Kramer Electronics, Ltd.

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USER MANUAL

Model:

VP-4x4

4x4 VGA/XGA Audio Matrix Switcher

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1 Introduction

Dedication by Kramer Electronics since 1981, to the development and manufacture of high quality video/audio equipment, makes the Kramer line an integral part of the finest production and presentation facilities in the world. In recent years, Kramer has redesigned and upgraded most of the line, making the best even better!

The Kramer line of professional video/audio electronics is one of the most versatile and complete available, and is a true leader in terms of quality, workmanship, price/performance ratio and innovation. In addition to our high quality industrial and broadcast switchers and matrix switchers, we also offer excellent amplifiers, remote controllers, processors, interfaces and computer-related products. Congratulations on purchasing your Kramer **VP-4x4** *VGA/XGA Audio Matrix Switcher*.

This product is ideal for the following typical applications:

- Professional display systems requiring true 4x4 matrix operation
- Multimedia and presentation source and acceptor selection
- Remote monitoring of computer activity in schools and businesses
- Rental/staging applications

The package includes the following items:

- **VP-4x4** VGA/XGA Audio Matrix Switcher
- Power cord
- Windows 95/98/NT™ Kramer control software
- Null-modem adapter
- This user manual
- Kramer concise product catalog/CD

2 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

3   Overview

The **VP-4x4** is a true 4x4 matrix switcher for VGA / XGA signals and stereo balanced audio signals. The **VP-4x4** enables the user to simultaneously route any or all of the 4 inputs to any or all of the 4 outputs.

In addition the **VP-4x4** includes:

- Video bandwidth of 440 MHz that ensures transparent VGA / XGA performance

- Easy-to-connect detachable terminal block connectors on which the audio signals reside

- DC coupled inputs and outputs

- Audio-follow-video and breakaway options

- Storing and recalling setup options

- "Take" button for precise switch control

- "Lock" button to prevent tampering with the front panel

- The ability to control via the front panel buttons, or remotely by RS-485 or RS-232 serial commands transmitted by a touch screen system, PC, or other serial controller

To achieve the best performance:

- Connect only good quality connection cables, thus avoiding interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)

- Avoid interference from neighboring electrical appliances that may adversely influence signal quality

- Position your Kramer **VP-4x4** in a location free from moisture and away from excessive sunlight and dust

4   Your VGA/XGA Audio Matrix Switcher

Figure 1 illustrates the front and rear panels of the **VP-4x4**. Tables 1 and 2 define the front and rear panels of the **VP-4x4**, respectively.
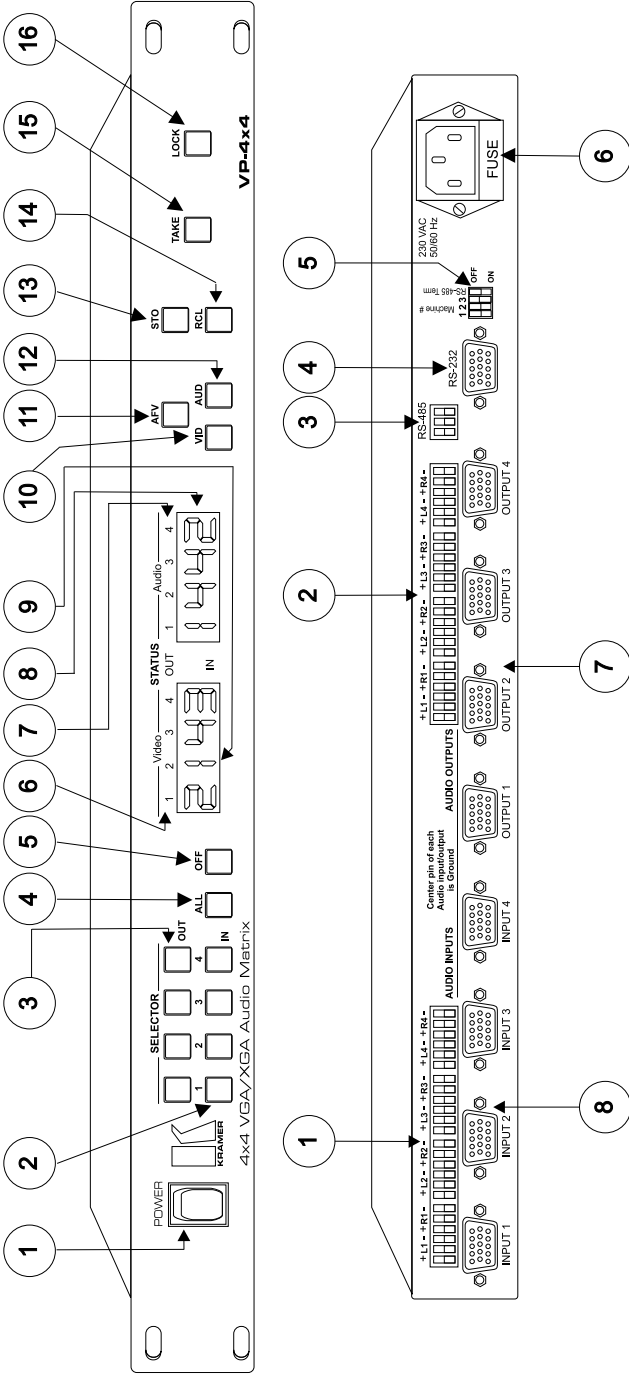
Your VGA/XGA Audio Matrix Switcher

Figure 1: VP-4x4 VGA/XGA Audio Matrix Switcher

Table 1: Front Panel VP-4x4 VGA/XGA Audio Matrix Switcher Features

#	Feature	Function	
1	*Power* Switch	Illuminated switch supplying power to the unit	
2	*SELECTOR IN* Buttons	Select the input to switch to the output	The *SELECTOR IN* and *OUT* buttons also store/recall the input/output configurations[1]
3	*SELECTOR OUT* Buttons	Select the output to which the input is switched	
4	*ALL* Button	Pressing *ALL* before pressing an *INPUT* button, connects that input to all outputs[2]	
5	*OFF* Button	Pressing *OFF* after pressing an *OUTPUT* button disconnects that output from the inputs. To disconnect all the outputs, press the *ALL* button and then the *OFF* button	
6	*Video STATUS OUT* labels	Identifies a cross point between each video output to which the video input displayed below it is connected	
7	*Audio STATUS OUT* labels	Identifies a cross point between each audio output to which the audio input displayed below it is connected	
8	*Audio IN STATUS* 7-segment Display	Displays the selected audio input switched to the output (marked above each input)	Also displays the firmware version number and the MACHINE #[3]
9	*Video IN STATUS* 7-segment Display	Displays the selected video input switched to the output (marked above each input)	Also displays the number of IN and OUT ports[4]
10	*VID* Button	Affects video (the default)	
11	*AFV* Button	Affects audio-follow-video	
12	*AUD* Button	Affects audio	
13	*STO* Button	Pressing STO (STORE) followed by an output button stores the current setting[5]	
14	*RCL* Button	Pressing the *RCL* (*RECALL*) button and the corresponding OUTPUT key recalls a setup. The stored status blinks. Pressing a different OUTPUT button lets you view[6] another setup. After making your choice, pressing the *RCL* button again implements the new status	
15	*TAKE* Button	Pressing *TAKE* toggles the mode between the *CONFIRM* mode[7] and the *AT ONCE* mode (user confirmation per action is unnecessary)	
16	*LOCK* Button	Disengages the front panel switches	

Table 2: Rear Panel VP-4x4 VGA/XGA Audio Matrix Switcher Features

#	Feature	Function
1	*Audio INPUTS* Phoenix Connectors	Audio inputs
2	*Audio OUTPUTS* Phoenix Connectors	Audio outputs
3	*RS-485* Connector	RS-485 Phoenix detachable terminal block port
4	*RS-232* Connector	DB 9F connector connects to PC or Remote Controller
5	MACHINE #	Dipswitches setup
6	Power Connector with *Fuse*	AC connector enabling power supply to the unit
7	VGA/XGA Video OUTPUTS	Connects to the VGA/XGA video outputs (1 to 4)
8	VGA/XGA Video INPUTS	Connects to the VGA/XGA video inputs (1 to 4)

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1 Refer to section 5.5

2 For example, press ALL and then Input button # 2 to connect input # 2 to all the outputs

3 Refer to section 5.1

4 Refer to section 5.1

5 For example, press STO and then the Output button # 3 to store in Setup # 3

6 Only view, nothing is implemented at this stage

7 When in Confirm mode, the TAKE button illuminates

4.1 Connecting the VP-4x4

To connect the **VP-4x4**, connect the following[1] to the rear panel ports:

- Power cord
- VGA / XGA video input and output cables
- Audio input and output cables
- A PC via the null-modem adapter (when using the Kramer Control software or other controller) if control via RS-232 is required
- RS-485 Phoenix terminal block cable if control via RS-485 is required

In addition, set the dipswitches as section 4.1.3 describes.

4.1.1 Connecting a PC

To connect a PC to the **VP-4x4**, without using a Null-modem adapter:

- Connect the RS-232 DB9 port on your PC to the RS-232 DB9 rear panel port on the Master **VP-4x4** unit, as Figure 2 illustrates (depending on whether the PC has a 9-pin or 25-pin connector)
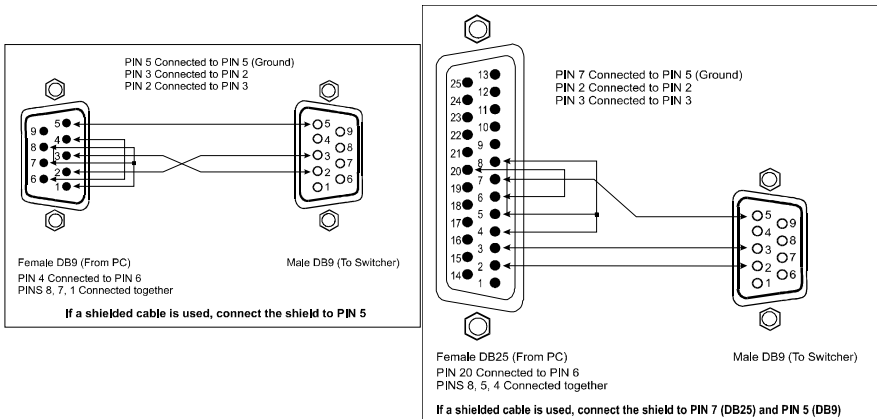
Figure 2: Connecting a PC without using a Null-modem Adapter

To connect a PC to the **VP-4x4**, using a Null-modem adapter:

- Connect the RS-232 DB9 rear panel port on the Master **VP-4x4** unit to the Null-modem adapter and connect the Null-modem adapter with a 9 wire flat cable to the RS-232 DB9 port on your PC, as Figure 3 illustrates

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1 Switch OFF the power on each device before connecting it to your VP-4x4. After connecting your VP-4x4, switch on its power and then switch on the power on each device

4.1.2 Connecting a Phoenix Terminal Block Cable

Connect a Phoenix terminal block cable connector to the RS-485 port on each **VP-4x4** unit in the series[1], as Figure 3 illustrates.
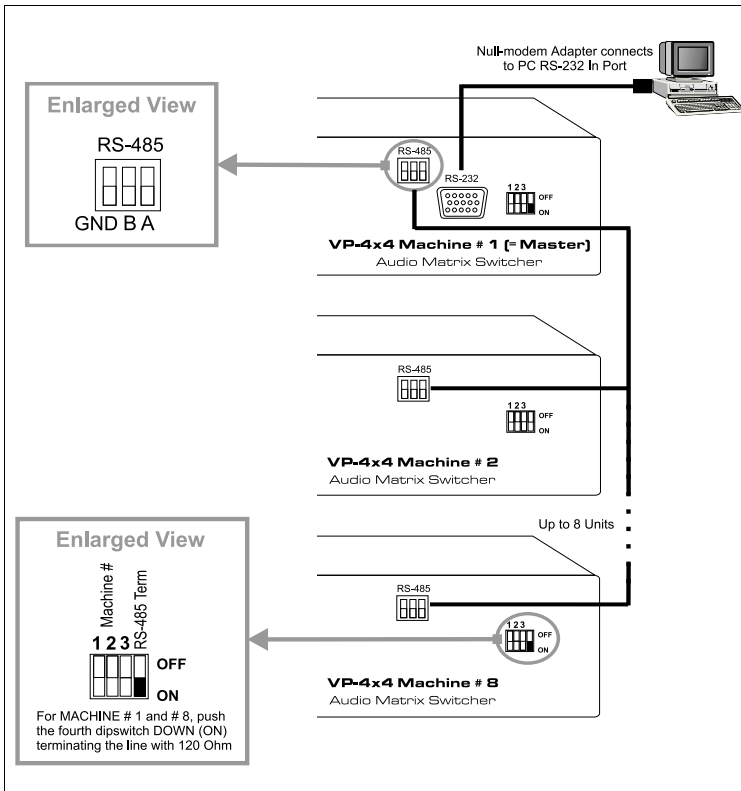
Figure 3: VP-4x4 Connections

4.1.3 Dipswitch Settings

The **VP-4x4** includes a set of 4 dipswitches, as Figure 3 illustrates above. You configure each **VP-4x4** unit by setting the dipswitches as follows:

- Pull a dipswitch DOWN to set it to ON

- Pull a dipswitch UP to set it to OFF

- Set dipswitch 4 to ON for the first and last units only[2] (otherwise set dipswitch 4 to OFF)

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1 You can connect up to 8 units

2 Acts as a terminator

- Set dipswitches 1, 2 and 3 according to Table 3:

Table 3: Rear Panel Dipswitches

Dipswitch Settings							
Machine #	Self Address				Dipswitch		
	3	2	1	0	1	2	3
1 Master	0	0	0	0	OFF	OFF	OFF
2	0	0	0	1	OFF	OFF	ON
3	0	0	1	0	OFF	ON	OFF
4	0	0	1	1	OFF	ON	ON
5	0	1	0	0	ON	OFF	OFF
6	0	1	0	1	ON	OFF	ON
7	0	1	1	0	ON	ON	OFF
8	0	1	1	1	ON	ON	ON

5   Operating Your Audio Matrix Switcher

Operate your **VP-4x4** via:

- The front panel buttons
- RS-232 serial commands transmitted by a touch screen system, PC[1], or other serial controller

5.1 Displaying Unit Characteristics

Clarify the following **VP-4x4** unit characteristics, as Figure 4 illustrates:

- The number of IN and OUT ports[2]
- The firmware version number and the MACHINE #[3]
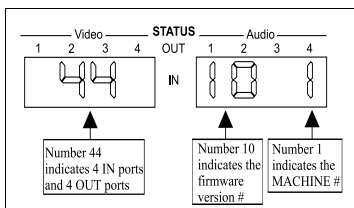

Figure 4: VP-4x4 Unit Characteristics

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[1] For instructions on using the Windows 95/98/NT ™ Control Software, refer to the separate user manual (included on the CD-ROM in .pdf format), *Kramer Control Software*

[2] Via the Video IN STATUS 7-segment display as item 9 in Figure 1 illustrates

[3] Via the Audio IN STATUS 7-segment display as item 8 in Figure 1 illustrates

VP-4x4 unit characteristics display in the following circumstances:

- Immediately (and automatically) after switching on the power; and
- When simultaneously pressing the 3 SELECTOR IN buttons[1] 1, 2 and 3, for 3 seconds

5.2 Choosing the Audio-Follow-Video or Breakaway Option

You can switch stereo audio signals in one of 2 ways, either:

- Audio-follow-video (AFV), in which all operations and status indicators relate to both the video and the audio channels[2]; or
- Breakaway, in which video and audio channels switch independently

5.2.1 Setting the Audio-Follow-Video Option

To set the Audio-follow-video (AFV) option:

1. Press the AFV button.
    The AFV button illuminates. The audio will follow the video.

2. If the audio configuration differs from the video configuration, both the Audio IN STATUS 7-segment displays and the AUD button will blink[3], and require reconfiguring for AFV operation.

3. Press the TAKE button to confirm the modification (reconfiguring the audio according to the video).

5.2.2 Setting the Breakaway Option

To set the Breakaway option:

1. Press either the AUD (for audio control only) or the VID (for video control only) button.

2. If the AUD button illuminates all switching operations relate to the Audio section.

3. If the VID button illuminates all switching operations relate to the Video section.

5.3 Switching OUT-IN Combinations

To switch a video/audio input to a video/audio output, do the following:

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1 Item 2 in Figure 1

2 Audio and video connections are the same

3 Warning that changes are about to occur in the audio section

1. Press an OUT button[1].
    The corresponding Audio and[2]/or Video IN STATUS 7-segment displays[3] blink.

2. Press an IN button[4].
    The selected input switches to the selected output.

For example, press the ALL button and then IN button # 2 to connect input # 2 to all the outputs

5.4 Confirming Settings

Choose to work in the AT ONCE or the CONFIRM mode.

In the AT ONCE mode:

- You save time
- Actions require no user confirmation
- Execution is immediate
- No protection is offered against changing an action in error

In the CONFIRM mode:

- You have an optional method to help avoid making a mistake
- Every action requires user confirmation
- Execution is delayed[5] until the user confirms the action
- Protection is offered to prevent erroneous switching
- You can key-in several actions and then confirm them by pressing the TAKE button once, to simultaneously switch all monitors

Pressing an OUT-IN combination when your **VP-4x4** operates in the AT ONCE mode implements the switch immediately. When the **VP-4x4** operates in the CONFIRM mode, press the blinking TAKE button to authorize the switch.

5.4.1 Toggling between the AT ONCE and CONFIRM Modes

To toggle between the AT ONCE and CONFIRM modes, do the following:

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1 Either 1, 2, 3, 4 or ALL

2 When the audio-follow-video option is active (refer to section 5.2)

3 Items 8 and 9, respectively, in Figure 1

4 Either 1, 2, 3, 4 or OFF

5 Failure to press the TAKE button within one minute (the Timeout) will abort the action

1. Press the dim TAKE button to toggle from the AT ONCE mode[1] to the CONFIRM mode[2].
   Actions now require user confirmation and the TAKE button illuminates.

2. Press the illuminated TAKE button to toggle from the CONFIRM mode back to the AT ONCE mode.
   Actions no longer require user confirmation and the TAKE button no longer illuminates.

5.4.2   Confirming a Switching Action

To confirm a switching action (in CONFIRM mode), do the following:

1. Press an OUT-IN combination.
   The corresponding Audio and Video IN STATUS 7-segment displays[3] blink. The TAKE button also blinks.

2. Press the blinking TAKE button to confirm the action.
   The corresponding Audio and Video IN STATUS 7-segment displays[4] no longer blink. The TAKE button illuminates.

To confirm several actions (in CONFIRM mode), do the following:

1. Press each OUT-IN combination in sequence.
   The corresponding Audio and Video IN STATUS 7-segment display[5] blinks. The TAKE button also blinks.

2. Press the blinking TAKE button to confirm all the actions.
   The corresponding Audio and Video IN STATUS 7-segment displays[6] no longer blink. The TAKE button illuminates.

5.5 Storing/Recalling Input/Output Configurations

You can store and recall[7] up to 8 input/output configurations using the 4 SELECTOR IN and the 4 SELECTOR OUT buttons, as Figure 5 illustrates:

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1 The TAKE button is dim

2 The TAKE button illuminates

3 Items 8 and 9, respectively, in Figure 1

4 Items 8 and 9, respectively, in Figure 1

5 Items 8 and 9, respectively, in Figure 1

6 Items 8 and 9, respectively, in Figure 1

7 The 8 input/output configurations (or setups) also include the relevant audio-follow-video / breakaway option definition
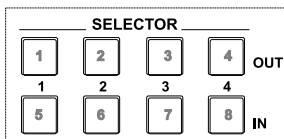
Figure 5: SELECTOR Buttons[1]

5.5.1 Storing an Input/Output Configuration

To store the current status in memory, do the following:

1. Press the STO button.
   The STO button blinks.

2. Press one of the 8 SELECTOR buttons.
   The memory stores the data at that reference.

5.5.2 Recalling an Input/Output Configuration

To recall an input/output configuration, do the following:

1. Press the RCL button.
   The RCL button blinks.

2. Press the appropriate SELECTOR button.
   The memory recalls the stored data from that reference.

If you cannot remember which of the 8 input/output configurations is the one that you want, set the **VP-4x4** to the CONFIRM mode and manually scan all the input/output configurations until you locate it.

5.5.3 Deleting an Input/Output Configuration

To delete an input/output configuration, do the following:

1. Press the STO and RCL buttons simultaneously.
   Both the STO and RCL buttons blink.

2. Press the appropriate SELECTOR button.
   This erases that specific input/output configuration from the memory, leaving it empty and available[2].

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1 The gray numbers (1 to 8) in Figure 5 that illustrate the corresponding store/recall configuration number, are for the purpose of illustration only and do not actually appear on the buttons

2 Storing a new configuration over a previous configuration (without deleting it first) replaces the previous configuration

5.6 Locking the Front Panel

To prevent changing the settings accidentally or tampering with the front panel, lock your **VP-4x4**. Unlocking releases the protection mechanism.

To lock the **VP-4x4**:

- Press the LOCK button for more than 2 seconds

The LOCK button illuminates, freezing the front panel controls. Pressing a button will have no effect, except to cause the LOCK button to blink[1]. Nevertheless, even though the front panel is locked you can still operate your PC control software

To unlock the **VP-4x4**:

- Press the illuminating LOCK button for more than 2 seconds

The **VP-4x4** unlocks and the LOCK button no longer illuminates

6 Technical Specifications

Table 4 includes the technical specifications:

Table 4: Technical Specifications of the VP-4x4 VGA/XGA Audio Matrix Switcher

INPUTS:	4 analog red, green, blue signals - 0.7 Vpp / 75 Ω; H & V syncs, TTL level on HD15F connectors
	4 balanced audio stereo signals, + 4dBm / 33kΩ typical, 21 Vpp max. on detachable terminal blocks
OUTPUTS:	4 analog red, green, blue signals - 0.7 Vpp / 75 Ω; H & V syncs, TTL level on HD15F connectors
	4 balanced audio stereo signals, + 4dBm / 50 Ω typical, 21 Vpp max. on detachable terminal blocks
VIDEO BANDWIDTH:	440 MHz -3dB
VIDEO CROSSTALK:	-55 dB
VIDEO S/N RATIO:	73 dB
DIFF. GAIN:	0.05%
DIFF. PHASE:	0.13 Deg.
K-FACTOR:	<0.05%
AUDIO BANDWIDTH:	100 kHz -3dB
AUDIO S/N RATIO:	77 dB unweighted
AUDIO THD + NOISE:	0.031%
2ND HARMONIC:	0.02%
CONTROL:	17 selector switches; RS-232, RS-485
DIMENSIONS:	19-inch (W), 7-inch (D) 1U (H) rack-mountable
POWER SOURCE:	230 VAC, 50/60 Hz, (115VAC, U.S.A.) 12VA max
WEIGHT:	2.7 kg (6 lbs.) approx
ACCESSORIES:	Power cord, Null modem adapter, Windows 95/98/NT TM Kramer control software

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1 Warning that you need to unlock to regain control via the front panel