Kramer Electronics, Ltd.

USER MANUAL

Model:

VS-42H

4x2 HDMI 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 your Kramer **VS-42H** *4x2 HDMI Matrix Switcher*. This product is ideal for conference room presentations and advertising applications, as well as for rental and staging.

Note, that the Kramer VM-42H is identical to the VM-42HDMI; **just the name has changed replacing the suffix "HDMI" by "H" (according to the HDMI Guideline).**

Each package includes the following items:

- **VS-42H** *4x2 HDMI Matrix Switcher*
- Power cord, rack "ears" and null-modem adapter
- Windows®-based Kramer control software[2] and Windows®-based Ethernet Configuration Manager and Virtual Serial Port Manager
- Kramer **RC-IR3** Infrared Remote Control Transmitter (including the required batteries and a separate user manual[3])
- 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: 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

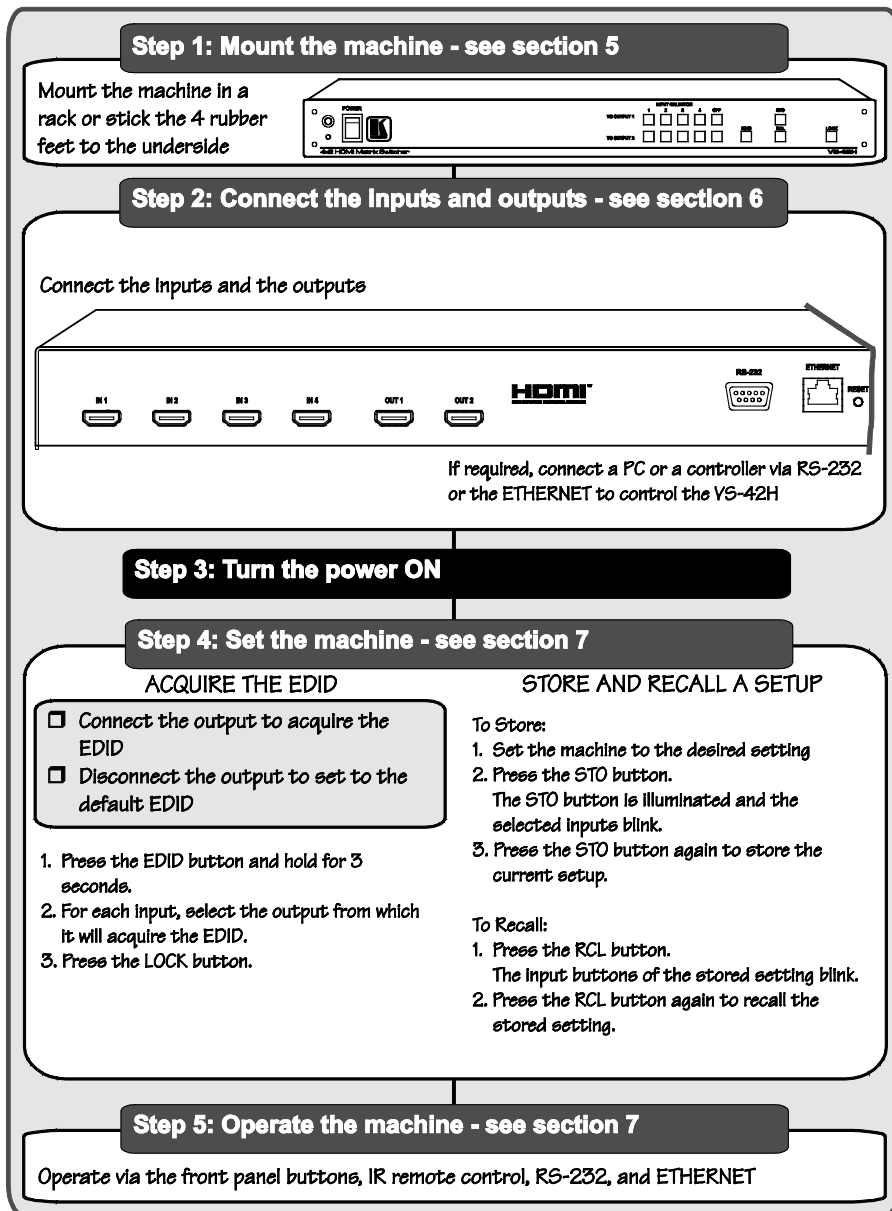2 Downloadable from our Web site at http://www.kramerelectronics.com

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.

Step 1: Mount the machine - see section 5

Mount the machine in a rack or stick the 4 rubber feet to the underside

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

Connect the inputs and the outputs

If required, connect a PC or a controller via RS-232 or the ETHERNET to control the VS-42H

Step 3: Turn the power ON

Step 4: Set the machine - see section 7

ACQUIRE THE EDID

☐ Connect the output to acquire the EDID
☐ Disconnect the output to set to the default EDID

1. Press the EDID button and hold for 3 seconds.
2. For each input, select the output from which it will acquire the EDID.
3. Press the LOCK button.

STORE AND RECALL A SETUP

To Store:
1. Set the machine to the desired setting
2. Press the STO button.
   The STO button is illuminated and the selected inputs blink.
3. Press the STO button again to store the current setup.

To Recall:
1. Press the RCL button.
   The input buttons of the stored setting blink.
2. Press the RCL button again to recall the stored setting.

Step 5: Operate the machine - see section 7

Operate via the front panel buttons, IR remote control, RS-232, and ETHERNET

3 Overview

The **VS-42H** is a high quality 4x2 matrix switcher for HDMI signals.

In particular, the **VS-42H** features:

- Support of up to 1.65Gbps bandwidth per graphic channel[1]
- Two sets of input selector buttons[2] (eight in total) to switch to the outputs
- I-EDIDPro™ Kramer Intelligent EDID Processing™, an intelligent EDID handling and processing algorithm that ensures Plug and Play operation for HDMI systems
- HDCP support (High Definition Digital Content Protection)
- Kramer reKlocking™ & Equalization Technology that rebuilds the digital signal to travel longer distances
- A PANEL LOCK button to prevent unwanted tampering with the buttons on the front panel
- Installation in one vertical space of a standard 19" professional rack enclosure

Control the **VS-42H** using the front panel buttons, or remotely via:

- RS-232 serial commands transmitted by a touch screen system, PC, or other serial controller
- The Kramer infrared remote control transmitter
- The ETHERNET

3.1 Defining EDID

The Extended Display Identification Data (EDID[3]) is a data-structure, provided by a display, to describe its capabilities to an HDMI source. The EDID enables the **VS-42H** to "know" what kind of monitor is connected to the output. The EDID includes the manufacturer's name, the product type, the timing data supported by the display, the display size, luminance data and (for digital displays only) the pixel mapping data.

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1 Suitable for resolutions up to UXGA at 60Hz, and for all HD resolutions

2 From INPUT 1 to INPUT 4, TO OUTPUT 1 and from INPUT 1 to OUTPUT 4, TO OUTPUT 2

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

3.2 About HDMI

High-Definition Multimedia Interface (HDMI) is an uncompressed all-digital[1] audio/video interface, widely supported in the entertainment and home cinema industry. It delivers the highest high-definition image and sound quality. Note that Kramer Electronics Limited is an HDMI Adopter and an HDCP Licensee.

In particular, HDMI[2]:

- Provides a simple[3] interface between any audio/video source, such as a set-top box, DVD player, or A/V receiver and video monitor, such as a digital flat LCD / plasma television (DTV), over a single lengthy4 cable
- Supports standard, enhanced, high-definition video, and multi-channel digital audio5 on a single cable
- Transmits all ATSC HDTV standards and supports 8-channel digital audio, with bandwidth to spare to accommodate future enhancements and requirements
- Benefits consumers by providing superior, uncompressed digital video quality via a single cable6, and user-friendly connector
- Is backward-compatible with DVI (Digital Visual Interface)
- Supports CEC, two-way communication between the video source (such as a DVD player) and the digital television, enabling new functionality such as automatic configuration and one-button play

HDMI has the capacity to support existing high-definition video formats (720p, 1080i, and 1080p, 2K and 4K), standard definition formats such as NTSC or PAL, as well as 480p and 576.

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1 Ensuring an all-digital rendering of video without the losses associated with analog interfaces and their unnecessary digital-to-analog conversions

2 HDMI, the HDMI logo and High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI licensing LLC

3 With video and multi-channel audio combined into a single cable, the cost, complexity, and confusion of multiple cables currently used in A/V systems is reduced

4 HDMI technology has been designed to use standard copper cable construction at up to 15m

5 HDMI supports multiple audio formats, from standard stereo to multi-channel surround-sound. HDMI has the capacity to support Dolby 5.1 audio and high-resolution audio formats

6 HDMI provides the quality and functionality of a digital interface while also supporting uncompressed video formats in a simple, cost-effective manner

3.3 Recommendations for Best Performance

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 **VS-42H** away from moisture, excessive sunlight and dust

3.4 Terminology Used in this User Manual

Table 1 defines some terms that are used in this user manual.

Table 1: Terminology Used in this User Manual

Term	Definition
802.3	The standard specification for ETHERNET that is maintained by the Institute of Electrical and Electronics Engineers (IEEE).
Dynamic Host Configuration Protocol (DHCP)	Allows the network administrator to distribute IP addresses from a central point and automatically send a new IP address when an Ethernet point is plugged into a different network location.
Gateway	A network position serving as an entry to another network. On the Internet, a node or stopping point can be either a gateway node or a host (end-point) node.
IP Address	A 32-binary digit number that identifies each sender or receiver (within a network via a particular server or workstation) of data (HTML pages or e-mails) that is sent in packets across the Internet. Every device connected to an IP network must have a unique IP address. This address is used to reference the specific unit.
Local Area Network (LAN)	Computers sharing a common communications line or wireless link, which often share a server within a defined geographic area.
Media Access Control (MAC) Address	A computer's unique hardware number (or address) in a LAN or other network. On an Ethernet LAN, the (MAC) address is identical to the Ethernet address.
Transmission Control Protocol/Internet Protocol (TCP/IP)	The basic communication language or protocol of the Internet that breaks the message into appropriately sized packets for the network, and can be used as a communications protocol in an intranet or an extranet.

4 Your VS-42H 4x2 HDMI Matrix Switcher

Figure 1 illustrates the front and rear panels of the **VS-42H**. Table 2 and Table 3 define the front and rear panels of the **VS-42H**, respectively.
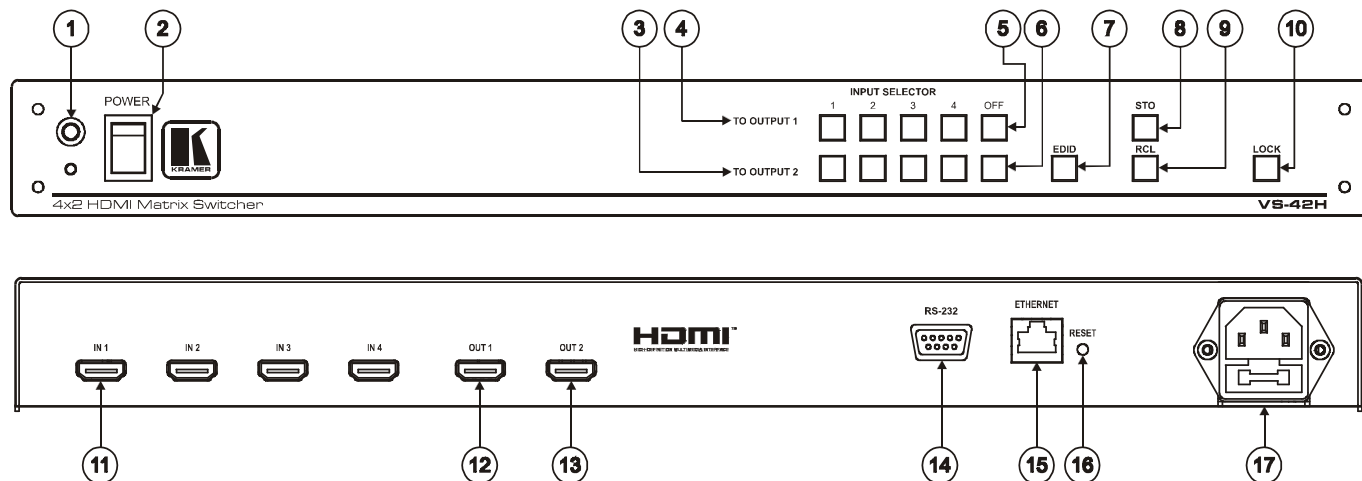
Figure 1: VS-42H 4x2 HDMI Matrix Switcher

Table 2: VS-42H 4x2 HDMI Matrix Switcher Front Panel Features

#	Feature		Function
1	IR Receiver		The red LED lights when receiving signals from the Infra-red remote control transmitter
2	*POWER* Switch		Illuminated switch for turning the unit ON or OFF
3	*INPUT SELECTOR* Buttons	*TO OUTPUT 2*	Press an INPUT SELECTOR button to select an input (from 1 to 4) to switch to output 2
4		*TO OUTPUT 1*	Press an INPUT SELECTOR button to select an input (from 1 to 4) to switch to output 1
5	*OFF* Buttons	*TO OUTPUT 1*	Press to toggle disconnecting output 1
6		*TO OUTPUT 2*	Press to toggle disconnecting output 2
7	*EDID* Button[1]		Press to acquire the EDID
8	*STO* Button		Press to store an input setting
9	*RCL* Button		Press to recall an input setting
10	*LOCK* Button		Press to toggle disengaging the front panel buttons and to acquire the EDID (see section 7.1)

Table 3: VS-42H 4x2 HDMI Matrix Switcher Rear Panel Features

#	Feature	Function
11	*IN* HDMI Connectors	Connect to the HDMI sources (from 1 to 4)
12	*OUT 1* HDMI Connector	Connect to the HDMI acceptor 1
13	*OUT 2* HDMI Connector	Connect to the HDMI acceptor 2
14	*RS-232* 9-pin D-sub Port	Connects to the PC or the Remote Controller[2]
15	*ETHERNET* Connector	Connects to the PC or other Ethernet Controller
16	*RESET* Button	Press the ETHERNET factory reset button to reset to the factory default definitions[3]: IP number – 192.168.1.39 Mask – 255.255.255.0 Gateway – 192.168.1.1
17	Power Connector with Fuse	AC connector enabling power supply to the unit

1 Illuminates when configuring the EDID

2 Via a null-modem connection

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

5 Installing the VS-42H in a Rack

This section provides instructions for rack mounting the unit.

Before Installing in a Rack

Before installing in 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.
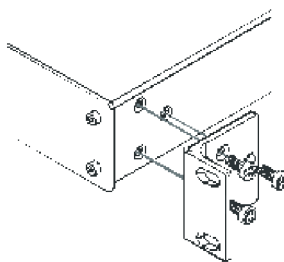
2. Place the ears of the machine against the rack rails, and insert the proper screws (not provided) through each of the four holes in the rack ears.

Note:

• 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 available from: http://www.kramerelectronics.com

6   Connecting a VS-42H 4x2 HDMI Matrix Switcher

To connect the **VS-42H** *4x2 HDMI Matrix Switcher*, as illustrated in the example in <u>Figure 2</u>, do the following[1]:

1. Connect[2] up to four HDMI sources (for example, DVD players) to the four IN HDMI connectors.

2. Connect[3] the OUT 1 and OUT 2 HDMI connectors to up to two HDMI acceptors (for example, LCD displays with built-in speakers).

3. If required, connect a PC and/or controller to the RS-232 port (see section <u>7.3</u>) and/or the ETHERNET port (see section <u>7.4</u>).

4. Connect the power connector to the mains electricity (not shown in <u>Figure 2</u>).

5. If required, acquire the EDID (see section <u>7.1</u>)

Press an INPUT SELECTOR button (two sets of buttons[4] from 1 to 4) to choose which HDMI input to route to the outputs.

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1 Switch OFF the power on each device before connecting it to your VS-42H. After connecting your VS-42H, switch on its power and then switch on the power on each device

2 You do not have to connect all the HDMI sources

3 You do not have to connect both outputs
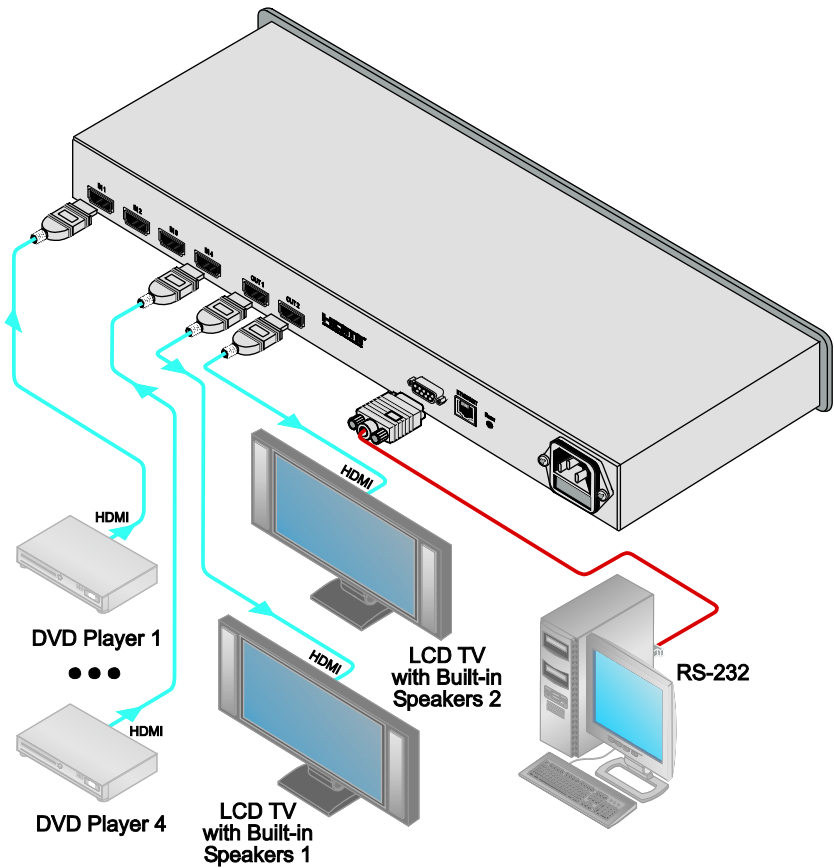
4 TO OUTPUT 1 and TO OUTPUT 2

Figure 2: Connecting a VS-42H 4x2 HDMI Matrix Switcher

7 Operating the VS-42H

This section describes how to:

- Acquire the EDID (see section 7.1)
- Store and recall a setting (see section 7.2)
- Control the machine via RS-232 (see section 7.3)
- Control the machine via the ETHERNET port (see section 7.4)

7.1 Acquiring the EDID

You can acquire the EDID from OUT 1 and/or OUT 2 and copy it to any of the four inputs, or reset to the default EDID. The EDID is acquired at once for all the inputs, according to the status of the selector buttons.

To acquire or change the EDID of a new output display:

1. Connect the required acceptor to the output from which you want to acquire the EDID.
2. Connect the power supply.
3. Press the EDID button and hold it for 3 seconds.
   Four input buttons blink[1].
4. For each input, select the output from which it will acquire the EDID.
   For example, to copy the EDID of output 2 to input 3, press the INPUT SELECTOR button 3 on the TO OUTPUT 2 line.
5. Press the LOCK button.
   The INPUT buttons blink in sequence until the EDID is acquired.

To acquire the EDID of both outputs[2]:

1. Connect the required acceptors to the outputs.
2. Connect the power supply.
3. Press the EDID button and hold it for 3 seconds.
   The selected input buttons blink[3].
4. For each input, select both outputs.
   For example, to copy the EDID of output 1 and output 2 to input 3, press the INPUT SELECTOR button 3 on the TO OUTPUT 1 line and on the TO OUTPUT 2 line.

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1 The four buttons that switch to the output from which you are acquiring the EDID

2 The EDID acquired is a weighted average of the connected outputs. For example, if displays with different resolutions are connected to the outputs, the acquired EDID supports both resolutions, as well as other parameters included in the EDID

3 The four buttons that switch to the output from which you are acquiring the EDID

5. Press the LOCK button.
   The INPUT buttons blink in sequence until the EDID is acquired.

To reset to the default EDID, disconnect the outputs and repeat the above steps.

7.2 Storing and Recalling a Setting

You can use the STO and RCL buttons to store the current setup and then recall it.

To store a setting:

1. Set the machine to the desired setting.
   For example, press INPUT SELECTOR button 3 on the TO OUTPUT 1 line and INPUT SELECTOR button 1 on the TO OUTPUT 2 line.

2. Press the STO button.
   The STO button is illuminated and the selected inputs[1] blink.

3. Press the STO button again[2] to store the current setup.
   The STO button no longer illuminates and the current setting is stored in the machine's non-volatile memory.

To recall a setup:

1. Press the RCL button.
   The RCL button illuminates as well as the current setting input buttons, and the input buttons of the stored setup blink.

2. Press the RCL button once again[2] to recall the stored setting.

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1 INPUT SELECTOR button 3 on the TO OUTPUT 1 line and INPUT SELECTOR button 1 on the TO OUTPUT 2 line

2 You have to press the STO button within 10 seconds, before the store operation times out


7.3 Connecting a PC

You can connect to the unit via a crossed RS-232 connection, using for example, a PC. A crossed cable or null-modem is required as shown in method A and B respectively. If a shielded cable is used, connect the shield to pin 5.

Method A—Connect the RS-232 9-pin D-sub port on the unit via a crossed cable (pin **2** to pin **3**, pin **3** to pin **2**, and pin **5** to pin **5**) to the RS-232 9-pin D-sub port on the PC.

Note: There is no need to connect any other pins.

Hardware flow control is not required for this unit. In the rare case where a controller requires hardware flow control, you should short pin 1 to 7 and 8, and pin 4 to 6 on the controller side.

Method B—Connect the RS-232 9-pin D-sub port on the unit via a straight (flat) cable to the null-modem adapter, and connect the null-modem adapter to the RS-232 9-pin D-sub port on the PC. The straight cable usually contains all nine wires for a full connection of the D-sub connector. Because the null-modem adapter (which already includes the flow control jumpering described in Method A above) only requires pins 2, 3 and 5 to be connected, you are free to decide whether to connect only these 3 pins or all 9 pins.
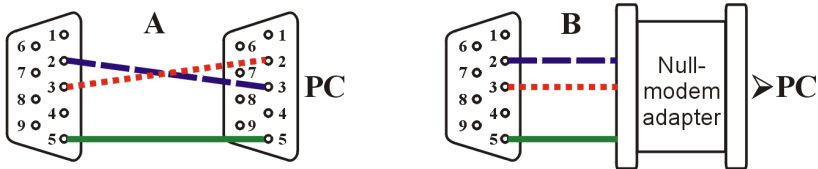
7.4 Controlling via ETHERNET

You can connect the **VS-42H** via the Ethernet, using a crossover cable (see section 7.4.1) for direct connection to the PC or a straight through cable (see section 7.4.2) for connection via a network hub or network router[1].

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

You can connect the Ethernet port of the **VS-42H** 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 **VS-42H** during the initial configuration

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1 After connecting the Ethernet port, you have to install and configure your Ethernet Port. For detailed instructions, see the "Ethernet Configuration (FC-11) guide.pdf" file in the technical support section on our Web site: http://www.kramerelectronics.com

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.

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

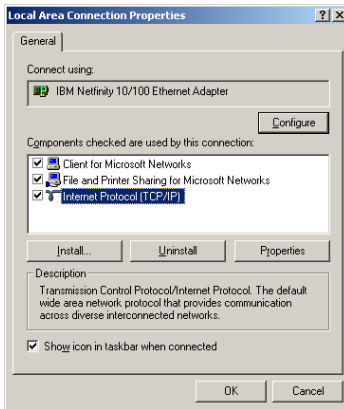5. Select the Internet Protocol (TCP/IP) and click the **Properties** Button (see Figure 3).

Figure 3: Local Area Connection Properties Window

6. Select Use the following IP Address, and fill in the details as shown in Figure 4.
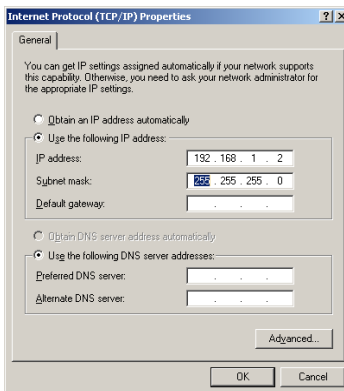
7. Click **OK**.

Figure 4: Internet Protocol (TCP/IP) Properties Window

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

You can connect the Ethernet port of the **VS-42H** to the Ethernet port on a network hub or network router, via a straight-through cable with RJ-45.

7.4.3 Control Configuration via the Ethernet Port

To control several units via the Ethernet, connect the Mster unit via the Ethernet port to the LAN port of your PC. Use your PC initially to configure the settings (see section 7.4).

8 Technical Specifications

Table 4 includes the technical specifications:

Table 4: Technical Specifications[1] of the VS-42H

INPUTS:	4 HDMI connectors
OUTPUTS:	2 HDMI connectors
BANDWIDTH:	Supports up to 1.65Gbps bandwidth per graphic channel
COMPLIANCE WITH HDMI STANDARD:	Supports HDMI and HDCP
AUDIO FORMAT:	Supports digital Dolby up to 5.1 channels[2]
RESOLUTION:	Up to UXGA; 1080p
POWER SOURCE:	100−264V AC; 50/60Hz, 10VA
CONTROLS:	Front panel buttons, infrared remote control transmitter, RS-232, Ethernet
DIMENSIONS:	19" x 7" x 1U W, D, H rack mountable
WEIGHT:	2.5kg (5.5lbs) approx.
ACCESSORIES:	Power cord, rack "ears", IR remote control, Null-modem adapter
OPTIONS:	Kramer HDMI cables[3]

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1 Specifications are subject to change without notice

2 Set the EDID to support the audio format

3 For best results, use Kramer cables such as the C-HM/HM series, the C-HM/DM series and/or our HDMI over fiber optics C-FOHM/FOHM series

9   EDID Factory Default Data

Monitor
Model name	VS-42HDMI
Manufacturer	KRM
Plug and Play ID	KRM3535
Serial number	N/A
Manufacture date	2006, ISO week 13

EDID revision	1.3
Input signal type	Digital (DVI(
Color bit depth	Undefined
Display type	RGB color
Screen size	700 x 390 mm (31.5 in(
Power management	Not supported
Extension blocs	1 (CEA-EXT(

DDC/CI	Not supported

Color characteristics
Default color space	Non-sRGB
Display gamma	2.20
Red chromaticity	Rx 0.640 - Ry 0.341
Green chromaticity	Gx 0.286 - Gy 0.610
Blue chromaticity	Bx 0.146 - By 0.069
White point (default)	Wx 0.284 - Wy 0.293
Additional descriptors	None

Timing characteristics
Horizontal scan range	30-91kHz
Vertical scan range	55-85Hz
Video bandwidth	160MHz
CVT standard	Not supported
GTF standard	Supported
Additional descriptors	None
Preferred timing	Yes
Native/preferred timing	1280x720p at 60Hz (16:9(
Modeline	"1280x720" 74.250 1280 1390 1430 1650 720 725 730 750 +hsync +vsync
Detailed timing #1	720x480p at 60Hz (16:9(
Modeline	"720x480" 27.000 720 736 798 858 480 489 495 525 -hsync -vsync

Standard timings supported
720	x 400p	at 70Hz - IBM VGA
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
832	x 624p	at 75Hz - Apple Mac II
1024	x 768p	at 60Hz - VESA
1024	x 768p	at 70Hz - VESA
1024	x 768p	at 75Hz - VESA
1280	x 1024p	at 75Hz - VESA
1600	x 1200p	at 60Hz - VESA STD
1280	x 960p	at 85Hz - VESA STD
1360	x 765p	at 85Hz - VESA STD
1024	x 768p	at 85Hz - VESA STD
800	x 600p	at 85Hz - VESA STD
640	x 480p	at 85Hz - VESA STD

EIA/CEA-861 Information

Revision number	3
IT underscan	Not supported
Basic audio	Supported
YCbCr 4:4:4	Not supported
YCbCr 4:2:2	Not supported
Native formats	0
Detailed timing #1	1920x1080i at 60Hz (16:9(
Modeline	"1920x1080" 74.250 1920 2008 2052 2200 1080 1084 1094 1124 interlace +hsync +vsync
Detailed timing #2	1920x1080i at 50Hz (16:9(
Modeline	"1920x1080" 74.250 1920 2448 2492 2640 1080 1084 1094 1124 interlace +hsync +vsync
Detailed timing #3.	720x576p at 50Hz (4:3(
Modeline	"720x576" 27.000 720 732 796 864 576 581 586 625 -hsync -vsync
Detailed timing #4	720x480p at 60Hz (4:3(
Modeline	"720x480" 27.000 720 736 798 858 480 489 495 525 -hsync -vsync
Detailed timing #5	640x480p at 60Hz (4:3(
Modeline	"640x480" 25.180 640 648 744 800 480 482 484 525 -hsync -vsync

CE video identifiers (VICs) - timing/formats supported

640	x 480p	at 60Hz - Default (4:3, 1:1(
720	x 480p	at 60Hz - EDTV (4:3, 8:9(
1280	x 720p	at 60Hz - HDTV (16:9, 1:1(
1920	x 1080i	at 60Hz - HDTV (16:9, 1:1(
720	x 480i	at 60Hz - Doublescan (4:3, 8:9(
1440	x 480p	at 60Hz - DVD (4:3, 4:9(
1920	x 1080p	at 60Hz - HDTV (16:9, 1:1(
720	x 576p at	50Hz - EDTV (4:3, 16:15(
1280	x 720p at	50Hz - HDTV (16:9, 1:1(
1920	x 1080i at	50Hz - HDTV (16:9, 1:1(
2880	x 576i at	50Hz - Console (4:3, 2:15-20:15(
1920	x 1080p at	50Hz - HDTV (16:9, 1:1(

NB: NTSC refresh rate = (Hz*1000)/1001

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

CE speaker allocation data

Channel configuration	2.0
Front left/right	Yes
Front LFE	No
Front center	No
Rear left/right	No
Rear center	No
Front left/right center	No
Rear left/right center	No
Rear LFE	No

CE vendor specific data (VSDB)

IEEE registration number	0x000C03
CEC physical address	1.0.0.0
Supports AI (ACP, ISRC)	No
Supports 48bpp	No
Supports 36bpp	No
Supports 30bpp	No
Supports YCbCr 4:4:4	No
Supports dual-link DVI	No
Maximum TMDS clock	165MHz

Report information

Date generated	20/02/2011
Software revision	2.52.0.857
Data source	Real-time 0x0031
Operating system	5.1.2600.2.Service Pack 3

10 Kramer Protocol 2000

The **VS-42H** is compatible with Kramer's Protocol 2000[1] (version 0.50) (below). 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.

Table 5: Protocol Definitions

MSB   LSB

	DESTNATION	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 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 machine numbers. 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.

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1 You can download our user-friendly "Software for Calculating Hex Codes for Protocol 2000" from our Web site: http://www.kramerelectronics.com

Table 6: 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	
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, 15
3	STORE VIDEO STATUS	Set as SETUP #	0 - to store 1 - to delete	2, 3, 15
4	RECALL VIDEO STATUS	Set as SETUP #	0	2, 3, 15
30	LOCK FRONT PANEL	0 - Panel unlocked 1 - Panel locked	0	2

NOTES on the above table:

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 15 – When the OVR bit (4th byte) is set, then the "video" commands have universal meaning. For example, instruction 1 (SWITCH VIDEO) will cause all units (including audio, data, etc.) to switch. Similarly, if a machine is in "FOLLOW" mode, it will perform any "video" instruction.

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 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.

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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.

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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.

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