



KRAMER ELECTRONICS LTD.

USER MANUAL

MODEL:

VM-400HDCP

1:4 DVI Distributor

P/N: 2900-300054 Rev 2

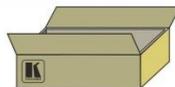


VM-400HDCP Quick Start Guide

This guide helps you install and use your product for the first time. For more detailed information, go to http://www.kramerelectronics.com/support/product_downloads.asp to download the latest manual or scan the QR code on the left.

Step 1: Check what's in the box

- VM-400HDCP 1:4 DVI Distributor
- 1 Quick start guide
- Power adapter (5V DC output)
- 4 Rubber feet



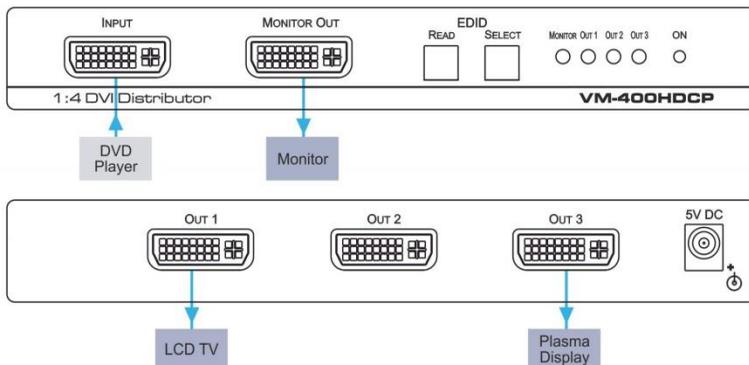
Save the original box and packing material should you need to return your VM-400HDCP for service.

Step 2: Install the VM-400HDCP

Mount the device in a rack (using the optional RK-2TB rack adapter) or place it on a shelf.

Step 3: Connect the input and outputs

Always switch off the power to all devices before connecting them to your VM-400HDCP.



Always use Kramer high-performance cables for connecting AV equipment to the VM-400HDCP.

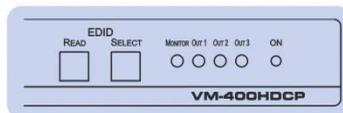
Step 4: Connect the power



Connect the power adapter to the VM-400HDCP and plug the adapter into the mains electricity.

Step 5: Optional—Set the EDID - see Section 6

- Press the EDID SELECT button to cycle through the EDID sources in the following order:
 - Monitor (Monitor LED flashes)
 - Output 1 (Output 1 LED lights)
 - Output 2 (Output 2 LED lights)
 - Output 3 (Output 3 LED lights)
 - Default EDID (all LEDs light)
 - Auto-Mix EDID (the LEDs flash in a running sequence)
- To store the EDID, press EDID READ and the EDID is acquired.



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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 that are clearly defined by function: 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 and GROUP 11: Sierra Products.

Congratulations on purchasing your Kramer MegaTOOLS® **VM-400HDCP 1:4 DVI Distributor**, which is ideal for the following typical applications:

- Home theater, presentation and multimedia applications
- Rental and staging

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



Go to http://www.kramerelectronics.com/support/product_downloads.asp to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

2.1 Achieving the Best Performance

To achieve the best performance:

- Use only good quality connection cables (we recommend Kramer high-performance, high-resolution cables) to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)
- Do not secure the cables in tight bundles or roll the slack into tight coils
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality
- Position your Kramer **VM-400HDCP** away from moisture, excessive sunlight and dust



This equipment is to be used only inside a building. It may only be connected to other equipment that is installed inside a building.

2.2 Safety Instructions



Caution: There are no operator serviceable parts inside the unit

Warning: Use only the Kramer Electronics input power wall adapter that is provided with the unit

Warning: Disconnect the power and unplug the unit from the wall before installing

2.3 Recycling Kramer Products

The Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC aims to reduce the amount of WEEE sent for disposal to landfill or incineration by requiring it to be collected and recycled. To comply with the WEEE Directive, Kramer Electronics has made arrangements with the European Advanced Recycling Network (EARN) and will cover any costs of treatment, recycling and recovery of waste Kramer Electronics branded equipment on arrival at the EARN facility. For details of Kramer's recycling arrangements in your particular country go to our recycling pages at <http://www.kramerelectronics.com/support/recycling/>.

3 Overview

The high quality **VM-400HDCP** accepts an HDMI signal and distributes the selected signal to up to four outputs over DVI connectors.

The **VM-400HDCP** features:

- Maximum data rate of 4.95Gbps (1.65Gbps per graphic channel)
- I-EDIDPro™ Kramer Intelligent EDID Processing™, an intelligent EDID handling & processing algorithm that ensures Plug and Play operation for DVI/HDMI systems
- Support for HDCP signals
- Equalization and reclocking of the data
- The ability to use a default EDID or acquire the EDID from one output or from all connected outputs (auto-mix)
- A MegaTOOLS® sized enclosure where the device can be mounted in a rack using the optional **RK-T2B** adapter

4 Defining the VM-400HDCP 1:4 DVI Distributor

[Figure 1](#) defines the front panel of the **VM-400HDCP**.

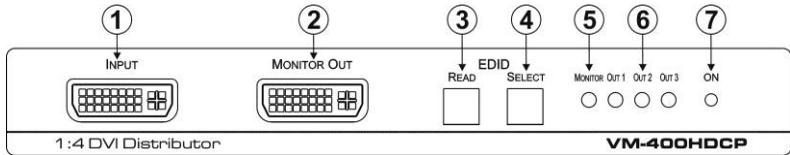


Figure 1: VM-400HDCP 1:4 DVI Distributor Front Panel

#	Feature	Function
1	<i>INPUT</i> DVI Connector	Connect to a DVI source
2	<i>MONITOR OUT</i> DVI Loop Connector	Connect to a DVI acceptor for input monitoring
3	<i>EDID</i>	<i>READ</i> Button Press to acquire the EDID following selecting the EDID source. Press again to indicate the EDID status (see Section 6) Lights when configuring the EDID
4		<i>SELECT</i> Button Press to select the EDID source (single output, Auto-Mix or default), see Section 6 Lights when configuring the EDID
5	<i>MONITOR LED</i>	Lights green when an output is connected to the Monitor Out connector and is active. The LED flashes to indicate the source of the EDID acquired (see Section 6) or when connecting a non HDCP display while providing HDCP content to the VM-400HDCP
6	<i>OUT1, OUT 2, OUT 3</i> LEDs	Lights green when an output is connected and is active. The LED flashes to indicate the source of the EDID acquired (see Section 6) or when connecting a non HDCP display while providing HDCP content to the VM-400HDCP
7	<i>ON LED</i>	Lights green when the device receives power

Figure 2 defines the rear panel of the VM-400HDCP.

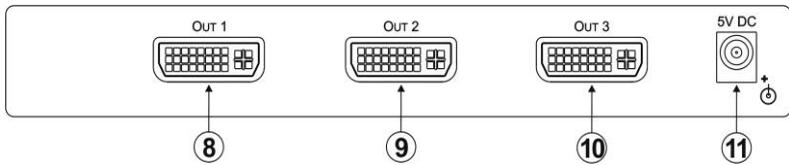


Figure 2: VM-400HDCP 1:4 DVI Distributor Rear Panel

#	Feature	Function
8	<i>OUT 1</i> DVI Connector	Connect to a DVI acceptor
9	<i>OUT 2</i> DVI Connector	Connect to a DVI acceptor
10	<i>OUT 3</i> DVI Connector	Connect to a DVI acceptor
11	<i>5V DC</i> Connector	Connect to the power adapter, center pin positive

5 Connecting the VM-400HDCP



Always switch off the power to any device before connecting it to your **VM-400HDCP**. After connecting your **VM-400HDCP**, connect its power and then switch on the power to the other devices.

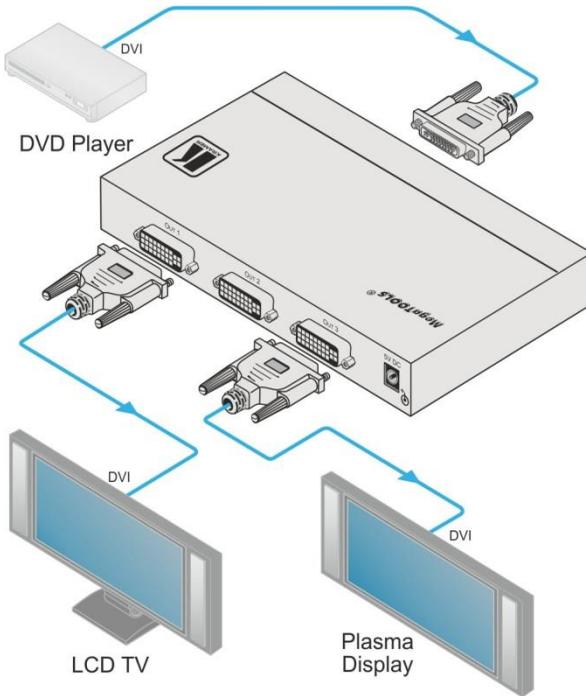


Figure 3: Connecting the VM-400HDCP 1:4 DVI Distributor

To connect the **VM-400HDCP** as illustrated in the example in [Figure 3](#):

1. Connect the DVI source (for example, a DVD player) to the DVI Input connector on the front panel.
2. Connect the DVI outputs and loop monitor to up to four DVI acceptors (for example, an LCD TV and a plasma display).
3. Connect the power adapter to the **VM-400HDCP** and to the mains electricity (not shown in [Figure 3](#)).

6 Acquiring the EDID

Each input on the **VM-400HDCP** has a factory default EDID loaded (see [Section 8](#)). This lets you connect the power before having to connect one of the acceptors.

The factory-default is the EDID which is programmed into the VM-400HDCP before being shipped.

The EDID can be acquired from:

This is usually done only once when the machine is being set up in an installation. Once acquired, the EDID is saved in non-volatile memory and further acquisition is not necessary.

- One output
- The default EDID
- Up to four connected outputs using the Auto-mix Mode

The EDID acquired is taken from the common resolutions of all the connected outputs. For example, if several displays with different resolutions are connected to the outputs, the acquired EDID supports the common resolutions, as well as other parameters included in the EDID.

Repeatedly pressing the EDID SELECT button cycles through the EDID sources in the following order:

If you attempt to acquire the EDID from an output that is not connected the default EDID is acquired.

- Monitor (Monitor LED flashes)
- Output 1 (Output 1 LED flashes)
- Output 2 (Output 2 LED flashes)
- Output 3 (Output 3 LED flashes)
- Default EDID (all LEDs flash)
- Auto-Mix EDID (all LEDs light)

To store the selected EDID, press EDID READ as described in the following examples.

To cancel the EDID modification wait for a few seconds without touching any button.

To acquire the EDID from Output 3:

1. Press the EDID SELECT button repeatedly until OUTPUT 3 LED flashes.
2. Press and hold the EDID READ button until the LED stops flashing.
The EDID from Output 3 is now stored at the input.

To acquire the EDID from auto-mix:

1. Press the EDID SELECT button repeatedly until all OUTPUT LEDs light.
2. Press and hold the EDID READ button until the LEDs turn off.
The auto-mix EDID is now stored at the input.

To check which EDID is stored:

Briefly press the EDID SELECT button once. The relevant LEDs indicate which EDID is stored at the input as follows:

- The MONITOR LED flashes—the EDID from MONITOR was the last acquired
- OUTPUT 1 LED flashes—the EDID from OUTPUT 1 was the last acquired
- OUTPUT 2 LED flashes—the EDID from OUTPUT 2 was the last acquired, and so on
- All OUTPUT LEDs flash—the default EDID was the last acquired
- All OUTPUT LEDs light—the Auto-Mix EDID was the last acquired

The EDID acquired is taken from the common resolutions of all the connected outputs. For example, if several displays with different resolutions are connected to the outputs, the acquired EDID supports the common resolutions, as well as other parameters included in the EDID.

7 Technical Specifications

INPUT:	1 DVI connector
OUTPUTS:	4 DVI connectors
BANDWIDTH:	4.95Gbps (1.65Gbps per graphic channel)
STANDARD COMPLIANCE:	Supports HDCP
INDICATOR LEDs:	POWER, OUTPUT
POWER CONSUMPTION:	5V DC, 1.2A
OPERATING TEMPERATURE:	0° to +40°C (32° to 104°F)
STORAGE TEMPERATURE:	-40° to +70°C (-40° to 158°F)
HUMIDITY:	10% to 90%, RHL non-condensing
DIMENSIONS:	18.8cm x 11.27cm x 2.57cm (7.4" x 4.44" x 1.01") W, D, H
WEIGHT:	0.42kg (0.93lbs) approx.
ACCESSORIES:	Power supply
OPTIONS:	RK-T2B 19" rack adapter
Specifications are subject to change without notice at http://www.kramerelectronics.com	

8 Default EDID

Monitor

Model name..... VM400HDCP
Manufacturer..... KRM
Plug and Play ID..... KRM0400
Serial number..... 505-707455010
Manufacture date..... 2009, ISO week 10
Filter driver..... None

EDID revision..... 1.3
Input signal type..... Digital
Color bit depth..... Undefined
Display type..... RGB color
Screen size..... 520 x 320 mm (24.0 in)
Power management..... Standby, Suspend, Active off/sleep
Extension blocs..... 1 (CEA-EXT)

DDC/CI..... n/a

Color characteristics

Default color space..... Non-sRGB
Display gamma..... 2.20
Red chromaticity..... Rx 0.674 - Ry 0.319
Green chromaticity..... Gx 0.188 - Gy 0.706
Blue chromaticity..... Bx 0.148 - By 0.064
White point (default)... Wx 0.313 - Wy 0.329
Additional descriptors... None

Timing characteristics

Horizontal scan range.... 30-83kHz
Vertical scan range..... 56-76Hz
Video bandwidth..... 170MHz
CVT standard..... Not supported
GTF standard..... Not supported
Additional descriptors... None
Preferred timing..... Yes
Native/preferred timing.. 1280x720p at 60Hz (16:10)
Modeline..... "1280x720" 74.250 1280 1390 1430 1650 720 725 730 750 +hsync +vsync

Standard timings supported

720 x 400p at 70Hz - IBM VGA
640 x 480p at 60Hz - IBM VGA
640 x 480p at 75Hz - VESA
800 x 600p at 60Hz - VESA
800 x 600p at 75Hz - VESA
1024 x 768p at 60Hz - VESA
1024 x 768p at 75Hz - VESA
1280 x 1024p at 75Hz - VESA
1280 x 1024p at 60Hz - VESA STD
1600 x 1200p at 60Hz - VESA STD
1152 x 864p at 75Hz - VESA STD

EIA/CEA-861 Information

Revision number..... 3
IT underscan..... Supported
Basic audio..... Supported
YCbCr 4:4:4..... Supported
YCbCr 4:2:2..... Supported
Native formats..... 1
Detailed timing #1..... 1920x1080p at 60Hz (16:10)
Modeline..... "1920x1080" 148.500 1920 2008 2052 2200 1080 1084 1089 1125 +hsync +vsync
Detailed timing #2..... 1920x1080i at 60Hz (16:10)
Modeline..... "1920x1080" 74.250 1920 2008 2052 2200 1080 1084 1094 1124 interlace +hsync +vsync
Detailed timing #3..... 1280x720p at 60Hz (16:10)
Modeline..... "1280x720" 74.250 1280 1390 1430 1650 720 725 730 750 +hsync +vsync
Detailed timing #4..... 720x480p at 60Hz (16:10)
Modeline..... "720x480" 27.000 720 736 798 858 480 489 495 525 -hsync -vsync

CE video identifiers (VICs) - timing/formats supported

1920 x 1080p at 60Hz - HDTV (16:9, 1:1)
1920 x 1080i at 60Hz - HDTV (16:9, 1:1)
1280 x 720p at 60Hz - HDTV (16:9, 1:1) [Native]
720 x 480p at 60Hz - EDTV (16:9, 32:27)
720 x 480p at 60Hz - EDTV (4:3, 8:9)
720 x 480i at 60Hz - Doublescan (16:9, 32:27)
720 x 576i at 50Hz - Doublescan (16:9, 64:45)
640 x 480p at 60Hz - Default (4:3, 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 vendor specific data (VSDB)

IEEE registration number. 0x000C03
CEC physical address..... 1.0.0.0
Maximum TMDS clock..... 165MHz

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

Report information

Date generated..... 19-Jan-12
Software revision..... 2.60.0.972
Data source..... File
Operating system..... 5.1.2600.2.Service Pack 3

Raw data

00,FF,FF,FF,FF,FF,FF,00,2E,4D,00,04,01,01,01,01,0A,13,01,03,80,34,20,78,EA,B3,25,AC,51,30,B4,26,
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00,00,18,00,47

LIMITED WARRANTY

The warranty obligations of Kramer Electronics for this product are limited to the terms set forth below:

What is Covered

This limited warranty covers defects in materials and workmanship in this product.

What is Not Covered

This limited warranty does not cover any damage, deterioration or malfunction resulting from any alteration, modification, improper or unreasonable use or maintenance, misuse, abuse, accident, neglect, exposure to excess moisture, fire, improper packing and shipping (such claims must be presented to the carrier), lightning, power surges, or other acts of nature. This limited warranty does not cover any damage, deterioration or malfunction resulting from the installation or removal of this product from any installation, any unauthorized tampering with this product, any repairs attempted by anyone unauthorized by Kramer Electronics to make such repairs, or any other cause which does not relate directly to a defect in materials and/or workmanship of this product. This limited warranty does not cover cartons, equipment enclosures, cables or accessories used in conjunction with this product.

Without limiting any other exclusion herein, Kramer Electronics does not warrant that the product covered hereby, including, without limitation, the technology and/or integrated circuit(s) included in the product, will not become obsolete or that such items are or will remain compatible with any other product or technology with which the product may be used.

How Long Does this Coverage Last

Seven years as of this printing; please check our Web site for the most current and accurate warranty information.

Who is Covered

Only the original purchaser of this product is covered under this limited warranty. This limited warranty is not transferable to subsequent purchasers or owners of this product.

What Kramer Electronics will do

Kramer Electronics will, at its sole option, provide one of the following three remedies to whatever extent it shall deem necessary to satisfy a proper claim under this limited warranty:

1. Elect to repair or facilitate the repair of any defective parts within a reasonable period of time, free of any charge for the necessary parts and labor to complete the repair and restore this product to its proper operating condition. Kramer Electronics will also pay the shipping costs necessary to return this product once the repair is complete.
2. Replace this product with a direct replacement or with a similar product deemed by Kramer Electronics to perform substantially the same function as the original product.
3. Issue a refund of the original purchase price less depreciation to be determined based on the age of the product at the time remedy is sought under this limited warranty.

What Kramer Electronics will not do Under This Limited Warranty

If this product is returned to Kramer Electronics or the authorized dealer from which it was purchased or any other party authorized to repair Kramer Electronics products, this product must be insured during shipment, with the insurance and shipping charges prepaid by you. If this product is returned uninsured, you assume all risks of loss or damage during shipment. Kramer Electronics will not be responsible for any costs related to the removal or re-installation of this product from or into any installation. Kramer Electronics will not be responsible for any costs related to any setting up this product, any adjustment of user controls or any programming required for a specific installation of this product.

How to Obtain a Remedy under this Limited Warranty

To obtain a remedy under this limited warranty, you must contact either the authorized Kramer Electronics reseller from whom you purchased this product or the Kramer Electronics office nearest you. For a list of authorized Kramer Electronics resellers and/or Kramer Electronics authorized service providers, please visit our web site at www.kramerelectronics.com or contact the Kramer Electronics office nearest you.

In order to pursue any remedy under this limited warranty, you must possess an original, dated receipt as proof of purchase from an authorized Kramer Electronics reseller. If this product is returned under this limited warranty, a return authorization number, obtained from Kramer Electronics, will be required. You may also be directed to an authorized reseller or a person authorized by Kramer Electronics to repair the product.

If it is decided that this product should be returned directly to Kramer Electronics, this product should be properly packed, preferably in the original carton, for shipping. Cartons not bearing a return authorization number will be refused.

Limitation on Liability

THE MAXIMUM LIABILITY OF KRAMER ELECTRONICS UNDER THIS LIMITED WARRANTY SHALL NOT EXCEED THE ACTUAL PURCHASE PRICE PAID FOR THE PRODUCT. TO THE MAXIMUM EXTENT PERMITTED BY LAW, KRAMER ELECTRONICS IS NOT RESPONSIBLE FOR DIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF WARRANTY OR CONDITION, OR UNDER ANY OTHER LEGAL THEORY. Some countries, districts or states do not allow the exclusion or limitation of relief, special, incidental, consequential or indirect damages, or the limitation of liability to specified amounts, so the above limitations or exclusions may not apply to you.

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IF ANY PRODUCT TO WHICH THIS LIMITED WARRANTY APPLIES IS A "CONSUMER PRODUCT" UNDER THE MAGNUSON-MOSS WARRANTY ACT (15 U.S.C.A. §2301, ET SEQ.) OR OTHER APPLICABLE LAW, THE FOREGOING DISCLAIMER OF IMPLIED WARRANTIES SHALL NOT APPLY TO YOU, AND ALL IMPLIED WARRANTIES ON THIS PRODUCT, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR THE PARTICULAR PURPOSE, SHALL APPLY AS PROVIDED UNDER APPLICABLE LAW.

Other Conditions

This limited warranty gives you specific legal rights, and you may have other rights which vary from country to country or state to state.

This limited warranty is void if (i) the label bearing the serial number of this product has been removed or defaced, (ii) the product is not distributed by Kramer Electronics or (iii) this product is not purchased from an authorized Kramer Electronics reseller. If you are unsure whether a reseller is an authorized Kramer Electronics reseller, please visit our Web site at www.kramerelectronics.com or contact a Kramer Electronics office from the list at the end of this document.

Your rights under this limited warranty are not diminished if you do not complete and return the product registration form or complete and submit the online product registration form. Kramer Electronics thanks you for purchasing a Kramer Electronics product. We hope it will give you years of satisfaction.



For the latest information on our products and a list of Kramer distributors, visit our Web site where updates to this user manual may be found.

We welcome your questions, comments, and feedback.

Web site: www.kramerelectronics.com

E-mail: info@kramerel.com



SAFETY WARNING

Disconnect the unit from the power supply before opening and servicing

P/N: 2900-300054



Rev: 2

