Kramer Electronics, Ltd.

USER MANUAL

Model:

VP-4x8

4x8 VGA / UXGA Matrix Switcher

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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.

Thank you for purchasing the Kramer **VP-4x8** *4x8 VGA / UXGA Matrix Switcher,* which is ideal for:

- Any professional display system requiring a true 4x8 computer graphics matrix operation
- Multimedia and presentation source, and acceptor selection

Each package includes the following items:

- The **VP-4x8** *4x8 VGA / UXGA Matrix Switcher*
- Windows®-based Kramer control software[2]
- Windows®-based Configuration Manager XPort software and Com Port Redirector
- Kramer **RC-IR2** Infrared Remote Control Transmitter (including the required battery and a separate user manual[3])
- Power cord, null-modem adapter and this user manual[3]

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[4]

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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: Twisted-Pair Solutions; 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 Downloadable from our Web site at http://www.kramerelectronics.com

3 Download up-to-date Kramer user manuals from our Web site at http://www.kramerelectronics.com

4 The complete list of Kramer cables is on our Web site at http://www.kramerelectronics.com

2.1 Quick Start

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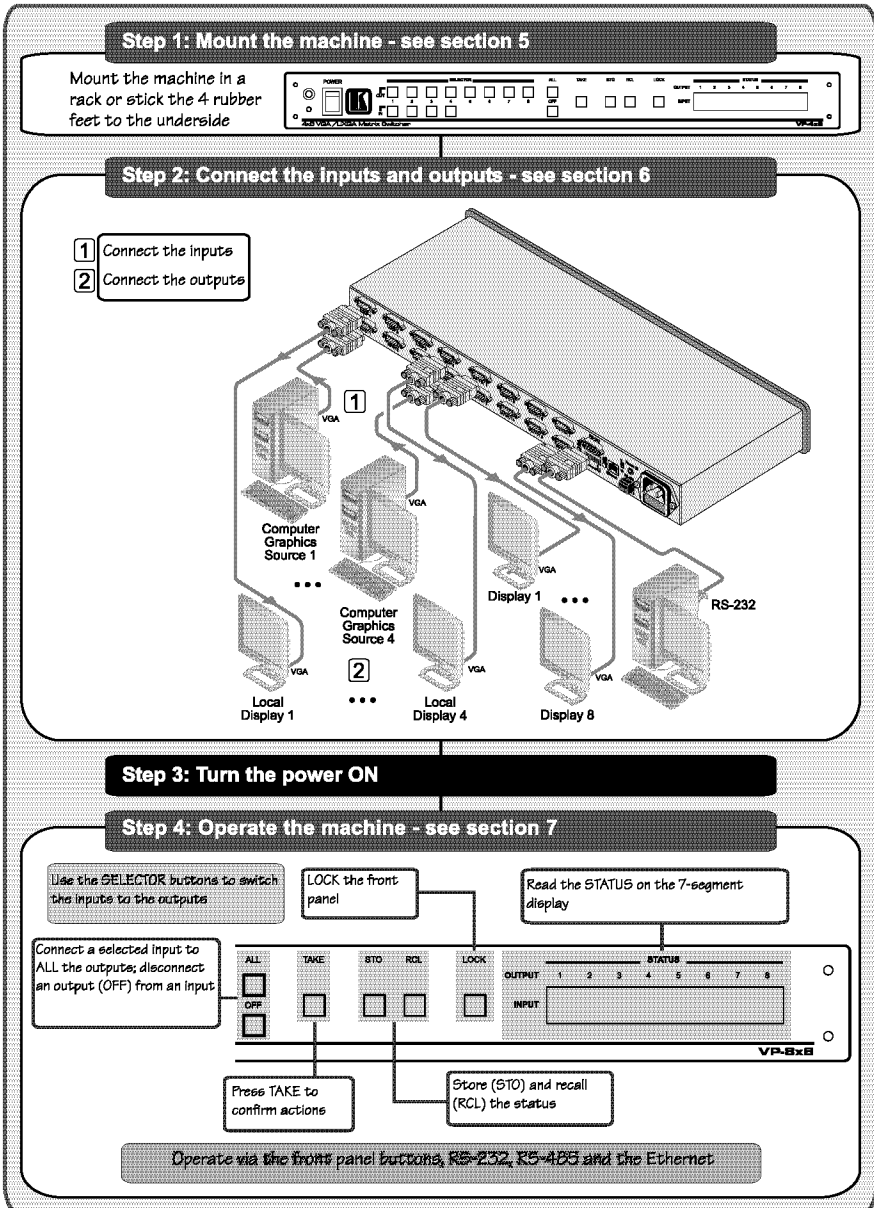
3   Overview

The **VP-4x8** is a high-performance, high-resolution computer graphics video switcher. The **VP-4x8** lets you simultaneously route any or all of the four inputs to any or all of the eight outputs and to loop each input to an additional output.

The **VP-4x8** *4x8 VGA / UXGA Matrix Switcher* features:

- Video bandwidth of 400MHz that ensures transparent performance even in the most critical applications
- 12 preset memory locations for quick access to common configurations
- Delayed switching mode (ranging from 0 to 3.5 sec[1]) for clean transitions (seamless switching) when switching between non-genlocked sources
- DC coupled inputs and outputs
- Kr-isp™ advanced sync processing technology, which provides a sharp, stable image when the sync level is too low, by restoring the sync signal waveform
- A TAKE button that allows you to place multiple switches in a queue and then activate them simultaneously with one touch of this button
- A LOCK button to prevent tampering with the front panel
- Automatic detection of connected input signals (respective button illuminates)

Control the **VP-4x8** using the front panel buttons, or remotely via:

- RS-485 or RS-232 serial commands transmitted by a PC, touch screen system, or other serial controller
- The Kramer Infrared remote control transmitter
- Ethernet
- An external remote IR receiver (optional)

The **VP-4x8** is a dependable and rugged unit that fits into one vertical space (1U) of a standard 19-inch professional rack[2].

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1 In increments of 0.5sec

2 The RGBHV signals are connected on 15-pin HD pin connectors to reduce enclosure size

To achieve the best performance:

- Use only good 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-4x8** away from moisture, excessive sunlight and dust

4 Your **VP-4x8** 4x8 VGA / UXGA Matrix Switcher

Figure 1, *Table 1* and *Table 2* define the **VP-4x8** *4x8 VGA / UXGA Matrix Switcher.*

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

Figure 1: VP-4x8 4x8 VGA / UXGA Matrix Switcher– Front and Rear View

Table 1: Front Panel VP-4x8 4x8 VGA / UXGA Matrix Switcher Features

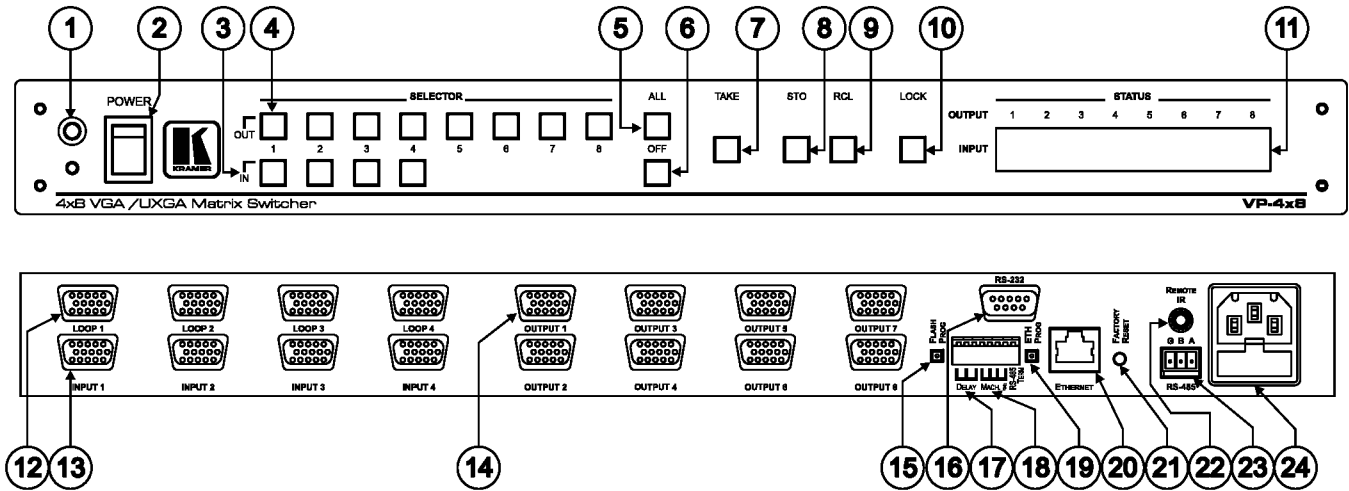| #	Feature	Function
1	IR Receiver	The red LED is illuminated when receiving signals from the Infrared remote control transmitter
2	*POWER* Switch	Illuminated switch for turning the unit ON or OFF
3	*IN SELECTOR* Buttons	Select the input to switch to the output. When a signal is detected, the input button illuminates in green
4	*OUT SELECTOR* Buttons	Select the output to which the input is switched
5	*ALL* Button	Pressing *ALL* followed by an *INPUT* button, connects that input to all outputs[1]
6	*OFF* Button	Press an *OUT* SELECTOR button and then an *OFF* button to disconnect that output from the inputs. Press the *ALL* button and then the *OFF* button to disconnect all the outputs
7	*TAKE* Button	Pressing *TAKE* toggles the mode between the Confirm mode[2] and the At Once mode (user confirmation per action is unnecessary)
8	*STO* (Store) Button	Pressing *STO* followed by an input/output button stores the current setting[3]
9	*RCL* (*Recall*) Button	Pressing the *RCL* button and the corresponding *IN/OUT* button recalls a setup from the non-volatile memory. The stored status blinks. Pressing a different *IN/OUT* button lets you view[4] another setup. After making your choice, pressing the *RCL* button again implements the new status
10	*LOCK* Button	Disengages the front panel switches
11	*STATUS 7-segment Display*	Displays the selected input switched to the output (marked above each input)[5]

Table 2: Rear Panel VP-4x8 4x8 VGA / UXGA Matrix Switcher Features

#	Feature	Function
12	*LOOP* 15-pin HD (F) Connectors	Connect looped input to output acceptor (1 to 4)
13	*INPUT* 15-pin HD (F) Connectors	Connect to the video sources (from 1 to 4)
14	*OUTPUT* 15-pin HD (F) Connectors	Connect to the output acceptor (from 1 to 8)
15	*FLASH PROG* Button	Push in for "Program" to upgrade to the latest Kramer firmware (see section 9.1), or release for Normal (the factory default)[6]
16	*RS-232* 9-pin D-sub (F) Port	Connects to the PC or the Remote Controller
17	*DELAY* Dipswitches	Dipswitches for setup of the unit (*DELAY* dips 1, 2, 3 are for setting the delay time)
18	*SETUP*, and *RS-485 TERM* Dipswitches	Dipswitches for setup of the unit (*SETUP* dips 1, 2, 3, 4 are for setting machine #; 8 is for RS-485 Termination)
19	*ETH PROG* Button	Push in to upgrade ETH firmware, release for normal operation

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

2 When in the Confirm mode, the TAKE button illuminates

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

4 Only view, nothing is implemented at this stage

5 Also displays the number of IN and OUT ports, the firmware version number, and the MACHINE #. Refer to section 7.1

6 The FLASH PROG "Reset" button is located on the underside of the unit

#	Feature	Function
20	*ETHERNET* RJ-45 Connector	Connects to the PC or other Serial Controller through computer networking
21	ETH Factory Reset Button	Press to reset to factory default definitions[1]: IP number – 192.168.1.39 Mask – 255.255.255.0 Gateway – 192.168.1.1
22	*REMOTE IR* 3.5mm Mini Jack	Connect to an external IR receiver unit for controlling the machine via an IR remote controller (instead of using the front panel IR receiver)[2]
23	*RS-485* Terminal Block Port	Pin G is for Ground connection; Pins B (-) and A (+) are for RS-485
24	Power Connector with Fuse	AC connector enabling power supply to the unit

Figure 2 illustrates the underside of the **VP-4x8** unit, and *Table 3* defines the underside features.

RESET FOR
PROGRAM

Figure 2: VP-4x8 Underside View

Table 3: VP-4x8 Underside Panel Features

Feature	Function
RESET FOR PROGRAM Button	Press to reset unit prior to firmware upgrade (see section 9.1.3)

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1 First disconnect the power cord and then connect it again while pressing the ETH Factory Reset button. The unit will power up and load its memory with the factory default definitions

2 Optional. Can be used instead of the front panel (built-in) IR receiver to remotely control the machine (only if the internal IR connection cable has been installed)

4.1 Using the IR Transmitter

You can use the **RC-IR2** IR transmitter to control the machine via the built-in IR receiver on the front panel or, instead, via an optional external IR receiver[1]. The external IR receiver can be located 15 meters away from the machine. This distance can be extended to up to 60 meters when used with three extension cables[2].

Before using the external IR receiver, be sure to arrange for your Kramer dealer to insert an internal IR connection cable[3], which is required so that the REMOTE IR 3.5mm connector can be used. Connect the external IR receiver to the REMOTE IR 3.5mm connector.

Control the matrix switcher using the front panel buttons, or remotely via the Kramer **RC-IR2** Infrared Remote Control Transmitter, via an external remote IR receiver (optional), or via RS-485 or RS-232 serial commands transmitted by a touch screen system, PC, or other serial controller.

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1 P/N: C-A35M/IRR-50

2 P/N: C-A35M/A35F-50

3 P/N: 505-70434010-S

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5 Installing the VP-4x8 in a Rack

This section describes how to install the **VP-4x8** in a rack.

Before Installing on a Rack

Before installing on a rack, be sure that the environment is within the recommended range:

Operating temperature range	+5º to +45º C (41º to 113º F)
Operating humidity range	10 to 90% RHL, non-condensing
Storage temperature range	-20º to +70º C (-4º to 158º F)
Storage humidity range	5 to 95% RHL, non-condensing

⚠ CAUTION!!

When installing on a 19" rack, avoid hazards by taking care that:

1. It is located within the recommended environmental conditions, as the operating ambient temperature of a closed or multi unit rack assembly may exceed the room ambient temperature.
2. Once rack mounted, enough air will still flow around the machine.
3. The machine is placed straight in the correct horizontal position.
4. You do not overload the circuit(s). When connecting the machine to the supply circuit, overloading the circuits might have a detrimental effect on overcurrent protection and supply wiring. Refer to the appropriate nameplate ratings for information. For example, for fuse replacement, see the value printed on the product label.
5. The machine is earthed (grounded) in a reliable way and is connected only to an electricity socket with grounding. Pay particular attention to situations where electricity is supplied indirectly (when the power cord is not plugged directly into the socket in the wall), for example, when using an extension cable or a power strip, and that you use only the power cord that is supplied with the machine.

How to Rack Mount

To rack-mount a machine:

1. Attach both ear brackets to the machine. To do so, remove the screws from each side of the machine (3 on each side), and replace those screws through the ear brackets.
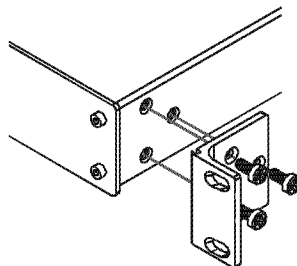
2. Place the ears of the machine against the rack rails, and insert the proper screws (not provided) through each of the four holes in the rack ears.

Note that:

- **In some models, the front panel may feature built-in rack ears**
- Detachable rack ears can be removed for desktop use
- Always mount the machine in the rack before you attach any cables or connect the machine to the power
- If you are using a Kramer rack adapter kit (for a machine that is not 19"), see the Rack Adapters user manual for installation instructions (you can download it at: http://www.kramerelectronics.com)

6 Connecting the VP-4x8 4x8 VGA / UXGA Matrix Switcher

This section describes how to:

- Connect the **VP-4x8** rear panel (see section 6.1)
- Connect the **VP-4x8** to a controlling device via RS-232 (see section 6.2), RS-485 (see section 6.3) and/or the Ethernet (see section 6.4)
- Set the dipswitches (see section 6.5)
- Connect several **VP-4x8** machines (see section 6.6)

6.1 Connecting the VP-4x8 Rear Panel

To connect the **VP-4x8** as shown in *Figure 3*, do the following[1]:

1. Connect up to 4 VGA/UXGA computer graphics sources to the INPUT connectors[2].

2. Connect up to 4 VGA/UXGA output acceptors to the LOOP connectors (local displays or inputs to another cascaded unit).

3. Connect[3] up to 8 output connectors to the VGA/UXGA video acceptors[4].

4. Set the dipswitches (see section 6.4).

5. Connect a PC and/or controller (if required) to the RS-232 port (see section 6.2) and/or RS-485 port (see section 6.3).

6. Connect the power cord[5] (not shown in *Figure 3*).

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1 Switch OFF the power on each device before connecting it to your VP-4x8. After connecting your VP-4x8, switch on its power and then switch on the power on each device. DO NOT push in the rear panel Flash Program "Program" button (item 9 in *Table 2*) and DO NOT push in the underside Flash Program "Reset" button. These are only used for upgrading to the latest Kramer firmware (see section 9)

2 Not all inputs need to be connected

3 When less than eight outputs are required, connect only those outputs of the VP-4x8 that are required, and leave the other outputs unconnected

4 Displays or projectors. Not all outputs need to be connected

5 We recommend that you use only the power cord that is supplied with this machine

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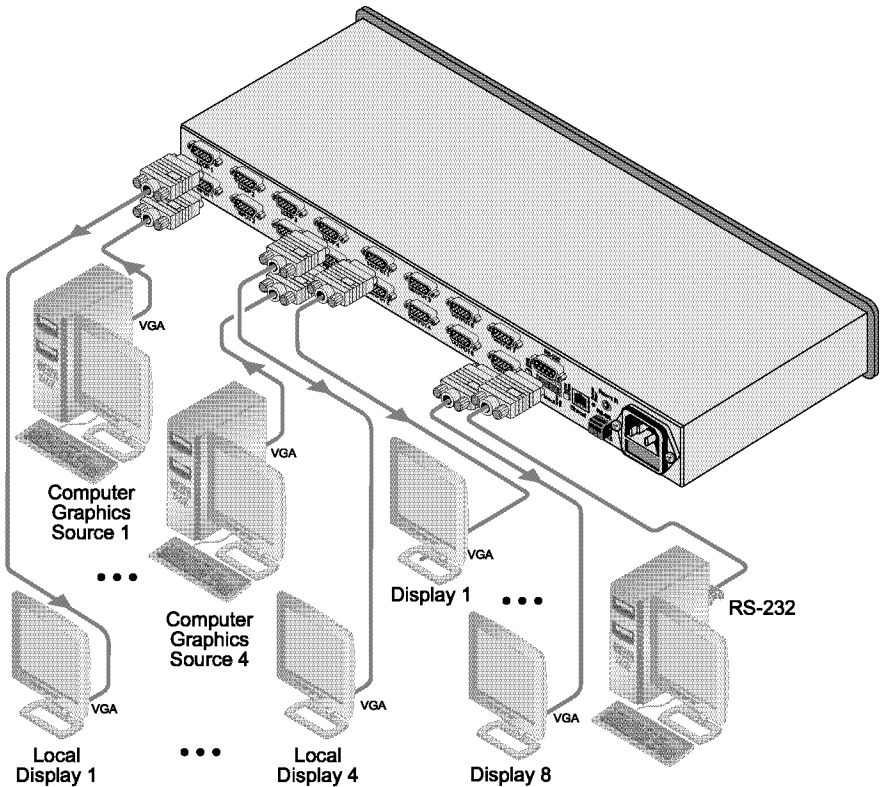
Figure 3: Connecting the VP-4x8 4x8 VGA / UXGA Matrix Switcher

6.2 Controlling via RS-232 (for example, using a PC)

To connect a PC to the **VP-4x8** unit, using the null-modem adapter provided *with* the machine (recommended):

- Connect the null-modem adapter to the RS-232 9-pin D-sub port on the rear panel of the Master **VP-4x8**. Connect the null-modem adapter to the RS-232 9-pin D-sub port on your PC with a 9-wire flat cable

To connect a PC to the **VP-4x8** unit, *without* using a null-modem adapter:

- Connect the RS-232 9-pin D-sub port on your PC to the RS-232 9-pin D-sub rear panel port on the Master **VP-4x8** unit, as *Figure 4* illustrates (depending on whether the PC has a 9-pin or 25-pin connector)
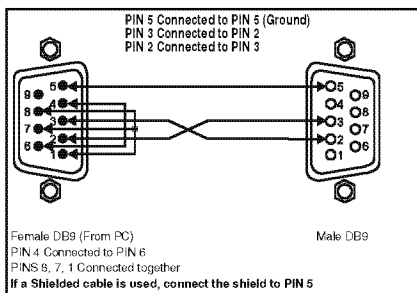
Figure 4: Connecting a PC without using a Null-modem Adapter

6.3 Controlling via RS-485

You can control a **VP-4x8** unit via an RS-485 controller, for example, a PC (equipped with an RS-485 interface) or a Master Programmable Remote Control system such as the Kramer **RC-3000**[1].

To connect an **RC-3000** to a **VP-4x8** unit (see *Figure 5*):

1. Connect the RS-485 terminal block port on the **RC-3000** to the RS-485 port on the **VP-4x8** unit, as follows:

   ▪ Connect the "A" (+) PIN on the RS-485 rear panel port of the RC-3000 to the "A" (+) PIN on the RS-485 rear panel port of the VP-4x8 unit

   ▪ Connect the "B" (-) PIN on the RS-485 rear panel port of the RC-3000 to the "B" (-) PIN on the RS-485 rear panel port of the VP-4x8 unit

   ▪ If shielded twisted pair cable is used, the shield may be connected to the "G" (Ground) PIN on one of the units (for example, on the RC-3000)

2. Set the **VP-4x8** unit as Machine # 1, according to *Table 6* (that is, DIP 1, DIP 2, DIP 3, and DIP 4 OFF), and set the other dipswitches on the **VP-4x8** unit, as follows:

   ▪ Set DIP 5, DIP 6, and DIP 7 OFF

   ▪ Set DIP 8 ON (for RS-485 Line Termination with 120Ω)

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1 Previously known as the VS-3000
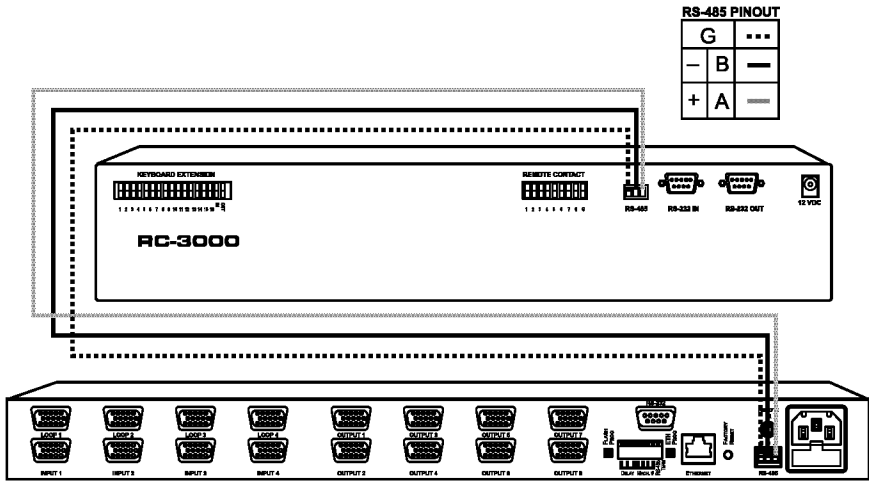
Figure 5: Controlling via RS-485 (for example, using an RC-3000)

6.4 Control Configuration via the Ethernet Port

You can connect the **VP-4x8** via the Ethernet, using a crossover cable (see section 6.4.1) for direct connection to the PC or a straight through cable (see section 6.4.2) for connection via a network hub or network router[1].

6.4.1 Connecting the ETHERNET Port directly to a PC (Crossover Cable)

You can connect the Ethernet port of the **VP-4x8** 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-4x8** during the initial configuration

After connecting the Ethernet port, configure your PC as follows:

1. Right-click the My Network Places icon on your desktop.

2. Select **Properties**.

3. Right-click Local Area Connection Properties.

---

1 After connecting the Ethernet port, you have to install and configure your Ethernet Port and also install the COM Port Redirector. For detailed instructions, see the "Ethernet Configuration (Lantronix) guide.pdf" file in the technical support section on our Web site: http://www.kramerelectronics.com

4. Select **Properties**.
   The Local Area Connection Properties window appears.

5. Select the Internet Protocol (TCP/IP) and click the **Properties** Button (see Figure 6).
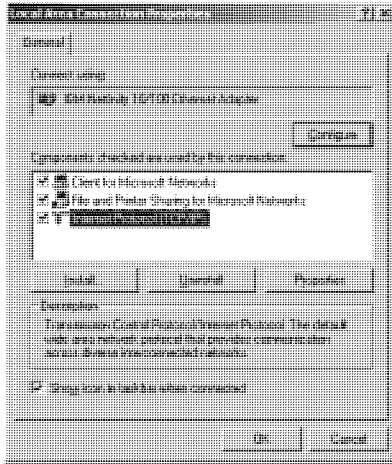
Figure 6: Local Area Connection Properties Window

6. Select Use the following IP Address, and fill in the details as shown in Figure 7.

7. Click **OK**.
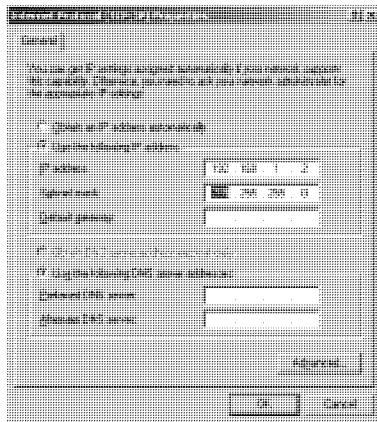
Figure 7: Internet Protocol (TCP/IP) Properties Window

6.4.2 Connecting the ETHERNET Port via a Network Hub (Straight-Through Cable)

You can connect the Ethernet port of the **VP-4x8** to the Ethernet port on a network hub or network router, via a straight-through cable with RJ-45 connectors.

6.4.3 Control Configuration via the Ethernet Port

To control several units via the Ethernet, connect the Master unit (MACH NO. 1) via the Ethernet port to the LAN port of your PC. Use your PC initially to configure the settings (see section 6.4).

6.5 Setting the Dipswitches

By default, all dipswitches are set to OFF. *Figure 8* illustrates the **VP-4x8** dipswitches:
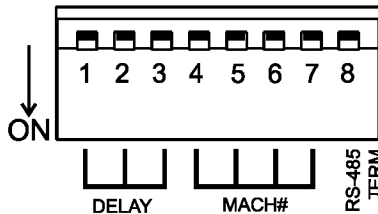
Figure 8: VP-4x8 Dipswitches

Table 4: Dipswitch Settings

DIPS	Function	Description
1, 2, 3	DELAY	Determines switching delay time
4, 5, 6, 7	Machine #	Determines the number of the machine in the sequence
8	RS-485 TERM	ON for RS-485 line termination with 120Ω; OFF for no RS-485 line termination

6.5.1 Setting the Delay

You can achieve clean transitions when switching between non-genlocked sources by setting the delay time—ranging from 0sec to 3.5sec[1]—via the DELAY dipswitches, as Table 5 defines. The **VP-4x8** unit is shipped (its factory default state) with no delay, that is, the DELAY dipswitches are set up for a 0 sec delay.

---

1 In increments of 0.5sec

Table 5: DELAY Dipswitch Settings

sec	DIP 1	DIP 2	DIP 3
0	OFF	OFF	OFF
0.5	OFF	OFF	ON
1.0	OFF	ON	OFF
1.5	OFF	ON	ON
2.0	ON	OFF	OFF
2.5	ON	OFF	ON
3.0	ON	ON	OFF
3.5	ON	ON	ON

6.5.2 Setting the Machine # Dipswitches

The Machine # determines the address of a **VP-4x8** unit, specifying which **VP-4x8** unit is being controlled when several **VP-4x8** units are connected to a PC or serial controller. Set the Machine # on a **VP-4x8** unit via MACH# DIPS 4, 5, 6 and 7, according to *Table 6*.

When using a standalone **VP-4x8** unit, set the Machine # to 1. When connecting more than one **VP-4x8** unit, set the first machine (the Master) that is closest to the PC, as Machine # 1 (dipswitches are set to OFF).

Table 6: Machine # Dipswitch Settings

Mach. #	DIP 4	DIP 5	DIP 6	DIP 7	Mach. #	DIP 4	DIP 5	DIP 6	DIP 7
1	OFF	OFF	OFF	OFF	9	ON	OFF	OFF	OFF
2	OFF	OFF	OFF	ON	10	ON	OFF	OFF	ON
3	OFF	OFF	ON	OFF	11	ON	OFF	ON	OFF
4	OFF	OFF	ON	ON	12	ON	OFF	ON	ON
5	OFF	ON	OFF	OFF	13	ON	ON	OFF	OFF
6	OFF	ON	OFF	ON	14	ON	ON	OFF	ON
7	OFF	ON	ON	OFF	15	ON	ON	ON	OFF
8	OFF	ON	ON	ON	16	ON	ON	ON	ON

6.6 Cascading Machines

You can cascade up to 16 **VP-4x8** units with control from a PC or serial controller (see *Figure 9*).

To cascade up to 16 individual **VP-4x8** units via RS-485, do the following:

1. Connect the VGA/UXGA sources and acceptors, as section 6.1 describes.

2. Connect the RS-232 port[1] on the first **VP-4x8** unit to the PC using the null-modem adapter provided with the machine (recommended), as section 6.2 describes.

---

1 Alternatively, the RS-485 port could be used for PC control (instead of RS-232)

3. Connect the RS-485 terminal block port on the first unit to the RS-485 port on the second **VP-4x8** unit and so on, connecting all the RS-485 ports.

4. Set the dipswitches, as section 6.4 describes:

   ▪ Set the first **VP-4x8** unit as Machine # 1 and the following 15 **VP-4x8** units as Machine # 2 to Machine # 16, according to *Table 6*

   ▪ Set DIP 8 ON on the first and last **VP-4x8** units (terminating the RS-485 line at 120Ω). Set DIP 8 OFF on the other **VP-4x8** units

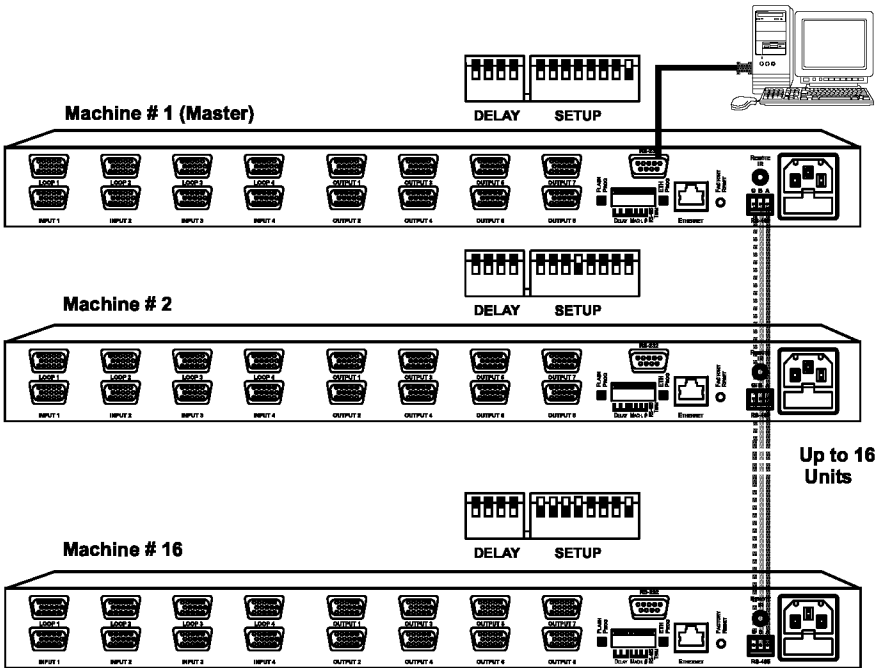   ▪ Set DIP 5, DIP 6 and DIP 7 OFF on all **VP-4x8** units

Figure 9: Control Configuration via RS-232 and RS-485

7 Operating the VP-4x8 4x8 VGA / UXGA Matrix Switcher
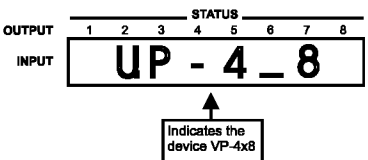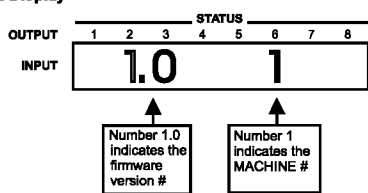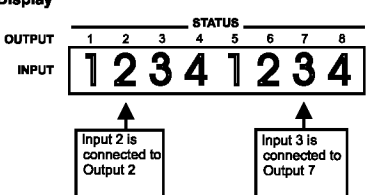
You can operate your **VP-4x8** via:

- The front panel buttons
- RS-232/RS-485 serial commands transmitted by a touch screen system, PC, or other serial controller
- The Kramer **RC-IR2** Infrared Remote Control Transmitter
- The Ethernet

7.1 Displaying Unit Characteristics

The STATUS 7-segment display shows three sets of information, as defined in *Table 7*:

Table 7: STATUS 7-segment Display

The STATUS Display	Shows:	When:
First Display OUTPUT 1 2 3 4 5 6 7 8 STATUS INPUT U P - 4 _ 8 Indicates the device VP-4x8	Device type: VP-4x8	Immediately (and automatically) after switching on the power
Second Display OUTPUT 1 2 3 4 5 6 7 8 STATUS INPUT 1.0 1 Number 1.0 indicates the firmware version # Number 1 indicates the MACHINE #	Unit characteristics: Firmware version Machine number	Immediately (and automatically) after switching on the power
Third Display OUTPUT 1 2 3 4 5 6 7 8 STATUS INPUT 1 2 3 4 1 2 3 4 Input 2 is connected to Output 2 Input 3 is connected to Output 7	Normal display: Inputs switched to the outputs	During normal operation, appears a few seconds after the first display[1]

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1 The "First Display" appears initially, followed a few seconds later by the "Second Display", then the "Third Display"

7.2   Confirming Settings

You can choose to work in the At Once or the Confirm mode.

In the At Once mode (the TAKE button is not illuminated):

- Pressing an OUT-IN combination implements the switch immediately
- You save time as execution is immediate and actions require no user confirmation
- No protection is offered against changing an action in error

In the Confirm mode (TAKE button is illuminated):

- You can key-in several actions and then confirm them by pressing the TAKE button, to simultaneously activate the multiple switches
- Every action requires user confirmation, protecting against erroneous switching
- Execution is delayed[1] until the user confirms the action

7.2.1   Toggling between the At Once and Confirm Modes

To toggle between the At Once and Confirm modes, do the following:

1. Press the dim TAKE button to toggle from the At Once mode (in which the TAKE button is dim) to the Confirm mode (in which the TAKE button illuminates).
   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.

7.2.2   Confirming a Switching Action

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

1. Press an OUT-IN combination.
   The corresponding 7-segment Display blinks. The TAKE button also blinks.

2. Press the blinking TAKE button to confirm the action.
   The corresponding 7-segment Display no longer blinks. The TAKE button illuminates.

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1 Failure to press the TAKE button within one minute (the Timeout) aborts the action

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

1. Press each OUT-IN combination in sequence.
   The corresponding 7-segment Display blinks. The TAKE button also blinks.

2. Press the blinking TAKE button to confirm all the actions.
   The corresponding 7-segment Display no longer blinks. The TAKE button illuminates.

7.3 Storing/Recalling Input/Output Configurations

You can store and recall up to 12 input/output configurations using the 4 input buttons and the 8 output buttons, as *Figure 10* illustrates:
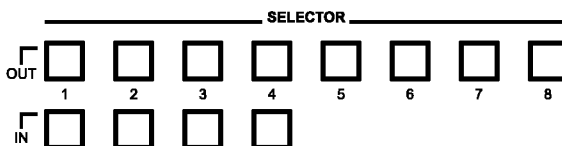
Figure 10: Storing and Recalling using the Input/Output Buttons

7.3.1 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 12 INPUT/OUTPUT buttons (this will be the setup # in which the current status is stored). If in the Confirm mode, press the blinking TAKE button to confirm the action.
   The memory stores the data at that reference.

7.3.2 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 INPUT/OUTPUT button (the button # corresponding to the setup #). If in the Confirm mode, that setup configuration will blink in the 7-segment Display, together with the RCL button and the TAKE button, and will only be implemented after pressing the TAKE button.
   The memory recalls the stored data from that reference.

Tip: If you cannot remember which of the 12 input/output configurations is the one that you want, set the **VP-4x8** to the Confirm mode and manually scan all the input/output configurations until you locate it.

7.3.3   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 INPUT/OUTPUT button.
   This erases that specific input/output configuration from the memory, leaving it empty and available[1].

7.4   Locking the Front Panel

To prevent changing the settings accidentally or tampering with the unit via the front panel buttons, lock[2] your **VP-4x8**. Unlocking releases the protection mechanism.

To lock the **VP-4x8**:

- Press the LOCK button for more than two seconds, until the LOCK button is illuminated
  The front panel is locked. Pressing a button will have no effect other than causing the LOCK button to blink[3]

To unlock the **VP-4x8**:

- Press the illuminated LOCK button for more than two seconds, until the LOCK button is no longer illuminated
  The front panel unlocks

---

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

2 Nevertheless, even though the front panel is locked you can still operate via RS-232 or RS-485, as well as via the Kramer RC-IR2 Infrared Remote Control Transmitter

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

8 Technical Specifications

The **VP-4x8** technical specifications are shown in *Table 8*:

Table 8: VP-4x8 Technical Specifications[1]

INPUTS:	4 computer graphics video on 15-pin HD connectors (VGA through UXGA)
OUTPUTS:	8 computer graphics video on 15-pin HD connectors (VGA through UXGA)
MAX. OUTPUT LEVEL:	1.5Vpp
BANDWIDTH (-3dB):	400MHz
DIFF. GAIN:	0.04%
DIFF. PHASE:	0.04Deg
K-FACTOR:	<0.05%
S/N RATIO:	75dB
CROSSTALK (all hostile):	−53dB
CONTROLS:	22 front panel buttons, RS-232, RS-485, Ethernet
COUPLING:	DC
POWER SOURCE:	100–240V AC, 50/60Hz, 23VA
DIMENSIONS	19" x 7" x 1U W, D, H, rack mountable
WEIGHT:	2.7kg (6lbs) approx
ACCESSORIES:	Power cord, null-modem adapter, Windows®-based Kramer control software, infrared remote control transmitter
OPTIONS:	External remote IR receiver cable

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1 Specifications are subject to change without notice

9 Updating the VP-4x8 Firmware

The **VP-4x8** functions by means of a device microcontroller and an Ethernet microcontroller that run firmware located in FLASH memory. The latest version of firmware can be downloaded from the Kramer Web site and updated in minutes using the following procedures:

- To update the device firmware, see section 9.1
- To update the Ethernet firmware, see section 9.2

> **Note**: The firmware update should be carried out by skilled technical personnel. Failure to update correctly can cause machine malfunction.

9.1 Updating the Device Firmware

To update the **VP-4x8** device firmware:

- Download the file from the Internet (see section 9.1.1)
- Connect a PC to the RS-232 port (see section 9.1.2)
- Install the latest firmware (see section 9.1.3)

9.1.1 Downloading from the Internet

To download the latest file[1] from the Internet:

1. Go to our Web site at www.kramerelectronics.com.

2. From the Technical Support section, download the file: "*FLIP_PL3.zip*"

3. Extract the file: "*FLIP_PL3.zip*" to a folder (for example, C:\Program Files\Kramer Flash).

4. Create a shortcut on your desktop to the file: "*FLIP.EXE*".

9.1.2 Connecting a PC to the RS-232 Port

To connect a PC to the RS-232 port of the **VP-4x8**:

1. Power the **VP-4x8** OFF.

2. Connect a serial cable from the **VP-4x8** RS-232 9-pin D-sub rear panel port to a PC as explained in section 6.2.

3. On the underside of the device, press in the PROGAM switch using a small screwdriver (see *Figure 1*).

4. Power the **VP-4x8** ON.

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1 The files indicated in this section are given as an example only. File names are liable to change from time to time

Note: This sequence is critical – first operate the **PROGRAM** switch and then turn on the unit

9.1.3 Installing the Device Firmware

To install the firmware, perform the following steps:

1. Double-click the desktop icon **Shortcut to FLIP.EXE**.
   The Splash screen appears[1]:
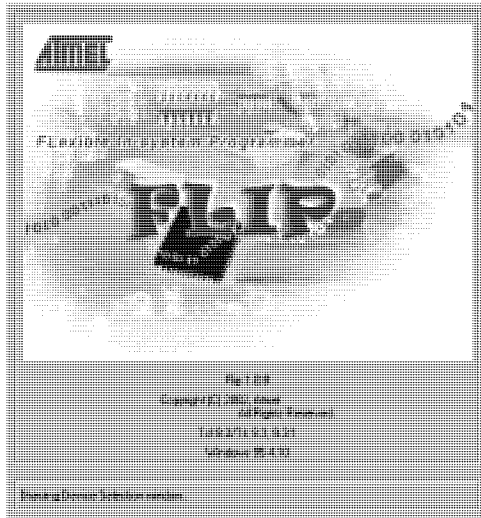
Figure 11: Splash Screen

2. After a few seconds, the Splash screen is replaced by the "*Atmel – Flip*" window:

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1 The screens appearing in this manual are examples of the process. The actual screens may differ in their content.
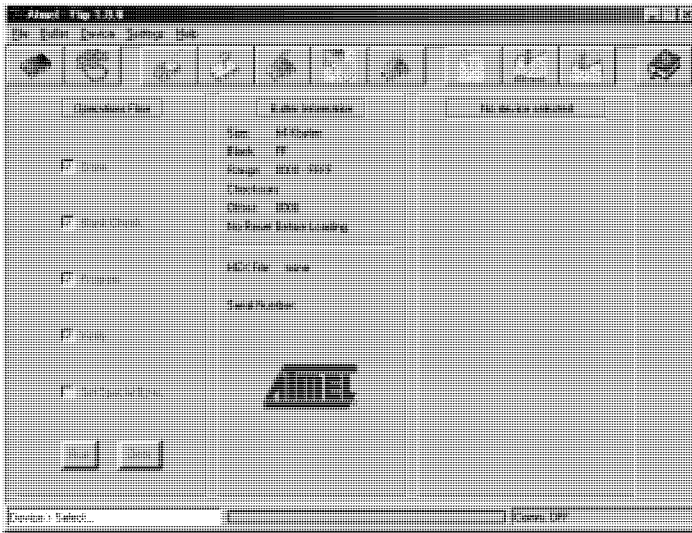
Figure 12: Atmel – Flip Window

3. Open the Device Selection window by:
   ▪ Pressing the keyboard shortcut key **F2**, or
   ▪ Choosing the **Select** command from the Device menu, or
   ▪ Pressing the integrated circuit icon in the upper right corner of the window).
   The Device Selection window appears:
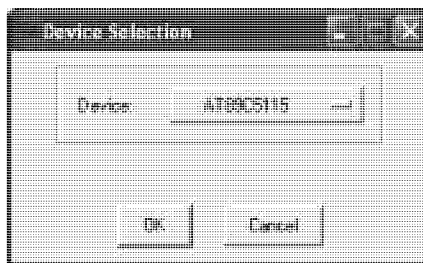
Figure 13: Device Selection Window

4. Click the button next to the name of the device and select from the list: **AT89C51RD2**:
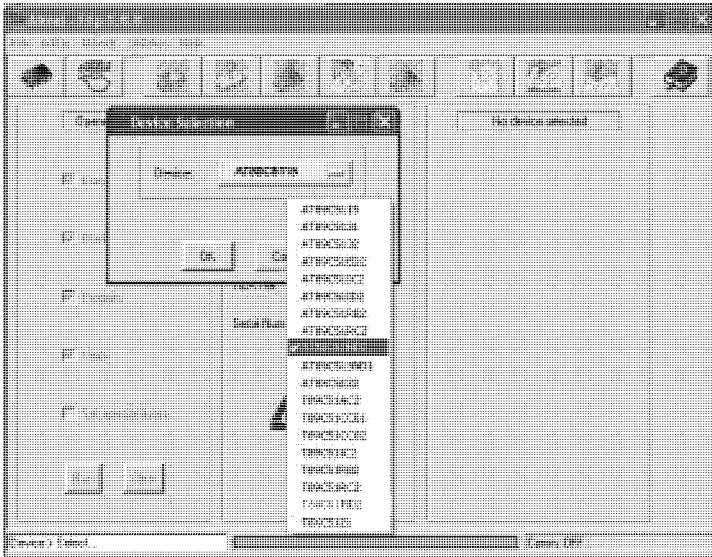
Figure 14: Device Selection Window

5. Click **OK**.

6. From the File menu, select **Load Hex**.
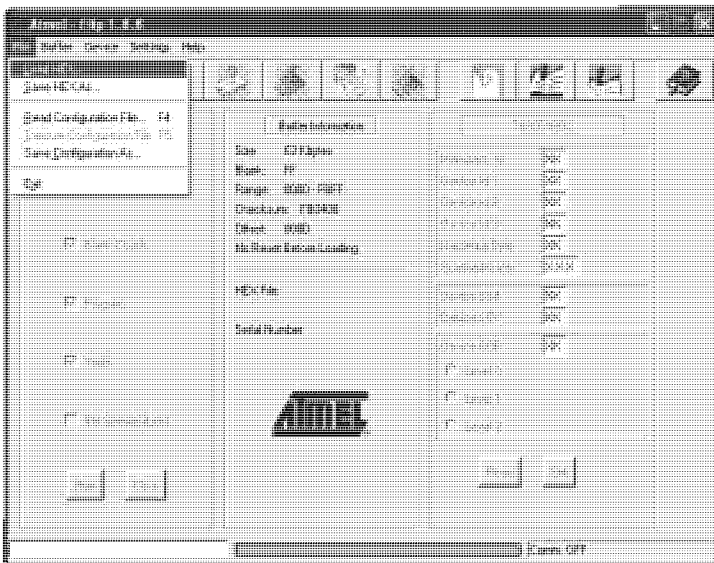
Figure 15: Loading the Hex

7. The Open File window opens. Select the correct HEX file that contains the updated version of the **VP-4x8** firmware (for example, *PL3_VIp2.hex*) and click **Open**.

8. Open the RS-232 window by pressing the keyboard shortcut key **F3** (or select the **Communication / RS232** command from the *Settings* menu, or press the keys: **Alt-SCR**).
   The RS232 window appears.

9. Change the COM port settings according to the configuration of your computer and select the 9600 baud rate:
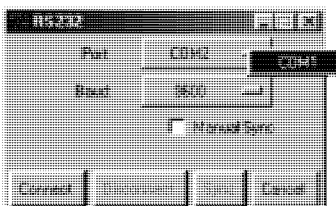
Figure 16: RS-232 Window

10. Click **Connect**.
    In the Operations Flow column of the Atmel – Flip window, the Run button is active, and the name of the chip appears as the name of the third column: *AT89C51RD2*.
    Verify that in the Buffer Information column, the "HEX File: PL3.hex" appears.
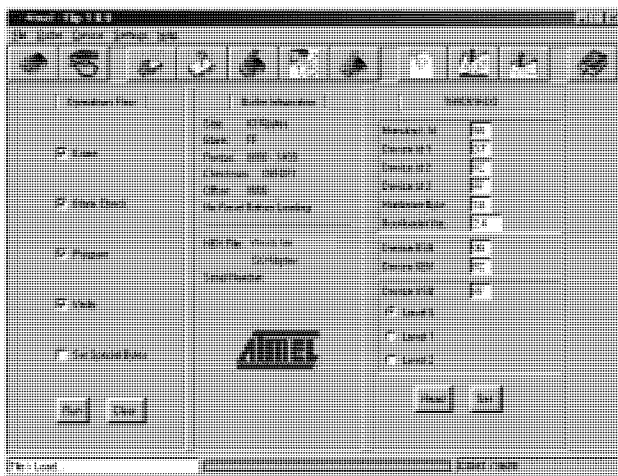
Figure 17: Atmel – Flip Window (Connected)

11. Click **Run**.
   As each stage of the operation completes, the check-box for that stage changes to green[1].
   When the operation is complete, all four check-boxes are green and the message Memory Verify Pass appears[2] in the status bar.
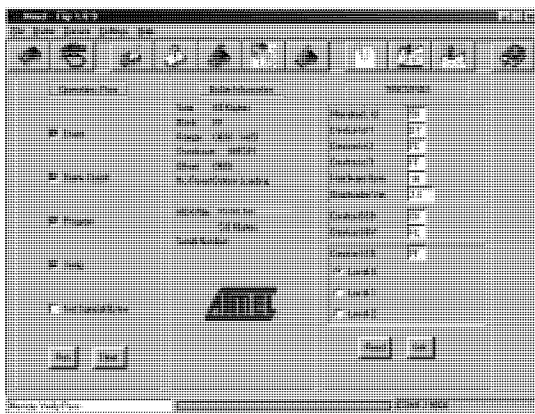
Figure 18: Atmel – Flip Window (Operation Completed)

12. Close the Atmel – Flip window.

13. Power OFF the **VP-4x8**.

14. If required, disconnect the null-modem adapter from the **VP-4x8**.

15. Press in the PROGRAM button on the underside of the **VP-4x8** to return it to its original position (see *Figure 1*).

16. Power ON the **VP-4x8**.

9.2 Upgrading the Ethernet Firmware

To update the **VP-4x8** Ethernet firmware:

- Download the file from the Internet (see section 9.2.1)
- Connect a PC to the RS-232 port (see section 9.2.2)
- Install the latest firmware (see section 9.2.3)

---

1 See also the blue progress indicator on the status bar

2 If an error message: "Not Finished" shows, click Run again

9.2.1 Downloading from the Internet

To download the latest file[1] from the Internet:

1. Go to our Web site at http://www.Kramerelectronics.com

2. From the technical support section, download the file: *SetKFRETH11-xx.zip*.

3. Extract the file "*SetKFRETH11-xx.zip*" (that includes the KFR-Programmer application setup and the *.s19* firmware file) to a folder (for example, C:\Program Files\KFR Upgrade).

4. Install the KFR-Programmer Application.

9.2.2 Connecting the PC to the RS-232 Port

To connect a PC to the RS-232 port of the **VP-4x8**:

1. Power the **VP-4x8** OFF.

2. Connect the RS-232 9-pin D-sub port (COM 1) on the **VP-4x8** to a null-modem adapter and connect the null-modem adapter with a 9-wire flat cable to the RS-232 9-pin D-sub COM port on your PC.

3. On the underside of the device, press in the ETH PROGAM switch using a small screwdriver (see *Figure 1*).

4. Power the **VP-4x8** ON.

9.2.3 Installing the Ethernet Firmware

To install the firmware, perform the following steps:

1. Double-click the KFR-Programmer desktop icon. The KFR-Programmer window appears (see *Figure 19*).
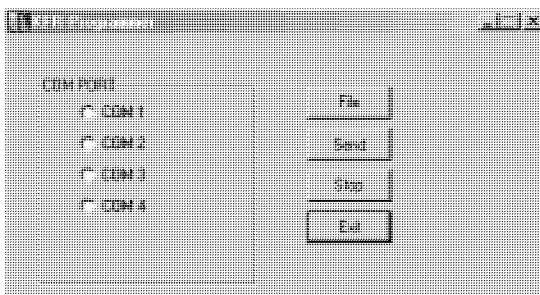
Figure 19: The KFR-Programmer Window

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1 The files indicated in this section are given as an example only. File names are liable to change from time to time

2. Select the required COM Port[1].

3. Press the **File** button to select the *.s19* firmware file included in the package.

4. Press the **Send** button to download the file. The Send button lights red.

5. Wait until the download is complete and the red Send button turns off.

6. Power OFF the **VP-4x8**.

7. Press in the ETH PROGRAM button on the back panel of the **VP-4x8** to return it to its original position (see *Figure 1*).

8. Power ON the **VP-4x8**.

10 Table of Hex Codes for Serial Communication

Table 9 lists the Hex values for a single machine (*MACHINE # 1*):

Table 9: VP-4x8 Hex Codes for Switching via RS-232/RS-485

	Switching Video Channels							
	OUT 1	OUT 2	OUT 3	OUT 4	OUT 5	OUT 6	OUT 7	OUT 8
IN 1	01	01	01	01	01	01	01	01
	81	81	81	81	81	81	81	81
	81	82	83	84	85	86	87	88
	81	81	81	81	81	81	81	81
IN 2	01	01	01	01	01	01	01	01
	82	82	82	82	82	82	82	82
	81	82	83	84	85	86	87	88
	81	81	81	81	81	81	81	81
IN 3	01	01	01	01	01	01	01	01
	83	83	83	83	83	83	83	83
	81	82	83	84	85	86	87	88
	81	81	81	81	81	81	81	81
IN 4	01	01	01	01	01	01	01	01
	84	84	84	84	84	84	84	84
	81	82	83	84	85	86	87	88
	81	81	81	81	81	81	81	81

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1 To which the **VP-4x8** is connected on your PC

11 Kramer Protocol 2000

The **VP-4x8** is compatible with Kramer's Protocol 2000, version 0.50. This RS-232/RS-485 communication protocol uses four bytes of information as defined below. For RS-232, a null-modem connection between the machine and controller is used. The default data rate is 9600 baud, with no parity, 8 data bits, and 1 stop bit.

Note: Compatibility with Kramer's Protocol 2000 does not mean that a machine uses all of the commands below. Each machine uses a sub-set of Protocol 2000, according to its needs.

Table 10: Protocol Definitions

MSB							LSB
	DESTINATION		INSTRUCTION				
0	D	N5	N4	N3	N2	N1	N0
7	6	5	4	3	2	1	0

1st byte

			INPUT				
1	I6	I5	I4	I3	I2	I1	I0
7	6	5	4	3	2	1	0

2nd byte

			OUTPUT				
1	O6	O5	O4	O3	O2	O1	O0
7	6	5	4	3	2	1	0

3rd byte

			MACHINE NUMBER				
1	OVR	X	M4	M3	M2	M1	M0
7	6	5	4	3	2	1	0

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 to be performed by the switcher(s) is defined by the INSTRUCTION (6 bits). Also, if a function is performed via the machine's keyboard, then these bits are set with the INSTRUCTION NO. that 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 (i.e. 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 11: 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
3	STORE VIDEO 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
15	REQUEST WHETHER SETUP IS DEFINED / 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		0 - error 1 - invalid instruction 2 - out of range	9, 25
30	LOCK FRONT PANEL	0 - Panel unlocked 1 - Panel locked	0	2
31	REQUEST WHETHER PANEL IS LOCKED	0	0	16
57	SET AUTO-SAVE	I3 - no save I4 - auto-save	0	12, 2
61	IDENTIFY MACHINE	1 - video machine name 3 - video software version	0 - Request first 4 digits	13
62	DEFINE MACHINE	1 - number of inputs 2 - number of outputs 3 - number of setups	1 - for video 2 - for audio 3 - for SDI 4 - for remote panel 5 - for RS-422 controller	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   82   83

was sent from the PC, then the switcher (machine 3) will switch input 5 to output 2. If the user switched input 1 to output 4 via the front panel keypad, then the switcher will send HEX codes:

      41   81   84   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 instruction 5 is the input connected to the output.

      05   80   88   85

would be HEX codes

      4B   80   84   85

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 12 – Under normal conditions, the machine's present status is saved each time a change is made. The "power-down" save (auto-save) may be disabled using this code. Note that whenever the machine is turned on, the auto-save function is set.

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. $128_{dec}+22_{dec}$ for 2nd byte, and $128_{dec}+16_{dec}$ 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. $128_{dec}+3_{dec}$ for 2nd byte, $128_{dec}+5_{dec}$ for 3rd byte).

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.

LIMITED WARRANTY

Kramer Electronics (hereafter *Kramer*) warrants 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 Kramer, 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 VOID IF 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 our Web site: www.kramerelectronics.com where updates to this user manual may be found.
We welcome your questions, comments and feedback.

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

Caution