



Kramer Electronics, Ltd.

USER MANUAL

4x1 Audio Switcher / Distributor

Model:

4x4A

IMPORTANT: Before proceeding, please read paragraph entitled
"Unpacking and Contents"



Table Of Contents

Section	Name	Page
1	INTRODUCTION	2
1.1	A Word on Video/Audio Switchers	2
1.2	A Word on Distribution Amplifiers	3
1.3	Computer and Presentation Audio Related Problems	3
2	HOW DO I GET STARTED?	4
3	UNPACKING AND CONTENTS	4
3.1	Optional Accessories	4
4	4X4A AUDIO SWITCHER DISTRIBUTOR	6
4.1	Getting to Know your 4x4A	6
5	INSTALLATION	7
5.1	Rack Mounting	7
6	CONNECTING TO AUDIO DEVICES	7
7	USING THE MACHINE	7
7.1	Turning On the Machine	7
7.2	Operation	8
8	TYPICAL APPLICATIONS	8
9	TAKING CARE OF YOUR MACHINE	8
10	TROUBLESHOOTING	9
10.1	Power and Indicators	9
10.2	Audio Signal	9
11	TECHNICAL SPECIFICATIONS	10
	Limited Warranty	11

List Of Illustrations

Figure	Description	Page
1	4x4A Front/Rear Panel Features	6

List Of Tables

Table	Description	Page
1	4x4A Front/Rear Panel Features	7



1 INTRODUCTION

Congratulations on your purchase of this Kramer Electronics Audio Switcher / Distributor. Since 1981, Kramer has been dedicated to the development and manufacture of high quality video/audio equipment. The Kramer line has become an integral part of many of the best production and presentation facilities around the world. In recent years, Kramer has redesigned and upgraded most of the line, making the best even better. Kramer's line of professional video/audio electronics is one of the most versatile and complete available, and is a true leader in terms of quality, workmanship, price/performance ratio and innovation. In addition to the Kramer product you have just purchased, Kramer also offers a full line of high quality distribution amplifiers, switchers, processors, interfaces, controllers and computer-related products. This manual includes configuration, operation and option information for the 4x4A.

1.1 A Word on Video/Audio Switchers

A video/audio switcher usually switches between several sources (inputs) and one or more acceptors (outputs). A switcher that allows several inputs to be connected to several outputs simultaneously is called a matrix switcher. Switchers may be of the electronic or mechanical type. Most matrices are of the active electronic type, with many crosspoints. Vertical Interval Switching, frequently used in video, ensures that the transition from one video source to another (such as switching between two genlocked cameras) is smooth and without interference. The switching and changeover is done during the blanked vertical interval period, when the transition is hidden from the eye. Vertical Interval Switching is needed when recording or transmitting a video program involving several video sources, as in live broadcast, to ensure clean, undisturbed picture transitions. The switched sources should be genlocked. Matrices and switchers may sometimes be RS-232 or RS-485/422 controlled. Each of these options is a way of remotely controlling a video/audio device (switcher, etc.) using a PC with a serial port, or another device that uses a similar communication protocol. The simplest connection between the RS-232 controller and the controlled device uses two wires (TRANSMIT, RECEIVE) and a common ground wire. Finally, wide video bandwidth permits these matrix switchers to be used in the most demanding applications.

There are many factors effecting signal quality when it is transmitted from a source to an acceptor:

- Source and acceptor signal handling capability. Since different equipment offer different degrees of quality, the final result is determined by the performance of the lowest quality item. Using a low quality source will always result in low quality duplicates.

- The connection cables should be of the best quality you can afford. Low quality cables are susceptible to interference, deteriorate signal quality due to poor matching and cause elevated noise levels.
- Sockets and connectors of the sources and acceptors, so often ignored, should be of best quality, as "Zero Ohm" connection resistance should be assured. Cheap connectors tend to rust, causing breaks in the signal path.
- Amplifying circuitry quality is extremely important and should possess high linearity, low distortion and low noise operation.
- The distance between source and acceptors plays a major role in the final result. If long distances (over 15 meters) exist between sources and acceptors - special means should be taken in order to avoid cable loss, such as using higher quality cables or, if necessary, line amplifiers.
- Interference from neighboring appliances can have an adverse effect on signal quality. Balanced audio lines are less prone to interference, but unbalanced audio and video lines, even though the cables are shielded, should be installed far away from mains carrying cables, electric motors, transmitters, etc.
- In some cases, either an induced interference on the cable carrying the signals, or ground loop problems may severely disturb the video image on the screen. To solve this problem, a differential video line amplifier, designed to eliminate the interfering signals, is needed.

1.2 A Word on Distribution Amplifiers

The Audio Distributor feature of the 4x4A distributes one signal to four users. Signal distributors, in general, vary in the number of outputs, operating format and bandwidth. Video/Audio Distributors are used to distribute one source to several acceptors (monitors, audio devices etc.) for simultaneous recording or monitoring of one source, preferably with no discernible signal degradation. A good quality distributor amplifies the incoming signal, pre-compensates the signal for potential losses (resulting from the use of long cables, noisy source, etc.) and generates several identical buffered and amplified outputs. Often, a signal processor is inserted between the source and the distributor for correction and fine-tuning of the source signal before multiplication, so that all copies are corrected in the same way.

1.3 Computer and Presentation Audio related problems

Personal computers have built-in audio cards that output music, speech and other sound generated in computers. Multimedia and presentation sessions use this sound – and other audio sources as well – from VCRs, microphones, receivers



etc. Selecting between those sources in a live presentation can become a serious problem. Another problem in such applications is that a sound card, or any other audio source, usually has only one output and in many circumstances more outputs are needed. The Kramer 4x4A provides a perfect solution to those problems – having 4 stereo inputs to select from, and a built-in distribution amplifier with 4 individual outputs. In addition, the machine allows for audio level control of the selected source for level correction and fine-tuning.

2 HOW DO I GET STARTED?

The fastest way to get started is to take your time and do everything right the first time. Taking 15 minutes to read the manual may save you a few hours later. You don't even have to read the whole manual. If a section doesn't apply to you, you don't have to spend your time reading it.

3 UNPACKING AND CONTENTS

The items contained in your Kramer format interface package are listed below. Please save the original box and packaging materials for possible future shipment.

Switcher/DA (4x4A)

User Manual

DC Power Supply

Kramer Concise Product Catalog

4 Rubber Feet

Mounting Brackets

3.1 Optional Accessories

The following accessories, which are available from Kramer, can enhance implementation of your machine. For information regarding cables and additional accessories, contact your Kramer dealer.

- **Rack Adapter** - Used to adapt smaller machines to a standard 1U or 3U rack. Three machines can be installed in a 1U adapter and up to eight machines (Kramer Tools) may be installed in a 3U rack space.
- **482** – *Balanced/Unbalanced Stereo Audio Transcoder* - for interfacing with professional balanced audio sources and acceptors. The **482** is a bi-directional, versatile tool converting between balanced and unbalanced stereo, the two most commonly used audio standards. The machine allows gain or attenuation while transcoding, to compensate for the 14-dB change between IHF audio levels and the newly adopted, balanced DAT input levels. Very low noise and distortion components are used throughout. The **482** has an unbalanced stereo audio input and a balanced stereo output, and



in the second channel, a balanced stereo audio input and an unbalanced stereo output. Both channels function independently of the other. Although fed from an external 12VDC source (wall transformer, battery belt, car battery, etc.) the machine generates internally a high voltage DC supply, and is therefore capable of outputting high-level signals as required for the most demanding applications. The **482** is part of the Kramer TOOLS family of compact, high quality and cost-effective solutions for a variety of applications.

- **FC-4208** – for interfacing with professional audio equipment. The Kramer **FC-4208** is a high quality format converter designed to transcode between balanced and unbalanced audio signals. A total of eight channels are provided, and all operate simultaneously. The first four channels convert balanced signals on XLR connectors to the unbalanced format on RCA connectors, and the second four channels operate in the opposite direction, converting unbalanced signals to the balanced format. The **FC-4208** provides a cut/boost control for each channel, which allows the user to set optimum output levels. Very low noise and distortion components are used throughout. It is rugged, dependable, and is housed in a professional 19” rack mountable enclosure requiring one vertical space.
- **SP-4200** – for audio processing and noise reduction. The machine is a unique audio processor which combines the functions of a preamp, audio-dynamics processor, unbalanced to balanced converter, and noise reducer in a rugged, compact desktop unit. It accepts one unbalanced line level stereo input via RCA connectors, and provides one set of unbalanced stereo outputs on RCA connectors, as well as one set of balanced stereo outputs on XLRs. The separate L/R GAIN controls affect only the balanced stereo outputs. The VOLUME and AUTO LEVEL controls, which comprise the LEVEL PROCESS, are engaged when the LEVEL PROCESS button is turned on, and otherwise they are bypassed. Depending on front panel settings, the **SP-4200** can provide true stereo signal processing including noise reduction by up to 25 dB without sonic artifacts, downward audio expansion, dynamic adjustment adaptive threshold for all-level operation, effective Dolby B^(R) decoding, AGC operation and level transcoding.
- **VS-81A** – to add more sources to switch from. The Kramer **VS-81A** is a high quality mechanical 8x1 switcher for stereo audio using RCA connectors. It is designed for applications requiring a compact desktop unit for routing stereo audio signals. High quality switching components provide excellent isolation between inputs. The **VS-81A** is extremely rugged and dependable. Its unpowered, passive design can be an advantage in applications where various regulatory compliance would otherwise be



required. The “hard-wire” passive signal path can also switch other signal formats.

4 4X4A AUDIO SWITCHER / DISTRIBUTOR

This section describes the controls and connections of your Audio Switcher / Distributor. Understanding the controls and connections helps you realize the full power of your machine.

4.1 Getting to Know Your 4x4A

The Kramer 4x4A is a simple, high quality 4x1 Stereo Audio switcher and 1:4 distribution amplifier. It accepts four stereo audio inputs, and distributes the selected input to 4 outputs. The machine uses 3.5 mm mini phone connectors, and is therefore perfectly suitable for PC-originated multimedia and presentation applications. A 12V power supply is provided, but the optional VA-50P can power up to six Kramer devices requiring 12VDC.

The 4x4A is part of the Kramer TOOLS family of compact, high quality, and cost effective solutions for a variety of applications.

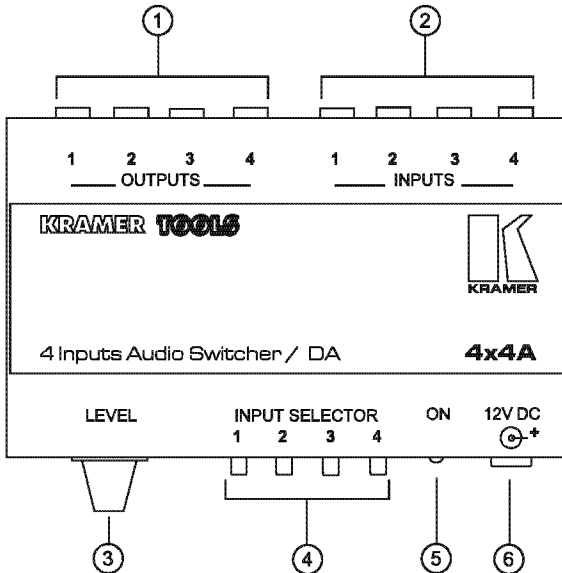


Figure 1: 4x4A Front/Rear Panel Features



Table 1: VS-33V Front/Rear Panel Features

	Feature	Function
1.	Outputs 1, 2, 3, 4	4 Stereo Audio outputs on 3.5 mm mini plugs.
2.	Inputs 1, 2, 3, 4	4 Stereo Audio inputs on 3.5 mm mini plugs.
3.	Level Control Button	Controlling audio output levels.
4.	Input Selector Switches	Select 1 of 4 Stereo Audio inputs for amplification and distribution.
5.	ON Led	Power indicator, glows when power is supplied to the machine.
4.	12VDC feed connector	A DC connector that allows power to be supplied to the unit.

5 INSTALLATION

5.1 Rack Mounting

The Kramer **4x4A** may be rack mounted in a standard 19" EIA rack assembly, using a special Adapter (see section 3.1). To mount the machine, follow the installation instructions enclosed with the rack mount adapter. It can be also table mounted using the brackets provided. The device does not require any specific spacing above or below the unit for ventilation.

6 CONNECTING TO AUDIO DEVICES

Audio sources and output devices (such as audio amplifiers and monitors, projectors or recorders) may be connected to the machine through the 3.5 mm mini plug connectors located on the back panel.

7 USING THE MACHINE

7.1 Turning On the Machine

Notes

The machine should only be turned on after all connections are completed and all source devices have been turned on. Do not attempt to connect or disconnect any video signal to the machine while it is turned on!

The socket-outlet should be near the equipment and should be easily accessible. To fully disconnect equipment, remove the power cord from the socket.



7.2 Operation

- Connect up to four audio sources to the INPUT sockets of the **4x4A** machine. Use best available cables for connection.
- Connect up to four audio acceptors to the OUTPUT sockets of the machine.
- Connect an appropriate 12VDC source to the DC socket of the **4x4A** machine. Observe polarity. The power LED will light.
- Operate sources and acceptor(s).
- Select the appropriate source by pressing one of the selector switches on the front panel of the machine.
- Adjust, if necessary, audio output levels using the LEVEL knob. This knob effects all outputs simultaneously.
- In emergency cases, the **4x1A** may be operated using a 9-Volt battery as power source, which will last for several hours.

8 TYPICAL APPLICATION

A typical application is a presentation session. When a presentation session has several audio sources do the following:

- Connect all needed audio sources (amplified microphone, line level sources, etc.) to the **4x4A**.
- Connect all the needed audio acceptors (projector, receiver-amplifier, recorder, etc.)
- Turn on all sources and acceptors and turn on the **4x4A**.
- Adjust output level, if necessary, using the LEVEL button.

9 TAKING CARE OF YOUR MACHINE

Do not locate your machine in an environment where it is susceptible to dust or moisture. Both of these may damage the electronics, and cause erratic operation or failure. Do not locate your machine where temperature and humidity may be excessive. Doing so may also damage the electronics, and cause erratic operation or failure of your machine. Do not clean your machine with abrasives or strong cleaners. Doing so may remove or damage the finish, or may allow moisture to build up. Take care not to allow dust or particles to build up inside unused or open connectors.



10 TROUBLESHOOTING

NOTES

Please note that if the output signal is disturbed or interrupted by very strong external electromagnetic interference, it should return and stabilize when such interference ends. If not, turn the power switch off and on again to reset the machine.

If the following recommended actions do not result in satisfactory operation, please consult your KRAMER Dealer.

10.1 Power and Indicators

Problem	Remedy
No Power	<ul style="list-style-type: none">➤ Confirm that power connections are secured at the machine and at the receptacle. Make sure the receptacle is active, outputting the proper voltage.➤ If there is still no power use a Philips screwdriver to remove screws on both sides of the machine's cover.➤ Locate the fuse inside your machine. Confirm that the fuse is good by looking for the wire connected between the ends of the fuse. If this wire is broken, replace fuse with another, with the same rating.➤ Install cover and tighten the Philips screws.

10.2 Audio Signal

Problem	Remedy
No Audio at the output device	<ul style="list-style-type: none">➤ Confirm that your source and output devices are turned on and connected properly. The input of your machine should be of an identical signal format to the output of your source (stereo or mono.)➤ Confirm that any other device in the signal path has the proper input and/or output selected.
Audio level is too high or too low.	<ul style="list-style-type: none">➤ Confirm that the connecting cables are of high quality and properly inserted.➤ Check level controls located on your source input device or output display.➤ Adjust, if necessary, audio output levels using the LEVEL control button. <i>Bear in mind that the machine is not designed to cope directly with microphone level signals. Those signals should be pre amplified first to line level signals prior the connection to the 4x4A.</i>



11 TECHNICAL SPECIFICATIONS

INPUTS:	Four Stereo Audio, 1Vpp/33k Ω typical, up to 5.2Vpp
OUTPUTS:	Four Stereo Audio, 1Vpp/220 Ω typical, up to 5.2Vpp Max. on 3.5mm mini phone connectors.
AUDIO BANDWIDTH:	100 kHz -3dB.
THD @ 1kHz:	Less than 0.018%.
2nd HARMONIC:	Less than 0.002%
MAX OUTPUT LEVEL:	5.2 Vpp (+7dBm.)
S/N RATIO:	Better than 90 dB.
CROSSTALK:	-79 dB @ 1kHz.
POWER SOURCE:	12 VDC 20 mA.
DIMENSIONS:	12cm x 7.5cm x 2.5cm (4.7" x 2.95" x 0.98", W, D, H.)
WEIGHT:	0.28 kg. (0.62 lbs.) Approx.
ACCESSORIES:	Power supply, mounting brackets.
OPTIONS:	19" rack adapter for 1 or 3 machines, model VA-50P power supply for six 12VDC powered units.



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 three 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.
- 3) Damage, deterioration or malfunction resulting from:
 - a) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature.
 - b) Product modification, or failure to follow instructions supplied with the product.
 - c) Repair or attempted repair by anyone not authorized by Kramer.
 - d) Any shipment of the product (claims must be presented to the carrier).
 - e) Removal or installation of the product.
 - f) Any other cause, which does not relate to a product defect.
 - g) 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

Kramer's liability for any defective 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.

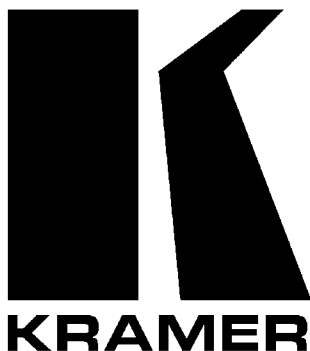
NOTICE

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 DC power supply included to power the machine.
- ⊗ Please use recommended interconnection cables to connect the machine to other components.



**The list of Kramer distributors appears on our web site:
www.kramerelectronics.com**

**From the web site it is also possible to e-mail factory headquarters.
We welcome your questions, comments and feedback.**

Kramer Electronics Ltd.

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