

Kramer Electronics, Ltd.



USER MANUAL

Model:

VS-161H

16x1 HDMI Switcher

Contents

1	Introduction	1
2	Getting Started	1
2.1	Quick Start	2
3	Overview	3
3.1	Defining EDID	3
3.2	About HDMI	4
3.3	About HDCP	5
3.4	Recommendations for Best Performance	5
4	Your VS-161H 16x1 Switcher	5
5	Installing the VS-161H in a Rack	8
6	Connecting a VS-161H 16x1 HDMI Switcher	9
7	Operating the VS-161H	10
7.1	The PC and DVD Modes	11
7.2	Acquiring the EDID	12
7.3	Controlling via RS-232 (for example, using a PC)	13
7.4	Controlling via ETHERNET	13
7.4.1	Connecting the ETHERNET Port directly to a PC (Crossover Cable)	13
7.4.2	Connecting the ETHERNET Port via a Network Hub (Straight-Through Cable)	15
7.4.3	Control Configuration via the Ethernet Port	15
8	Technical Specifications	15
9	Kramer Protocol 2000	16

Figures

Figure 1:	VS-161H 16x1 HDMI Switcher	6
Figure 2:	Connecting a VS-161H 16x1 HDMI Switcher	10
Figure 3:	Connecting a PC without Using a Null-modem Adapter	13
Figure 4:	Local Area Connection Properties Window	14
Figure 5:	Internet Protocol (TCP/IP) Properties Window	14

Tables

Table 1:	VS-161H 16x1 HDMI Switcher Features	7
Table 2:	DVD Mode and PC Mode Characteristics	12
Table 3:	Technical Specifications of the VS-161H	15
Table 4:	Protocol Definitions	16
Table 5:	Instruction Codes for Protocol 2000	17

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 groups¹ that are clearly defined by function.

Thank you for purchasing your Kramer **VS-161H** *16x1 HDMI Switcher*.

The **VS-161H** is ideal for conference room presentations and advertising applications, as well as for rental and staging.

Note, that the Kramer VS-161H is identical to the VS-161HDMI; just the name has changed replacing the suffix “HDMI” by “H” (according to the HDMI Guideline).

Each package includes the following items:

- **VS-161H** *16x1 HDMI Switcher*
- Power cord, rack “ears” and null-modem adapter
- Windows[®]-based Kramer control software² and Windows[®]-based Ethernet Configuration Manager and Virtual Serial Port Manager
- Kramer **RC-IR2** Infrared Remote Control Transmitter (including the required batteries and a separate user manual³)
- This user manual³

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 cables¹

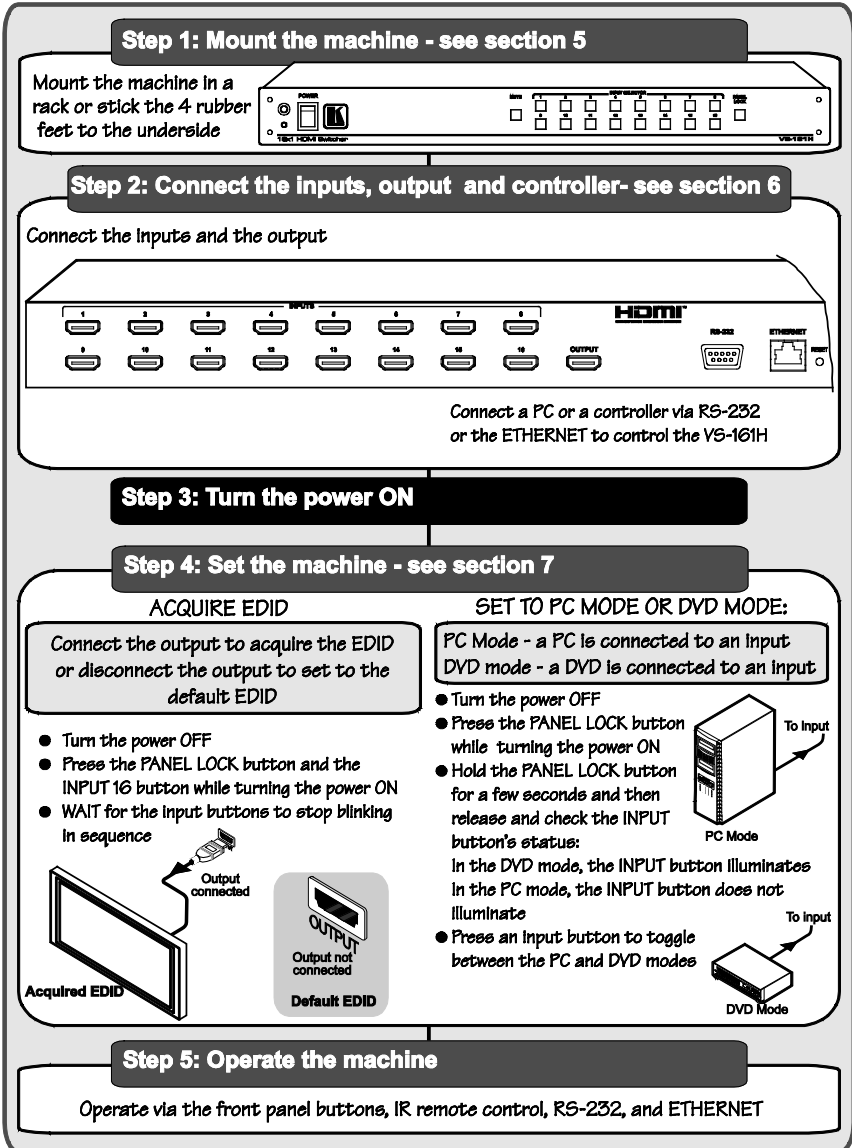
1 GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Matrix Switchers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity;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

2.1 Quick Start

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



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

3 Overview

The **VS-161H** is a high quality 16x1 switcher for HDMI signals.

In particular, the **VS-161H** features:

- Support of up to 1.65Gbps bandwidth per graphic channel¹
- Sixteen input selector buttons
- HDCP support (High Definition Digital Content Protection)
- HDMI Support – HDMI (V.1.3 with Lip Sync and CEC)
- EDID PassThru that passes EDID/HDCP signals from source to display
- A MUTE button to disconnect the output and 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-161H** 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 (EDID²) is a data-structure, provided by a display, to describe its capabilities to an HDMI source. The EDID enables the **VS-161H** 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.

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

² 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-digital¹ 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:

- Provides a simple² 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 lengthy³ cable
- Supports standard, enhanced, high-definition video, and multi-channel digital audio⁴ 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 cable⁵, and user-friendly connector
- Is backward-compatible with DVI (Digital Visual Interface)
- Supports 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/60), as well as standard definition formats such as NTSC or PAL.

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

2 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

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

4 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

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

3.3 About HDCP

The High-Bandwidth Digital Content Protection (HDCP) standard¹, protects digital video and audio signals transmitted over DVI or HDMI connections between two HDCP-enabled devices to eliminate the reproduction of copyrighted material. To protect copyright holders (such as movie studios) from having their programs copied and shared, the HDCP standard provides for the secure and encrypted transmission of digital signals.

3.4 Recommendations for Best Performance

To achieve the best performance:

- Use only good quality connection cables² 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 **VS-161H** away from moisture, excessive sunlight and dust

4 Your VS-161H 16x1 Switcher

[Figure 1](#) and [Table 1](#) define the **VS-161H**.

¹ Developed by Intel

² Available from Kramer Electronics on our Web site at <http://www.kramerelectronics.com>

Your VS-161H 16x1 Switcher

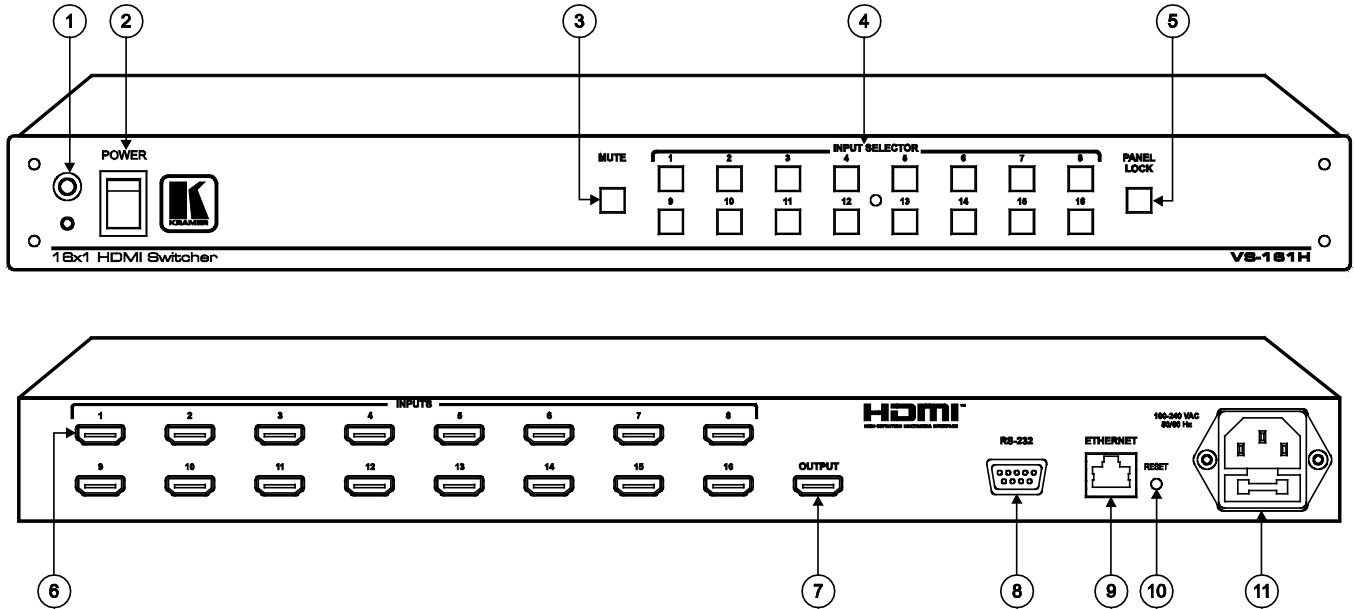


Figure 1: VS-161H 16x1 HDMI Switcher

Your VS-161H 16x1 Switcher

Table 1: VS-161H 16x1 HDMI Switcher Features

#	Feature	Function
1	IR Receiver	The red LED lights when receiving signals from the Infrared remote control transmitter
2	<i>POWER</i> Switch	Illuminated switch for turning the unit ON or OFF
3	<i>MUTE</i> Button	Press to toggle disconnecting the output
4	<i>INPUT SELECTOR</i> Buttons	Press the INPUT button to select input (from 1 to 16)
5	<i>PANEL LOCK</i> Button	Press to toggle disengaging the front panel buttons, to acquire the EDID and to set to the PC/DVD mode
6	<i>INPUT</i> HDMI Connectors	Connect to the HDMI sources (from 1 to 16)
7	<i>OUTPUT</i> HDMI Connector	Connect to the HDMI acceptor
8	<i>RS-232</i> DB 9F Port	Connects to the PC or the RS-232 Remote Controller
9	<i>ETHERNET</i> Connector	Connects to the PC or other Ethernet Controller
10	<i>RESET</i> Button	Press the ETHERNET factory reset button to reset to the factory default definitions ¹ : IP number – 192.168.1.39 Mask – 255.255.255.0 Gateway – 192.168.1.1
11	Power Connector with Fuse	AC connector enabling power supply to the unit

¹ 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-161H 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	+5° to +45° C (41° to 113° F)
Operating humidity range	10 to 90% RHL, non-condensing
Storage temperature range	-20° to +70° C (-4° to 158° F)
Storage humidity range	5 to 95% RHL, non-condensing



CAUTION!

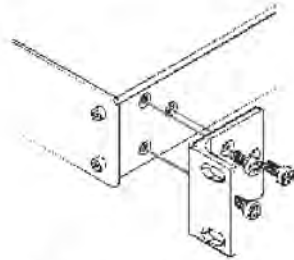
When installing on a 19" rack, avoid hazards by taking care that:

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-161H 16x1 HDMI Switcher

To connect the **VS-161H 16x1 HDMI Switcher** as illustrated in the example in [Figure 2](#), do the following¹:

1. If required:
Set the appropriate INPUTS to the DVD/PC mode (see section [7.1](#))
 - Acquire the EDID (see section [7.2](#))
2. Connect² the HDMI sources as follows³:
 - A multimedia player to INPUT 1
 - A set top box to INPUT 2
 - A DVD player to INPUT 6
 - A DVD player to INPUT 16
3. Connect the OUTPUT HDMI connector to an HDMI acceptor (for example, a plasma display).
4. If required, connect a PC and/or controller to the RS-232 port (see section [7.3](#)) and/or the ETHERNET port (see section [7.4](#)).
5. Connect the power connector to the mains electricity.

Press an INPUT SELECTOR button (from 1 to 16) to choose which HDMI input to route to the output⁴.

1 Switch OFF the power on each device before connecting it to your VS-161H. After connecting your VS-161H, switch on its power and then switch on the power on each device.

2 You can connect up to 16 HDMI sources.

3 Alternatively, you can connect a PC to any of the inputs and set those inputs to the PC mode (see section [9](#)).

4 The input button illuminates.

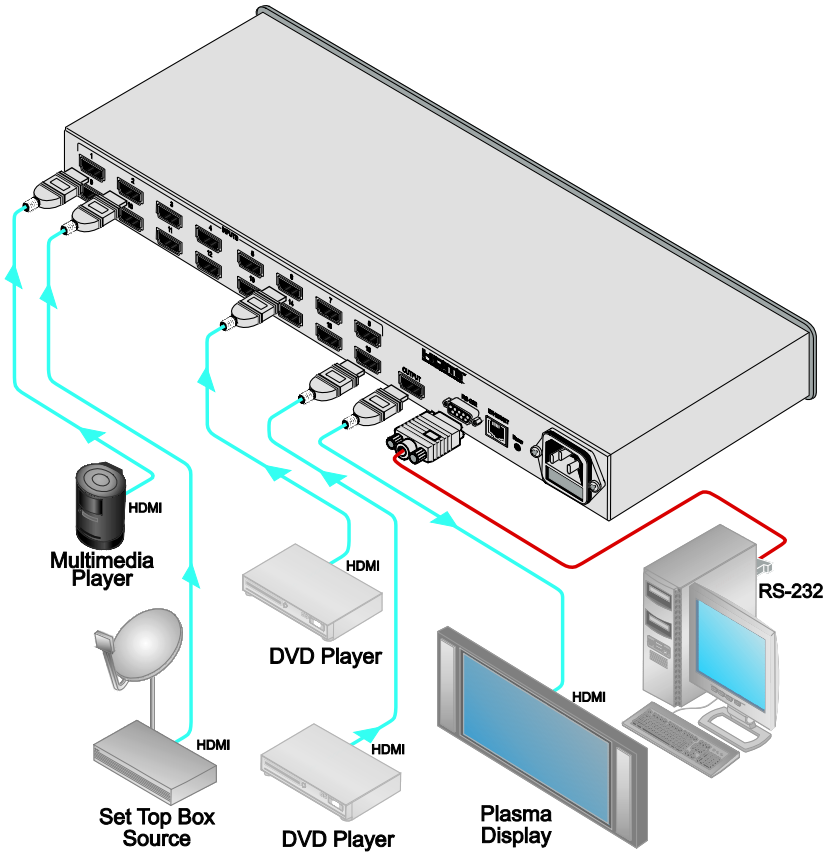


Figure 2: Connecting a VS-161H 16x1 HDMI Switcher

7 Operating the VS-161H

This section describes:

- The PC mode and the DVD mode (see section [7.1](#))
- How to acquire the EDID (see section [7.2](#))
- How to control the machine via RS-232 (see section [7.3](#))
- How to control the machine via the ETHERNET port (see section [7.4](#))

7.1 The PC and DVD Modes

The **VS-161H** has two operation modes that are specific per input: the PC mode¹ and the DVD mode:

- The PC mode is used when connecting a computer or several computers to one or more of the inputs via a DVI-to-HDMI converter cable²
- The DVD mode is used when connecting a DVD or several DVDs to the inputs

When in the PC mode, the input has access to the EDID (default or acquired) to prevent the computer from resetting if an output is not connected. In the DVD mode, the EDID of the connected output is available only when the input to which the DVD is connected, is switched to the output.

The PC mode and the DVD mode can be applied to a single input or to several inputs. For example, if you want to connect a computer to INPUT 1, another computer to INPUT 2, and DVD machines to all the other inputs (from INPUT 3 to INPUT 16), set INPUT 1 and INPUT 2 to the PC mode and all the other inputs to the DVD mode.

To set the inputs to either the PC or the DVD mode, do the following:

1. Turn the POWER off.
2. Press the PANEL LOCK button while turning the POWER on again. The INPUT buttons blink simultaneously.
3. Keep pressing and holding the PANEL LOCK button for a few seconds and then release it.
The PANEL LOCK button blinks.
If an input button illuminates, this indicates that that input is set to the DVD mode.
If an input button is not illuminated, this indicates that that input is set to the PC mode.
4. Toggle between the PC mode (input button not illuminated) and the DVD mode (input button illuminated) by pressing that input.
5. Press the PANEL LOCK button to exit this mode.
6. You can connect a computer to the input(s) that is set to the PC mode and a DVD to the input(s) that is set to the DVD mode.

¹ The default

² For example, the Kramer HDMI-DVI Gold Plated Cable in various lengths (3", 6", 10" and 15")

[Table 2](#) summarizes the differences between the PC mode and the DVD mode:

Table 2: DVD Mode and PC Mode Characteristics

PC Mode	DVD Mode
The input is connected to a computer	The input is connected to a multimedia application, such as a DVD, a set top box and so on
The EDID is available at all times (to prevent computer reset)	The EDID is available only when that input is connected to an output
The input EDID source is the default EDID or an acquired EDID (see section 7.2)	The input EDID source is acquired directly from the connected output

7.2 Acquiring the EDID

The acquired EDID is used when an input is set to the PC mode.

To acquire the EDID, do the following:

1. Turn the POWER off.
2. Press the PANEL LOCK button and the INPUT 16 button while turning the POWER on again.
The INPUT buttons blink in sequence until the unit has completed to read the EDID.
3. Release the PANEL LOCK and INPUT 16 buttons.

If an output was connected, the output EDID is read to all the inputs. If an output was not connected to the machine, the default EDID is read to the inputs.

7.3 Controlling via RS-232 (for example, using 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.

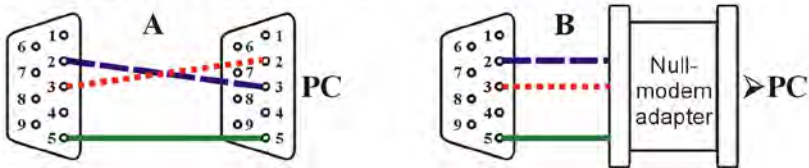


Figure 3: Connecting a PC without Using a Null-modem Adapter

7.4 Controlling via ETHERNET

You can connect the **VS-161H** 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 router¹.

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

You can connect the Ethernet port of the **VS-161H** to the Ethernet port on your PC, via a crossover cable with RJ-45 connectors.

This type of connection is recommended for identifying the **VS-161H** with the factory configured default IP address

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 4](#)).

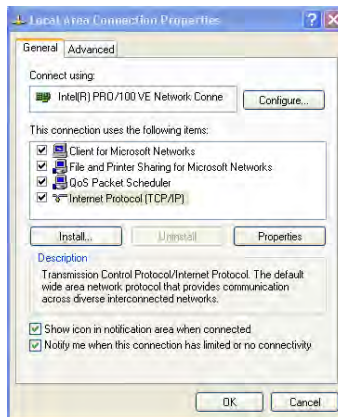


Figure 4: Local Area Connection Properties Window

6. Select Use the following IP Address, and fill in the details as shown in [Figure 5](#).
7. Click **OK**.

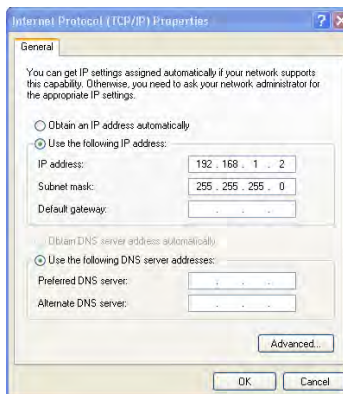


Figure 5: Internet Protocol (TCP/IP) Properties Window

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

You can connect the Ethernet port of the **VS-161H** to the Ethernet port on a network hub or network router, via a straight-through cable with RJ-45 connectors.

7.4.3 Control Configuration via the Ethernet Port

To control several units via the Ethernet, connect the Master unit (Machine # 1) via the Ethernet port to the LAN port of your PC. Use your PC initially to configure the settings.

8 Technical Specifications

[Table 3](#) includes the technical specifications:

Table 3: Technical Specifications¹ of the VS-161H

INPUTS:	16 HDMI connectors
OUTPUT:	1 HDMI connector
BANDWIDTH:	Supports up to 1.65Gbps bandwidth per graphic channel
COMPLIANCE WITH HDMI STANDARD:	Supports HDMI and HDCP
RESOLUTION:	Up to UXGA; 1080p
POWER SOURCE:	90–240VAC; 50/60Hz, 22VA
CONTROLS:	Front panel buttons, infrared remote control transmitter, RS-232, Ethernet
DIMENSIONS:	19" x 7" x 1U (W, D, H)
WEIGHT:	2.5kg (5.5lbs) approx.
ACCESSORIES:	Power cord, null-modem adapter, rack "ears", IR remote control
OPTIONS:	Kramer HDMI cables ²

¹ Specifications are subject to change without notice

² 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 Kramer Protocol 2000

The **VS-161H** is compatible with Kramer's Protocol 2000¹ (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 4: 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	6	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.

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

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 5: Instruction Codes for Protocol 2000

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

#	INSTRUCTION	DEFINITION FOR SPECIFIC INSTRUCTION		NOTE
		DESCRIPTION	INPUT	
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
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 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

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 three 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.



Caution

Safety Warning:

Disconnect the unit from the power supply before opening/servicing.



Kramer Electronics, Ltd.

Web site: www.kramerelectronics.com

E-mail: info@kramereel.com

P/N: 2900-000665 REV 2