



KRAMER ELECTRONICS LTD.

# USER MANUAL

MODEL:

**VA-8xl**  
8-Channel Balanced Stereo  
Audio Amplifier

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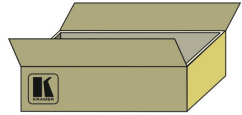
P/N: 2900-300151 Rev 1

# VA-8xl Quick Start Guide

This page guides you through a basic installation and first-time use of your **VA-8xl**. For more detailed information, see the **VA-8xl** User Manual. You can download the latest manual at <http://www.kramerelectronics.com>.

## Step 1: Check what's in the box

- VA-8xl** 8-Channel Balanced Stereo Audio Amplifier
- 1 Power cord
- 4 Rubber feet
- 1 Quick Start sheet
- 1 User Manual
- Windows®-based Kramer control software



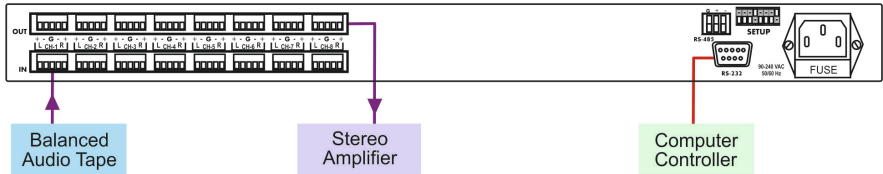
Save the original box and packaging in case your **VA-8xl** needs to be returned to the factory for service.

## Step 2: Install the VA-8xl

Mount the machine in a rack 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 **VA-8xl**.



Always use Kramer high-performance cables for connecting AV equipment to the **VA-8xl**.

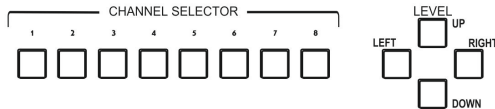
## Step 4: Connect the power

Connect the power cord to the **VA-8xl** and plug it into the mains electricity.



## Step 5: Operate the VA-8xl

Select the channel, choose RIGHT or LEFT and adjust the volume level UP or DOWN.



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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 **VA-8xl** *8-Channel Balanced Stereo Audio Amplifier*, which is ideal for the following typical applications:

- Large presentation audio level control
- Audio broadcast and editing studios
- PA remote audio level control

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## 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 **VA-8xl** away from moisture, excessive sunlight and dust

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## 3 Overview

The **VA-8xl 8-Channel Balanced Stereo Audio Amplifier** is a high-performance 8-channel, balanced stereo input volume controller for balanced audio signals on terminal block connectors. The volume of each L and R stereo channel can be adjusted independently of the other stereo channel.

In particular, the **VA-8xl** features:

- A digitally controlled volume control function, with gain from -95dB (attenuation) up to +31dB (amplification) - in increments of 0.5dB
- Clean, noise-free transition during gain setting changes
- Transparent performance even in the most critical broadcast applications
- 8 independent channels
- Control of the amplifier gain of the left and right channels— together or separately—via the front panel buttons, or remotely via RS-232 or RS-485
- Daisy-chaining of up to 15 machines in a single system using RS-485 or RS-232, allowing control of up to 120 stereo audio channels!
- Storing and recalling up to 15 configuration setups via the non-volatile memory, using the front panel buttons, or remotely via RS-232 or RS-485
- A LED display on the front panel, showing the gain of the selected channel (that is, its left and right decibel status)
- Easy-to-connect detachable terminal block connectors
- A rugged, professional 1U rack mountable enclosure and ship with Windows®-based software

### 3.1 Defining the VA-8xl 8-Channel Balanced Stereo Audio Amplifier

This section defines the **VA-8xl**.

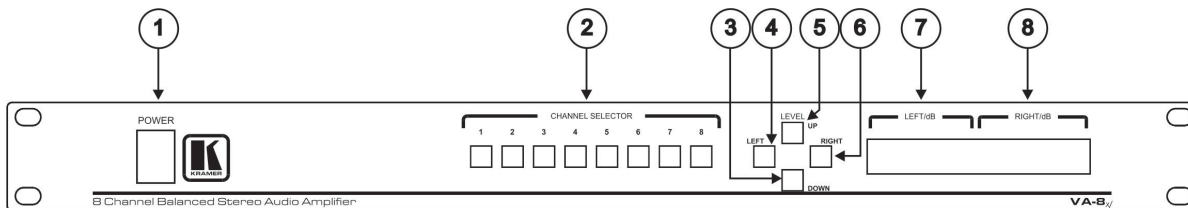


Figure 1: VA-8xl 8-Channel Balanced Stereo Amplifier Front Panel

#	Feature	Function	
1	<b>POWER</b> Switch	Illuminated switch supplying power to the unit	
2	<b>CHANNEL SELECTOR</b> Buttons	(a). Select/deselect the stereo channel (from 1 to 8) (b). Select a setup number (from 1 to 15)	
3	<b>LEVEL Control Buttons</b>	<b>DOWN</b>	(a). Decreases the volume in increments of 0.5dB from -95dB to +31dB gain (b). Stores the current setting in the non-volatile memory
4		<b>LEFT</b>	Selects/deselects the left channel
5		<b>UP</b>	(a). Increases the volume in increments of 0.5dB from -95dB to +31dB gain (b). Recalls a setup from the non-volatile memory
6		<b>RIGHT</b>	Selects/deselects the right channel
7	<b>LEFT/dB</b> LED Display	Shows the gain of the selected left channel	
8	<b>RIGHT/dB</b> LED Display	Shows the gain of the selected right channel	

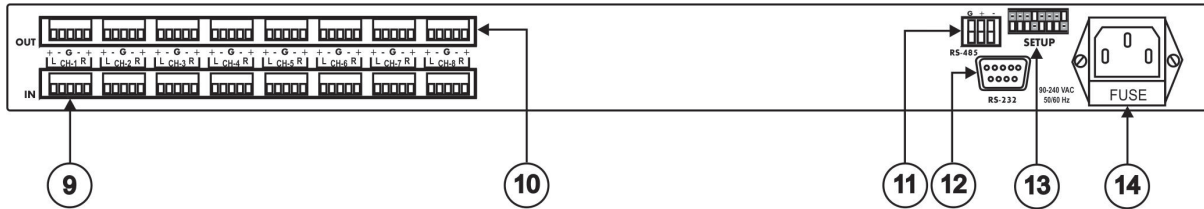


Figure 2: VA-8x1 8-Channel Balanced Stereo Audio Amplifier Rear Panel

#	Feature	Function
9	IN Terminal Block Connectors	Connect to audio sources (from 1 to 8)
10	OUT Terminal Block Connectors	Connect to audio acceptors (from 1 to 8)
11	RS-485 Detachable Terminal Block Port	Pin # 1 is for Ground; Pin # 2 is for +; Pin # 3 is for –
12	RS-232 9-pin D-sub Port	Connects to the PC or the Remote Controller
13	SETUP DIP-switches	DIP-switches for setup of the unit
14	Power Connector with FUSE	AC connector enabling power supply to the unit



## 4 Connecting the VA-8xl



Always switch off the power to each device before connecting it to your **VA-8xl**. After connecting your **VA-8xl**, connect its power and then switch on the power to each device.

To connect the **VA-8xl** as illustrated in the example in [Figure 6](#):

1. Using the appropriate wiring shown in the figures below, connect up to 8 balanced stereo audio sources (for example, a tape deck) to INPUT CHANNEL 1 – 8 via terminal block connectors:  
You do not have to connect all channels.
2. Using the appropriate wiring shown in the figures below, connect up to 8 balanced stereo audio acceptors (for example, a stereo amplifier) to OUTPUT CHANNEL 1 – 8 via terminal block connectors:  
You do not have to connect all channels.
3. If required, connect a PC via RS-232, (see [Page 8](#)).

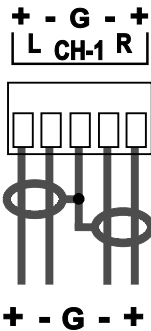


Figure 3: Balanced Stereo Audio Connection

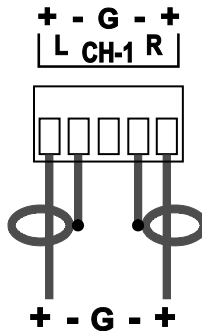


Figure 4: Unbalanced Stereo Audio Input Connection

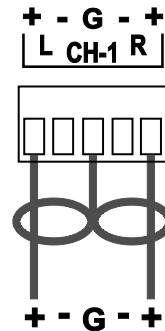


Figure 5: Unbalanced Stereo Audio Output Connection

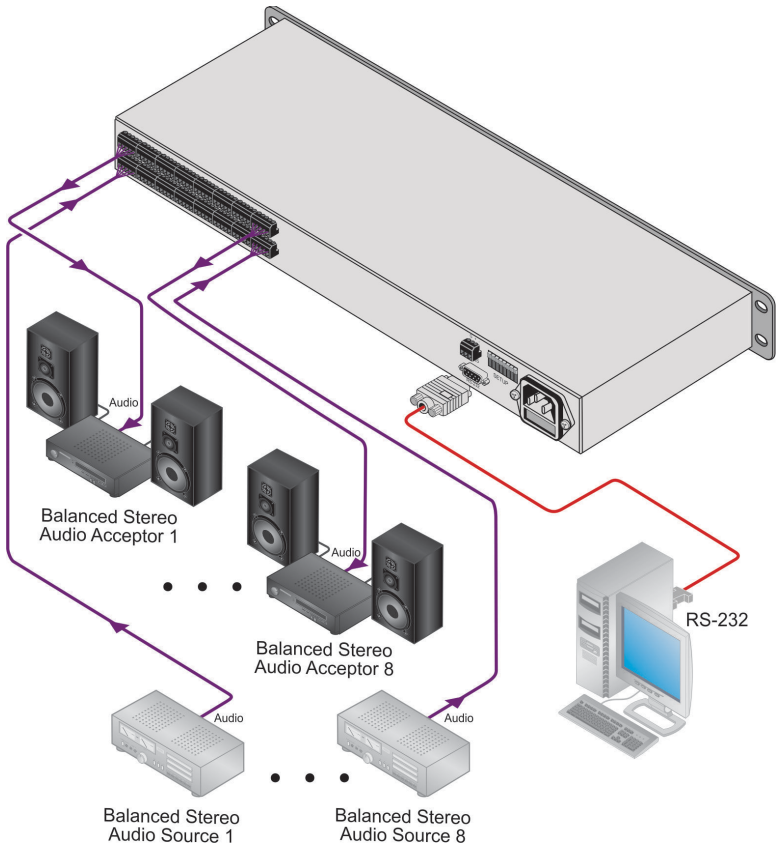


Figure 6: Connecting the VA-8xl 8-Channel Balanced Stereo Audio Amplifier

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## 5 Operating the VA-8xl

When switching on the **VA-8xl** (after a previous session), the **VA-8xl** briefly scans each channel (stored in the non-volatile memory), showing the settings in the LED displays. After that, the **VA-8xl** goes to channel 1, and shows its gain/attenuation level in dB.

During regular work, the **VA-8xl** shows the status of the last channel you observed and/or changed.

### To observe the status of a channel:

- Press a CHANNEL SELECTOR button.  
That CHANNEL SELECTOR button illuminates for about 20 seconds and the decibel values of the selected channel appear in the dimmed LED displays

*When the LEDs are dimmed, you cannot change the gain or attenuation - the values are for observation only*

You can control the amplifier gain of the left and right channels via the front panel buttons, or remotely via RS-232 or RS-485. You can increase or decrease the gain in increments of 0.5dB from -95dB up to +31dB.

You can control the amplifier gain of the left and/or right channels separately or together (see [Section 5.1](#)).

### 5.1 Adjusting the Gain/Attenuation of the Channels

#### To adjust the amplifier gain or the attenuation:

1. Press the appropriate CHANNEL SELECTOR button.  
That CHANNEL SELECTOR button illuminates and the decibel values of the selected channel appear in the dimmed LED displays (stored in the non-volatile memory).  
*(When the LEDs are dimmed, you cannot change the gain or attenuation - the values are for observation only).*
2. Press the LEFT LEVEL and/or the RIGHT LEVEL button.  
The decibel values of the selected channel appear in the bright LEFT and/or RIGHT LED display.

3. Press the UP or DOWN button **once** to increase or decrease, as appropriate, in increments of 0.5dB. Press and **hold** the UP or DOWN button, to increase or decrease the decibel level by a significant amount.
4. Press the LEFT LEVEL or the RIGHT LEVEL button to set the level.  
The bright LEFT and/or RIGHT LED display becomes dim again, preventing unintentionally altering the settings.

## 5.2 Storing and Recalling Setups

You can store/recall up to 15 settings in the non-volatile memory, via the front panel buttons, or remotely via RS-232 or RS-485.

A setting refers to the gain/attenuation level of the selected channel that appears in the dimmed LED displays, and each setting includes all 8 channels.

### **To store a setting, via the front panel buttons:**

1. When the LED displays are dimmed, press the DOWN button.  
The abbreviation “StO” (store) appears in the LEFT LED display.
2. Choose a setup number (between 1 to 8), by pressing the appropriate CHANNEL SELECTOR button.  
The abbreviation “StO” (store) appears in the LEFT LED display and the setup number appears in the RIGHT LED display.
3. Press the same CHANNEL SELECTOR button again.  
The memory stores the chosen setup number. As confirmation, for a few seconds, “YES” appears in the LEFT LED display and the setup number appears in the RIGHT LED display.

Note:

- Saving a setup to an previously allocated setup number, overwrites the previous setup
- To cancel, press the LEFT or RIGHT button

To recall a setting, via the front panel buttons, do the following:

1. When the LED displays are dimmed, press the UP button.  
The abbreviation “rCL” (recall) appears in the LEFT LED display.
2. Press the appropriate CHANNEL SELECTOR button.  
The abbreviation “rCL” (recall) appears in the LEFT LED display and the number of that CHANNEL SELECTOR button appears in the RIGHT LED display.
3. Press the same CHANNEL SELECTOR button again.  
The memory recalls the setup. As confirmation, for a few seconds, “YES” appears in the LEFT LED display and the setup number appears in the RIGHT LED display.  
If no setting is stored in the non-volatile memory with that setup #, “NO” appears in the LEFT LED display and the setup number appears in the RIGHT LED display.

Note:

- Recalling a setup implements the amplifier gain or the attenuation immediately

## 6 Controlling the VA-8xl

You can control a single **VA-8xl** unit (see [Section 6.1](#)) or configure up to a 120 channel balanced stereo audio amplifier, using 15 units via RS-485 or RS-232 (see [Section 6.3](#)).

### 6.1 Controlling a Single VA-8xl Unit

To connect and control a single **VA-8xl** unit, connect the following to the rear panel:

- PC or other controller, see [Section 6.2](#): “Preparing the RS-232 Port on a Single Unit”
- Set the DIP-switches, see [Section 6.2.1](#)
- Power cord

### 6.2 Preparing the RS-232 Port on a Single Unit

You can connect to the unit via a crossed RS-232 connection, using for example, a PC. A crossed cable or null-modem is required as shown in method A and B respectively. If a shielded cable is used, connect the shield to pin 5.

**Method A** ([Figure 7](#))—Connect the RS-232 9-pin D-sub port on the unit via a crossed cable (only pin 2 to pin 3, pin 3 to pin 2, and pin 5 to pin 5 need be connected) to the RS-232 9-pin D-sub port on the PC.

**Note:** There is no need to connect any other pins.

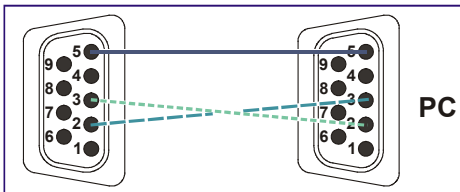


Figure 7: Crossed Cable RS-232 Connection

Hardware flow control is not required for this unit. In the rare case where a controller requires hardware flow control, short pin 1 to 7 and 8, and pin 4 to 6 on the controller side.

**Method B (Figure 8)**—Connect the RS-232 9-pin D-sub port on the unit via a straight (flat) cable to the null-modem adapter, and connect the null-modem adapter to the RS-232 9-pin D-sub port on the PC. The straight cable usually contains all nine wires for a full connection of the D-sub connector. Because the null-modem adapter (which already includes the flow control jumpering described in Method A above) only requires pins 2, 3 and 5 to be connected, you are free to decide whether to connect only these 3 pins or all 9 pins.

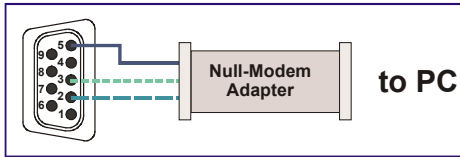


Figure 8: Straight Cable RS-232 Connection with a Null Modem Adapter

## 6.2.1 DIP-Switch Settings

Configure the **VA-8xl** by setting the DIP-switches as defined in [Figure 9](#):

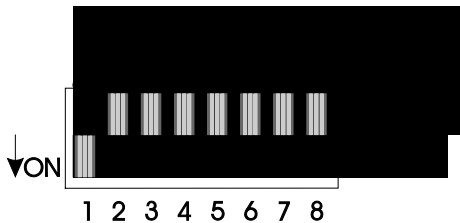


Figure 9: Rear Panel DIP-switches (Factory Default)

DIP #	Function:
1-4	Set the MACHINE # (see <a href="#">Section 6.2.2</a> )
5	Not used
6	RS-485 termination for first and last machine = ON (RS-485 line terminates with 110Ω); for others = OFF (RS-485 line is open)
7/8	Used for the firmware upgrade procedure (see <a href="#">Section 7</a> )

### 6.2.2 Setting the MACHINE #

To control a unit via RS-232 or RS-485, each unit has to be identified via its unique MACHINE #. Set the MACHINE # on a **VA-8xl** unit according to the following table. A valid MACHINE # is from 1 to 15.

For a single, stand alone machine, set as MACHINE # 1.

MACHINE #	DIP-SWITCH			
	1	2	3	4
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON
11	ON	ON	OFF	ON
12	OFF	OFF	ON	ON
13	ON	OFF	ON	ON
14	OFF	ON	ON	ON
15	ON	ON	ON	ON

## 6.3 Configuring up to a 120 Channel Balanced Stereo Audio Amplifier

To connect up to 15 **VA-8xl** units, do the following:

- Connect the balanced/unbalanced audio sources/acceptors to the rear panel on each unit (see [Section 4](#))
- Connect a PC or other controller (see [Section 6.3.1](#))
- Set the DIP-switches on each unit (see [Section 6.2.1](#))
- Connect the power cord on each unit

[Figure 10](#) illustrates how to configure up to 15 **VA-8xl** units.



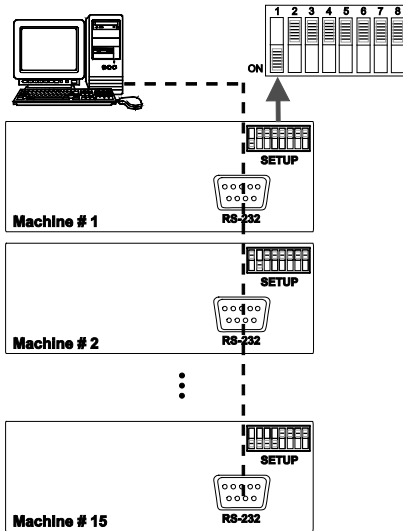


Figure 10: Configuring up to 15 VA-8xl Units

### 6.3.1 Connecting a Control Interface on a Set of Units

To connect the control interface on a set of units, do one of the following:

- Connect the RS-232 port on the first **VA-8xl** unit to a PC or other controller, and then connect the RS-232 port on each of the **VA-8xl** units, using the specially prepared RS-232 cable (see [Section 6.3.2](#)) or
- Connect a PC or other controller to the “RS-232 in” 9-pin D-sub (F) port on a Kramer Tools **VP-43xl Interface Converter** and connect the RS-485 port on the **VP-43xl** to the RS-485 ports on each of the **VA-8xl** units (see [Section 6.3.3](#))

### 6.3.2 Preparing the RS-232 Port on a Set of Units

To connect a PC to a set of **VA-8xl** units do the following:

1. Prepare the RS-232 9-pin D-sub (F) connector (A), by connecting PIN 4 to PIN 6 and connecting PINS 8, 7, and 1 together.

2. Attach the RS-232 9-pin D-sub (F) connector (A) to another RS-232 9-pin D-sub (M) connector (B) by connecting PIN 5 to PIN 5, PIN 3 to PIN 2, and PIN 2 to PIN 3.
3. Connect the RS-232 9-pin D-sub (F) connector (A) to your PC's RS-232 9-pin D-sub (M) port.
4. Attach the RS-232 9-pin D-sub (M) connector (B) to another RS-232 9-pin D-sub (M) connector (C), by connecting PIN 5 to PIN 5, PIN 8 to PIN 3, PIN 9 to PIN 2.
5. Connect the RS-232 9-pin D-sub (M) connector (B) to the RS-232 9-pin D-sub (F) port on the first **VA-8xl** unit.
6. Attach the RS-232 9-pin D-sub (M) connector (C) to another RS-232 9-pin D-sub (M) connector, if required, by connecting PIN 5 to PIN 5, PIN 8 to PIN 3, PIN 9 to PIN 2.
7. Connect the RS-232 9-pin D-sub (M) connector (C) to the RS-232 9-pin D-sub (F) port on the next **VA-8xl** unit.

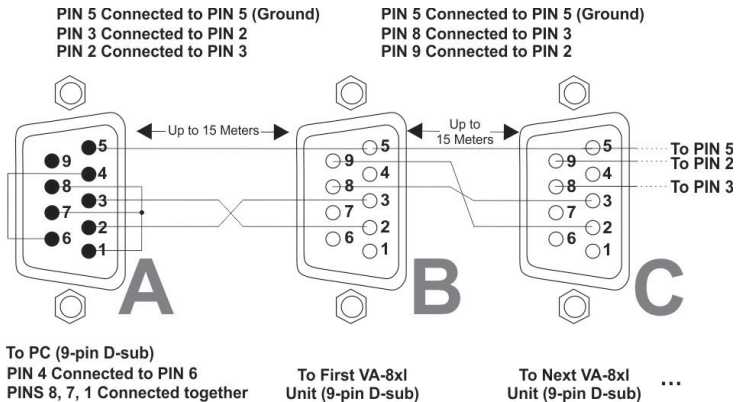


Figure 11: Preparing the RS-232 Connectors

### 6.3.3 Connecting the RS-485 Control Interface

To connect an RS-485 connector on one **VA-8xl** unit to an RS-485 connector on another unit:

1. Connect the “+” PIN on the first VA-8xl unit to the “+” PIN on the second **VA-8xl** unit
2. Connect the “-” PIN on the first VA-8xl unit to the “-” PIN on the second **VA-8xl** unit
3. If shielded cable is used for an RS-485 connection, connect the shield to the Ground PIN.

[Figure 12](#) illustrates the RS-485 line that connects:

- Between each **VA-8xl** unit
- To the PC via a Kramer Tools **VP-43xl Interface Converter** (connect the PC’s 9-pin D-sub COM port to the “RS-232 in” 9-pin D-sub (F) port on the **VP-43xl**. Next, connect the RS-485 port on the **VP-43xl** to the RS-485 ports on the **VA-8xl** units)

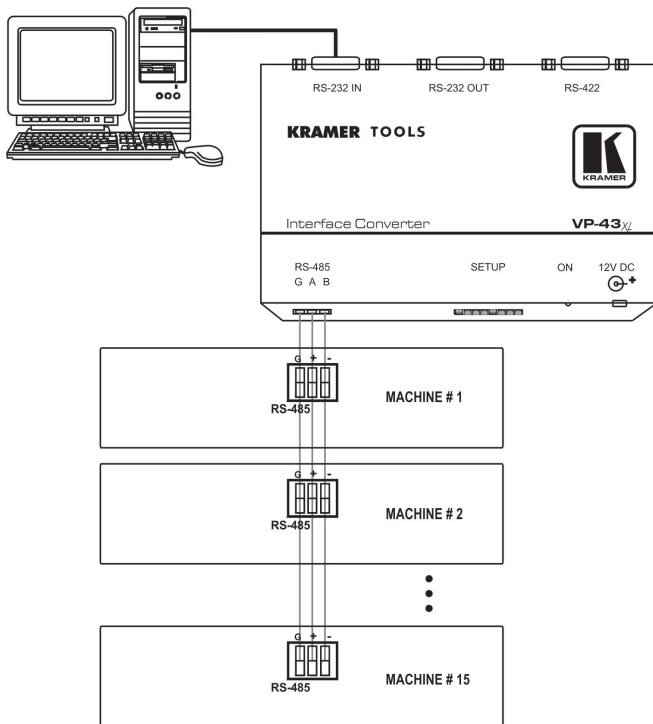


Figure 12: An RS-485 Control Interface Setup

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# 7 Upgrading the Flash Memory

The **VA-8xl** firmware is located in FLASH memory, which lets you upgrade to the latest Kramer firmware version in minutes! The process involves:

- Downloading from the Internet (see [Section 7.1](#))
- Connecting the PC to the RS-232 port (see [Section 7.2](#))
- Upgrading Firmware (see [Section 7.3](#))

## 7.1 Downloading from the Internet

You can download the up-to-date file from the Internet. To do so:

1. Go to our Web site at <http://www.kramerelectronics.com> and download the file: "FLIP\_Va8xl.zip" from the Technical Support section.
2. Extract the file: "*FLIP\_Va8xl.zip*" to a folder (for example, C:\Program Files\Kramer Flash).

## 7.2 Connecting the PC to the RS-232 Port

Before installing the latest Kramer firmware version on a **VA-8xl** unit, do the following:

1. Connect the RS-232 9-pin D-sub rear panel port on the **VA-8xl** unit to the null modem adapter and connect the null modem adapter with a 9-wire flat cable to the RS-232 9-pin D-sub COM port on your PC (see [Section 4](#)). It is recommended that you use COM port 2 (default). However, if your computer has only one COM port, open the file: "*Va8xl.cfg*" (located at C:\Program Files\Kramer Flash\Va8xl.cfg) in **Notepad**, and change "*set port COM2*" to "*set port COM1*".
2. Set the DIP-switches as follows:
  - Set DIP 8 ON
  - Set DIP 7 ON

3. Connect the power cord and turn the *POWER* switch on the **VA-8xl** ON.  
The LED displays may show erratic data, which should be ignored.

## 7.3 Upgrading Firmware

Follow these steps to upgrade the firmware:

1. Double click the desktop icon: “*Shortcut to FLIP.EXE*”.

The Splash screen appears as follows:

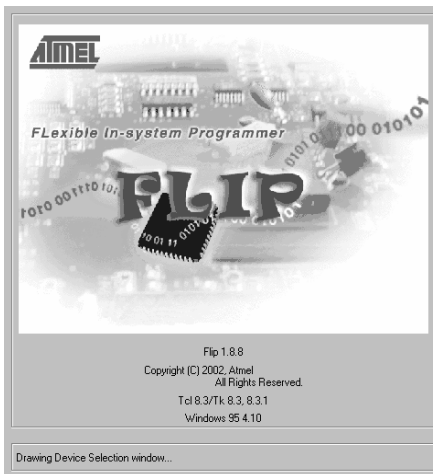


Figure 13: Splash Screen

2. After a few seconds, the Splash screen is replaced by the “*Atmel – Flip*” window:

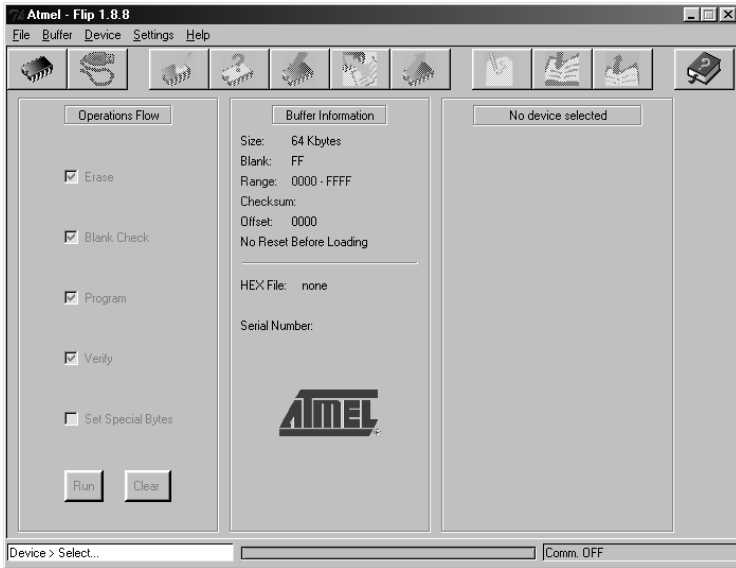


Figure 14: Atmel – Flip Window

3. Press the keyboard shortcut key *F4* (or select the “*Read Configuration File*” command from the *File* menu, or press the keys: *Alt FR*).

The “*Open Configuration File*” window appears:

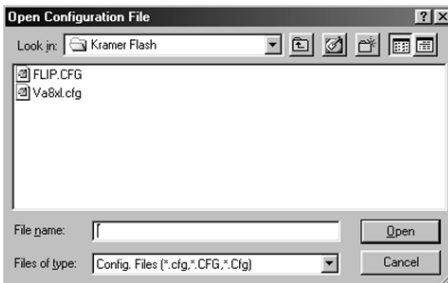


Figure 15: Open Configuration File Select Window

4. Choose the file: “*Va8xl.cfg*” (by double-clicking it).  
If COM 2 was not selected (see [Section 7.2](#)), an RS-232 error message appears. In the “*Atmel – Flip*” window, the *Operations Flow* column is disabled, and crosses appear in the third column.

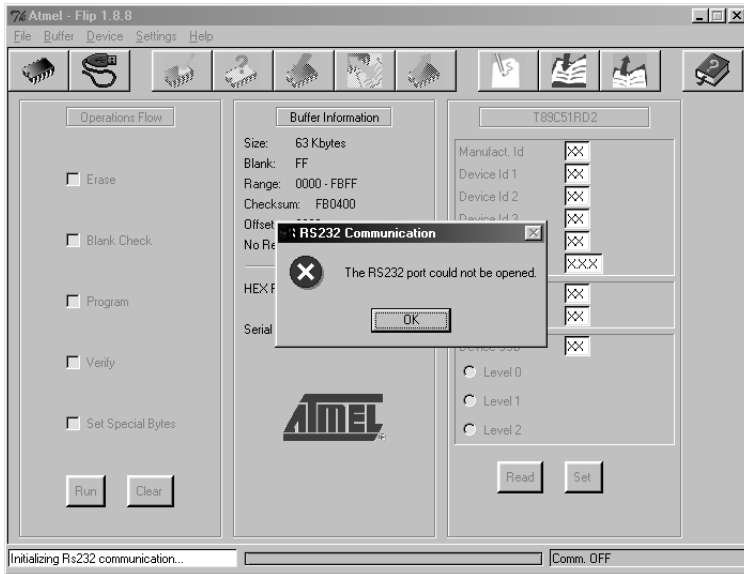


Figure 16: Atmel – Flip Window (RS-232 Communication)

- Click OK and press the keyboard shortcut key *F3* (or select the “*Communication / RS232*” command from the *Settings* menu, or press the keys: *Alt SCR*).

The “*RS232*” window appears. Change the COM port:

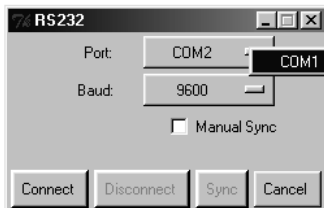


Figure 17: RS-232 Window

- Click Connect.

In the “*Atmel – Flip*” window, in the *Operations Flow* column, the *Run* button is active, and the name of the chip appears as the name of the third column: *T89C51RD2*.

Verify that in the *Buffer Information* column, the “*HEX File: Va8xl.hex*” appears.



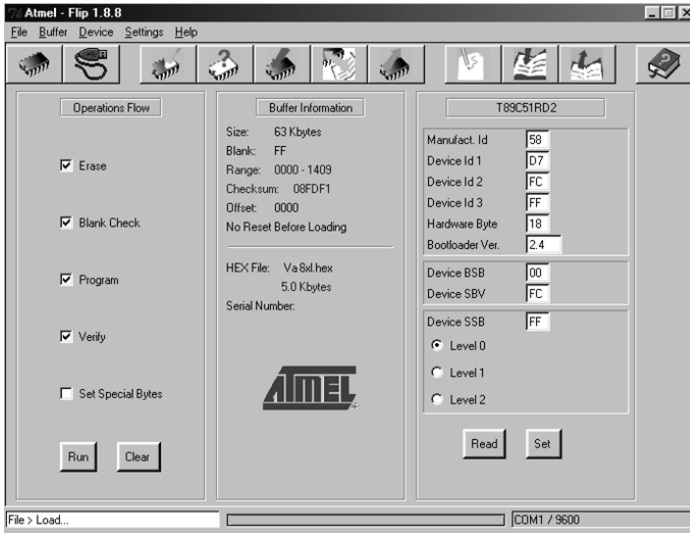


Figure 18: Atmel – Flip Window (Connected)

7. Click *Run*.

After each stage in the operation is completed, the check-box for that stage becomes colored green (see also the blue progress indicator on the status bar).

When the operation is completed, all 4 check-boxes will be colored green and the status bar message: *Memory Verify Pass* appears:  
 If an error message: "Not Finished" shows, click Run again.

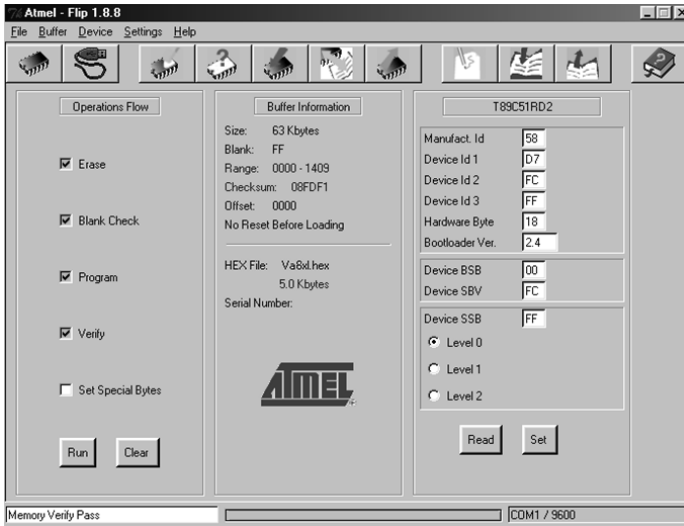


Figure 19: Atmel – Flip Window (Operation Completed)

8. Close the “Atmel – Flip” window.
9. Turn the POWER switch on the VA-8xl OFF.
10. Disconnect the RS-232 9-pin D-sub rear panel port on the **VA-8xl** unit from the null modem adapter.
11. Set DIP 7 OFF.
12. Set DIP 8 OFF.
13. Turn the *POWER* switch on the **VA-8xl** ON.  
Upon initialization, the new **VA-8xl** software version shows in the RIGHT LED display.

## 8 Technical Specifications

INPUTS:	8 balanced stereo audio +4dBm / 30k $\Omega$ on detachable terminal blocks
OUTPUTS:	8 balanced stereo audio +4dBm / 50 $\Omega$ on detachable terminal blocks
GAIN:	-95dB to +31dB
MAX. OUTPUT LEVEL:	>20dBu balanced (TND +N <0.01)
BANDWIDTH (-0.3dB):	20 Hz to 40 kHz
NOISE FLOOR:	<90dB (GAIN 0dB)
THD + NOISE:	0.006%, +4dBu 1kHz
CONTROLS:	Front pushbuttons, RS-232, and RS-485
INDICATORS:	Gain in dB for left and right channels
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:	90 - 240V AC, 13VA
DIMENSIONS:	19" x 7" x 1U (W, D, H) rack-mountable
WEIGHT:	3.5kg (7.8lbs) approx.
ACCESSORIES:	Power cord, null modem adapter, Windows®-based control software
Specifications are subject to change without notice at <a href="http://www.kramerelectronics.com">http://www.kramerelectronics.com</a>	

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## 9 Default Communication Parameters

<b>RS-232 Protocol 2000</b>	
Baud Rate:	9600
Data Bits:	8
Stop Bits:	1
Parity:	None
Command Format:	HEX
Example (Output 1 to Input 1):	0x01, 0x81, 0x81, 0x81
<b>Ethernet</b>	
IP Address:	192.168.1.39
TCP Port Number:	5000
Network Mask:	255.255.255.0
Default Gateway:	192.168.1.1

# 10 Kramer Protocol 2000

The **VA-8xl** is compatible with Kramer's Protocol 2000 (version 0.50). This RS-232 / RS-485 communication protocol uses four bytes of information as defined below:

**1st BYTE:** Bit 7 (MSB) Defined as 0.  
 Bit 6 0 - for sending information to the switchers (from the PC)  
 1 - for sending to the PC (from the switcher).  
 Bits 5...0 INSTRUCTION

The function that the switcher is to perform is defined in the INSTRUCTION table below. Similarly, if a function is performed via the machine's front panel, then these bits are set according to the INSTRUCTION NO. that was performed.

**2nd BYTE:** Bit 7 (MSB) Defined as 1.  
 Bits 4...0 Channel number  
 Bit 5 Left (set to 1 when referring to the left channel)  
 Bit 6 Right (set to 1 when referring to the right channel)

**Note:** To mute with regular attenuation use Bit 5 and 6 = 1  
 To mute immediately use Bit 5 and 6 = 0, however there may be a pop or click on the output of the muted channel.

**3rd BYTE:** Bit 7 (MSB) Defined as 1.  
 Bits 6...0 7 least significant bits of data

**4th BYTE:** Bit 7 (MSB) Defined as 1.  
 Bit 5 MSB of data (7 LSBs are in 3rd byte).  
 Bits 4...0 MACHINE NUMBER.

For RS-232, a null-modem connection between the machine and controller is used. For both RS-232/RS-485 interfaces the default data rate is 9600 baud, with no parity, 8 data bits and 1 stop bit.

All the values in the table are decimal, unless otherwise stated

INSTRUCTION		
#	DESCRIPTION	3rd BYTE
22dec (16hex)	SET AUDIO GAIN	Set 7 LSBs of gain value Gain (dB) = 31.5 - (0.5x(255-DATA))
24dec (18hex)	INCREASE / DECREASE AUDIO GAIN	0 - increase gain 1 - decrease gain
25dec (19hex)	REQUEST AUDIO GAIN	As in Instruction 22dec above. When requesting both channels, the reply is: <ul style="list-style-type: none"> <li>For equal left and right gain: bits 5 = bit 6</li> <li>For unequal left and right gain: bits 6 = 0; bit 5 = 1 for reply for left channel</li> </ul>

In addition to the above, instructions 15, 18, 19, 20, 61, 62 (decimal) of Kramer's Protocol 2000 are also fully implemented in the unit. For instructions 18 and 19, setups 01 to 15 (decimal) are valid.  
 See the following examples:

EXAMPLES	
COMMAND	EXAMPLES (MACHINE # 1)
16h E7h 90h 81h	Set channel 7 both left and right gain -8dB
16h AAh FFh 81h	Set channel 10 left gain -32.5dB
16h CAh COh A1h	Set channel 10 right gain 0dB
16h FOh DOh A1h	Set channel 16 both left and right gain +8dB
18h EFh 80h 81h	Increment (increase) gain on 0.5dB on left and right of channel 15
19h CFh 80h 81h	Request gain of channel 15 right. If the gain is 0dB for both left and right channels, then the reply would be: 59h EFh COh A1h
19h EEh 80h 81h	Request gain of channel 14 both left and right. If the gain is different for the left and right channels, then, for +3dB gain in the left channel the reply would be: 59h AEh C6h A1h

The following tables define the **VA-8xl** hex codes for attenuation gain control, amplification gain control and the channel number codes.

## 10.1 Hex Codes for Attenuation Gain Control

Gain (dB)	LED	Hex Codes
Mute	---	16 XX 80 81
-95.5	-95.5	16 XX 81 81
-95	-95	16 XX 82 81
-94.5	-94.5	16 XX 83 81
-94	-94	16 XX 84 81
-93.5	-93.5	16 XX 85 81
-93	-93	16 XX 86 81
-92.5	-92.5	16 XX 87 81
-92	-92	16 XX 88 81
-91.5	-91.5	16 XX 89 81
-91	-91	16 XX 8A 81
-90.5	-90.5	16 XX 8B 81
-90	-90	16 XX 8C 81
-89.5	-89.5	16 XX 8D 81
-89	-89	16 XX 8E 81
-88.5	-88.5	16 XX 8F 81
-88	-88	16 XX 90 81
-87.5	-87.5	16 XX 91 81
-87	-87	16 XX 92 81
-86.5	-86.5	16 XX 93 81
-86	-86	16 XX 94 81
-85.5	-85.5	16 XX 95 81
-85	-85	16 XX 96 81
-84.5	-84.5	16 XX 97 81
-84	-84	16 XX 98 81
-83.5	-83.5	16 XX 99 81
-83	-83	16 XX 9A 81
-82.5	-82.5	16 XX 9B 81
-82	-82	16 XX 9C 81
-81.5	-81.5	16 XX 9D 81
-81	-81	16 XX 9E 81
-80.5	-80.5	16 XX 9F 81
-80	-80	16 XX A0 81
-79.5	-79.5	16 XX A1 81
-79	-79	16 XX A2 81
-78.5	-78.5	16 XX A3 81
-78	-78	16 XX A4 81
-77.5	-77.5	16 XX A5 81
-77	-77	16 XX A6 81
-76.5	-76.5	16 XX A7 81
-76	-76	16 XX A8 81
-75.5	-75.5	16 XX A9 81
-75	-75	16 XX AA 81
-74.5	-74.5	16 XX AB 81
-74	-74	16 XX AC 81
-73.5	-73.5	16 XX AD 81
-73	-73	16 XX AE 81
-72.5	-72.5	16 XX AF 81
-72	-72	16 XX B0 81
-71.5	-71.5	16 XX B1 81

Gain (dB)	LED	Hex Codes
-68	-68	16 XX B8 81
-67.5	-67.5	16 XX B9 81
-67	-67	16 XX BA 81
-66.5	-66.5	16 XX BB 81
-66	-66	16 XX BC 81
-65.5	-65.5	16 XX BD 81
-65	-65	16 XX BE 81
-64.5	-64.5	16 XX BF 81
-64	-64	16 XX C0 81
-63.5	-63.5	16 XX C1 81
-63	-63	16 XX C2 81
-62.5	-62.5	16 XX C3 81
-62	-62	16 XX C4 81
-61.5	-61.5	16 XX C5 81
-61	-61	16 XX C6 81
-60.5	-60.5	16 XX C7 81
-60	-60	16 XX C8 81
-59.5	-59.5	16 XX C9 81
-59	-59	16 XX CA 81
-58.5	-58.5	16 XX CB 81
-58	-58	16 XX CC 81
-57.5	-57.5	16 XX CD 81
-57	-57	16 XX CE 81
-56.5	-56.5	16 XX CF 81
-56	-56	16 XX D0 81
-55.5	-55.5	16 XX D1 81
-55	-55	16 XX D2 81
-54.5	-54.5	16 XX D3 81
-54	-54	16 XX D4 81
-53.5	-53.5	16 XX D5 81
-53	-53	16 XX D6 81
-52.5	-52.5	16 XX D7 81
-52	-52	16 XX D8 81
-51.5	-51.5	16 XX D9 81
-51	-51	16 XX DA 81
-50.5	-50.5	16 XX DB 81
-50	-50	16 XX DC 81
-49.5	-49.5	16 XX DD 81
-49	-49	16 XX DE 81
-48.5	-48.5	16 XX DF 81
-48	-48	16 XX E0 81
-47.5	-47.5	16 XX E1 81
-47	-47	16 XX E2 81
-46.5	-46.5	16 XX E3 81
-46	-46	16 XX E4 81
-45.5	-45.5	16 XX E5 81
-45	-45	16 XX E6 81
-44.5	-44.5	16 XX E7 81
-44	-44	16 XX E8 81
-43.5	-43.5	16 XX E9 81

Gain (dB)	LED	Hex Codes
-40	-40	16 XX F0 81
-39.5	-39.5	16 XX F1 81
-39	-39	16 XX F2 81
-38.5	-38.5	16 XX F3 81
-38	-38	16 XX F4 81
-37.5	-37.5	16 XX F5 81
-37	-37	16 XX F6 81
-36.5	-36.5	16 XX F7 81
-36	-36	16 XX F8 81
-35.5	-35.5	16 XX F9 81
-35	-35	16 XX FA 81
-34.5	-34.5	16 XX FB 81
-34	-34	16 XX FC 81
-33.5	-33.5	16 XX FD 81
-33	-33	16 XX FE 81
-32.5	-32.5	16 XX FF 81
-32	-32	16 XX 80 A1
-31.5	-31.5	16 XX 81 A1
-31	-31	16 XX 82 A1
-30.5	-30.5	16 XX 83 A1
-30	-30	16 XX 84 A1
-29.5	-29.5	16 XX 85 A1
-29	-29	16 XX 86 A1
-28.5	-28.5	16 XX 87 A1
-28	-28	16 XX 88 A1
-27.5	-27.5	16 XX 89 A1
-27	-27	16 XX 8A A1
-26.5	-26.5	16 XX 8B A1
-26	-26	16 XX 8C A1
-25.5	-25.5	16 XX 8D A1
-25	-25	16 XX 8E A1
-24.5	-24.5	16 XX 8F A1
-24	-24	16 XX 90 A1
-23.5	-23.5	16 XX 91 A1
-23	-23	16 XX 92 A1
-22.5	-22.5	16 XX 93 A1
-22	-22	16 XX 94 A1
-21.5	-21.5	16 XX 95 A1
-21	-21	16 XX 96 A1
-20.5	-20.5	16 XX 97 A1
-20	-20	16 XX 98 A1
-19.5	-19.5	16 XX 99 A1
-19	-19	16 XX 9A A1
-18.5	-18.5	16 XX 9B A1
-18	-18	16 XX 9C A1
-17.5	-17.5	16 XX 9D A1
-17	-17	16 XX 9E A1
-16.5	-16.5	16 XX 9F A1
-16	-16	16 XX A0 A1
-15.5	-15.5	16 XX A1 A1

Gain (dB)	LED	Hex Codes
-71	-71	16 XX B2 81
-70.5	-70.5	16 XX B3 81
-70	-70	16 XX B4 81
-69.5	-69.5	16 XX B5 81
-69	-69	16 XX B6 81
-68.5	-68.5	16 XX B7 81
-12	-12	16 XX A8 A1
-11.5	-11.5	16 XX A9 A1
-11	-11	16 XX AA A1
-10.5	-10.5	16 XX AB A1
-10	-10	16 XX AC A1
-9.5	-9.5	16 XX AD A1
-9	-9	16 XX AE A1
-8.5	-8.5	16 XX AF A1

Gain (dB)	LED	Hex Codes
-43	-43	16 XX EA 81
-42.5	-42.5	16 XX EB 81
-42	-42	16 XX EC 81
-41.5	-41.5	16 XX ED 81
-41	-41	16 XX EE 81
-40.5	-40.5	16 XX EF 81
-8	-8	16 XX B0 A1
-7.5	-7.5	16 XX B1 A1
-7	-7	16 XX B2 A1
-6.5	-6.5	16 XX B3 A1
-6	-6	16 XX B4 A1
-5.5	-5.5	16 XX B5 A1
-5	-5	16 XX B6 A1
-4.5	-4.5	16 XX B7 A1

Gain (dB)	LED	Hex Codes
-15	-15	16 XX A2 A1
-14.5	-14.5	16 XX A3 A1
-14	-14	16 XX A4 A1
-13.5	-13.5	16 XX A5 A1
-13	-13	16 XX A6 A1
-12.5	-12.5	16 XX A7 A1
-4	-4	16 XX B8 A1
-3.5	-3.5	16 XX B9 A1
-3	-3	16 XX BA A1
-2.5	-2.5	16 XX BB A1
-2	-2	16 XX BC A1
-1.5	-1.5	16 XX BD A1
-1	-1	16 XX BE A1
-0.5	-0.5	16 XX BF A1

## 10.2 Hex Codes for Amplification Gain Control

Gain (dB)	LED	Hex Codes
0	0	16 XX C0 A1
+0.5	+0.5	16 XX C1 A1
+1	+1	16 XX C2 A1
+1.5	+1.5	16 XX C3 A1
+2	+2	16 XX C4 A1
+2.5	+2.5	16 XX C5 A1
+3	+3	16 XX C6 A1
+3.5	+3.5	16 XX C7 A1
+4	+4	16 XX C8 A1
+4.5	+4.5	16 XX C9 A1
+5	+5	16 XX CA A1
+5.5	+5.5	16 XX CB A1
+6	+6	16 XX CC A1
+6.5	+6.5	16 XX CD A1
+7	+7	16 XX CE A1
+7.5	+7.5	16 XX CF A1
+8	+8	16 XX D0 A1
+8.5	+8.5	16 XX D1 A1
+9	+9	16 XX D2 A1
+9.5	+9.5	16 XX D3 A1
+10	+10	16 XX D4 A1
+10.5	+10.5	16 XX D5 A1

Gain (dB)	LED	Hex Codes
+11	+11	16 XX D6 A1
+11.5	+11.5	16 XX D7 A1
+12	+12	16 XX D8 A1
+12.5	+12.5	16 XX D9 A1
+13	+13	16 XX DA A1
+13.5	+13.5	16 XX DB A1
+14	+14	16 XX DC A1
+14.5	+14.5	16 XX DD A1
+15	+15	16 XX DE A1
+15.5	+15.5	16 XX DF A1
+16	+16	16 XX E0 A1
+16.5	+16.5	16 XX E1 A1
+17	+17	16 XX E2 A1
+17.5	+17.5	16 XX E3 A1
+18	+18	16 XX E4 A1
+18.5	+18.5	16 XX E5 A1
+19	+19	16 XX E6 A1
+19.5	+19.5	16 XX E7 A1
+20	+20	16 XX E8 A1
+20.5	+20.5	16 XX E9 A1
+21	+21	16 XX EA A1
+21.5	+21.5	16 XX EB A1

Gain (dB)	LED	Hex Codes
+22	+22	16 XX EC A1
+22.5	+22.5	16 XX ED A1
+23	+23	16 XX EE A1
+23.5	+23.5	16 XX EF A1
+24	+24	16 XX F0 A1
+24.5	+24.5	16 XX F1 A1
+25	+25	16 XX F2 A1
+25.5	+25.5	16 XX F3 A1
+26	+26	16 XX F4 A1
+26.5	+26.5	16 XX F5 A1
+27	+27	16 XX F6 A1
+27.5	+27.5	16 XX F7 A1
+28	+28	16 XX F8 A1
+28.5	+28.5	16 XX F9 A1
+29	+29	16 XX FA A1
+29.5	+29.5	16 XX FB A1
+30	+30	16 XX FC A1
+30.5	+30.5	16 XX FD A1
+31	+31	16 XX FE A1
+31.5	+31.5	16 XX FF A1

## 10.3 Channel Number Codes

Channel	Left	Right	Both (L & R)
1	A1	C1	E1
2	A2	C2	E2
3	A3	C3	E3
4	A4	C4	E4
5	A5	C5	E5
6	A6	C6	E6
7	A7	C7	E7
8	A8	C8	E8

Channel	Left	Right	Both (L & R)
9	A9	C9	E9
10	AA	CA	EA
11	AB	CB	EB
12	AC	CC	EC
13	AD	CD	ED
14	AE	CE	EE
15	AF	CF	EF
16	B0	D0	F0

## 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](http://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.

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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.

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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](http://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](http://www.kramerelectronics.com)

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



**SAFETY WARNING**

Disconnect the unit from the power supply before opening and servicing



P/N: 2900-300151



Rev: 1