



KRAMER ELECTRONICS LTD.

USER MANUAL

MODEL:

908

40W per Channel Stereo Audio
Amplifier

P/N: 2900-000537 Rev 8

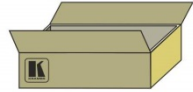


908 Quick Start Guide

This guide helps you install and use your product for the first time. For more detailed information, go to <http://www.kramerav.com/manual/908> to download the latest manual or scan the QR code on the left.

Step 1: Check what's in the box

- ✓ 908 40W per Channel Stereo Audio Amplifier
- ✓ 1 Power supply (24V DC)
- ✓ 4 Rubber feet
- ✓ 1 Quick Start sheet
- ✓ Kramer RC-IR3 Infrared Remote Control Transmitter with batteries and user manual



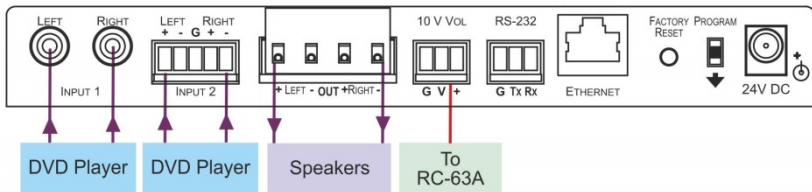
Save the original box and packaging materials in case you need to return your **908** for service.

Step 2: Install the 908

Attach the rubber feet and place on a table or mount the **908** in a rack (using an optional **RK-T2B** rack mount).

Step 3: Connect the inputs and outputs

Always switch off the power on each device before connecting it to your **908**.



Always use Kramer high-performance cables for connecting AV equipment to the **908**.

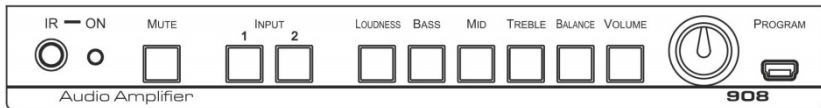
Step 4: Connect the power

Connect the 24V DC power adapter to the **908** and plug the adapter into the mains electricity.



Step 5: Operate the 908

Operate using the front panel buttons, RS-232, Ethernet or the IR remote control.



Contents

1	Introduction	1
2	Getting Started	2
2.1	Achieving the Best Performance	2
2.2	Safety Instructions	3
2.3	Recycling Kramer Products	3
3	Overview	4
3.1	Defining the 908 40W per Channel Stereo Audio Amplifier	5
4	Connecting the 908	7
4.1	Connecting Balanced/Unbalanced Stereo Audio Input/Output	8
4.2	Connect the 10V CONTROL Port to an External Controller	9
4.3	Connecting a PC via RS-232	9
4.4	Connecting the 908 via the Ethernet Port	10
5	Operating the 908	12
5.1	Using the Front Panel Buttons	12
5.2	Using Serial Commands	13
5.3	Using the Embedded Web Server	13
5.4	Using the RC-IR3 Infrared Remote Controller	17
6	Updating the 908 Firmware	18
7	Default Communication Parameters	19
8	Technical Specifications	20
9	908 Commands in Protocol 3000	21
9.1	Operating Commands	21
9.2	Help Commands	21
9.3	Device Initiated Messages	21
9.4	Result and Error Codes	21
9.5	Basic Routing Commands	22
9.6	Audio Parameters Commands	22
9.7	Identification Commands	23
9.8	Network Setting Commands	24
9.9	Machine Information Commands	24
9.10	Protocol 3000 Syntax	25

Figures

Figure 1:	908 40W per Channel Stereo Audio Amplifier	5
Figure 2:	Connecting the 908 40W per Channel Stereo Audio Amplifier	8
Figure 3:	Balanced Stereo Audio Connection	8
Figure 4:	Unbalanced Stereo Audio Input Connection	8
Figure 5:	Unbalanced Stereo Audio Output Connection	8
Figure 6:	Connecting the 10V VOL Terminal Block Connector	9
Figure 7:	Connecting to a PC	9
Figure 8:	Local Area Properties Window	10
Figure 9:	Internet Protocol (TCP/IP) Properties Window	11
Figure 10:	Java Test Page Success Message	13
Figure 11:	Entering the IP Number in the Address Bar	14
Figure 12:	Loading the Embedded Web Server	14
Figure 13:	First Time Security Warning	15
Figure 14:	The 908 Control Window	15
Figure 15:	Control Settings	16
Figure 16:	Ethernet Settings	16

1 Introduction

Welcome to Kramer Electronics! Since 1981, Kramer Electronics has been providing a world of unique, creative, and affordable solutions to the vast range of problems that confront video, audio, presentation, and broadcasting professionals on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better!

Our 1,000-plus different models now appear in 14 groups that are clearly defined by function: GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Routers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters; GROUP 11: Sierra Video Products; GROUP 12: Digital Signage; GROUP 13: Audio; and GROUP 14: Collaboration.

Congratulations on purchasing your Kramer **908** *40W per Channel Stereo Audio Amplifier*, which is ideal for the following typical applications:

- Presentation rooms and multimedia applications for quick, local audio amplification
- Personal audio listening (for example, a PC and portable CD player)

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



Go to www.kramerav.com/downloads/908 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 (we recommend Kramer high-performance, high-resolution cables) to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)
- Do not secure the cables in tight bundles or roll the slack into tight coils
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality
- Position your Kramer **908** away from moisture, excessive sunlight and dust



This equipment is to be used only inside a building. It may only be connected to other equipment that is installed inside a building.

2.2 Safety Instructions



Caution: There are no operator serviceable parts inside the unit

Warning: Use only the Kramer Electronics input power wall adapter that is provided with the unit

Warning: Disconnect the power and unplug the unit from the wall before installing

2.3 Recycling Kramer Products

The Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC aims to reduce the amount of WEEE sent for disposal to landfill or incineration by requiring it to be collected and recycled. To comply with the WEEE Directive, Kramer Electronics has made arrangements with the European Advanced Recycling Network (EARN) and will cover any costs of treatment, recycling and recovery of waste Kramer Electronics branded equipment on arrival at the EARN facility. For details of Kramer's recycling arrangements in your particular country go to our recycling pages at www.kramerav.com/support/recycling/.

3 Overview

The Kramer **908** is a high-performance audio amplifier for line-level stereo audio signals. It accepts either a stereo audio signal on RCA connectors or a balanced stereo audio signal on a terminal block connector. It delivers a speaker output of 2x40 watts RMS per channel into an 8Ω load on a 10A 4-pin terminal block connector. The **908** features:

- Two input selector buttons and a mute button
- One gain knob for adjusting the audio output levels for loudness, bass, middle, treble, balance and the volume
- A USB connector for firmware upgrade
- RS-232 and Ethernet ports
- A 10V control port for adjusting the audio gain via an external connector (for example, the Kramer **RC-63A**)

The **908** can be controlled:

- Directly, via the front panel push buttons and adjustment knob
- By RS-232 serial commands transmitted by a touch screen system, PC, or other serial controller
- Via an external 10V controller (for volume)
- Via the Ethernet using the embedded Web server
- Remotely, from the infrared remote control transmitter

The **908** is housed in a Kramer MegaTOOLS™ enclosure and is fed by a 24V DC power supply.

3.1 Defining the 908 40W per Channel Stereo Audio Amplifier

This section defines the **908**.

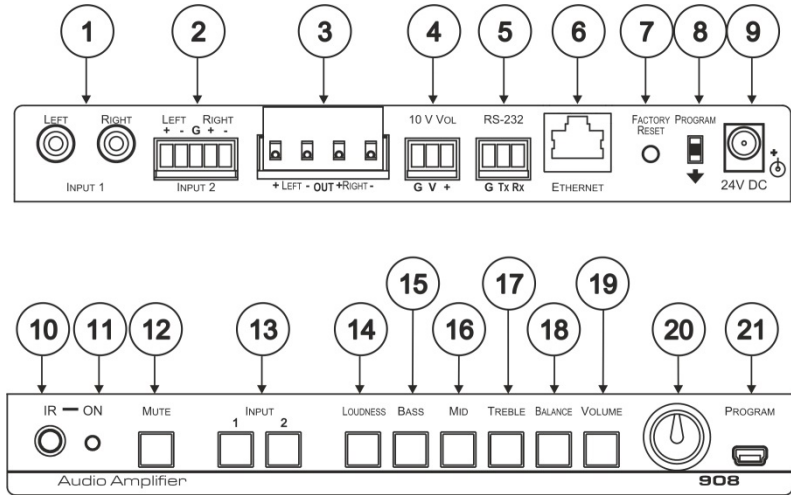


Figure 1: 908 40W per Channel Stereo Audio Amplifier

#	Feature	Function
1	INPUT 1 L and R RCA Connectors	Connect to the left and right unbalanced stereo analog audio acceptor
2	INPUT 2 Terminal Block Connector	Connect to the balanced stereo audio source
3	OUTPUT Terminal Block Connector	Connect to a balanced stereo acceptor (speakers)
4	10V VOL G, V, + Terminal Block Connector	Connect to a controller (for example, the Kramer RC-63A) to adjust the volume via the controller
5	RS-232 G Tx Rx Terminal Block Connector	Control connector
6	ETHERNET Port	Connects to your LAN
7	FACTORY RESET Button	Press to return the device to its factory default settings
8	PROGRAM Switch	Switch down before performing a firmware upgrade, leave up (the default) for normal operation
9	24V DC Connector	+24V DC for powering the unit
10	IR IN Receiver	Accepts IR remote commands
11	ON LED	Illuminates green when receiving power, flashes when receiving IR commands
12	MUTE Button	Press to disable/enable the audio output. The button illuminates when the audio output is disabled
13	INPUT SELECTOR Buttons	Press to select the input audio source 1 or 2

#	Feature	Function
14	<i>LOUDNESS</i> Button	Press to select the loudness adjustment, adjust with the level knob
15	<i>BASS</i> Button	Press to select the bass adjustment, adjust with the level knob
16	<i>MID</i> Button	Press to select the mid- range adjustment, adjust with the level knob
17	<i>TREBLE</i> Button	Press to select the treble adjustment, adjust with the level knob
18	<i>BALANCE</i> Button	Press to select the balance between right and left speakers, adjust with the level knob
19	<i>VOLUME</i> Button	Press to select the volume adjustment, adjust with the level knob
20	Level Adjustment Knob	Increase and decrease the level of the previously selected function. Press and hold to disable local volume control and enable remote volume control. Press and hold again to activate local volume control (see Section 5.1)
21	<i>PROGRAM (USB)</i> Connector	Connect to a computer to upgrade the firmware

4 Connecting the 908



Always switch off the power to each device before connecting it to your **908**. After connecting your **908**, connect its power and then switch on the power to each device.

To connect the **908**, as illustrated in the example in [Figure 2](#), (see the input/output connections in [Section 4.1](#)) do the following:

1. Connect an unbalanced stereo audio source (for example, the unbalanced stereo audio output of a DVD player) to the L and R INPUT 1 RCA connectors.
2. Connect a balanced stereo audio source (for example, the balanced stereo audio output of a DVD player) to the INPUT 2 terminal block connector.
3. Connect the OUTPUT terminal block to a pair of loudspeakers:
Connect the “L+” and the “L-” terminal block connectors to the left loudspeaker, and the “R+” and the “R-” terminal block connectors to the right loudspeaker. **Do not ground the loudspeakers.**
4. Connect the 24V DC power adapter to the power socket and connect the adapter to the mains electricity (not shown in [Figure 2](#)).
5. If required, connect:
 - The 10V CONTROL terminal block connector to an external controller (for example, the Kramer **RC-63A**) (see [Section 4.2](#))
 - The RS-232 port to a PC and/or serial controller (see [Section 4.3](#))
 - The Ethernet port to a PC or a network hub or router (see [Section 4.4](#))

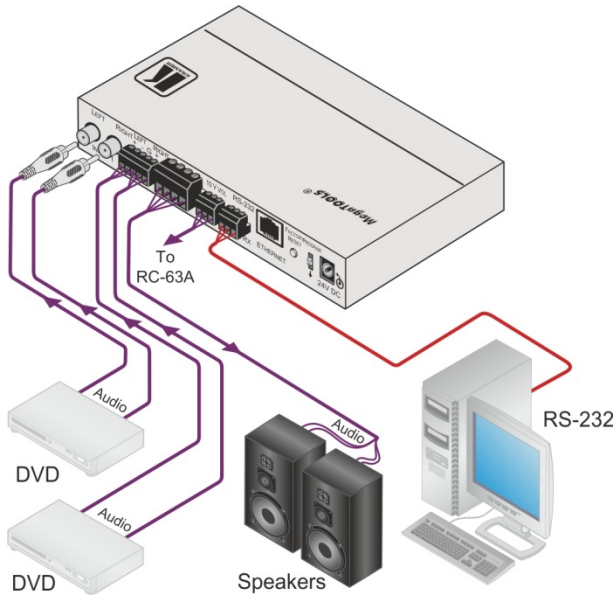


Figure 2: Connecting the 908 40W per Channel Stereo Audio Amplifier

4.1 Connecting Balanced/Unbalanced Stereo Audio Input/Output

This section illustrates how to wire:

- A balanced stereo audio connection, see [Figure 3](#)
- An unbalanced stereo audio input connection, see [Figure 4](#)
- An unbalanced stereo audio output connection, see [Figure 5](#)

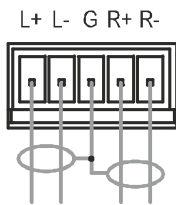


Figure 3: Balanced Stereo Audio Connection

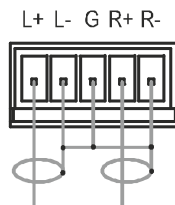


Figure 4: Unbalanced Stereo Audio Input Connection

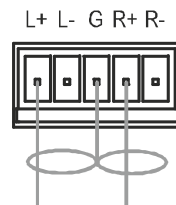


Figure 5: Unbalanced Stereo Audio Output Connection

4.2 Connect the 10V CONTROL Port to an External Controller

You can connect the **908** 10V VOL terminal block connector to a controller (for example, the Kramer **RC-63A**) as illustrated in [Figure 6](#):

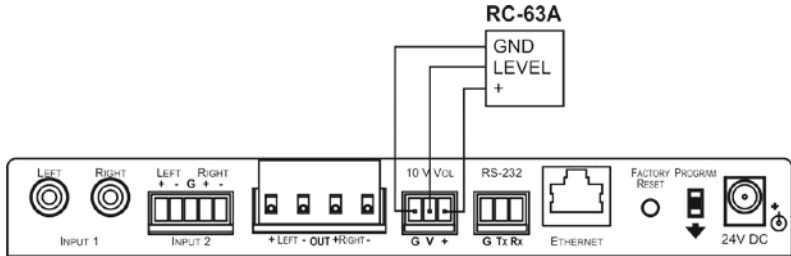


Figure 6: Connecting the 10V VOL Terminal Block Connector

4.3 Connecting a PC via RS-232

You can connect a PC (or other controller) to the **908** via the RS-232 terminal block connector.

To connect a PC to a **908** unit, connect the RS-232 terminal block connector on the **908** unit to the RS-232 9-pin D-sub port on your PC, see [Figure 7](#):

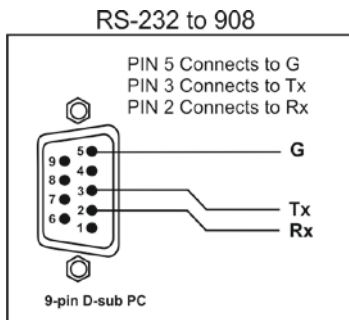


Figure 7: Connecting to a PC

4.4 Connecting the 908 via the Ethernet Port

To connect the **908** via the Ethernet port, do the following:

- When connecting to the Ethernet port on a network hub or network router, use a straight-through cable with RJ-45 connectors
- When connecting to the Ethernet port of a PC, use a crossover cable with RJ-45 connectors

If you are connecting the **908** directly to your computer (not through the network) you may need to reconfigure the PC network settings.

To reconfigure the PC network settings:

1. Navigate to *Start > Settings > Network Connections*.
2. Click on the appropriate *Local Area Connection*.
3. Right-click the *Local Area Connection* and click *Properties*.

The Local Area Properties Window appears:

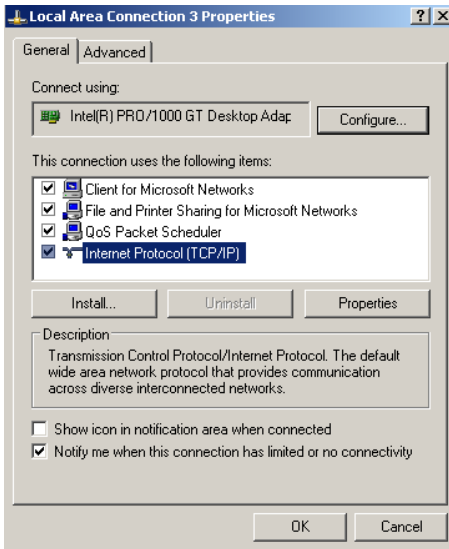


Figure 8: Local Area Properties Window

4. Select *Internet Protocol (TCP/IP)* and click *Properties*.

The Internet Protocol (TCP/IP) Properties Window appears:

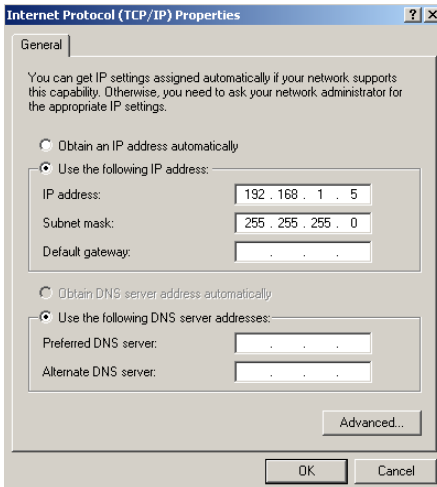


Figure 9: Internet Protocol (TCP/IP) Properties Window

5. Click *Use the following IP address* and enter the IP address and Subnet mask shown above. Click *OK* and *OK* to close both windows and save the settings.

5 Operating the 908

You can operate your **908** using:

- The front panel buttons (see [Section 5.1](#))
- PC, touch screen system, or other serial controller via RS-232 serial commands (see [Section 5.2](#))
- The Ethernet via the embedded Web server (see [Section 5.3](#))
- The included RC-IR3 Infrared Remote Controller (see [Section 5.4](#))

5.1 Using the Front Panel Buttons

The front panel buttons let you:

- Select an input, by pressing the INPUT 1 or the INPUT 2 button
- Adjust the sound
- Mute the sound by pressing the MUTE button

To adjust the sound of the output signal:

1. Press the sound component that you want to adjust (LOUD, BASS, MID, TREBLE, BAL or VOLUME). The button illuminates.
2. Turn the adjustment knob to adjust the setting.

Note: To enable remote volume control via the 10V VOL connector (using for example, the Kramer **RC-63A**), you must disable the local digital volume control by pressing and holding the VOLUME button on the front panel for several seconds. The LED flashes to indicate that remote control is enabled. In this mode, volume control via software ("Set simple audio volume" P3000 command, see [Section 9.6](#)) is disabled. To disable remote control, press and hold the VOLUME button and the LED lights solid.

5.2 Using Serial Commands

To operate your device using serial commands, you need to install Kramer's control software.

Download control software from our Web site at www.kramerav.com.

For an explanation of all control commands, see [Section 9](#).

5.3 Using the Embedded Web Server

You can remotely operate the **908** using a Web browser via the Ethernet connection (see [Section 5.3](#)). To be able to do so, you must use a supported Web browser; Microsoft (V6.0 and higher), Chrome or Firefox (V3.0 and higher).

Note: The Web server may not work with Windows 7 and higher.

To check that Java is installed correctly and running, browse to:

<http://www.java.com/en/download/help/testvm.xml>

This page runs a test and displays a Java success (see [Figure 10](#)) or failure message.



Figure 10: Java Test Page Success Message

If you do not see the success message, follow the instructions on the page to:

- Load and enable Java
- Enable Javascript in your browser

Make sure that your PC is connected via the Ethernet connection to the **908** (see [Section 4.4](#)) and do the following:

1. Open your Internet browser.
2. Enter the unit's IP number or name in the Address bar of your browser.
If you are using DHCP, you must enter the name.
The default IP number is 192.168.1.39, and may be changed by the system integrator.



Figure 11: Entering the IP Number in the Address Bar

The following window appears:

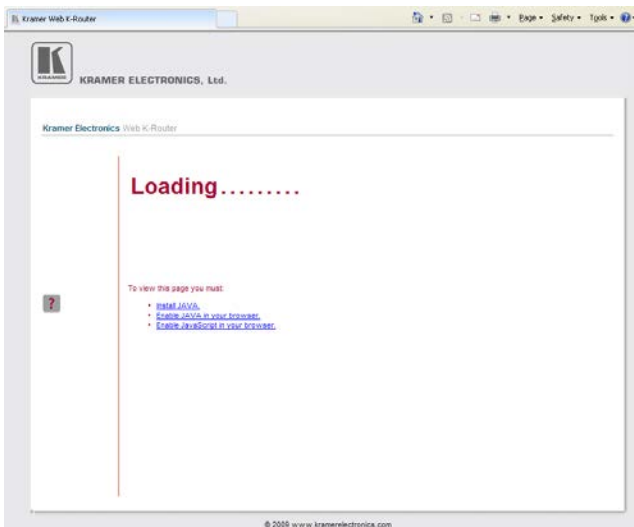


Figure 12: Loading the Embedded Web Server

3. Check that Java and JavaScript is enabled in your browser.
The following window appears:



Figure 13: First Time Security Warning

4. Click Run.

The **908** Control Window opens (see [Figure 14](#)):

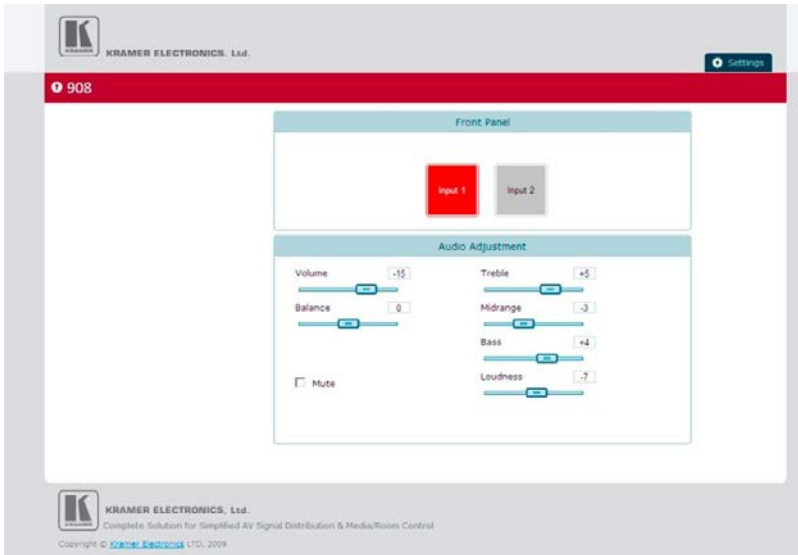


Figure 14: The 908 Control Window

5. To choose the desired input, click on *Input 1* or *Input 2* (see [Figure 15](#)). Each input has its own set of audio adjustments.
6. To adjust each function, click and hold each slider and drag to the right to increase or to the left to decrease the shown value.
7. To mute the output, check the Mute box.

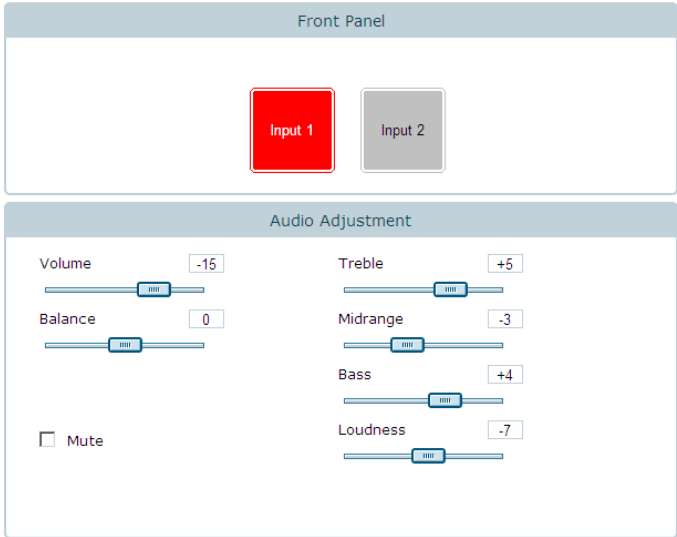


Figure 15: Control Settings

8. To change the Ethernet settings, click the *Settings* tab at the top of the Control Window. The Ethernet settings display (see [Figure 16](#)):

908

Name	<input type="text" value="KRAMER_0017"/>
Model	<input type="text" value="K-DEVICE"/>
Serial Number	<input type="text" value="95900017"/>
Firmware Version	<input type="text" value="01.00.09.0803"/>
K-NET ID	<input type="text" value="01"/>
MAC Address	<input type="text" value="00-1d-56-00-b8-b2"/>
IP Address	<input type="text" value="192.168.1.39"/>
DHCP	<input type="checkbox"/>
Gateway	<input type="text" value="0.0.0.0"/>
Subnet Mask	<input type="text" value="255.255.0.0"/>

Figure 16: Ethernet Settings

9. Make any necessary changes and click *Save* to save the settings.
10. To return to the Control Window, click *908* under the Kramer logo.

5.4 Using the RC-IR3 Infrared Remote Controller

You can use the **RC-IR3** remote controller to make some of the adjustments that are made using the front panel buttons:

Loudness, bass, mid, treble and balance adjustments are not adjustable using the IR remote.

- To choose an input, press button 1 or 2
- To toggle muting, press the OFF button
- To increase the volume, press + (▶)
- To decrease the volume, press – (◀)

6 Updating the 908 Firmware

The **908** functions by means of a device microcontroller that runs firmware located in FLASH memory.

If required, you can download and upgrade to the latest version of firmware.

Download from the Kramer Web site www.kramerav.com.

The firmware is installed using the P3K software that is also available from the Kramer Web site.

7 Default Communication Parameters

The following table lists the communication parameters as used in Kramer Electronics products.

RS-232	
Protocol 3000 (Default)	
Baud Rate:	115,200
Data Bits:	8
Stop Bits:	1
Parity:	None
Command Format:	ASCII
Ethernet Factory Default Values	
IP Address: 192.168.1.39 Mask: 255.255.255.0 Gateway: 192.168.1.1	Power cycle the unit while pressing the Factory Reset button, located on the rear panel of the unit.
TCP Port #: 5000	
UDP Port #: 50000	

8 Technical Specifications

INPUTS:	1 unbalanced stereo audio input on RCA connectors 1 balanced stereo audio input on a 5-pin terminal block connector 1 USB connector
OUTPUTS:	1 speaker stereo audio output on a 4-pin terminal block connector
INPUT SENSITIVITY:	Unbalanced: 360mVpp; balanced: 220mVpp
MAX. VOLTAGE GAIN:	Unbalanced: 35dB; balanced: 40.5dB
OUTPUT POWER:	40W per channel into 8Ω
BANDWIDTH (-3dB):	22kHz
CROSSTALK:	<-57dB @20kHz
CONTROLS:	Level: <-30dB to 35.5dB; balance: -30dB to 0dB; loudness: -14dB to 0dB @1kHz; bass: -15dB to 12dB @100Hz; mid: -15dB to 11dB @1kHz; treble: -14dB to 13dB @10kHz; input selector buttons, mute button, loudness, bass, mid, treble, balance, volume buttons, IR, RS-232, Ethernet, 10V volume control
COUPLING:	Input: AC, output: DC
AUDIO THD + NOISE:	0.15%
AUDIO 2nd HARMONIC:	0.06%
SIGNAL/NOISE RATIO:	63dB, 80dB @10% distortion
AMPLIFIER TYPE:	Class D
POWER CONSUMPTION:	24V DC, 2A
OPERATING TEMPERATURE:	0° to +40°C (32° to 104°F)
STORAGE TEMPERATURE:	-40° to +70°C (-40° to 158°F)
HUMIDITY:	10% to 90%, RHL non-condensing
DIMENSIONS:	18.8cm x 11.4cm x 2.4cm (7.4" x 4.5" x 0.94") W, D, H
WEIGHT:	0.6kg (1.32lbs)
ACCESSORIES:	Power supply, RC-IR3 remote controller
OPTIONS:	RK-T2B 19" rack adapter
Specifications are subject to change without notice at www.kramerav.com	

9 908 Commands in Protocol 3000

This RS-232/RS-485 communication protocol lets you control the machine from any standard terminal software (for example, Windows® HyperTerminal Application) and uses a data rate of 115200 baud, with no parity, 8 data bits, and 1 stop bit.

This section describes all commands sent to the **908**. For an explanation of the syntax and use of Protocol 3000, see [Section 9.10](#).

9.1 Operating Commands

Following are the specific commands that the room controller (RC device) sends to the **908** to operate the external devices.

9.2 Help Commands

Command	Syntax	Response
Protocol handshaking	# CR	~OK CRLF

9.3 Device Initiated Messages

Command	Syntax
Start message	Kramer Electronics LTD. , Device Model Version Software Version

Switcher actions:

Audio channel has switched (breakaway mode)	AUD IN>OUT
---	----------------------

9.4 Result and Error Codes

	Syntax
Command ran successfully, no error.	COMMAND PARAMETERS OK

Protocol Errors:

Syntax error	ERR001
Command not available for this device	ERR002
Parameter is out of range	ERR003
Unauthorized access (command run without the matching login).	ERR004

9.5 Basic Routing Commands

Command	Syntax	Response
Switch audio only	AUD <u>IN</u> > <u>OUT</u> , <u>IN</u> > <u>OUT</u> , ... Short form: A <u>IN</u> > <u>OUT</u> , <u>IN</u> > <u>OUT</u> , ...	AUD <u>IN</u> > <u>OUT</u> , <u>IN</u> > <u>OUT</u> , <u>RESULT</u>
Switch audio only	AUD <u>IN</u> > <u>OUT</u> , <u>IN</u> > <u>OUT</u> , ... Short form: A <u>IN</u> > <u>OUT</u> , <u>IN</u> > <u>OUT</u> , ...	AUD <u>IN</u> > <u>OUT</u> , <u>IN</u> > <u>OUT</u> , <u>RESULT</u>
Read audio connection	AUD? <u>OUT</u> Short form: A? <u>OUT</u> AUD? *	AUD <u>IN</u> > <u>OUT</u> AUD <u>IN</u> >1, <u>IN</u> >2, ...

Parameter Description:

IN = Input number or '0' to disconnect output.

'>' = Connection character between in and out parameters.

OUT = Output number or '*' for all outputs.

9.6 Audio Parameters Commands

Command	Syntax	Response
Set simple audio volume	VOLUME <u>VOLUME</u> Short form: VOL <u>VOLUME</u>	VOLUME <u>VOLUME</u> <u>RESULT</u>
Increase/decrease simple audio volume	VOLUME <u>++/--</u> Short form: VOL <u>++/--</u>	VOLUME <u>++/--</u> <u>RESULT</u>
Read simple audio level	VOLUME? Short form: VOL?	VOLUME <u>VOLUME</u>
Set audio level in specific amplifier stage.	AUD-LVL <u>STAGE</u> , <u>CHANNEL</u> , <u>VOLUME</u> Short form: ADL <u>STAGE</u> , <u>CHANNEL</u> , <u>VOLUME</u>	AUD-LVL <u>STAGE</u> , <u>CHANNEL</u> , <u>VOLUME</u> <u>RESULT</u>
Read audio volume level	AUD-LVL? <u>STAGE</u> , <u>CHANNEL</u> Short form: ADL? <u>STAGE</u>	AUD-LVL <u>STAGE</u> , <u>CHANNEL</u> , <u>VOLUME</u>

Advanced commands for controlling each stage of audio amplification:

Set audio bass level	BASS <u>CHANNEL</u> , <u>BASS</u> Short form: ADB <u>CHANNEL</u> , <u>BASS</u>	BASS <u>CHANNEL</u> , <u>BASS</u> <u>RESULT</u>
Read audio bass level	BASS? <u>CHANNEL</u> Short form: ADB? <u>CHANNEL</u>	BASS <u>CHANNEL</u> , <u>BASS</u>
Set audio treble level	TREBLE <u>CHANNEL</u> , <u>TREBLE</u> Short form: ADT <u>CHANNEL</u> , <u>TREBLE</u>	TREBLE <u>CHANNEL</u> , <u>TREBLE</u> <u>RESULT</u>
Read audio treble	TREBLE? <u>CHANNEL</u> Short form: ADT? <u>CHANNEL</u>	TREBLE <u>CHANNEL</u> , <u>TREBLE</u>
Set audio midrange	MIDRANGE <u>CHANNEL</u> , <u>MID_RANGE</u> Short form: ADM <u>CHANNEL</u> , <u>MID_RANGE</u>	MIDRANGE <u>CHANNEL</u> , <u>MID_RANGE</u> <u>RESULT</u>
Read audio midrange	MIDRANGE? <u>CHANNEL</u> Short form: ADM? <u>CHANNEL</u>	MIDRANGE <u>CHANNEL</u> , <u>MID_RANGE</u>
Set audio loudness	LOUDNESS <u>CHANNEL</u> , <u>LOUDNESS</u> Short form: ADS <u>CHANNEL</u> , <u>LOUDNESS</u>	LOUDNESS <u>CHANNEL</u> , <u>LOUDNESS</u> <u>RESULT</u>

Command	Syntax	Response
Read audio loudness	LOUDNESS? CHANNEL Short form: ADS? CHANNEL	LOUDNESS CHANNEL, LOUDNESS
Mute audio	MUTE MUTE-MODE	MUTE MUTE-MODE RESULT
Read audio mute state	MUTE?	MUTE MUTE-MODE
Set stereo mode	STEREO STEREO-MODE	STEREO STEREO-MODE RESULT
Read stereo mode	STEREO?	STEREO STEREO-MODE
Set balance mode	BALANCE OUT-CHANNEL BALANCE-LEVEL	BALANCE OUT-CHANNEL, BALANCE-LEVEL RESULT
Read balance mode	BALANCE? OUT-CHANNEL	BALANCE OUT-CHANNEL, BALANCE-LEVEL
<p>Parameter Description: [STAGE] = 'IN, 'OUT' or Numeric value of present audio processing stage. For example: '0' for input level, '1' for pre-amplifier, '2' for amplifier (OUT) etc. [CHANNEL] = Input or Output # [VOLUME] / [BASS] / [TREBLE] / [MID_RANGE] = Audio parameter in Kramer units, minus sign precedes negative values. ++ increase current value, -- decrease current value.</p>		

9.7 Identification Commands

Command	Syntax	Response
Protocol handshaking	#CR	-OK CRLF
Read device model	MODEL?	MODEL MACHINE_MODEL
Read device serial number	SN?	SN SERIAL_NUMBER
Read device firmware version	VERSION?	VERSION MAJOR MINOR BUILD REVISION
Set machine name	NAME MACHINE_NAME	NAME MACHINE_NAME RESULT
Read machine name	NAME?	NAME MACHINE_NAME
Reset machine name to factory default*	NAME-RST	NAME-RST MACHINE_FACTORY_NAME RESULT

***Note:** The machine name is not the same as the model name. The machine name is used to identify a specific machine or a network in use (with DNS feature on).

[MACHINE_NAME] = Up to 14 alphanumeric chars.

* **Machine factory name** = Model name + last 4 digits from serial number.

Set machine ID number	MACH-NUM MACHINE_NUMBER	MACH-NUM OLD_MACHINE_NUMBER NEW_MACHINE_NUMBER RESULT
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* A response is sent after the machine number was changed. The response with the header is:

NEW_MACHINE_NUMBER @MACH-NUM OLD_MACHINE_NUMBER NEW_MACHINE_NUMBER
OK

9.8 Network Setting Commands

Command	Syntax	Response
Set IP address	NET-IP <u>IP_ADDRESS</u> Short form: NTIP	NET-IP <u>IP_ADDRESS</u> <u>RESULT</u>
Read IP address	NET-IP? Short form: NTIP?	NET-IP <u>IP_ADDRESS</u>
Read MAC address	NET-MAC? Short form: NTMC	NET-MAC <u>MAC_ADDRESS</u>
Set subnet mask	NET-MASK <u>SUBNET_MASK</u> Short form: NTMSK	NET-MASK <u>SUBNET_MASK</u> <u>RESULT</u>
Read subnet mask	NET-MASK? Short form: NTMSK?	NET-MASK <u>SUBNET_MASK</u>
Set gateway address	NET-GATE <u>GATEWAY_ADDRESS</u> Short form: NTGT	NET-GATE <u>GATEWAY_ADDRESS</u> <u>RESULT</u>
Read subnet mask	NET-GATE? Short form: NTGT?	NET-GATE <u>GATEWAY_ADDRESS</u>
Set DHCP mode	NET-DHCP <u>DHCP_MODE</u> Short form: NTDH	NET-DHCP <u>DHCP_MODE</u> <u>RESULT</u>
Read subnet mask	NET-DHCP? Short form: NTDH?	NET-DHCP <u>DHCP_MODE</u>

DHCP_MODE =

'0' – Don't use DHCP (Use IP set by factory or IP set command).

'1' – Try to use DHCP, if unavailable use IP as above.

Change protocol Ethernet port	ETH-PORT <u>PROTOCOL</u> , <u>PORT</u> Short form: ETHP	ETH-PORT <u>PROTOCOL</u> <u>PORT</u> <u>RESULT</u>
Read protocol Ethernet port	ETH-PORT? <u>PROTOCOL</u> Short form: ETHP?	ETH-PORT <u>PROTOCOL</u> , <u>PORT</u>

PROTOCOL = TCP/UDP (transport layer protocol)

PORT = Ethernet port that accepts Protocol 3000 commands

1-65535 = User defined port

0 - Reset port to factory default (50000 for UDP, 5000 for TCP)

9.9 Machine Information Commands

Command	Syntax	Response
Set device time and date	TIME <u>DATE_TIME</u>	TIME <u>DATE_TIME</u> <u>RESULT</u>
Read device time and date	TIME?	TIME? <u>DATE_TIME</u>

Note: Time setting commands require administrator authorization.

Read in/out count	INFO-IO?	INFO-IO: IN <u>INPUTS_COUNT</u> , OUT <u>OUTPUTS_COUNT</u>
Read max preset count	INFO-PRST?	INFO-PRST: VID <u>PRESET_VIDEO_COUNT</u> , AUD <u>PRESET_AUDIO_COUNT</u>
Execute firmware upgrade*	UPGRADE	UPGRADE OK
Firmware usually uploads to a device via a command like LDFW. The device may need to be reset to complete the process.		

Command	Syntax	Response
Reset to factory default configuration	FACTORY	FACTORY RESULT
Set model name	FCT-MODEL FACTORY_PASSWORD MODEL_NAME	FCT-MODEL MAC_ADDRESS RESULT

*If implemented by hard coding, protocol command is unnecessary

Set MAC address	FCT-MAC FACTORY_PASSWORD MAC_ADDRESS	FCT-MAC MAC_ADDRESS RESULT
Set SN #	FCT-SN FACTORY_PASSWORD SN#	FCT-SN SN# RESULT

* Machine factory settings commands are not for public knowledge. Reference is only for internal implementation

9.10 Protocol 3000 Syntax

Protocol 3000 is used to control the **908** via an RS-232 connection using a PC, touch screen, other serial controller or RC type controller.

9.10.1 Host Message Format

Start	Address (optional)	Body	Delimiter
#	<i>Destination_id@</i>	Message	CR

9.10.2 Simple Command

Command string with only one command without addressing:

Start	Body	Delimiter
#	Command SP <i>Parameter_1,Parameter_2,...</i>	CR

9.10.3 Command String

Formal syntax with commands concatenation and addressing:

Start	Address	Body	Delimiter
#	<i>Destination_id@</i>	Command_1 <i>Parameter1_1,Parameter1_2,...</i> / Command_2 <i>Parameter2_1,Parameter2_2,...</i> / Command_3 <i>Parameter3_1,Parameter3_2,...</i> ...	CR

9.10.4 Device Message Format

Start	Address (optional)	Body	delimiter
~	<i>Sender_id@</i>	Message	CR LF

9.10.5 Device Long Response

Echoing command:

Start	Address (optional)	Body	Delimiter
~	Sender_id@	Command SP [Param1 ,Param2 ...] result	CR LF

CR = Carriage return (ASCII 13 = 0x0D)

LF = Line feed (ASCII 10 = 0x0A)

SP = Space (ASCII 32 = 0x20)

9.10.6 Command Terms

Command

A sequence of ASCII letters ('A'-'Z', 'a'-'z' and '-').

Command and parameters must be separated by at least one space.

Parameters

A sequence of alphanumeric ASCII characters ('0'-'9','A'-'Z','a'-'z' and some special characters for specific commands). Parameters are separated by commas.

Message string

Every command entered as part of a message string begins with a **message starting character** and ends with a **message closing character**.

Note: A string can contain more than one command. Commands are separated by a pipe ('|') character.

Message starting character

'#' – For host command/query

'~' – For machine response

Query sign

'?' follows some commands to define a query request.

All outputs sign

'*' defines all outputs.

Message closing character

CR – For host messages; carriage return (ASCII 13)

CRLF – For machine messages; carriage return (ASCII 13) + line-feed (ASCII 10)

Command chain separator character

When a message string contains more than one command, a pipe ('|') character separates each command.

Spaces between parameters or command terms are ignored.

9.10.7 Entering Commands

You can directly enter all commands using a terminal with ASCII communications software, such as HyperTerminal, Hercules, etc. Connect the terminal to the serial, Ethernet, or USB port on the Kramer device. To enter **CR**, press the Enter key. (**LF** is also sent but is ignored by command parser).

For commands sent from some non-Kramer controllers like Crestron, some characters require special coding (such as, /X##). Refer to the controller manual.

9.10.8 Command Forms

Some commands have short name syntax in addition to long name syntax to allow faster typing. The response is always in long syntax.

9.10.9 Command Chaining

Multiple commands can be chained in the same string. Each command is delimited by a pipe character ('|'). When chaining commands, enter the **message starting character** and the **message closing character** only once, at the beginning of the string and at the end.

Commands in the string do not execute until the closing character is entered.

A separate response is sent for every command in the chain.

9.10.10 Maximum String Length

64 characters.

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SAFETY WARNING

Disconnect the unit from the power supply before opening and servicing

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Rev: 8

