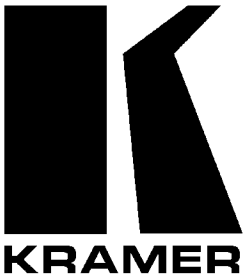
Kramer Electronics, Ltd.



USER MANUAL

Models:

VP-503xl, ***UXGA Scan Converter***

VP-504xl, ***UXGA/HD Scan Converter***

Contents

Figures

Tables

1 Introduction

Welcome to Kramer Electronics (since 1981): a world of unique, creative and affordable solutions to the infinite range of problems that confront the video, audio and presentation professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better! Our 500-plus different models now appear in 8 Groups[1], which are clearly defined by function.

Congratulations on purchasing your Kramer **VP-503xl** *UXGA Scan Converter* or **VP-504xl** *UXGA/HD Scan Converter*. This product is ideal for:

- Multimedia, board rooms, and video conferencing
- Any application where high quality conversion of graphical data signals to video signals is required
- Set-top box and HD conversion to SD video (**VP-504xl**)

The package includes the following items:

- **VP-503xl** *UXGA Scan Converter* or **VP-504xl** *UXGA/HD Scan Converter*
- Power adapter (12V DC Input)
- Windows®-based Kramer control software[2]
- 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]

2.1 Quick Start

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

---

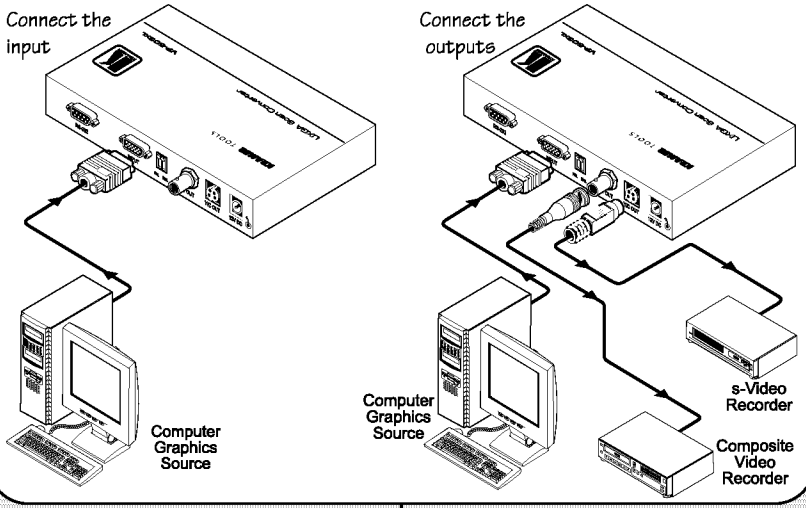
1 GROUP 1: Distribution Amplifiers; GROUP 2: Video and Audio Switchers, Matrix Switchers and Controllers; GROUP 3: Video, Audio, VGA/XGA Processors; GROUP 4: Interfaces and Sync Processors; GROUP 5: Twisted Pair Interfaces; GROUP 6: Accessories and Rack Adapters; GROUP 7: Scan Converters and Scalers; and GROUP 8: Cables and Connectors

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

Step 1: Connect the inputs and outputs - see section 5

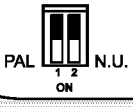


Step 2: Connect the control port - see section 5.1

Connect an RS-232 control port (optional)

Step 3: Set the dipswitches - see section 6.4

VP-503xl



Set the video standard: PAL - ON, NTSC - OFF
Set the color space: YUV - ON, RGB - OFF

VP-504xl

Step 4: Connect the power

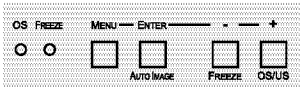
Step 5: Operate the machine - see section 6

Via the Quick-Set Buttons:

AUTO IMAGE - Press to automatically improve the image quality

FREEZE - Press to freeze the image on the screen. Press again to resume to current input image.

OS/US - Press to toggle between over-scan and under-scan



Via the Menu Buttons:

MENU - Press to display the Menu or return to the previous Menu or exit the Menu

ENTER - Press to accept changes

+ and - - Press to move up or down the Menu

Via RS-232:

Use the Windows®-based Kramer control software

MENU Items

- **Picture Setup**
- **TV Output Setup**
- **VGA Input Setup**
- **Zoom**
- **Advanced**
- **Information**

You can save settings before exiting the Menu

3 Overview

The Kramer **VP-503xl** is a high quality scan converter for down-scaling computer graphics (VGA up to UXGA) to PAL or NTSC video.

The Kramer **VP-504xl** is a high quality scan converter for down-scaling computer graphics and HD to PAL or NTSC video. It supports VGA up to UXGA, as well as the HD resolutions: 480p, 576p, 720p and 1080i. The input color space (RGB or YUV) is selected via a dipswitch[1].

The high quality **VP-503xl/VP-504xl**:

- Has user-friendly front panel buttons for easy control of ProcAmp functions, flicker-reduction, image optimization, one-touch freezing, over-scanning and under-scanning
- Can save and recall up to four setups, which include picture setup[2], input setup and output setup, zoom and advanced features
- Outputs high quality composite video and s-Video (Y/C) simultaneously
- Enables you to select the video standard (PAL or NTSC)
- Can be controlled via the front panel buttons and via RS-232
- Is fed from an external 12V DC source, making it suitable for field operation

To achieve the best performance:

- Connect only good quality connection cables, thus avoiding interference, deterioration in signal quality due to poor matching, and elevated noise-levels (often associated with low quality cables)
- Avoid interference from neighboring electrical appliances and position your Kramer **VP-503xl/VP-504xl** away from moisture, excessive sunlight and dust

4 Your VP-503xl/VP-504xl Scan Converter

This section describes the:

- **VP-503xl** *UXGA Scan Converter* (see section 4.1)
- **VP-504xl** *UXGA/HD Scan Converter* (see section 4.2)

1 See section 6.4

2 Brightness, contrast, saturation and flicker filter

4.1 Your VP-503xl UXGA Scan Converter

Figure 1, Figure 2 and Table 1 describe the **VP-503xl**:

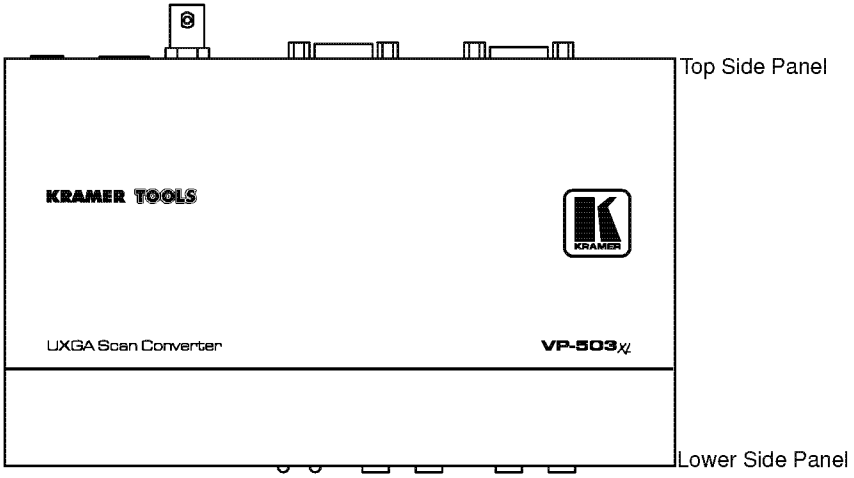


Figure 1: VP-503xl UXGA Scan Converter

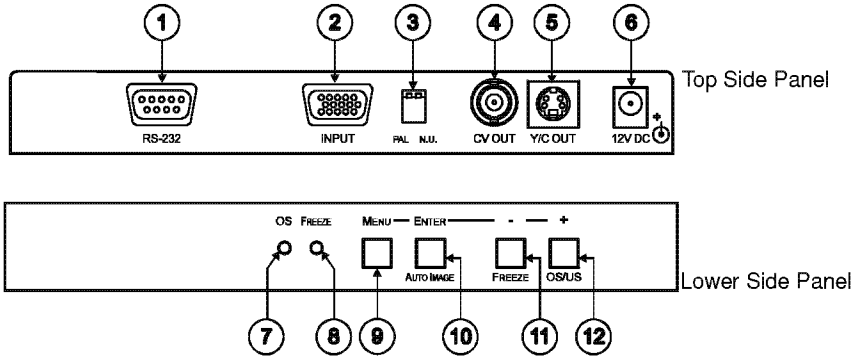


Figure 2: VP-503xl UXGA Scan Converter (Top and Lower Side Panel)

Table 1: VP-503xl UXGA Scan Converter Features

#	Feature	Function
1	*RS-232* DB 9F Port	Connect to the PC or Remote Controller
2	*INPUT* HD15F Connector	Connect to the computer graphics source
3	*PAL Dipswitch*	Select the video standard (ON for PAL, OFF for NTSC)
4	*CV OUT* BNC Connector	Connect to the composite video acceptor
5	*Y/C OUT* 4p Connector	Connect to the s-Video acceptor
6	*12V DC*	+12V DC connector for powering the unit
7	*OS* LED	Lights when the image is over-scanned[1]
8	*FREEZE* LED	Lights when the FREEZE button is pressed
9	*MENU* Button	Press to enter the menu and adjust the Scan Converter features
10	*ENTER / AUTO IMAGE* Button[2]	Press ENTER to accept the settings; press AUTO IMAGE to acquire optimal screen display
11	*- / FREEZE* Button[2]	Press - to scroll down the menu; press FREEZE to freeze the video image and features. Press again to disable
12	*+ / OS/US* Button[2]	Press + to scroll up the menu; press OS/US to toggle between over-scan[1] and under-scan[3]

4.2 Your VP-504xl UXGA/HD Scan Converter

Figure 3, Figure 4 and Table 2 describe the **VP-504xl**:

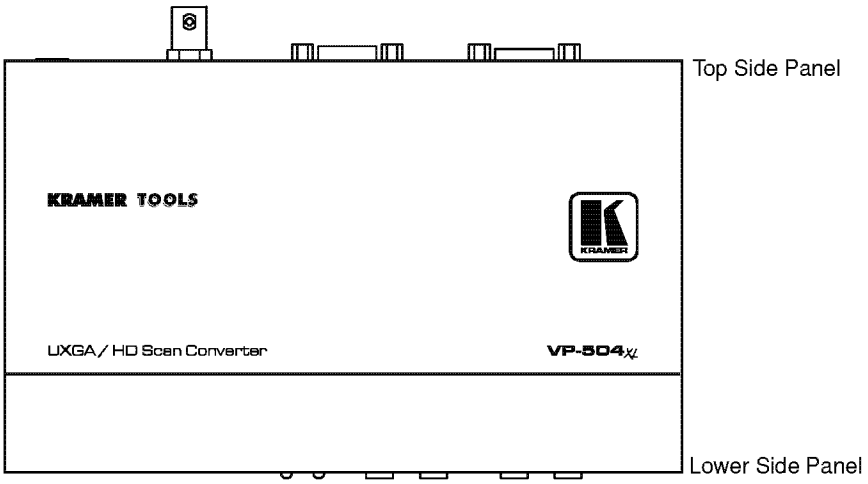


Figure 3: VP-504xl UXGA/HD Scan Converter

1 The displayed image, when set correctly, is larger than the screen (see section 6.1.3)

2 This button has dual functionality. When in the MENU mode, it functions according to the labeling above the button. When not in the MENU mode, the labeling below the button takes precedence

3 The image is smaller than the screen, leaving a border around the image (see section 6.1.3)

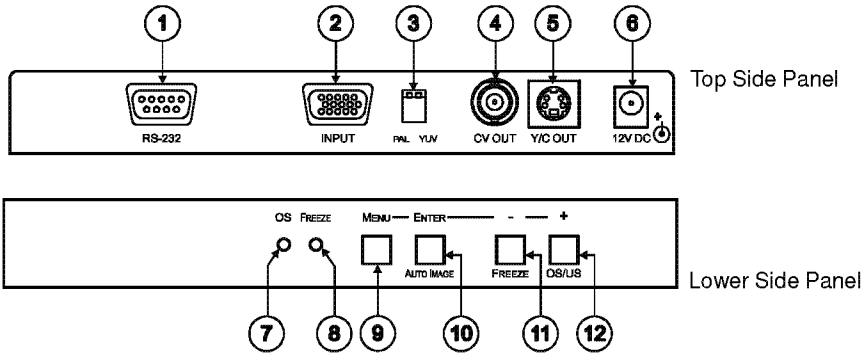


Figure 4: VP-504xl UXGA/HD Scan Converter (Top and Lower Side Panel)

Table 2: VP-504xl UXGA/HD Scan Converter Features

#	Feature	Function
1	*RS-232* DB 9F Port	Connect to the PC or Remote Controller
2	*INPUT* HD15F Connector	Connect to the computer graphics or HD source
3	*PAL, YUV Dipswitches*	Select the video standard (ON for PAL, OFF for NTSC) and the color space (ON for YUV, OFF for RGB)
4	*CV OUT* BNC Connector	Connect to the composite video acceptor
5	*Y/C OUT* 4p Connector	Connect to the s-Video acceptor
6	*12V DC*	+12V DC connector for powering the unit
7	*OS* LED	Lights when the image is over-scanned[1]
8	*FREEZE* LED	Lights when the FREEZE button is pressed
9	*MENU* Button	Press to enter the menu and adjust the Scan Converter features
10	*ENTER / AUTO IMAGE* Button[2]	Press ENTER to accept settings; press AUTO IMAGE to acquire optimal screen display
11	- / *FREEZE* Button	Press - to scroll down the menu; press FREEZE to freeze the video image and features. Press again to disable
12	+ / *OS/US* Button	Press + to scroll up the menu; press OS/US to toggle between over-scan[1] and under-scan[3]

1 The displayed image, when set correctly, is larger than the screen (see section 6.1.3)

2 This button has dual functionality. When in the MENU mode, it functions according to the labeling above the button. When not in the MENU mode, the labeling below the button takes precedence

3 The image is smaller than the screen, leaving a border around the image (see section 6.1.3)

5 Connecting the VP-503xl/VP-504xl

This section describes how to connect the:

- **VP-503xl** *UXGA Scan Converter* (see section 5.1)
- **VP-504xl** *UXGA/HD Scan Converter* (see section 5.2)

5.1 Connecting your VP-503xl UXGA Scan Converter

To connect your **VP-503xl** as the example in Figure 5 illustrates, do the following[1]:

1. Connect a computer graphics source to the HD15F INPUT connector.
2. Connect the Y/C OUT 4p connector to the Y/C acceptor (for example, an s-Video recorder) and/or the CV OUT BNC connector to the CV acceptor (for example, a composite video recorder).
3. If required, connect a PC or controller to the RS-232 port (see section 5.3).
4. Set the dipswitches (see section 6.4.1).
5. Connect the 12V DC power adapter to the power socket and connect the adapter to the mains electricity (not shown in Figure 5).

Adjust the Scan Converter features if required (see section 6.3).

1 Switch OFF the power on each device before connecting it to your VP-503xl. After powering up your VP-503xl, switch on the power on each device. The VP-504xl connection is similar to that of the VP-503xl

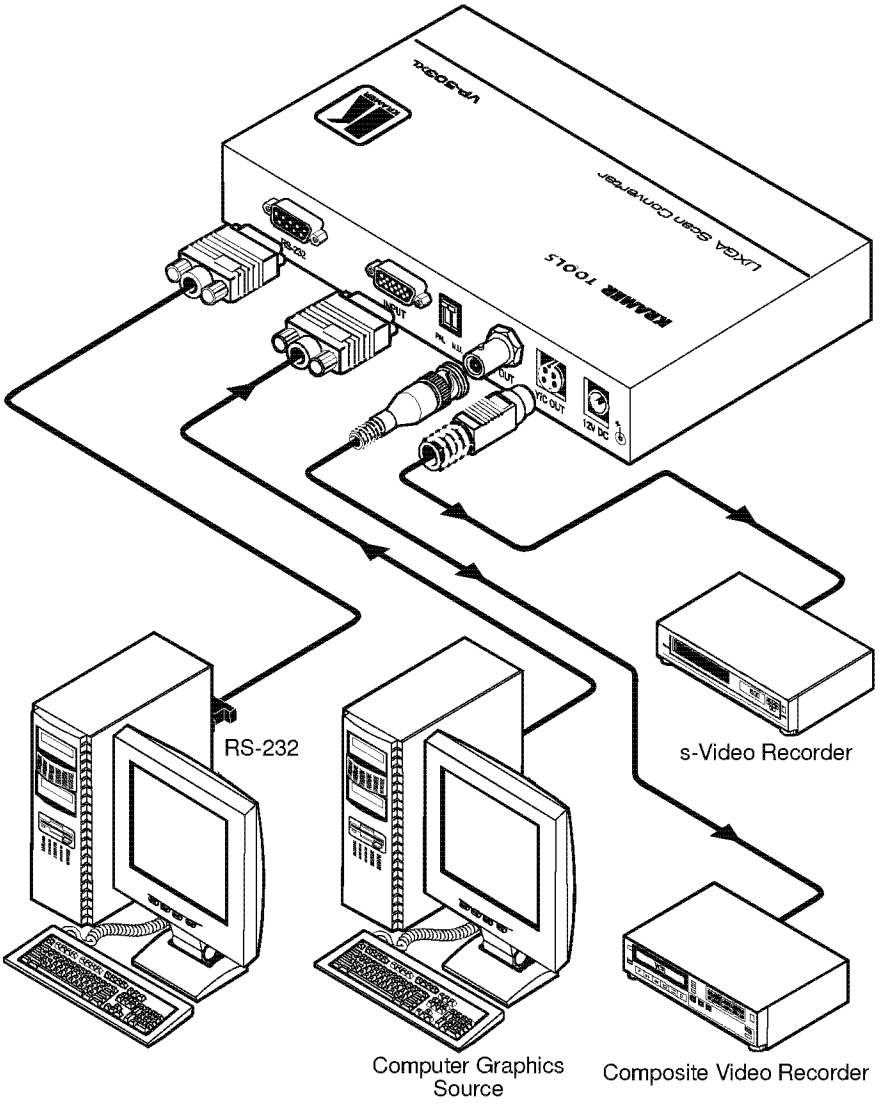


Figure 5: Connecting the VP-503xl

5.2 Connecting your VP-504xl UXGA/HD Scan Converter

To connect your **VP-504xl** as the example in Figure 6 illustrates, do the following[1]:

1. Connect a high definition source[2] to the HD15F INPUT connector (for example, a set top box).
2. Connect the Y/C OUT 4p connector to the Y/C acceptor (for example, an s-Video recorder) and/or the CV OUT BNC connector to the CV acceptor (for example, a composite video recorder).
3. If required, connect a PC or controller to the RS-232 port (see section 5.3).
4. Set the dipswitches (see section 6.4.2).
5. Connect the 12V DC power adapter to the power socket and connect the adapter to the mains electricity (not shown in Figure 6).

Adjust the Scan Converter features if required (see section 6.3).

1 Switch OFF the power on each device before connecting it to your VP-504xl. After powering up your VP-504xl, switch on the power on each device

2 To connect a high definition source, use a breakout cable such as the Kramer C-GM/3RVF. If you have a VGA to a 5BNC cable, use the RGB wires only. For direct wiring, see the table in Figure 6

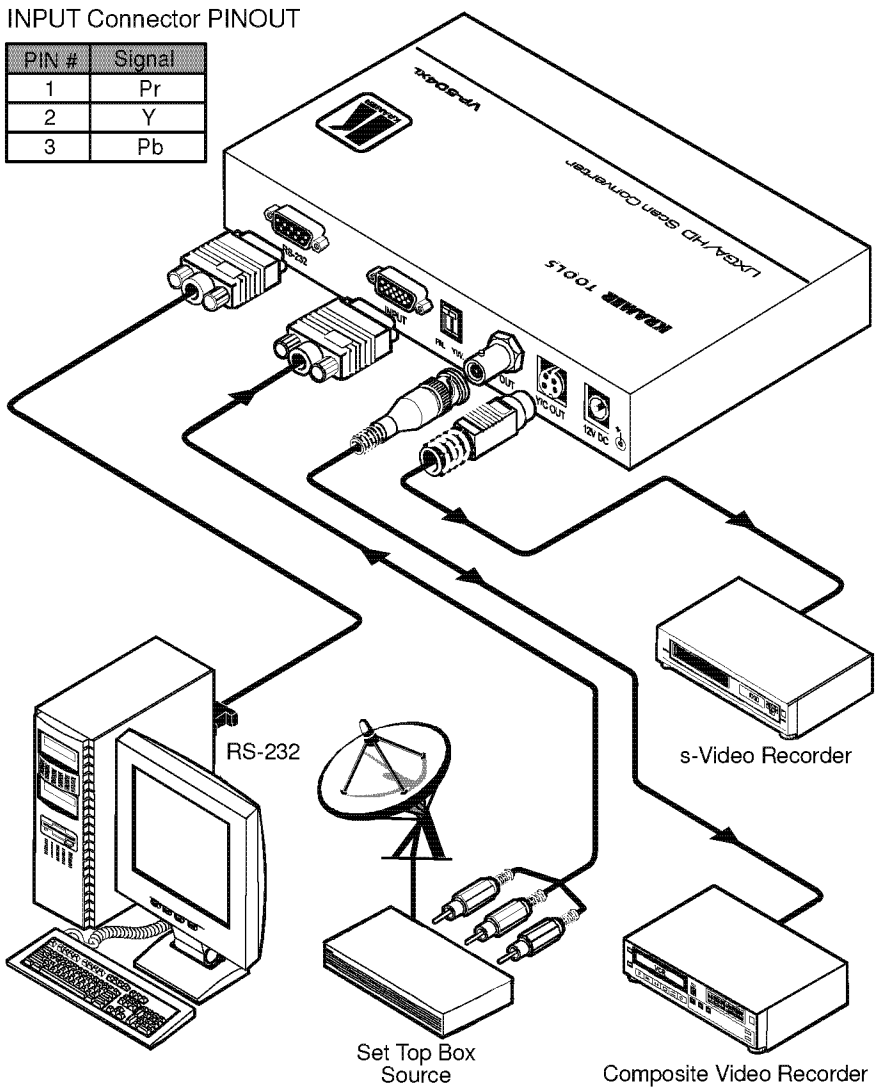


Figure 6: Connecting the VP-504xl

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

To connect a PC to the **VP-503xl/VP-504xl** unit, using the Null-modem adapter provided *with* the machine (recommended):

- Connect the RS-232 DB9 rear panel port on the **VP-503xl/VP-504xl** unit to the Null-modem adapter and connect the Null-modem adapter with a 9-wire flat cable to the RS-232 DB9 port on your PC

To connect a PC to the **VP-503xl/VP-504xl** unit, *without* using a Null-modem adapter:

- Connect the RS-232 DB9 port on your PC to the RS-232 DB9 rear panel port on the Master **VP-503xl/VP-504xl** unit, as Figure 7 illustrates

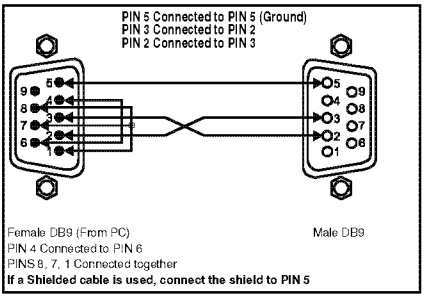


Figure 7: Connecting a PC without using a Null-modem Adapter

6 Operating the VP-503xl/VP-504xl

You can operate your **VP-503xl/VP-504xl** via the front panel buttons, which are dual-purpose buttons[1] that function as:

- Quick-set buttons: AUTO IMAGE, FREEZE and OS/US, or
- Menu buttons: MENU, ENTER, – and +

This section describes how to:

- Use the Quick set buttons (see section 6.1)
- Use the set of menu buttons (see section 6.2)
- Use the Menu screen (see section 6.3)
- Set the dipswitches (see section 6.4)

1 Except for the MENU button

6.1 Using the Quick-Set Buttons

The following sections describe the **VP-503xl** and **VP-504xl** quick set-buttons.

6.1.1 Using the AUTO IMAGE Button

The **VP-503xl/VP-504xl** assesses the image and improves its quality, by automatically adjusting the phase, frequency and position, when the AUTO IMAGE button is pressed.

For example, if your computer application switches resolutions (and frequency), press the AUTO IMAGE button to automatically improve the picture quality.

6.1.2 Using the FREEZE Button

Press the FREEZE button to freeze the picture on the screen. The frozen picture is displayed regardless of the signal on the input to the unit. This allows you, for example, to change the programs on the PC, and set up the next image.

By pressing the FREEZE button again, the frozen image will be replaced by the most current image on the input to the unit.

6.1.3 Using the OS/US Button

Press the OS/US button to toggle between over-scan and under-scan:

- Over-scan omits the border. The displayed image, when set correctly, is larger than the screen[1]
- Under-scan (sometimes know as the Compress mode) leaves a border around the image[2]

Over-scan

Under-scan

Figure 8: Over-scanned and Under-scanned images

1 Making the data bigger and easier to read but running the risk of having some of it run off the edge of the screen

2 The image appears reduced in size with a margin around it so that none of the data gets lost

6.2 Adjusting the Display via the Menu Buttons

The set of menu buttons (MENU, ENTER, – and +) let you adjust the screen settings. Use the menu buttons as follows:

- Press the MENU[1] button to display the menu on the screen
- Press the MENU button again each time you want to return to the previous menu level or exit the menu
- Press the + or - buttons to move up or down the menu respectively
- Press ENTER to accept changes
- Before exiting the menu, you can save settings[2]

6.3 Using the Menu

Using the main menu, you can adjust the screen display[3]. After pressing the MENU button[4], the main Menu[5] appears on the screen. Use the menu buttons to scroll through the menu and make the required adjustments. Table 3 defines the menu items.

Table 3: VP-503xl/VP-504xl Menu Items

Menu Items	Function
Picture Setup	Set the Contrast, Brightness, Sharpness and Saturation levels; Set the Flicker Filter for flicker reduction[6]
TV Output Setup	Set the H Center, H Width, V Center and V Height levels
VGA Input Setup	Set the VGA Left, VGA Width, VGA Top and VGA Bottom levels
Zoom	Set the zoom to ON to zoom the image; when the zoom is selected, pan the H and V position
Advanced	Select from seven different Test Patterns (for example, see Figure 9); Select a test pattern to appear when no input is connected; and Save up to 4 setups[2] and recall them
Information	Verifies the V Total Line, the H Timing, the V Timing, and the software version

1 Pressing the MENU button disables the quick-set buttons (AUTO IMAGE, FREEZE and OS/US)

2 See section 6.3.1.2

3 Screen adjustments apply to both CV and Y/C displays

4 Quick set-buttons are disabled

5 The menu times-out after 20 seconds of inactivity

6 The flicker filter essentially blends the value of vertically adjacent pixels to decrease the differences in adjacent odd/even lines. This dramatically reduces the noticeable image flicker, but it also reduces the level of the vertical detail

6.3.1 The Advanced Menu

The Advanced menu lets you select Test Patterns and Save and Recall setups.

6.3.1.1 Test Patterns

The **VP-503xl/VP504xl** stores seven test patterns. From the Advanced menu, you can select a test pattern (from 1 to 7) to show on screen. Figure 9 shows test pattern number 1.

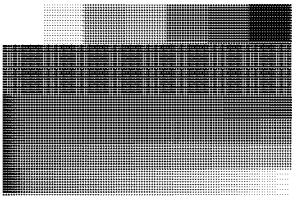


Figure 9: Test Pattern Number 1

You can set a test pattern to appear on the screen when there is no input connected to the **VP-503xl/VP504xl**. To do so, enter the Advanced menu, select No Input and set a test pattern number. This test pattern will appear when there is no input connected. For example, set No Input to 1 if you want test pattern 1 (as in Figure 9) to appear when there is no input connected to the unit.

6.3.1.2 Save and Recall

The **VP-503xl/VP-504xl** lets you save and recall up to 4 setups (from setup 0 to setup 3). The Save mode stores all the menu settings[1] in the selected setup memory (0 to 3).

Saving Through the Advanced Menu

To save setup 1, for example:

1. Adjust the Picture Setup, the VGA Input Setup, the TV Output Setup, the Zoom and panning, and the No Input number.
2. In the Advanced menu, select Save and set to number 1.
3. Press ENTER.
   The setup is saved.

Recalling a Setup

To recall a setup select Recall from the advanced menu and select the setup number you want to recall.

1 The Save mode saves the Picture setup, the TV Output setup, the VGA Input Setup, the Zoom setup, and the advanced setup (test patterns)

6.4 Setting the Dipswitches for VP-503xl and VP-504xl

The following sections describe the dipswitch settings for the **VP-503xl** and **VP-504xl**.

6.4.1 VP-503xl Dipswitch Settings

Figure 10 and Table 4 describe the factory default dipswitches setting for the **VP-503xl**:

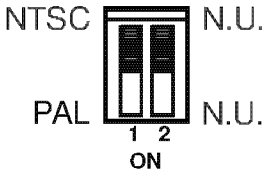


Figure 10: VP-503xl Dipswitches

Table 4: VP-503xl Dipswitch Settings

DIP	Function	Description
1	PAL/NTSC	Determines the video standard to be used: Set to OFF to select NTSC Set to ON to select PAL
2	N.U	Not Used

6.4.2 VP-504xl Dipswitch Settings

Figure 11 and Table 5 describe the factory default dipswitches setting for the **VP-504xl**:

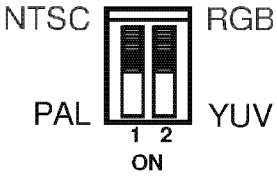


Figure 11: VP-504xl Dipswitches

Table 5: VP-504xl Dipswitch Settings

DIP	Function	Description
1	PAL/NTSC	Determines the video standard to be used: Set to OFF to select NTSC Set to ON to select PAL
2	YUV/RGB	Determines the input color space to be used: Set to OFF to select RGB Set to ON to select YUV

7 Technical Specifications

Table 6 includes the technical specifications.

Table 6: Technical Specifications[1] of the VP-503xl/VP-504xl

INPUTS:	**VP-503xl**: 1 x VGA/ UXGA on an HD15F connector **VP-504xl**: 1 x VGA/ UXGA, analog component HD on an HD15F connector
OUTPUTS:	1 composite video 1Vpp/75Ω on a BNC connector 1 Y/C (s-Video) 1Vpp / 75 ohms (Y), 0.3Vpp / 75 ohms (C) on a 4p connector
MAX. OUTPUT LEVEL:	1Vpp
INPUT RESOLUTIONS:	**VP-503xl**: VGA up to UXGA **VP-504xl**: VGA up to UXGA; 480p, 576p, 720p, 1080i (for 1080i, does not support 50Hz)
CONTROLS:	Front panel, RS-232 and OSD: ProcAmp video controls, Freeze, Underscan / Overscan, Auto-image, 8 color bars
POWER SOURCE:	12VDC, 310mA
DIMENSIONS:	18.8cm x 11.4cm x 2.4cm (7.41" x 4. 5" x 0.95", W, D, H)
WEIGHT:	0.4 kg. (0.88 lbs.) approx.
ACCESSORIES:	Power supply, mounting bracket
OPTIONS:	VGA to 3RCA breakout cable C-GM/3RVF

1 Specifications are subject to change without notice

8 VP-503xl / VP-504xl Communication Protocol

Set Command: Y■Control_Type■Function■Param■CR

■ Reply: Z■Control_Type■Function■Param■CRDoneCR

Get Command: Y■Control_Type■Function■CR

■Reply : Z■Control_Type■Function■Param■CR

Example:

1. "Y■0■7■31■CR" -> set Contrast value as 31

   "Z■0■7■31■CR"

2. "Y■1■7■CR" -> get current Contrast value

   "Z■1■7■31■CR" -> current Contrast value is 31

■ : ASCII Code 0x20

CR : Ascii Code 0xD or 0xA

Table 7 defines the Set Commands:

Table 7: Set Commands

Control Type		Function	Param	Description
Set	Get			
Keypad				
0	N/A	0	N/A	Menu
0	N/A	1	N/A	Enter
0	N/A	2	N/A	-
0	N/A	3	N/A	+
0	N/A	4	N/A	Auto Image
0	1	5	0: Off 1: On	Freeze
0	1	6	0: OS 1: US	OS/US
Picture Setup				
0	1	7	-32~31	Contrast
0	1	8	-32~31	Brightness
0	1	9	0: Off 1: On	Sharpness
0	1	10	0~8	Flicker Filter
0	1	11	-32~31	Saturation

Control Type		Function	Param	Description
Set	Get			
TV Output Setup				
0	1	12	-16~16	H Center
0	1	13	-16~16	H Width
0	1	14	-10~10	V Center
0	1	15	-10~10	V Height
VGA Input Setup				
N/A	1	16	By input signal	Max VGA Left
N/A	1	17	By input signal	Min VGA Left
0	1	18	Max VGA Left ~ Min VGA Left	VGA Left
N/A	1	19	By input signal	Max VGA Width
N/A	1	20	By input signal	Min VGA Width
0	1	21	Max VGA Width ~ Min VGA Width	VGA Width
N/A	1	22	By input signal	Max VGA Top
N/A	1	23	By input signal	Min VGA Top
0	1	24	Max VGA Top ~ Min VGA Top	VGA Top
N/A	1	25	By input signal	Max VGA Bottom
N/A	1	26	By input signal	Min VGA Bottom
0	1	27	Max VGA Bottom ~ Min VGA Bottom	VGA Bottom
Zoom				
0	1	28	0: Off 1: On	Zoom
N/A	1	29	By input/output signal	Max Pan H-Pos
N/A	1	30	By input/output signal	Min Pan H-Pos
0	1	31	Max Pan H-Pos ~ Min Pan H-Pos	Pan H-Pos
N/A	1	32	By input/output signal	Max Pan V-Pos
N/A	1	33	By input/output signal	Min Pan H-Pos
0	1	34	Max Pan V-Pos ~ Min Pan V-Pos	Pan V-Pos
Information				
N/A	1	35	By input signal	V total Line
N/A	1	36	By input signal	H Timing
N/A	1	37	By input signal	V Timing
N/A	1	38		Version

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.
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.

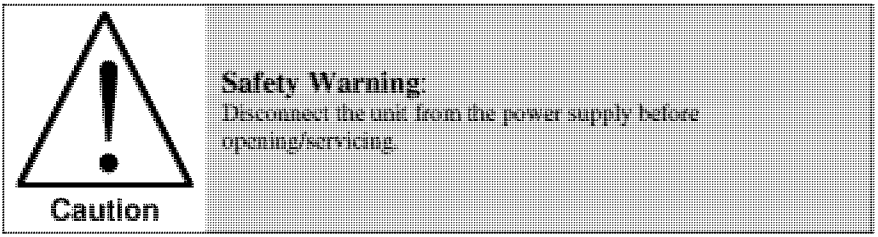
This equipment has been tested to determine compliance with the requirements of:

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.

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.



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