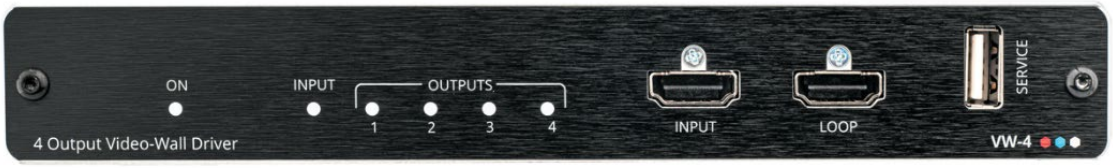
KRAMER

USER MANUAL

MODEL:

VW-4
4 Output Video-Wall Driver



Contents

Introduction

Welcome to Kramer Electronics! Since 1981, Kramer Electronics has been providing a world of unique, creative, and affordable solutions to the vast range of problems that confront the video, audio, presentation, and broadcasting professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better!

Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment.
- Review the contents of this user manual.

Go to www.kramerav.com/downloads/VW-4 to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

Achieving Best Performance

- Use only good quality connection cables (we recommend Kramer high-performance, high-resolution cables) to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables).
- Do not secure the cables in tight bundles or roll the slack into tight coils.
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality.
- Position your Kramer **VW-4** away from moisture, excessive sunlight and dust.

Safety Instructions

Caution:

- This equipment is to be used only inside a building. It may only be connected to other equipment that is installed inside a building.
- For products with relay terminals and GPI\O ports, please refer to the permitted rating for an external connection, located next to the terminal or in the User Manual.
- There are no operator serviceable parts inside the unit.

Warning:

- Use only the power cord that is supplied with the unit.
- To ensure continuous risk protection, replace fuses only according to the rating specified on the product label which is located on the bottom of the unit.

Recycling Kramer Products

The Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC aims to reduce the amount of WEEE sent for disposal to landfill or incineration by requiring it to be collected and recycled. To comply with the WEEE Directive, Kramer Electronics has made arrangements with the European Advanced Recycling Network (EARN) and will cover any costs of treatment, recycling and recovery of waste Kramer Electronics branded equipment on arrival at the EARN facility. For details of Kramer's recycling arrangements in your particular country go to our recycling pages at www.kramerav.com/support/recycling.

Overview

Congratulations on purchasing your Kramer **VW-4 4 Output Video-Wall Driver**, designed to configure and manage video-walls quickly and easily. Use one **VW-4** device to create any wall configuration with up to 4 displays, for example, a 2x2, 4x1, 1x4, 2x1, 3x1 video-wall. Connect additional devices to create walls of any size and configuration of up to 64 displays. Configure a single or multiple device setup using the **VW-4** app via Ethernet or RS-232, or quickly configure a basic setup using the local DIP-switches.

VW-4 provides exceptional quality and user-friendly operation.

Exceptional Quality

- Scalable Video-walls – Create and manage a video-wall of up to 4 displays or, by adding devices, create video-walls of up to 64 displays.
- Content Protection – Supports HDCP 2.2 on the input and loop output and HDCP 1.4 on the main outputs.
- EDID Support – Upload EDID files, copy any output EDID to the input, and select from several built-in EDID files.
- Reliable Video – Features constant output sync, and includes auto-sync off options for shutting down the output when no input is detected.
- Auto Display Powering – CEC capabilities turn ON or OFF the connected displays according to the status of the input video.
- HDMI Support – CEC (by-pass loop for output only), 4K@60Hz (input and loop output), 1080P (output), Deep Color, 7.1 PCM, as specified in HDMI 2.0.

Advanced and User-friendly Operation

- Quick, Basic, Local Setup – Use front panel DIP-switches for basic setup of video-walls up to 16 displays.
- Full Feature Configuration – Use the **VW-4** app via Ethernet or RS-232 to set up video-walls of up to 8x8 displays. Also use the app for bezel corrections, HDCP status, factory reset, upgrading firmware, viewing network settings and copying EDID.
- Easy Installation – Compact MegaTOOLS® fan-less enclosure for surface mounting or side-by-side mounting of 2 units in a 1U rack space with the recommended rack adapter.

Typical Applications

VW-4 is ideal for the following typical applications:

- Command and control rooms
- Digital signage
- Stock market displays
- Building lobbies
- Corporate offices
- In-store retail promotion
- Convention and trade shows.

Controlling your VW-4

Control your **VW-4** via:

- DIP-switch settings – for basic video-wall configuration.
- **VW-4** app, via the Ethernet or RS-232.
- Remotely, by RS-232 serial commands transmitted by a touch screen system, PC, or other serial controller.

Defining VW-4 4 Output Video-Wall Driver

This section defines **VW-4**.

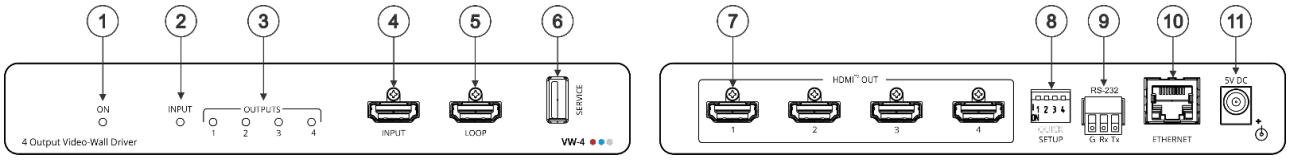


Figure 1: VW-4 4 Output Video-Wall Driver

#	Feature	Function
1	ON LED	Lights green when the device is powered.
2	INPUT LED	Lights green when a valid input signal is detected on the input.
3	OUTPUT LEDs (1 to 4)	Light green when an acceptor is detected on that output.
4	INPUT HDMI Connector	Connect to an HDMI source.
5	LOOP HDMI Connector	Connect to an additional **VW-4** device for configuring a large video-wall or to a local monitor.
6	SERVICE USB Port	Use to perform firmware upgrade.
7	OUT HDMI Connectors (1 to 4)	Connect to up to 4 HDMI acceptors that make up the video-wall configuration. The appropriate segments of the zoomed picture are output on these connectors for connection to the displays in the video-wall. The output on these connectors is at 1080P resolution.
8	SETUP 4-way DIP-switch	Use for fast, basic configuration of the device without needing to be connected to a PC, see Configuring SETUP DIP-Switches on page 10.
9	RS-232 3-pin terminal block connector	Use to setup and monitor the **VW-4** via the Windows software and to upgrade the firmware.
10	ETHERNET RJ-45 Connector	Connect to a PC via a LAN to setup and monitor the **VW-4** via the configuration app.
11	5V DC Connector	Connect to the supplied power adapter.

Mounting VW-4

This section provides instructions for mounting **VW-4**. Before installing, verify that the environment is within the recommended range:

- Operation temperature – 0° to 40°C (32 to 104°F).
- Storage temperature – -40° to +70°C (-40 to +158°F).
- Humidity – 10% to 90%, RHL non-condensing.

Caution:

- Mount **VW-4** before connecting any cables or power.

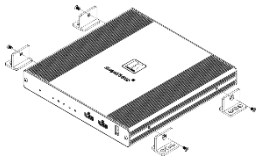
Warning:

- Ensure that the environment (e.g., maximum ambient temperature & air flow) is compatible for the device.
- Avoid uneven mechanical loading.
- Appropriate consideration of equipment nameplate ratings should be used for avoiding overloading of the circuits.
- Reliable earthing of rack-mounted equipment should be maintained.
- Maximum mounting height for the device is 2 meters.

Mount VW-4 in a rack:

- Use the recommended rack adapter (see www.kramerav.com/product/VW-4).

Mount VW-4 on a surface using one of the following methods:



- Attach the rubber feet and place the unit on a flat surface.
- Fasten 2 brackets (included) on each side of the unit and attach them to a flat surface. For more information go to www.kramerav.com/downloads/VW-4.

Connecting VW-4

You can connect up to 16 **VW-4** devices to create a video-wall of 8x8, using 64 displays. In the example below, three **VW-4** devices are used to create a 6x2 video-wall.

The ID Name of the three devices in this 6x2 diagram are set by the App to 0, 1 and 2 (see Changing the Device ID Number on page 16). Each output is designated by the device ID number and its outputs. For example, VW-4 (1) is defined as the second device in this video-wall configuration and VW-4 (1-2) is HDMI OUT 2 on that device.

Always switch off the power to each device before connecting it to your **VW-4**. After connecting your **VW-4**, connect its power and then switch on the power to each device.

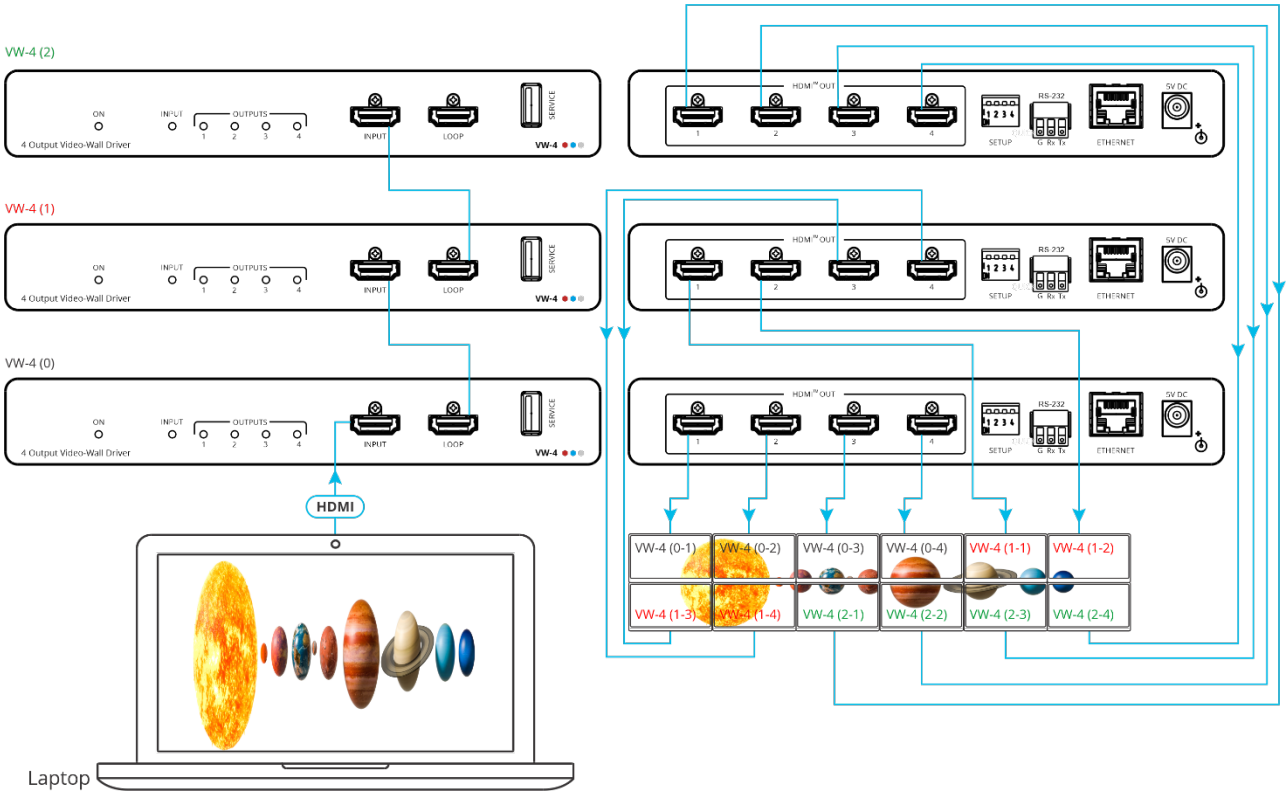


Figure 2: Connecting to the VW-4

To connect VW-4 as illustrated in the example in Figure 2:

1. Connect the HDMI source (for example, a laptop) to the HDMI INPUT connector (4) on the front panel of **VW-4** (0).
2. Connect the LOOP HDMI connector (5) on **VW-4** (0) to the HDMI INPUT connector on the front panel of **VW-4** (1).
3. Connect the LOOP HDMI connector on **VW-4** (1) to the HDMI INPUT connector on the front panel of **VW-4** (2).
4. Connect each of the HDMI OUT connectors (7) on the three **VW-4** devices to a display (in its appropriate location on the video-wall).
5. Connect the power adapter to **VW-4** and to the mains electricity (not shown in Figure 2).
6. Configure the video-wall (see Configuring VW-4 on page 10).

Connecting to VW-4 via RS-232

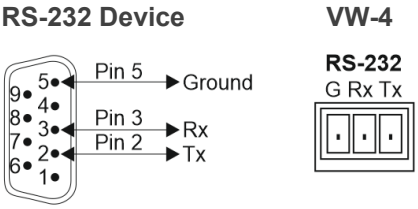
You can connect to **VW-4** via an RS-232 connection (13) using, for example, a PC.

VW-4 features an RS-232 3-pin terminal block connector allowing the RS-232 to control **VW-4**.

Connect the RS-232 terminal block on the rear panel of **VW-4** to a PC/controller, as follows:

From the RS-232 9-pin D-sub serial port connect:

- Pin 2 to the TX pin on the **VW-4** RS-232 terminal block
- Pin 3 to the RX pin on the **VW-4** RS-232 terminal block
- Pin 5 to the G pin on the **VW-4** RS-232 terminal block



Connecting via Ethernet

You can connect to **VW-4** via Ethernet using either of the following methods:

- Directly to the PC using a crossover cable (see Connecting Ethernet Port Directly to PC on page 7).
- Via a network hub, switch, or router, using a straight-through cable (see Connecting Ethernet Port via Network Hub on page 9).

If you want to connect via a router and your IT system is based on IPv6, speak to your IT department for specific installation instructions.

Connecting Ethernet Port Directly to PC

You can connect the Ethernet port of **VW-4** directly to the Ethernet port on your PC using a crossover cable with RJ-45 connectors.

This type of connection is recommended for identifying **VW-4** with the factory configured default IP address.

After connecting **VW-4** to the Ethernet port, configure your PC as follows:

1. Click **Start** > **Control Panel** > **Network and Sharing Center**.
2. Click **Change Adapter Settings**.

3. Highlight the network adapter you want to use to connect to the device and click **Change settings of this connection**.
   The Local Area Connection Properties window for the selected network adapter appears as shown in Figure 3.

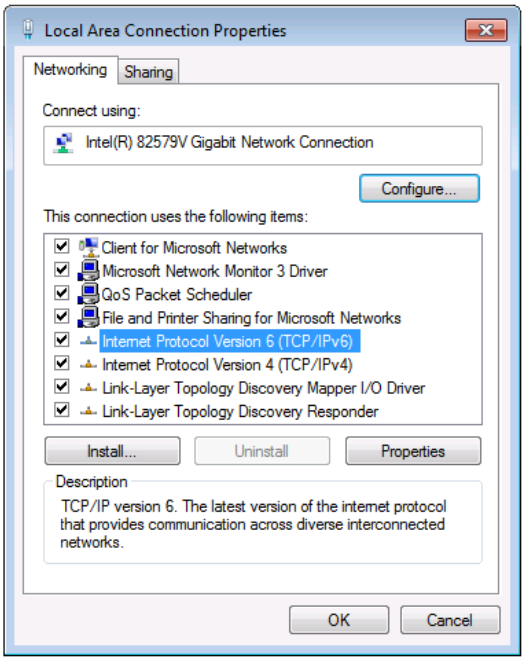


Figure 3: Local Area Connection Properties Window

4. Highlight either **Internet Protocol Version 6 (TCP/IPv6)** or **Internet Protocol Version 4 (TCP/IPv4)** depending on the requirements of your IT system.
5. Click **Properties**.
   The Internet Protocol Properties window relevant to your IT system appears as shown in Figure 4 or Figure 5.

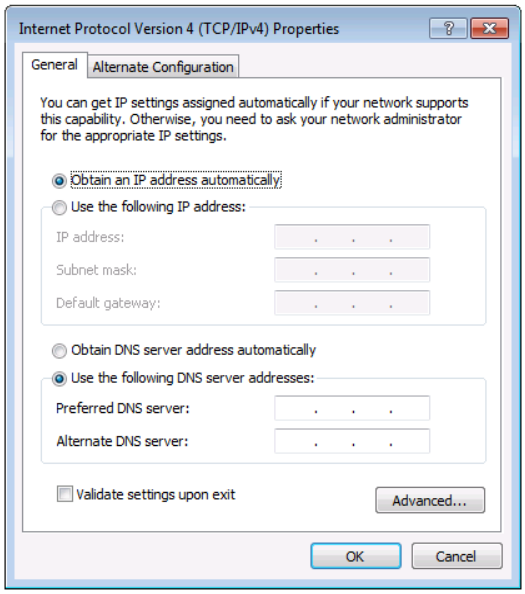


Figure 4: Internet Protocol Version 4 Properties Window

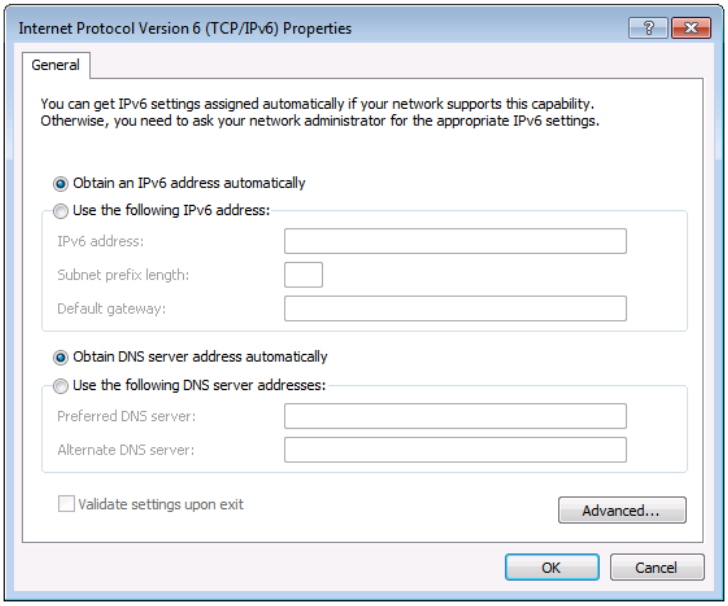


Figure 5: Internet Protocol Version 6 Properties Window

6. Select **Use the following IP Address** for static IP addressing and fill in the details as shown in Figure 6.
   For TCP/IPv4 you can use any IP address in the range 192.168.1.1 to 192.168.1.255 (excluding 192.168.1.39) that is provided by your IT department.

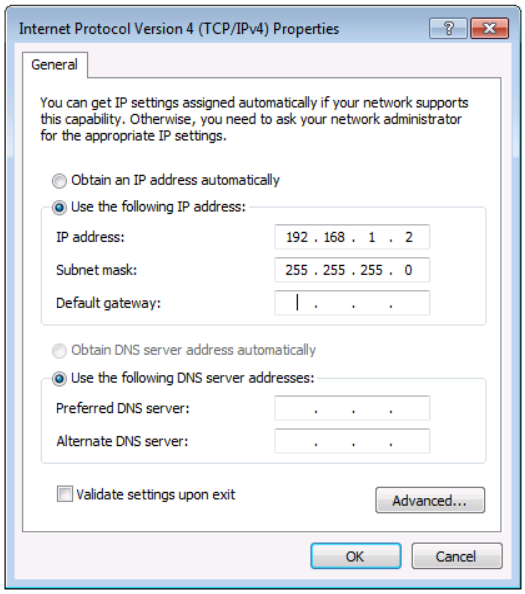


Figure 6: Internet Protocol Properties Window

7. Click **OK**.
8. Click **Close**.

Connecting Ethernet Port via Network Hub or Switch

You can connect the Ethernet port of **VW-4** to the Ethernet port on a network hub or using a straight-through cable with RJ-45 connectors.

Configuring Ethernet Port

You can set the Ethernet parameters via the embedded webpages.

Configuring VW-4

We recommend that you configure the video-wall after connecting the video-wall. You can configure the video-wall by:

- Configuring SETUP DIP-Switches on page 10.
- Using the VW-4 App on page 11.
- Configuring the video-wall via protocol commands (see Protocol 3000 on page 30).

Once the video-wall settings are defined, adjust the image on the video-wall (see Adjusting the Video-Wall Image on page 24).

Configuring SETUP DIP-Switches

Use the SETUP ⑧ DIP-switch settings to configure a basic video-wall (without defining bezel correction) of up to 4x4, consisting of 1 to 4 **VW-4** devices. This can be very useful for quickly testing video-wall functionality when setting up the system.

When the video-wall size is configured using the DIP-switches, you cannot set it via the configuration app. To use the app, make sure that all DIP-switches are OFF.

DIP 1	DIP 2	DIP 3	DIP 4	Columns x Rows Layout	Notes
OFF	OFF	OFF	OFF	Basic setup is not used (default)	The setup is configured via the APP, not via the DIP-switches.
OFF	OFF	OFF	ON	Full size picture (“1x1” wall)	Image appears on all displays. (Each display shows the full image).
OFF	OFF	ON	OFF	N/A	
OFF	OFF	ON	ON	N/A	
One **VW-4** Device					
OFF	ON	OFF	OFF	2x2 wall (0)	VW-4 (0) OUT 1 / VW-4 (0) OUT 2 / VW-4 (0) OUT 3 / VW-4 (0) OUT 4
OFF	ON	OFF	ON	4x1 wall (0)	VW-4 (0) OUT 1 / VW-4 (0) OUT 2 / VW-4 (0) OUT 3 / VW-4 (0) OUT 4
OFF	ON	ON	OFF	1x4 wall (0)	VW-4 (0) OUT 1 / VW-4 (0) OUT 2 / VW-4 (0) OUT 3 / VW-4 (0) OUT 4
OFF	ON	ON	ON	N/A	
Three **VW-4** Devices					
ON	OFF	OFF	OFF	3x3 wall, first unit (0)	VW-4 (0) OUT 1 / VW-4 (0) OUT 2 / VW-4 (0) OUT 3 / VW-4 (0) OUT 4 / VW-4 (1) OUT 1 / VW-4 (1) OUT 2 / VW-4 (1) OUT 3 / VW-4 (1) OUT 4 / VW-4 (2) OUT 1
ON	OFF	OFF	ON	3x3 wall, second unit (1)	
ON	OFF	ON	OFF	3x3 wall, third unit (2)	
ON	OFF	ON	ON	N/A	

DIP 1	DIP 2	DIP 3	DIP 4	Columns x Rows Layout	Notes
Four **VW-4** Devices					
ON	ON	OFF	OFF	4x4 wall, first unit (0)	VW-4 (0) OUT 1 / VW-4 (0) OUT 2 / VW-4 (0) OUT 3 / VW-4 (0) OUT 4 VW-4 (1) OUT 1 / VW-4 (1) OUT 2 / VW-4 (1) OUT 3 / VW-4 (1) OUT 4 VW-4 (2) OUT 1 / VW-4 (2) OUT 2 / VW-4 (2) OUT 3 / VW-4 (2) OUT 4 VW-4 (3) OUT 1 / VW-4 (3) OUT 2 / VW-4 (3) OUT 3 / VW-4 (3) OUT 4
ON	ON	OFF	ON	4x4 wall, second unit (1)	
ON	ON	ON	OFF	4x4 wall, third unit (2)	
ON	ON	ON	ON	4x4 wall, fourth unit (3)	

Using the VW-4 App

Use the **VW-4** Windows® Control Software app to configure a video-wall of up to 8x8, consisting of one or more **VW-4** devices.
Download app from www.kramerav.com/product/VW-4#Tab_Resources).

VW-4 app enables performing the following actions:

- Connecting VW-4 Devices to the Network on page 12.
- Configuring Device Settings on page 15.
- Configuring Device Layout on page 21.

In the following example, two **VW-4** devices are used to configure a 3x2 video-wall.

We recommend that you first arrange the displays on the video-wall and then configure the devices using the **VW-4** App.

Connecting VW-4 Devices to the Network

Before setting the video-wall using the app, you need to connect all the **VW-4** devices to the same network as your PC and then open the app.

Set each device with a unique IP address. You can do this by connecting a device to the App and changing its IP address (see Updating Network Settings on page 14).

To Connect the video-wall VW-4 devices (for example, a 3x2 video-wall, using two devices):

1. Connect all the video-wall **VW-4** devices to your network, making sure that each has a unique IP address.
2. Open the app.

Figure 7: VW-4 Windows® Control Software App

3. Click **Connection**.
   The Connection window opens, showing a list of all the connected **VW-4** devices and the available RS-232 ports on your PC.

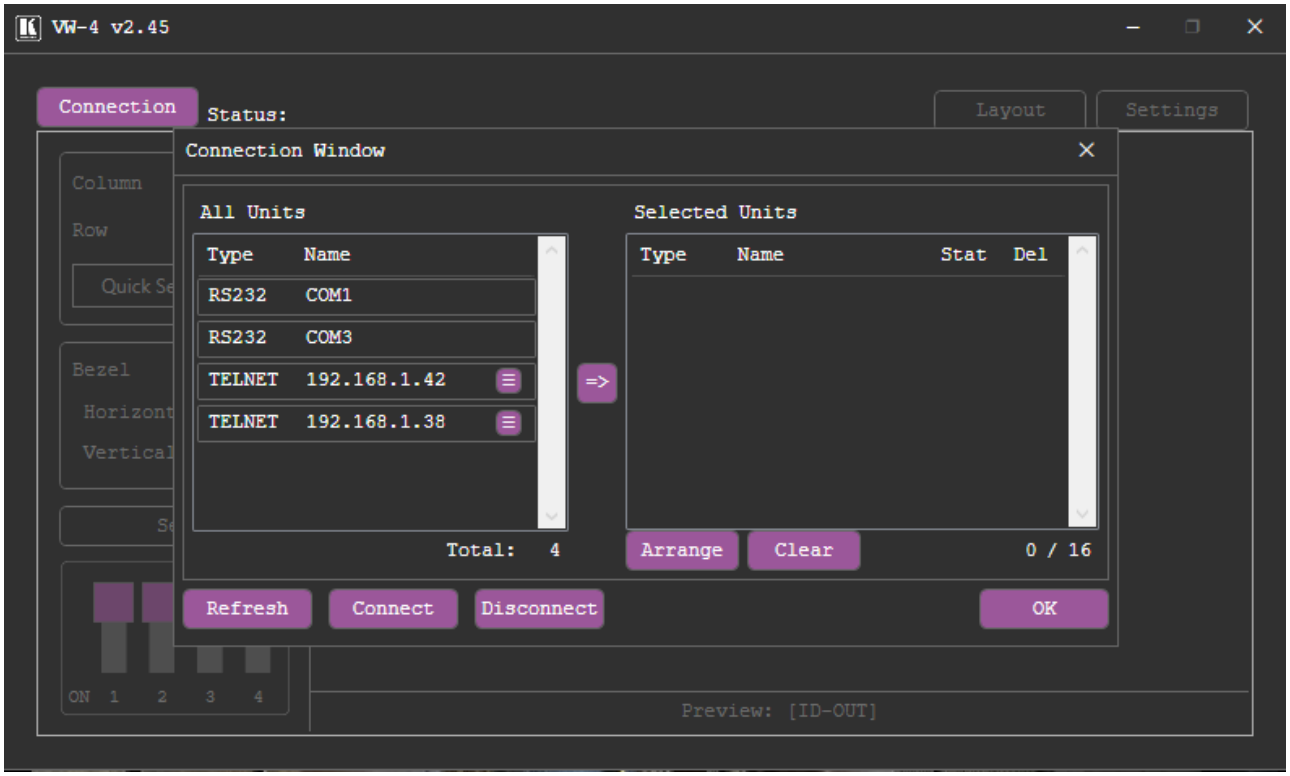


Figure 8: Connection Window

4. Select a connected device under All Units and click  .
   The selected device moves to the Selected Units area.

5. Move other connected devices.

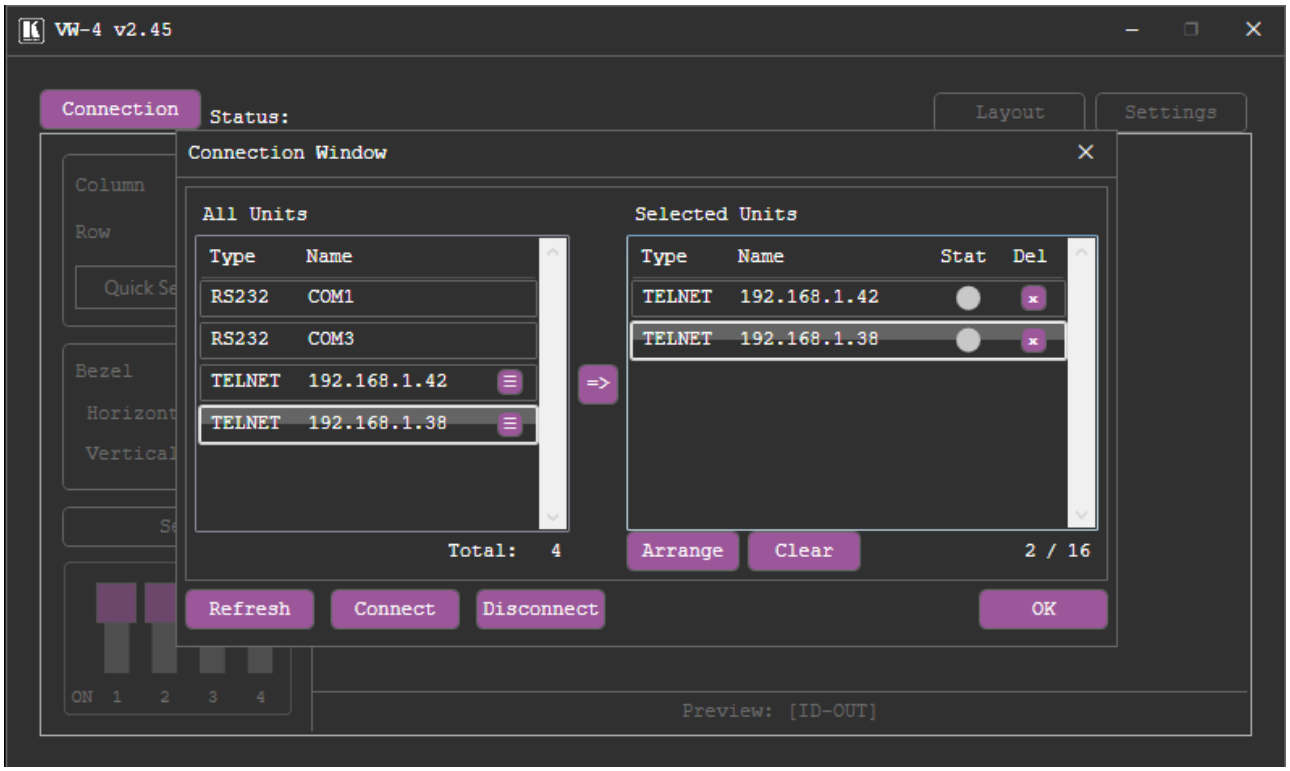


Figure 9: Selected Devices under Selected Units

6. Click **Connect**. The device is connected, and a green indication circle appears under Stat.

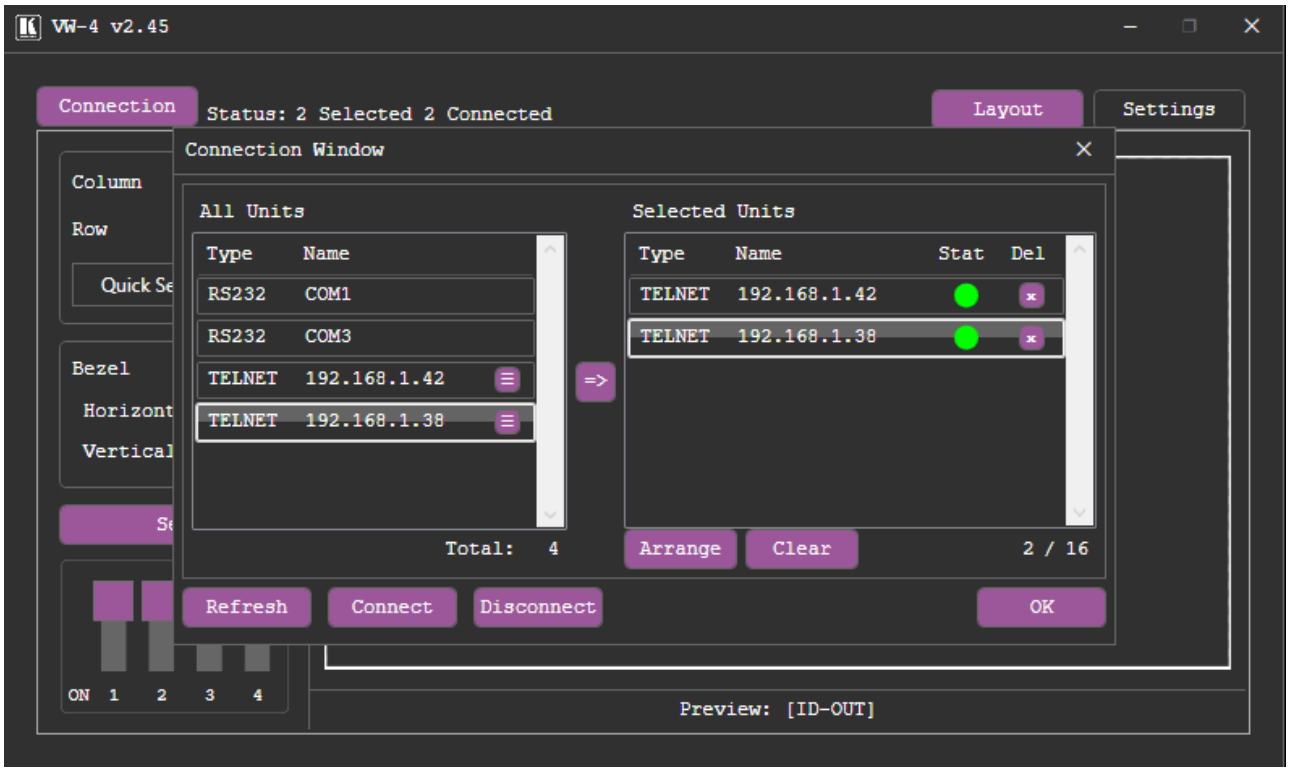


Figure 10: [Figure Caption]

7. Click **OK**. The app Status line indicates the number of devices selected and connected.

Video-wall devices are connected.

Updating Network Settings

Change the IP address and other Network settings via P3K commands (see Protocol 3000 Commands on page 31) or via the **VW-4** App.

When changing Network settings, the device should be disconnected.

To update the Network settings:

1. Click **Connection**.
2. Click next to the TELNET number of a device. The Network status window opens.

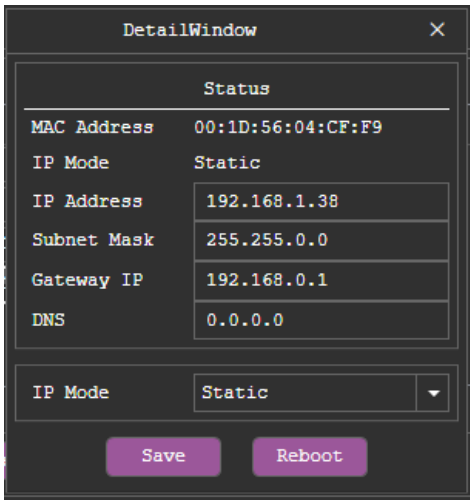


Figure 11: Network Settings Window (Detail Window)

3. Change Network settings (if IP mode is set to Static).
4. Change the IP mode to static or DHCP.
5. Change Network settings as required.
6. Click **Save** and then **Reboot**.

Network settings are updated.

Configuring Device Settings

Once the devices are connected, you can configure each of the video-wall **VW-4** devices via the Settings tab.

Settings tab enables performing the following actions:

- Changing the Device ID Number on page 16.
- Updating the Firmware on page 17.
- Performing Factory Reset on page 18.
- Viewing Network Settings on page 18.
- Defining Input Settings on page 18.
- Defining Output Settings on page 20.

Changing the Device ID Number

The ID-NAME area lists the devices in the order they were discovered and connected: “0” is the first, “1” the second, and so on. You can change that order to match your video-wall configuration.

To change the ID of a device:

1. Select the **Settings** tab.
2. Place cursor next to the ID.

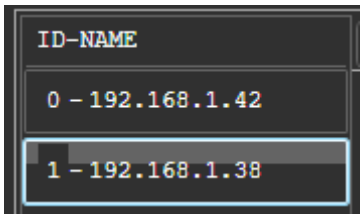


Figure 12: ID-NAME List

3. Change the ID number for each device and press **ENTER** on your PC.

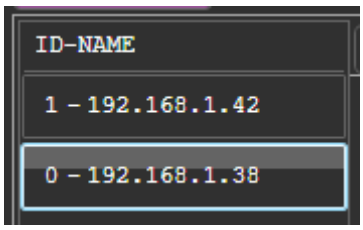


Figure 13: ID-NAME Changed

The device ID number has changed and is saved.

Updating the Firmware

VW-4 App enables updating the firmware for each device.

To update the firmware:

1. Save the new firmware file to a memory stick.

   The memory stick should only include this file.

2. Select the Settings tab and then click **System** tab.

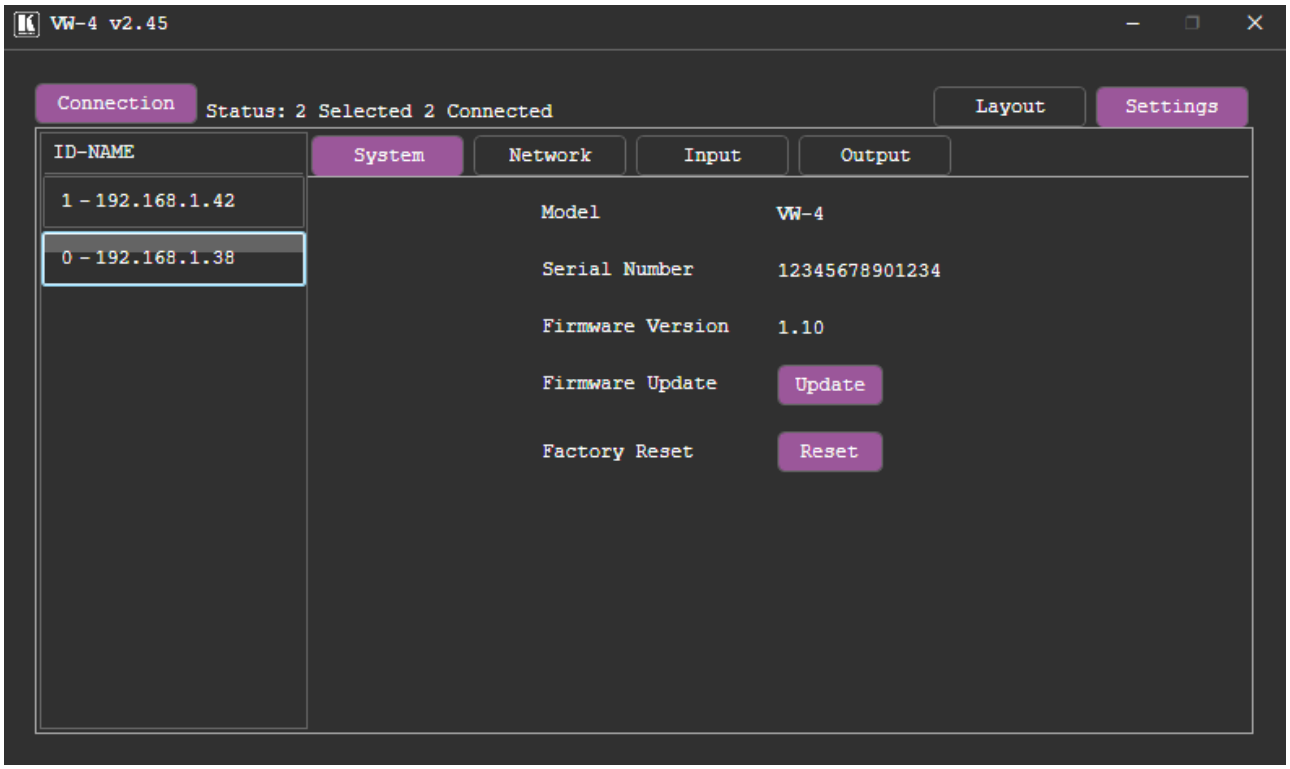


Figure 14: System Tab

3. Click Update. The following message appears.

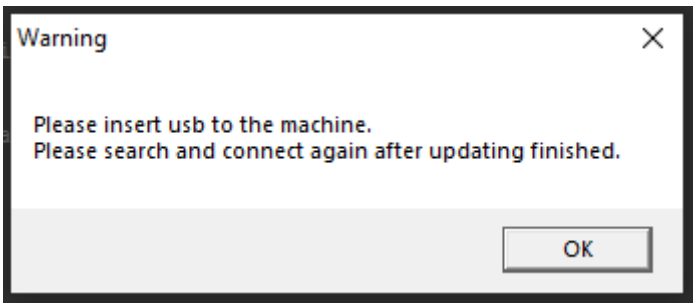


Figure 15: Firmware Update Message

4. Connect the memory stick (USB) to **SERVICE** USB connector (6).
5. Click **OK**. The device disconnects and the firmware is upgraded.
6. Reconnect the device and make sure that the firmware revision has changed.

Firmware is updated.

Performing Factory Reset

To perform factory reset:

1. Select the Settings tab and then click **System** tab.
2. Click **Reset**.

The device is reset to its factory default values (except for the network parameters).

Viewing Network Settings

You can change Network settings via the Connection window (see Updating Network Settings on page 14).

To view Network settings:

1. Select the Settings tab and then click **Network** tab.
2. View the device Network settings.

Network settings are viewed.

Defining Input Settings

Manage the EDID and HDCP settings.

To define input settings:

1. Select the Settings tab and then click **Input** tab.

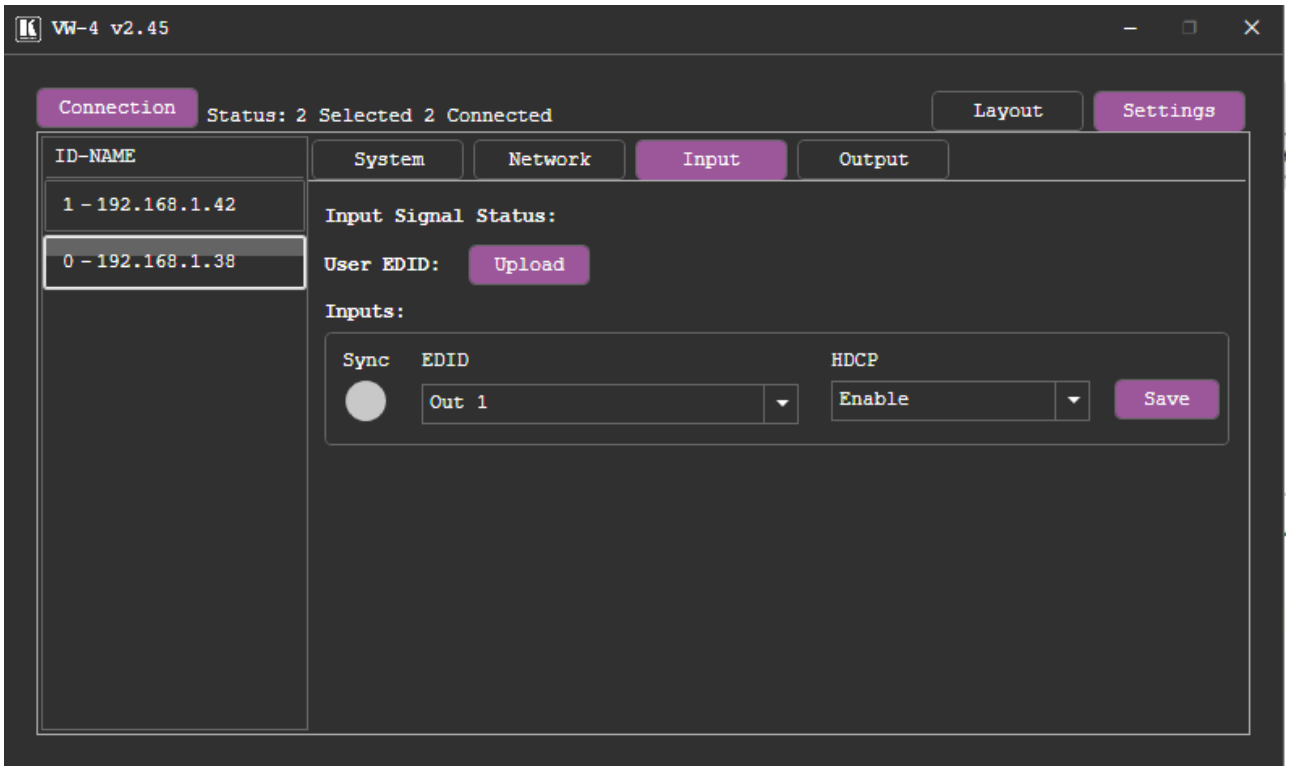


Figure 16: Input Settings

2. View the input signal status. Sync is green if a valid input is detected.

3. Set EDID in one of the following ways:
   - Click **Upload** to load a custom EDID and follow the instructions.

     The custom EDID should be loaded to a USB memory stick as a single file and connected to the SERVICE USB connector.

   - Select an EDID from the EDID dropdown box and then click **Save**.
     You can copy the EDID from the display on one of the outputs (Out 1-4); select the manually uploaded EDID (User); or select a factory programmed 4K or 1080p EDID.

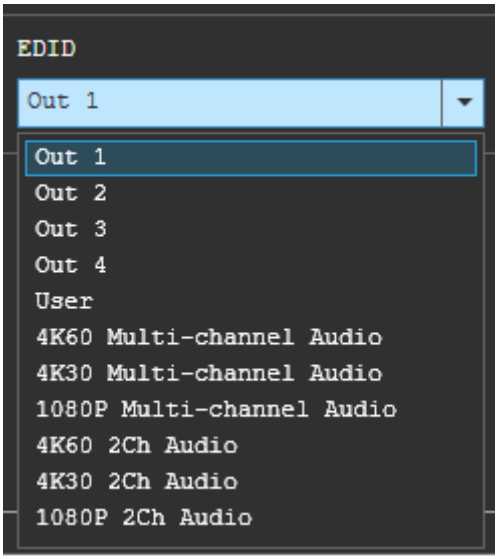


Figure 17: Input Settings – EDID Options

4. Set HDCP to Enable/Disable and then click **Save**.

Input Settings are defined.

Defining Output Settings

Define **VW-4** output settings.

To define output settings:

1. Select the Settings tab and then click **Output** tab.

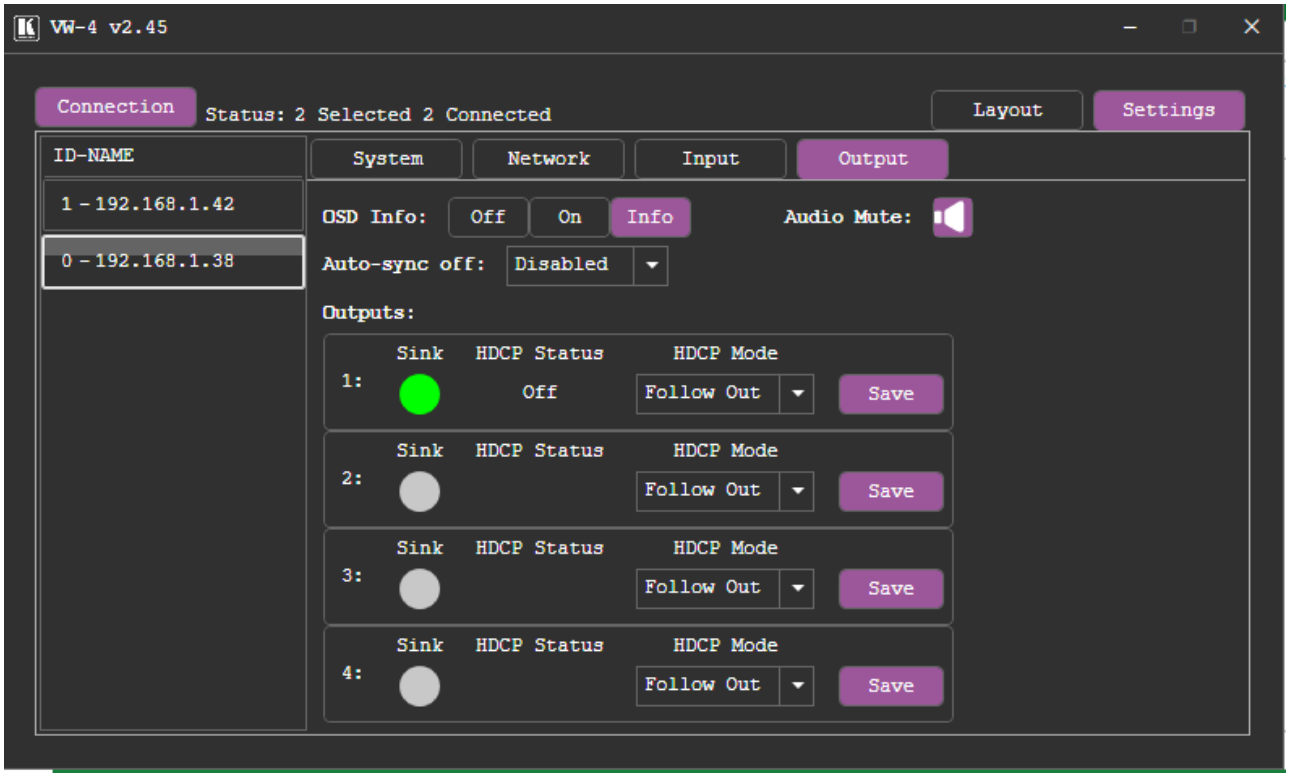


Figure 18: [Figure Caption]

2. Define the OSD information behavior:
   - Click **Off** to keep OSD (On-Screen-Display) info always off.
   - Click **On** to keep OSD info always on.
   - Click **Info** to show information for a few seconds only after a change is made.
3. Click next to Audio Mute to mute or unmute audio output.
4. Select Auto-sync off Disabled, Slow or Fast from the drop-down list. When not disabled, the unit turns off its HDMI outputs (after the selected timeout period) when there is no video on the input.
5. Set the status for each output (sink is green if a valid output is detected):
   - View HDCP output status.
   - Set HDCP status to: Follow In or Follow Out.
   - Click **Save** per output.

Output settings are defined.

Configuring Device Layout

After setting the ID NAME and other device settings you can continue to configure the video-wall layout.

Layout configuration applies to all the **VW-4** devices that are connected to the same network, making it very easy to configure the layout in one go. Once the layout is set, you can disconnect the devices from the Network.

If you are able to connect only one device at a time, you need to set the layout separately for each device.

The Layout tab enables performing the following actions:

- Defining Video-Wall Size on page 21.
- Setting Bezel Corrections on page 23.
- Viewing the DIP-Switch Setup on page 24.

Defining Video-Wall Size

Video-wall size is defined by the number of its columns and rows.

To define the wall size:

1. Select Layout tab.

Figure 19: Layout Tab

2. Set the video-wall size, in one of the following ways:
   - Selecting Column and Row numbers (for example, 3 x 2).

Figure 20: Layout Tab – 3x2 Video-wall Setting

   - Clicking **Quick Selection** for common video-wall configurations.

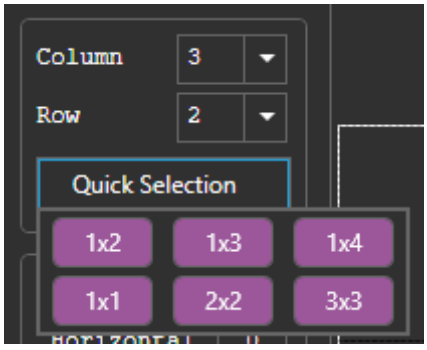


Figure 21: Quick Selection Video-wall Layout

3. View the video-wall layout in the Preview window.

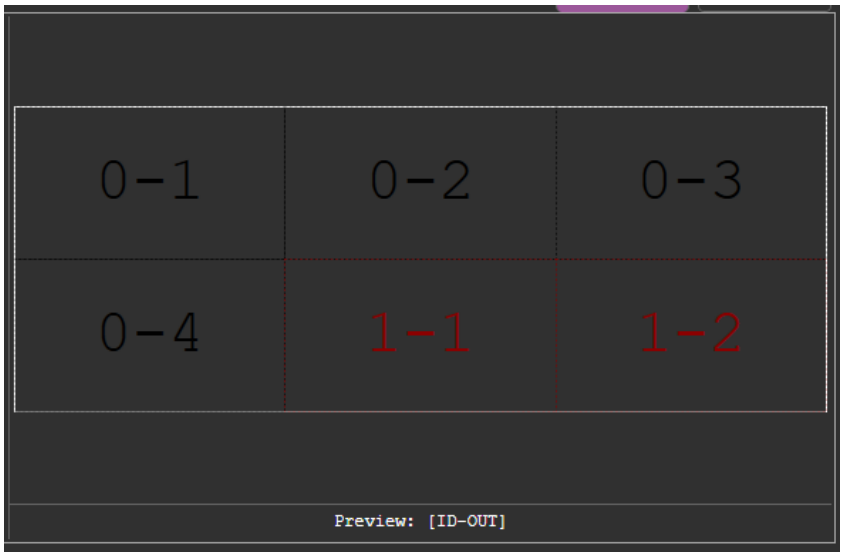
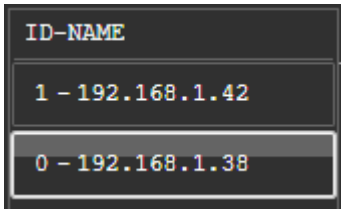


Figure 22: Video-wall Preview

The Preview window displays the selected video-wall size and each display in the video-wall is tagged by the device number. For example:

- "0" is the ID number of the first **VW-4** in the wall ("0-192.168.1.38" as defined via settings tab).
- "1" is the ID number of the second **VW-4** in the wall ("0-192.168.1.42" as defined via settings tab).
- 1 to 4 indicate the HDMI outputs.



Video-wall layout is defined.

Setting Bezel Corrections

Enter horizontal and vertical bezel corrections (in pixels).

To define bezel corrections:

1. Select Layout tab (see Figure 19).
2. Click Bezel **Off** to set its status. Bezel status changes to **On**.

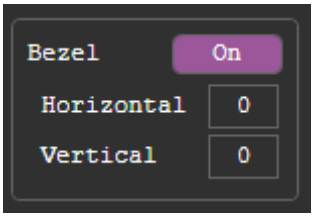


Figure 23: Bezel Status On

3. Enter horizontal and vertical bezel corrections (in pixels) as required for the defined video-wall setting.

The pixel range for both vertical and horizontal corrections is 0 to 50.

Bezel corrections are defined.

Viewing the DIP-Switch Setup

The Layout tab shows the DIP-switch setup of the device that is currently selected in the Settings tab.

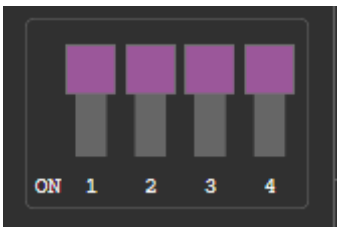


Figure 24: Current DIP-Switch Setup

To use the App, all DIP-switches need to be set to OFF.

Adjusting the Video-Wall Image

Unless the aspect ratio of the entire video-wall is the same as that of the input image (for example, a 2x2, 3x3 or 4x4 wall), the aspect ratio of the image is not maintained on the video-wall. The image on the input spreads over the entire video-wall, therefore you need to adjust the input image, so it fits the video-wall correctly.

For example, the image on the input display is output to a 6x2 video-wall. The aspect ratio of this image on the input is correct but it would be distorted on a 6x2 video-wall.

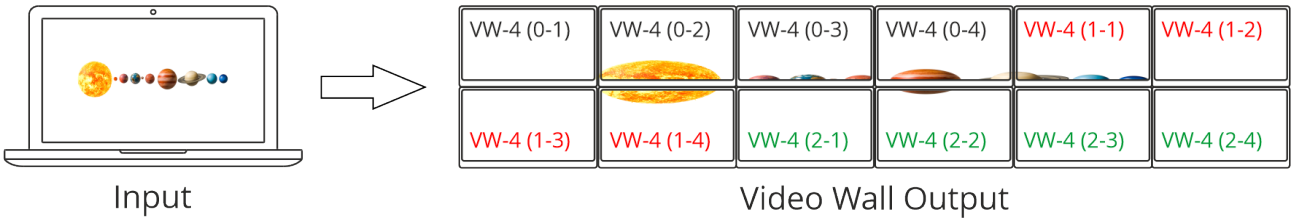


Figure 25: Distorted Aspect Ratio on Output Image

For these “non-square” wall sizes, make sure to manipulate the aspect ratio of the input image to perfect it for the proportions of the picture on the output.

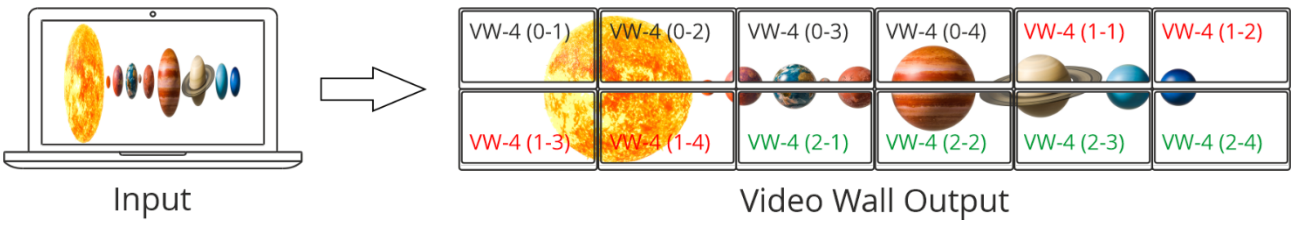


Figure 26: Correct Aspect Ratio on Output Image

Upgrading Firmware

Upgrade the firmware via the app (see Updating the Firmware on page 17), using the **VW-4** SERVICE USB port (6).

Technical Specifications

Inputs	1 HDMI	On a female HDMI connector
Outputs	4 HDMI	On female HDMI connectors
	1 HDMI Loop	On a female HDMI connector
Ports	1 Ethernet	On an RJ-45 female connector
	1 RS-232	On a 3-pin terminal block connector
	1 USB	On a USB type-A connector
Video	Max Input Resolution	4K@60Hz (4:4:4)
	Max Input Data Rate	18Gbps
	Output Resolution	1080p
	Content Protection on Input and Loop Output	HDCP 2.2
	Content Protection on Video-wall Outputs	HDCP 1.4
	Compliance	HDMI 2.0
Controls	DIP-switches	On rear panel
User Interface	Indicators	I/O detection
		On LED
	Controls	DIP-switches for basic setup
		Computer app for comprehensive setup via Ethernet or RS-232
	USB	Firmware upgrade
Power	Consumption	5V DC, 2.9A
	Source	5V DC, 4A
Environmental Conditions	Operating Temperature	0° to +40°C (32° to 104°F)
	Storage Temperature	-40° to +70°C (-40° to 158°F)
	Humidity	10% to 90%, RHL non-condensing
Regulatory Compliance	Safety	CE, FCC
	Environmental	RoHs, WEEE
Enclosure	Size	MegaTOOLS®
	Type	Aluminum
	Cooling	Convection Ventilation
General	Net Dimensions (W, D, H)	19cm x 19cm x 2.7cm (7.5" x 7.7" x 1.1")
	Shipping Dimensions (W, D, H)	35.1cm x 21.2cm x 7.2cm (13.8" x 8.4" x 2.8")
	Net Weight	0.9kg (1.9lbs)
	Shipping Weight	1.4 kg (3.1lbs) approx.
Accessories	Included	Power adapter and cord
Specifications are subject to change without notice at www.kramerav.com		

Default Communication Parameters

RS-232	
Baud Rate:	115,200
Data Bits:	8
Stop Bits:	1
Parity:	None
Command Format:	ASCII
Example (Set Auto-sync Off to Fast):	#SCLR-AS 1,2
Ethernet	
To update IP settings, Click Connection > click  next to current IP address > change settings.	
IP Address:	192.168.1.39
Subnet mask:	255.255.0.0
Default gateway:	192.168.0.1
TCP Port #:	5000
Factory Reset	
App	Connect the device: in Settings>System click Reset (not for Network parameters).w
P3000	FACTORY and RESET commands.

Default EDID

Monitor
  Model name..... VW-4
  Manufacturer..... KMR
  Plug and Play ID..... KMR0FCC
  Serial number..... 1
  Manufacture date..... 2020, ISO week 45
  Filter driver..... None

  EDID revision..... 1.3
  Input signal type..... Digital
  Color bit depth..... Undefined
  Display type..... RGB color
  Screen size..... 120 x 90 mm (5.9 in)
  Power management..... Not supported
  Extension blocs..... 1 (CEA/CTA-EXT)

  DDC/CI..... n/a

Color characteristics
  Default color space..... Non-sRGB
  Display gamma..... 2.20
  Red chromaticity..... Rx 0.594 - Ry 0.349
  Green chromaticity..... Gx 0.339 - Gy 0.521
  Blue chromaticity..... Bx 0.158 - By 0.162
  White point (default).... Wx 0.323 - Wy 0.340
  Additional descriptors... None

Timing characteristics
  Horizontal scan range.... 15-136kHz
  Vertical scan range..... 23-61Hz
  Video bandwidth..... 600MHz
  CVT standard..... Not supported
  GTF standard..... Not supported
  Additional descriptors... None
  Preferred timing..... Yes
  Native/preferred timing.. 3840x2160p at 60Hz (16:9)
    Modeline..... "3840x2160" 594.000 3840 4016 4104 4400 2160 2168 2178 2250 +hsync +vsync
  Detailed timing #1..... 1920x1200p at 60Hz (16:10)
    Modeline..... "1920x1200" 154.000 1920 1968 2000 2080 1200 1203 1209 1235 +hsync -vsync

Standard timings supported
    720 x 400p at 70Hz - IBM VGA
    640 x 480p at 60Hz - IBM VGA
    640 x 480p at 75Hz - VESA
    800 x 600p at 60Hz - VESA

```
    800 x  600p at  75Hz - VESA
   1024 x  768p at  60Hz - VESA
   1024 x  768p at  75Hz - VESA
   1280 x 1024p at  75Hz - VESA
   1280 x  720p at  60Hz - VESA STD
   1280 x 1024p at  60Hz - VESA STD
   1600 x  900p at  60Hz - VESA STD
   1600 x 1200p at  60Hz - VESA STD
   1920 x 1080p at  60Hz - VESA STD
   1152 x  864p at  75Hz - VESA STD
   1920 x 1200p at  60Hz - VESA STD
   1280 x  800p at  60Hz - VESA STD

EIA/CEA/CTA-861 Information
  Revision number..... 3
  IT underscan..... Supported
  Basic audio..... Supported
  YCbCr 4:4:4..... Supported
  YCbCr 4:2:2..... Supported
  Native formats..... 0
  Detailed timing #1..... 1920x1080p at 60Hz (16:9)
    Modeline..... "1920x1080" 148.500 1920 2008 2052 2200 1080 1084 1089 1125 +hsync +vsync
  Detailed timing #2..... 2560x1440p at 60Hz (16:9)
    Modeline..... "2560x1440" 241.500 2560 2608 2640 2720 1440 1443 1448 1481 +hsync -vsync

CE video identifiers (VICs) - timing/formats supported
    1920 x 1080p at  60Hz - HDTV (16:9, 1:1)
    1920 x 1080i at  60Hz - HDTV (16:9, 1:1)
    1920 x 1080p at  24Hz - HDTV (16:9, 1:1)
    1920 x 1080p at  30Hz - HDTV (16:9, 1:1)
    1280 x  720p at  60Hz - HDTV (16:9, 1:1)
     720 x  480p at  60Hz - EDTV (16:9, 32:27)
    1280 x  720p at  50Hz - HDTV (16:9, 1:1)
    1920 x 1080i at  50Hz - HDTV (16:9, 1:1)
    1920 x 1080p at  50Hz - HDTV (16:9, 1:1)
    1920 x 1080p at  50Hz - HDTV (16:9, 1:1)
    1920 x 1080p at  50Hz - HDTV (16:9, 1:1)
    1920 x 1080p at  50Hz - HDTV (16:9, 1:1)
    1920 x 1080p at  50Hz - HDTV (16:9, 1:1)
    1920 x 1080p at  50Hz - HDTV (16:9, 1:1)
     720 x  576p at  50Hz - EDTV (16:9, 64:45)
    NB: NTSC refresh rate = (Hz*1000)/1001

CE audio data (formats supported)
  LPCM    2-channel, 16/20/24 bit depths at 32/44/48 kHz

CE speaker allocation data
  Channel configuration.... 2.0
  Front left/right..... Yes
  Front LFE..... No
  Front center..... No
  Rear left/right..... No
  Rear center..... No
  Front left/right center.. No
  Rear left/right center... No
  Rear LFE..... No

CE vendor specific data (VSDB)
  IEEE registration number. 0x000C03
  CEC physical address..... 1.0.0.0
  Supports AI (ACP, ISRC).. Yes
  Supports 48bpp..... No
  Supports 36bpp..... Yes
  Supports 30bpp..... Yes
  Supports YCbCr 4:4:4..... Yes
  Supports dual-link DVI... No
  Maximum TMDS clock..... 300MHz
  Audio/video latency (p).. n/a
  Audio/video latency (i).. n/a
  HDMI video capabilities.. Yes
  EDID screen size..... No additional info
  3D formats supported..... Not supported
  Data payload..... 030C001000B83C2F00600103040000000000000000000

CE vendor specific data (VSDB)
  IEEE registration number. 0xC45DD8
  CEC physical address..... 0.1.7.8
  Supports AI (ACP, ISRC).. Yes
  Supports 48bpp..... No
  Supports 36bpp..... No
  Supports 30bpp..... No
```

Supports YCbCr 4:4:4..... No
Supports dual-link DVI... No
Maximum TMDS clock..... 15MHz

YCbCr 4:2:0 capability map data
Data payload..... 0F0012

Report information
Date generated..... 21/06/2021
Software revision..... 2.91.0.1043
Data source..... File - NB: improperly installed
Operating system..... 10.0.18362.2

Raw data
00,FF,FF,FF,FF,FF,FF,00,2D,B2,CC,0F,01,00,00,00,2D,1E,01,03,80,0C,09,78,0A,1E,AC,98,59,56,85,28,
29,52,57,A5,4B,00,81,C0,81,80,A9,C0,A9,40,D1,C0,71,4F,D1,00,81,00,08,E8,00,30,F2,70,5A,80,B0,58,
8A,00,A0,5A,00,00,00,1E,28,3C,80,A0,70,B0,23,40,30,20,36,00,A0,64,00,00,00,1A,00,00,00,FC,00,56,
57,2D,34,0A,20,20,20,20,20,20,20,20,00,00,00,FD,00,17,3D,0F,88,3C,00,0A,20,20,20,20,20,20,01,7A,
02,03,41,F0,50,10,05,20,22,04,03,13,14,1F,61,5D,5F,66,62,64,12,23,09,07,07,83,01,00,00,77,03,0C,
00,10,00,B8,3C,2F,00,60,01,03,04,00,00,00,00,00,00,00,00,00,00,67,D8,5D,C4,01,78,80,03,E3,0F,00,
12,02,3A,80,18,71,38,2D,40,58,2C,45,00,A0,5A,00,00,00,1E,56,5E,00,A0,A0,A0,29,50,30,20,35,00,A0,
5A,00,00,00,1A,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,CB

Protocol 3000

Kramer devices can be operated using Kramer Protocol 3000 commands sent via serial or Ethernet ports.

Understanding Protocol 3000

Protocol 3000 commands are a sequence of ASCII letters, structured according to the following.

- **Command format**:

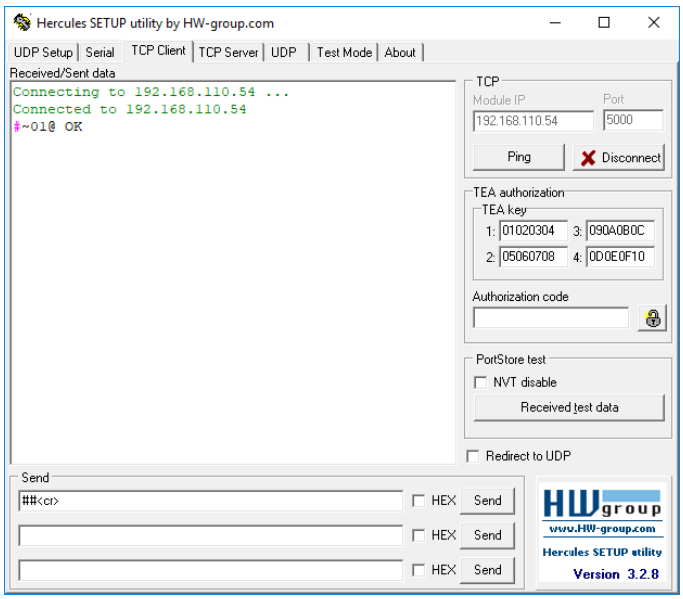
Prefix	Command Name	Constant (Space)	Parameter(s)	Suffix
#	Command	␣	Parameter	<CR>

- **Feedback format**:

Prefix	Device ID	Constant	Command Name	Parameter(s)	Suffix
~	nn	@	Command	Parameter	<CR><LF>

- **Command parameters** – Multiple parameters must be separated by a comma (,). In addition, multiple parameters can be grouped as a single parameter using brackets ([and]).
- **Command chain separator character** – Multiple commands can be chained in the same string. Each command is delimited by a pipe character (|).
- **Parameters attributes** – Parameters may contain multiple attributes. Attributes are indicated with pointy brackets (<…>) and must be separated by a period (.).

The command framing varies according to how you interface with **VW-4**. The following figure displays how the # command is framed using terminal communication software (such as Hercules):



Protocol 3000 Commands

Function	Description	Syntax	Parameters/Attributes	Example
#	Protocol handshaking. ⓘ Validates the Protocol 3000 connection and gets the machine number. Step-in master products use this command to identify the availability of a device.	COMMAND #<CR> FEEDBACK ~nn@␣ok<CR><LF>		#<CR>
BEZEL	Set bezel On/Off, H/V correction.	COMMAND #BEZEL␣out_index,hv_value,switch,h_value,v_value<CR> FEEDBACK ~nn@BEZEL␣out_index,hv_value,switch,h_value,v_value<CR><LF>	out_index – 0 hv_value – 0 – current H/V value 1 – max. H/V value switch – Enable/Disable bezel correction 0 – Off 1 – On h_value – Horizontal correction values v_value – Vertical correction values	Set bezel On with H/V correction: #BEZEL␣1,0,1,12,24<CR>
BEZEL?	Get bezel switch, H/V correction status.	COMMAND #BEZEL?␣<CR> FEEDBACK ~nn@BEZEL␣out_index,hv_value,switch,h_value,v_value<CR><LF>	out_index – 0 hv_value – 0 – current H/V value 1 – max. H/V value switch – Enable/Disable bezel correction 0 – Off 1 – On h_value – Horizontal correction values v_value – Vertical correction values	Get bezel switch, H/V correction status: #BEZEL?␣1<CR>
BUILD-DATE?	Get device build date.	COMMAND #BUILD-DATE?␣<CR> FEEDBACK ~nn@BUILD-DATE␣date,time<CR><LF>	date – Format: YYYY/MM/DD where YYYY = Year MM = Month DD = Day time – Format: hh:mm:ss where hh = hours mm = minutes ss = seconds	Get the device build date: #BUILD-DATE?<CR>
CPEDID	Copy EDID data from the output to the input EEPROM. ⓘ Destination bitmap size depends on device properties (for 64 inputs it is a 64-bit word). Example: bitmap 0x0013 means inputs 1,2 and 5 are loaded with the new EDID. In certain products Safe_mode is an optional parameter. See the HELP command for its availability.	COMMAND #CPEDID␣edid_io,src_id,edid_io,dest_bitmap<CR> or #CPEDID␣edid_io,src_id,edid_io,dest_bitmap<CR> FEEDBACK ~nn@CPEDID␣edid_io,src_id,edid_io,dest_bitmap<CR><LF> ~nn@CPEDID␣edid_io,src_id,edid_io,dest_bitmap <CR><LF>	edid_io – *EDID* source type 1 – Output src_id – Number of chosen source stage 0 – Default EDID source 1 – HDMI OUT 1 2 – HDMI OUT 2 3 – HDMI OUT 3 4 – HDMI OUT 4 edid_io – *EDID destination* type (usually input) 0 – Input dest_bitmap – 1	Copy the EDID data from the Output 1 (EDID source) to the Input: #CPEDID␣1,1,0,1<CR>
CPEDID?	GET EDID data from the output to the input EEPROM.	COMMAND #CPEDID?␣<CR> FEEDBACK ~nn@CPEDID␣edid_io,src_id,edid_io,dest_bitmap<CR><LF>	edid_io – *EDID* source type 1 – Output src_id – Number of chosen source stage 0 – Default EDID source 1 – HDMI OUT 1 2 – HDMI OUT 2 3 – HDMI OUT 3 4 – HDMI OUT 4 edid_io – *EDID destination* type (usually input) 0 – Input dest_bitmap – 1	Get the EDID data from the Output 1 (EDID source) to the Input: #CPEDID?␣<CR>
DISPLAY?	Get output HPD status.	COMMAND #DISPLAY?␣out_index<CR> FEEDBACK ~nn@DISPLAY␣out_index,status<CR><LF>	out_index – Number that indicates the specific output: 1-4 status – HPD status according to signal validation 0 – Signal or sink is not valid 1 – Signal or sink is valid 2 – Sink and EDID is valid	Get the output HPD status of Output 1: #DISPLAY?␣1<CR>
DPSW-STATUS?	Get the DIP-switch state.	COMMAND #DPSW-STATUS?␣dip_id<CR> FEEDBACK ~nn@DPSW-STATUS␣dip_id,status<CR><LF>	dip_id – 1 to 4 (number of DIP switches) status – Up/down 0 – Up 1 – Down	get the DIP-switch 2 status: #DPSW-STATUS?␣2<CR>
ETH-PORT	Set Ethernet port protocol. ⓘ If the port number you enter is already in use, an error is returned. The port number must be within the following range: 0-(2^16-1).	COMMAND #ETH-PORT␣port_type,port_id<CR> FEEDBACK ~nn@ETH-PORT␣port_type,port_id<CR><LF>	port_type – TCP/UDP port_id – TCP/UDP port number (0 – 65535)	Set the Ethernet port protocol for TCP to port 12457: #ETH-PORT␣0,12457<CR>

Function	Description	Syntax	Parameters/Attributes	Example
ETH-PORT?	Get Ethernet port protocol.	**COMMAND** **#ETH-PORT?**␣port_type**<CR>** **FEEDBACK** **~nn@ETH-PORT**␣port_type,port_id**<CR><LF>**	**port_type** – TCP/UDP 0 – TCP 1 – UDP **port_id** – TCP / UDP port number (0 – 65535)	Get the Ethernet port protocol for UDP: #ETH-PORT?␣1<CR>
FACTORY	Reset device to factory default configuration. ⓘ This command deletes all user data from the device. The deletion can take some time. Your device may require powering off and powering on for the changes to take effect.	**COMMAND** **#FACTORY<CR>** **FEEDBACK** **~nn@FACTORY**␣ok**<CR><LF>**		Reset the device to factory default configuration: #FACTORY<CR>
HDCP-MOD	Set HDCP mode. ⓘ Set HDCP working mode on the device input: HDCP supported - HDCP_ON [default]. HDCP not supported - HDCP OFF. HDCP support changes following detected sink - MIRROR OUTPUT. When you define 3 as the mode, the HDCP status is defined according to the connected output in the following priority: OUT 1, OUT 2. If the connected display on OUT 2 supports HDCP, but OUT 1 does not, then HDCP is defined as not supported. If OUT 1 is not connected, then HDCP is defined by OUT 2.	**COMMAND** **#HDCP-MOD**␣stage,stage_id,mode**<CR>** **FEEDBACK** **~nn@HDCP-MOD**␣ok**<CR><LF>**	**stage** – Input/Output 0 – Input 1 – Output **stage_id** – Input number: 1 – HDMI Output number 1 – HDMI 1 2 – HDMI 2 3 – HDMI 3 4 – HDMI 4 2 – HDBT **mode** – HDCP mode Input: 0 – Off 1 – On Output: 2 – Follow input 3 – Follow output	Set the input HDCP-MODE of the HDMI input to Off: **#HDCP-MOD**␣0,1,0**<CR>**
HDCP-MOD?	Get HDCP mode. ⓘ Set HDCP working mode on the device input: HDCP supported - HDCP_ON [default]. HDCP not supported - HDCP OFF. HDCP support changes following detected sink - MIRROR OUTPUT.	**COMMAND** **#HDCP-MOD?**␣stage,stage_id**<CR>** **FEEDBACK** **~nn@HDCP-MOD**␣stage,stage_id,mode**<CR><LF>**	**stage** – Input/Output 0 – Input 1 – Output **stage_id** – Input number: 1 – HDMI Output number 1 – HDMI 1 2 – HDMI 2 3 – HDMI 3 4 – HDMI 4 **mode** – HDCP mode Input: 0 – Off 1 – On Output: 2 – Follow input 3 – Follow output	Get the input HDCP-MODE of the HDMI input: **#HDCP-MOD?**␣0,1**<CR>**
HDCP-STAT?	Get HDCP signal status. ⓘ io_mode =1 – get the HDCP signal status of the sink device connected to the specified output. io_mode =0 – get the HDCP signal status of the source device connected to the specified input.	**COMMAND** **#HDCP-STAT?**␣io_mode,in_index**<CR>** **FEEDBACK** **~nn@HDCP-STAT**␣io_mode,in_index,status**<CR><LF>**	**io_mode** – Input/Output 0 – Input 1 – Output **io_index** – Number that indicates the specific number of inputs or outputs Input number: 1 – HDMI Output number 1 – HDMI 1 2 – HDMI 2 3 – HDMI 3 4 – HDMI 4 **status** – Signal encryption status - valid values On/Off 0 – HDCP Off 1 – HDCP On	Get the output HDCP-STATUS of IN 1: #HDCP-STAT?␣0,1<CR>
HELP	Get command list or help for specific command.	**COMMAND** **#HELP<CR>** **#HELP**␣cmd_name**<CR>** **FEEDBACK** 1. Multi-line: **~nn@Device**␣cmd_name,␣cmd_name…**<CR><LF>** To get help for command use: HELP (COMMAND_NAME)<CR><LF> **~nn@HELP**␣cmd_name:**<CR><LF>** **description<CR><LF>** **USAGE:usage<CR><LF>**	**cmd_name** – Name of a specific command	Get the command list: **#HELP<CR>** To get help for AV-SW-TIMEOUT: HELP␣**av-sw-timeout**<CR>

Function	Description	Syntax	Parameters/Attributes	Example
MACH-NUM	Set machine number. ⓘ Some devices do not set the new machine number until the device is restarted. Some devices can change the machine number only from DIP-switches.	**COMMAND** **#MACH-NUM** machine_id **<CR>** **FEEDBACK** **~nn@MACH-NUM** machine_id **<CR><LF>**	**machine_id** – New device machine number	Set machine number: **#MACH-NUM** 1 **<CR>**
MODEL?	Get device model. ⓘ This command identifies equipment connected to **VW-4** and notifies of identity changes to the connected equipment. The Matrix saves this data in memory to answer REMOTE-INFO requests.	**COMMAND** **#MODEL?** **<CR>** **FEEDBACK** **~nn@MODEL** model_name **<CR><LF>**	**model_name** – String of up to 19 printable ASCII chars	Get the device model: **#MODEL?** **<CR>**
MUTE	Set audio mute.	**COMMAND** **#MUTE** out_index,mute_mode **<CR>** **FEEDBACK** **~nn@MUTE** out_index,mute_mode **<CR><LF>**	**out_index** – 0 **mute_mode** – On/Off 0 – Off 1 – On	Set Output 1 to mute: **#MUTE** 1,1 **<CR>**
MUTE?	Get audio mute.	**COMMAND** **#MUTE?** out_index **<CR>** **FEEDBACK** **~nn@MUTE** out_index,mute_mode **<CR><LF>**	**out_index** – 0 **mute_mode** – On/Off 0 – Off 1 – On	Get mute status of output 1 **#MUTE** 1? **<CR>**
NAME	Set machine (DNS) name. ⓘ The machine name is not the same as the model name. The machine name is used to identify a specific machine or a network in use (with DNS feature on).	**COMMAND** **#NAME** machine_name **<CR>** **FEEDBACK** **~nn@NAME** machine_name **<CR><LF>**	**machine_name** – String of up to 15 alpha-numeric chars (can include hyphen, not at the beginning or end)	Set the DNS name of the device to room-442: **#NAME** room-442 **<CR>**
NAME?	Get machine (DNS) name. ⓘ The machine name is not the same as the model name. The machine name is used to identify a specific machine or a network in use (with DNS feature on).	**COMMAND** **#NAME?** **<CR>** **FEEDBACK** **~nn@NAME** machine_name **<CR><LF>**	**machine_name** – String of up to 15 alpha-numeric chars (can include hyphen, not at the beginning or end)	Get the DNS name of the device: **#NAME?** **<CR>**
NET-DHCP	Set DHCP mode. ⓘ Only 1 is relevant for the mode value. To disable DHCP, the user must configure a static IP address for the device. Connecting Ethernet to devices with DHCP may take more time in some networks. To connect with a randomly assigned IP by DHCP, specify the device DNS name (if available) using the **NAME** command. You can also get an assigned IP by direct connection to USB or RS-232 protocol port, if available. For proper settings consult your network administrator. ⓘ For Backward compatibility, the **id** parameter can be omitted. In this case, the Network ID, by default, is 0, which is the Ethernet control port.	**COMMAND** **#NET-DHCP** netw_id,dhcp_state **<CR>** **FEEDBACK** **~nn@NET-DHCP** netw_id,dhcp_state **<CR><LF>**	**netw_id** – Network ID–the device network interface (if there are more than one). Counting is 0 based, meaning the control port is '0', additional ports are 1,2,3…. **dhcp_state** – 1 – Try to use DHCP. (If unavailable, use the IP address set by the factory or the net-ip command).	Enable DHCP mode for port 1, if available: **#NET-DHCP** 1,1 **<CR>**

Function	Description	Syntax	Parameters/Attributes	Example
NET-DHCP?	Get DHCP mode. ⓘ For Backward compatibility, the **id** parameter can be omitted. In this case, the Network ID, by default, is 0, which is the Ethernet control port.	COMMAND **#NET-DHCP?**␣netw_id**<CR>** FEEDBACK **~nn@NET-DHCP**␣netw_id,dhcp_mode**<CR><LF>**	**netw_id** – Network ID–the device network interface (if there are more than one). Counting is 0 based, meaning the control port is '0', additional ports are 1,2,3…. **dhcp_mode** – 0 – Do not use DHCP. Use the IP set by the factory or using the **net-ip** or **net-config** command. 1 – Try to use DHCP. If unavailable, use the IP set by the factory or using the **net-ip** or **net-config** command.	Get DHCP mode for port 1: **#NET-DHCP?**␣1**<CR>**
NET-GATE	Set gateway IP. ⓘ A network gateway connects the device via another network and maybe over the Internet. Be careful of security issues. For proper settings consult your network administrator.	COMMAND **#NET-GATE**␣ip_address**<CR>** FEEDBACK **~nn@NET-GATE**␣ip_address**<CR><LF>**	**ip_address** – Format: xxx.xxx.xxx.xxx	Set the gateway IP address to 192.168.0.1: **#NET-GATE**␣192.168.000.001**<CR>**
NET-GATE?	Get gateway IP. ⓘ A network gateway connects the device via another network and maybe over the Internet. Be aware of security problems.	COMMAND **#NET-GATE?**␣**<CR>** FEEDBACK **~nn@NET-GATE**␣ip_address**<CR><LF>**	**ip_address** – Format: xxx.xxx.xxx.xxx	Get the gateway IP address: **#NET-GATE?**␣**<CR>**
NET-IP	Set IP address. ⓘ For proper settings consult your network administrator.	COMMAND **#NET-IP**␣ip_address**<CR>** FEEDBACK **~nn@NET-IP**␣ip_address**<CR><LF>**	**ip_address** – Format: xxx.xxx.xxx.xxx	Set the IP address to 192.168.1.39: **#NET-IP**␣192.168.001.039**<CR>**
NET-IP?	Get IP address.	COMMAND **#NET-IP?**␣**<CR>** FEEDBACK **~nn@NET-IP**␣ip_address**<CR><LF>**	**ip_address** – Format: xxx.xxx.xxx.xxx	Get the IP address: **#NET-IP?**␣**<CR>**
NET-MAC?	Get MAC address. ⓘ For backward compatibility, the **id** parameter can be omitted. In this case, the Network ID, by default, is 0, which is the Ethernet control port.	COMMAND **#NET-MAC?**␣id**<CR>** FEEDBACK **~nn@NET-MAC**␣id,mac_address**<CR><LF>**	**id** – Network ID–the device network interface (if there are more than one). Counting is 0 based, meaning the control port is '0', additional ports are 1,2,3…. **mac_address** – Unique MAC address. Format: XX-XX-XX-XX-XX-XX where X is hex digit	**#NET-MAC?**␣id**<CR>**
NET-MASK	Set subnet mask. ⓘ For proper settings consult your network administrator.	COMMAND **#NET-MASK**␣net_mask**<CR>** FEEDBACK **~nn@NET-MASK**␣net_mask**<CR><LF>**	**net_mask** – Format: xxx.xxx.xxx.xxx	Set the subnet mask to 255.255.0.0: **#NET-MASK**␣255.255.000.000**<CR>**
NET-MASK?	Get subnet mask.	COMMAND **#NET-MASK?**␣**<CR>** FEEDBACK **~nn@NET-MASK**␣net_mask**<CR><LF>**	**net_mask** – Format: xxx.xxx.xxx.xxx	Get the subnet mask: **#NET-MASK?<CR>**
PROT-VER?	Get device protocol version.	COMMAND **#PROT-VER?**␣**<CR>** FEEDBACK **~nn@PROT-VER**␣3000:version**<CR><LF>**	**version** – XX.XX where X is a decimal digit	Get the device protocol version: **#PROT-VER?**␣**<CR>**
RESET	Reset device. ⓘ To avoid locking the port due to a USB bug in Windows, disconnect USB connections immediately after running this command. If the port was locked, disconnect and reconnect the cable to reopen the port.	COMMAND **#RESET<CR>** FEEDBACK **~nn@RESET**␣ok**<CR><LF>**		Reset the device: **#RESET<CR>**
SCLR-AS	Set auto-sync features. ⓘ Sets the auto sync features for the selected scaler.	COMMAND **#SCLR-AS**␣scaler_index,sync_speed**<CR>** FEEDBACK **~nn@SCLR-AS**␣scaler_index,sync_speed**<CR><LF>**	**scaler_index** – Scaler Number – 1 **sync_speed** – 0, 1 or 2 0 – off 1 – fast 2 – slow	Set auto-sync features: **#SCLR-AS**␣1,1**<CR>**
SCLR-AS?	Set auto-sync features. ⓘ Sets the auto sync features for the selected scaler.	COMMAND **#SCLR-AS**␣scaler_index**<CR>** FEEDBACK **~nn@SCLR-AS**␣scaler_index,sync_speed**<CR><LF>**	**scaler_index** – Scaler Number 1-Scaler1 **sync_speed** – 0, 1 or 2 0 – off 1 – fast 2 – slow	Get auto-sync features: **#SCLR-AS?**␣1**<CR>**
SHOW-OSD	Set the OSD of selected channel.	COMMAND **#SHOW-OSD**␣out_index,switch**<CR>** FEEDBACK **~nn@SHOW-OSD**␣out_index,switch**<CR><LF>**	**out_index** – Number that indicates the specific output: 1 **switch** – On/Off 0 – Off 1 – On	Set the OSD of selected channel: **#SHOW-OSD**␣1,1**<CR>**

Function	Description	Syntax	Parameters/Attributes	Example
SHOW-OSD?	Get the OSD of selected channel.	COMMAND #SHOW-OSD?␣out_index<CR> FEEDBACK ~nn@SHOW-OSD␣out_index,switch<CR><LF>	out_index – Number that indicates the specific output: 1-N (N= the total number of outputs) switch – On/Off 0 – Off 1 – On	Get the OSD of selected channel: #SHOW-OSD?␣1<CR>
SIGNAL?	Get input signal status.	COMMAND #SIGNAL?␣in_index<CR> FEEDBACK ~nn@SIGNAL␣in_index,status<CR><LF>	in_index – Number that indicates the specific input: 1- status – Signal status according to signal validation: 0 – Off 1 – On	Get the input signal lock status of IN 1: #SIGNAL?␣1<CR>
SN?	Get device serial number.	COMMAND #SN?␣<CR> FEEDBACK ~nn@SN␣serial_num<CR><LF>	serial_num – 14 decimal digits, factory assigned	Get the device serial number: #SN?␣<CR>
VERSION?	Get firmware version number.	COMMAND #VERSION?␣<CR> FEEDBACK ~nn@VERSION␣firmware_version<CR><LF>	firmware_version – XX.XX.XXXX where the digit groups are: major.minor.build version	Get the device firmware version number: #VERSION?␣<CR>
WALL-LAYOUT	Set the video-wall layout.	COMMAND #WALL-LAYOUT␣h_value,v_value<CR> FEEDBACK ~nn@WALL-LAYOUT␣ok<CR><LF>	h_value – Number of columns: 1 to 8 v_value – Number of rows: 1 to 8	Set the video-wall layout to 3x2: #WALL-LAYOUT␣3,2<CR>
WALL-LAYOUT?	Get the video-wall layout.	COMMAND #WALL-LAYOUT?␣<CR> FEEDBACK ~nn@WALL-LAYOUT␣h_value,v_value<CR><LF>	h_value – Number of columns: 1 to 8 v_value – Number of rows: 1 to 8	Get the video-wall layout: #SHOW-OSD?␣<CR>

Result and Error Codes

Syntax

In case of an error, the device responds with an error message. The error message syntax:

- **~NN@ERR XXX<CR><LF>** – when general error, no specific command
- **~NN@CMD ERR XXX<CR><LF>** – for specific command
- **NN** – machine number of device, default = 01
- **XXX** – error code

Error Codes

Error Name	Error Code	Description
P3K_NO_ERROR	0	No error
ERR_PROTOCOL_SYNTAX	1	Protocol syntax
ERR_COMMAND_NOT_AVAILABLE	2	Command not available
ERR_PARAMETER_OUT_OF_RANGE	3	Parameter out of range
ERR_UNAUTHORIZED_ACCESS	4	Unauthorized access
ERR_INTERNAL_FW_ERROR	5	Internal FW error
ERR_BUSY	6	Protocol busy
ERR_WRONG_CRC	7	Wrong CRC
ERR_TIMEDOUT	8	Timeout
ERR_RESERVED	9	(Reserved)
ERR_FW_NOT_ENOUGH_SPACE	10	Not enough space for data (firmware, FPGA…)
ERR_FS_NOT_ENOUGH_SPACE	11	Not enough space – file system
ERR_FS_FILE_NOT_EXISTS	12	File does not exist
ERR_FS_FILE_CANT_CREATED	13	File can’t be created
ERR_FS_FILE_CANT_OPEN	14	File can’t open
ERR_FEATURE_NOT_SUPPORTED	15	Feature is not supported
ERR_RESERVED_2	16	(Reserved)
ERR_RESERVED_3	17	(Reserved)
ERR_RESERVED_4	18	(Reserved)
ERR_RESERVED_5	19	(Reserved)
ERR_RESERVED_6	20	(Reserved)
ERR_PACKET_CRC	21	Packet CRC error
ERR_PACKET_MISSED	22	Packet number isn't expected (missing packet)
ERR_PACKET_SIZE	23	Packet size is wrong
ERR_RESERVED_7	24	(Reserved)
ERR_RESERVED_8	25	(Reserved)
ERR_RESERVED_9	26	(Reserved)
ERR_RESERVED_10	27	(Reserved)
ERR_RESERVED_11	28	(Reserved)
ERR_RESERVED_12	29	(Reserved)
ERR_EDID_CORRUPTED	30	EDID corrupted
ERR_NON_LISTED	31	Device specific errors
ERR_SAME_CRC	32	File has the same CRC – not changed
ERR_WRONG_MODE	33	Wrong operation mode
ERR_NOT_CONFIGURED	34	Device/chip was not initialized

The warranty obligations of Kramer Electronics Inc. ("Kramer Electronics") for this product are limited to the terms set forth below:

What is Covered

This limited warranty covers defects in materials and workmanship in this product.

What is Not Covered

This limited warranty does not cover any damage, deterioration or malfunction resulting from any alteration, modification, improper or unreasonable use or maintenance, misuse, abuse, accident, neglect, exposure to excess moisture, fire, improper packing and shipping (such claims must be presented to the carrier), lightning, power surges, or other acts of nature. This limited warranty does not cover any damage, deterioration or malfunction resulting from the installation or removal of this product from any installation, any unauthorized tampering with this product, any repairs attempted by anyone unauthorized by Kramer Electronics to make such repairs, or any other cause which does not relate directly to a defect in materials and/or workmanship of this product. This limited warranty does not cover cartons, equipment enclosures, cables or accessories used in conjunction with this product.

Without limiting any other exclusion herein, Kramer Electronics does not warrant that the product covered hereby, including, without limitation, the technology and/or integrated circuit(s) included in the product, will not become obsolete or that such items are or will remain compatible with any other product or technology with which the product may be used.

How Long this Coverage Lasts

The standard limited warranty for Kramer products is seven (7) years from the date of original purchase, with the following exceptions:

1. All Kramer VIA hardware products are covered by a standard three (3) year warranty for the VIA hardware and a standard three (3) year warranty for firmware and software updates; all Kramer VIA accessories, adapters, tags, and dongles are covered by a standard one (1) year warranty.
2. Kramer fiber optic cables, adapter-size fiber optic extenders, pluggable optical modules, active cables, cable retractors, ring mounted adapters, portable power chargers, Kramer speakers, and Kramer touch panels are covered by a standard one (1) year warranty. Kramer 7-inch touch panels purchased on or after April 1st, 2020 are covered by a standard two (2) year warranty.
3. All Kramer Calibre products, all Kramer Minicom digital signage products, all HighSecLabs products, all streaming, and all wireless products are covered by a standard three (3) year warranty.
4. All Sierra Video MultiViewers are covered by a standard five (5) year warranty.
5. Sierra switchers & control panels are covered by a standard seven (7) year warranty (excluding power supplies and fans that are covered for three (3) years).
6. K-Touch software is covered by a standard one (1) year warranty for software updates.
7. All Kramer passive cables are covered by a lifetime warranty.

Who is Covered

Only the original purchaser of this product is covered under this limited warranty. This limited warranty is not transferable to subsequent purchasers or owners of this product.

What Kramer Electronics Will Do

Kramer Electronics will, at its sole option, provide one of the following three remedies to whatever extent it shall deem necessary to satisfy a proper claim under this limited warranty:

1. Elect to repair or facilitate the repair of any defective parts within a reasonable period of time, free of any charge for the necessary parts and labor to complete the repair and restore this product to its proper operating condition. Kramer Electronics will also pay the shipping costs necessary to return this product once the repair is complete.
2. Replace this product with a direct replacement or with a similar product deemed by Kramer Electronics to perform substantially the same function as the original product. If a direct or similar replacement product is supplied, the original product's end warranty date remains unchanged and is transferred to the replacement product.
3. Issue a refund of the original purchase price less depreciation to be determined based on the age of the product at the time remedy is sought under this limited warranty.

What Kramer Electronics Will Not Do Under This Limited Warranty

If this product is returned to Kramer Electronics or the authorized dealer from which it was purchased or any other party authorized to repair Kramer Electronics products, this product must be insured during shipment, with the insurance and shipping charges prepaid by you. If this product is returned uninsured, you assume all risks of loss or damage during shipment. Kramer Electronics will not be responsible for any costs related to the removal or re-installation of this product from or into any installation. Kramer Electronics will not be responsible for any costs related to any setting up this product, any adjustment of user controls or any programming required for a specific installation of this product.

How to Obtain a Remedy Under This Limited Warranty

To obtain a remedy under this limited warranty, you must contact either the authorized Kramer Electronics reseller from whom you purchased this product or the Kramer Electronics office nearest you. For a list of authorized Kramer Electronics resellers and/or Kramer Electronics authorized service providers, visit our web site at www.kramerav.com or contact the Kramer Electronics office nearest you.

In order to pursue any remedy under this limited warranty, you must possess an original, dated receipt as proof of purchase from an authorized Kramer Electronics reseller. If this product is returned under this limited warranty, a return authorization number, obtained from Kramer Electronics, will be required (RMA number). You may also be directed to an authorized reseller or a person authorized by Kramer Electronics to repair the product.

If it is decided that this product should be returned directly to Kramer Electronics, this product should be properly packed, preferably in the original carton, for shipping. Cartons not bearing a return authorization number will be refused.

Limitation of Liability

THE MAXIMUM LIABILITY OF KRAMER ELECTRONICS UNDER THIS LIMITED WARRANTY SHALL NOT EXCEED THE ACTUAL PURCHASE PRICE PAID FOR THE PRODUCT. TO THE MAXIMUM EXTENT PERMITTED BY LAW, KRAMER ELECTRONICS IS NOT RESPONSIBLE FOR DIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF WARRANTY OR CONDITION, OR UNDER ANY OTHER LEGAL THEORY. Some countries, districts or states do not allow the exclusion or limitation of relief, special, incidental, consequential or indirect damages, or the limitation of liability to specified amounts, so the above limitations or exclusions may not apply to you.

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Other Conditions

This limited warranty gives you specific legal rights, and you may have other rights which vary from country to country or state to state.

This limited warranty is void if (i) the label bearing the serial number of this product has been removed or defaced, (ii) the product is not distributed by Kramer Electronics or (iii) this product is not purchased from an authorized Kramer Electronics reseller. If you are unsure whether a reseller is an authorized Kramer Electronics reseller, visit our web site at www.kramerav.com or contact a Kramer Electronics office from the list at the end of this document.

Your rights under this limited warranty are not diminished if you do not complete and return the product registration form or complete and submit the online product registration form. Kramer Electronics thanks you for purchasing a Kramer Electronics product. We hope it will give you years of satisfaction.

KRAMER

P/N: 2900-301487 Rev: 2

SAFETY WARNING

Disconnect the unit from the power supply before opening and servicing

For the latest information on our products and a list of Kramer distributors, visit our website where updates to this user manual may be found.

We welcome your questions, comments, and feedback.

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