KRAMER ELECTRONICS LTD.

# USER MANUAL

MODEL:

**VM-73**
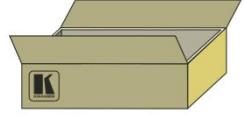Multiformat 1:3 Distribution
Amplifier

# VM-73 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-73** Multiformat 1:3 Distribution Amplifier
☑ 1 Power cord
☑ 1 Set of rack "ears"
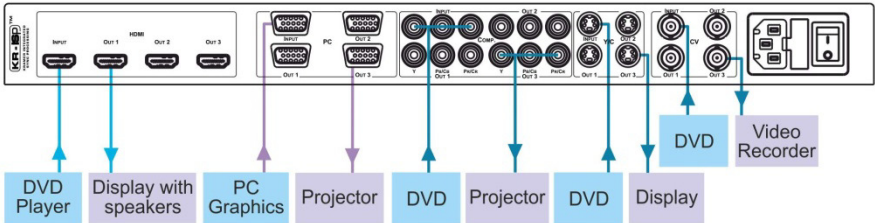☑ 4 Rubber feet
☑ 1 Quick Start sheet

Save the original box and packaging materials in case you need to return your **VM-73** for service.

## Step 2: Install the VM-73

Mount the VM-73 in a rack (using the included rack "ears") or attach the rubber feet and place on a table.

## Step 3: Connect the inputs and outputs

Always switch off the power on each device before connecting it to your **VM-73**.



DVD Player | Display with speakers | PC Graphics | Projector | DVD | Projector | DVD | Display | DVD | Video Recorder

Always use Kramer high-performance cables for connecting AV equipment to the **VM-73.**

## Step 4: Connect the power

Connect the power cord to the **VM-73** and plug it into the mains electricity.

# Contents

# Figures

# 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 video, audio, presentation, and broadcasting professionals 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 Routers; 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 **VM-73** *Multiformat 1*:*3 Distribution Amplifier*, which is ideal for the following typical applications:

- Video reproduction in studios
- School and university presentations

# 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

- Use only the power cord that is supplied with this machine

Go to http://www.kramerelectronics.com 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 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-73** away from moisture, excessive sunlight and dust

## 2.2     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 **VM-73** is a high-performance distribution amplifier for HDMI, computer graphics, component video, s-Video and composite video signals. The unit takes one input of each video format and distributes each input to three identical outputs.

Specifically, the **VM-73** features:

- Multiformat operation: composite, component, Y/C, XGA and HDMI
- High bandwidth (-3dB) of 430MHz for composite video, 440MHz for Y/C, 430MHz for component video, 405MHz for XGA and 2.25Gbps for HDMI
- HDTV compatibility
- HDMI and HDCP compatibility
- The ability to pass EDID information from PC OUT 1 to the PC input
- The option to acquire the EDID information from the highest priority connected HDMI output
  OUT 1 being the highest priority output and OUT 3 the lowest (see Section 5.1.2)
- A worldwide power supply 100-240V AC
- A standard 19" rack mount size, rack "ears" included

## 3.1 Defining the VM-73 Multiformat 1:3 Distribution Amplifier
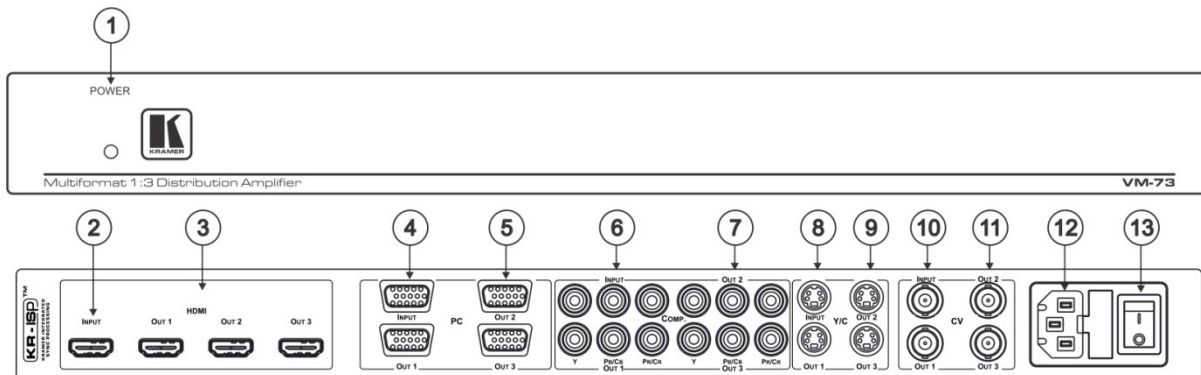
This section defines the **VM-73**.

Figure 1: VM-73 Multiformat 1:3 Distribution Amplifier Front Panel

| # | Feature | Function |
|---|---------|----------|
| 1 | *POWER* LED | Lights green when receiving power |
| 2 | *HDMI INPUT* Connector | Connects to the HDMI source |
| 3 | *HDMI OUT* Connectors | Connect to the HDMI acceptors (1 to 3) |
| 4 | *PC INPUT* 15-pin HD Connector | Connects to the computer graphics source |
| 5 | *PC OUT* 15-pin HD Connectors | Connect to the computer graphic acceptors (1 to 3) |
| 6 | *COMP. INPUT RCA* Connectors | Connects to the component video source |
| 7 | *COMP. OUT RCA* Connectors | Connect to the component video (Y/Pr/Pb) acceptors (1 to 3) |
| 8 | *Y/C INPUT* s-Video Connector | Connects to the Y/C video source |
| 9 | *Y/C OUT* s-Video Connectors | Connect to the Y/C acceptors (1 to 3) |
| 10 | *CV INPUT* BNC Connector | Connects to the composite video source |
| 11 | *CV OUT* BNC Connectors | Connect to the composite video acceptors (1 to 3) |
| 12 | *POWER IN* with Fuse | AC connector and fuse enabling power supply to the unit |
| 13 | *POWER* Switch | Illuminated switch for turning the unit on and off |

# 4 Installing in a Rack

This section provides instructions for rack mounting the unit.

**Before installing in a rack**, be sure that the environment is within the recommended range:

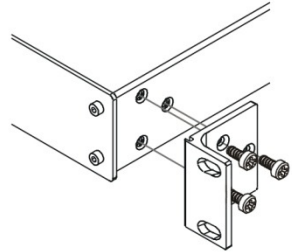| OPERATING TEMPERATURE: | 0° to +40°C (32° to 104°F) |
|---|---|
| STORAGE TEMPERATURE: | -40° to +70°C (-40° to 158°F) |
| HUMIDITY: | 10% to 90%, RHL non-condensing |

**!** **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.

**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 our Web site

# 5 Connecting the VM-73

> Always switch off the power to each device before connecting it to your **VM-73**. After connecting your **VM-73**, connect its power and then switch on the power to each device.

To connect the **VM-73** as illustrated in the example in Figure 2:

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

2.  Connect the three HDMI OUT connectors to up to three HDMI acceptors, (for example, LCD televisions with speakers).
    Not all outputs need to be connected.

3.  Connect a computer graphics input source (for example, a PC graphics card) to the PC INPUT 15-pin HD connector.

4.  Connect the three PC OUT 15-pin HD connectors to up to three PC acceptors (for example, VGA displays or projectors).

5.  Connect the component input source (for example, a DVD player) to the COMP. INPUT RCA connectors (Y/Pb/Pr or Y/Cb/Cr).

6.  Connect the three COMP. OUT connectors to up to three component acceptors (for example, component displays or projectors).

7.  Connect the Y/C input source (for example, a DVD player) to the Y/C INPUT s-Video connector.

8.  Connect the three Y/C OUT connectors to up to three Y/C acceptors (for example, displays).

9.  Connect the composite video input source (for example, a DVD player) to the CV INPUT BNC connector.

10. Connect the three CV OUT connectors to up to three CV acceptors, (for example, video recorders).

11. Connect the power cord to the mains electricity (not shown in Figure 2).
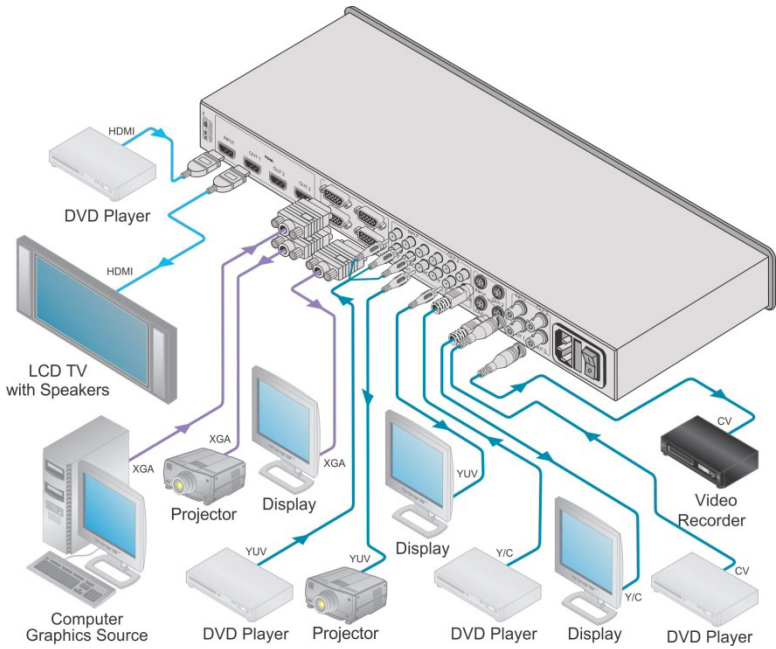
12. Turn the POWER on.



Figure 2: Connecting the VM-73 Multiformat 1:3 Distribution Amplifier

## 5.1 Reading the EDID

The **VM-73** PC input directly reads the EDID from the PC OUT 1 output (see Section 5.1.1), and allows the HDMI input to read the EDID of the HDMI outputs (see Section 5.1.2).

### 5.1.1 Reading the EDID from PC OUT 1

The EDID information of the output connected to PC OUT 1 goes directly to the PC input via pins 12 and 15 of the 15-pin HD connectors.

### 5.1.2 Reading the EDID from the HDMI Outputs

The EDID is always acquired from the highest priority output (OUT 1 being the highest and OUT 3 the lowest).

For example, if all three outputs are connected, the EDID will be read from OUT 1. If OUT 2 and OUT 3 are connected, the EDID will be read from OUT 2.

You can acquire the EDID by disconnecting (for 2 seconds) and then reconnecting the HDMI input.

To read the EDID (from OUT 2, for example), do the following:

1. Connect an acceptor to OUT 2 (OUT 3 can also be connected, but OUT 1 cannot).

2. Turn ON the POWER.

3. Disconnect the input for 2 seconds and then reconnect it.
   The input reads the OUT 2 EDID information.
   If you connect OUT 1, the EDID still remains that of OUT 2.

To acquire the default EDID, disconnect all the HDMI outputs, disconnect the HDMI input for 2 seconds and then reconnect it.

# 6    Technical Specifications

| | Composite | Y/C | Component | XGA | HDMI |
|---|---|---|---|---|---|
| INPUTS: | 1 composite on a BNC connector | 1 s-Video on a 4-pin connector | 1 component (Y, Pb/Cb, Pr/Cr) on 3 RCA connectors | 1 XGA on a 15-pin HD connector | 1 HDMI on an HDMI connector |
| OUTPUTS: | 3 composite on BNC connectors | 3 s-Video on 4-pin connectors | 3 component (Y, Pb/Cb, Pr/Cr) on 3 RCA connectors each | 3 XGA on 15-pin HD connectors | 3 HDMI on HDMI connectors |
| OUTPUT LEVEL: | 1.8Vpp | 1.9Vpp | 2.0Vpp | 2.0Vpp | |
| BANDWIDTH (-3dB): | 430MHz | 440MHz | 430MHz | 405MHz | 2.25Gbps |
| DIFF. GAIN: | 0.05% | 0.06% | 0.05% | 0.05% | |
| DIFF. PHASE: | 0.05Deg | 0.02Deg | 0.05Deg | 0.03Deg | |
| S/N RATIO @5MHz: | 62dB | 62dB | 74dB | 69dB | |
| COUPLING: | DC | Y-DC, C-AC | DC | DC | |
| K-FACTOR: | <0.05% | | | | |
| CROSSTALK (all hostile): | -60dB | | | | |
| POWER CONSUMPTION: | 100-240V AC, 100mA | | | | |
| 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 | 19 " x 7" x 1U  W, D, H | | | | |
| WEIGHT: | 2kg (4.4lbs) | | | | |
| ACCESSORIES: | Power cord, rack "ears" | | | | |
| Specifications are subject to change without notice  at http://www.kramerelectronics.com | | | | | |

## 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.

**Exclusive Remedy**

TO THE MAXIMUM EXTENT PERMITTED BY LAW, THIS LIMITED WARRANTY AND THE REMEDIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, REMEDIES AND CONDITIONS, WHETHER ORAL OR WRITTEN, EXPRESS OR IMPLIED. TO THE MAXIMUM EXTENT PERMITTED BY LAW, KRAMER ELECTRONICS SPECIFICALLY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IF KRAMER ELECTRONICS CANNOT LAWFULLY DISCLAIM OR EXCLUDE IMPLIED WARRANTIES UNDER APPLICABLE LAW, THEN ALL IMPLIED WARRANTIES COVERING THIS PRODUCT, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, SHALL APPLY TO THIS PRODUCT AS PROVIDED UNDER APPICABLE LAW.

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 APPICABLE 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

CE

ISO 9001:2008
IQC
Institute of
Quality & Control

! **SAFETY WARNING**
Disconnect the unit from the power
supply before opening and servicing

P/N: 2900-000544          Rev: 3