Kramer Electronics, Ltd.

USER MANUAL

Model:
VM-4H
1:4 HDMI Distributor
Contents

1 Introduction 1
2 Getting Started 1
  2.1 Quick Start 2
3 Overview 3
  3.1 About HDMI 3
  3.2 Defining EDID 4
  3.3 Recommendations for Best Performance 5
4 Your VM-4H 1:4 HDMI Distributor 5
5 Installing the VM-4H on a Rack 7
6 Connecting a VM-4H 1:4 HDMI Distributor 8
7 Acquiring the EDID 9
  7.1 The Simple Operation State 9
  7.2 The Normal Operation State 10
  7.2.1 Acquiring the EDID from a Selected Output 10
  7.2.2 Restoring the Default EDID 10
  7.2.3 Acquiring the Auto EDID 10
8 Technical Specifications 11

Figures

Figure 1: VM-4H 1:4 HDMI Distributor 6
Figure 2: Connecting a VM-4H 1:4 HDMI Distributor 9

Tables

Table 1: VM-4H 1:4 HDMI Distributor Features 7
Table 2: Technical Specifications of the VM-4H 1:4 HDMI Distributor 11
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 VM-4H 1:4 HDMI Distributor. The VM-4H is ideal for:
• Home theater, presentation and multimedia applications
• Rental and staging

Note, that the Kramer VM-4H is identical to the VM-4HDMI; just the name has changed replacing the suffix “HDMI” by “H” (according to the HDMI Guideline).

The package includes the following items:
• VM-4H 1:4 HDMI Distributor
• Power cord and rack “ears”
• This user manual²

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 cables³

¹ GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Matrix Switchers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters; GROUP 11: Sierra Products
² Download up-to-date Kramer user manuals from our Web site at http://www.kramerelectronics.com
³ 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 Input and outputs - see section 6**

1. Connect the input
2. Connect the outputs

**Step 3: Turn the power ON**

**Step 4: Acquire EDID - see section 7**

**SET THE OPERATION STATE**

**THE NORMAL OPERATION STATE**
Turn the machine ON while pressing the SELECT button

- Acquire the EDID from:
  - A connected output
  - Several connected outputs
  - The default EDID

**THE SIMPLE OPERATION STATE**
Turn the machine ON while pressing the READ button

The default EDID is sent to the input automatically.
Overview

The Kramer VM-4H is a high quality 1:4 HDMI distributor that accepts an HDMI input and distributes the signal to four outputs, allowing one or more of the outputs to be connected to receiving devices, thus making it a versatile, reliable component in a video system. The VM-4H distributes signals having resolutions up to UXGA, including all HDTV formats.

In particular, the VM-4H:

- Supports up to 2.25Gbps bandwidth per graphic channel\(^1\)
- Equalizes and reclocks the data
- Has I-EDIDPro™ Kramer Intelligent EDID Processing™, an intelligent EDID handling and processing algorithm that ensures Plug and Play operation for HDMI systems
- Can read and store, in non-volatile memory, the EDID\(^2\) block from one or more outputs, so it can then provide the EDID information to the HDMI source even if the display device is not connected
- Includes five HDMI connectors, four output status LEDs, an active status LED, as well as EDID read and select buttons

The VM-4H is housed in a 19" 1U rack-mountable enclosure, and is fed from a 100-264V AC universal switching power supply.

3.1 About HDMI

High-Definition Multimedia Interface (HDMI) is an uncompressed all-digital\(^3\) audio/video interface, widely supported in the entertainment and home cinema industry. It delivers the highest high-definition image and sound quality.

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1 Suitable for resolutions up to UXGA at 60Hz, and for all HD resolutions
2 EDID is Extended Display Identification Data
3 Ensuring an all-digital rendering of video without the losses associated with analog interfaces and their unnecessary digital-to-analog conversions
In particular, HDMI\textsuperscript{1}:

- Provides a simple\textsuperscript{2} 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 lengthy\textsuperscript{3} cable
- Supports standard, enhanced, high-definition video, and multi-channel digital audio\textsuperscript{4} 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 cable\textsuperscript{5}, 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

### 3.2 Defining EDID

The Extended Display Identification Data (EDID\textsuperscript{6}) is a data-structure, provided by a display, to describe its capabilities to a graphics card (that is connected to the display’s source). The EDID enables the VM-4H 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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\textsuperscript{1} HDMI, the HDMI logo and High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI licensing LLC

\textsuperscript{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

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

\textsuperscript{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

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

\textsuperscript{6} Defined by a standard published by the Video Electronics Standards Association (VESA)
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 VM-4H away from moisture, excessive sunlight and dust

4 **Your VM-4H 1:4 HDMI Distributor**

*Figure 1* and *Table 1* define the VM-4H 1:4 HDMI Distributor:
Your VM-4H 1:4 HDMI Distributor

Figure 1: VM-4H 1:4 HDMI Distributor
### Table 1: VM-4H 1:4 HDMI Distributor Features

<table>
<thead>
<tr>
<th>#</th>
<th>Feature</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>POWER Switch</td>
<td>Illuminated switch for turning the unit ON or OFF</td>
</tr>
<tr>
<td>2</td>
<td>ACTIVE LED</td>
<td>Illuminates when the input is active; flashes when the input is not valid</td>
</tr>
<tr>
<td>3</td>
<td>EDID READ Button</td>
<td>Press to read the EDID of the selected display</td>
</tr>
<tr>
<td>4</td>
<td>SELECT Button</td>
<td>Select the desired display for EDID information</td>
</tr>
<tr>
<td>5</td>
<td>OUTPUTS LEDs</td>
<td>LEDs light when an output(s) is connected and active; LEDs flash when selecting EDID (see section 7)</td>
</tr>
<tr>
<td>6</td>
<td>INPUT HDMI Connector</td>
<td>Connects to the HDMI source</td>
</tr>
<tr>
<td>7</td>
<td>OUTPUT HDMI Connectors</td>
<td>Connect to the HDMI acceptors (from 1 to 4)</td>
</tr>
<tr>
<td>8</td>
<td>Power Connector with Fuse</td>
<td>AC connector enabling power supply to the unit</td>
</tr>
</tbody>
</table>

### 5 Installing the VM-4H on a Rack

This section provides instructions for rack mounting the unit.

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**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.

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Before installing in a rack:
- 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.kamerelectronics.com
6 Connecting a VM-4H 1:4 HDMI Distributor

To connect the VM-4H as a 1:4 HDMI distributor, do the following:

1. Connect an HDMI source (for example, a DVD player) to the INPUT connector.

2. Connect the four OUTPUT connectors¹ to up to four HDMI acceptors, as follows:
   - OUTPUT 1 connector to HDMI acceptor 1 (for example, an LCD TV)
   - OUTPUT 2 connector to HDMI acceptor 2 (for example, a plasma display)
   - OUTPUT 3 connector to HDMI acceptor 3 (for example, a plasma display)
   - OUTPUT 4 connector to HDMI acceptor 4 (for example, a plasma display)

3. Connect the power cord to the mains electricity.

4. Turn ON the POWER.

5. Acquire EDID (see section 7).

¹ As required. Up to 4 outputs can be connected on the VM-4H. Not all outputs need to be connected.
7 Acquiring the EDID

The VM-4H initially operates with the default EDID. This means that you can turn ON the power before connecting any of the acceptors or the source.

This section describes the two EDID working modes, the:
- Simple mode (see section 7.1)
- Normal mode (see section 7.2)

7.1 The Simple Operation State

In the Simple operation state, the READ and SELECT front panel buttons are disabled, and the default EDID is passed directly to the input.

To enter the Simple Operation State, turn the machine ON while pressing the READ button.

LEDS 3 and 4 flash three times
7.2 The Normal Operation State

In the Normal operation state, you can toggle between the following working modes:

- Sending the EDID from a selected output to the input (see section 7.2.1)
- Sending the default EDID to the input (see section 7.2.2)
- Sending the auto\(^1\) EDID to the input (see section 7.2.3)

To enter the Normal Operation State, turn the machine ON while pressing the SELECT button. LEADS 1 and 2 flash three times.

7.2.1 Acquiring the EDID from a Selected Output

To select an EDID from a selected output, do the following:

1. Press the SELECT button, as required, to reach the desired output, which flashes.
2. Press the READ button.
   The EDID of the selected output is stored in the non-volatile memory when the READ button no longer illuminates as well as the selected output LED.

7.2.2 Restoring the Default EDID

To restore the default EDID, do the following:

1. Press the SELECT button several times until the OUTPUT LEDs flash simultaneously.
2. Press the READ button.
   The READ button illuminates.
   The default EDID is stored in the non-volatile memory when the READ button no longer illuminates as well as the output LEDs.

7.2.3 Acquiring the Auto EDID

To acquire the Auto EDID, do the following:

1. Press the SELECT button several times until the OUTPUT LEDs flash in sequence.
2. Press the READ button.
   The READ button illuminates.

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\(^1\) The auto EDID is an adjusted calculation of the EDIDs of all the connected outputs
The auto EDID is stored in the non-volatile memory when the READ button no longer illuminates as well as the output LEDs.

8 Technical Specifications

Table 2 includes the technical specifications:

Table 2: Technical Specifications\(^1\) of the VM-4H 1:4 HDMI Distributor

<table>
<thead>
<tr>
<th>INPUT:</th>
<th>HDMI connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>OUTPUTS:</td>
<td>4 HDMI connectors</td>
</tr>
<tr>
<td>BANDWIDTH:</td>
<td>Supports up to 2.25Gbps bandwidth per graphic channel</td>
</tr>
<tr>
<td>COMPLIANCE WITH HDMI STANDARD:</td>
<td>Supports HDMI and HDCP</td>
</tr>
<tr>
<td>CONTROLS:</td>
<td>SELECT and READ buttons for selecting and storing EDID information</td>
</tr>
<tr>
<td>INDICATOR LEDS:</td>
<td>OUTPUTS 1 to 4, and ACTIVE LED</td>
</tr>
<tr>
<td>POWER SOURCE:</td>
<td>100-264V AC, 50/60Hz, 16VA</td>
</tr>
<tr>
<td>DIMENSIONS:</td>
<td>19” x 7” x 1U W, D, H rack mountable</td>
</tr>
<tr>
<td>WEIGHT:</td>
<td>2.5kg (5.5lbs) approx.</td>
</tr>
<tr>
<td>ACCESSORIES:</td>
<td>Power cord, rack “ears”</td>
</tr>
<tr>
<td>OPTIONS:</td>
<td>HDMI/HDMI male-to-male cables</td>
</tr>
</tbody>
</table>

\(^1\) Specifications are subject to change without notice
LIMITED WARRANTY
Kramer Electronics (hereafter Kramer) warrants this product free from defects in material and workmanship under the following terms.

HOW LONG IS THE WARRANTY
Labor and parts are warranted for seven years from the date of the first customer purchase.

WHO IS PROTECTED?
Only the first purchase customer may enforce this warranty.

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

1. Any product which is not distributed by Kramer, or which is not purchased from an authorized Kramer dealer. If you are uncertain as to whether a dealer is authorized, please contact Kramer at one of the agents listed in the Web site www.kramerelectronics.com.
2. Any product, on which the serial number has been defaced, modified or removed, or on which the WARRANTY VOID IF TAMPERED sticker has been torn, reattached, removed or otherwise interfered with.
3. Damage, deterioration or malfunction resulting from:
   i) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature
   ii) Product modification, or failure to follow instructions supplied with the product
   iii) Repair or attempted repair by anyone not authorized by Kramer
   iv) Any shipment of the product (claims must be presented to the carrier)
   v) Removal or installation of the product
   vi) Any other cause, which does not relate to a product defect
   vii) Cartons, equipment enclosures, cables or accessories used in conjunction with the product

WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR
We will pay labor and material expenses for covered items. We will not pay for the following:
1. Removal or installations charges.
2. Costs of initial technical adjustments (set-up), including adjustment of user controls or programming. These costs are the responsibility of the Kramer dealer from whom the product was purchased.
3. Shipping charges.

HOW YOU CAN GET WARRANTY SERVICE
1. To obtain service on your 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.

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.