Kramer Electronics, Ltd.

USER MANUAL

Model:

VP-31KSi

3x1 UXGA/Audio STEP-IN Switcher

Contents

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1   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! Our 1,000-plus different models now appear in 11 groups[1] that are clearly defined by function.

Congratulations on purchasing your Kramer **VP-31KSi** *3x1 UXGA/Audio STEP-IN Switcher.*

The **VP-31KSi** is ideal for:

- Display systems requiring simple input selection
- Remote monitoring of computer activity in schools and businesses
- Rental/staging applications
- Multimedia and presentation source selection

The package includes the following items:

- **VP-31KSi** *3x1 UXGA/Audio STEP-IN Switcher*
- Infrared **RC-IR3** remote control transmitter (including the required battery and a separate user manual[2])
- This user manual[2]
- Power adapter

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
- Use Kramer high-performance high-resolution cables[3]

2.1   Quick Start

This quick start chart summarizes the basic setup and operation steps.

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1 GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Matrix Switchers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters; GROUP 11: Sierra Products

2 Download up-to-date Kramer user manuals from http://www.kramerelectronics.com

3 The complete list of Kramer cables is available from http://www.kramerelectronics.com

Step 1: Mount the machine

Mount the machine in a rack (using the optional rack adapter kit) or stick the 4 rubber feet to the underside and place on a shelf

Step 2: Connect the inputs and outputs - see Section 6

1 Connect the input(s)
2 Optional - Connect remote step-in panels
3 Connect the output
4 Optional - Connect remote input selection switches
5 Optional - Connect a controller via Ethernet/ RS-232

SI-1VGA

To remote input selection switch

To TP-122/N or Compatible Receiver

Computer Graphics Source

Computer Graphics Source

Power Amplifier with Speakers

Projector
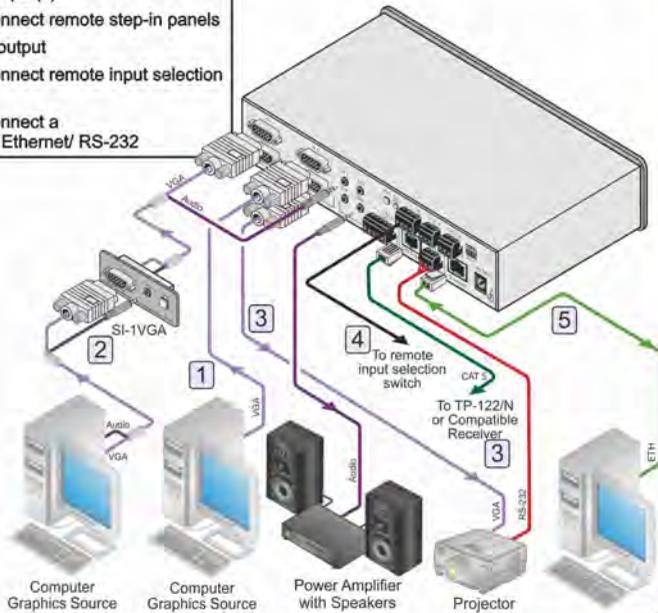
Step 3: Plug in the power adapter

Step 4: Operate the machine - see Sections 7 and 8

Select an input using one of the INPUT SELECTOR buttons
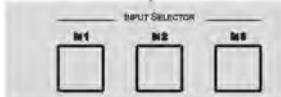
Lock the front panel via remote control

VIDEO lit—Switching relates to the video signal
AUDIO lit—Switching relates to the audio signal
VIDEO + AUDIO lit—Audio follows video when switching
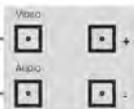
Increase or decrease the audio gain (while the AUDIO button is lit)

Operate via the front panel buttons, IR remote controller, RS-232, RS-485 and Ethernet

2

3 Overview

The **VP-31KSi** routes one of three video and audio inputs to the video and audio (balanced or unbalanced) outputs. It also converts the video and audio signals into a TP (Twisted Pair) signal for transmission over TP cable to any compatible TP receiver (for example, the Kramer **TP-120**).

In particular, the **VP-31KSi**:

- Features a very high video bandwidth ensuring transparent UXGA performance
- Features audio-follow-video (AFV) in which all operations relate to both the video and the audio channels, or the audio breakaway option, in which video and audio channels are switched independently
- Includes a volume control
- Includes the Kramer innovative integrated sync processing Kr-isp™ technology, which lets you achieve a sharp, stable image even when the sync level is too low, by restoring the sync signal waveform
- I-EDIDPro™ Kramer Intelligent EDID Processing™ – Intelligent EDID handling & processing algorithm ensures Plug and Play operation for analog systems
- Supports the cascading of up to eight devices to provide a single virtual switcher with up to 17 inputs
- Supports the Kramer *Remote Step-In Panels* (for example, the **SI-1VGA, WSI-1VGA** or **SI-VGAT**) for remote inputs and remote step-in control

You can control the **VP-31KSi** using the front panel buttons, or remotely via:

- RS-485 or RS-232 serial commands transmitted by a touch screen system, PC or other serial controller
- Ethernet over a LAN using a Web browser
- Kramer *Remote Step-in Panels* (for example, the **SI-1VGA** or **SI-VGAT**)
- The Kramer **RC-IR3** Infrared Remote Control Transmitter
- Remote, contact closure switches

3.1 Recommendations for Best Performance

To achieve the best performance:

- Use only high quality connection cables[1] to avoid 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 and position your Kramer **VP-31KSi** away from moisture, excessive sunlight and dust

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1 Available from Kramer Electronics and listed on our Web site at http://www.kramerelectronics.com

	Caution:	No operator serviceable parts inside the unit
	Warning:	Use only the Kramer Electronics input power wall adapter that is provided with the unit
	Warning:	Disconnect the power and unplug the unit from the wall before installing

3.2   Defining EDID

The Extended Display Identification Data (EDID[1]) is a data-structure, provided by a display that describes its capabilities to a graphics card (that is connected to the display's source). The EDID enables the PC or laptop to "know" what kind of monitor is connected to the output. The EDID includes the manufacturer's name, product type, timing data supported by the display, display size, luminance data and (for digital displays only) pixel mapping data.

1 Defined by a standard published by the Video Electronics Standards Association (VESA)

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4   Defining the VP-31KSi 3x1 UXGA/Audio STEP-IN Switcher

Figure 1 and Table 1 define the front panel of the **VP-31KSi** *3x1 UXGA/Audio STEP-IN Switcher.*
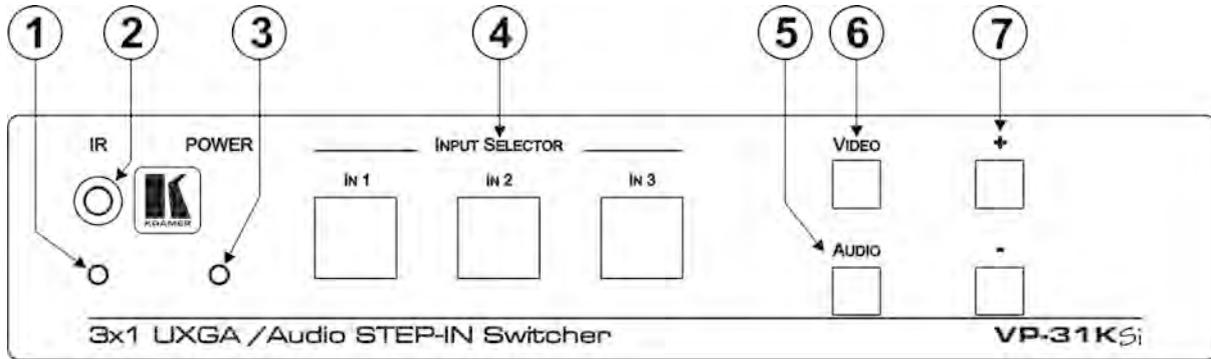
Figure 1: VP-31KSi 3x1 UXGA/Audio STEP-IN Switcher Front Panel

Table 1: VP-31KSi 3x1 UXGA/Audio STEP-IN Switcher Front Panel Features

#	Feature	Function
1	*IR* LED	Lights yellow when the unit receives an IR signal
2	*IR* Sensor	Receiver for the IR Remote Control signal
3	*POWER* LED	Lights green when he unit receives power
4	*INPUT SELECTOR IN 1 ~ IN 3* Buttons	Press to select the input (from 1 to 3) to switch to the outputs. The button lights red if it is selected and here is no input signal. The button lights green if it is not selected but there is an input signal at that input. The button lights violet if it is selected and there is an input signal connected
5	*AUDIO* Button	Press to execute audio related actions. The button lights when the audio mode is operational. When both the Audio and Video buttons light, he device is in audio follow video mode

#	Feature		Function
6	VIDEO Button		Press to execute video related actions.
			The button lights when the video mode is operational.
			When bo h the Audio and Video buttons light, the device is in audio follow video mode
7	AUDIO GAIN Buttons	+	Press to increase the audio output level of he selected input[1]
		–	Press to decrease the audio output level of the selected input[1]

Figure 2 and Table 2 define the rear panel of the **VP-31KSi** *3x1 UXGA/Audio STEP-IN Switcher.*
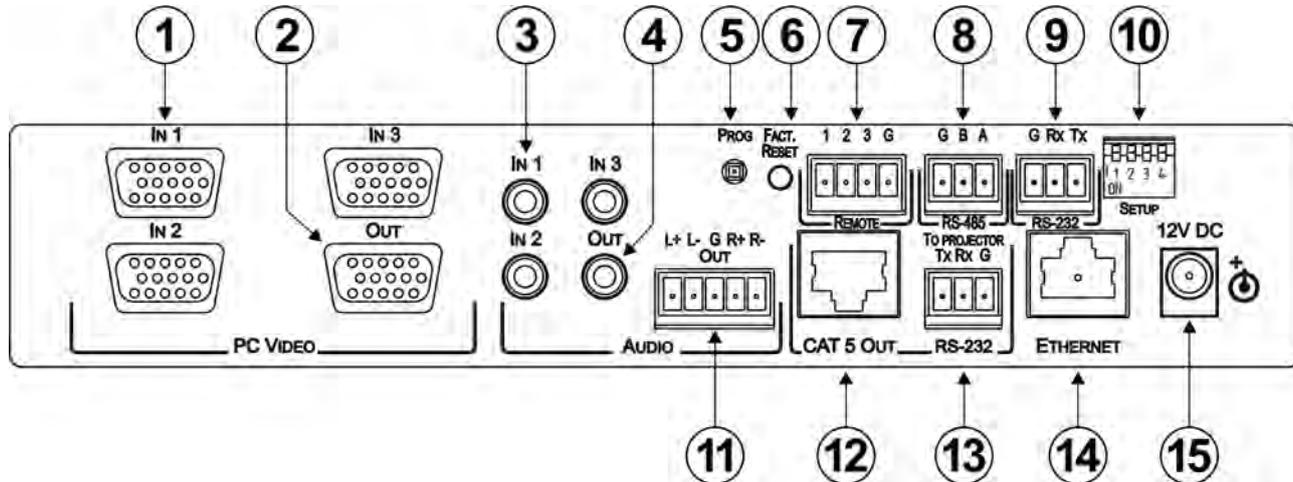
Figure 2: VP-31KSi 3x1 UXGA/Audio STEP-IN Switcher Rear Panel

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1 While the AUDIO button is lit

Table 2: VP-31KSi 3x1 UXGA/Audio STEP-IN Switcher Rear Panel Features

#	Feature	Function
1	*PC VIDEO IN 1 ~ IN 3* 15-pin HD (F) Connectors	Connect to the VGA (up to WUXGA) sources (from 1 to 3)
2	*OUT* 15-pin HD Connector	Connect to the VGA (up to WUXGA) acceptor
3	*AUDIO IN 1 ~ IN 3* 3.5mm Mini Jacks	Connect to the unbalanced stereo audio sources (from 1 to 3)
4	*AUDIO OUT* 3.5mm Mini Jack	Connect to the unbalanced stereo audio acceptor
5	*PROG* Button	For the use of Kramer technical support only
6	*FACT. RESET* Button	Press and hold while turning the unit on to reset all parameters to heir factory default values (see Section 11)
7	*REMOTE* Switch 4-pin Terminal Block	Connect to contact closure switches (1 to 3) for duplicating he function of the front panel Input Selector buttons (see Section 5.2)
8	*RS-485* 3-pin Terminal Block	Connect to RS-485 port on a remote controller or another VP-31KSi (see Section 5.6)
9	*RS-232* 3-pin Terminal Block	Connect to the RS-232 port on a remote controller (see Sec ion 5 5)
10	*SETUP* 4-way DIP-switch	DIP-switches: 1, 2 and 3 assign the RS-485 machine number (see Section 5.6.1) Switch 4 sets the RS-485 termination on or off (see Sec ion 5.6.1)
11	*AUDIO OUT* 5-pin Terminal Block Connector	Connect to the balanced stereo audio acceptor
12	*CAT 5 OUT* RJ-45 Connector	Connect to a compa ible TP receiver (for example, TP-122/N)
13	*TO PROJECTOR RS-232-2* 3-pin Terminal Block	Connect to an RS-232 controllable device, for example, a projector (see Figure 3 and Section 5.8)
14	*ETHERNET* RJ-45 Connector	Connect to a remote controller via a LAN (see Sec ion 5 9)
15	*12V DC* Power Connector	Connect the mains power adapter (center pin posi ive)

4.1 Using the IR Transmitter for the VP-31KSi

You can use the **RC-IR3** IR transmitter to operate the machine via the built-in IR receiver on the front panel.

5 Connecting the VP-31KSi 3x1 UXGA/Audio STEP-IN Switcher

Always switch off the power to each device before connecting it to your **VP-31KSi**. After connecting your **VP-31KSi**, connect its power and then switch on the power to each device.
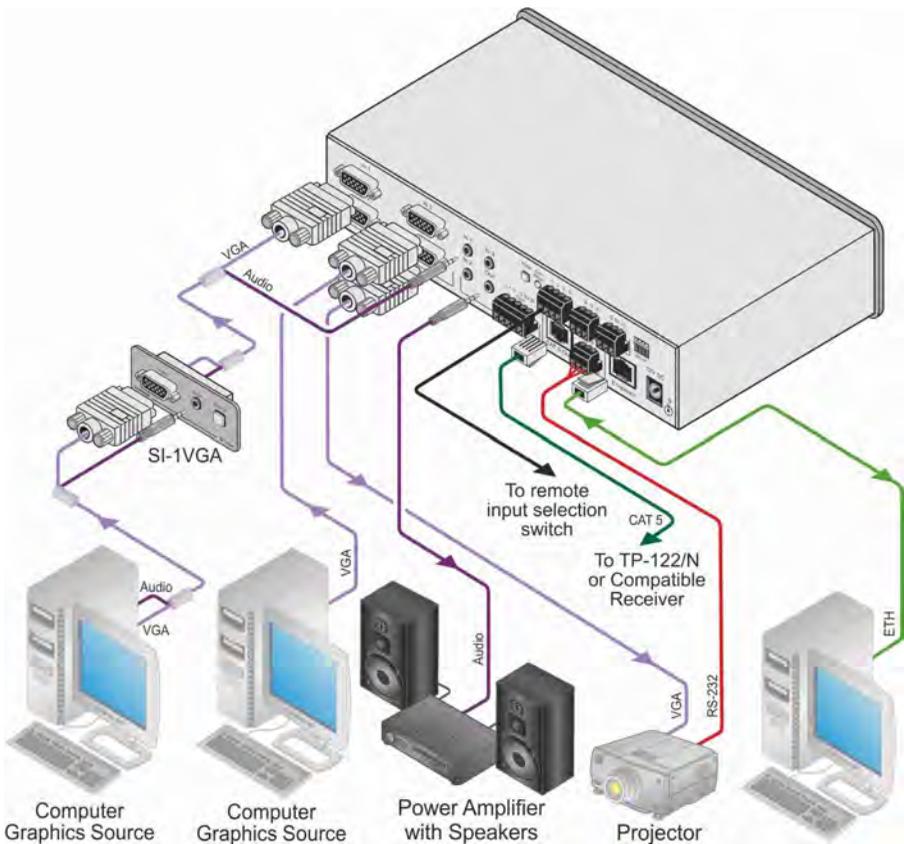
Figure 3: Connecting the VP-31KSi

To connect[1] the VP-31KSi, as illustrated in the example in Figure 3**:**

1. Connect up to three[2] *Remote Step-in Panels* (for example, the **SI-1VGA** or **SI-VGAT**) to the **VP-31KSi** 15-pin HD VIDEO INPUT connectors[3] and to the 3.5mm mini jacks (from 1 to 3).

2. Connect up to three UXGA computer graphics sources to the **SI-1VGA** 15-pin HD video connectors.

3. Connect up to three unbalanced audio sources to the 3.5mm mini jack audio connectors on the **SI-1VGA** panels.

4. Connect the 15-pin HD VIDEO OUTPUT connector to a UXGA acceptor (for example, a projector).

5. Connect the RJ-45 CAT 5 OUT connector to a compatible TP receiver (for example, the Kramer **TP-120**).

6. Connect either, but not both:
   - the unbalanced audio 3.5mm AUDIO OUTPUT jack to an unbalanced audio acceptor (for example, power amplifier)
     —OR—
   - the balanced audio 5-pin terminal block (see Section 5.1) to an audio acceptor (not shown in Figure 3)

7. Connect up to three remote, contact closure input selection switches to the REMOTE terminal block (see Section 5.2).

8. Connect a PC over a LAN to the Ethernet for remote operation.

9. Set the DIP-switches (see Section 5.6.1) for remote operation. You can connect a PC and/or controller to the:
   - RS-232 port (see Section 5.3)
   - RS-485 port (see Section 5.6.1)

10. Connect the power adapter to the device and to the mains electricity.

5.1 Connecting the Balanced/Unbalanced Stereo Audio Output

This section illustrates how to wire the devices to the balanced audio output:

- A balanced stereo output connection, see Figure 4
- An unbalanced stereo output connection, see Figure 5

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1 Be sure that the power is switched off on each device before connecting it to your VP-31KSi After connecting all the devices to your VP-31KSi, switch on the power of the VP-31KSi, and then switch on the power of each device

2 You do not have to connect all the inputs

3 The cable used must connect all 15 pins

L+ L- G R+ R-
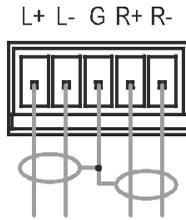
Figure 4: Balanced Stereo Audio Connection

L+ L- G R+ R-
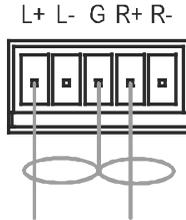
Figure 5: Unbalanced Stereo Audio Connection

5.2 Connecting Remote Contact Closure Input Selection Switches

You can connect remote input selection switches to the Remote terminal block on the rear panel of the **VP-31KSi** which enables you to remotely activate the relevant input.

The following example (see Figure 6) illustrates three switches (A, B and C) connected to remotely control inputs 1, 2 and 3 respectively (up to three switches can be connected). Pressing switch A causes input 1 on the **VP-31KSi** to be the active input, pressing switch B causes input 2 to be the active input, and pressing switch C causes input 3 to be the active input.
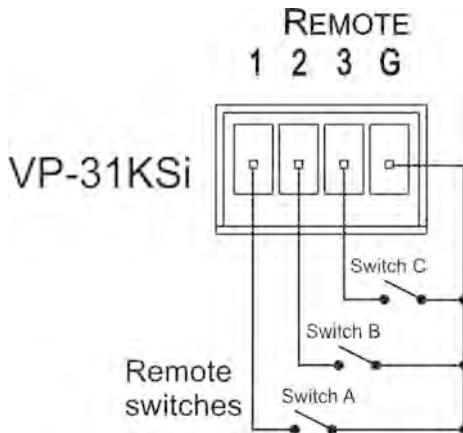
Figure 6: Remote Input Selection Switch Wiring

To connect remote input selection switches as the example illustrated in Figure 6**:**

1. Connect Switch A to pins 1 and G (ground) on the terminal block.
2. Connect Switch B to pins 2 and G on the terminal block.
3. Connect Switch C to pins 3 and G on the terminal block.

5.3 Connecting the SI-1VGA Remote Step-in Module

For detailed instructions refer to the **SI-1VGA** *Step-in Module Installation Instructions*[1].

To connect an SI-1VGA remote step-in module to the VP-31KSi as illustrated in the example in Figure 7**:**

1. Mount the **SI-1VGA** in either the **TBUS-10** or the **K-POD301**.
2. Using a 15-pin HD (male to male) cable[2], connect the 15-pin HD connector on the rear of the **SI-1VGA** to the corresponding input on the rear of the **VP-31KSi**.
3. Using an audio cable with 3.5mm mini jacks at both ends[3], connect the 3.5mm mini connector on the rear of the **SI-1VGA** to the corresponding audio input on the rear of the **VP-31KSi**.
4. Repeat steps 2 and 3 for each **SI-1VGA** remote step-in module.
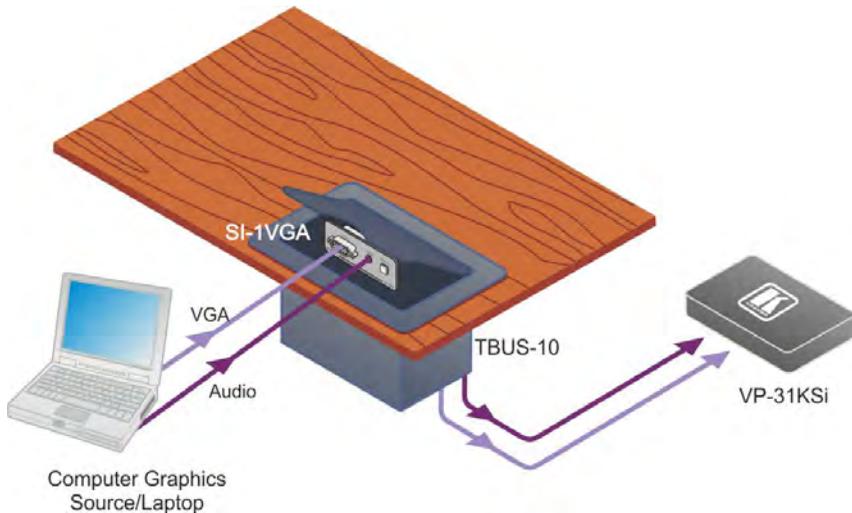
Figure 7: Connecting the SI-1VGA

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1 Available for download from http://www.kramerelectronics.com

2 For example, Kramer C-GM/GM

3 For example, Kramer C-A35M/A35M

5.4 Connecting the CAT 5 Twisted Pair Output

You can connect the **VP-31KSi** to any compatible Kramer TP (Twisted Pair) receiver, for example, **TP-120** (no audio) or **TP-122/N** (with audio).

For further details, refer to the relevant TP receiver user manual[1].

5.5 Connecting to the VP-31KSi via the RS-232 Port

You can connect to the **VP-31KSi** via an RS-232 connection using, for example, a PC as shown in Figure 8.
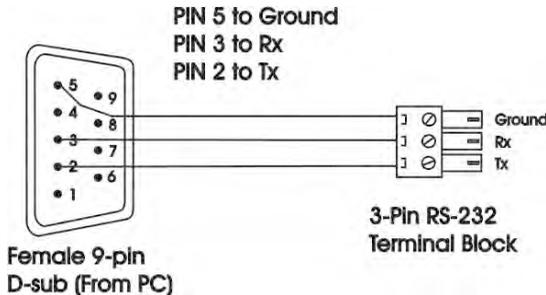
Figure 8: Connecting to the RS-232 Communication Port

To connect to the VP-31KSi via RS-232 as shown in Figure 8**:**

- Connect the 3-pin terminal block on the rear panel port of the **VP-31KSi** (pin G to pin 5, pin Rx to pin 3, pin Tx to pin 2) to the RS-232 9-pin D-sub port on your PC

5.6 Connecting to the VP-31KSi via the RS-485 Port

You can operate the **VP-31KSi** via the RS-485 port from a distance of up to 1200m (3900ft) using any device equipped with an RS-485 port (for example, a PC). For successful communication, you must set the RS-485 machine number and bus termination.

To connect a device with a RS-485 port to the VP-31KSi:

- Connect the A (+) pin on the RS-485 port of the PC to the A (+) pin on the RS-485 port on the rear panel of the **VP-31KSi**
- Connect the B (–) pin on the RS-485 port of the PC to the B (–) pin on the RS-485 port on the rear panel of the **VP-31KSi**
- Connect the G pin on the RS-485 port of the PC to the G pin on the RS-485 port on the rear panel of the **VP-31KSi**

5.6.1 Setting the RS-485 Machine Number and Bus Termination DIP-switches

This section describes the **VP-31KSi** DIP-switch settings that determine the RS-485 machine number and bus termination.

Figure 9 and Table 3 define the DIP-switch positions.
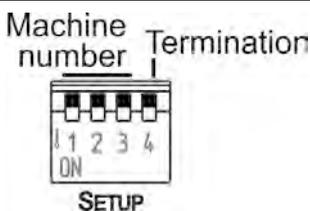
Figure 9: RS-485 DIP-switch Default Setting

Table 3: RS-485 DIP-switch Settings

DIP-switch Number	Function
1, 2, 3	Machine number (see Table 4) Default—All off (up), machine number 1
4	RS-485 Bus Termina ion Default—Off (up)

DIP-switches 1, 2 and 3 determine the RS-485 machine number of the **VP-31KSi**. When several **VP-31KSi** units are connected, the machine number determines the unique identity of the **VP-31KSi** on the bus (see Table 4).

Note:

- When using a stand-alone **VP-31KSi** unit, set the machine number to 1 (factory default)
- When connecting more than one **VP-31KSi**, set the first machine (connected via RS-232) to be machine number 1. The other **VP-31KSi** units must each be set to a unique machine number between 2 and 8

Table 4: Machine Number DIP-switch Settings

Machine Number	1	2	3
1 (Default)	OFF	OFF	OFF
2	OFF	OFF	ON
3	OFF	ON	OFF
4	OFF	ON	ON
5	ON	OFF	OFF
6	ON	OFF	ON
7	ON	ON	OFF
8	ON	ON	ON

DIP-switch 4 sets the RS-485 bus termination of the **VP-31KSi**. Only the first and last physical units on the RS-485 bus must be terminated, all others must be unterminated. Moving the DIP-switch up turns the termination off (default), moving the switch down turns the termination on.

5.6.2 Connecting and Controlling Multiple VP-31KSi Devices

You can daisy-chain up to eight **VP-31KSi** devices with operation via RS-232 from a PC or serial controller (see Figure 10).

To daisy-chain up to eight VP-31KSi devices:

1. Connect the RS-232 port[1] on the first **VP-31KSi** device to the PC (see Section 5.5).
2. Connect the RS-485 terminal block port on the first device to the RS-485 port on the second device, and so on for all devices.
3. Set the DIP-switches (see Section 5.6.1) as follows:
   - The first device is machine number 1 and the following seven devices are machine numbers 2 to 8
   - Terminate the first and last physical devices, that is, in this example terminate machine numbers 1 and 8. Ensure that all other devices are unterminated
   - Terminate the first and last physical devices, that is, terminate machine numbers 1 and 8. Ensure that all other devices are unterminated

5.7 Cascading Multiple VP-31KSi Devices

You can cascade up to eight **VP-31KSi** devices to build a single "virtual" switcher with up to 57 inputs and one output as illustrated in Figure 10.

To cascade up to eight VP-31KSi devices:

1. Connect the output on the Master **VP-31KSi** to the video acceptor (for example, a projector).
2. Connect Input 1 on the Master **VP-31KSi** to the output of the second device.
3. Connect Input 1 on the second **VP-31KSi** to the output of the third device, and so on for all devices.

Note: Audio connections must follow the same connection scheme as the video connections.

4. Set the DIP-switches (see Section 5.6.1) as follows:
   - The first device is machine number 1 (Master) and the following seven devices are machine numbers 2 to 8
   - Terminate the first and last physical devices, that is, terminate machine numbers 1 and 8. Ensure that all other devices are unterminated

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1 Alternatively, the RS-485 port could be used for PC control
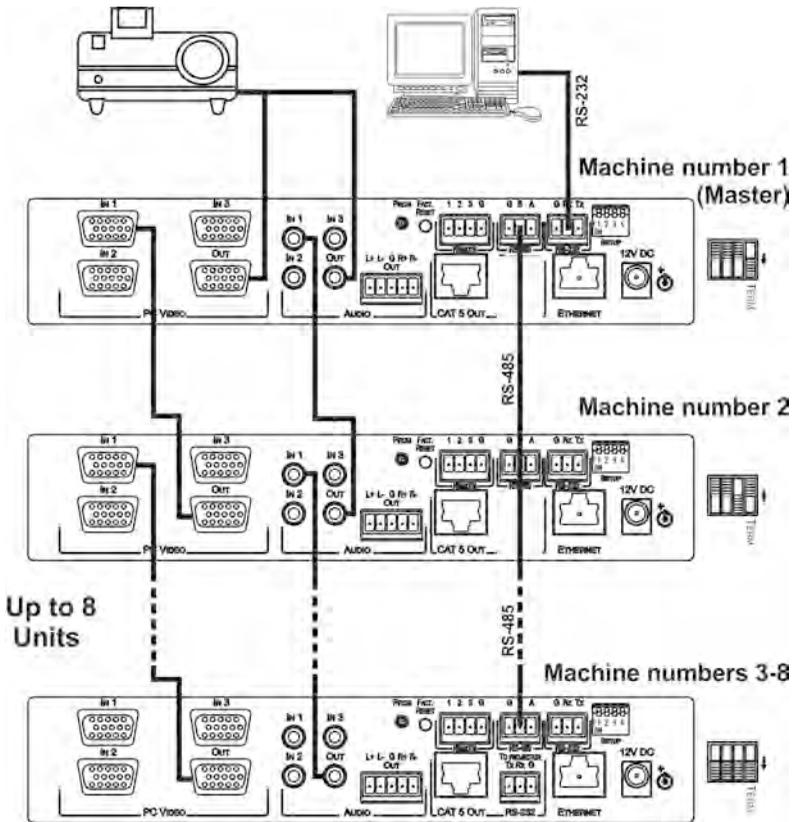
Figure 10: Cascading up to Eight VP-31KSi Devices

Note: The video acceptor must be connected to the Master output. The outputs of all other devices may be connected to any input on the subsequent device.

5.8 Controlling a Remote RS-232 Device

Use the Kramer **K-Config** software[1] to define macros sent from the "To Projector" RS-232 port to remote RS-232 serial devices (for example, a projector). For instructions on using the **K-Config** software, see the **K-Config** software guide.

A computer running the **K-Config** software can be connected to the **VP-31KSi** via either the "To Projector" serial or the Ethernet ports.

You can configure the "To Projector" RS-232 port command macros to send any data on one of the two possible triggers:

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1 Download the latest version from http://www.kramerelectronics.com/support/?soft=k-config

The "Device startup" trigger. This trigger is generated when one or more signals are detected on any of the inputs and can be used for example, to activate a projector connected to the output of the **VP-31KSi**.

The "Device inactivity" trigger. This trigger is generated when there is no signal detected on any input during the inactivity timeout period (which is set using the **K-Config** software to be between 0 and 180 minutes). This trigger can be used for example, to deactivate a projector connected to the output of the **VP-31KSi**.

5.9 Connecting to the VP-31KSi via the Ethernet Port

You can connect the **VP-31KSi** via the Ethernet in the following ways:
- For direct connection to the PC, use a crossover cable (see)
- For connection via a network hub or network router, use a straight through cable (see)

Note: The following instructions are valid only if your PC uses a fixed IP address. If your PC receives an IP address from a DHCP server, consult your IT department regarding a suitable IP address.

5.9.1 Connecting Directly to the Ethernet Port

You can connect the Ethernet port of the **VP-31KSi** to the Ethernet port on your PC via a crossover cable with RJ-45 connectors.

> This type of connection is recommended for identification of the factory default IP address of the **VP-31KSi** during the initial configuration

To connect the VP-31KSi directly to a PC:
1. Using a crossover cable, connect the **VP-31KSi** to the PC via the Ethernet port on both units.
2. On the PC, click **Start** > **Control Panel.**
3. Double-click **Network Connections.**
4. Right-click, and from the menu select **Properties**.
   The **Local Area Connection Properties** window appears.
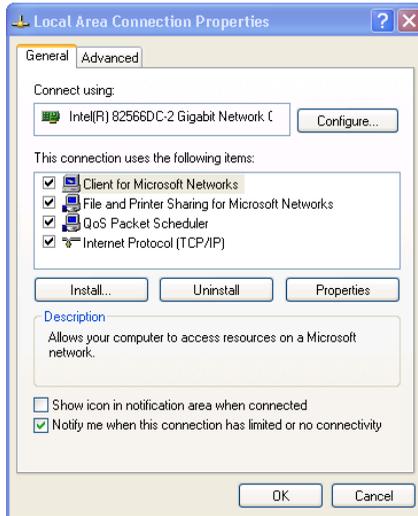
Figure 11: Local Area Connection Properties Window

5. Select **Internet Protocol (TCP/IP)** (see Figure 11).
6. Click the **Properties** button.
7. Select **Use the following IP address**, and fill in the details as shown in Figure 12.
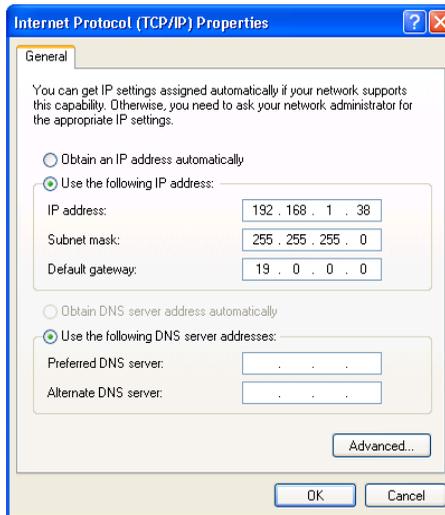
Figure 12: Internet Protocol (TCP/IP) Properties Window

8. Click **OK**.

5.9.2 Connecting via a Network Hub, Switch, or Router

You can connect the Ethernet port of the **VP-31KSi** to the Ethernet port on a network hub, switch, or router, via a straight through cable with RJ-45 connectors. The **VP-31KSi** Ethernet port has to be configured to be compatible with your network (see Section 5.9.3).

5.9.3 Configuring the Ethernet Port on the VP-31KSi

To configure the Ethernet port on the **VP-31KSi**, use the **K-Upload** software[1]. For instructions on using the **K-Upload** software, refer to the *K-Upload Software Guide*.

6 Operating the VP-31KSi Locally via the Front Panel Buttons

Powering up the **VP-31KSi** recalls the previous settings (that is, the state of the unit when it was powered down) from the non-volatile memory.

6.1 Using the Front Panel INPUT SELECTOR Buttons

Table 5 describes the input selector button illumination descriptions.

Table 5: Button Illumination Descriptions

Button Color	Selected Input	Input Signal Detected
Red (video and audio)	Yes	No
Green (video)	No	Yes
Purple (video)	Yes	Yes
Button does not light	No	Yes or no

When a video input signal is detected, the button lights green. No audio signal detection is performed.

When an input is selected (whether video or audio) and an input signal is detected, the button lights red.

When a video signal is detected and the input is selected, the button lights purple.

To switch an input to the output, press one of the three front panel INPUT SELECTOR buttons. The INPUT SELECTOR button lights (see Table 5) and switches the input simultaneously to both the VGA and CAT 5 TP outputs.

6.2 The Audio-Follow-Video and Breakaway Modes

When the **VP-31KSi** operates in audio-follow-video mode, all operations relate to both the video and audio. When in this mode, both the VIDEO and the AUDIO buttons are lit.

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1 Available from http://www.kramerelectronics.com

6.2.1 Switching to Breakaway Mode

To switch to breakaway mode:

- Press either the VIDEO button or the AUDIO button.
  If the VIDEO button lights, the switching relates only to video (and the audio selection remains unchanged). If the AUDIO button lights, the switching relates only to audio (and the video selection remains unchanged)

6.2.2 Switching to Audio-Follow-Video Mode

To switch to Audio-Follow-Video mode:

- Press the VIDEO and the AUDIO buttons simultaneously.
  Both VIDEO and AUDIO buttons light red and the audio channel will immediately switch to the same input as the video selection

6.3 Setting the Audio Output Gain

You can set the audio output gain using the + and – buttons[1].

To set the audio output gain:

1. Ensure that the Audio button is lit and that the VIDEO button is not lit.
2. Press the input button of the input for which you want to set the audio gain. The input button lights.
3. Press either the + (to increase) or – (to decrease) button to vary the gain.

6.4 Reading and Writing the EDID

The **VP-31KSi** is delivered with preprogrammed EDID data for each input (see Section 6.4). Using the Kramer EDID Designer software[2] you can read and write EDID data to individual inputs.

7 Operating the VP-31KSi Remotely

You can operate the **VP-31KSi** remotely using the **Kramer K-Single Control Software** on a PC. For full details, see the **Kramer Control Software** *Online Guide*.

The **VP-31KSi** can be operated remotely via any of the following methods:

- The Kramer **RC-IR3** Infra-Red Remote Control transmitter
- Contact closure switches (for connecting, see Section 5.2)
- **SI-1VGA** *Remote Step-in Panel* (for connecting, see Section 5.3)
- RS-232 (for connecting, see Section 5.4)
- RS-485 (for connecting, see Section 5.6)
- Ethernet over a LAN using a Web browser (see Section 8)

---

1 You can set the audio input gain for each input individually using the IR remote control or Protocol 2000/3000 commands via RS-232/Ethernet

2 The Kramer EDID Designer software can be downloaded from http://www.kramerelectronics.com

8   Operating the VP-31KSi Remotely using a Web Browser

The embedded Web pages can be used to remotely operate the **VP-31KSi** using a Web browser and an Ethernet connection.

Before attempting to connect:

- Perform the procedures in Section 5.9
- Ensure that the Java™ software is installed and functioning correctly on your computer. If not, download it from www.java.com
- Ensure that your browser is supported—Microsoft IE (V6.0 and higher), Google Chrome, Firefox (V3.0 and higher)

To check that Java is installed and running correctly, browse to http://www.java.com/en/download/help/testvm.xml

This page runs a test and displays a Java success (see Figure 13) or failure message.

Figure 13: Java Test Page Success Message

If you do not see the success message, follow the instructions on the page to:

- Load and enable Java
- Enable Javascript in your browser

8.1   To Log On to the VP-31KSi Web Pages

To log on to VP-31KSi Web pages:

1. Open your Internet browser.
2. Type the unit's IP number (see Table 7) in the Address bar of your browser.

The **Loading** page appears.

Kramer Electronics Web K-Router
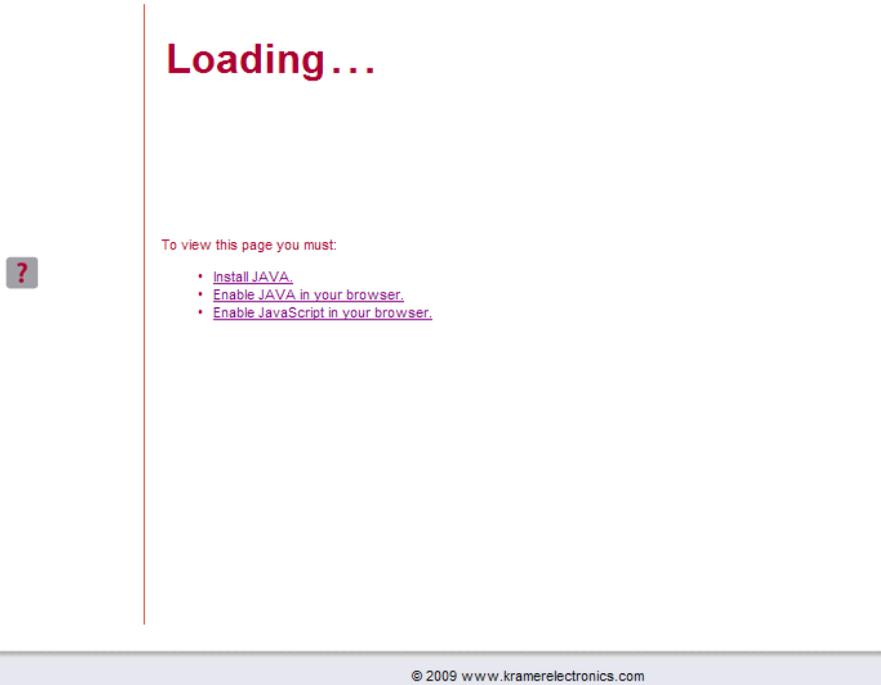
Figure 14: The Loading Page

The first time that you run the program the Warning-Security screen appears.

Figure 15: First Time Security Warning

3. Click **Run**.
    The main switching control Home page is displayed which shows a graphical interpretation of the front panel (see Figure 16).

The Web pages let you control the **VP-31KSi** via the Ethernet. The menu appears on the left side of the screen. There are three remote operation Web pages:

- The switching matrix (see Section 8.2)
- Audio gain control (See Section 8.3)
- Configuration (See Section 8.4)

A description of each Web page is displayed if you hover your mouse over the question mark ? that appears on the left side of the screen.

8.2   The Switching Matrix Page

The **VP-31KSi** switching matrix page lets you route any of the three inputs to the output by clicking the audio and/or video signal indicators (purple and blue, respectively).

Figure 16: VP-31KSi Switching Matrix Page

You can perform the following operations via this Web page:

- Operate in the AFV mode or switch the audio and video separately, by clicking the **Audio**, **Video** or **AFV** buttons (see Section 8.2.1)
- Select an audio and/or video signal[1] by clicking that signal indicator
- Operate in the At Once or Confirm mode (see Section 8.2.2)
- Click the lock icon 🔓 to lock or unlock the front panel

---

1 Depending on the operation mode (Audio, Video or AFV)

8.2.1 Switching an Input to an Output

To switch an input to an output (for example, input 4 to output 1):

1. Click on the dark blue **AFV** mode button. (To switch only the video or audio channel, click on purple **Audio** or blue **Video** button respectively.)
   The border of the button turns dark.
2. Click on the switching point within the matrix (In 2 to Out 1).
   The audio/video signal indicators move to the In 2 to Out 1 switching matrix box, indicating that In 2 is now switched to Out 1.
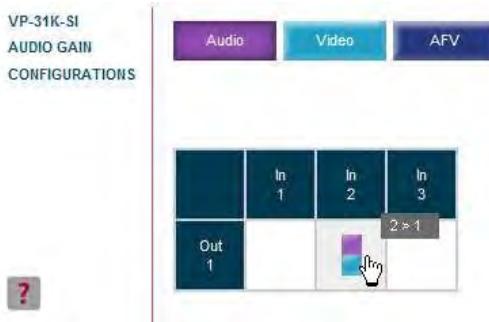
Figure 17: Switching an Input to an Output

8.2.2 Operating in the Confirm Mode

By default, the device is set to the At-Once mode.

To operate in the Confirm mode:

1. Click the red **Offline** button.
   The border of the button turns dark.
2. Click the desired switching-point in the switching matrix.
   Audio/video indicator outlines appear on the matrix and the **Take** and **Cancel** buttons turn blue.
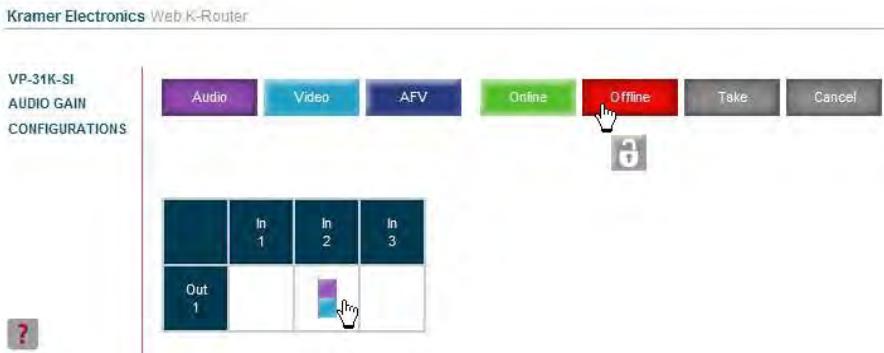
Figure 18: Switching an Input to an Output

3. Click either **Take** to accept the changes or **Cancel** to abandon them.
4. Click the **Online** button to exit the Confirm mode.
   If you click the **Online** button before you click the **TAKE** button, the warning shown in <u>Figure 19</u> appears.

Figure 19: Exiting Offline Warning

Clicking **OK** cancels all changes made. Clicking **Cancel** returns you to the switching matrix screen with the changes made but not saved.

8.3 The Audio Gain Page

The Audio Gain screen lets you set the gain for each of the input and the output channels.
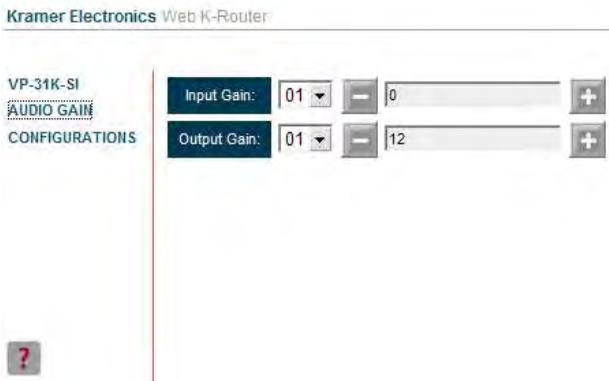
Figure 20: Audio Gain Page

To change an input or output gain:
1. Using the Input Gain or Output Gain drop-down list, select the channel number.
2. Click and hold the **+** or **–** button to increase or decrease the gain respectively.
   Each click on the **+** or **–** button increases/decreases the audio gain by 0.5 units.

8.4 The Configurations Page

The Configurations page lets you view some Ethernet settings and change others (see Figure 21). Fields with a white background are editable; fields with a blue background are read-only.

To change the configuration definitions:

1. Click **CONFIGURATIONS**.
   The Configurations Web page appears.
2. Modify the values as required.
3. Click the blue **Submit** button to apply changes or Cancel to abandon them.
   A confirmation window appears asking if you are sure you want to change the network settings.
4. Click **Yes**.
   A window appears informing you that the configuration has been successfully changed.
5. Click **OK**
6. If the IP address has been changed, close your browser and reload the Web page using the new IP address.

Figure 21: Configurations Page

9 Updating the Firmware

For instructions on updating the firmware, see the document *K-Upload Software Guide*.

The latest version of firmware and accompanying guide can be downloaded from the Kramer Web site at www.kramerelectronics.com.

10   Technical Specifications

[Table 6](#) lists the technical specifications[1] of the **VP-31KSi**.

Table 6: Technical Specifications of the VP-31KSi

INPUTS:	3 XGA on 15-pin HD (F) connectors 3 Unbalanced stereo audio on a 3 5mm mini jack	
OUTPUTS:	1 XGA on 15-pin HD connector 1 TP on RJ-45 connector 1 unbalanced stereo audio on a 3.5mm mini jack 1 balanced stereo audio on a 5-pin terminal block	
MAX. OUTPUT LEVEL:	VIDEO: 2.2Vpp	AUDIO: Stereo Unbalanced 7.9Vpp Stereo Balanced 15.8Vpp differential (17dBu)
BANDWIDTH (-3dB):	VIDEO: Out, Min 411MHz, Max 440MHz CAT 5 (Rec Out) 150MHz	AUDIO: Stereo Unbalanced 20kHz Stereo Balanced 20kHz
RESOLUTION:	VIDEO: VGA up to WUXGA	
DIFF. GAIN:	VIDEO: XGA 0.06%	
DIFF. PHASE:	VIDEO: UXGA: 0.05Deg	
K FACTOR:	VIDEO: UXGA: <0.05%	
S/N RATIO:	VIDEO: UXGA 69.5dB to 5MHz CAT 5: 69.1dB to 5MHz	AUDIO: Stereo Unbalanced 80 8dB @1KHz Stereo Balanced 80.8dB @1kHz CAT5 (Rec Out) 80.1dB
CROSSTALK (all hos ile):	VIDEO: UXGA –63.2dB @5MHz	AUDIO: Local Stereo Unbalanced –117.7dB @1kHz Local Stereo Balanced –108.8dB @1kHz
VOLUME CONTROL:	AUDIO: Stereo Unbalanced –116 3 to 21.1dB Stereo Balanced –109.7 to 27.1dB	
COUPLING:	VIDEO: UXGA—DC TP Out—DC	AUDIO: Stereo Unbalanced—In AC, Out AC Stereo Balanced—In AC, Out AC
AUDIO THD + NOISE:	Stereo Unbalanced 0.026% Stereo Balanced 0.01%	
AUDIO 2nd HARMONIC:	Stereo Unbalanced 0.002% Stereo Balanced 0.003%	
POWER SOURCE:	12V DC 260mA. When connected to TP-122/N or TP124, 750mA	
OPERATING TEMPERATURE:	0° to +55°C (32° to 131°F)	
STORAGE TEMPERATURE:	–45° to +72°C (–49° to 162°F)	
HUMIDITY:	10% to 90%, RHL non-condensing	
DIMENSIONS:	16.9cm x 16.7cm x 3 2cm (6.7" x 6.57" x 1.3") W, D, H	
WEIGHT:	1.1kg (2.43lbs) approx.	
ACCESSORIES:	Power cord, Windows®-based Kramer control software, RC-IR3 Infrared Remote Control transmitter	
OPTIONS:	SI-1VGA, SI-1VGAT, SI-VGAT and WSI-1VGA Remote Step-in modules, Rack Mount Kit RK-1	

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1 Specifications are subject to change without notice

11 Default Parameters

11.1 Default Communication Parameters

Table 7 lists the default communication parameters as used in Kramer Electronics products.

Table 7: Default Communication Parameters

RS-232				
Protocol 2000			**Protocol 3000 (Default)**	
Baud Rate:	9600		Baud Rate:	115,200
Data Bits:	8		Data Bits:	8
Stop Bits:	1		Stop Bits:	1
Parity:	None		Parity:	None
Command Format:	HEX		Command Format:	ASCII
Example (Output 1 to Input 1):	0x01, 0x81, 0x81, 0x81		Example (Output 1 to Input 1):	#AV 1>1<CR>
Switching Protocol				
P2000 -> P3000			**P3000 -> P2000**	
Command:	0x38, 0x80, 0x83, 0x81		Command:	#P2000<CR>
Front Panel:	Press and hold Output 1 and Output 3 simultaneously		Front Panel:	Press and hold Output 1 and Output 2 simultaneously
Ethernet				
To reset the IP settings to the factory reset values, power cycle the device while holding in the Fact Reset button, located on the rear panel of the unit				
IP Address:	192.168.1.39			
Subnet mask:	255.255 255.0			
Default gateway:	192.168.1.1			
TCP Port #:	5000			
UDP Port #:	50000			
Maximum UDP Ports:	10			
Maximum TCP Ports:	4			

11.2 Default Audio and Video Parameters

Table 8 lists the default audio and video parameters as used in Kramer Electronics products.

Table 8: Default Audio and Video Parameters

Parameter	Default
Audio-follow-video	On
Input audio gain	0dB
Output audio gain	0dB
Switched input	1

11.3 Default EDID

Each input on the **VP-31KSi** has a factory default EDID loaded. The EDID for each input can be changed independently by uploading an EDID binary file to each input via the RS-232 port using Kramer EDID Designer software[1].

```
Monitor
  Model name............... VP-31K-SI
  Manufacturer............. KRM
  Plug and Play  D......... KRM0808
  Serial number............ 2
  Manufacture date......... 2009, ISO week 10
  ------------------------
  EDID revision............ 1 3
  Input signal type........ Analog 0.700,0.000 (0.7V p-p)
  Sync input support....... Separate, Composite, Sync-on-green
  Display type............. RGB color
  Screen size.............. 360 x 290 mm (18 2 in)
  Power management......... Standby, Suspend, Active off/sleep
  Extension blocs.......... None
  ------------------------
  DDC/CI.................. Not supported

Color characteristics
  Default color space...... sRGB
  Display gamma............ 2.00
  Red chromaticity......... Rx 0 611 - Ry 0.329
  Green chromaticity....... Gx 0.312 - Gy 0.559
  Blue chromaticity........ Bx 0.148 - By 0.131
  White point (default).... Wx 0 320 - Wy 0.336
  Additional descriptors... None

Timing characteristics
  Range limits............. Not available
  GTF standard............. Not supported
  Additional descriptors... None
  Preferred timing......... Yes
  Native/preferred timing.. 1024x768p at 60Hz (4 3)
    Modeline............... "1024x768" 65.000 1024 1048 1184 1344 768 771 777 806 -hsync -vsync
  Detailed timing #1....... 1280x800p at 60Hz (1:1)
    Modeline............... "1280x800" 71.000 1280 1328 1360 1440 800 803 809 823 +hsync -vsync

Standard timings supported
    640 x 480p at 60Hz - IBM VGA
    640 x 480p at 67Hz - Apple Mac II
    640 x 480p at 72Hz - VESA
    640 x 480p at 75Hz - VESA
    800 x 600p at 56Hz - VESA
    800 x 600p at 60Hz - VESA
    800 x 600p at 72Hz - VESA
    800 x 600p at 75Hz - VESA
    1024 x 768p at 60Hz - VESA
    1024 x 768p at 70Hz - VESA
    1024 x 768p at 75Hz - VESA
    1280 x 1024p at 75Hz - VESA
    1280 x 1024p at 60Hz - VESA STD
    1280 x 960p at 60Hz - VESA STD
    1400 x 1050p at 60Hz - VESA STD
    1440 x 900p at 60Hz - VESA STD
    1600 x 1200p at 60Hz - VESA STD
    1920 x 1200p at 60Hz - VESA STD
    1920 x 1080p at 60Hz - VESA STD

Report information
  Date generated........... 12/7/2010
  Software revision........ 2.43 0 822
  Operating system......... 5.1.2600.2.Service Pack 3

Raw data
  00,FF,FF,FF,FF,FF,FF,00,2E,4D,08,08,02,00,00,00,0A,13,01,03,6E,24,1D,64,EE,9C,20,9C,54,4F,8F,26,21,52,56,
  3F,CF,00,81,80,81,40,90,40,95,00,A9,40,D1,00,D1,C0,01,01,64,19,00,40,41,00,26,30,18,88,36,00,30,E4,10,00,00,
  18,BC,1B,00,A0,50,20,17,30,30,20,36,00,20,20,00,00,00,1A,00,00,00,FC,00,56,50,2D,38,31,4B,2D,53,49,0A,20,20,
  20,00,00,00,10,00,56,50,2D,38,31,4B,2D,53,49,00,0A,20,20,00,68
```

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1 Available for download from http://www.kramerelectronics com

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12 Table of ASCII Codes for Serial Communication (Protocol 3000)

Table 9 lists the ASCII values to switch an input to an output for a single **VP-31KSi** device. For more detailed information, see Protocol 3000 Section 14.2.

Table 9: VP-31KSi Video and Audio Signal Codes

	Video	Audio
IN 1	#V 1>1 CR	#A 1>1 CR
IN 2	#V 2>1 CR	#A 2>1 CR
IN 3	#V 3>1 CR	#A 3>1 CR

Table 10 lists the codes that set the audio input gain. For more detailed information, see Section 14.2.

Table 10: VP-31KSi Audio Input Gain Codes

INPUT 1	INPUT 2	INPUT 3	Level [Rel]
#AUD-LVL 1,1, -63CR	#AUD-LVL 1,2, -63CR	#AUD-LVL 1,3, -63CR	-63dB
#AUD-LVL 1,1, -50CR	#AUD-LVL 1,2, -50CR	#AUD-LVL 1,3, -50CR	-50dB
#AUD-LVL 1,1, 0CR	#AUD-LVL 1,2, 0CR	#AUD-LVL 1,3, 0CR	0dB
#AUD-LVL 1,1, 7CR	#AUD-LVL 1,2, 7CR	#AUD-LVL 1,3, 7CR	+7dB (Max)

Table 11 lists the codes that set the video and audio output gain. For more detailed information, see Section 14.1.2.

Table 11: VP-31KSi Audio and Audio Output Gain Codes

OUTPUT 1	Level [Rel]
#AUD-LVL 2,1, -30CR	-30dB
#AUD-LVL 2,1, 0CR	0dB
#AUD-LVL 2,1, 20CR	+20dB

13 Table of Hex Codes for Serial Communication (Protocol 2000)

Table 12 lists the Hex values to switch an input to an output for a single **VP-31KSi** machine. For more detailed information, see Protocol 2000[1] (see Section 14.3).

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1 Go to the Technical Support section of our Web site at http://www.kramerelectronics.com

Table 12: VP-31KSi Hex Codes for Protocol 2000

	Video	Audio
IN 1	01, 81, 81, 81	02, 81, 81, 81
IN 2	01, 82, 81, 81	02, 82, 81, 81
IN 3	01, 83, 81, 81	02, 83, 81, 81

Table 13 lists the Hex codes that increase or decrease audio input gain.

Table 13: VP-31KSi Hex Codes that Increase/Decrease Audio Input Gain

	IN 1	IN 2	IN 3
Increase	18 81 86 81	18 82 86 81	18 83 86 81
Decrease	18 81 87 81	18 82 87 81	18 83 87 81

Table 14 lists the Hex codes that set the audio input gain.

Note: Before sending any of the codes in Table 14, the command **2A 86 80 81** must be sent.

Table 14: Hex Codes that Set the Audio Input Gain

IN 1	IN 2	IN 3	Level [Rel]
16 81 80* 81	16 82 80* 81	16 83 80* 81	-63dB Mute
16 81 8D* 81	16 82 8D* 81	16 83 8D* 81	-50dB
16 81 BF* 81	16 82 BF* 81	16 83 BF* 81	0dB
16 81 C6* 81	16 82 C6* 81	16 83 C6* 81	+7dB (Max)

* BYTE 3 = 0x80 + Gain Value (0x00-0x46)

Table 15 lists the Hex codes that increase or decrease the audio output gain.

Table 15: VP-31KSi Hex Codes for Increasing/Decreasing the Output Gain

	OUT 1
Increase	18 81 80 81
Decrease	18 81 81 81

Table 16 lists the Hex codes that set the audio output gain.

Before sending the any of the codes in Table 16, the command 2A 87 80 81 must be sent.

Table 16: Hex Codes for Setting the Audio Output Gain

OUT 1	Level [Rel]
16 81 80* 81	-30dB
16 81 9E* 81	0dB
16 81 B2* 81	+20dB

*BYTE 3 = 0x80 + Gain Value (0x00-0x32)

14 Kramer Protocol

Section 14.1 describes how to switch between Protocol[1] 3000 and Protocol 2000.

By default, the **VP-31KSi** is set to protocol 3000 (see Section 14.2) but is also compatible with Kramer's Protocol 2000 (see Section 14.3).

14.1 Switching Protocols

You can switch protocols either via the front panel buttons (see Section 14.1.1) or the protocol commands (see Section 14.1.2).

14.1.1 Switching Protocols via the Front Panel Buttons

To switch from protocol 3000 to protocol 2000 via the:

- Front panel buttons, press the IN 1 and IN 2 button simultaneously
- Infrared remote control transmitter, press the TAKE button and then 13

To switch from protocol 2000 to protocol 3000 via the:

- Front panel buttons, press the IN 1 and IN 3 button simultaneously
- Infrared remote control transmitter, press the TAKE button and then 16

14.1.2 Switching Protocols via Protocol Commands

To switch from protocol 3000 to protocol 2000, send the following command:

#P2000<CR>

To switch from protocol 2000 to protocol 3000, send the following command:

0x38, 0x80, 0x83, 0x81

> The Windows®-based Kramer control software[2] operates with Protocol 2000.
> If the **VP-31KSi** is set to Protocol 3000, it is automatically switched to Protocol 2000.

14.2 Kramer Protocol 3000

This RS-232/RS-485/Ethernet communication protocol[3] lets you control the machine from any standard terminal software (for example, Windows® HyperTerminal Application). For serial communication parameters, see Section 11.1.

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1 You can download our user-friendly "Software for Calculating Hex Codes for Protocol 2000" from the technical support section at http://www.kramerelectronics.com

2 Download the latest software from our Web site at http://www.kramerelectronics.com

3 Not available at the time of printing Refer to our Web site http://www.kramerelectronics.com for details

14.2.1 Protocol 3000 Syntax

Host message format:

Start	Address (optional)	Body	Delimiter
#	*Destination_id@*	message	CR

Simple command (commands string with only one command without addressing):

start	body	delimiter
#	Command SP Parameter_1,Parameter_2,…	CR

Commands string (formal syntax with commands concatenation and addressing):

 # Address@ **Command_1** *Parameter1_1,Parameter1_2,… |Command_2 Parameter2_1,Parameter2_2,… |Command_3 Parameter3_1,Parameter3_2,… |…***CR**

Device message format:

Start	Address (optional)	Body	Delimiter
~	*Sender_id@*	message	CR LF

Device long response (**Echoing command**):

Start	Address (optional)	Body	Delimiter
~	*Sender_id@*	**command** SP [*param1 ,param2 …*] result	CR L F

CR = Carriage return (ASCII 13 = 0x0D)

LF = Line feed (ASCII 10 = 0x0A)

SP = Space (ASCII 32 = 0x20)

14.2.2 Command Part Details

Command:

Sequence of ASCII letters ('A'-'Z', 'a'-'z' and '-')

Command will separate from parameters with at least single space

Parameters:

Sequence of Alfa-Numeric ASCII chars ('0'-'9','A'-'Z','a'-'z' and some special chars for specific commands), parameters will be separated by commas

Message string:

Every command must to be entered as part of message string that begin with **message starting char** and end with **message closing char**, note that string can contain more then one command separated by pipe ("|") char

Message starting char:

'#' for host command\query

'~' for machine response

Device address (Optional, for Knet):

Knet Device ID follow by '@' char

Query sign = '?', will follow after some commands to define query request

Message closing char =

Host messages - Carriage Return (ASCII 13), will be referred to by `CR` in this document

Machine messages **-** Carriage Return (ASCII 13) + Line-Feed (ASCII 10), will be referred to by `CRLF`

Spaces between parameters or command parts will be ignored

Commands chain separator char:

When **message string** contains more than one command, commands will be separated by pipe ("|")

Commands entering:

If terminal software used to connect over serial \ ethernet \ USB port, that possible to directly enter all commands characters (`CR` will be entered by Enter key, that key send also `LF`, but this char will be ignored by commands parser)

Sending commands from some controllers (like Crestron) require coding some characters in special form (like \X##) Anyway, there is a way to enter all ASCII characters, so it is possible to send all commands also from controller

(Similar way can use for URL \ Telnet support that maybe will be added in future)

Commands forms:

Some commands have short name syntax beside the full name to allow faster typing, response is always in long syntax

Commands chaining:

It is possible to enter multiple commands in same string by '|' char (pipe)

In this case the **message starting char** and the **message closing char** will be entered just one time, in the string beginning and at the end

All the commands in string will not execute until the closing char will be entered

Separate response will be sent for every command in the chain

Input string max length:

64 characters

Backward support:

Design note: transparent supporting for protocol 2000 will be implemented by switch protocol command from protocol 3000 to protocol 2000, in protocol 2000 there is already such a command to switch protocol to ASCII protocol (#56 : H38 H80 H83 H81)

Table 17: Instruction Codes for Protocol 3000

Help commands		
Command	**Syntax**	**Response**
Protocol Handshaking	#`CR`	~OK`CRLF`

Device initiated messages	
Command	**Syntax**
Start message	Kramer Electronics LTD. , **Device Model** Version **Software Version**
Switcher actions	
Audio-video channel has switched (AFV mode)	**AV** *IN>OUT*
Video channel has switched (Breakaway mode)	**VID** *IN>OUT*
Audio channel has switched (Breakaway mode)	**AUD** *IN>OUT*

Result codes (errors)	
	Syntax
No error. Command running succeeded	COMMAND PARAMETERS **OK**
Protocol Errors	
Syntax Error	**ERR001**
Command not available for this device	**ERR002**
Parameter is out of range	**ERR003**
Unauthorized access (running command without the match login).	**ERR004**

Basic routing commands		
Command	**Syntax**	**Response**
Switch audio & video	**AV** *IN*>*OUT*, *IN*>*OUT*, …	**AV** *IN*>*OUT*, *IN*>*OUT*,…*RESULT*
Switch video only	**VID** *IN*>*OUT*, *IN*>*OUT*, … **Short form**: **V** *IN*>*OUT*, *IN*>*OUT*, …	**VID** *IN*>*OUT*, *IN*>*OUT*, …*RESULT*
Note: When AFV mode is active, this command will switch also audio. If audio is breakaway – device display mode will change to show audio connections status.		
Switch audio only	**AUD** *IN*>*OUT*, *IN*>*OUT*, … **Short form**: **A** *IN*>*OUT*, *IN*>*OUT*, …	**AUD** *IN*>*OUT*, *IN*>*OUT*, …*RESULT*
Note: When AFV mode is ac ive, this command will switch also video.		
Read video connection	**VID?** *OUT* **Short form**: **V?** *OUT* **VID?** *	**VID** *IN*>*OUT* **VID** *IN*>1 *IN*>2, …
Read audio connection	**AUD?** *OUT* **Short form**: **A?** *OUT* **AUD?** *	**AUD** *IN*>*OUT* **AUD** *IN*>1, *IN*>2, …
Parameters Descrip ion: **IN** = Input number or '0' to disconnect output. '>' = Connection character between in and out parameters. **OUT** = Output number or '*' for all outputs.		
Examples:		
Switch Video and Audio input 3 to output 7	#AV 3>7**CR**	~AV 3>7 OK**CRLF**
Switch Video input 2 to output 4	#V 2>4**CR**	~VID 2>4 OK**CRLF**
Switch Video input 4 to output 2 in machine number 6	#6@VID 4>2**CR**	~6@VID 4>2 OK**CRLF**
Disconnect Video and Audio Output 4	#AV 0>4**CR**	~AV 0>4 OK**CRLF**
Switch Video Input 3 to All Outputs	#V 3>***CR**	~VID 3>* OK**CRLF**

| Chaining Multiple commands* | #AV 1>* \| V 3>4, 2>2, 82>1, 0>2 \|V 82>3\| A 0>1 \| V? * **CR**

First switch all Audio and video outputs from input 1,
Then switch video input 3 to output 4, video input 2 to output 2, video input and disconnect video output 2.
Then switch audio input 3 to output 2,
Then disconnect audio output 1.
Then get status of all links (assume this is 4x4 matrix).
Commands processing start after entering **CR**, response will sent for each command after processing it. | ~AV 1>* OK**CRLF**
~VID 1>2, 3>4 OK**CRLF**
~VID 82>3 **ERR###** **CRLF**
~AUD 0>1 OK**CRLF**
~V 1>1, 0>2, 1>3, 3>4 **CRLF** |

Signal Status commands		
Command	**Syntax**	**Response**
Change signal status	------------------	**SIGNAL** *INPUT*, *STATUS*
Get signal status	**SIGNAL?** *INPUT*	**SIGNAL** *INPUT*, *STATUS*

Parameters Description:
NPUT = Input number, '*' for all. **STATUS** = Signal state: "0" or "off" for not existent signal. "1" or "on" for existent signal.

Preset commands		
Command	**Syntax**	**Response**
Store current connections to preset	**PRST-STO** *PRESET* **Short form**: **PSTO** *PRESET*	**PRST-STO** *PRESET* *RESULT*
Recall saved preset	**PRST-RCL** *PRESET* **Short form: PRCL** *PRESET*	**PRST-RCL** *PRESET* *RESULT*
Delete saved preset	**PRST-DEL** *PRESET* **Short form: PDEL** *PRESET*	**PRST-DEL** *PRESET* *RESULT*
Read video connections from saved preset	**PRST-VID?** *PRESET* *OUT* **Short form: PVID?** *PRESET*, *OUT* **PRST-VID?** *PRESET*, *	**PRST-VID** *PRESET*, *IN*>*OUT* **PRST-VID** *PRESET*, *IN*>*1*, *IN*>*2*,…
Read audio connections from saved preset	**PRST-AUD?** *PRESET* *OUT* **Short form: PAUD?** *PRESET* *OUT* **PRST-AUD?** *PRESET*, *	**PRST-AUD** *PRESET*: *IN*>*OUT* **PRST-AUD** *PRESET*: *IN*>*1*, *IN*>*2*,…
Read saved presets list	**PRST-LST?** **Short form: PLST?**	**PRST-LST** *PRESET*, *PRESET*, …
Parameters Description: **PRESET** = Preset number. **OUT** = Output in preset to show for, '*' for all.		

Examples:		
Store current Audio & Video connections to preset 5	#PRST-STR 5**CR**	~PRST-STR 5 OK**CRLF**

Examples:		
Recall Audio & Video connections from preset 3	#PRCL 3**CR**	~PRST-RCL 3 OK**CRLF**
Show source of video output 2 from preset 3	#PRST-VID? 3,2**CR**	~PRST-VID 3: 4>2 **CRLF**

Operation commands		
Command	**Syntax**	**Response**
Lock front panel	**LOCK-FP** *LOCK-MODE* **Short form: LCK** *LOCK-MODE*	**LOCK-FP** *LOCK-MODE* *RESULT*

Get front panel locking state	**LOCK-FP?**	**LOCK-FP** *LOCK-MODE*
Parameters Description:		

LOCK-MODE **=** Front panel locking state:
  "0" or "off" to unlock front panel buttons.
  "1" or "on" to lock front panel buttons.		

Restart device	**RESET**	**RESET OK**

Switch to protocol 2000*	**P2000**	**P2000 OK**
* Protocol 2000 has command to switch back to ASCII protocol (like protocol 3000)		

Audio parameters commands		
Command	**Syntax**	**Response**
Set audio level in specific amplifier stage.	**AUD-LVL** *STAGE*, *CHANNEL*, *VOLUME* **Short form: ADL** *STAGE*, *CHANNEL*, *VOLUME*	**AUD-LVL** *STAGE*, *CHANNEL*, *VOLUME* *RESULT*
Read audio volume level	**AUD-LVL?** *STAGE*, *CHANNEL* **Short form: ADL?** *STAGE*	**AUD-LVL** *STAGE*, *CHANNEL*, *VOLUME*

Mute audio	**MUTE** *MUTE-MODE*	**MUTE** *MUTE-MODE* *RESULT*

Parameters Description:

STAGE =
"In","Out"
or
Numeric value (present audio processing stage). For example: "0" for Input level, "1" for Pre-Amplifier, "2" for Amplifier (Out) etc.
 	
CHANNEL = Input or Output #
 	
VOLUME **=** Audio parameter in Kramer units, precede minus sign for nega ive values.
     ++ increase current value
     – decrease current value
MUTE MODE = 1 – Mute
          0 – Unmute

Machine info commands		
Command	**Syntax**	**Response**
* Time settings commands require admin authoriza ion		

Machine info commands		
Read in/outs count	**INFO-IO?**	**INFO-IO: IN** *INPUTS_COUNT*, **OUT** *OUTPUTS_COUNT*

Read max presets count	**INFO-PRST?**	**INFO-PRST: VID** *PRESET_VIDEO_COUNT*, **AUD** *PRESET_AUDIO_COUNT*

Reset configuration to factory default	**FACTORY**	**FACTORY** *RESULT*

Identification commands		
Command	**Syntax**	**Response**

Protocol Handshaking	#**CR**	~**OK CRLF**

Read device model	**MODEL?**	**MODEL** *MACHINE_MODEL*

Read device serial number	**SN?**	**SN** *SERIAL_NUMBER*

Read device firmware version	**VERSION?**	**VERSION** *MAJOR* .*MINOR* .*BUILD* .*REVISION*

Set machine name	**NAME** *MACHINE_NAME*	**NAME** *MACHINE_NAME RESULT*
Read machine name	**NAME?**	**NAME** *MACHINE_NAME*
Reset machine name to factory default*	**NAME-RST**	**NAME-RST** *MACHINE_FACTORY_NAME RESULT*

*Note: machine name not equal to model name. This name relevance for site viewer identification of specific machine or for network using (with DNS feature on).
MACHINE_NAME = Up to 14 Alfa-Numeric chars.
* **Machine factory name =** Model name + last 4 digits from serial number.

Set machine id number	**MACH-NUM** *MACHINE_NUMBER*	**MACH-NUM** *OLD_MACHINE_NUMBER* ,*NEW_MACHINE_NUMBER RESULT*

* Response will send after machine number has been changed. So the replay with header will be:
NEW_MACHINE_NUMBER @**MACH-NUM** *OLD_MACHINE_NUMBER NEW_MACHINE_NUMBER* **OK**

Network settings commands		
Set IP Address	**NET-IP** *IP_ADDRESS* **NTIP**	**NET-IP** *IP_ADDRESS RESULT*
Read IP Address	**NET-IP?** **NTIP**?	**NET-IP** *IP_ADDRESS*

Read MAC Address	**NET-MAC?** **NTMC**	**NET-MAC** *MAC_ADDRESS*

Set subnet mask	**NET-MASK** *SUBNET_MASK* **NTMSK**	**NET-MASK** *SUBNET_MASK RESULT*
Read subnet mask	**NET-MASK?** **NTMSK?**	**NET-MASK** *SUBNET_MASK*

Network settings commands		
Set gateway address	**NET-GATE** *GATEWAY_ADDRESS* **NTGT**	**NET-GATE** *GATEWAY_ADDRESS* *RESULT*
Read subnet mask	**NET-GATE?** **NTGT?**	**NET-GATE** *GATEWAY_ADDRESS*

Set DHCP mode	**NET-DHCP** *DHCP_MODE* **NTDH**	**NET-DHCP** *DHCP_MODE* *RESULT*
Read subnet mask	**NET-DHCP?** **NTDH?**	**NET-DHCP** *DHCP_MODE*
DHCP_MODE = 0 – Don't use DHCP (Use IP set by factory or IP set command). 1 – Try to use DHCP, if unavailable use IP as above.		

Change protocol Ethernet port	**ETH-PORT** *PROTOCOL* , *PORT* **ETHP**	**ETH-PORT** *PROTOCOL* ,*PORT* *RESULT*
Read protocol Ethernet port	**ETH-PORT?** *PROTOCOL* **ETHP?**	**ETH-PORT** *PROTOCOL* , *PORT*
PROTOCOL = TCP / UDP (transport layer protocol) *PORT* = E hernet port to enter protocol 3000 commands 1-65535 = User defined port 0 - reset port to factory default (50000 for UDP, 5000 for TCP)		

Advanced switching commands		
Command	Syntax	Response
Set audio follow video mode	**AFV** *AFV-MODE*	**AFV** *AFV-MODE* *RESULT*
Note: This command effect device front-panel mode and AUD\VID command		
Read audio follow video mode	**AFV?**	**AFV** *AFV-MODE*

AFV-MODE = Front panel AFV mode
   "0" or "afv" to set front panel switching buttons in audio-follow-video state
   "1" or "brk" to set front panel switching buttons in their previous state when audio	

14.3 Kramer Protocol 2000

This RS-232/RS-485/Ethernet communication protocol (Version 0.51) uses four bytes of information as defined below. For serial communication parameters, see Section 11.1.

Table 18: Protocol Definitions

MSB							LSB
	DESTINATION	INSTRUCTION					
	D	N5	N4	N3	N2	N1	0
	6	5	4	3	2	1	

1st byte

	INPUT						
	6	I5	I4	I3	I2	I1	0
	6	5	4	3	2	1	

2nd byte

	OUTPUT						
	O6	O5	O4	O3	O2	O1	0
	6	5	4	3	2	1	

3rd byte

		MACHINE NUMBER					
	OVR	X	M4	M3	M2	M1	0
	6	5	4	3	2	1	

4th byte

1st BYTE: Bit 7 – Defined as 0

D – "DESTINATION":   0 - for sending information to the switchers (from the PC);

1 - for sending to the PC (from the switcher)

N5   N0 – "INSTRUCTION"

The function that is to be performed by the switcher(s) is defined by the INSTRUCTION (6 bits) Similarly, if a function is performed via the machine's keyboard, then these bits are set with the INSTRUCTION NO , which was performed The instruction codes are defined according to the table below (INSTRUCTION NO is the value to be set for N5   N0)

2nd BYTE: Bit 7 – Defined as 1

I6   I0 – "INPUT"

When switching (ie instruction codes 1 and 2), the INPUT (7 bits) is set as the input number which is to be switched Similarly, if switching is done via the machine's front-panel, then these bits are set with the INPUT NUMBER which was switched For other operations, these bits are defined according to the table

3rd BYTE: Bit 7 – Defined as 1

O6   O0 – "OUTPUT"

When switching (ie instruction codes 1 and 2), the OUTPUT (7 bits) is set as the output number which is to be switched Similarly, if switching is done via the machine's front-panel, then these bits are set with the OUTPUT NUMBER which was switched For other operations, these bits are defined according to the table

4th BYTE: Bit 7 – Defined as 1

Bit 5 – Don't care

OVR – Machine number override

M4   M0 – MACHINE NUMBER

Used to address machines in a system via their <u>machine numbers</u> When several machines are controlled from a single serial port, they are usually configured together with each machine having an individual machine number If the OVR bit is set, then all machine numbers will accept (implement) the command, and the addressed machine will reply

For a single machine controlled via the serial port, always set M4   M0 = 1, and make sure that the machine itself is configured as MACHINE NUMBER = 1

Table 19: Instruction Codes for Protocol 2000

Note: All values in the table are decimal, unless otherwise stated

INSTRUCTION		DEFINITION FOR SPECIFIC INSTRUCTION		NOTE
#	DESCRIPTION	INPUT	OUTPUT	
0	RESET VIDEO	0	0	1
1	SWITCH VIDEO	Set equal to video input which is to be switched (0 = disconnect)	Set equal to video output which is to be switched (0 = to all the outputs)	2
2	SWITCH AUDIO	Set equal to audio input which is to be switched (0 = disconnect)	Set equal to audio output which is to be switched (0 = to all the outputs)	2
3	STORE V DEO STATUS	Set as SETUP #	0 - to store 1 - to delete	2, 3
4	RECALL VIDEO STATUS	Set as SETUP #	0	2, 3
5	REQUEST STATUS OF A VIDEO OUTPUT	Set as SETUP #	Equal to output number whose status is required	4, 3
6	REQUEST STATUS OF AN AUDIO OUTPUT	Set as SETUP #	Equal to output number whose status is required	4, 3
8	BREAKAWAY SETT NG	0	0 - audio-follow-video 1 - audio breakaway	2
11	REQUEST BREAKAWAY SETT NG	Set as SETUP #	0 - Request audio breakaway setting	3, 4, 6
15	REQUEST WHETHER SETUP IS DEF NED / VALID INPUT IS DETECTED	SETUP # or Input #	0 - for checking if setup is defined 1 - for checking if input is valid	8
16	ERROR / BUSY	For invalid / valid input (i.e. OUTPUT byte = 4 or OUTPUT byte = 5), this byte is set as the input #	0 - error 1 - invalid instruction 2 - out of range 3 - machine busy 4 - invalid input 5 - valid input 6 - RX buffer overflow	9, 25
22	SET AUDIO PARAMETER	Equal to input / output number whose parameter is to be set (0 = all)	Set as parameter value	2, 24
24	NCREASE / DECREASE AUDIO PARAMETER	Equal to input / output number whose parameter is to be increased / decreased (0 = all)	0 - increase output 1 - decrease output	2
25	REQUEST AUDIO PARAMETER	Equal to input / output number whose parameter is requested	0	6, 24
30	LOCK FRONT PANEL	0 - Panel unlocked 1 - Panel locked	0	2
31	REQUEST WHETHER PANEL IS LOCKED	0	0	16
42	AUDIO PARAMETER SETT NGS FOR INSTRUCTIONS 22, 24, 25	INPUT Bit: I0 - 0=input; 1=output I1 - Left I2 - Right	0 - Gain 1 - Bass 2 - Treble 3 - Midrange 4 - Mix On	24
56	CHANGE TO ASCII	0	Kramer protocol 3000	19

	INSTRUCTION	DEFINITION FOR SPECIFIC INSTRUCTION		NOTE
#	DESCRIPTION	INPUT	OUTPUT	
61	DENT FY MACHINE	1 - video machine name 2 - audio machine name 3 - video software version 4 - audio software version	0 - Request first 4 digits 1 - Request first suffix 2 - Request second suffix 3 - Request third suffix 10 - Request first prefix 11 - Request second prefix 12 - Request third prefix	13
62	DEF NE MACH NE	1 - number of inputs 2 - number of outputs 3 - number of setups	1 - for video 2 - for audio	14

NOTES on the above table:

NOTE 1 - When the master switcher is reset, (e g when it is turned on), the reset code is sent to the PC If this code is sent to the switchers, it will reset according to the present power-down settings

NOTE 2 - These are bi-directional definitions That is, if the switcher receives the code, it will perform the instruction; and if the instruction is performed (due to a keystroke operation on the front panel), then these codes are sent For example, if the HEX code

01	85	88	83

was sent from the PC, then the switcher (machine 3) will switch input 5 to output 8 If the user switched input 1 to output 7 via the front panel keypad, then the switcher will send HEX codes:

41	81	87	83

to the PC

When the PC sends one of the commands in this group to the switcher, then, if the instruction is valid, the switcher replies by sending to the PC the same four bytes that it was sent (except for the first byte, where the DESTINATION bit is set high)

NOTE 3 - SETUP # 0 is the present setting SETUP # 1 and higher are the settings saved in the switcher's memory, (i e those used for Store and Recall)

NOTE 4 - The reply to a "REQUEST" instruction is as follows: the same instruction and INPUT codes as were sent are returned, and the OUTPUT is assigned the value of the requested parameter The replies to instructions 10 and 11 are as per the definitions in instructions 7 and 8 respectively For example, if the present status of machine number 5 is breakaway setting, then the reply to the HEX code

0B	80	80	85

would be HEX codes

4B	80	81	85

NOTE 6 – If INPUT is set to 127 for these instructions, then, if the function is defined on this machine, it replies with OUTPUT=1 If the function is not defined, then the machine replies with OUTPUT=0, or with an error (invalid instruction code)

If the INPUT is set to 126 for these instructions, then, if possible, the machine will return the current setting of this function, even for the case that the function is not defined For example, for a video switcher which always switches during the VIS of input #1, (and its VIS setting cannot be programmed otherwise), the reply to the HEX code

0A	FE	80	81 (ie request VIS setting, with INPUT set as 126dec)

would be HEX codes

4A	FE	81	81 (ie VIS setting = 1, which is defined as VIS from input #1)

NOTE 8 - The reply is as in TYPE 3 above, except that here the OUTPUT is assigned with the value 0 if the setup is not defined / no valid input is detected; or 1 if it is defined / valid input is detected

NOTE 9 - An error code is returned to the PC if an invalid instruction code was sent to the switcher, or if a parameter associated with the instruction is out of range (e g trying to save to a setup greater than the highest one, or trying to switch an input or output greater than the highest one defined) This code is also returned to the PC if an RS-232 instruction is sent while the machine is being programmed via the front panel Reception of this code by the switcher is not valid

NOTE 10 – This code is reserved for internal use

NOTE 13 - This is a request to identify the switcher/s in the system If the OUTPUT is set as 0, and the INPUT is set as 1, 2, 5 or 7, the machine will send its name The reply is the decimal value of the INPUT and OUTPUT For example, for a 2216, the reply to the request to send the audio machine name would be (HEX codes):

7D	96	90	81 (i e 128dec+ 22dec for 2nd byte, and 128dec+ 16dec for 3rd byte)

If the request for identification is sent with the INPUT set as 3 or 4, the appropriate machine will send its software version number Again, the reply would be the decimal value of the INPUT and OUTPUT - the INPUT representing the number in front of the decimal point, and the OUTPUT representing the number after it For example, for version 3 5, the reply to the request to send the version number would be (HEX codes):

7D	83	85	81 (i e 128dec+ 3dec for 2nd byte, 128dec+ 5dec for 3rd byte)

If the OUTPUT is set as 1, then the ASCII coding of the lettering following the machine's name is sent For example, for the VS-7588YC, the reply to the request to send the first suffix would be (HEX codes):

7D	D9	C3	81 (i e 128dec+ ASCII for "Y"; 128dec+ ASCII for "C")

NOTE 14 - The number of inputs and outputs refers to the specific machine which is being addressed, not to the system For example, if six 16X16 matrices are configured to make a 48X32 system (48 inputs, 32 outputs), the reply to the HEX code

3E	82	81	82 (ie request the number of outputs)

would be HEX codes

7E	82	90	82

ie 16 outputs

NOTE 16 - The reply to the "REQUEST WHETHER PANEL IS LOCKED" is as in NOTE 4 above, except that here the OUTPUT is assigned with the value 0 if the panel is unlocked, or 1 if it is locked

NOTE 19 – After this instruction is sent, the unit will respond to the ASCII command set defined by the OUTPUT byte The ASCII command to operate with the HEX command set must be sent in order to return to working with HEX codes

NOTE 24 – Further information needed in instructions 21, 22, 25 and 26 is sent using instruction 42 – which is sent prior to the instruction For example, to request the audio gain value of right input # 9, send hex codes

2A	84	80	81

and then send HEX codes

19	89	81	81

To set MIX mode, send hex codes

2A	81	84	81

and then send HEX codes

16

NOTE 25 – For units which detect the validity of the video inputs, Instruction 16 will be sent whenever the unit detects a change in the state of an input (in real-time)

For example, if input 3 is detected as invalid, the unit will send the HEX codes

10	83	84	81

If input 7 is detected as valid, then the unit will send HEX codes

10	87	85	81

LIMITED WARRANTY

We warrant this product free from defects in material and workmanship under the following terms.

HOW LONG IS THE WARRANTY

Labor and parts are warranted for seven years from the date of the first customer purchase.

WHO IS PROTECTED?

Only the first purchase customer may enforce this warranty.

WHAT IS COVERED AND WHAT IS NOT COVERED

Except as below, this warranty covers all defects in material or workmanship in this product. The following are not covered by the warranty:

1. Any product which is not distributed by us or which is not purchased from an authorized Kramer dealer. If you are uncertain as to whether a dealer is authorized, please contact Kramer at one of the agents listed in the Web site www.kramerelectronics.com.

2. Any product, on which the serial number has been defaced, modified or removed, or on which the WARRANTY VO D F TAMPERED sticker has been torn, reattached, removed or otherwise interfered with.

3. Damage, deterioration or malfunction resulting from:
   i) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature
   ii) Product modification, or failure to follow instructions supplied with the product
   iii) Repair or attempted repair by anyone not authorized by Kramer
   iv) Any shipment of the product (claims must be presented to the carrier)
   v) Removal or installation of the product
   vi) Any other cause, which does not relate to a product defect
   vii) Cartons, equipment enclosures, cables or accessories used in conjunction with the product

WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR

We will pay labor and material expenses for covered items. We will not pay for the following:

1. Removal or installations charges.

2. Costs of initial technical adjustments (set-up), including adjustment of user controls or programming. These costs are the responsibility of the Kramer dealer from whom the product was purchased.

3. Shipping charges.

HOW YOU CAN GET WARRANTY SERVICE

1. To obtain service on you product, you must take or ship it prepaid to any authorized Kramer service center.

2. Whenever warranty service is required, the original dated invoice (or a copy) must be presented as proof of warranty coverage, and should be included in any shipment of the product. Please also include in any mailing a contact name, company, address, and a description of the problem(s).

3. For the name of the nearest Kramer authorized service center, consult your authorized dealer.

LIMITATION OF IMPLIED WARRANTIES

All implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this warranty.

EXCLUSION OF DAMAGES

The liability of Kramer for any effective products is limited to the repair or replacement of the product at our option. Kramer shall not be liable for:

1. Damage to other property caused by defects in this product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss; or:

2. Any other damages, whether incidental, consequential or otherwise. Some countries may not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights, which vary from place to place.

NOTE: All products returned to Kramer for service must have prior approval. This may be obtained from your dealer.

This equipment has been tested to determine compliance with the requirements of:

EN-50081:   "Electromagnetic compatibility (EMC);
              generic emission standard.
              Part 1: Residential, commercial and light industry"
EN-50082:   "Electromagnetic compatibility (EMC) generic immunity standard.
              Part 1: Residential, commercial and light industry environment".
CFR-47:   FCC* Rules and Regulations:
              Part 15: "Radio frequency devices
              Subpart B Unintentional radiators"

CAUTION!

◗ Servicing the machines can only be done by an authorized Kramer technician. Any user who makes changes or modifications to the unit without the expressed approval of the manufacturer will void user authority to operate the equipment.

◗ Use the supplied DC power supply to feed power to the machine.

◗ Please use recommended interconnection cables to connect the machine to other components.

   * FCC and CE approved using STP cable (for twisted pair products)

**For the latest information on our products and a list of
Kramer distributors, visit** www.kramerelectronics.com
**where updates to this user manual may be found.
We welcome your questions, comments and feedback.**

⚠ **Caution**	**Safety Warning**: Disconnect the unit from the power supply before opening/servicing.