Administrator role can access all receivers, RX groups, transmitters, TX groups, the [**Receivers**]/[**Transmitters**] tabs are not required in the configuration window for the Administrator-role users.

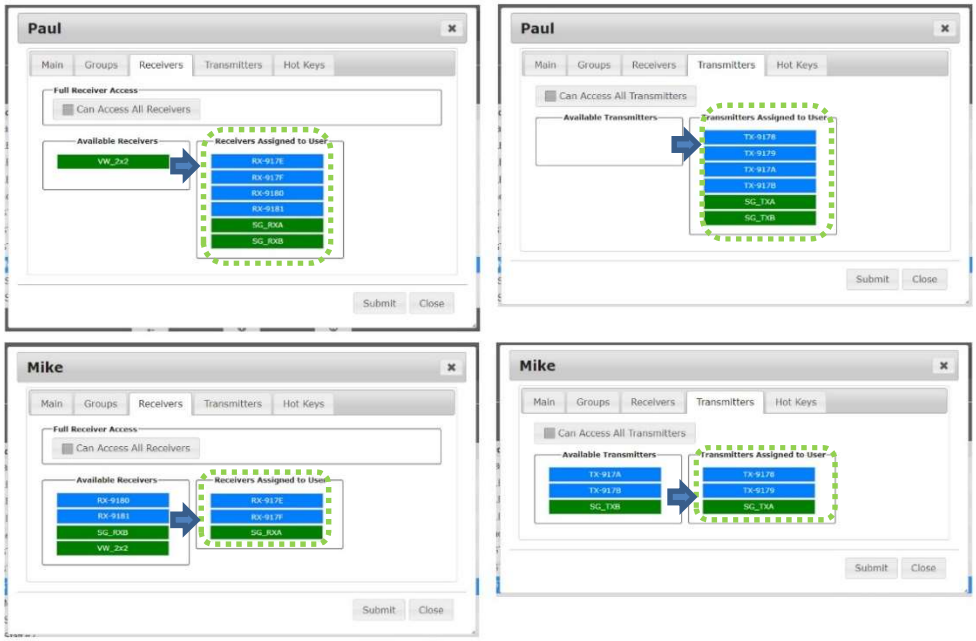


Figure 5-94 Users>(User) List>[Receivers]/[Transmitters] Tabs Configuration

[Hot Keys] Tab

The transmitter hotkeys set here can be used to perform TX source switching after a user (Administrator/Super User/Simple User) has logged into the receiver's OSD menu.

*Note: Refer to the RX unit OSD menu operation section **8.2.1** for more details.

Figure 5-95 Users>(User) List>[Hot Keys] Tab Configuration

[Read Only Password] Tab

Each simple user account (e.g., **Helen**) also has a [**Read Only Password**] tab. When a user with the Simple-user Role account uses this Read Only Password to login the ***AVoIP Manager***, he can only execute the existing Macros that were previously set by the Simple-user role account in the **Dashboard**>**Control Panel** page.

*Note: For this Read Only Password, please set it to a value different from the regular password used for logging into the simple-user account.

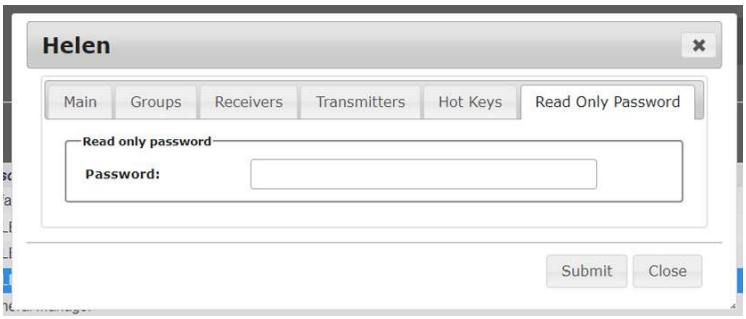


Figure 5-96 Users>(User) List>[Read Only Password] Tab Configuration

Global Actions Settings

When no user is selected, click the available <**Global Actions**> button to open the <**Global User Settings**> window. The <**Global User Settings**> window allows you to apply a single set of settings to all users in one operation.

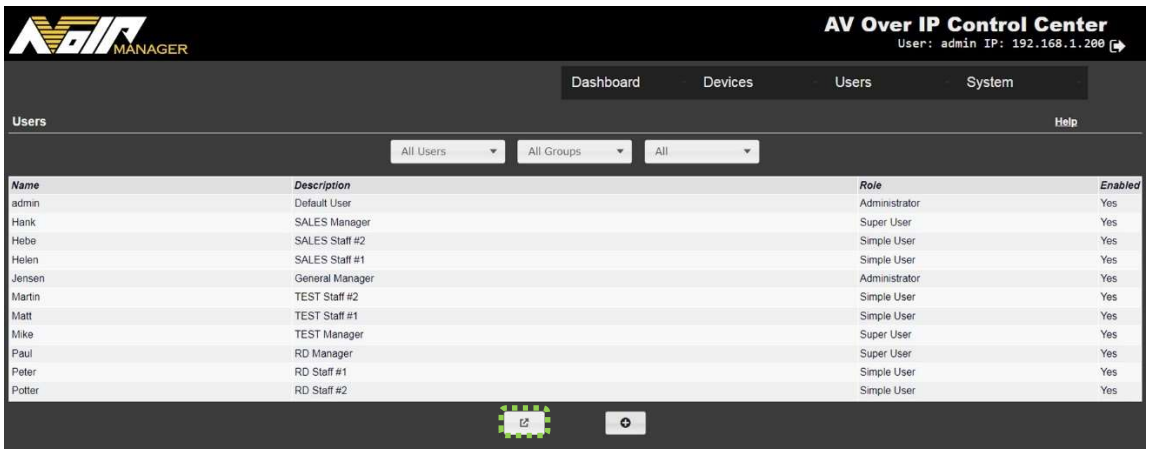


Figure 5-97 Users>(User) List>Global Actions

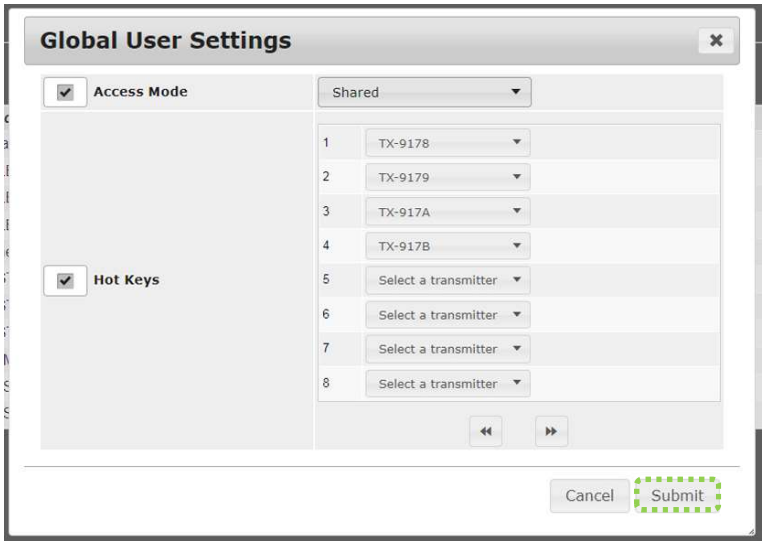


Figure 5-98 Users>(User) List>Global Actions>Global User Settings

5.4.2 (User) Groups

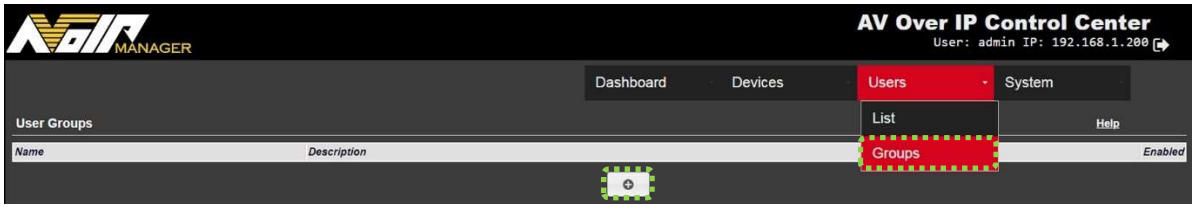


Figure 5-99 Main Menu>Users>(User) Groups

This <**Groups**> page lists the user groups in the HX-143AVC database. User Groups are sets of users with the same device access rights. Each row displays **Name**, **Description**, and the **Enabled** Property. When the **Enabled** Property of a user group is set to disabled, it means the administrator has revoked its access right for logging into receivers and accessing transmitters.

Add New User Groups

Whether or not a user group row is selected, click the available <**New Group**> button to add a new user group. In the configuration window, set up its Name, Members, Accessible Receivers, and Accessible Transmitters. The assignment of accessible RXs and TXs can be configured as shown in Figure 5-90.

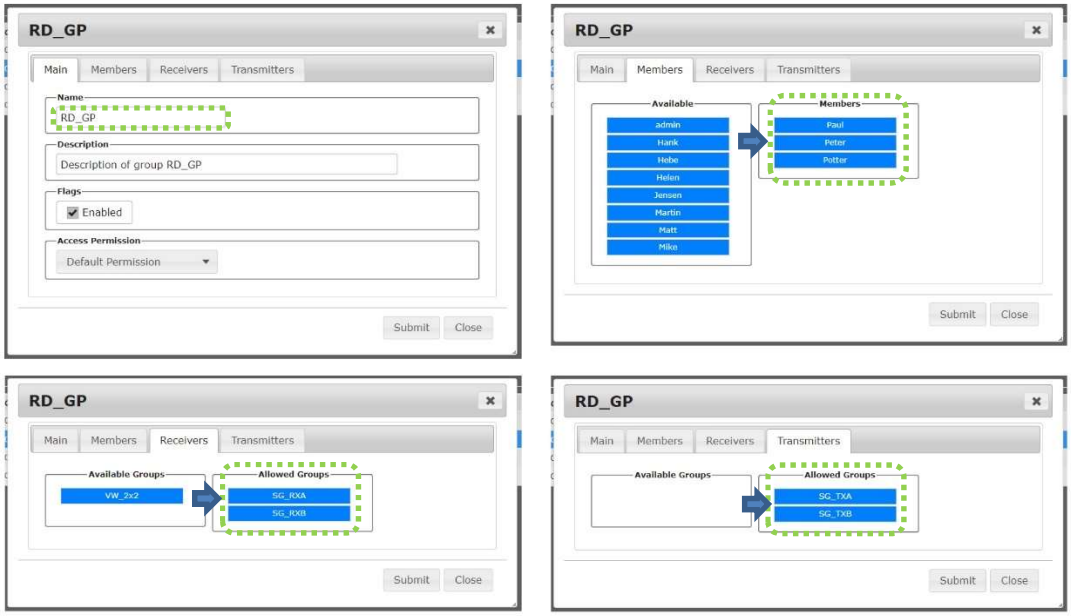


Figure 5-100 Users>(User) Groups>New Group>RD_GP

Figure 5-101 Users>(User) Groups>New Group>SALES_GP

Edit User Groups

Select an existing User Group (e.g., **RD_GP**) and click the <**Edit Group**> button to reconfigure the Name of the user group, Members, Accessible Receivers, and Accessible Transmitters.

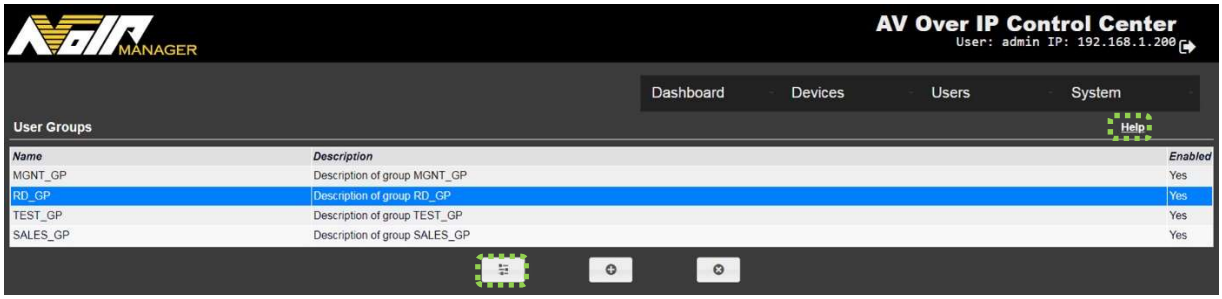


Figure 5-102 Users>(User) Groups>Edit User Groups

Online <Help> Tab

For Online help of <Users> sections, please go to **Main Menu**>**Users**, selecting any items and click the <**Help**> tab at the upper-right corner to get detailed instructions.

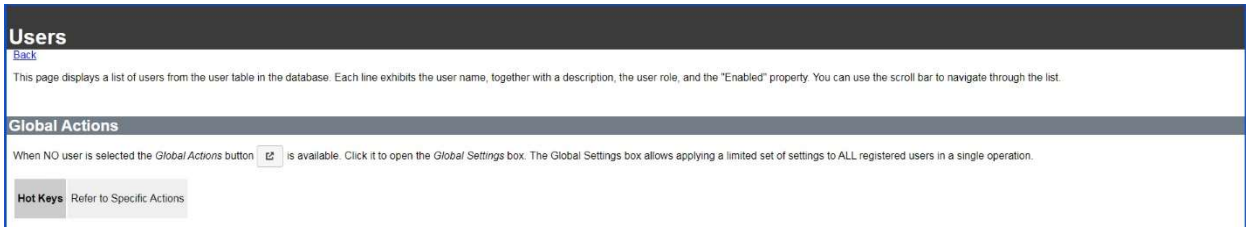


Figure 5-103 Users>(User) List>Online Help

5.5 System

Click the drop-down menu <**System**> at the top of the interface to access the following options: <**Miscellaneous**>, <**Log**>, <**Date & Time**>, <**Networks**>, <**Backups**>, <**Upgrade**>, <**Replication**>, and <**Power**>.

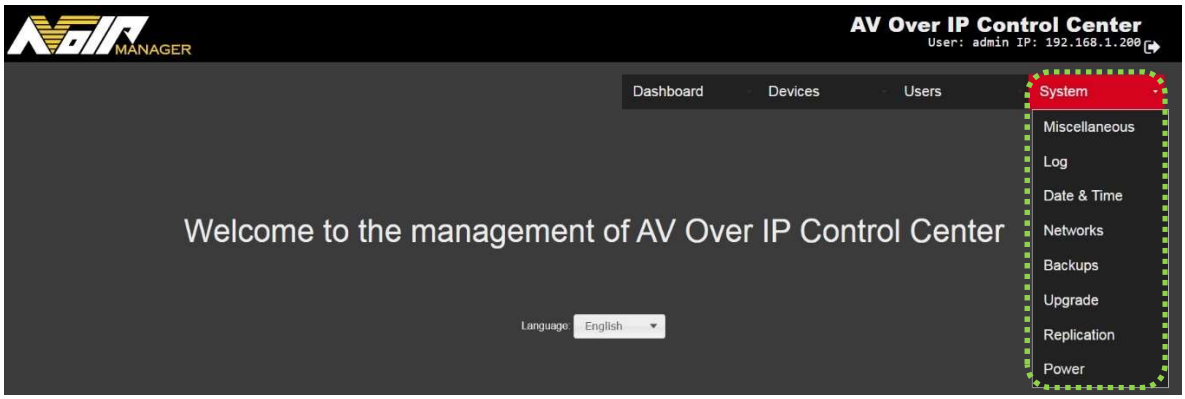


Figure 5-104 Main Menu>System

5.5.1 Miscellaneous

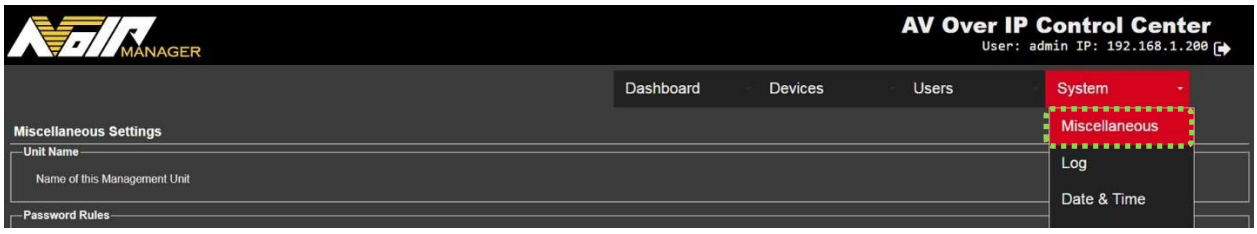


Figure 5-105 System>Miscellaneous

In the <**System**> menu, select and enter the <**Miscellaneous**> page. Next, click on the <**Configure**> button to open the <**Miscellaneous Setup**> window.

In the <**Management Unit**> tab, enter the name of the HX-143AVC controller. This information is important, especially when a second HX-143AVC controller is deployed in the same AV NETWORK for failover redundancy.

In the <**Password**> tab, you can set the minimum password length (options: **4**/**8**/**12**/**16**), disable/enable password strength verification, and set maximum password age (options: **No limit**/**1**/**2**/**3**/**4**/**6**/**9**/**12**/**18**/**24** months). When the password strength verification box is unchecked, you must set your password to include at least one uppercase letter, one lowercase letter, one number, and one special character.

In the <**Login Rules**> tab, you can configure the maximum number of failed login attempts (options: **No limit**/**5**/**10**/**20**), deactivation time after too many failed login attempts (options: **5**/**10**/**20**/**30**/**60** minutes), and automatic logout timeout due to inactivity (options: **No logout**/**5**/**10**/**15**/**20**/**30** minutes).

In the <**Access Level**> tab, you can configure the default access level for all TX units with any of the four options:

View-Only: When connecting to a specific TX unit with this access level, the RX unit user can only view the video from this TX unit, without keyboard and mouse (K/M) access.

Shared: When connecting to a specific TX unit with this access level, the RX unit user has the same keyboard, video, and mouse (K/V/M) access as other RX unit users accessing this TX unit.

Occupy: When connecting to a specific TX unit with this access level, the RX unit user has exclusive K/V/M access. Other RX unit users can only connect to this TX unit with View-Only access, without K/M access.

Private: When connecting to a specific TX unit with this access level, the RX unit user has exclusive K/V/M access, and this TX unit will become invisible to other RX unit users in their TX lists.

To change the access level of a specific TX unit, click on the name of the TX unit on the **Devices**>**Transmitters** page. Next, click the <**Set Up Transmitter**> button and then select a preferred <**Access Level**> option.

In the <**Access Level**> tab, you can also configure the default access permission of all users, including four options: **View-Only** / **Shared** / **Occupy** / **Private**.

To change the access permission of a specific user, simply click on the name of the user in the **User**> **(User) List** and select a preferred <**Access Permission**> option.

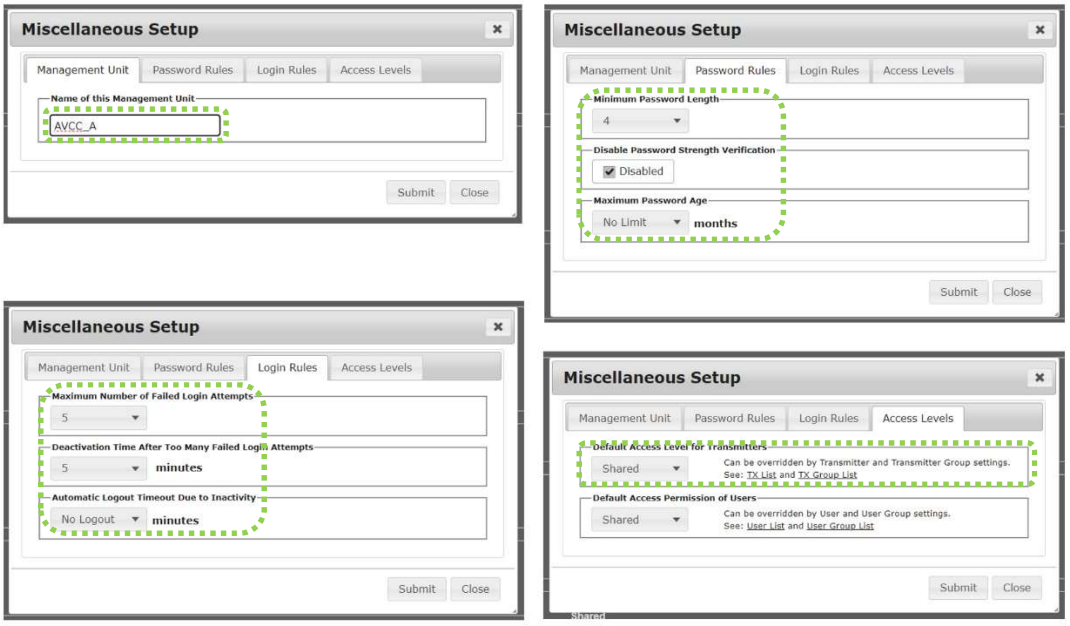


Figure 5-106 System>Miscellaneous Setup

Refer to Figure 5-107, the <**Access Permission**> of the administrator user (Name: **admin**) is set to **Private** and the access levels of the TX units **TX-9178**, **TX-9179**, **TX-917A**, and **TX-917B** are respectively set to **View-only**, **Shared**, **Occupy**, and **Private**.

Take **TX-917A** for example, as the administrator user **admin** is set to **Private**, **TX-917A**'s available access levels will be **View-only**, **Shared**, and **Occupy**. As the administrator user **admin** is set to **Shared**, **TX-917A**'s available access levels will be **View-only** and **Shared**.

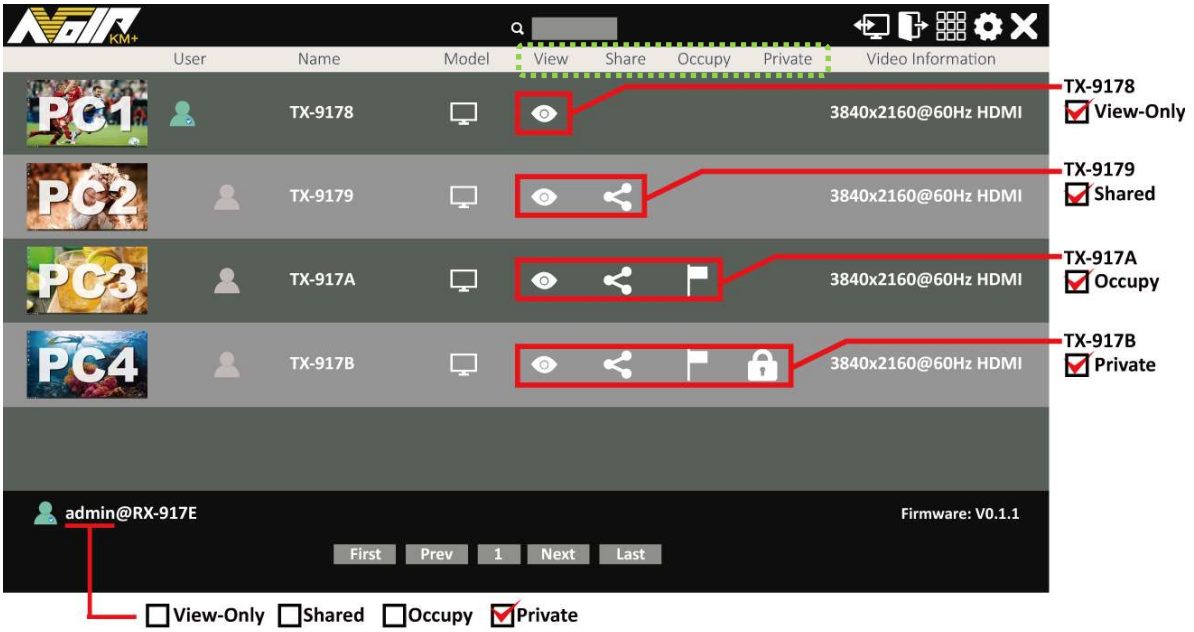


Figure 5-107 System>Miscellaneous Setup>Combinations of different TX Access Leve and the Logged-in User's Access Permission.

5.5.2 Log

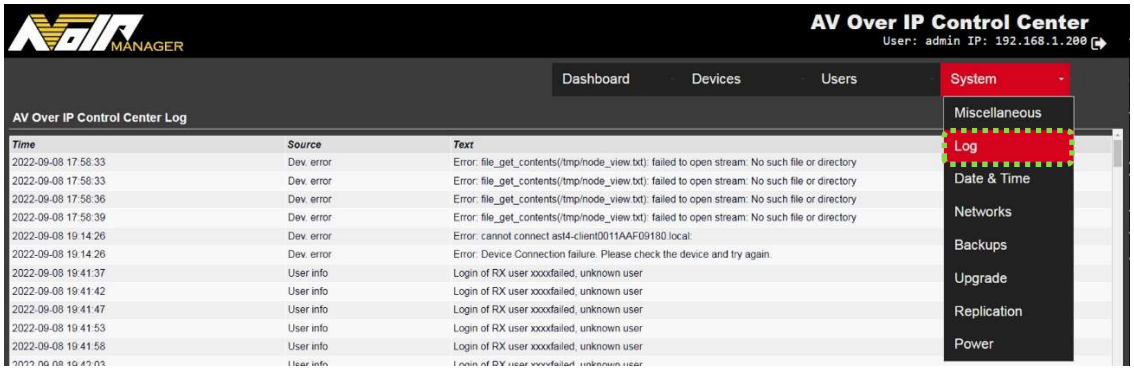


Figure 5-108 System>Log

The <**Log**> page records events of the HX-143AVC controller including Information and Errors of User, Device, and System. It also records each login attempt, even for unsuccessful ones.

Figure 5-109 System>Log>Configuration Buttons

Specify Events to be Logged

Click the <**Recording Options**> button to enter the configuration window. Click the <**Save To File**> button to save the current Log data to **avcc-log.txt.gz** file. Click the <**Clear Records**> button to delete the log record. To avoid accidental loss of information, the deleted lines of the log will be downloaded as the **avcc-log.txt.gz** file. Click the <**Display Filter**> button to only display the log information of interest.

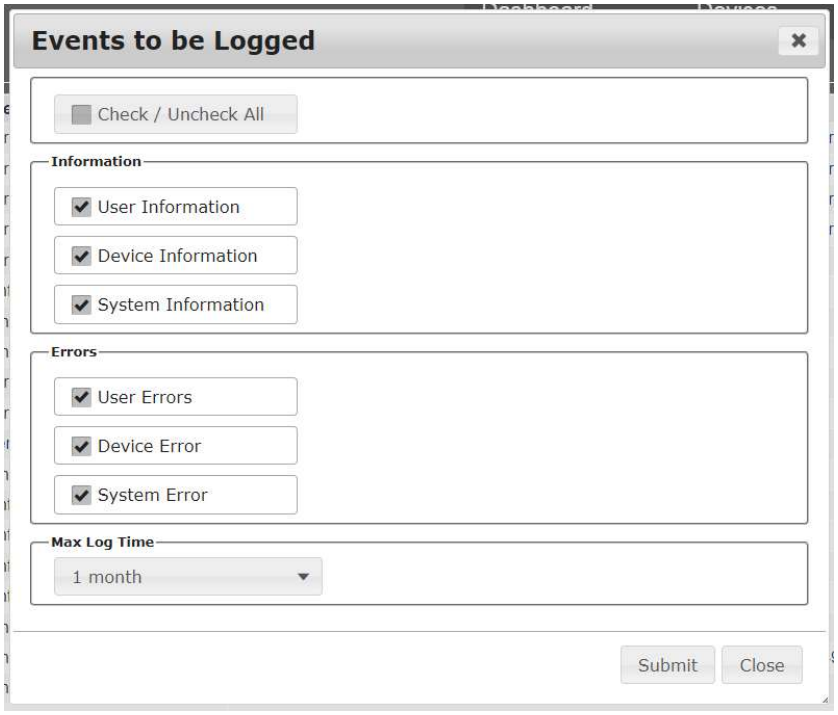


Figure 5-110 System>Log>Events to Be Logged

5.5.3 Date & Time

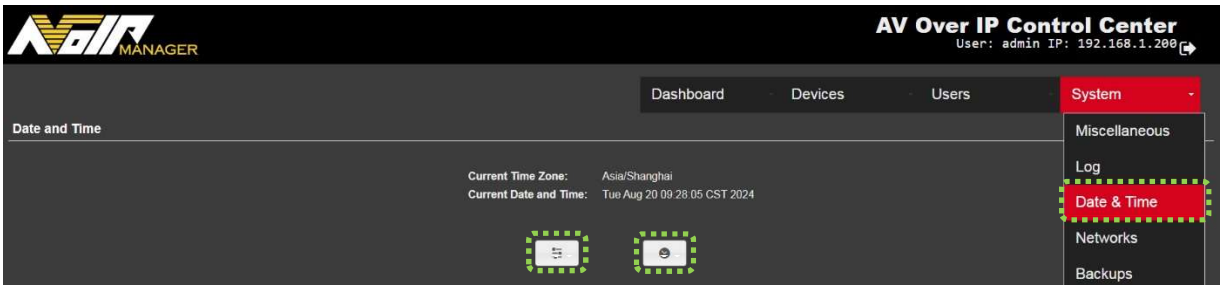


Figure 5-111 System>Date & Time

The <**Date & Time**> page is used to set up the HX-143AVC's clock. The HX-143AVC's clock can be synchronized by Internet NTP servers by clicking the <**Configure**> button and check the <**Use Internet Time**> box. The clock can also be set by clicking the available <**Set Date and Time**> button while the <**Use Internet Time**> box is not checked. The attached time information of the logged events is based on the clock information. After the Time Zone or the <**Use Internet Time**> box status is modified, click the <**Submit**> button to validate the time settings.

*Note: If you check the <**Use Internet Time**> box and still do not see the system time updated correctly, please direct your IT staff to **System**>**Networks**>**Control Network Settings** to ensure that the CONTROL NETWORK of the HX-143AVC controller is has an internet connection.

Figure 5-112 System>Date & Time>Time and Date Setup

5.5.4 Networks

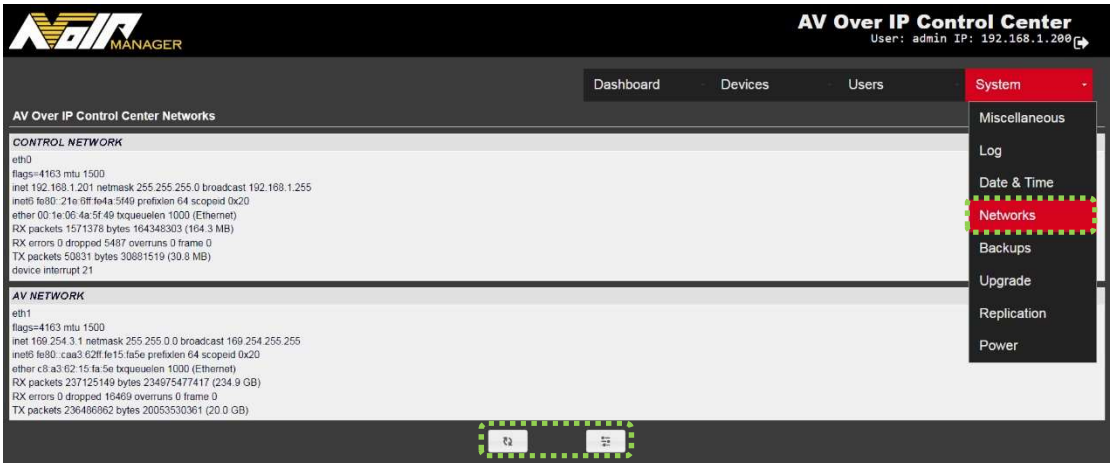


Figure 5-113 System>Networks

The HX-143AVC configuration supports 1000Mbps ethernet networking for ultra-high-speed A/V data transmission. The user interface operates based on TCP/IP protocol and provides an HTTPS network server, allowing users to access the devices on the local network via the web browser. HX-143AVC can use the default HTTPS port 443 or configurable ports from 5008 to 5025. Since HX-143AVC employs a non-CA self-signed certificate, the web browser will display a warning about an unsafe connection. However, HX-143AVC is a hardware controller rather than a website. It needs to connect with TX/RX devices via a dedicated A/V LAN (i.e., the 1000Mbps Ethernet network). HX-143AVC cannot be installed in a network environment other than the dedicated A/V LAN to access the TX/RX devices. Given that communication between HX-143AVC and TX/RX devices is TLS-encrypted, the HX-143AVC controller meets high standards of information security.

The <**Networks**> page displays the current statuses of two HX-143AVC network interfaces. Click the <**Refresh**> button to refresh the information. Click the <**Configure**> button to configure the two network interfaces.

Go to **System**>**Networks**, click the <**Configure**> button to enter <**Network Settings**> window. Modify the CONTROL NETWORK IP and AV NETWORK IP, specifying them to be different from the factory defaults. Finally, click the <**Submit**> button to reboot the HX-143AVC controller.

Set CONTROL NETWORK IP and AV NETWORK IP

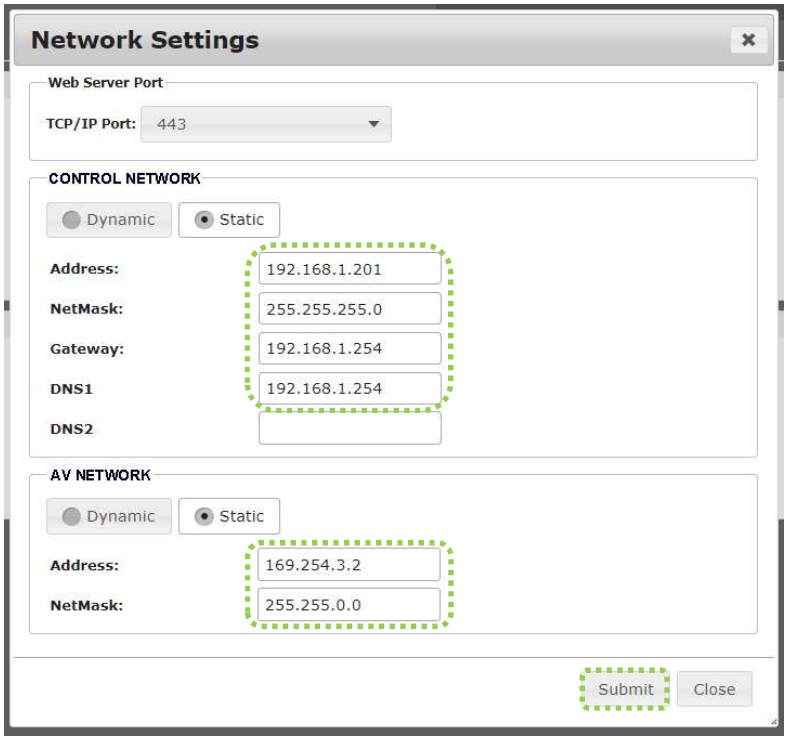


Figure 5-114 System>Networks>Configure>Network Settings

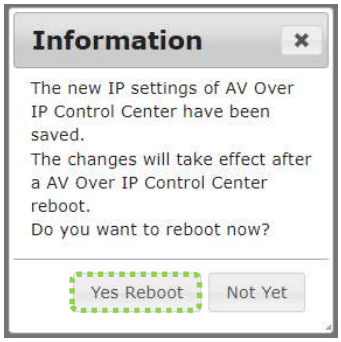


Figure 5-115 System>Networks>Configure>Network Settings>Information

5.5.5 Backups

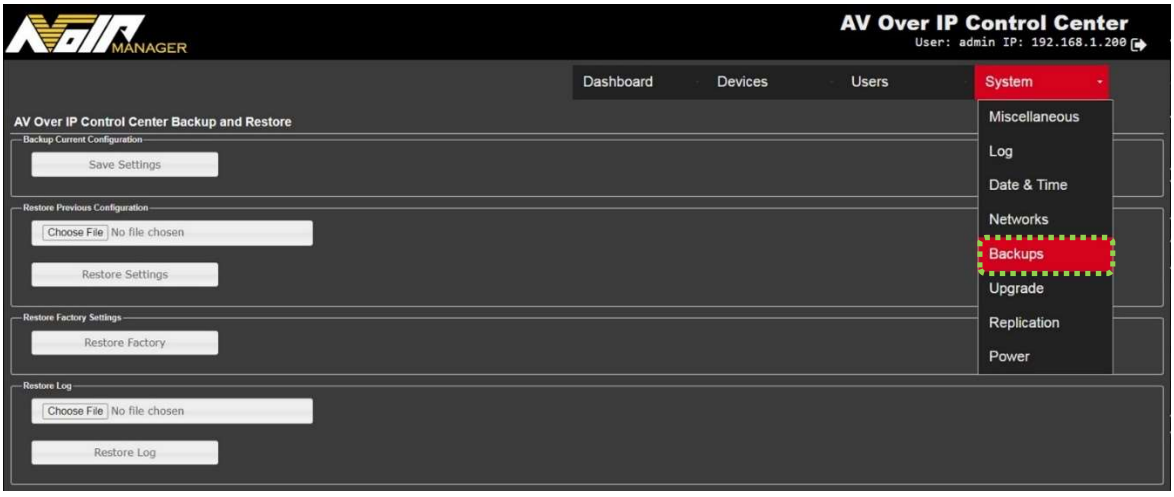


Figure 5-116 System>Backups

The <**Backups**> page allows you to back up and restore the contents of the HX-143AVC database for enhanced portability and usability. It is always recommended to back up your configuration to the computer after making any change. With the backup

files saved on your computer, you can restore them to another HX-143AVC unit with identical settings, effectively creating a redundant backup server.

The name of the backup file is generated automatically. Its format is "**avcc-backup-yymmdd.sql.gz**" where "**yymmdd**" represents the timestamp (e.g., **avcc-backup-240820.sql.gz**). This backup file is specifically for restoring to an HX-143AVC unit and should not be decompress or used for other purpose.

Manually Back up the HX-143AVC Database from the Master Unit

Manually backing up the HX-143AVC unit database is applicable only when a single HX-143AVC unit is deployed or when two HX-143AVC units are deployed but the failover function of the slave unit is disabled. To back up the current configuration, go to **System**>**Backups**, and in the <**Backup Current Configuration**> section, click the <**Save Settings**> button to periodically save the ***.gz** compressed file to your computer.

Figure 5-117 System>Backups>Backup Current Configuration

Restore HX-143AVC Database Backup to a New HX-143AVC Controller

On the <**AV Over IP Control Center Backup and Restore**> page, select the latest backup file, then click the <**Restore Settings**> button to restore it to the new HX-143AVC unit. After the restoration process is complete, its IP settings should be resubmitted to take effect before the new HX-143AVC unit reboots.

Figure 5-118 System>Backups>Restore Previous Configuration

Go to **System**>**Networks**, and click the <**Configure**> button to set up the CONTROL NETWORK IP and AV NETWORK IP. Finally, click the <**Submit**> button to reboot the new HX-143AVC unit, allowing the network settings to take effect.

*Note: Resubmit the IP settings before rebooting the new HX-143AVC unit.

Backup and Restore Log

Go to **System**>**Log**, and click the <**Save to File**> button to download the current log backup file (format: **avcc-log.txt.gz**) to your computer.

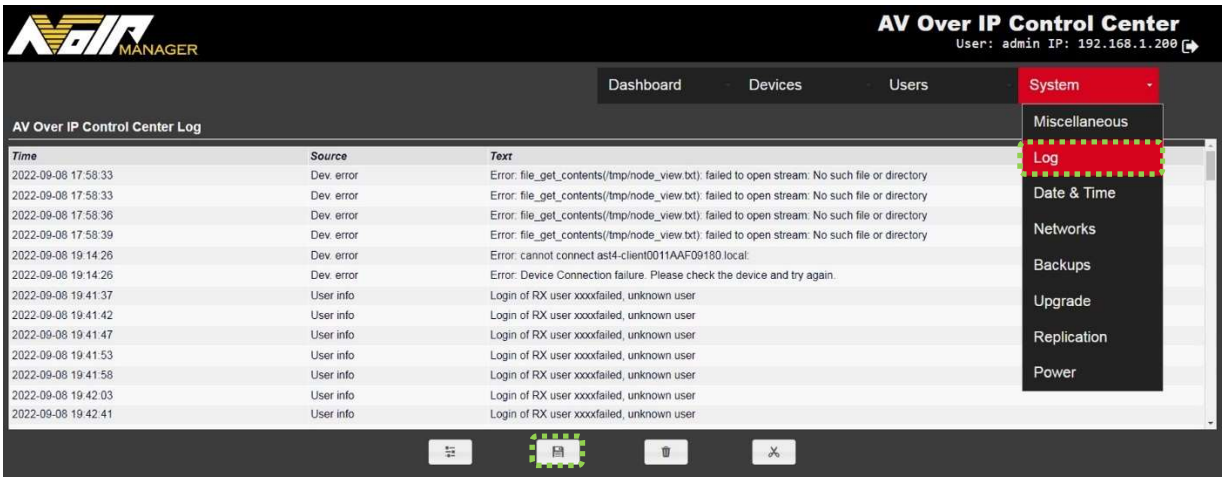


Figure 5-119 System>Log>Save to File

Next, go to **System**>**Backups**, select an existing log backup file from your computer, and click the <**Restore Log**> button to restore the log backup file to the HX-143AVC unit.

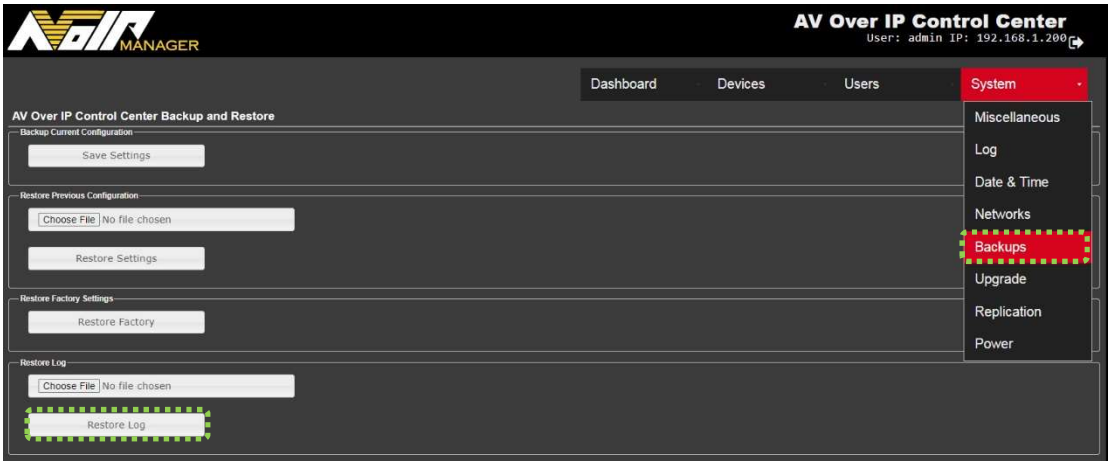


Figure 5-120 System>Backups>Restore Log

Download the Master Backup Files from the Slave Unit Management Interface

On the slave unit management interface homepage, click the <**Download Master Backup**> button . Then, click the <**Save Database Backup**> to save the database backup file to your computer, and click the <**Save Log Backup**> button to save the log backup file to your computer.

Figure 5-121 HX-143AVC Slave Unit Management Interface Homepage>Download Master Backup

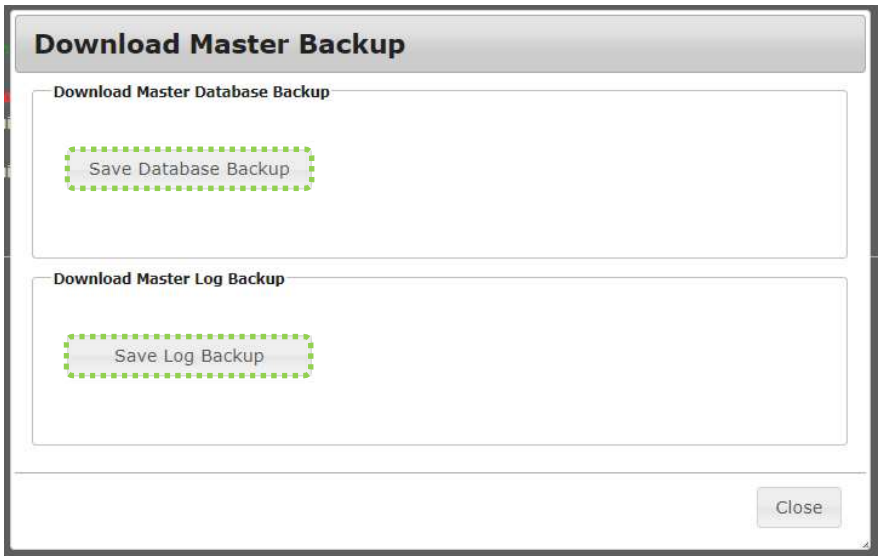


Figure 5-122 HX-143AVC Slave Unit Management Interface Homepage>Download Master Backup

*Note: HX-143AVC master unit **database backup file** format: **avcc-backup-master-xxxxxx.sql.gz**.

HX-143AVC master unit **log backup file** format: **avcc-log-master-xxxxxx.sql.gz**.

5.5.6 Upgrade

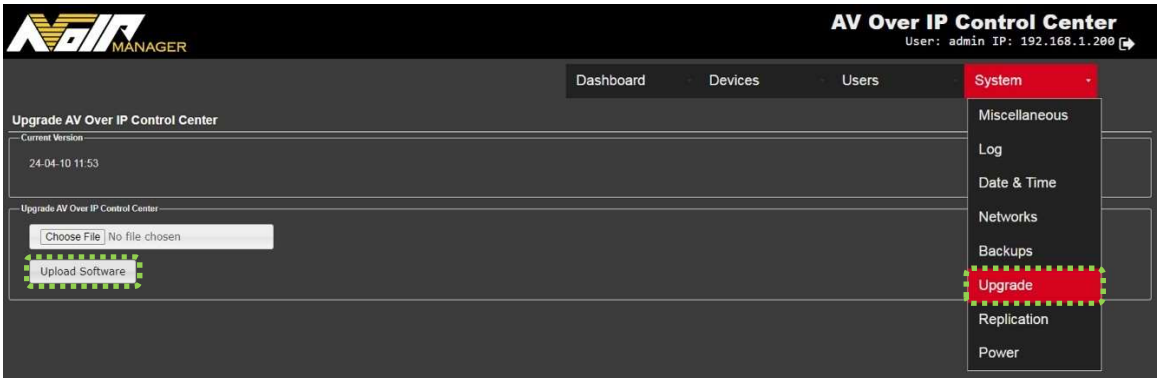


Figure 5-123 System>Upgrade

The <**Upgrade**> page displays the current version of HX-143AVC software and allows you to upgrade it. To upgrade the HX-143AVC unit, select an applicable backup file, and then click the <**Upload Software**> button. If any exception occurs during the upgrade process, go to **System**>**Backups** and restore the HX-143AVC unit to factory default settings. Then, repeat the upgrade process.

5.5.7 Replication

The <**Replication**> page is used to set up the HX-143AVC controller to operate in <**Master**> mode or <**Slave**> mode to support Failover Redundant Backup operation. After setting is selected in the <**Replication Mode**> window, the administrator can proceed with manual database replication or automatic failover management.

The HX-143AVC's factory default setting is <**No Replication**> mode, which is applicable when the user deploys only a single HX-143AVC controller in the system, or when the second HX-143AVC controller is not set as the slave unit. If the user selects <**No Replication**> mode, the administrator needs to manually save the database and log backup files to the computer regularly.

In Master-slave mode operation, the master controller unit is the control center of the HX-143AVC system. It monitors whether the slave controller unit is operating and functioning normally. The slave controller unit will regularly pool the master controller unit and back up the current database and logs from it. When the failover function is enabled, if the master controller unit fails, the slave controller unit can replace the failed master controller unit and take over its role as the new master controller unit.

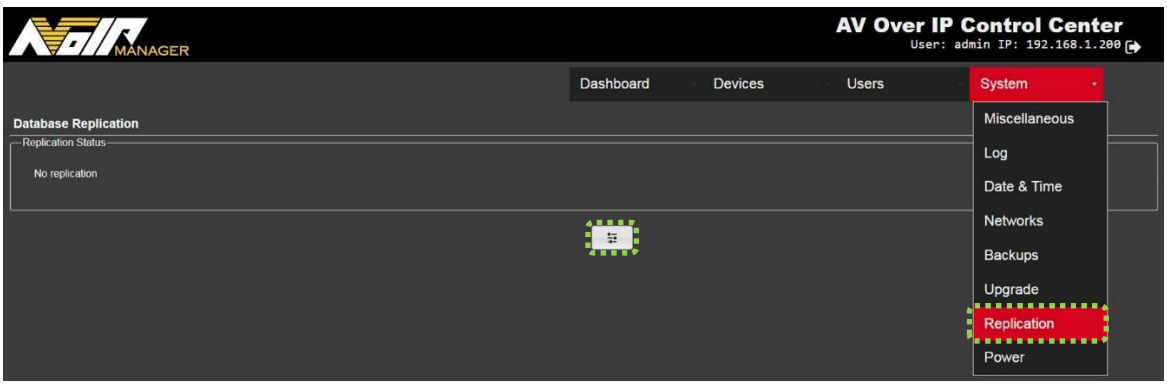


Figure 5-124 System>Replication>Configure the Replication Mode

Configure the Replication Mode

Go to **System**>**Replication**, click the <**Configure the Replication Mode**> button .

Replication Mode Default Setting <No Replication>

The default setting is <**No Replication**> when only one controller unit is installed in the system. Go to **System**> **Networks**, and click the <**Configure the Replication Mode**> button . Set the <**Replication Mode**> as <**No Replication**>. Click the <**Submit**> button, skip rebooting the controller unit, and proceed with the following IP setting procedure.

Go to **System**>**Networks**, and click the <**Configure**> button . Specify IP addresses (e.g., CONTROL NETWORK IP: 192.168.1.**201**; AV NETWORK IP: 169.254.3.**2**) that are different from the factory defaults and other connected devices. Finally, click the <**Submit**> button to reboot the controller unit and apply all the new settings.

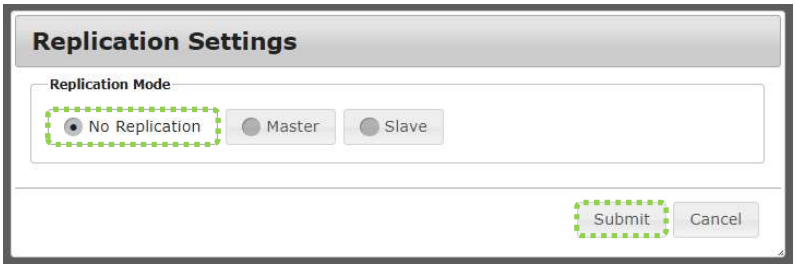


Figure 5-125 System>Replication>Replication Mode>No Replication

Set the Replication Mode to <Master>

Go to **System**>**Replication**, and set <**Replication Mode**> to <**Master**>. Finally, click the <**Submit**> button to reboot the controller unit. Check the <**Set Email Alarm**> box to notify the administrator to take the necessary remedial action when there is any controller major change in the controller (e.g., startup, fail, or shutdown).

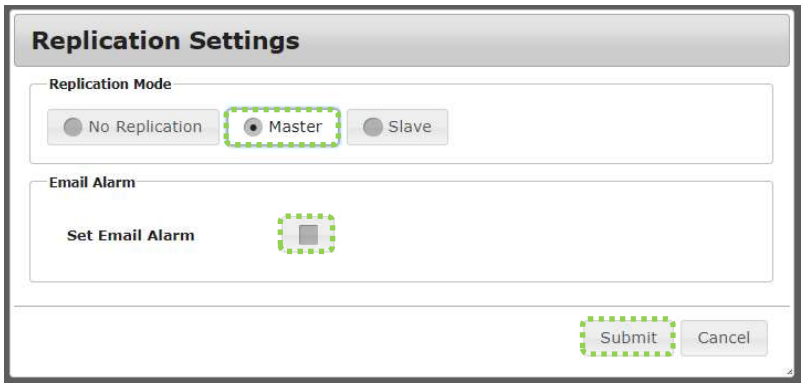


Figure 5-126 System>Replication>Replication Mode>Master

Go to **System**>**Networks**, and click the <**Configure**> button . Specify IP addresses (e.g., CONTROL NETWORK IP: 192.168.1.**201**; AV NETWORK IP: 169.254.3.**2**) that are different from the factory defaults and other connected devices. Finally, click the <**Submit**> button to reboot the controller unit and apply all the new settings.

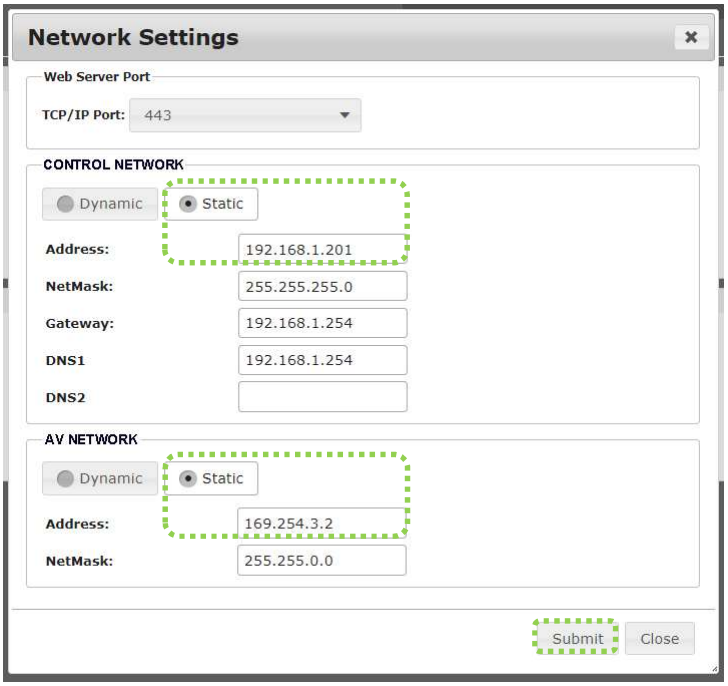


Figure 5-127 System>Networks>Network Settings

Set the Replication Mode to <Slave> and Enable Failover Function

Set the <**Replication Mode**> of the second controller unit to <**Slave**> and enable the **Failover** function. Go to **System**>**Replication**, and click the <**Configuration Replication Mode**> button . Select the <**Slave**> mode and check the <**Failover Enabled**> box. Enter the IP address of the Master unit (e.g., 192.168.1.**201**), then click the <**Submit**> button. Skip rebooting the system and proceed to **System**>**Networks**. Click the <**Configure**> button to change the IP addresses of the slave unit (e.g., CONTROL NETWORK IP: 192.168.1.**202**; AV NETWORK IP: 169.254.3.**3**). Finally, click the <**Submit**> button to reboot the controller unit and apply all the new settings.

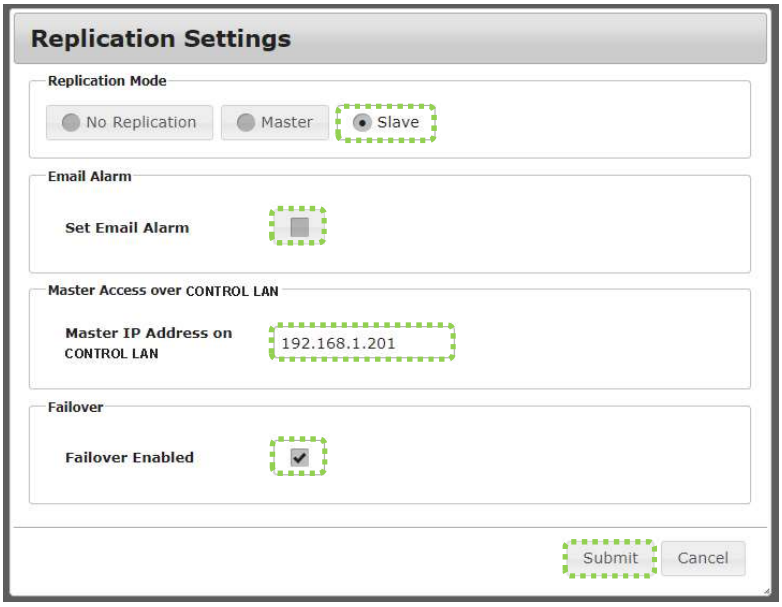


Figure 5-128 System>Replication>Replication Mode>Slave

Replication Mode: Select the <**Slave**> option.

Email Alarm: Check this box so that the administrator can be notified immediately if the slave unit fails and needs to be replaced.

Master Access over User LAN: Enter the corresponding CONTROL NETWORK IP address of the master unit.

Failover: Check the <**Failover Enabled**> box so that the slave unit can automatically start the failover redundant backup procedure.

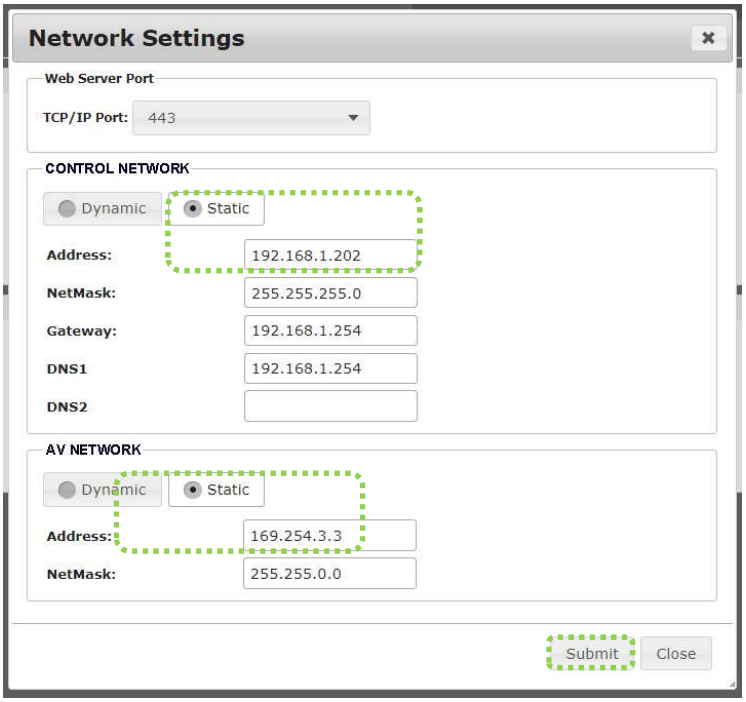


Figure 5-129 System>Networks>Configure>Network Settings

After the slave controller reboots, use the new management interface login IP address (https://192.168.1.**202**) to access the homepage of the slave unit. If the Failover function is not enabled, the user must manually back up the HX-143AVC database regularly and check the <**Set Email Alarm**> box to receive notifications about various changes of the slave unit (e.g., startup, fail, shutdown) and take the appropriate remedial actions.

5.5.8 Power

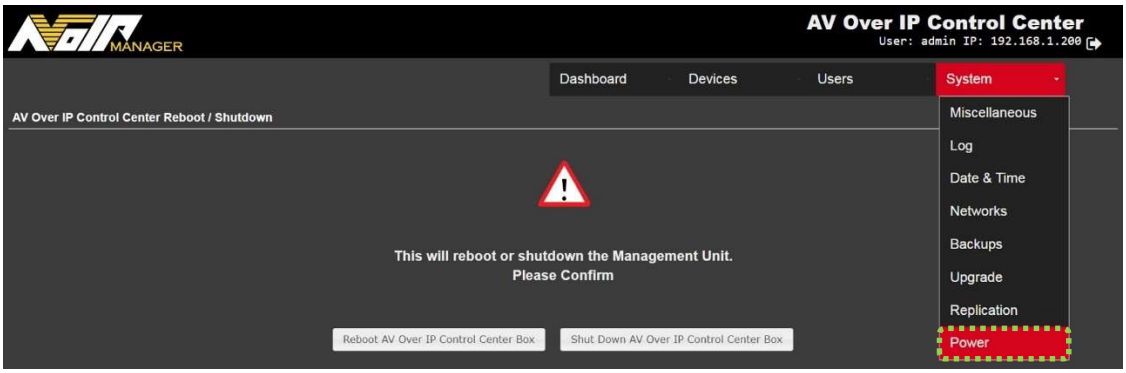


Figure 5-130 System>Power>Reboot/Shutdown

This <**Power**> page is used to reboot or shut down the HX-143AVC controller.

- Reboot HX-143AVC Controller:

  Click the <**Reboot AV Over IP Control Center Box**> button to reboot the HX-143AVC controller. In most cases, rebooting is a maintenance operation.

- Shut Down HX-143AVC Controller:

  Click the <**Shut Down AV Over IP Control Center Box** > button to turn off the HX-143AVC controller. This is equivalent to pressing the physical button on the front panel of the HX-143AVC controller.

*Note: The HX-143AVC can also be shut down by briefly pressing the <**Power**> button on its front panel.

Online <Help> Tab

For Online help with the <**System**> sections, go to **Main Menu**>**System**, selecting any items, and click the <**Help**> tab in the upper-right corner to get detailed instructions.

Figure 5-131 System>Log>Online Help

Chapter 6 Database Replication Applications

Please follow these steps to set up a master controller unit and a slave controller unit.

(1) Introduction to the Database Replication Pages of the Master and Slave Units

Go to **System**>**Replication** in the ***AVoIP Manager*** Web-based Management Interfaces of both the master and slave controller units. On the <**Database Replication**> page in the slave unit's management interface, some function menus such as <**Dashboard**>, <**Device**>, and <**User**> are not available. The slave unit management interface also indicates the current controller unit is a slave by displaying "**Replication Slave Mode**" in red.

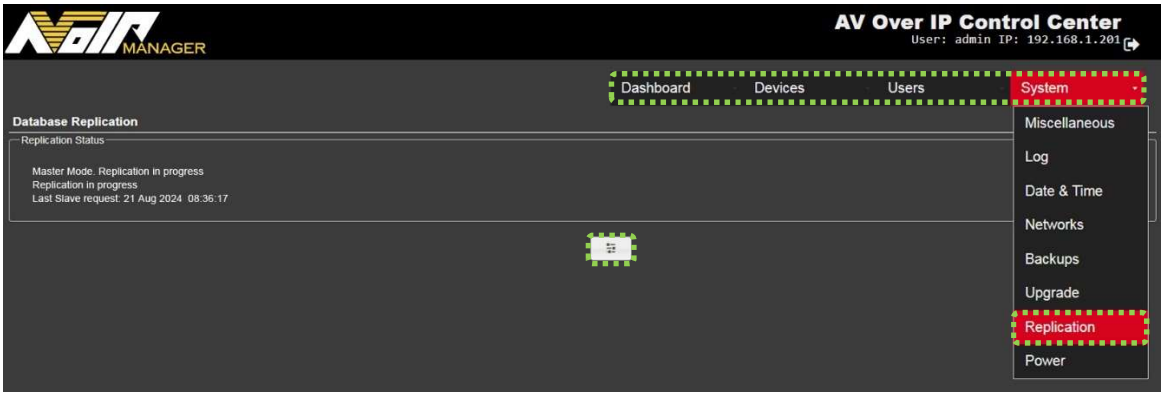


Figure 6-1 Database Replication page of the Master Controller Unit

Figure 6-2 Database Replication page of the Slave Controller Unit

(2) Download the Master Database Backup and Master Log Backup from the Slave Controller Unit

On the <**Database Replication**> page, click the <**Download Master Backup**> button to save Master unit's database and log backup files to the computer. If the master unit fails, the user can restore the backup files to the current slave unit. The slave unit will then take over the role of the failed master unit and become the new master unit. Click the <**Save Database Backup**> button to save the Master Database Backup file (***avcc-backup-master-xxxxxx.sql.gz***) to the computer. Next, click the <**Save Log Backup**> button to save the Master Log Backup file (***avcc-log-master-xxxxxx.txt.gz***) to the computer.

*Note: Do not decompress those two files for other use.

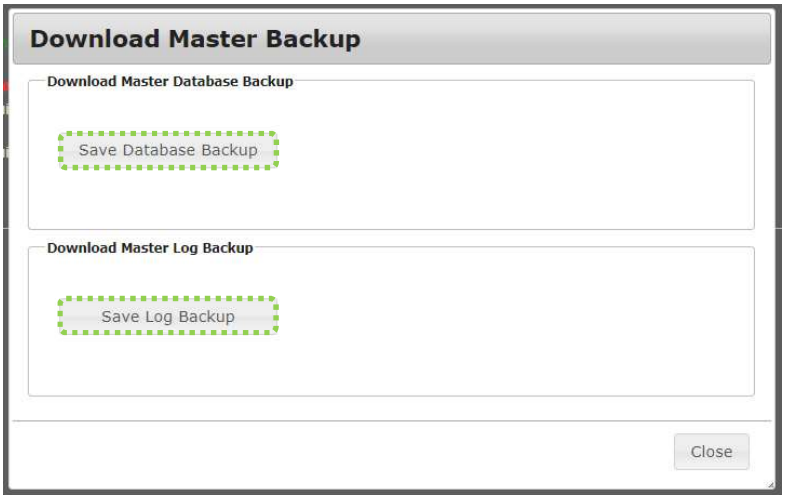


Figure 6-3 Slave Unit Management Interface Homepage>Download Master Backup

(3) Download the Database Backup File from the Current Controller (Master/Slave/Single Unit) and Restore It to the New Controller.

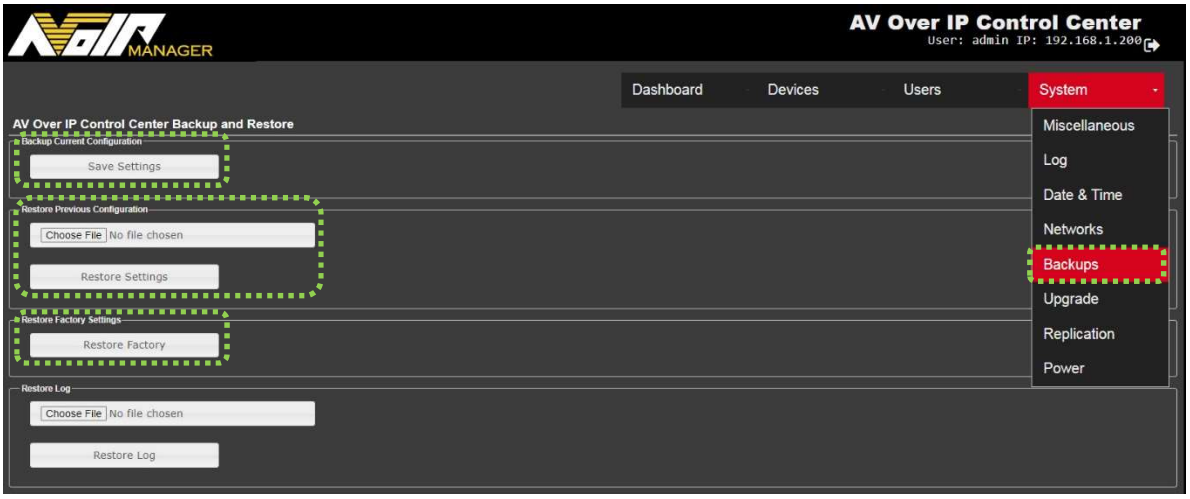


Figure 6-4 System>Backups

a. In a single-controller system, the user can go to **System**>**Backups** and click the <**Save Settings**> button to save a database backup file to the computer.

b. In a dual-controller system, if the current controller unit replacing the failed master unit is not newly purchased, click the <**Restore Factory**> button to reset it to factory default settings. Then, go to <**Restore Previous Configuration**> and select a previously saved database backup file from the computer to restore it to the current controller unit.

c. In a single-controller system, the user can reset the failed controller to factory default settings and restore the database backup file to it by following the same steps as described above.

(4) Download the Log Backup File from the Master Unit or Single Controller Unit and Restore It to the New Controller

a. Go to **System**>**Log** and click the <**Save to File**> button to download the Log Backup file (***avcc-log-xxxxxx.txt.gz***) from the current controller unit to the computer.

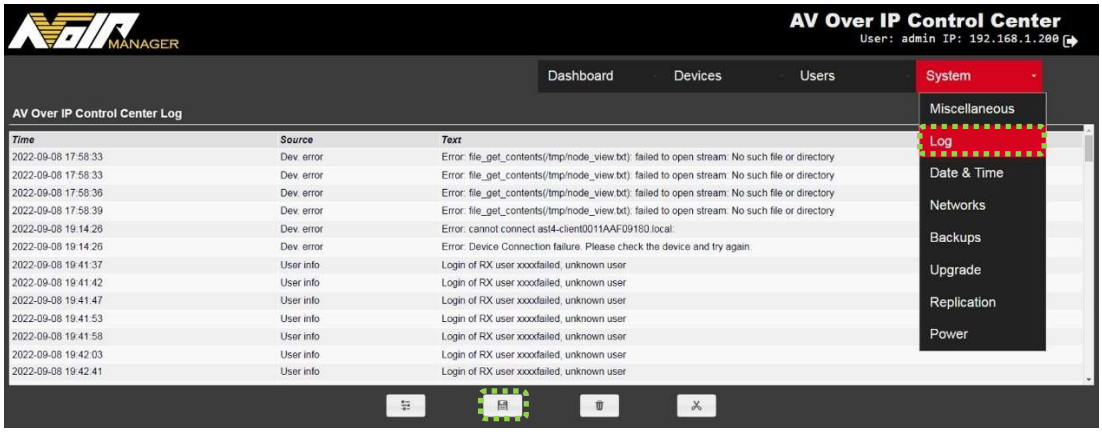


Figure 6-5 System>Log>Save to File

b. Go to **System**>**Backups** and click the <**Restore Log**> button to restore the Log Backup file previously saved on the computer to the current controller unit.

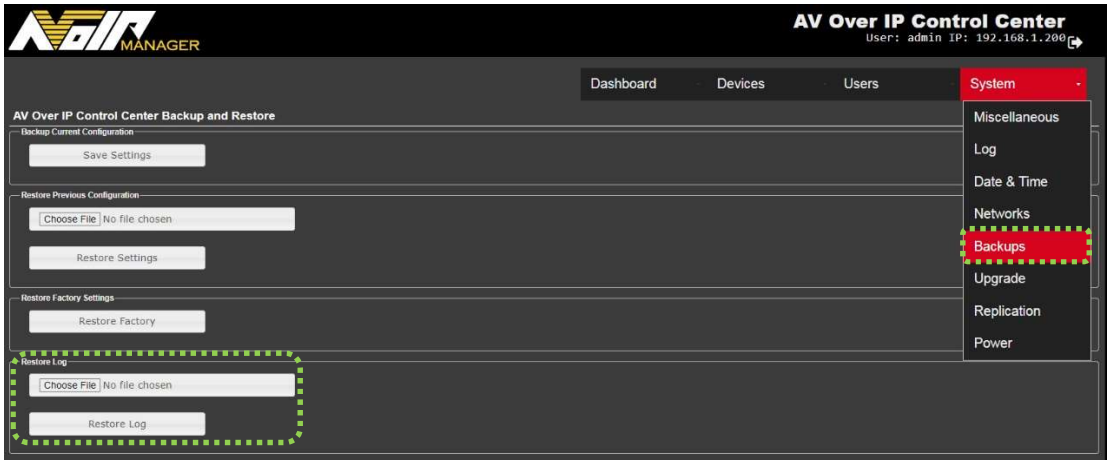


Figure 6-6 System>Backups>Restore Log

*Note: The Log Backup file only records various system events and does not affect any substantial operation of the controller. Log restoration is performed upon the user's request.

(5) Set up the New Controller Unit as Master or Slave Unit

a. Set up the newly added controller as a master unit

Go to **System**>**Replication**, set the <**Replication Mode**> option to <**Master**>.

Click the <**Submit**> button to reboot the controller.

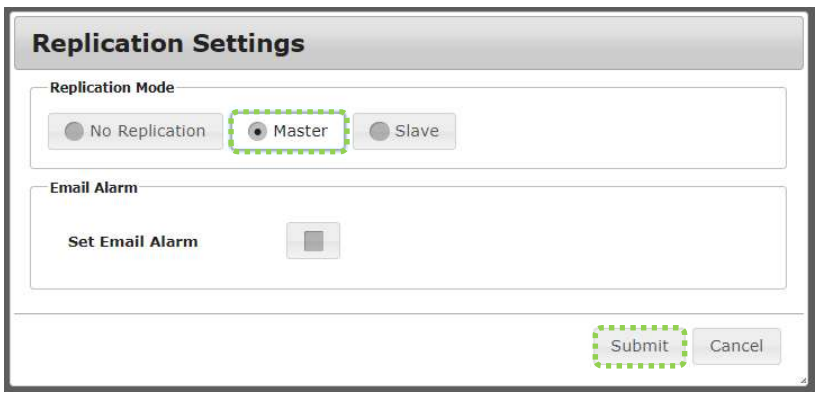


Figure 6-7 System>Replication>Replication Mode>Master

b. Set up the newly added controller as a slave unit

Go to **System**>**Replication**, set the <**Replication Mode**> option to <**Slave**>.

Enter the IP address of the master unit.

The Failover function can be enabled based on user's preference. When enabled, the slave unit will automatically replace the failed master unit and become the new master unit.

Click the <**Submit**> button to reboot the controller.

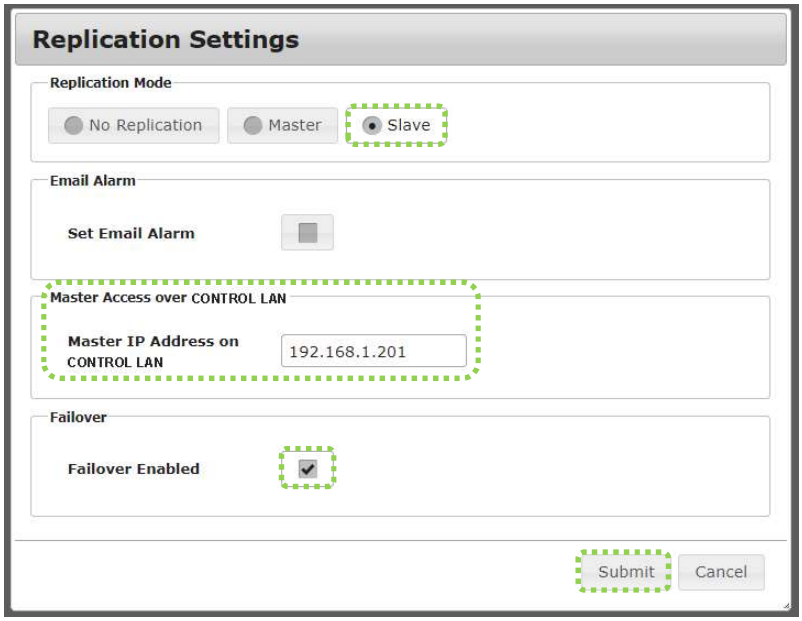


Figure 6-8 System>Replication>Replication Mode>Slave

Chapter 7 Master-slave System Failover

In a Master-slave System Failover setup, the master and slave units operate in parallel with their databases synchronized to ensure they are nearly identical. To create a redundant and failover-capable server solution, both a master unit and a slave unit should be included in the system. When the master unit fails or becomes offline, the system can address the failure either through the administrator's manual intervention or via the system's automatic failover procedure.

7.1 HX-143AVC Master-slave Deployment

To set up a redundant failover system, first configure an HX-143AVC master unit. Next, configure an HX-143AVC slave unit to serve as a failover redundant server. During normal operation, the HX-143AVC master unit and the HX-143AVC slave unit will work in parallel. The slave unit will poll the master unit every minute to back up the latest database settings and event logs.

With the Failover function enabled, if the slave unit detects that the master unit has failed or is offline, it will automatically take over as the new master unit. Additionally, the slave unit will send an email notification to the administrator, informing him of the failure and prompt him to replace the failed master unit with a new slave unit.

In the Master-slave system failover setup, if the master unit no longer receives polling from the slave unit, it will send an email notification to alert the administrator of the slave unit's failure. The administrator will need to download the database backup files from the master unit to the computer and then restore them to the newly added controller unit, which will become the new slave unit.

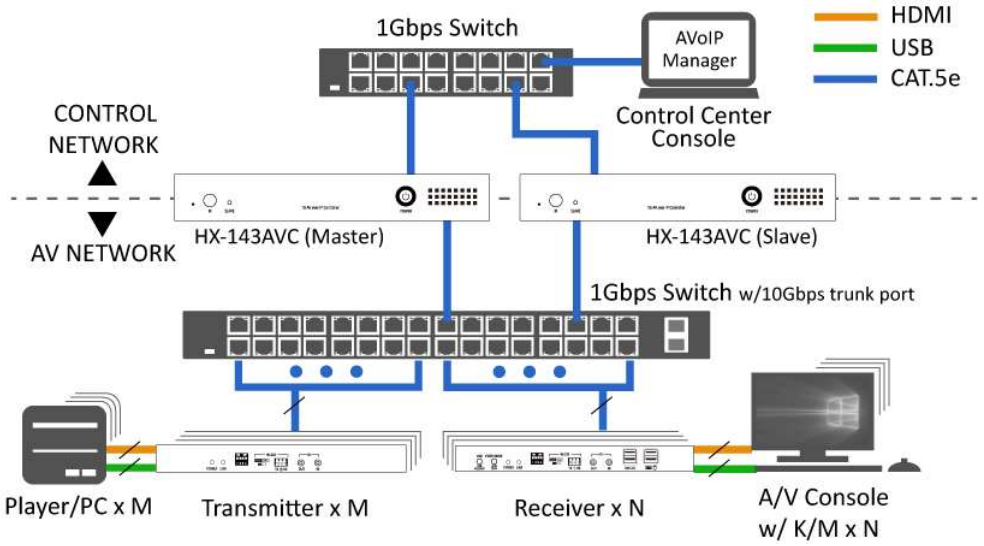


Figure 7-1 Configuration Diagram for Master and Slave Units

7.1.1 How to Setup HX-143AVC Master-slave Units

The database replication procedure involves two controller units: a HX-143AVC master unit and a HX-143AVC slave unit. The administrator should complete hardware connection of the master and slave units according to the configuration diagram. (Please follow the steps below to determine the power-on sequence.) Log in to the web-based management interface ***AVoIP Manager*** and set up the two units with different CONTROL NETWORK IP addresses and different AV NETWORK IP addresses. Ensure that the two controller units are located within the same AV NETWORK segment where the transmitters and receivers are installed. Use different CONTROL NETWORK IP addresses to respectively log in to the web-based management interfaces for master and slave units. In HX-143AVC <**Database Replication**> mode, configure one unit as the master and the other as the slave. The automatic failover procedure will only take effect if the <**Failover Enabled**> box is checked in the <**Replication Settings**> window of the slave unit.

Steps for Creating a Master-slave Failover Environment

Please follow the installation steps below to deploy one master unit and one slave unit in the system.

- **Installation Notes**

1) Complete the hardware installation and software configuration for the HX-143AVC master unit first, followed by the HX-143AVC slave unit.
2) The HX-143AVC master unit and slave unit must be connected to the same network segment of the CONTROL NETWORK and the same network segment of the AV NETWORK. The CONTROL NETWORK and the AV NETWORK must be independent of each other.

- **Installation Steps**

1) Connect the HX-143AVC master unit to the system and power it on. Open a browser of a PC connected to the same CONTROL NETWORK as the two HX-143AVC units. In the browser, enter the factory default management interface login IP address (**https://192.168.1.200**). Use the factory default Administrator username (***admin***) and password (***adminpass***) to log in to the management interface ***AVoIP Manager***.
2) After the first login, create a new administrator username and password, then delete the factory default Administrator account (***admin***). Next, log in to the management interface again using the new administrator account. Change the network settings of the master unit by following these steps:
   a. In the management interface, navigate to **System > Networks**.
   b. Click the **<Configure>** button at the bottom of the page to open the Network Settings page.
   c. Enter the CONTROL NETWORK IP as **192.168.1.201** for the master unit.
   d. Enter the AV NETWORK IP as **169.254.3.2**.
   e. Keep the rest of the settings as default.
   f. Click the **<Submit>** button and skip the reboot process.
3) Navigate to **System > Replication**. At the bottom of the page, click the **<Configure the Replication Mode>** button to open the <**Replication Settings**> window. Set this unit as <**Master**>. Click the **<Submit>** button and reboot the master unit.
4) After the HX-143AVC master unit reboots successfully, enter the new management interface login IP address: **https://192.168.1.201** to log in to the master unit's management interface.
5) Connect the HX-143AVC slave unit to the system and power it on. Open a browser and enter the factory default management interface login IP address (**https://192.168.1.200**). Log in to the management interface using the factory default administrator username (***admin***) and password (***adminpass***).
6) After the first login, create a new administrator username and password, then delete the factory default administrator account (***admin***). Next, log in to the management interface again using the new administrator account. Navigate to **System > Networks** and click the **<Configure>** button. Change the slave unit's CONTROL NETWORK IP address to **192.168.1.202** and its AV NETWORK IP to **169.254.3.3**.
7) Navigate to **System > Replication**. At the bottom of the page, click the **<Configure the Replication Mode>** button to open the <**Replication Settings**> window. Set this unit as <**Slave**> and enter the Master IP Address on the CONTROL LAN as **192.168.1.201**. Reboot the slave unit, then log in to the slave unit's management interface using the new management interface login IP address: **https://192.168.1.202**.

- **Steps to Set up the IP Address of the Master Unit**

a. Log in to the master unit's management interface using the factory default login IP address (**https://192.168.1.200**).

b. Navigate to **System**>**Networks**, and click the <**Configure**> button .

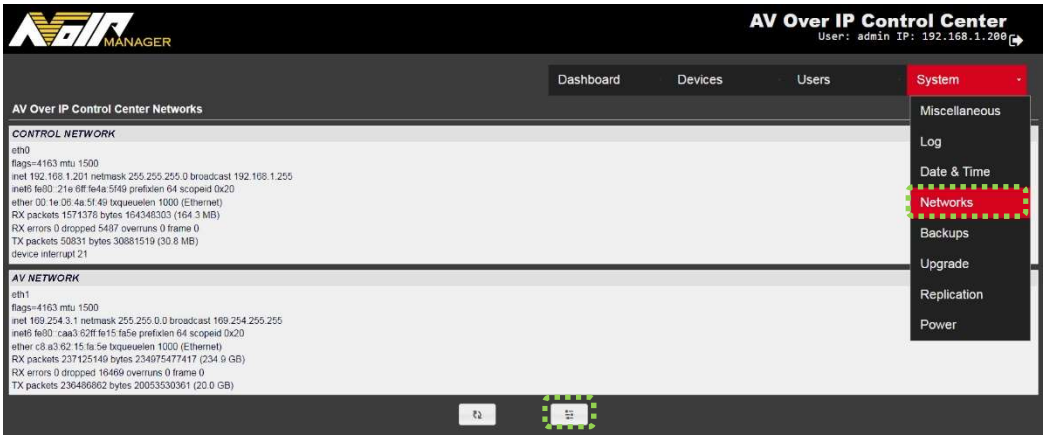


Figure 7-2 System>Networks>Configure

c. Enter the Master unit CONTROL NETWORK IP as **192.168.1.201** and the AV NETWORK IP as **169.254.3.2**. Click the **<Submit>** button, skip rebooting, and continue with the following steps.

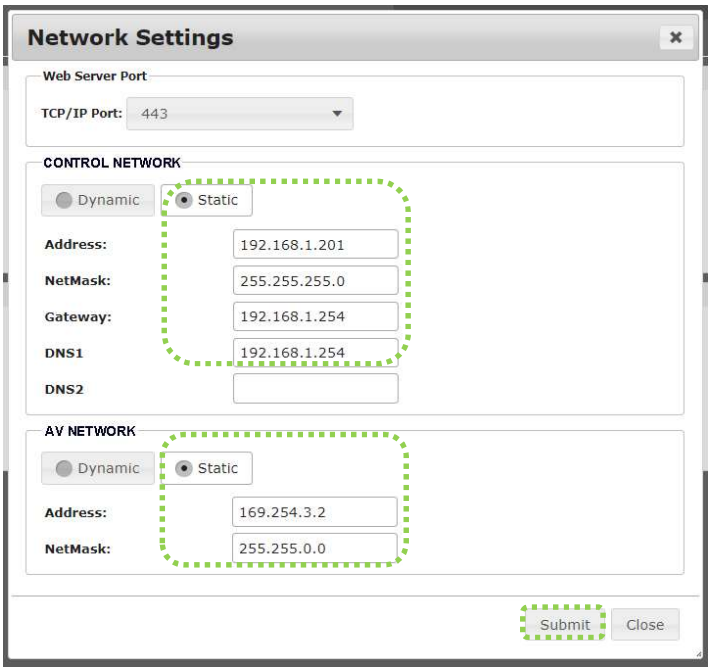


Figure 7-3 System>Networks>Configure>Network Settings

Figure 7-4 Skip Rebooting the Master Controller Unit

d. Go to **System**>**Replication**, click the <**Configure the Replication Mode**> button , set the <**Replication Mode**> option to <**Master**>, and then click the <**Submit**> button to reboot the master unit.

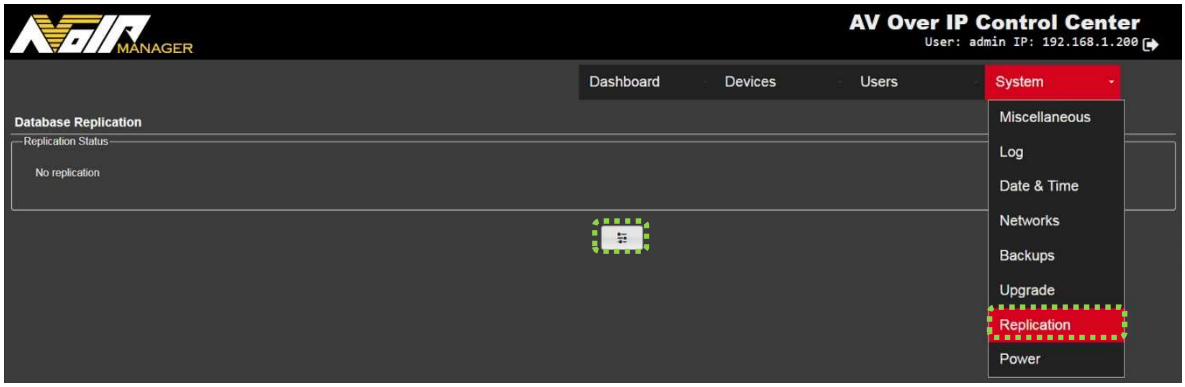


Figure 7-5 System>Replication>Configure the Replication Mode

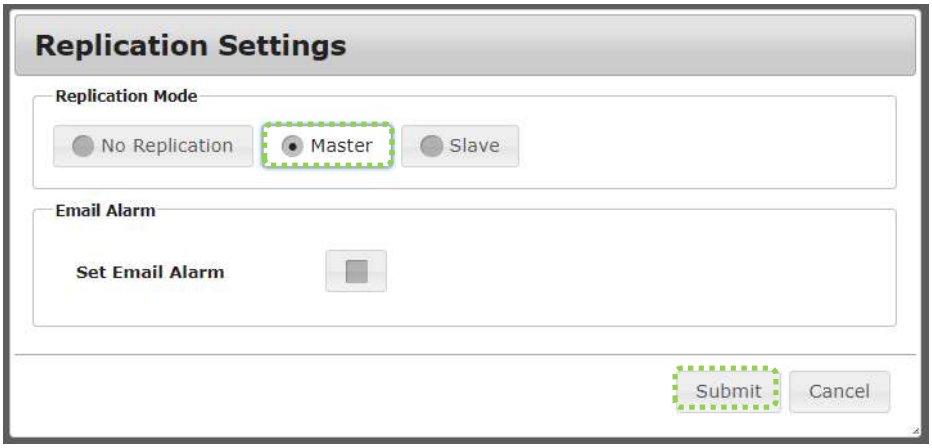


Figure 7-6 System>Replication> Configure the Replication Mode >Replication Settings

Figure 7-7 Confirmation Window to Change the Controller into the Replication Master

e. Enter the new management interface login IP address (**https://192.168.1.201**) in the browser's address bar to log in to the management interface of the master unit.

●Steps to Set up the IP Address of the Slave Unit

a. Log in to the slave unit's management interface using the factory default login IP address (**https://192.168.1.200**).

b. Navigate to **System**>**Networks**, click the <**Configure**> button .

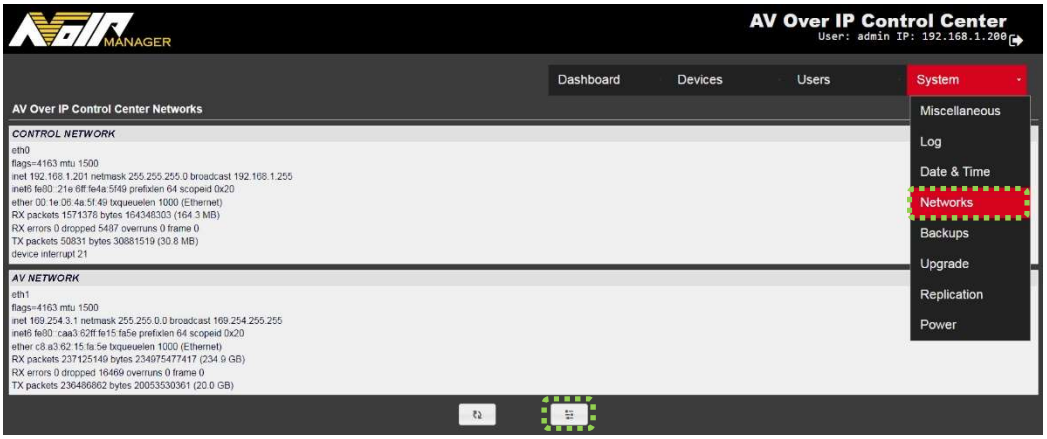


Figure 7-8 System>Networks>Configure

c. Enter the Slave unit CONTROL NETWORK IP as **192.168.1.202** and the AV NETWORK IP as **169.254.3.3**. Click the **<Submit>** button, skip rebooting, and continue with the following steps.

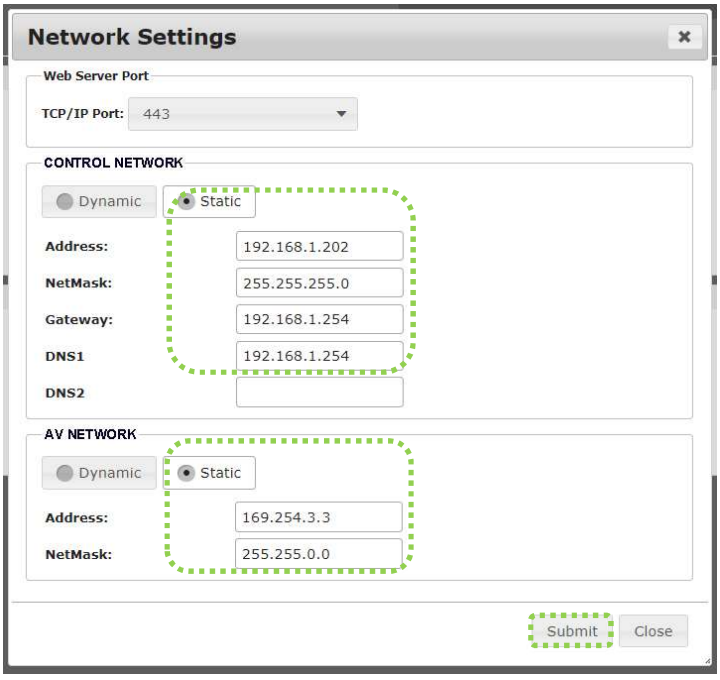


Figure 7-9 System>Networks>Configure>Network Settings

Figure 7-10 Skip Rebooting the Slave Controller Unit

d. Go to **System > Replication**, click the **<Configure the Replication Mode>** button , set the <**Replication Mode**> option to <**Slave**>, enter the Master unit CONTROL NETWORK IP address (**192.168.1.201**), and check the Email Alarm and Failover boxes according to the user's needs. Finally, click the **<Submit>** button to reboot the slave unit.

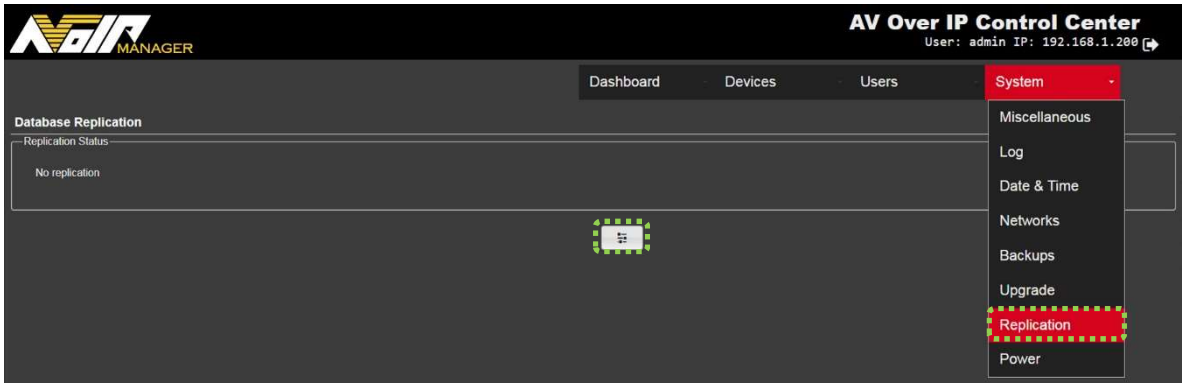


Figure 7-11 System>Replication>Configure the Replication Mode

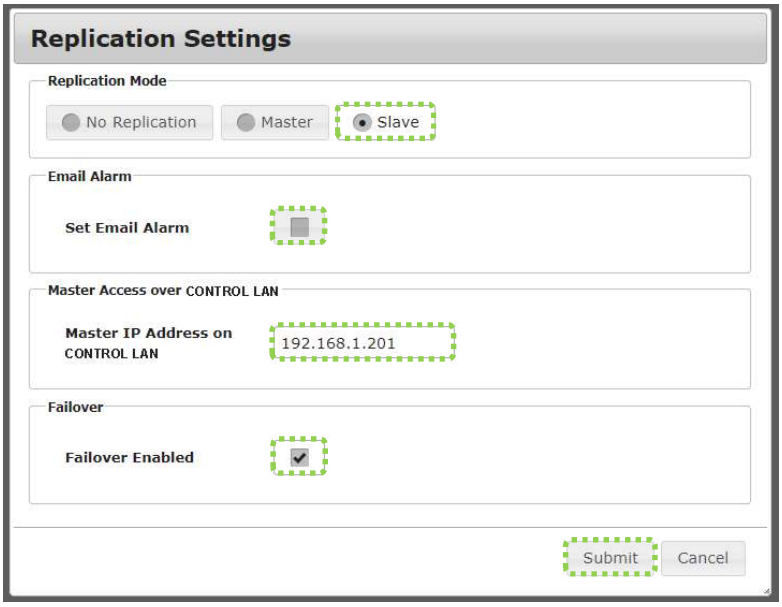


Figure 7-12 System>Replication> Configure the Replication Mode >Replication Settings

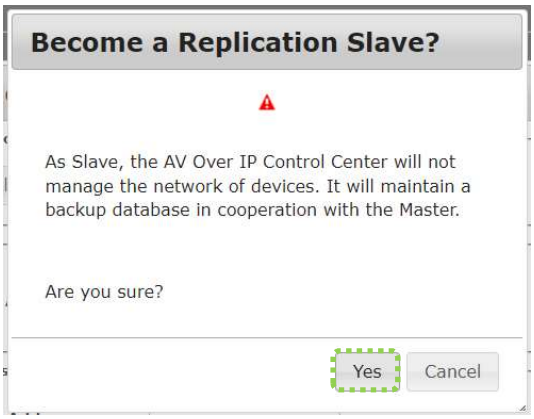


Figure 7-13 Confirmation Window to Change the Controller into the Replication Slave

e. Enter the new management interface login IP address (**https://192.168.1.202**) in the browser's address bar to log in to the management interface of the slave unit.

7.1.2 How to Reset the HX-143AVC Controller to Factory Default Settings

There are two approaches to reset the HX-143AVC controller to factory default settings:

(2) Hardware Approach: Press and hold the recessed tact switch on the rear panel of the HX-143AVC controller for at least 15 seconds. When the controller is being reset to factory default, the monitor connected to the rear panel HDMI connector will go black. Please note that the entire process will take at least 3 minutes. **DO NOT REMOVE** the power

supply of the HX-143AVC controller during this time to avoid any serious failures. When the process is complete, the power button with the LED indicator will light up, and the monitor will display the login page of the ***AVoIP Manager***, indicating that the controller is back in service.

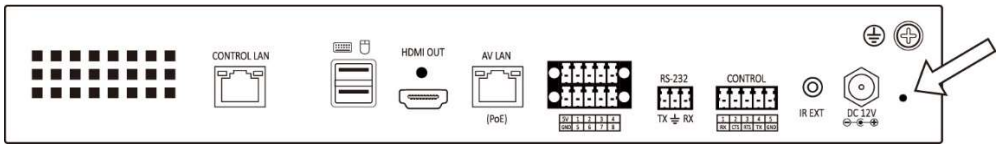


Figure 7-14 Recessed Tact Switch to Reset the Controller to Factory Default Setting

*Note: The Power LED Indicator and the SLAVE LED Indicator on the front panel of the controller represent different system statuses, as shown in the table below:

Table 7-1

Power LED Indicator Status	SLAVE LED Indicator Status	System Status
OFF	OFF	Controller's Power Supply Unavailable/Shutdown Status
Constantly ON	OFF	Single Controller in <**No Replication**> Mode
Flashing	OFF	Master Controller Unit in <**Replication**> Mode
Flashing	ON	Slave Controller Unit in <**Replication**> Mode

(2) Software Approach: Go to **System**>**Backups**, and click the <**Restore Factory**> button. When the controller is being reset to factory default, the screen of the monitor connected to the rear panel HDMI connector will go black. Please note that the entire process will take at least 3 minutes. **DO NOT REMOVE** the power supply of the HX-143AVC controller during this time to avoid any serious failures. When the process is complete, the power button with the LED indicator will light up, and the monitor will display the login page of the ***AVoIP Manager***, indicating that the controller is back in service.

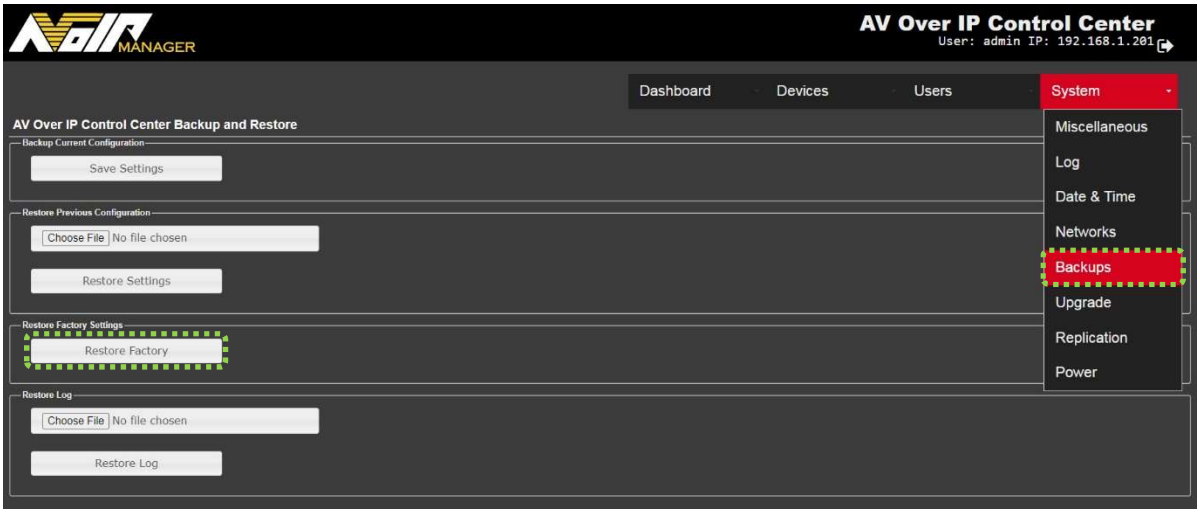


Figure 7-15 System>Backups>Restore Factory Settings

7.2 HX-143AVC Master-slave Database Replication Failover

In a system with only one HX-143 unit, the administrator must regularly perform manual database and log backups of this controller unit to the computer. If this single controller unit fails or goes offline, the administrator can manually restore the latest backup files to a new controller unit to replace the failed one.

While there is one HX-143AVC master unit and one HX-143AVC slave unit operating in parallel in the system, the slave unit will regularly poll the master unit and replicate database and log backups from it. If the master unit stops responding to the slave unit or fails to receive polling from the slave unit, it is considered a controller failure or an offline event. The operational controller unit will send a notification to the email address specified by the user. This email will inform the administrator of the failure event of either the master or the slave unit. The user can enable the Failover function by selecting it in the database replication settings of the slave unit. If the HX-143AVC master unit fails, the slave unit will automatically replace the failed master unit and take over the role of the new master unit. The administrator will then need to manually remove the failed master unit and add a new slave unit. Whether the failure is resolved manually or automatically, the system can quickly resume normal operation.

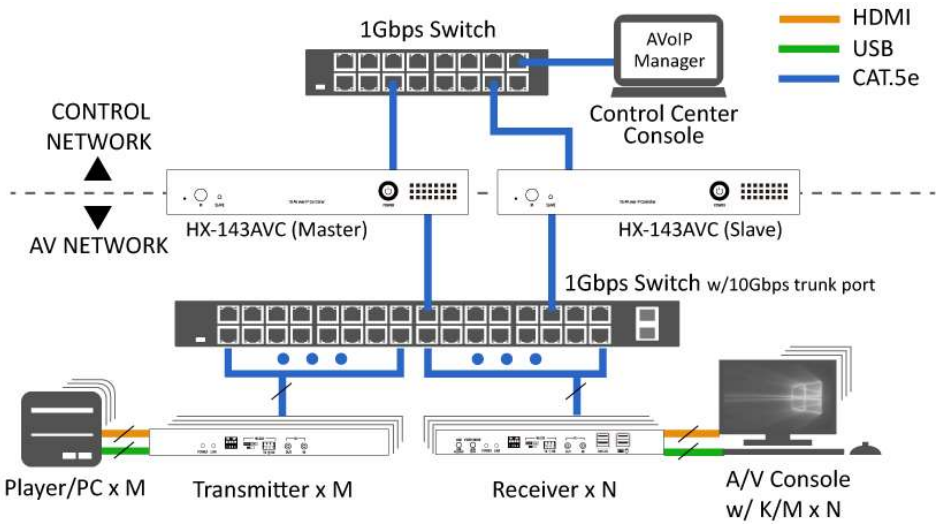


Figure 7-16 Dual-Controller System Configuration

7.2.1 HX-143AVC Database Replication with Failover Function Disabled (Manual Recovery Operation)

In the <**Replication**> menu, please refer to the following examples to replace the failed master or slave units.

(1) Single Controller System Operating without a Slave Controller Unit

When the single controller unit is operating normally, the administrator must regularly save the database and log backups from the single controller unit to the computer manually. If the controller fails, the administrator will restore the backup files to a new controller unit after being notified of the system failure. The administrator will remove the failed controller unit and place the new controller unit in the same network environment as the failed master unit. Once the new controller reboots successfully, the system will resume operation.

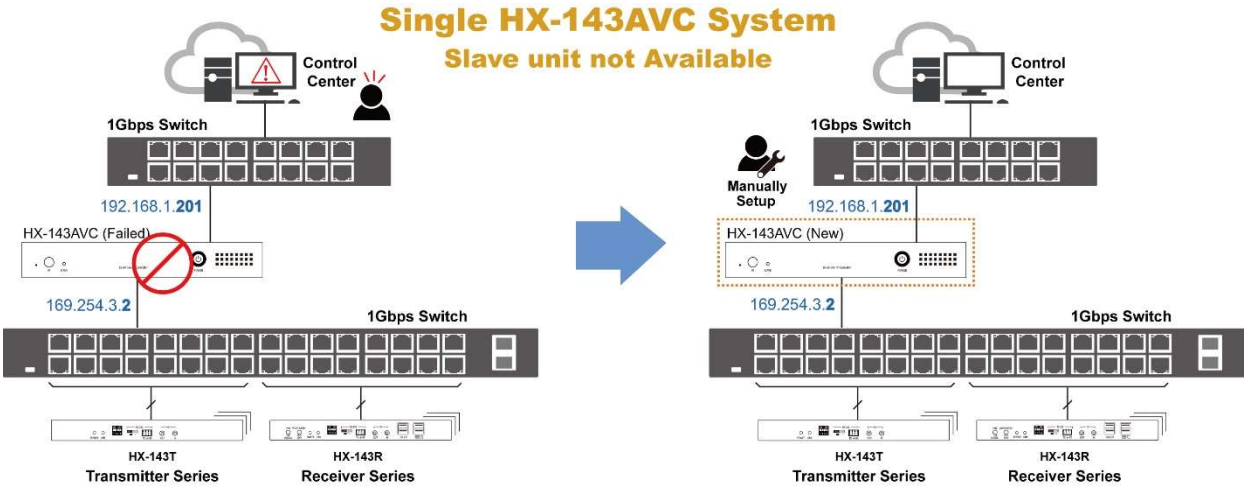


Figure 7-17 Single-controller System Manual Recovery Operation

(2) Master and Slave Controller Units Operating in Parallel with the Failover Function of the Slave Unit Disabled

In Replication Mode, the Failover Function of the slave unit is disabled by the user. Once the master unit fails, the slave unit will not automatically replace the failed master unit. The administrator needs to manually download the database and log backups from the slave unit to the computer. Next, restore these backups from the computer to a new controller unit. Remove the failed master unit and place the new master unit back into the same network environment as the failed master unit. Change its CONTROL NETWORK/AV NETWORK IP settings to match those of the failed master unit and reboot the new master unit to resume system operation.

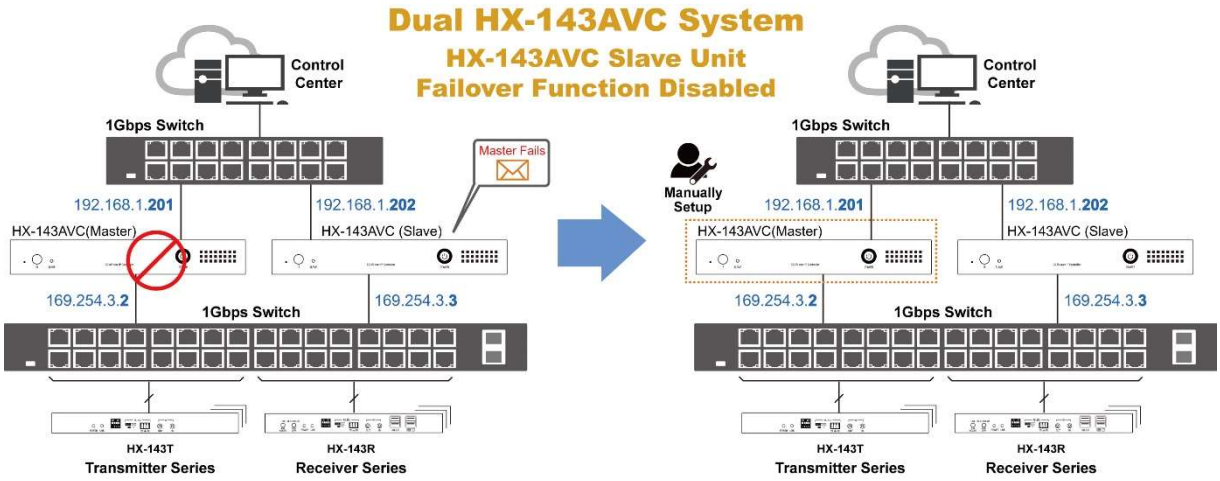


Figure 7-18 Dual-controller System Manual Recovery Operation

As mentioned above, since the Failover function is disabled, the administrator still needs to manually set up and replace the failed controller units as soon as the system fails. The user can decide whether to enable it based on his application.

*Note: Once the system operates with a master unit and a slave unit in parallel, the slave unit will regularly perform database and log backups from the master unit to itself. The Failover function checkbox only relates to the decision of allowing the slave unit to automatically replace the failed master unit to resume the system.

Download the database backup from the controller unit to the computer and restore the backup file from the computer to the controller unit.

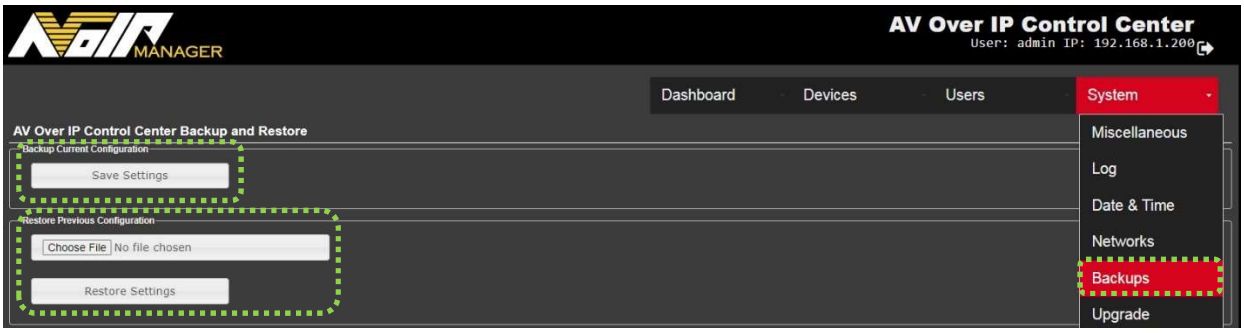


Figure 7-19 System>Backups>Database Backup and Restore

Go to **System**>**Backups**, download the database backup file from the HX-143AVC controller unit in normal operation, and save it to the computer.

Remove the failed controller unit. Then go to **System**>**Backups**. To restore the previous configuration, find the database backup files (file format: **dxcc-backup-xxxxxx.sql.gz**), click <**Choose File**> button to load the desired database backup file, and then click the <**Restore Settings**> button to resolve the fault condition.

Scenario (a): The master unit and slave unit operate in parallel, and the master unit fails.

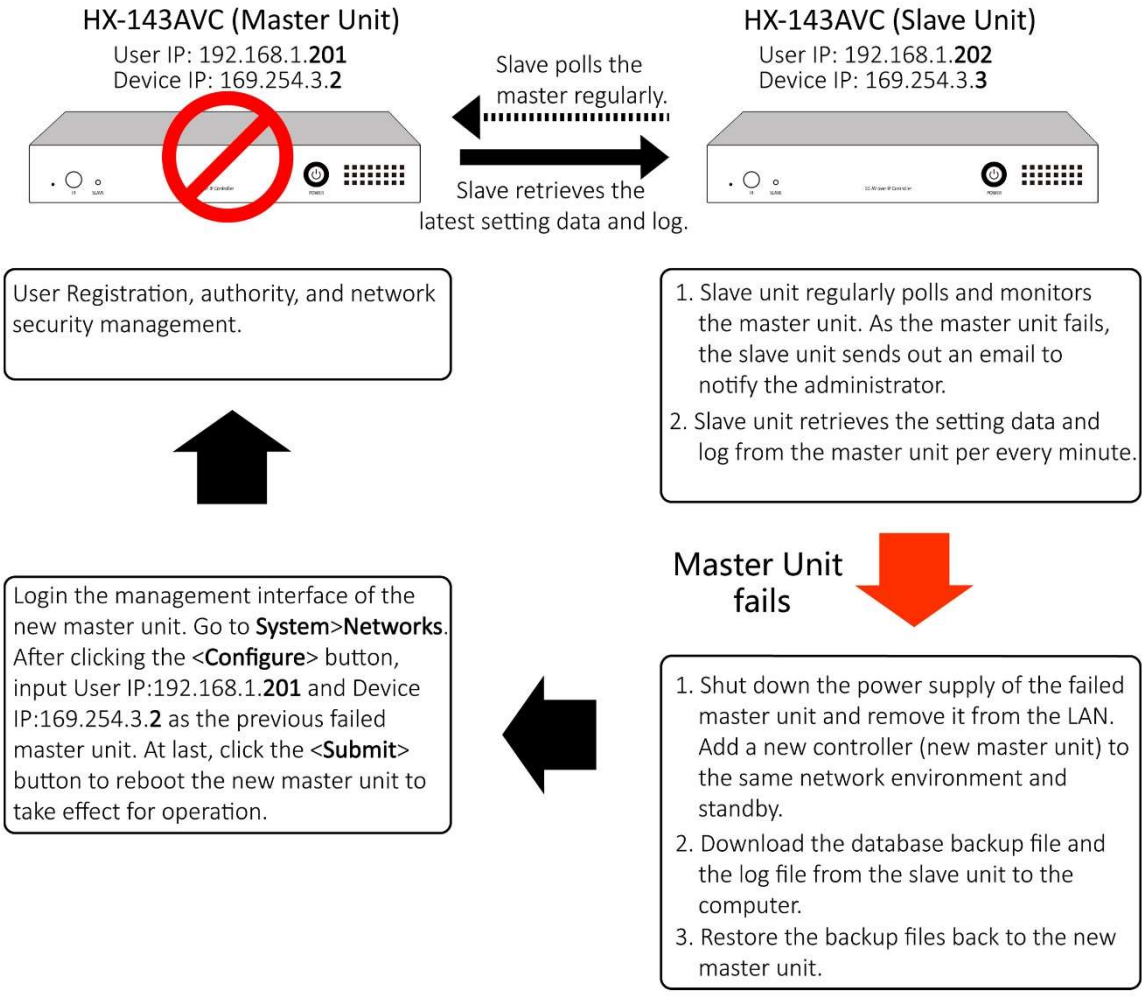


Figure 7-20 Flow to Replace the Failed Master Unit with Failover Function Disabled

Scenario (b): The master unit and slave unit operate in parallel, and the slave unit fails.

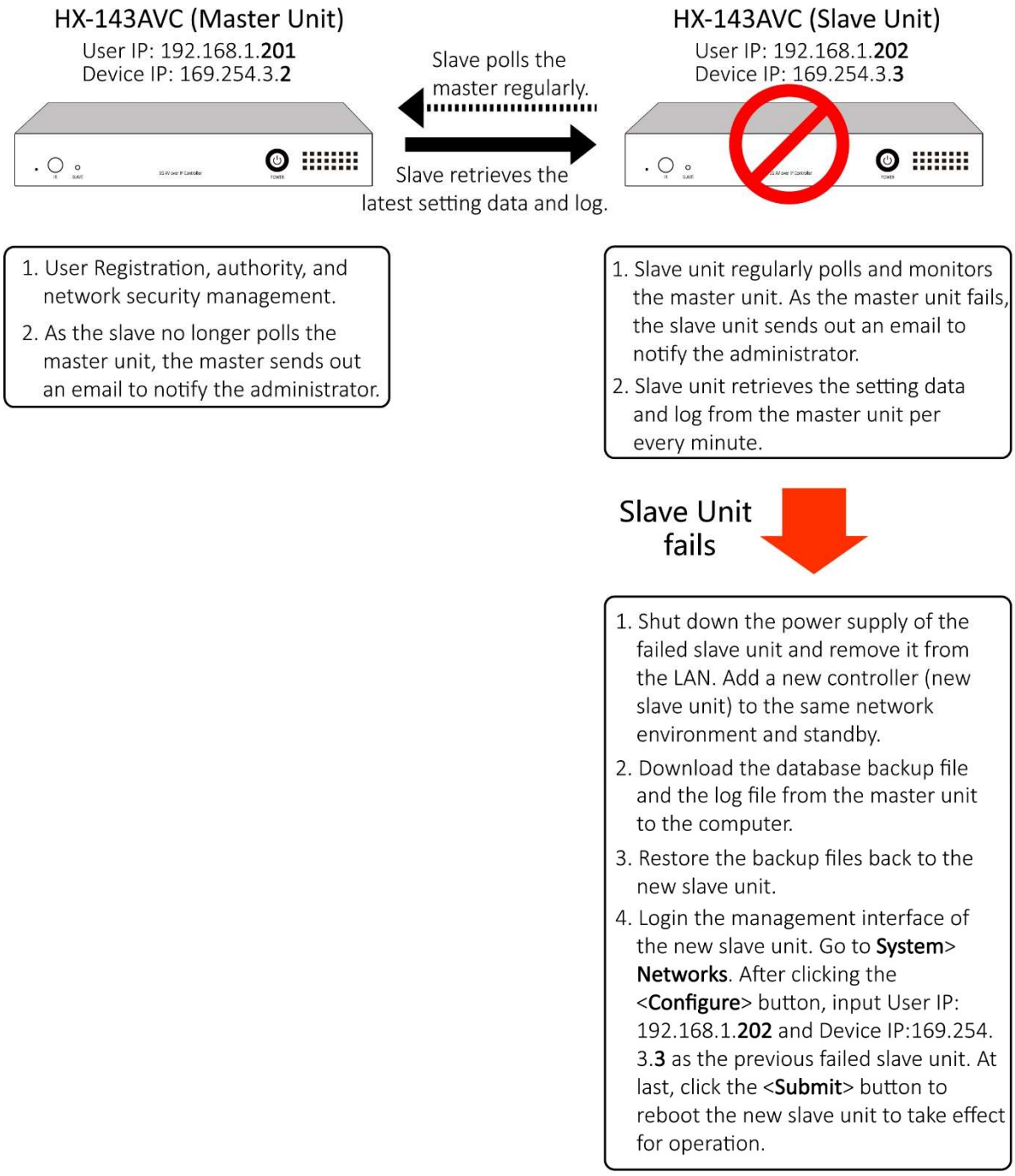


Figure 7-21 Flow to Replace the Failed Slave Unit with Failover Function Disabled

7.2.2 HX-143AVC Database Replication with Failover Enabled (Automatic Recovery Operation)

In the <**Replication**> menu, please refer to the following examples to replace the failed master or slave units.

When the master unit fails, the slave unit will automatically initiate the Auto Failover Procedure without any manual operation or confirmation. The slave unit not only replaces the failed master unit but also sends an email to notify the administrator of the fault event. The administrator will then manually remove the failed master unit and set up a new slave unit.

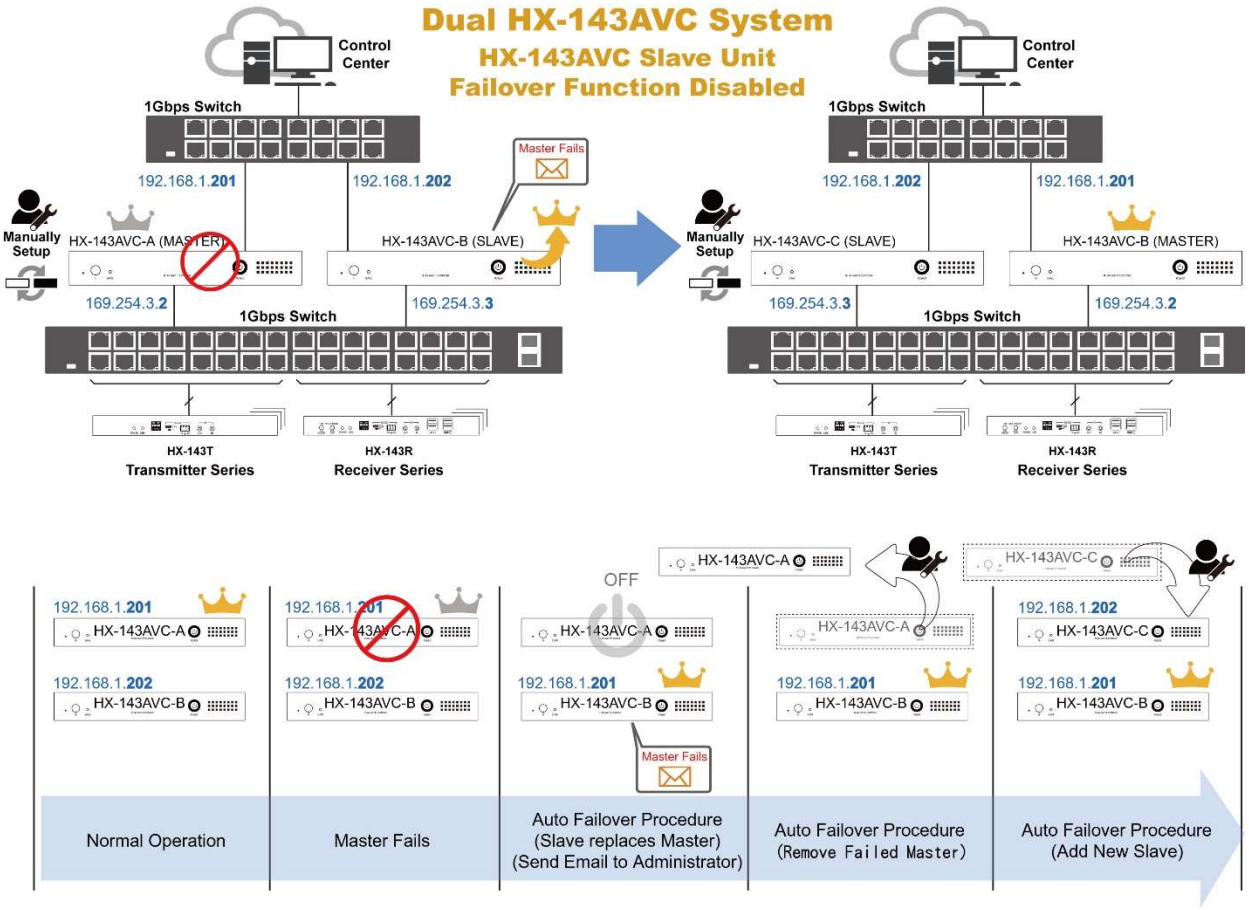


Figure 7-22 Dual-controller System Automatic Recovery Operation

Check the <**Failover Enabled**> box at the <**Replication Settings**> for the slave unit.

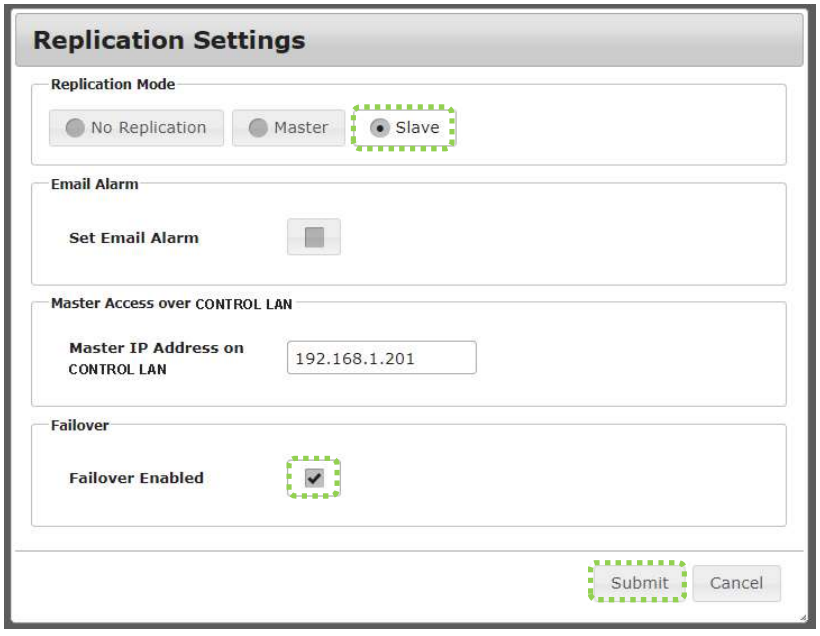


Figure 7-23 System>Replication> Configure the Replication Mode >Replication Settings

Set the Newly Added Controller Unit as Slave.

Go to **System**>**Networks**, click the <**Configure**> button to set the CONTROL NETWORK IP (192.168.1.**202**) and AV NETWORK IP (169.254.3.**3**). Go to **System**>**Replication**, click the <**Configure the Replication Mode**> button and input the CONTROL NETWORK IP address of the master unit (192.168.1.**201**).

Check the <**Failover Enabled**> box and click the <**Submit**> button to reboot the HX-143AVC slave unit.

Scenario (c): The master unit and slave unit operate in parallel, and the master unit fails

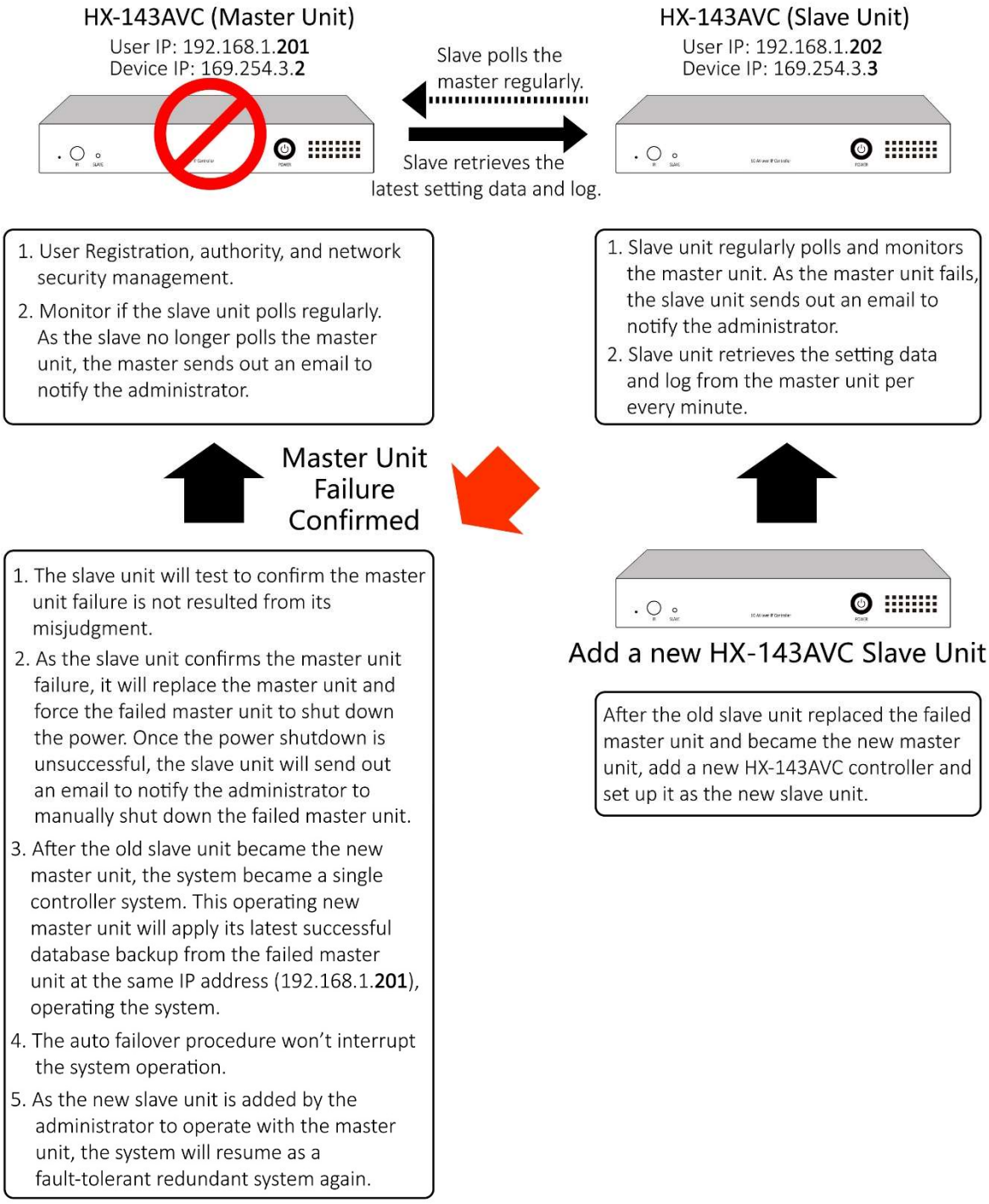


Figure 7-24

- When the master unit fails, the old slave unit replaces the failed master unit. The administrator manually removes the failed master unit and adds a new HX-143AVC controller as the new slave unit.
- Log in to the new HX-143AVC controller with the factory default management interface login IP address (**https://192.168.1.200**). Go to **System**>**Networks**, and click the <**Configure**> button to set the CONTROL NETWORK IP(192.168.1.**202**) and AV NETWORK IP(169.254.3.**3**) as the old slave unit.
- Open the <**Replication Settings>** window, set the new HX-143AVC controller as <**Slave**>, and input the CONTROL NETWORK IP address of the master unit (192.168.1.**201**). Finally, click the <**Submit**> button to reboot the new HX-143AVC controller. The new HX-143AVC controller will become the new slave unit.

Scenario (d): The master unit and slave unit operate in parallel, and the slave unit fails

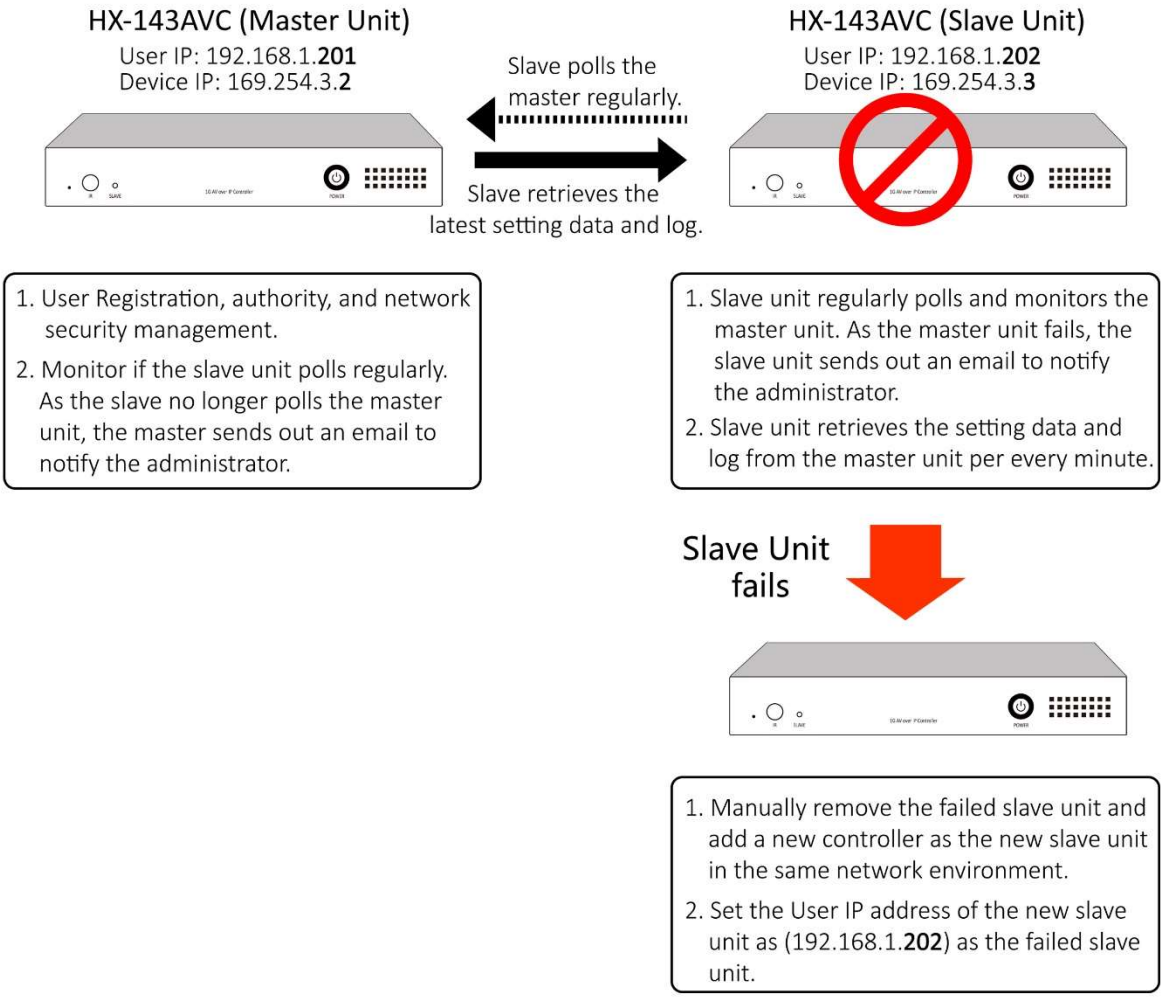


Figure 7-25

- When the slave unit fails, the administrator manually removes the failed slave unit and adds a new HX-143AVC controller as the new slave unit.
- Log in to the new HX-143AVC controller with the factory default management interface login IP address (**https://192.168.1.200**). Go to **System**>**Networks**, and click the <**Configure**> button to set the CONTROL NETWORK IP (192.168.1.**202**) and AV NETWORK IP (169.254.3.**3**) as the old slave unit.
- Open the <**Replication Settings>** window, set the new HX-143AVC controller as <**Slave**>, and input the CONTROL NETWORK IP address of the master unit (192.168.1.**201**). Finally, click the <**Submit**> button to reboot the new HX-143AVC controller. The new HX-143AVC controller will become the new slave unit.

Chapter 8 RX unit OSD Menu Operation

8.1 Brief Introduction of OSD Menus for Different User Roles

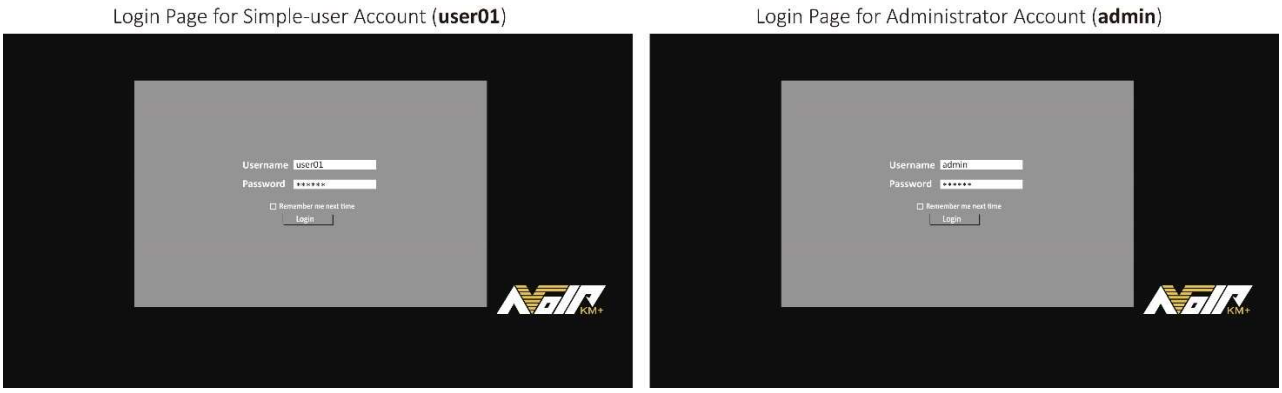


*Figure 8-1 Login Pages for Simple-user Account (**user01**) and Administrator Account(**admin**)*

When the HX-143AVC controller is deployed within the same AV network as all the TX/RX units, you will need to enter user credentials to access the RX unit's OSD menu. After powering up a RX unit (e.g., **RX-917E**), you can bring up its OSD menu by pressing the default OSD Launch hotkey <**ScrLk**>, <**ScrLk**>, <**Space**> or the quick-launch hotkey left <**Left Ctrl**>, <**Left Ctrl**>. This will bring up the OSD menu's login page, as shown in Figure 8-1. Next, enter the user's credential (e.g., ***user01***/***admin***) to access the receiver's OSD menu. Depending on the accessible TX units set by the ***AVoIP Manager*** for different users, you will see varying TX lists in each user's OSD menu, as shown in Figure 8-2. For example, the simple user account ***user01*** can only access **TX-9178** and **TX-917B**, while the administrator account ***admin*** can access all TX units deployed on the AV NETWORK.

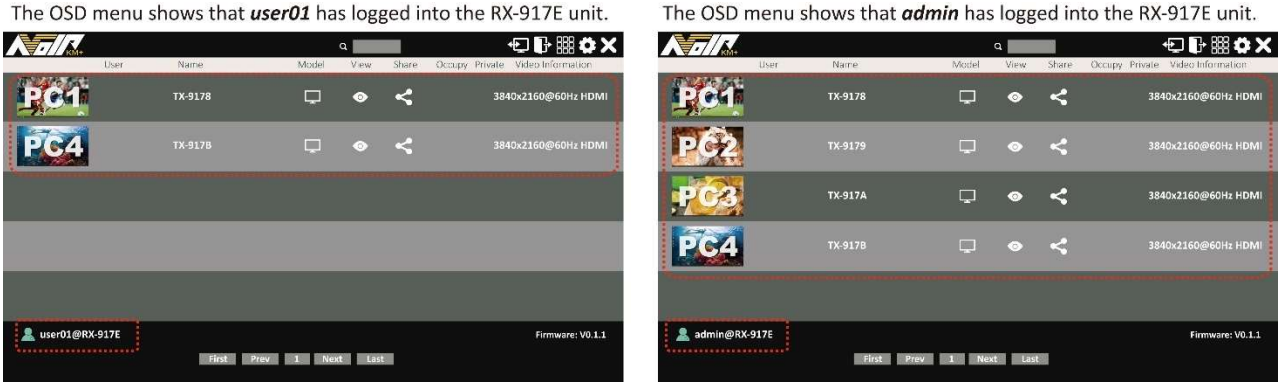


*Figure 8-2 TX List Pages for Simple-user Account (**user01**) and Administrator Account(**admin**)*

Figure 8-3 shows that when the operating RX unit is not connected to a TX unit, the OSD menu is displayed in full-screen size. When the operating RX unit has connected to a TX unit, the OSD menu will become scaled down and is positioned at the top of the video source from the PC to which the TX unit is connected.

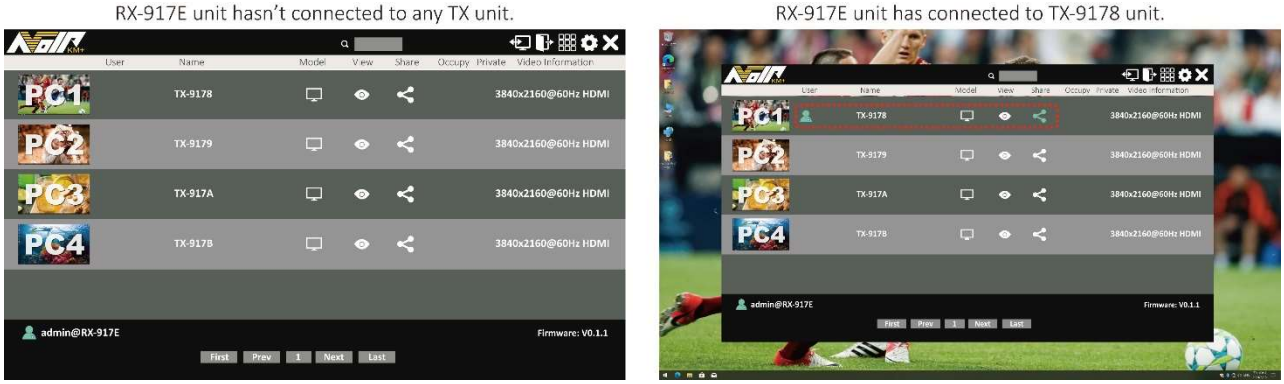


Figure 8-3 Different OSD menu sizes when the RX unit is not connected to a TX unit versus when it is.

8.2 RX Unit OSD Menu Introduction

8.2.1 Process to Enter the OSD Menu with/without HX-143AVC Controller Management

As Figure 8-4 shows, whenever the RX unit is managed by the HX-143AVC controller, the user will be required to enter their credentials to log in to the OSD menu after pressing the OSD launch hotkey <**ScrLk**>, <**ScrLk**>, <**Space**>.

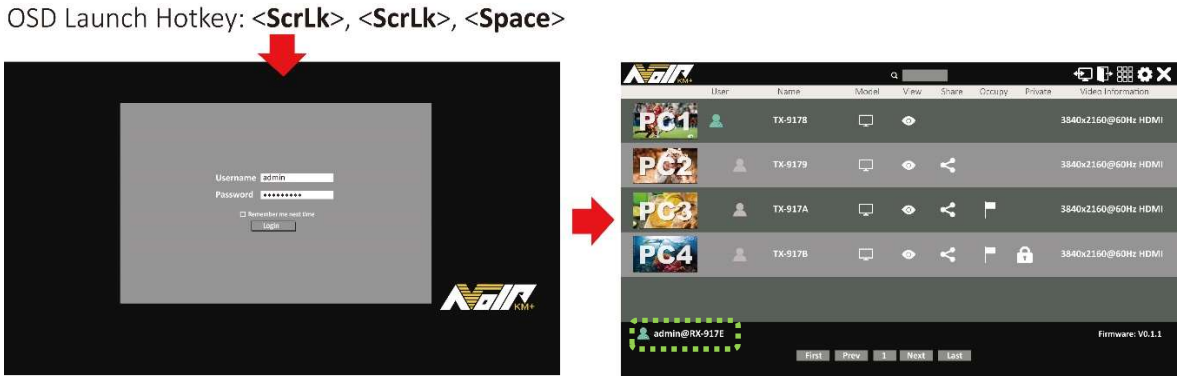


Figure 8-4 Process to Bring up an OSD Menu of a RX unit with HX-143AVC controller management

As Figure 8-5 shows, whenever the RX unit is not managed by the HX-143AVC controller, the OSD menu will be directly opened without the login process after the user has pressed the OSD launch hotkey <**ScrLk**>, <**ScrLk**>, <**Space**>.

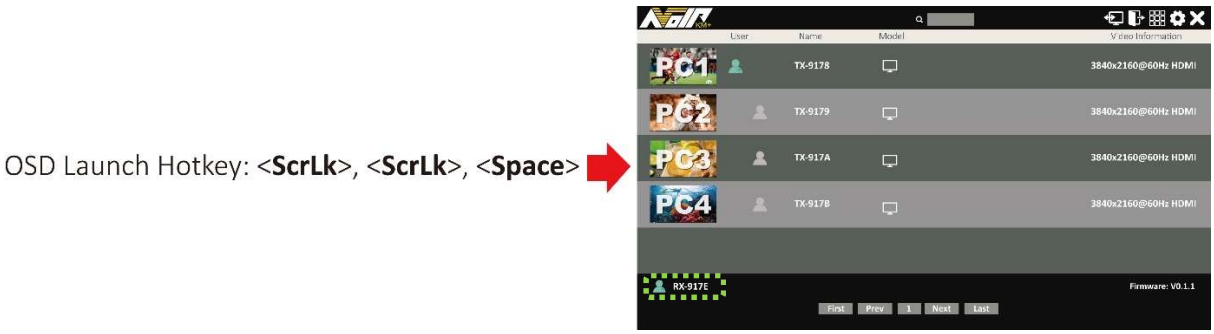


Figure 8-5 Process to Bring up an OSD Menu of a RX unit without HX-143AVC controller management

8.2.2 RX Unit's OSD Menu with HX-143AVC Controller's Management

When an HX-143AVC controller and all TX and RX units are deployed in the same AV NETWORK, all the TX and RX units will be automatically managed by the HX-143AVC controller. Press <**ScrLk**>, <**ScrLk**>, <**Space**> on an RX unit's keyboard to bring up its OSD menu. Log in to the RX unit (e.g., **RX-917E**) with the user credential (e.g., ***admin***) as shown in Figure 8-6.

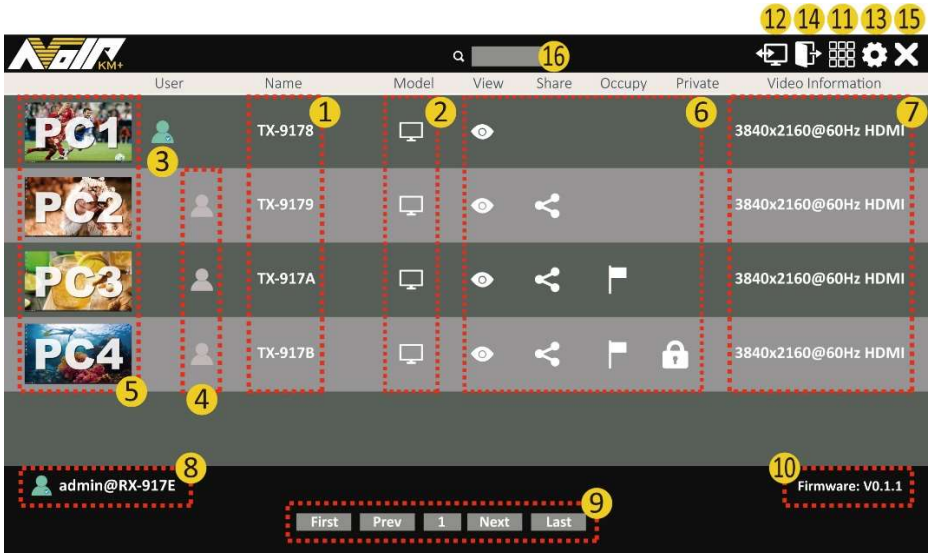


Figure 8-6 RX Unit's OSD Menu with HX-143AVC's Management

All the accessible transmitter units connected to the AV NETWORK will be displayed in this TX list page.

(1) Double click on any transmitter name to connect it to the operating receiver (e.g., **RX-917E**).

(2) The screen icon has three forms, each representing a different status: Normal Operation (white), Power Supply or Link Failure (black with a red X), and Video Lost (black).

(3) The green user icon represents that the operating RX unit (e.g., **RX-917E**) is connected to a TX unit (e.g., **TX-9178**).

(4) Grey user icons represent that other RX units are connecting to their respective TX units (e.g., **TX-9179**, **TX-917A**, and **TX-917B**).

(5) The video thumbnails of all corresponding TX units. Double-click on any of them to connect to this operating RX unit.

(6) The available access levels of all corresponding TX units for the currently logged-in user include [**View**], [**Share**], [**Occupy**], and [**Private**]. Double-click any icon of them to connect the operating RX unit to the selected TX unit with the specified access level.

(7) The video resolutions of all the corresponding TX units.

(8) The name of the logged-in user account (e.g., ***admin***) and this operating RX unit (e.g., **RX-917E**).

(9) Users can click these navigation buttons to go through the TX list page-by-page.

(10) The firmware version information.

(11) Click to open a preview page showing all video thumbnails of all connected TX units as Figure 8-7 shows.

(12) Click to open the Console Collaboration page, as shown in Figure 8-8.

(13) Click to review the transmitter switching hotkeys that the administrator has set in the HX-143AVC web-based management interface ***AVoIP Manager***. Each switching hotkey includes at least three keystrokes, such as <**ScrLk**>, <**ScrLk**>, <**Number Key**>. In addition to the default hotkey prefix key <**Scroll Lock**>, the user can also assign other preferred hotkey prefix keys (e.g., **Num Lock**, **Caps Lock**, **Left Alt**, **Right Alt**) on this page.

*Note: To connect the operating RX unit to a specific TX unit, press <**ScrLk**>, <**ScrLk**>, <**Number Key**>, <**Enter**> to complete the operation.

(14) Click to log out of the OSD menu. The next time you press the default hotkey <**ScrLk**>, <**ScrLk**>, <**Space**> to bring up the OSD menu, you will need to enter the user credential again to access the RX unit's OSD menu.

(15) Click to close the OSD menu.

(16) Find a specific TX unit quickly by entering its name in this column.

Figure 8-7 shows the Video Thumbnail Preview Page of all connected TX units. Click the icon to open it and use the navigation buttons to preview them page-by-page.

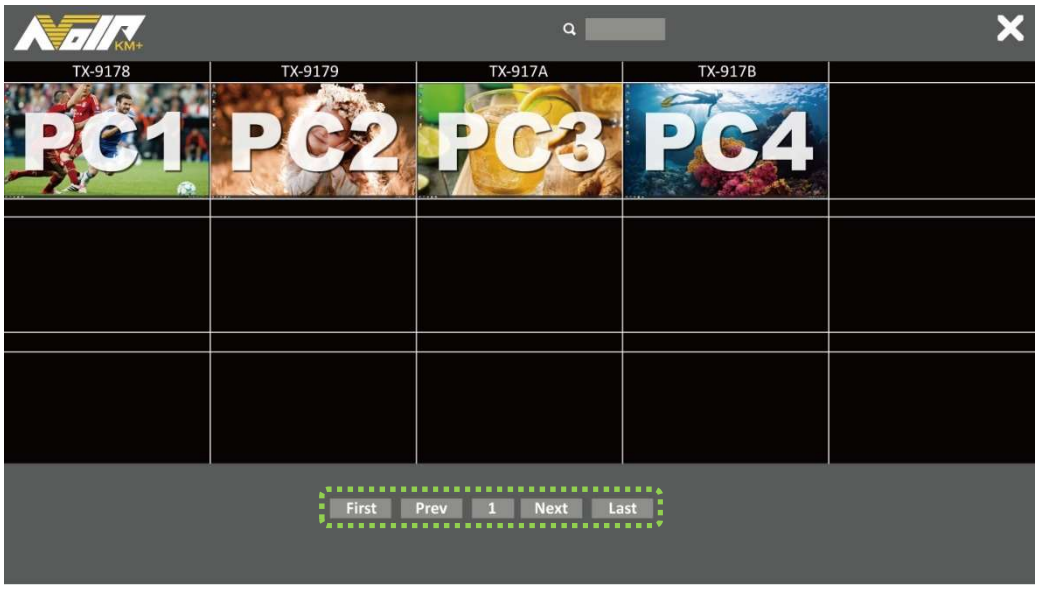


Figure 8-7 Video Thumbnail Preview Page of All Connected TX units

Figure 8-8 shows the Console Collaboration Page for operating Console Resource PUSH/PULL Operation. Three examples (A), (B), and (C) are provided to explain the operation.

*Note: This Console Collaboration Function only applies to extender devices operating in [**Matrix**] Operation Mode and does not apply to those set in [**Extender**] Operation Mode.

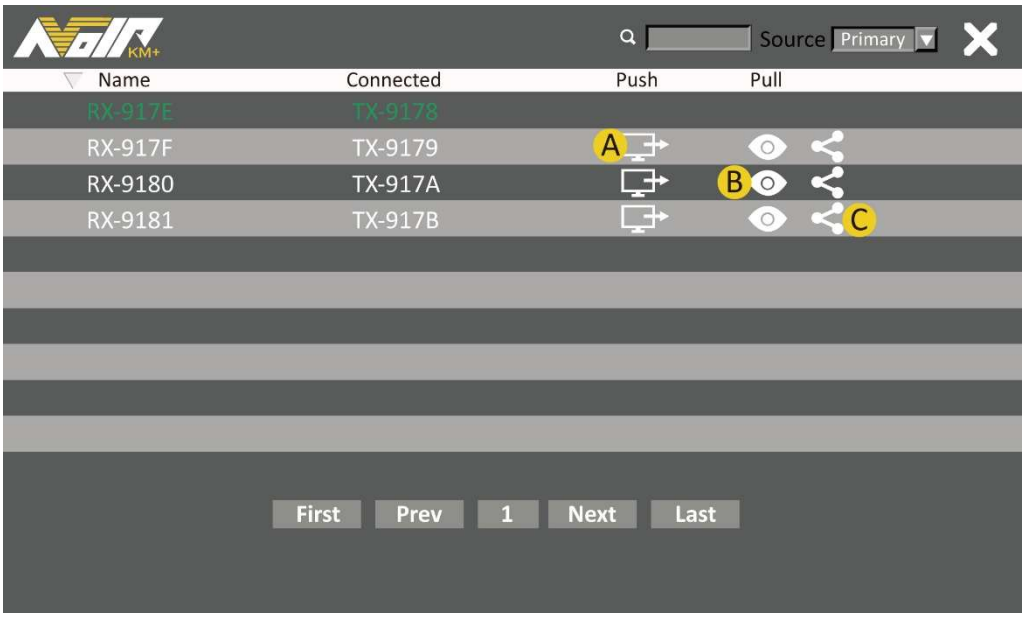


Figure 8-8 Console Collaboration Function

(A) Double-click the icon in the row of the RX unit **RX-917F**, representing a PUSH of the resource from the **TX-9178** that the operating RX unit **RX-917E** is connecting to, to the RX unit **RX-917F**, as illustrated in Figure 8-9.

*Note: During this operation, the console of the RX unit **RX-917F** will display a request window asking the **RX-917F** user to accept or decline the TX resource PUSH operation. When the **RX-917F** user accepts this request, he will be able to access the **TX-9178** resource that the **RX-917E** has pushed.

Figure 8-9 TX Resource Push Operation

(B) *D*ouble-click the icon in the row of the RX unit **RX-9180**, representing a PULL of the resource from the **TX-917A** that the **RX-9180** is connecting to, to the RX unit **RX-917E**, as illustrated in Figure 8-10.

*Note: After double-clicking this icon, the resource of **TX-917A** will be instantly pulled to the console of the **RX-917E** with the [**View-only**] Access Level. This means that the console of the **RX-917E** can only view the resource of **TX-917A**, while its keyboard and mouse access will be disabled.

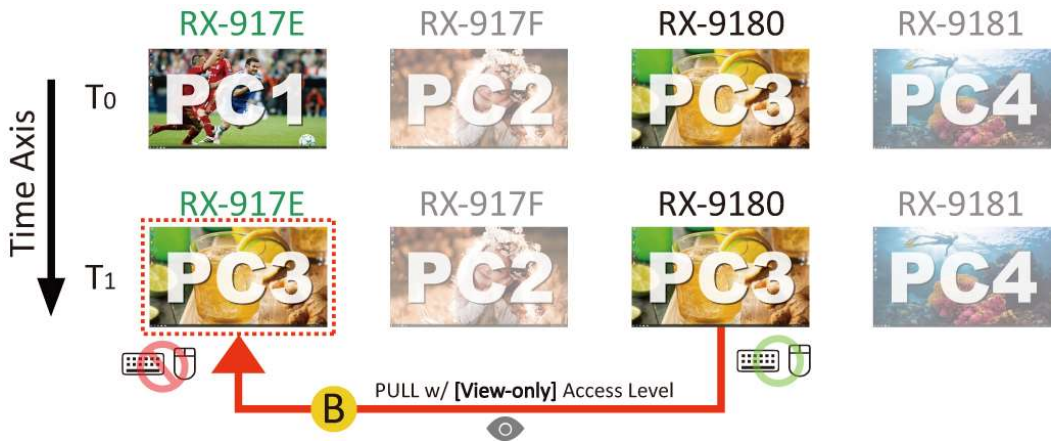


Figure 8-10 TX Resource Pull Operation with [View-only] Access Level

(C) *D*ouble-click the icon in the row of the RX unit **RX-9181**, representing a PULL of the resource from the **TX-917B** that the **RX-9181** is connecting to, to the RX unit **RX-917E**, as illustrated in Figure 8-11.

*Note: After double-clicking this icon, the resource of **TX-917B** will be instantly pulled to the console of the **RX-917E** with the [**Shared**] Access Level. This means that the console of the **RX-917E** can fully access the resource of **TX-917B**, just like the console of the **RX-9181**.

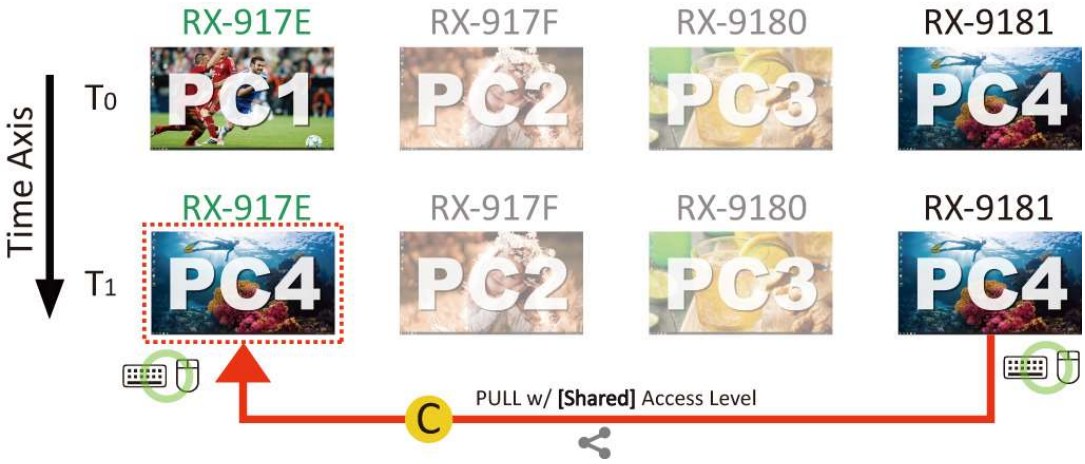


Figure 8-11 TX Resource Pull Operation with [Shared] Access Level

Figure 8-12 shows the page of transmitter switching hotkeys that have been set by the administrator in the ***AVoIP Manager***. Click the icon at the upper-right corner of the OSD menu to open it. Take Hotkey No. 2 for example, when the user presses <**ScrLk**>, <**ScrLk**>, <**2**>, <**Enter**>, the operating RX unit (i.e. **RX-917E**) will be instantly switched to connect to the TX unit **TX-9179**.

The checkbox [**Keep OSD after switching**] allows users to decide whether to keep or close the OSD menu after switching TX resources.

The checkbox [**Enable menu quick key**] allows users to enable or disable the OSD menu quick-launch key <**Left Ctrl**>, <**Left Ctrl**>.

The checkbox [**Push requests confirmation**] allows users to decide if the RX console (e.g., **RX-917F** shown in Figure 8-9) receiving the TX-resource PUSH request needs to confirm before switching to the incoming TX resource. The TX switching hotkey prefix can be selected as either <**Scroll Lock**>, <**Num Lock**>, <**Caps Lock**>, <**Left Alt**>, or <**Right Alt**> based on the user's preference.

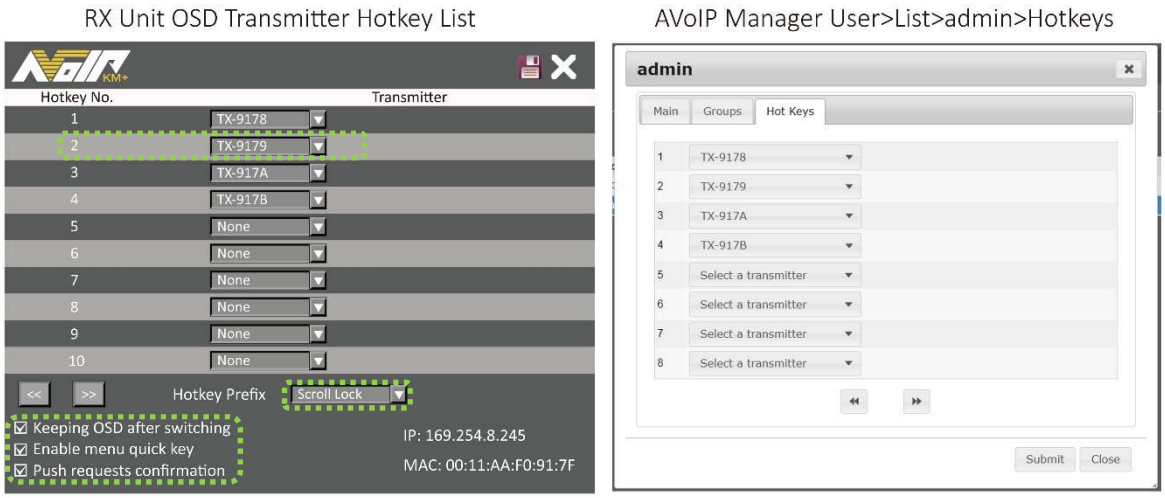


Figure 8-12 Console Collaboration Function

8.2.3 RX Unit's OSD Menu without HX-143AVC Controller's Management

When the HX-143AVC controller is not deployed in an AV network to which all TX and RX units are connected, these TX and RX units will not be managed. The OSD menu of an RX unit (e.g., **RX-917E**) can be opened directly by pressing <**ScrLk**>, <**ScrLk**>, <**Space**> on the RX unit's keyboard without inputting the user credential, as shown in Figure 8-13.

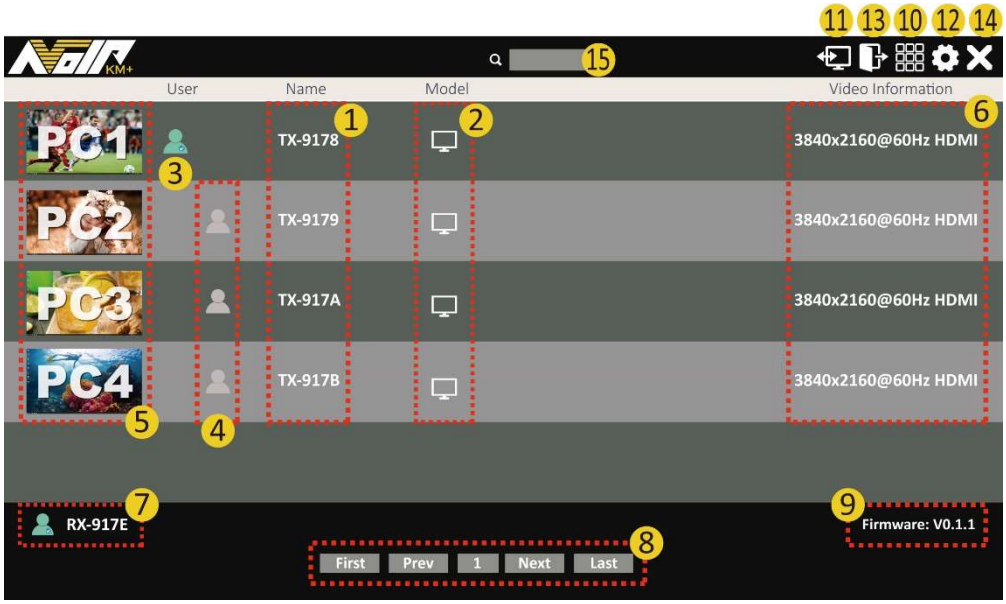


Figure 8-13 RX Unit's OSD Menu without HX-143AVC's Management

All the transmitter units connected to the AV NETWORK will be displayed in this TX list page.

(1) Double click on any transmitter name to connect it to the operating receiver (e.g., **RX-917E**).

(2) The screen icon has three forms, each representing a different status: Normal Operation (white), Power Supply or Link Failure (black with a red X), and Video Lost (black). Double-click any of them to enter the transmitter setting page (Referring to Figure 8-15).

(3) The green user icon represents that the operating RX unit (e.g., **RX-917E**) is connected to a TX unit (e.g., **TX-9178**).

(4) Grey user icons represent that other RX units are connecting to their respective TX units (e.g., **TX-9179**, **TX-917A**, and **TX-917B**).

(5) The video thumbnails of all corresponding TX units. Double-click on any of them to connect to this operating RX unit.

(6) The video resolutions of all the corresponding TX units.

(7) The name of this operating RX unit (e.g., **RX-917E**).

*Note: Since the RX unit does not need to go through login process, there will be no user's name displayed here as the item (8) of Figure 8-6.

(8) Users can click these navigation buttons to go through the TX list page-by-page.

(9) The firmware version information.

(10) Click to bring up a preview page showing all video thumbnails of all connected TX units as Figure 8-7 shows.

(11) Click to enter the Console Collaboration page, as shown in Figure 8-8.

Click to enter the setting page of this RX unit (e.g., **RX-917E**), as shown in Figure 8-14. In the [**Advanced**] setting page, the user can configure transmitter switching hotkeys for each detected TX units. Each transmitter switching hotkey includes at least three keystrokes, such as <**ScrLk**>, <**ScrLk**>, <**Number Key**>. In addition to the default hotkey prefix key <**Scroll Lock**>, the user can also assign any other preferred hotkey prefix keys (e.g., **Num Lock**, **Caps Lock**, **Left Alt**, **Right Alt**) on this page.

*Note: To connect the operating RX unit to a specific TX unit, press <**ScrLk**>, <**ScrLk**>, <**Number Key**>, <**Enter**> to complete the operation.

(12) Click to log out of the OSD menu. The next time you press the default hotkey <**ScrLk**>, <**ScrLk**>, <**Space**>, the OSD menu will appear again.

(13) Click to close the OSD menu.

(14) Find a specific TX unit quickly by entering its name in this column.

8.2.4 RX Unit's Configuration

To enter the RX unit's main setting page, click the icon at the upper-right corner of the TX list page.

The annotations of the RX unit's main setting pages shown in Figure 8-14 are described as follows:

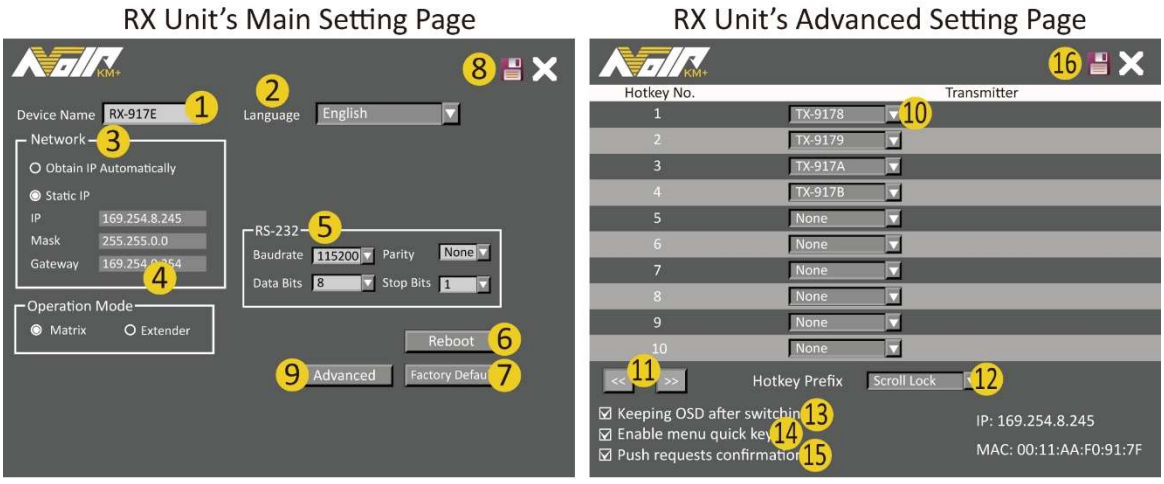


Figure 8-14 Receiver unit's Main Setting Page and Advanced Setting Page

1. Device Name: User can change to a new receiver name for easy recognition.

2. Language: Drop down this option to select a preferred language (English/Traditional Chinese).

3. Network: Choose to obtain an IP automatically or manually configure a static IP.

4. Operation Mode: Select a desired mode according to your requirement. Make sure this option you selected must match with its connected transmitter.

*Note: If the connected TX and RX units are misaligned in **Operation Mode**, the RX unit's monitor will show a black screen.

5. RS-232: Set up the serial parameters for the connected RS-232 device to match the transmitter and connected PC settings. The default system settings are:

Baudrate: 115200 Data bits: 8 Parity: None Stop bits: 1

6. Reboot: Click to reboot the receiver unit, and then click the <**OK**> button to proceed.

7. Factory default: Click to restore the RX unit to the factory default settings, and then click the <**OK**> button to proceed.

8. Save: Click this icon to save all the settings in the RX unit's Main Setting Page once you have changed them.

9. Advanced: Click this button to open the advance setting page.

10. Transmitter Switching Hotkey List: When this AV system is managed by a HX-143AVC controller, this list is read-only in this advanced setting page. On the contrary, when this RX unit is not managed by the HX-143AVC controller, you can manually select a TX unit to correspond the number of the transmitter switching hotkey. (e.g., Selecting the number **1** column as **TX-9178** represents when the user presses the hotkey <**ScrLk**>, <**ScrLk**>, <**1**>, <**Enter**>, the operating RX unit (e.g., **RX-917E**) will be instantly connected to the **TX-9178**.

11. Transmitter Switching Hotkey List Navigation Buttons: Press the **<<** or **>>** button to review the TX switching hotkeys page-by-page.

12. Change Hotkey Prefix: Drop down this option and select any hotkey prefix from: <**Scroll Lock**>, <**Num Lock**>, <**Caps Lock**>, <**Left Alt**>, and <**Right Alt**>.

13. Keeping OSD after switch channel: Check this box to continue displaying the OSD menu after the TX unit switching.

14. Enable menu quick key: Check this box to enable using the OSD Quick-launch Hotkey <**Left Ctrl**>, <**Left Ctrl**>.

15. Push requests confirmation: Check this box to enable the PUSH request window for the RX unit receiving the TX-source connection request.

16. Save: Click this icon to save all the settings in the RX unit's Advanced Setting Page once you have changed them.

*Note: (1) As you need to manually assign IP addresses for transmitter and receiver devices, **please always set up TX device before setting up RX device** and make sure their AV NETWORK IP addresses are in the same network segment.

(2) New settings will only be applied after the receiver reboots.

8.2.5 TX Unit's Configuration

To enter a specific TX unit's setting page, click the icon of the selected TX unit's row on the TX list page.

The annotations of the TX unit's setting pages shown in Figure 8-15 are described as follows:

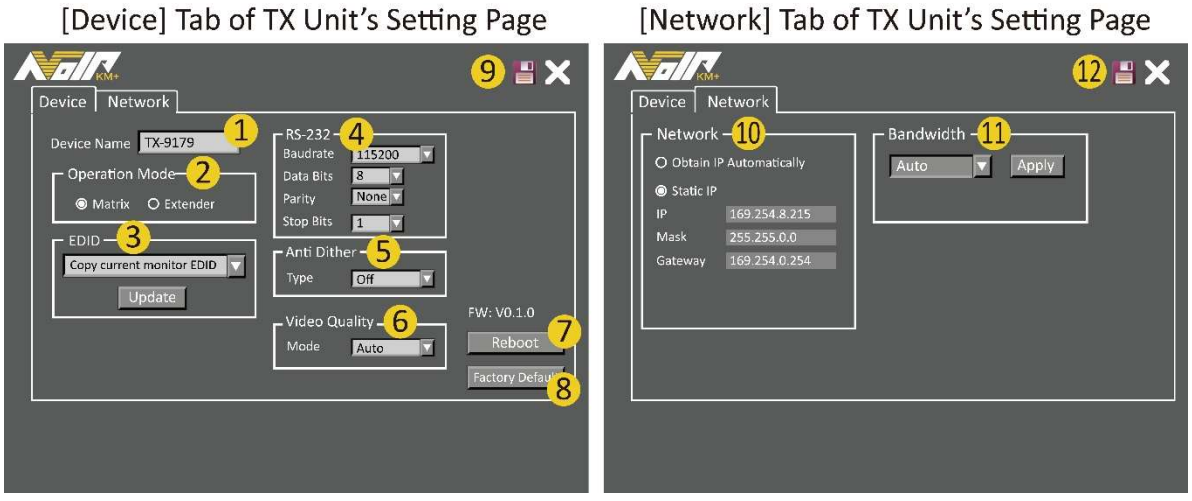


Figure 8-15 [Device] and [Network] Tabs of the TX unit's Setting Page

1. Device Name: User can change to a new transmitter name for easy recognition.

2. Operation Mode: Select a desired mode according to your requirement. Make sure this option you selected is matched with the connected receiver.

*Note: If the connected TX and RX units are misaligned in **Operation Mode**, the RX unit's monitor will show a black screen.

3. EDID: Select a video resolution output from the PC, including: **1920x1080** / **1024x768** / **1920x1200** / **3840x2160** / **Copy current monitor EDID** and then click the <**Update**> button to apply.

4. RS-232: Set up the serial parameters for the connected PC to match the receiver and connected RS-232 device settings. The default system settings are:

Baudrate: 115200 Data bits: 8 Parity: None Stop bits: 1

5. Anti Dither: If the image on the RX console monitor appears odd, apply **Mode 1** or **Mode 2** to resolve it. The default setting is: **Off**.

6. Video Quality: Choose from **Auto** (default), **Graphic**, or **Video** for the best viewing experience.

7. Reboot: Click to reboot the transmitter unit, and then click the <**OK**> button to proceed.

8. Factory default: Click to restore the transmitter unit to the factory default settings, and then click the <**OK**> button to proceed.

9. Save: Click this icon to save all changes in the [**Device**] tab of the TX unit's settings page.

10. Network: Choose to obtain an IP automatically or manually configure a static IP.

11. Bandwidth: Select a bandwidth option (**200Mbps** / **100Mbps** / **50Mbps** / **10Mbps**) to fit your requirements, such as prioritizing video quality or the number of deployed units. The default option is **Auto**.

12. Save: Click this icon to save all changes in the [**Network**] tab of the TX unit's settings page.

Chapter 9 Statements and Precautions

9.1 FCC Statement

This equipment has been tested and found to comply with the regulations for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this User Guide, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case, the user will be required to correct the interference at his/her own expense.

9.2 CE Statement

This is a Class B product in a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

9.3 Copyright Notice

9.4 Disclaimer Notice

The information in this document is subject to possible changes or cancelation without prior notice.
Specifications, procedures, and screenshots described in the manual may be changed or updated for indications and explanations.

9.5 Precautions

(1) Place and operate the product at the best location.
(2) Before installation, disconnect all power sources connected to the product.
(3) To avoid electric shocks, do no open the enclosure of the product.
(4) Check if the power supply works normally before operation.
(5) Do not disassemble the product without authorization.
(6) Please only use the power adapter in the package.

9.6 Technical Support

Please contact your local distributor for more information. Or contact the original manufacturer for more technical supports.

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