

**Kramer Electronics, Ltd.**



# **USER MANUAL**

**Model:**

**VM-22HD**

*2 x 1:2 HD/SD-SDI DA*

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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<sup>1</sup> that are clearly defined by function.

Thank you for purchasing the Kramer DigiTOOLS<sup>®</sup> **VM-22HD** *2 x 1:2 HD/SD-SDI DA*, which is ideal for:

- SDI production studios for signal distribution
- Broadcast studios for on-air operation and SDI field production
- Using with SDI video sources such a professional digital camera
- Signal equalization after long cable runs

The package includes the following items:

- The **VM-22HD** *2 x 1:2 HD/SD-SDI DA*
- Power supply (12V DC / 250mA)
- This user manual<sup>2</sup>

## 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<sup>3</sup>

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1 GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Matrix Switchers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalars; 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>



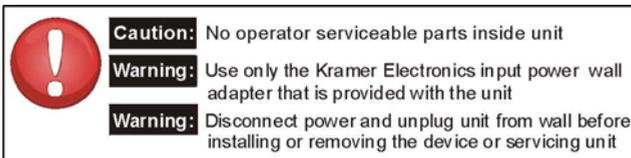
### 3 Overview

The **VM-22HD** 2 x 1:2 HD/SD-SDI DA is a high-performance 2 x 1:2 distributor for all SDI video signals. In particular, the **VM-22HD**:

- Transmits up to 200m
- Accepts two inputs and distributes each signal to two pairs of identical outputs using BNC connectors
- Has a video bandwidth of 1.485GHz that enables it to be used for standard-definition and high-definition serial digital video signals (SD/HD-SDI)
- Also passes digital information (embedded audio, Teletext, time code, and so on) during the video blanking period
- SMPTE 292M, 259M, 344M, and 372M (dual link application) compliance and data rates of 143, 177, 270, 360, 540, 1483.5, and 1485Mbps
- Provides automatic, multi-rate, equalization and reclocking to compensate for losses typical to long runs of 75Ω co-axial cable of up to 200m
- Has LEDs indicating the SDI resolution

To achieve the best performance:

- Use only good quality connection cables<sup>1</sup> 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 **VM-22HD** away from moisture, excessive sunlight and dust



<sup>1</sup> Available from Kramer Electronics on our Web site at <http://www.kramerelectronics.com>

## 4 Your VM-22HD 2 x 1:2 HD/SD-SDI DA

[Figure 1](#) and [Table 1](#) define the unit.

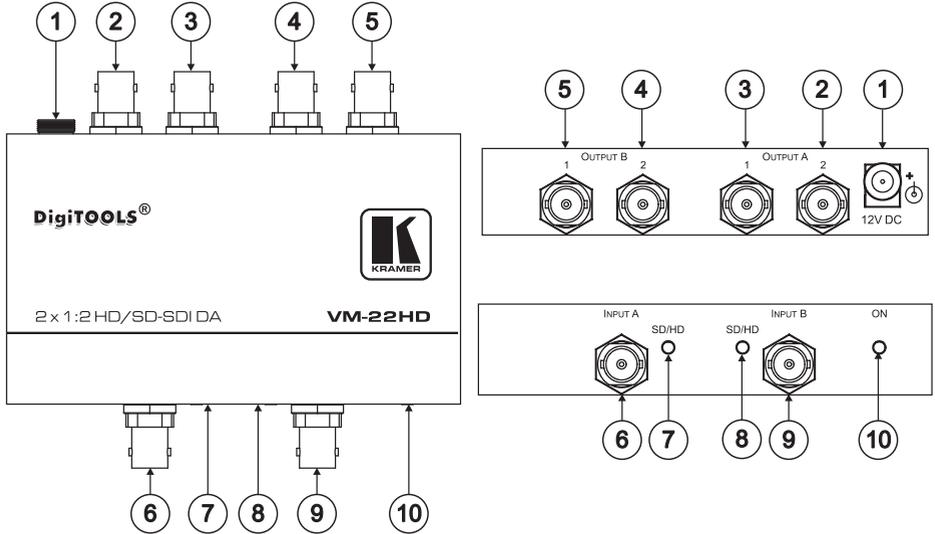


Figure 1: VM-22HD 2 x 1:2 HD/SD-SDI DA

Table 1: VM-22HD 2 x 1:2 HD/SD-SDI DA Functions

#	Feature	Function
1	12V DC Connector	+12V DC for powering the unit
2	OUTPUT A 2 BNC connector	Connects to the SDI A acceptor 2
3	OUTPUT A 1 BNC connector	Connects to the SDI A acceptor 1
4	OUTPUT B 2 BNC connector	Connects to the SDI B acceptor 2
5	OUTPUT B 1 BNC connector	Connects to the SDI B acceptor 1
6	INPUT A BNC connector	Connects to the SDI A source
7	SD <sup>1</sup> /HD <sup>2</sup> INPUT A LED	Illuminates blue for the HD-SDI signal, green for the SD-SDI signal on input A
8	SD/HD INPUT B LED	Illuminates blue for the HD-SDI signal, green for the SD-SDI signal on input B
9	INPUT B BNC connector	Connects to the SDI B source
10	ON LED	Illuminates green when receiving power

1 Standard Definition (SD) means an NTSC or PAL compatible video format, consisting of 480 (for NTSC) or 576 (for PAL) lines of interlaced video; as well as 480 and 576 line progressive scan video format

2 High Definition (HD) means a video format, consisting of either 720 active lines of progressive video or 1080 lines of either progressive or interlaced video

## 5 Connecting the VM-22HD 2 x 1:2 HD/SD-SDI DA

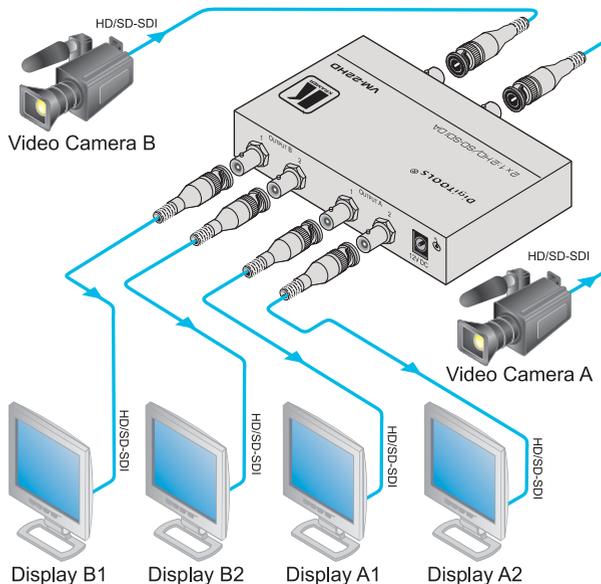
This section describes how to connect the **VM-22HD** in single link mode (see section [5.1](#)) and in dual link mode (see section [5.2](#)).

### 5.1 Connecting the VM-22HD in the Single Link Mode

To connect the **VM-22HD**, as shown in the example in [Figure 2](#), do the following<sup>1</sup>:

1. Connect one or two HD-SDI/SD-SDI video sources (for example, cameras) to the INPUT A and/or B BNC connectors.
2. Connect up to<sup>2</sup> four video OUTPUT BNC connectors to the appropriate HD-SDI/SD-SDI video acceptors (for example, displays).
3. Connect the 12V DC power adapter to the power socket and connect the adapter to the mains electricity (not shown in [Figure 2](#)).

The **VM-22HD** operates as soon as it is connected and powered on.



*Figure 2: Connecting the VM-22HD in Single Link Mode*

<sup>1</sup> Switch OFF the power on each device before connecting it to your **VM-22HD**. After connecting your **VM-22HD**, switch on its power and then switch on the power on each device

<sup>2</sup> You do not have to connect all outputs

## 5.2 Connecting the VM-22HD in the Dual Link Mode

To connect the **VM-22HD**, as the example in [Figure 3](#) illustrates, do the following<sup>1</sup>:

1. Connect one HD-SDI/SD-SDI video source (for example, a dual-link camera) to the INPUT A and B BNC connectors.
2. Connect OUTPUT A 1 and B 1 BNC connectors to a dual link HD-SDI/SD-SDI video acceptor (for example, display A).
3. Connect OUTPUT A 2 and B 2 BNC connectors to a dual link HD-SDI/SD-SDI video acceptor (for example, display B).
4. Connect the 12V DC power adapter to the power socket and connect the adapter to the mains electricity (not shown in [Figure 3](#)).

The **VM-22HD** operates as soon as it is connected and powered on.

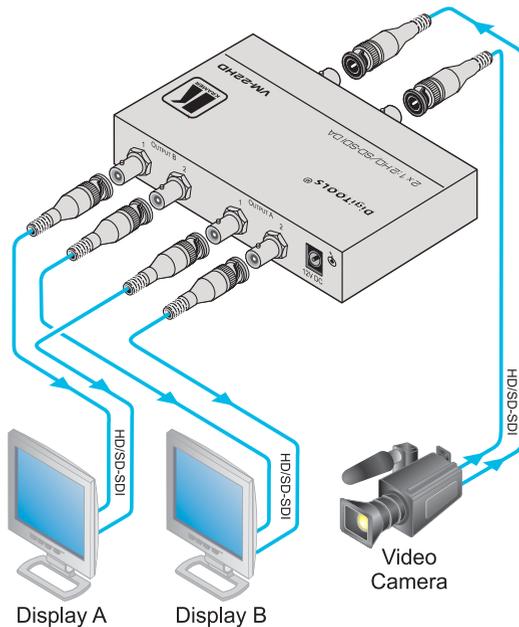


Figure 3: Connecting the VM-22HD in Dual Link Mode

<sup>1</sup> Switch OFF the power on each device before connecting it to your **VM-22HD**. After connecting your **VM-22HD**, switch on its power and then switch on the power on each device

## 6 Technical Specifications

The **VM-22HD** technical specifications are shown in [Table 2](#):

*Table 2: VM-22HD 2 x 1:2 HD/SD-SDI DA Technical Specifications<sup>1</sup>*

INPUTS:	2 SMPTE-259M, 292M, 344M, 372M serial video inputs, 75Ω on BNC connectors
OUTPUTS:	4 equalized and reclocked SMPTE-259M, 292M, 344M, 372M serial video outputs, 75Ω on BNC connectors
OUTPUT LEVEL:	800mVpp /75Ω
COUPLING:	AC
POWER SOURCE:	12V DC, 250mA
DIMENSIONS:	12cm x 7.2cm x 2.4cm (4.7" x 2.8" x 1.0") W, D, H
WEIGHT:	0.3kg (0.7lbs) approx.
ACCESSORIES:	Power supply
OPTIONS:	RK-3T 19" rack adapter

<sup>1</sup> Specifications are subject to change without notice

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## 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](http://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)



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**For the latest information on our products and a list of Kramer distributors, visit our Web site: [www.kramerelectronics.com](http://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.



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**Kramer Electronics, Ltd.**

Web site: [www.kramerelectronics.com](http://www.kramerelectronics.com)

E-mail: [info@kramereel.com](mailto:info@kramereel.com)

**P/N: 2900-000353 REV 3**