Models:

SX42PHU-4X – Secure 4 to 2 port DP/HDMI KVM Ultra Mini-Matrix with fUSB support, NIAP PP4.0 compliant
SX82PHU-4X – Secure 8 to 2 port DP/HDMI KVM Ultra Mini-Matrix with fUSB support, NIAP PP4.0
SX42PHU-NX – Commercial 4 to 2 port DP/HDMI KVM Ultra Mini-Matrix with USB 3.0 support
SX82PHU-NX – Commercial 8 to 2 port DP/HDMI KVM Ultra Mini-Matrix

HLT37143 Rev. 1.0

TABLE OF CONTENTS

INTRODUCTION

High Sec Labs' Secure Keyboard/Video/Mouse (KVM) Ultra Mini-Matrix enables simultaneous viewing and control of multiple computers presented on the same display, using a single set of keyboard, mouse, video, audio, and USB peripherals. It uses advanced video processing technology to display dynamic high-resolution images from connected sources, all while enforcing unidirectional data flow through its USB and video ports. This allows seamless switching between all connected computers, without any risk of data leaks, making it ideal for meeting rooms or other environments where computers may have differing levels of security classification.

This User Manual shows how to install, configure, and operate an HSL KVM Ultra Mini-Matrix.

Highlights

- **Simultaneous Viewing and Control:**
  The Ultra Mini-Matrix can display and control multiple computer sources at the same time.
- **Multiple Viewing Modes:**
  The Ultra Mini-Matrix has several layouts to provide the ideal presentation for any environment, including Extended, Duplicate, Tile Mode, Scale Mode, and Picture-in-Picture.
- **Seamless Mouse Switching:**
  The Ultra Mini-Matrix uses Virtual Display Technology (VDT) to switch the mouse and keyboard controls between different sources by simply dragging the mouse from channel to channel.
- **4K Support:**
  For high quality viewing, the HSL Ultra Mini-Matrix supports 4K resolutions up to 3840x2160.

INTRODUCTION

Features Exclusive to Secure Models

- **NIAP Compliance:**
  The Secure Ultra Mini-Matrix is designed for compliance with NIAP's Common Criteria PP4.0 Protection Protocol.
- **Share Peripherals Across Different Security Domains:**
  Share peripherals between computers that belong to different security levels, while keeping the highest possible data classification separation security.
- **Prevent Information Leaks:**
  Prevent threats derived from sharing and switching of vulnerable, untrusted, or unauthorized peripheral devices. Block peripheral exploits, information leaks, eavesdropping, signal transmissions, computer malware; hardware and firmware tampering, by enforcing multi-layered security mechanisms.
- **Filter USB Peripherals:**
  Block unauthorized USB devices while allowing secure switching of smart card and biometric authentication devices between computers. Whitelist and blacklist specific USB devices based on VID/PID characteristics.

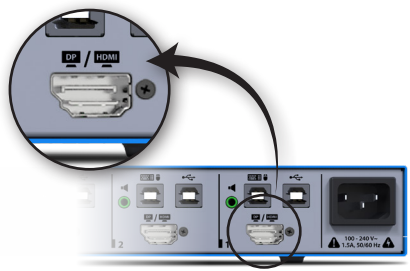
Features Exclusive to Commercial Models

- **USB 3.0 Support:**
  Connect computers and peripherals using USB 3.0.

DP/HDMI Combo Connector

To ensure easy and intuitive interoperability with different sources, the HSL KVM Ultra Mini-Matrix includes a special type of video input connector: the DP/HDMI Combo Connector. The connector supports both HDMI and DisplayPort video interfaces and allows connections to either type of cable.

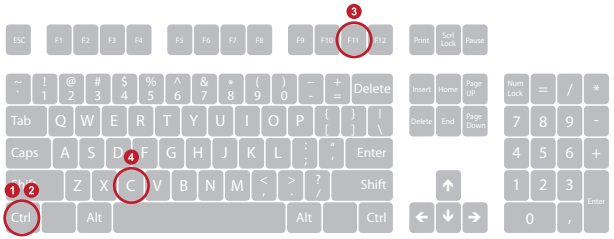
DP\HDMI Connector



INTRODUCTION

Keyboard Hotkeys

The interface to operate the HSL KVM Ultra Mini-Matrix uses keyboard hotkeys that can be entered at any time. These hotkeys are based on a QWERTY keyboard layout. For example, to enter the key combination **Ctrl | Ctrl | F11 | F3**, press the keys seen below, regardless of the keyboard layout used:



Keyboard Hotkey Terms

- **|** Separates keys pressed in sequential order. For example, to enable Extended Viewing Mode, the key combination is two presses of the **Ctrl** key and one press of the x key, so the combination is shown as **Ctrl | Ctrl | x**.
- **+** Press two buttons simultaneously. For example, to temporarily switch to Absolute Mouse Navigation, press and hold **LCtrl + LShift**.

Notes:

- All letter keys in hotkey combinations are shown in lowercase, but the hotkeys are not case sensitive. They are shown as lowercase to prevent confusion between letter keys and function keys, such as confusing the combination **f | 3** and the function key **F3**.
- Always use the left Control key (**LCtrl**) unless otherwise specified.
- Do not use the numeric pad for number keys, unless otherwise specified.
- All hotkey combinations are configured using a QWERTY keyboard. When using a non-QWERTY keyboard, use the key location corresponding to the QWERTY layout. For example, on an AZERTY keyboard where the **a** key is in the location of the **q** key on a QWERTY keyboard, the hotkey **Ctrl | Ctrl | q** would be entered as **Ctrl | Ctrl | a**.

INTRODUCTION

On-Screen Display

In addition to using keyboard hotkeys, HSL's KVM Ultra Mini-Matrix is equipped with an On-Screen Display (OSD) interface for easy customization of video, channel display, USB interface, and audio settings. The OSD can be opened at any time by entering **LCtrl | LCtrl | o** or **LCtrl | LAlt | o**.

Detailed instructions on how to operate the OSD can be found in the section **On-Screen Display Operation**.

Ultra Mini-Matrix Specifications

Part Number	SX42PHU-4X	SX82PHU-4X	SX42PHU-NX	SX82PHU-NX
Number of Sources	4	8	4	8
Console Ports				
Displays	2xHDMI	2xHDMI	2xHDMI	2xHDMI
Max Output Resolution	Supporting UHD 4K Resolutions up to 3840x2160		Supporting UHD 4K Resolutions up to 3840x2160	
Mouse and Keyboard	USB Type A	USB Type A	USB Type A	USB Type A
Audio Jack	3.5mm	3.5mm	3.5mm	3.5mm
USB Port	USB Type A filtered	USB Type A filtered	4 x USB 3.0 Type A	USB 3.0 Type A
Remote Control Unit Port	RJ14 Female	RJ14 Female	RJ14 Female	RJ14 Female
Microphone Jack	NA	NA	3.5mm	NA
Computer Ports				
Displays	4xDP/HDMI	8xDP/HDMI	4xDP/HDMI	8xDP/HDMI
Max Input Resolution	Supporting UHD 4K Resolutions up to 3840x2160		Supporting UHD 4K Resolutions up to 3840x2160	
Mouse and Keyboard	USB Type B	USB Type B	USB Type B	USB Type B
Audio Jack	3.5mm	3.5mm	3.5mm	3.5mm
USB Port	fUSB Type B	fUSB Type B	USB 3.0 Type B	USB 3.0 Type B
Microphone Jack	NA	NA	3.5mm	NA
Physical				
Dimensions	342x148x42mm / 13.4x5.8x1.6 in	440x192x48mm / 17.3x7.5x1.9in	342x148x42mm / 13.4x5.8x1.6in	440x192x48mm / 17.3x7.5x1.9in
Weight	1.6kg / 3.5lb	3.7kg / 8.1lb	1.6kg /3.5lb	3.7kg / 8.1lb
Power				
Power Requirements	35W Max	35W Max	35W Max	35W Max
AC Input	100V to 240V AC	100V to 240V AC	100V to 240V AC	100V to 240V AC
Power Type	Internal	Internal	Internal	Internal
Environmental				
Operating Temperature	0°C to 40°C / 32°F to 104°F	0°C to 40°C / 32°F to 104°F	0°C to 40°C / 32°F to 104°F	0°C to 40°C / 32°F to 104°F
Storage Temperature	-20°C to 60°C / -4°F to 140°F	-20°C to 60°C / -4°F to 140°F	-20°C to 60°C / -4°F to 140°F	-20°C to 60°C / -4°F to 140°F
Humidity	0%-80% RH, non-condensing	0%-80% RH, non-condensing	0%-80% RH, non-condensing	0%-80% RH, non-condensing
Software				
Supported OS	Windows, Linux, Mac	Windows, Linux, Mac	Windows, Linux, Mac	Windows, Linux, Mac
Security				
Compliance	Designed for compliance with NIAP Common Criteria PP4.0 for Peripheral Sharing Device (PSD)		NA	NA

INSTALLATION

Before Installation

Before opening the product's sealed packaging, inspect the seal's condition to verify that the product was not accessed or tampered with during delivery. If the packaging seal looks suspicious, contact HSL support and do not use the product.

Tamper-Evident Label

The KVM Ultra Mini-Matrix uses a holographic tamper-evident label to provide visual indications in case of enclosure intrusion attempts. These labels display white dots or the text "VOID", once removed. When opening the product's packaging, inspect the tampering evident label.

Once the KVM Ultra Mini-Matrix is removed from its packaging materials, carefully inspect the tamper-evident label to verify that the product is properly sealed. If the label is damaged or missing, contact HSL support and do not use the product.

HSL Holographic Tamper-Evident Label

Package Contents

Once the packaging for the KVM Ultra Mini-Matrix is opened, inspect the contents of the package to make sure all components are included.

Model	Component	Qty
SX42PHU-4X	Secure 4P to 2P DP/HDMI KVM Ultra Mini-Matrix with fUSB support, PP 4.0	1
	RJ14 to DB9 (Female, RS-232) Cable	1
	C13 Female to C14 Male Power Cable	1
	Adapters Kit- Plugs UK/USA/AU/EU to ERC230/C13	1
SX82PHU-4X	Secure 8P to 2P DP/HDMI KVM Ultra Mini-Matrix with fUSB support, PP4.0	1
	WR80-MM Remote Control	1
	RJ14 to RJ14Cable	1
	RJ14 to DB9 (Female, RS-232) Cable	1
	C13 Female to C14 Male Power Cable	1
	Adapters Kit - Plugs UK/USA/AU/EU to ERC230/C13	1
	WX12N-4 HSL Mini-Matrix AFP Splitter	1
	FH10NN-4 USB HID filter	1
	K10NEW-ML HSL Secure Keyboard	1
	8/16-Port Rack Mount Kit	1
SX42PHU-NX	Commercial 4P to 2P DP/HDMI KVM Ultra Mini-Matrix with USB 3.0 support	1
	RJ14 to DB9 (Female, RS-232) Cable	1
	C13 Female to C14 Male Power Cable	1
	Adapters Kit- Plugs UK/USA/AU/EU to ERC230/C13	1
SX82PHU-NX	Commercial 8P to 2P DP/HDMI KVM Ultra Mini-Matrix with USB 3.0 support	1
	WR80-MM Remote Control	1
	RJ14 to RJ14Cable	1
	RJ14 to DB9 (Female, RS-232) Cable	1
	C13 Female to C14 Male Power Cable	1
	Adapters Kit- Plugs UK/USA/AU/EU to ERC230/C13	1
	WX12N-4 HSL Mini-Matrix AFP Splitter	1
	FH10NN-4 USB HID filter	1
	K10NEW-ML HSL Secure Keyboard	1
	8/16-Port Rack Mount Kit	1

Cable Installation

Step 1 – Connect the Console Port Peripherals

- Connect the primary video display to the Ultra Mini-Matrix's primary HDMI port.
- Connect the secondary video display to the Ultra Mini-Matrix's secondary HDMI port.

Note: It is highly recommended to use identical primary and secondary display models. EDID information is taken from the primary console display port (#1) and sent to all connected computers. When using non-identical displays, connect the lower resolution display to the primary console display port.

- Connect the console keyboard and mouse to the Ultra Mini-Matrix's USB A ports, and the console audio output to the 3.5mm jack. These are shared securely between all sources.

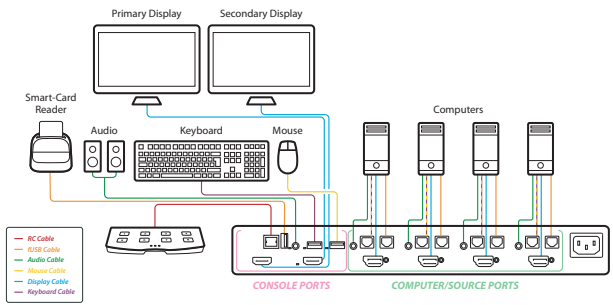
Note: The Ultra Mini-Matrix's mouse and keyboard USB A ports only support USB HID keyboards and mice. These ports will not support non-standard keyboards, keyboards with USB hubs or other USB-integrated devices, or other USB devices apart from keyboards and mice.

- To support user authentication across multiple isolated sources, connect a smartcard/biometric reader such as HSL's Multi-Domain Reader to the Ultra Mini-Matrix's console fUSB secure port.

Step 2 – Connect the Source Port Peripherals

- For each source, connect the video, keyboard, mouse, USB, and audio cables to the Ultra Mini-Matrix's corresponding source ports.

To receive dual-screen support in MS-Windows OS, download and install HSL's multi-display driver on source computers that have multiple screens (https://highseclabs.com/downloads/km-multi-display-drivers/).



INSTALLATION

Step 3 – Power On the Ultra Mini-Matrix

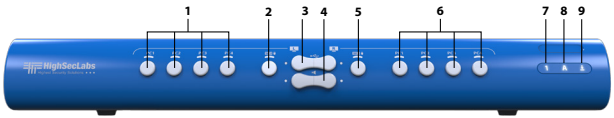
- Power ON all PCs connected to the Ultra Mini-Matrix.
- Connect the power supply and power ON the Ultra Mini-Matrix (approximate boot time is 10 seconds).

Note: Only use the power supply provided with the Ultra Mini-Matrix. If this power supply fails, contact HSL Support to order a replacement.

- The Ultra Mini-Matrix boots into Duplicate Mode, where the video of PC #1 is presented on both displays.

Basic Use of the KVM Ultra Mini-Matrix

The HSL KVM Ultra Mini-Matrix enables viewing and interacting with multiple computers simultaneously. There is always an active channel to which the keyboard and mouse are linked. Inactive channels are displayed but not interactable until selected.



1 Left Side Channel Select Buttons
2 Left Side Keyboard and Mouse Toggle
3 Left/Right Side fUSB Freeze toggle
4 Left/Right Side Audio Freeze toggle
5 Right Side Keyboard and Mouse toggle
6 Right Side Channel Select Buttons
7 Num Lock LED
8 Caps Lock LED
9 Scroll Lock LED

Front Panel Buttons

The KVM Ultra Mini-Matrix can switch channels by pressing the buttons along the front panel. By default, pressing one of the numbered buttons will switch to the corresponding channel. In addition, the Ultra Mini-Matrix can freeze the audio and USB ports of a chosen channel. This allows for listening to audio or using a USB device connected to a specific channel while operating on another.

On-Screen Display

The KVM Ultra Mini-Matrix features an On-Screen Display (OSD) to configure video, channel display, USB interface, and audio settings. The OSD can be opened at any time by entering **LCtrl | LCtrl | o** or **LCtrl | LAlt | o**.

Detailed instructions on how to operate the OSD can be found in the section **On-Screen Display Operation**.

OPERATION

Keyboard Hotkeys

The KVM Ultra Mini-Matrix has a variety of functions that can be controlled by entering keyboard hotkeys.

Action	Keyboard Hotkey
Reset to Factory Default	**Ctrl | Ctrl | F11 | r**
Activate On-Screen Display	**LCtrl | RCtrl | o or LCtrl | LAlt | o**
Relative Mouse	**Ctrl | Ctrl | F11 | b**
Absolute Mouse	**Ctrl | Ctrl | F11 | c**
Temporarily Enable Absolute Mouse Navigation	**LCtrl + LShift**
Increase Mouse Speed (Relative Mouse Mode)	**Ctrl | Ctrl | F11 | +**
Decrease Mouse Speed (Relative Mouse Mode)	**Ctrl | Ctrl | F11 | -**
Activate Terminal Menu	**LCtrl | RCtrl | t**
Extended Screen Mode, Vertical	**Ctrl | Ctrl | F11 | s | 3**
Extended Screen Mode, Horizontal	**Ctrl | Ctrl | F11 | s | 2**
Duplicate Screen Mode	**Ctrl | Ctrl | F11 | s | 1**
Tile Mode	**Ctrl | Ctrl | q**
Scale Mode	**Ctrl | Ctrl | z**
Enable 4K Resolution	**Ctrl | Ctrl | F11 | d | 8**
Enable HD Resolution	**Ctrl | Ctrl | F11 | d | 4**
Picture-in-Picture	**Ctrl | Ctrl | F11 | x**
Enable Direct Mode	**Ctrl | Ctrl | F12 | d | e**
Disable Direct Mode	**Ctrl | Ctrl | F12 | d | d**
Maintain Aspect Ratio	**Ctrl | Ctrl | a | e**
Disable Aspect Ratio	**Ctrl | Ctrl | a | d**

Mouse Navigation Options

The Ultra Mini-Matrix has two options for navigating with a mouse:

- **Relative Mouse (REL):**
  Relative Mouse Mode confines mouse movement to the active channel. While REL Mouse is active, switching channels can be done by using the buttons on the Ultra Mini-Matrix's front panel. REL Mouse is the default mode upon booting up, and can also be enabled by entering the key combination **Ctrl | Ctrl | F11 | b**.
- **Absolute Mouse (ABS):**
  Absolute Mouse Mode uses Virtual Display Technology (VDT) to switch seamlessly between sources, simply by holding down the **LCtrl** key and moving the cursor across the borders between channels. Depending on the chosen configuration of displays, the VDT mouse cursor movement axis between video displays can be either horizontal (where the cursor moves across displays arranged left-to-right) or vertical (where the cursor moves across displays arranged top-to-bottom). ABS Mouse can be toggled by entering **Ctrl | Ctrl | F11 | c**, or temporarily enabled from Relative Mouse Mode by holding **Lctrl + LShift**.
- **ABS Mouse Safety Trigger:**
  By default, hold down the **LCtrl** key to switch between channels while in ABS Mouse Mode. This prevents uncontrolled switching between source computers.

OPERATION

System Reset

Performing a system reset restores the device to its factory default configuration. This clears previously stored behavioral characteristics such as mouse settings and display presets. To perform a system reset, enter the key combination **Ctrl | Ctrl | F11 | r**.

Viewing Modes

The HSL Ultra Mini-Matrix has multiple selectable viewing modes: preset layouts, configured for the most common workflows. Each viewing mode shows a windowed version of the connected sources.

Extended Mode

Ctrl | Ctrl | x

In Extended Mode, the displays show unscaled, full-screen windows of the selected sources. The buttons on the left side of the Ultra Mini-Matrix's front panel select channels on the Primary Display, and the buttons on the right side of the front panel switch select channels on the Secondary Display. Both displays can show any source, including the same source simultaneously.

By default, the Ultra Mini-Matrix will boot up in Extended mode.

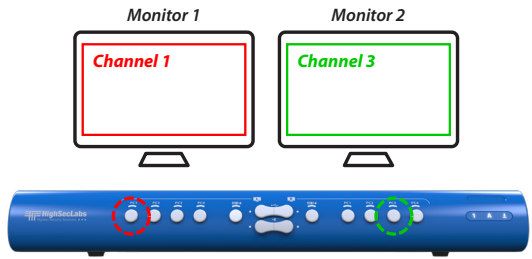


***Figure 1**: Extended Mode*

Duplicate Mode

Ctrl | Ctrl | F11 | s | 1

Single Display

In Duplicate Mode, the display shows the selected channels side-by-side. The buttons on the left side of the Ultra Mini-Matrix's front panel select channels on the left side of the display, and the buttons on the right side of the front panel select channels on the right side of the display. Both sides of the display can show any channel, including the same channel simultaneously. The images in each channel do not maintain their aspect ratio and appear vertically stretched.

To switch between displays using the mouse, hold down the **LCtrl** button and drag the cursor from one display to the other. Absolute Mouse Mode must be enabled.

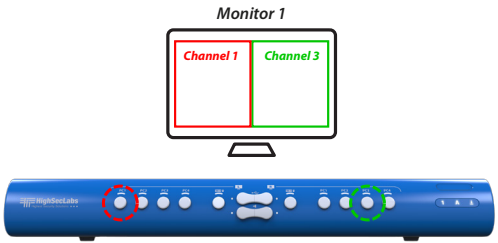


***Figure 2**: Duplicate Mode, Single Display*

Dual Display

If two displays are connected to the Ultra Mini-Matrix while in Duplicate Mode, both displays will show the same channels. The Mouse and Keyboard controls will operate identically on both displays.

To switch between channels using the mouse, hold down the **LCtrl** button and drag the cursor from one channel to the other. Absolute Mouse Mode must be enabled.

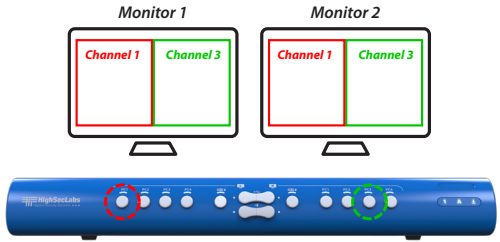


***Figure 3**: Duplicate Mode, Dual Display*

Tile Mode

Ctrl | Ctrl | q

Tile Mode displays the channels in equally spaced sections, scaled down to fit the display while maintaining their aspect ratio. These channels cannot be repositioned or resized.

The buttons on both the left and right of the Ultra Mini-Matrix's front panel select the active channel on the Primary Display.

Single Display

When using Tile Mode on a single display, the display shows all channels until one is selected as the active channel. The active channel is then displayed as a full-screen window, with all other channels hidden. Selecting a different channel displays the new active channel as a full-screen window. Selecting the active channel again returns the screen layout back to Tile Mode.

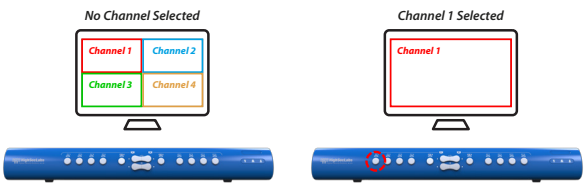


***Figure 4**: Tile Mode with a single display*

Dual Display

When using Tile Mode with two displays, the Primary Display shows an unscaled, full-screen image of the active channel. The Secondary Display shows all channels in equally spaced sections. The buttons on both the left and right of the Ultra Mini-Matrix's front panel select the active channel on the Primary Display.

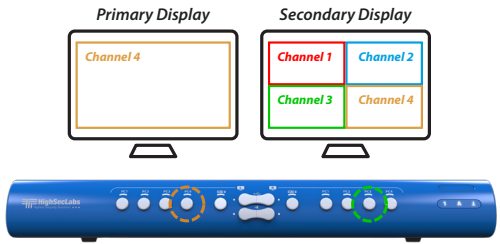


***Figure 5**: Tile Mode with two displays*

Scale Mode

Ctrl*|*Ctrl*|*z

Scale Mode displays a scaled window of the active channel that occupies approximately two-thirds of the display, along with smaller thumbnail images of the other channels on the right side of the display. The active channel does not maintain its aspect ratio by default, but the thumbnail images do maintain their aspect ratio.

Note: It is possible to enable a scaled image for the active channel that maintains its aspect ratio, by using the On-Screen Display. See the section **On-Screen Display Operation** for further details.

To use the mouse to interact with the channels on the Secondary Display, hold down the **LCtrl** button and drag the cursor from the Primary Display to the Secondary. Absolute Mouse Mode must be enabled.

Single Display

When using a single display, the buttons on both the left and right side of the Ultra Mini-Matrix's front panel select the active channel.

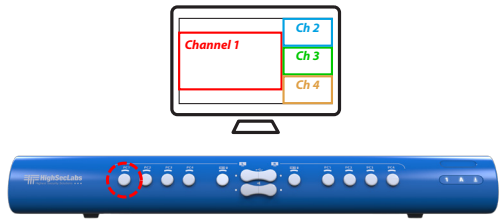


***Figure 6**: Scale Mode with a single display*

Dual Display

When using two displays, the Primary Display shows a full-screen image of the active channel. The buttons on the left side of the Ultra Mini-Matrix select the active channel on the Primary Display. The Secondary Display shows all channels in Scale Mode. The buttons on the right side of the Ultra Mini-Matrix select the active channel on the Secondary Display.

To switch between channels using the mouse, hold down the **LCtrl** button and drag the cursor from one channel to the other. Absolute Mouse Mode must be enabled.

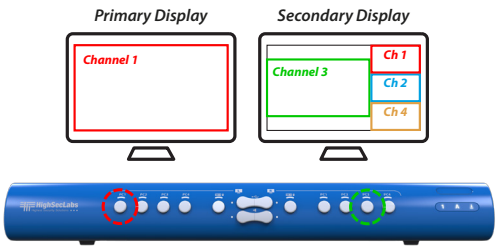


***Figure 7**: Scale Mode with two displays*

Picture-in-Picture (PIP) Mode (Single Display Only)

Ctrl | Ctrl | F11 | x

Picture-in-Picture Mode shows a full-screen window of an active channel, with a small PIP window of a second channel in the upper-right corner of the screen. The buttons on the left side of the Ultra Mini-Matrix's front panel select the active channel in the full-screen window, and the buttons on the right side select the active channel in the PIP window.

By default, the mouse cursor will remain on the full-screen window and pass behind the PIP window; to move the mouse cursor into the PIP window, ensure Absolute Mouse Mode is enabled, then hold the **LCtrl** key and drag the cursor to the PIP window.

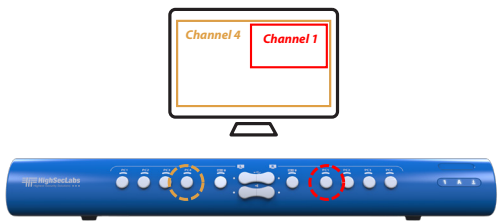


***Figure 8**: PIP Mode with a single display*

Dual Head Mode

Dual-Head Mode enables the functionality of a traditional dual-head secure KVM setup, while also allowing the ability to view and operate multiple computer sources across two displays.

To activate and configure Dual-Head Mode, activate the On-Screen Display. Detailed instructions on how to operate the OSD can be found in the section **On-Screen Display Operation**.

4-Port Model

A 4-Port Ultra Mini-Matrix can replicate a dual-head 2-port KVM setup. While in Dual-Head Mode, the Ultra Mini-Matrix shows the primary and secondary screens of the active channel in the full-screen windows of both displays. The primary and secondary screens of the inactive are shown in PIP windows on both displays.

To switch between channels using the mouse, hold down the **LCtrl** button and drag the cursor from one channel to the other. Absolute Mouse Mode must be enabled.

8-Port Model

An 8-Port Ultra Mini-Matrix can replicate a dual-head 4-port KVM setup. While in Dual-Head Mode, the Ultra Mini-Matrix shows the primary and secondary screens of the active channel in a scaled window on the left side of the screen. The primary and secondary screens of the inactive channels are shown in scaled thumbnail windows on the right side of the screen.

To switch between channels using the mouse, hold down the **LCtrl** button and drag the cursor from one channel to the other. Absolute Mouse Mode must be enabled.

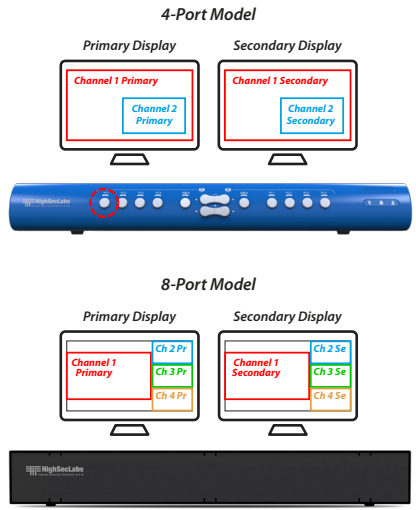


***Figure 9**: Dual-Head Mode on 4-Port and 8-Port Models*

On-Screen Display Operation

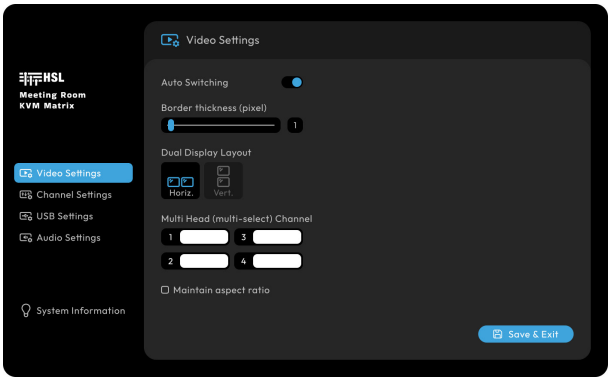
LCtrl | RCtrl | o or LCtrl | LAlt | o

The KVM Ultra Mini-Matrix is configured using an On-Screen Display (OSD) menu system. The OSD allows easy customization of video, channel, USB, and audio settings to create an optimal setup.

Multiple settings can be adjusted across different menus while the OSD is active, but no changes will be saved until selecting the option **Save & Exit**. Exiting the OSD without saving will discard any changes and revert to previous settings.

To exit the OSD without saving any changes, press **Esc**.

Video Settings



Auto Switching (Commercial Models Only)

If a new source is connected while the Ultra Mini-Matrix is on, Auto Switching immediately displays the new source as the active channel.

Border Thickness

Determine the thickness (in pixels) of the borders around the channel windows. By default, the borders are set to 6 pixels thick.

Dual Display Layout

Define the alignment of the Primary and Secondary Displays as horizontal or vertical. This determines the VDT mouse cursor movement axis when Absolute Mouse Mode is enabled.

Multi-Head (Multi select) Channel

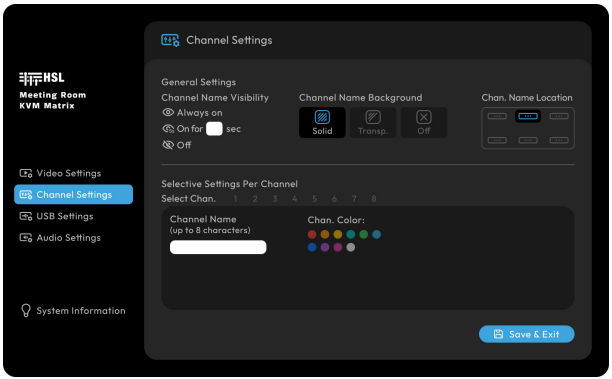
To connect a multi-head PC to multiple channels, select the channel connected to the USB port. In the text box next to the selected channel, add the other channels with displays connected to the same PC, with each channel number separated by the + key (e.g. "**1+2**").

For example, if there is a dual-head PC connected to Channels 1 and 2, select Channel 1 and enter "**1+2**" in the text box.

Maintain Aspect Ratio

Select whether a channel window will maintain the aspect ratio of the displayed channel when it is scaled up or down for different viewing modes.

Channel Settings



General Settings

These settings apply across all channels.

Channel Name Visibility

Determine how long the designated names of each channel are visible on the display(s).

- **Always on:** Channel names are always visible.
- **On for (x) sec:** Specify how many seconds the channel names are visible.
- **Always off:** Channel names are not visible.

Channel Name Background

Determine the visibility of a pill-shaped background that appears behind the channel name to stand out from the channel image.

- **Solid:** The background is shown as a solid color, contrasting the channel name sharply from the channel image.
- **Transparent:** The background is semi-transparent, contrasting the channel name partially from the channel image.
- **Off:** The background is removed, only displaying the channel name.

Channel Name Location

Determine the location of the channel window in which the channel name appears:

- Upper-left corner
- Upper middle
- Upper-right corner
- Lower-left corner
- Lower middle
- Lower-right corner

OPERATION

Selective Settings Per Channel

These settings only apply to a selected channel.

Channel Name

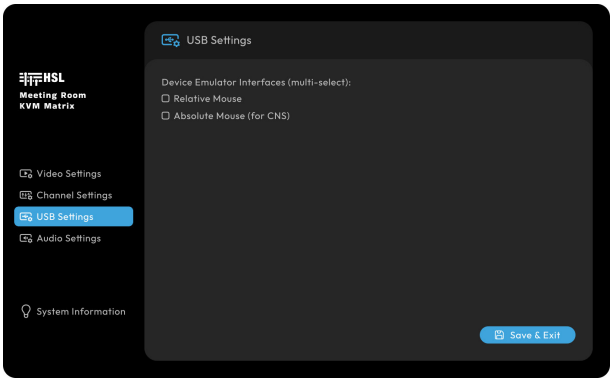
Enter a custom name for an individual channel by entering the name into the text box. Channel names can be a maximum of 8 characters long, and letters must be in uppercase.

Channel Color

Select a color for the borders of a selected channel:

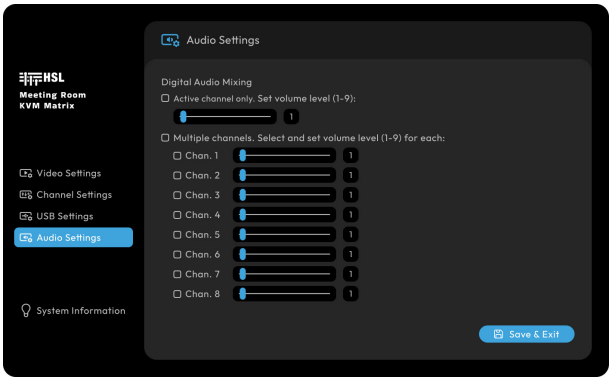
- Red
- Orange
- Yellow
- Mint
- Green
- Cyan
- Blue
- Purple
- Magenta
- White

USB Settings



- **Relative Mouse (REL):** Relative Mouse Mode confines mouse movement to the selected source's channel. While REL Mouse is active, switching between channels can be done by using the buttons on the Ultra Mini-Matrix's front panel. REL Mouse is the default mode upon booting up.
- **Absolute Mouse (ABS):** Absolute Mouse Mode uses Virtual Display Technology (VDT) to switch seamlessly between sources, simply by holding the **LCtrl** key and moving the cursor across the borders between channels. Depending on the chosen configuration, the VDT mouse cursor movement axis between video displays can be either horizontal (where the cursor moves across screens arranged left-to-right) or vertical (where the cursor moves across screens arranged top-to-bottom).

Audio Settings



The KVM Ultra Mini-Matrix features Digital Audio Mixing, playing digital audio from multiple channels simultaneously so alerts tones and other audio from inactive channels can be heard while operating on another.

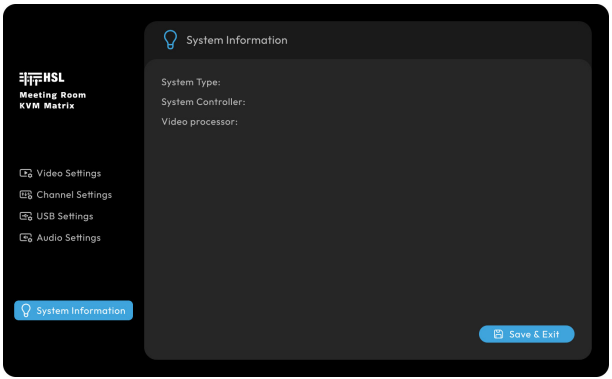
Active Channel Only

Only the audio from the active channel and set its volume level. This option is selected by default, with the volume set to level 9.

Multiple Channels

Select which channels play digital audio and set the volume for each channel independently.

System Information



System Type

Specifies if the KVM Ultra Mini-Matrix is a Secure or Commercial model.

System Controller

Indicates the firmware version for the Ultra Mini-Matrix's system controller.

Video Processor

Displays the firmware version of the FPGA EDID Generator for the video matrix, controller functionality, and view layouts.

Remote Control Device Settings

The KVM Ultra Mini-Matrix can be controlled using an external remote control, PC, or any other device with RS-232 capability (referred to hereafter as the Remote Control Unit or RCU).

Connect the Controlling Device to the Ultra Mini-Matrix

- Connect the Remote Control Unit to the Ultra Mini-Matrix via the RJ14 port labeled RDC (Remote Device Control) or RCU.
- It may be necessary to connect the devices using a USB to RJ14 cable (Part CUS18RJ, sold separately).
- The specific method of connecting the RCU to the Ultra Mini-Matrix may vary depending on the type of device being used. For full instructions on how to connect a controlling device, consult the RS-232 Remote Control Administrator Guide:

https://highseclabs.com/wp-content/uploads/2020/10/HDC18581_HSL_QSG_Remote-RS232-control_1.3.pdf

Remote Control Commands

The buttons on an RCU replicate the buttons on the Ultra Mini-Matrix's front panel. This is done by entering commands via a serial terminal program (e.g. PuTTY).

Keepalive events are used by the Ultra Mini-Matrix to periodically communicate its status to the RCU, using the RS-232 protocol. Entering an RS-232 command updates the keepalive event. Because these events are related to the buttons on the Ultra Mini-Matrix's front panel, they are constructed as **#AFP_ALIVE** followed by the command argument corresponding to the selected channel.

For example, to switch to Channel 4 on the left side of a 4-port Ultra Mini-Matrix, enter the command **#AFP_ALIVE FFFFFFF7**.

Note: while using a Remote Control Unit, the Ultra Mini-Matrix's front panel buttons are deactivated. This is because the Ultra Mini-Matrix is receiving commands from the RCU instead of the front panel buttons.

APPENDIX

To replicate the Ultra Mini-Matrix's front panel buttons using RS-232, enter the **#AFP_ALIVE** command with the following arguments:

4-Port Ultra Mini-Matrix		
Front Panel Button	**Left Side**	**Right Side**
Channel 1	FFFFFFFE	FFFFFFFB
Channel 2	FFFFFFFD	FFFFFFF7
Channel 3	FFFFFFEF	FFFFFFBF
Channel 4	FFFFFFDF	FFFFFF7F
Channel 5	FFFEFFE	FFFBFFB
Channel 6	FFFDFFD	FFF7FF7
Channel 7	FFEFFEF	FFBFFBF
Channel 8	FFDFFDF	FF7FF7F

Note: To freeze the keyboard/mouse, audio, or fUSB to the left or right side, enter the respective toggle command twice. Entering the command a third time will unfreeze.

For example, to freeze the audio to the left side of a 4-port Ultra Mini-Matrix, enter the command **#AFP_ALIVE FFFFFFF7** twice. Entering **#AFP_ALIVE FFFFFFF7** again will unlock the audio.

Command Structure for Kramer, Extron, Crestron Remote Controls

Depending on the manufacturer, some Remote Control Units may require certain characters when entering a keepalive command. The following are command structures for the most common RCUs.

Action	Description	Kramer	Extron	Crestron
Carriage Return	Return text cursor to beginning of line	<cr>	<cr>	\x0d
Line Feed	Move text cursor to new line	<lf>	<lf>	\x0a
Command Start	Begin a new command			#
Space	Separate multiple strings			\x

Examples:

The following examples all enter a command into the keepalive sequence for an 8-port Ultra Mini-Matrix's front panel "**AFP_ALIVE**" to switch to Channel 1 "**FFFFFFE**" ending with a carriage return.

- Kramer or Extron: **#AFP_ALIVE FFFFFFFE <cr>**
- Crestron: **##AFP_ALIVE FFFFFFFE\x0d**

For further information on programming a Remote Control Unit to enter RS-232 commands, consult the Programmable Remote Control User Manual.

Highseclabs.com

For more information about HSL's solutions, please contact:

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