



KRAMER ELECTRONICS LTD.

USER MANUAL

MODEL:

VM-5ARII

Video Audio Distribution
Amplifier

VM-20ARII

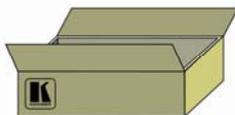
1:20 Programmable Video
Audio Distributor

VM-5ARII, VM-20ARII Quick Start Guide

This page guides you through a basic installation and first-time use of your product. For more detailed information, see the **VM-5ARII, VM-20ARII User Manual**. You can download the latest manual at <http://www.kramerelectronics.com>.

Step 1: Check what's in the box

- VM-5ARII or VM-20ARII Distributor
- 1 Power cord
- 1 Set of rack "ears"
- 1 Quick Start sheet
- 1 User Manual
- 4 Rubber feet



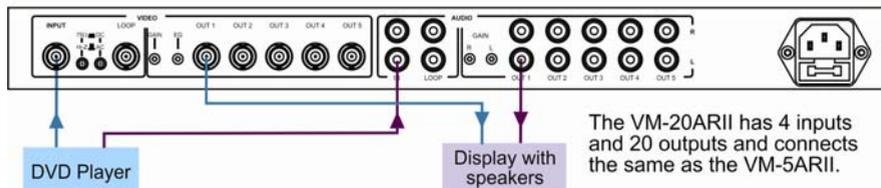
Save the original box and packaging in case your VM-5ARII, VM-20ARII needs to be returned to the factory

Step 2: Install the VM-5ARII or VM-20ARII

Mount the machine 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-5ARII or VM-20ARII.



Always use Kramer high-performance cables for connecting AV equipment to the VM-5ARII or VM-20ARII.

Step 4: Connect the power

Connect the power cord to the VM-5ARII or VM-20ARII and plug it into the mains electricity.

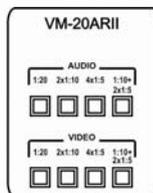
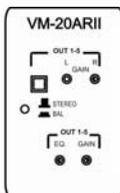
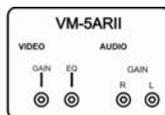


Step 5: Operate the VM-5ARII or VM-20ARII

Adjust the EQ. and LEVEL. Set the mode of operation (VM-20ARII).

Adjust the EQ. and LEVEL

Set mode of operation



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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 **VM-5ARII** and/or **VM-20ARII** distributors, which are ideal for the following typical applications:

- Any professional AV system requiring a compact, high-quality DA
- Retail stores and other point-of-sale display systems
- Security and CCTV applications
- Studio RGB/YUV distribution

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)
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality
- Position your Kramer product away from moisture, excessive sunlight and dust

3 Overview

This section gives an overview of the:

- **VM-5ARII** *Video Audio Distribution Amplifier*, see [Section 3.1](#)
- **VM-20ARII** *1:20 Programmable Video Audio Distributor*, see [Section 3.2](#)

3.1 The VM-5ARII Video Audio Distribution Amplifier

The Kramer **VM-5ARII** is a high-performance distribution amplifier for composite video and unbalanced stereo audio signals. It takes one input, provides correct buffering and isolation and distributes the signal to five identical outputs.

More specifically, the **VM-5ARII** features:

- High bandwidth 360MHz (-3dB)
- 1 composite video input and 5 outputs on BNC connectors
- 1 unbalanced stereo input and 5 outputs on RCA connectors
- Looping input
- Selectable input signal termination
- Video level and equalization, and audio level controls
- Video AC/DC coupling detection
- Standard 19" 1U rack mount size

3.2 The VM-20ARII 1:20 Programmable Video Audio Distributor

The **VM-20ARII** is a multi-format, high-performance distribution amplifier that can be configured for composite video and unbalanced stereo audio signals. It can be configured as a 1:10 distribution amplifier for s-Video (Y/C) signals or a 1:5 distribution amplifier for RGBS signals, both with unbalanced stereo audio.

More specifically, the **VM-20ARII** features:

- High bandwidth of 430MHz (-3dB)
- 1 video input and 20 outputs on BNC connectors
- 1 unbalanced stereo input and 20 outputs on RCA connectors
- Looped input capability
- Grouped audio level control
- Selectable input signal termination
- Audio level and video level and equalization controls
- Video AC/DC coupling selection
- Standard 19" 2U rack mount size

4 Defining the VM-5ARII and VM-20ARII

This section defines your:

- **VM-5ARII** *Video Audio Distribution Amplifier*, see [Figure 1](#)
- **VM-20ARII** *1:20 Programmable Video Audio Distributor*, see [Figure 2](#), [Figure 3](#) and [Figure 4](#)

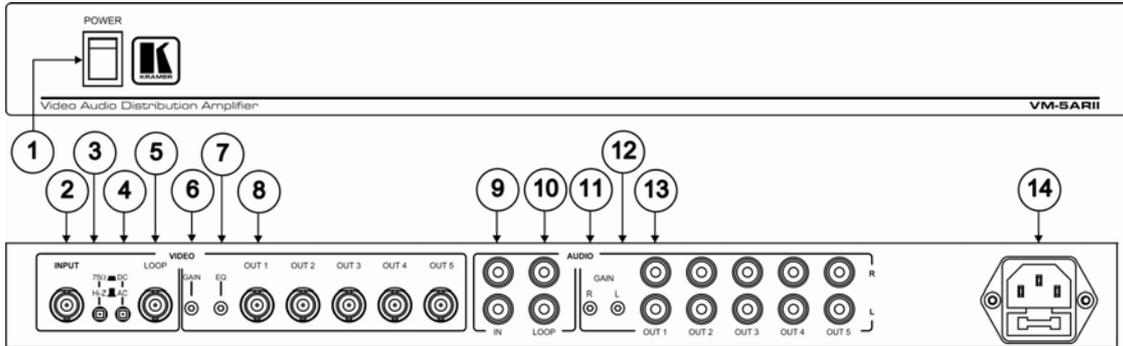


Figure 1: VM-5ARII Video Audio Distribution Amplifier – Front and Rear Panels

	Feature	Function
1	Illuminated Power Switch	Illuminated switch for turning the unit ON or OFF
2	VIDEO IN BNC Connector	Connects to the video source
3	75Ω/Hi-Z Pushbutton	Press in for input 75Ω termination, release for no termination
4	DC/AC Pushbutton	Press in for DC coupling, release for AC coupling
5	VIDEO LOOP BNC Connector	Connects to a display
6	VIDEO GAIN Control	Adjusts the video gain level
7	VIDEO EQ. Control	Adjusts the cable compensation equalization level
8	VIDEO OUT BNC Connectors	Connects to the video acceptor (from 1 to 5)
9	AUDIO IN RCA Connectors (L and R)	Connects to the L and R channels of the audio source
10	AUDIO LOOP RCA Connectors (L and R)	Connects to an audio acceptor
11	AUDIO GAIN R	Controls the volume on the right audio channel
12	AUDIO GAIN L	Controls the volume on the left audio channel
13	AUDIO OUT RCA Connectors (L and R)	Connects to the audio acceptors (from 1 to 5)
14	Power Connector with Fuse	AC connector for supplying power to the unit

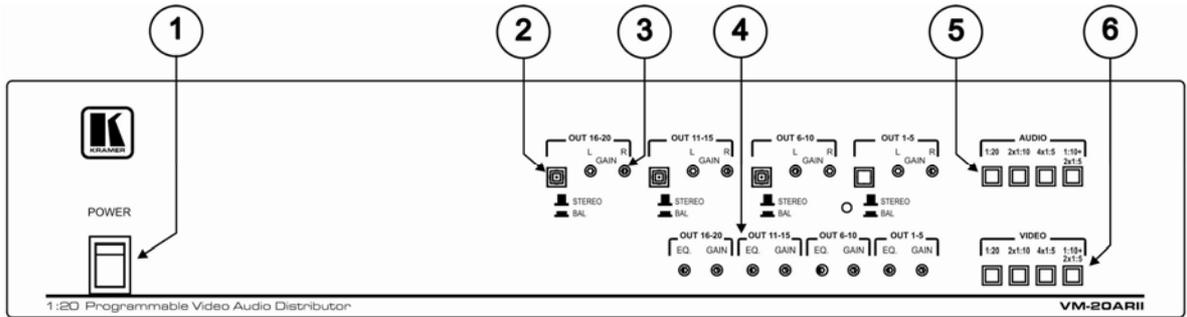


Figure 2: VM-20ARII 1:20 Programmable Video Audio Distributor – Front Panel

#	Feature	Function
1	Illuminated Power Switch	Illuminated switch for turning the unit ON or OFF
2	STEREO/BAL pushbuttons	Select stereo or balanced mode of operation (pushed=balanced)
3	OUT 1-20 (L, R) audio GAIN trimmers	Controls audio level of outputs 1 to 20
4	OUT 1-20 EQ. and GAIN trimmers	Control video level and cable equalization of outputs 1 to 20
5	1:20, 2x1:10, 4x1:5, 1:10+2x1:5 AUDIO Operating Mode Switches	Programming switches for audio mode of operation as follows: 1:20 – Splits input "1" to all 20 outputs 2x1:10 – Splits input "1" to outputs "1-10" and input "3" to outputs "11-20" 4x1:5 – Splits four inputs to four consecutive sets of five outputs each 1:10+2x1:5 – Splits input "1" to outputs "1-10", input "3" to outputs "11-15" and input "4" to outputs "16-20"
6	1:20, 2x1:10, 4x1:5, 1:10+2x1:5 VIDEO Operating Mode Switches	Programming switches for video mode of operation as follows: 1:20 – Splits input "1" to all 20 outputs 2x1:10 – Splits input "1" to outputs "1-10" and input "3" to outputs "11-20" 4x1:5 – Splits four inputs to four consecutive sets of five outputs each 1:10+2x1:5 – Splits input "1" to outputs "1-10", input "3" to outputs "11-15" and input "4" to outputs "16-20"

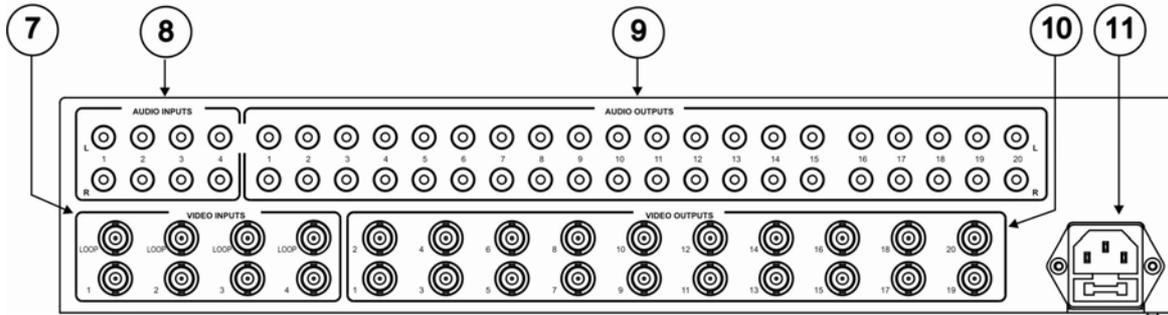


Figure 3: VM-20ARII 1:20 Programmable Video Audio Distributor – Rear Panel

#	Feature	Function
7	VIDEO INPUTS (1-4) and LOOP (1-4) BNC Connectors	Connect to the video sources and input loops
8	AUDIO IN (L and R) (1-4) RCA Connectors	Connect to the L and R channels of the audio source
9	AUDIO OUT (L and R) (1-20) RCA Connectors	Connect to the audio acceptors (from 1 to 20)
10	VIDEO OUTPUTS (1-20) BNC Connectors	Connect to the video acceptors (from 1 to 20)
11	Power Connector with Fuse	AC connector for supplying power to the unit

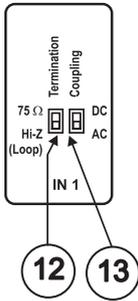


Figure 4: VM-20ARII Underside Switches

#	Feature	Function
12	TERM/75Ω Switches (IN1-IN4)	Select 75Ω for termination (up) or HI-Z for looping (down)
13	AC/DC Switches (IN1-IN4)	Select DC (up) or AC (down) coupling

5 Installing in a Rack

This section provides instructions for rack mounting the units.

Note: The VM-20ARII is a 2U unit and has rack “ears” with 5 mounting holes and screws.

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

OPERATING TEMPERATURE:	0° to +55°C (32° to 131°F)
STORAGE TEMPERATURE:	-45° to +72°C (-49° to 162°F)
HUMIDITY:	10% to 90%, RHL non-condensing



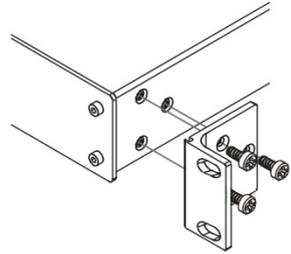
CAUTION!

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

6 Connecting the Distribution Amplifiers

This section describes how to connect the:

- **VM-5ARII** *Video Audio Distribution Amplifier*, see [Section 6.1](#)
- **VM-20ARII** *1:20 Programmable Video Audio Distributor*, see [Section 6.2](#)



Always switch off the power to each device before connecting it to your **VM-5ARII/VM-20ARII**. After connecting your **VM-5ARII/VM-20ARII**, connect its power and then switch on the power to each device.

6.1 Connecting the VM-5ARII Video Audio Distribution Amplifier

To connect the **VM-5ARII**, as shown in the example in [Figure 5](#), do the following:

1. Connect the input video source (for example, a composite video player) to the VIDEO INPUT BNC connector.
2. Connect the input audio source (for example, the audio from a composite video player) to the AUDIO IN RCA connectors noting the right and left channels.
3. Connect the VIDEO OUT 1 to 5 BNC connectors to up to 5 acceptors (for example, composite video recorders).
You are not required to connect two acceptors.
4. Connect the AUDIO OUT 1 to 5 RCA connectors to up to 5 acceptors (for example, the audio input on the composite video recorders).
You are not required to connect two acceptors.
5. If needed, connect the VIDEO LOOP BNC connector to an acceptor (for example, a composite video display or another **VM-5ARII**) and set the termination pushbutton to 75Ω.
6. Connect the power cord to the unit (not shown in the illustration) and then to the mains electricity. Switch on the power.
Use the power cord supplied with the unit.

7. If needed, adjust the VIDEO GAIN or EQ controls or the AUDIO GAIN on the front panel.

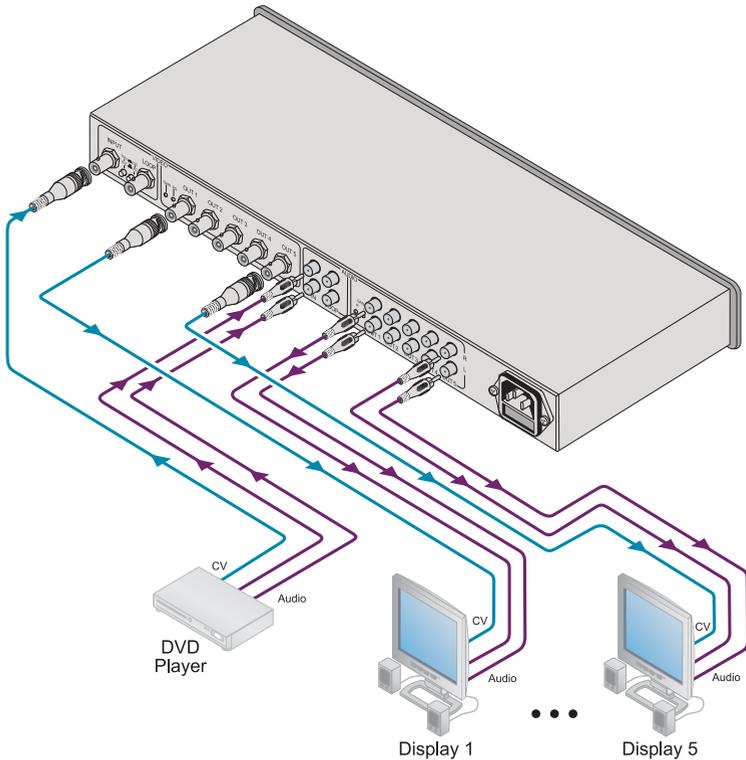


Figure 5: Connecting the VM-5ARII

6.2 Connecting the VM-20ARII Video Audio Distributor

To connect the **VM-20ARII**, as shown in the example in [Figure 6](#), do the following:

1. Connect up to 4 input video sources (for example, composite video players) to the VIDEO INPUTS 1 to 4 BNC connectors.
2. Connect up to 4 input audio sources (for example, the audio from the video players) to the AUDIO INPUTS RCA connectors 1 to 4 noting the right and left channels.

3. Connect the VIDEO OUT 1 to 20 BNC connectors to up to 20 acceptors (for example, composite video recorders).
You are not required to connect all the acceptors.
4. Connect the AUDIO OUT 1 and 20 RCA connectors to up to 20 acceptors (for example, the audio input on the video recorders).
You are not required to connect all the acceptors.
5. If needed, connect the VIDEO LOOP BNC connector to an acceptor (for example, a composite video display or another **VM-20ARII**) and set the termination pushbutton to 75Ω.
6. Connect the power cord to the unit (not shown in the illustration) and then to the mains electricity. Switch on the power.
Use the power cord supplied with the unit.
7. If needed, adjust the VIDEO GAIN or EQ controls or the AUDIO GAIN on the front panel.
8. Set the mode of operation by pressing one of the operating mode control switches (one set for audio and one set for video) as follows:
 - Press the 1:20 switch to split input "1" to all 20 outputs
 - Press the 2x1:10 switch to split input "1" to outputs "1-10" and input "3" to outputs "11-20"
 - Press the 4x1:5 switch to split four inputs to four consecutive sets of five outputs each
 - Press the 1:10+2x1:5 switch to split input "1" to outputs "1-10", input "3" to outputs "11-15" and input "4" to outputs "16-20"

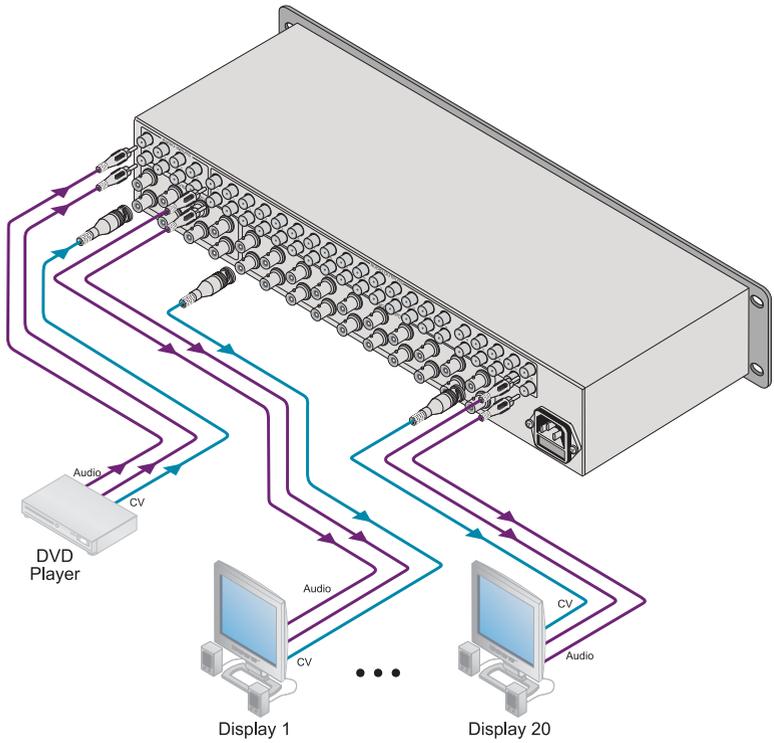


Figure 6: Connecting the VM-20ARII

7 Technical Specifications

VM-5ARII	
INPUT:	1 video, composite or single component, looping, 1Vpp/75Ω on BNC connectors with termination switch; 1 audio stereo looping, +4dBu/50kΩ on RCA connectors
OUTPUT:	5 video, composite or single component, 1 Vpp/75Ω on BNC connectors; 5 audio stereo, +4dBu/150Ω, on RCA connectors
MAX. OUTPUT:	Video: 2.2Vpp; Audio: 27Vpp
VIDEO BANDWIDTH (-3dB):	360MHz
AUDIO BANDWIDTH (-3dB):	60kHz
DIFF. GAIN:	0.03%
DIFF. PHASE:	0.06Deg
K-FACTOR:	0.05%
VIDEO S/N RATIO:	76dB
AUDIO S/N RATIO:	85dB
AUDIO THD:	0.021% (1V, 1kHz.)
CONTROL:	Video gain: -1 to +1.8dB; audio gain: -40 to +6dB; EQ.: 0 to +2.5dB, audio: 0.2 to +6dB.
COUPLING:	DC/AC selectable (video), AC (audio.)
OPERATING TEMPERATURE:	0° to +55°C (32° to 131°F)
STORAGE TEMPERATURE:	-45° to +72°C (-49° to 162°F)
HUMIDITY:	10% to 90%, RHL non-condensing
POWER SOURCE:	230V AC, 50/60Hz, (115V U.S.A.) 21VA.
DIMENSIONS:	19" x 7" x 1U W, D, H, rack mountable.
WEIGHT:	1.94kg (4.3lbs) approx.
ACCESORIES:	Power cord.
Specifications are subject to change without notice at http://www.kramerelectronics.com	

VM-20ARII	
INPUT:	4 video looping, 1Vpp/75Ω on BNC connectors with termination switches; 4 audio stereo (or balanced mono) +4dBu/50kΩ, on RCA connectors
OUTPUT:	Video: 20 (1:20, 2x1:10, 4x1:5, 1:10, 2x1:5) 1Vpp/75Ω on BNC connectors; Audio: 20 (1:20, 2x1:10, 4x1:5, 1:10, 2x1:5) stereo or balanced mono, +4dBu/50Ω, on RCA connectors
VIDEO BANDWIDTH (-3dB):	430MHz
AUDIO BANDWIDTH (-3dB):	110kHz
DIFF. GAIN:	0.06%
DIFF. PHASE:	0.08Deg
VIDEO S/N RATIO:	76dB
AUDIO S/N RATIO:	80dB
VIDEO CONTROL:	-1.2/+1.7dB level, 0/+2.4dB EQ
AUDIO CONTROL:	+0.3/+6.2dB
VIDEO COUPLING:	DC/AC user selectable
AUDIO COUPLING:	AC (input), DC (output)
AUDIO THD+NOISE:	0.02%
2nd HARMONIC:	0.002%
OPERATING TEMPERATURE:	0° to +55°C (32° to 131°F)
STORAGE TEMPERATURE:	-45° to +72°C (-49° to 162°F)
HUMIDITY:	10% to 90%, RHL non-condensing
POWER SOURCE:	Universal switching power supply: 100-240 VAC, 50/60Hz 18.5VA
DIMENSIONS:	19" x 7" x 2U W, D, H, rack mountable
WEIGHT:	3.6kg (8lbs) approx
ACCESORIES:	Power cord
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 APPLICABLE 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 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