



KRAMER ELECTRONICS LTD.

USER MANUAL

MODEL:

VP-23C
Presentation Switcher

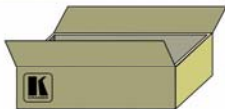
P/N: 2900-000202 Rev 3

VP-23C Quick Start Guide

This page guides you through a basic installation and first-time use of your **VP-23C**. For more detailed information, see the **VP-23C** user manual. You can download the latest manual at <http://www.kramerelectronics.com>.

Step 1: Check what's in the box

- | | |
|---|---|
| <input checked="" type="checkbox"/> VP-23C Presentation Switcher | <input checked="" type="checkbox"/> 1 Quick Start sheet |
| <input checked="" type="checkbox"/> 1 Power cord | <input checked="" type="checkbox"/> 1 User Manual |
| <input checked="" type="checkbox"/> 1 Null modem adapter | <input checked="" type="checkbox"/> Windows®-based
Kramer control software |
| <input checked="" type="checkbox"/> 1 Set of rack "ears" | |
| <input checked="" type="checkbox"/> 4 Rubber feet | |



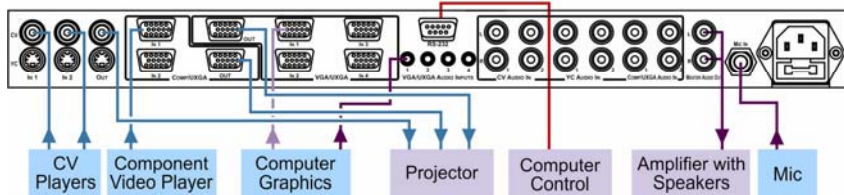
Save the original box and packaging materials in case your Kramer product needs to be returned to the factory for service.

Step 2: Install the VP-23C

Mount the machine in a rack (using the included rack "ears") or attach the rubber feet and place on a table.

Step 3: Connect the inputs and outputs

Always switch off the power on each device before connecting it to your **VP-23C**.



For best results, we recommend that you always use Kramer high-performance cables to connect AV equipment to the **VP-23C**.

Step 4: Connect the power

Connect the power cord to the **VP-23C** and plug it into the mains electricity. Switch the power on to all devices.



Step 5: Operate the VP-23C

Set the parameters using the OSD and the front panel buttons.



Press a button to select an input on each switcher group (CV, s-Video, COMP/UXGA and/or VGA/UXGA) to route to the appropriate output. Selected input buttons illuminate.

AUDIO LEVEL



Adjust MIC Volume:
Press + (increase) or - (decrease) buttons to adjust the MIC signal

- | | |
|--------------------------------------|--|
| <input type="checkbox"/> Mix | Press the Mix button to mix the master audio output with the microphone signal. |
| <input type="checkbox"/> LOCK | Press the Lock button to lock the front panel buttons. |
| <input type="checkbox"/> MUTE | Press the Mute button to disconnect the audio inputs from the Master output. This lets you output the microphone only. |

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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 **VP-23C** *Presentation Switcher*, which is ideal for the following typical applications:

- Presentation and conference room systems
- Production studios, as well as rental and staging

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 **VP-23C** away from moisture, excessive sunlight and dust

3 Overview

The **VP-23C** is a high-quality presentation switcher designed for a wide variety of presentation and multimedia applications. The **VP-23C** includes four switcher groups, that combine the functions of a 2x1 switcher for composite video, a 2x1 switcher for s-Video, a 2x1 switcher for component video/UXGA, and a 4x1 switcher for VGA/UXGA type signals. Each video input has its own unbalanced stereo audio input. There is also an independent unbalanced stereo master audio output, which can select a signal from any of the 10 audio inputs.

In addition the **VP-23C** features:

- 10 selector buttons, and front panel control buttons for the master audio output level and microphone level
- Control of each switcher group independently from the other sections
- HDTV compatibility
- Control via the front panel buttons or by RS-232 serial commands transmitted by a touch screen system, PC, or other serial controller
- Mixing the mic with the master output signal or by muting the master output signal
- A lock button to prevent unintentional tampering with the front panel buttons

3.1 Defining the VP-23C Presentation Switcher

This section defines the **VP-23C**.

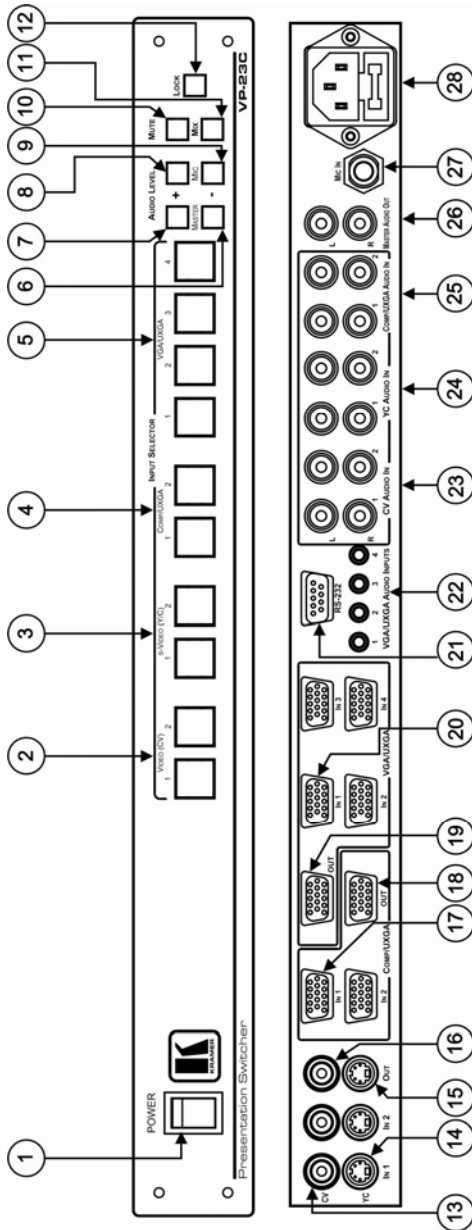


Figure 1: VP-23C Presentation Switcher

#	Feature	Function		
1	POWER Switch	Illuminated switch for turning the unit ON or OFF		
2	INPUT SELECTOR	VIDEO (CV) Buttons	Select the composite video / audio input (1 and 2)	
3		s-VIDEO (Y/C) Buttons	Select the s-Video / audio input (1 and 2)	
4		COMP/UXGA Buttons	Select the component video / audio input (1 and 2) Can also be used for UXGA inputs	
5		VGA/UXGA Buttons	Select the VGA/UXGA video / audio input (from 1 to 4)	
6	AUDIO LEVEL	MASTER	- Button	Decrease the master audio signal level
7			+ Button	Increase the master audio signal level
8		MIC	+ Button	Increase the microphone audio signal level
9			- Button	Decrease the microphone audio signal level
10	MUTE Button	Press to disable/enable the Master Audio output Except for the microphone signal in the MIX mode		
11	MIX Button	Press to toggle. When on, mixes the microphone signal with the Master Audio output When the MUTE button and the MIX button are pressed, only the microphone signal is transferred to the output		
12	LOCK Button	Press and hold to lock/unlock the front panel buttons		
13	CV IN/RCA Connectors	Connect to the composite video sources (IN 1 and IN 2)		
14	YC IN 4-pin Connectors	Connect to the s-Video sources (IN 1 and IN 2)		
15	YC OUT 4-pin Connector	Connect to the s-Video acceptor		
16	CV OUT/RCA Connector	Connect to the composite video acceptor		
17	COMP/UXGA IN 15-pin HD Connectors	Connect to the component video or UXGA sources (IN 1 and IN 2) When the 15-pin HD connector is used for UXGA signals, the syncs are on PIN 13 and PIN 14		
18	COMP/UXGA OUT 15-pin HD Connector	Connect to the component video or UXGA acceptor		
19	VGA/UXGA OUT 15-pin HD Connector	Connect to the VGA/UXGA video acceptor		
20	VGA/UXGA IN 15-pin HD Connectors	Connect to the VGA/UXGA video sources (from IN 1 to 4)		
21	RS-232 Connector	9-pin D-sub connector connects to PC or Remote Controller		
22	VGA/UXGA AUDIO INPUTS 3.5mm Mini Jack Connectors	Connect to the VGA/UXGA unbalanced stereo audio sources (from 1 to 4)		
23	CV AUDIO IN/RCA Connectors	Connect to the composite video sources (1 and 2)		
24	YC AUDIO IN/RCA Connectors	Connect to the s-Video unbalanced stereo audio sources (1 and 2)		
25	COMP/UXGA AUDIO IN/RCA Connectors	Connect to the component video stereo audio sources (1 and 2)		
26	MASTER AUDIO OUT/RCA Connectors	Connect to the stereo audio acceptor The input selector button last pressed transmits the audio input signal of the selected channel to the master audio output		
27	MIC IN 6.3mm Phone Jack Connector	Connects to the microphone		
28	Power Connector with Fuse	AC connector enabling power supply to the unit		

Figure 2 describes the underside of the **VP-23C**:

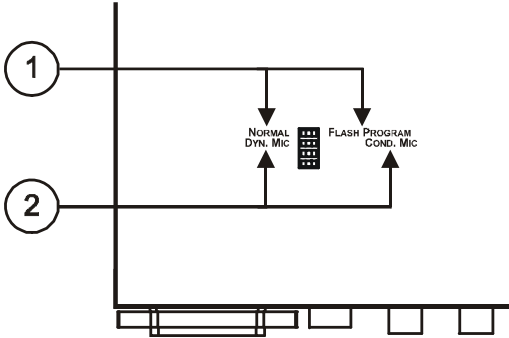


Figure 2: VP-23C Presentation Switcher – Underside View

#	Feature	Function
1	<i>NORMAL / FLASH PROGRAM</i> Switch	Select between <i>NORMAL</i> for normal operation (the factory default), and <i>FLASH PROGRAM</i> to upgrade to the latest Kramer firmware
2	<i>COND. MIC / DYN. MIC</i> Switch	Select between a dynamic microphone and a condenser

4 Installing in a Rack

Before Installing in a Rack

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

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



CAUTION!

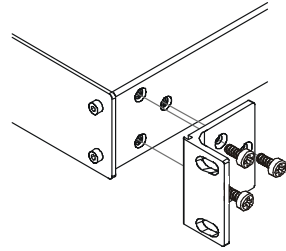
When installing on a 19" rack, avoid hazards by taking care that:

1. It is located within the recommended environmental conditions, as the operating ambient temperature of a closed or multi unit rack assembly may exceed the room ambient temperature.
2. Once rack mounted, enough air will still flow around the machine.
3. The machine is placed straight in the correct horizontal position.
4. You do not overload the circuit(s). When connecting the machine to the supply circuit, overloading the circuits might have a detrimental effect on overcurrent protection and supply wiring. Refer to the appropriate nameplate ratings for information. For example, for fuse replacement, see the value printed on the product label.
5. The machine is earthed (grounded) in a reliable way and is connected only to an electricity socket with grounding. Pay particular attention to situations where electricity is supplied indirectly (when the power cord is not plugged directly into the socket in the wall), for example, when using an extension cable or a power strip, and that you use only the power cord that is supplied with the machine.

How to Rack Mount

To rack-mount a machine:

1. Attach both ear brackets to the machine. To do so, remove the screws from each side of the machine (3 on each side), and replace those screws through the ear brackets.



2. Place the ears of the machine against the rack rails, and insert the proper screws (not provided) through each of the four holes in the rack ears.

Note:

- In some models, the front panel may feature built-in rack ears
- Detachable rack ears can be removed for desktop use
- Always mount the machine in the rack before you attach any cables or connect the machine to the power
- If you are using a Kramer rack adapter kit (for a machine that is not 19"), see the Rack Adapters user manual for installation instructions available from: <http://www.kramerelectronics.com>

5 Connecting the VP-23C



Always switch off the power to each device before connecting it to your **VP-23C**. After connecting your **VP-23C**, connect its power and then switch on the power to each device.

In [Figure 3](#), the audio input connections are not shown, except for the microphone. In this example, all the outputs are connected to the same projector. Use the projector controller to switch between the **VP-23C** video outputs or the projector inputs.

To connect the **VP-23C**, as illustrated in the example in [Figure 3](#), do the following: You do not need to connect all the inputs.

1. Connect the following video sources:

Although in this example not all the sources are connected (for example, the s-Video source), you can connect all of the inputs, that is, 10 in total.

- One composite video source (for example, composite video player 1) to the CV IN 1 RCA connector
- One composite video source (for example, a composite video player 2) to the CV IN 2 RCA connector
- One component video source (for example, component video player 1) to the COMP/UXGA IN 1 15-pin HD connector
When connecting a component video input or output, connect Y to PIN 1, U to PIN 2 and V to PIN 3 on the 15-pin HD connector.
When the 15-pin HD connector is used for UXGA signals, the syncs are on PIN 13 and PIN 14
- One component video source (for example, a component video player 2) to the COMP/UXGA IN 2 15-pin HD connector
- One VGA/UXGA source (for example, a computer graphics source) to the VGA/UXGA IN 1 15-pin HD connector

2. Connect the acceptors to a projector as follows:

In this example a projector is used, but you can also connect separate outputs such as displays, video recorders and so on

- The composite video CV OUT RCA connector to the composite video input of the projector

- The COMP/UXGA OUT 15-pin HD connector to the component video input of the projector
When connecting a component video input or output, connect Y to PIN 1, U to PIN 2 and V to PIN 3 on the 15-pin HD connector.
 - The VGA/UXGA OUT 15-pin HD connector to the VGA/UXGA input of the projector
3. Connect the appropriate unbalanced stereo audio sources (not shown in [Figure 3](#)).
 4. Connect the MASTER AUDIO OUT RCA connectors to an amplifier with speakers.
 5. Connect a dynamic or a condenser microphone, if required, to the MIC IN 6.3 mm phone jack connector.
Use the COND. MIC / DYN. MIC switch (refer to item 2 in [Figure 2](#)) to select a dynamic microphone or a condenser
 6. As an option, you can connect a PC and/or controller to the RS-232 port (see [Section 5.1](#)).
 7. Connect the power cord (not shown in [Figure 3](#)).

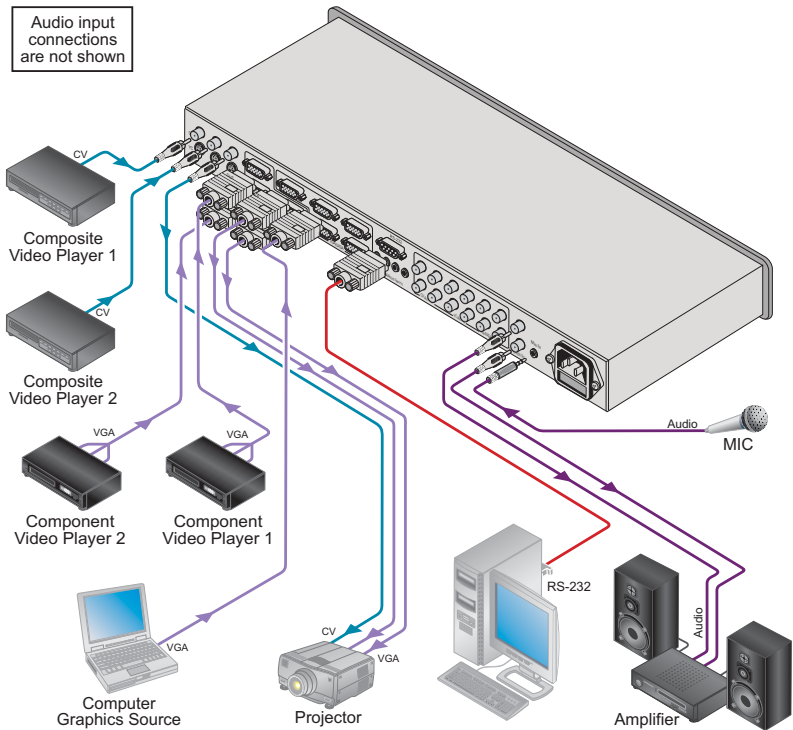


Figure 3: Connecting the VP-23C Presentation Switcher

5.1 Connecting to the VP-23C via RS-232

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 4)—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.

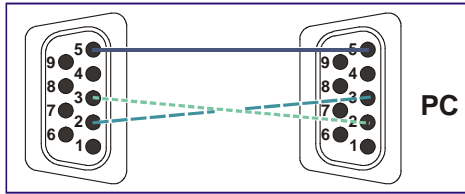


Figure 4: Crossed Cable RS-232 Connection

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 5)—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.

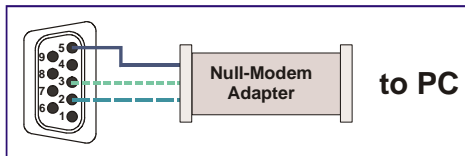


Figure 5: Straight Cable RS-232 Connection with a Null Modem Adapter

6 Operating the VP-23C Presentation Switcher

You can operate your **VP-23C** via:

- The front panel buttons
- RS-232 serial commands transmitted by a touch screen system, PC, or other serial controller

The front panel buttons include the INPUT SELECTOR buttons, the MASTER and MIC AUDIO LEVEL BUTTONS, and the MUTE, LOCK and MIX buttons.

6.1 Operating your Switcher

You can select the video signals within each switcher group by pressing the relevant INPUT SELECTOR buttons.

You can overlook a switcher group and choose not to select a button from it.

You can switch:

- One of the two composite video VIDEO (CV) inputs to the composite video output
You cannot select more than one button in a section.
- One of the two s-Video (Y/C) inputs to the s-Video output
- One of the two component video COMP/UXGA inputs to the component video output
- One of the four VGA/UXGA inputs to the VGA/UXGA output

The selected button in each group is illuminated in red. Pressing an illuminated button for more than 2 seconds disconnects the output and the button no longer illuminates.

The **VP-23C** operates in the audio-follow-video (AFV) mode so that the audio signal follows the selected input signal in which all operations relate to both the video and the audio channels.

The audio signal is routed to the MASTER AUDIO OUT output, therefore the last INPUT SELECTOR button selected (from any of the switcher groups) routes the audio signal of that input to the audio output.



The last selected button is illuminated in purple to indicate the source of the outputted audio signal

When setting the master audio gain to its minimum, the MUTE button illuminates.

When both the MUTE and MIX buttons are on, only the microphone signal is transferred to the master output.

The MUTE and MIX buttons can be turned ON or OFF via RS-232 control and their respective buttons on the front panel illuminate.

7 Technical Specifications

INPUTS:	2 composite video (1Vpp/75Ω) on RCA connectors 2 s-Video 1 Vpp (Y), 0.3Vpp (C) / 75Ω on 4-pin connectors 2 component video/UXGA on 15-pin HD connectors 4 VGA/UXGA on 15-pin HD connectors 4 unbalanced stereo audio on 3.5mm jack connectors (for VGA/UXGA): +4dBm/10kΩ 6 unbalanced stereo audio channels: +4dBm / 10kΩ on RCA connectors (for CV, YC, COMP/UXGA) Mic: 3mV / 10kΩ condenser with 15V phantom voltage/ dynamic on a 6.3mm phone jack connector	
OUTPUTS:	1 composite video (1Vpp/75Ω) on an RCA connector 1 s-Video 1Vpp (Y), 0.3Vpp (C) / 75Ω on a 4-pin connector 1 component video/UXGA on an 15-pin HD connector 1 VGA/UXGA on an 15-pin HD connector 1 unbalanced stereo master audio channel: +4dBm / 50Ω on RCA connectors	
MAX. OUTPUT LEVEL:	VIDEO: 2.1Vpp	AUDIO: 27Vpp
BANDWIDTH (-3dB):	VIDEO: VGA / UXGA: 400MHz; s-Video (Y): 310MHz; Composite/SDI video: 310MHz; Component video: 380MHz; HDTV compatible	AUDIO: 40kHz
DIFF. GAIN:	<0.07% all channels	
DIFF. PHASE:	<0.05Deg all channels	
S/N RATIO:	VIDEO: 75dB all channels	AUDIO: 75dB / 1 Vpp all channels
CONTROLS:	10 selector buttons, master audio level, mic audio level, mix, lock, mute, RS-232	
POWER SOURCE:	100-240V AC, 50/60Hz, (115V AC, U.S.A.) 7VA	
DIMENSIONS:	19" x 7" x 1U (W, D, H) rack-mountable	
WEIGHT:	2.6kg (8lbs) approx	
ACCESSORIES:	Power cord, null modem adapter, Windows®-based Kramer control software	
Specifications are subject to change without notice at http://www.kramerelectronics.com		

8 Default Communication Parameters

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

9 Hex Tables

These tables list the Hex values (which the protocol in [Section 10](#) describes in more detail) for the **VP-23C Presentation Switcher**.

Inputs Group	#	Composite Video OUT	s-Video OUT	Component Video OUT	VGA/UXGA OUT
Composite Video	In 1	01 81 81 81			
	In 2	01 82 81 81			
s-Video	In 1		01 81 82 81		
	In 2		01 82 82 81		
Component Video	In 1			01 81 83 81	
	In 2			01 82 83 81	
VGA / UXGA	In 1				01 81 84 81
	In 2				01 82 84 81
	In 3				01 83 84 81
	In 4				01 84 84 81

Master Audio Selector	
Composite Video Group	02 81 81 81
s-Video Group	02 82 81 81
Component Video Group	02 83 81 81
VGA / UXGA Group	02 84 81 81
Microphone	02 85 81 81

9.1 Audio Gain Control Hex Tables

The next tables describe the audio gain controls:

When controlling the VP-23C via RS-232, read the note to command 42 in the communication protocol.

Set Relative Audio Gain of Master Audio Out Gain	
16 81 80 81	Mute
⋮	
16 81 D3 81	-6dB
⋮	
16 81 DF 81	0dB
⋮	
16 81 EB 81	6dB
⋮	
16 81 FF 81	16dB

Gain by One Step	Master Out	Microphone
Increase	18 81 80 81	18 82 80 81
Decrease	18 82 81 81	18 82 81 81

For the microphone gain control, the second byte equals 82

10 Kramer Protocol 2000

The **VS-23C** is compatible with Kramer's Protocol 2000 (version 0.48) (below). This RS-232/RS-485 communication protocol uses four bytes of information as defined below. For RS-232, a null-modem connection between the machine and controller is used. The default data rate is 9600 baud, with no parity, 8 data bits and 1 stop bit.

1 st byte	MSB						LSB
	DESTINATION	INSTRUCTION					
0	D	N5	N4	N3	N2	N1	N0
7	6	5	4	3	2	1	0

2d byte	INPUT						
	1	I6	I5	I4	I3	I2	I1
7	6	5	4	3	2	1	0

3d byte	OUTPUT						
	1	O6	O5	O4	O3	O2	O1
7	6	5	4	3	2	1	0

4 th byte	MACHINE NUMBER						
	1	OVR	X	M4	M3	M2	M1
7	6	5	4	3	2	1	0

1st BYTE: Bit 7 – Defined as 0.
D – "DESTINATION": 0 - for sending information to the switchers (from the PC);
1 - for sending to the PC (from the switcher).
N5...N0 – "INSTRUCTION"

The function that is to be performed by the switcher(s) is defined by the INSTRUCTION (6 bits). Similarly, if a function is performed via the machine's keyboard, then these bits are set with the INSTRUCTION NO., which was performed. The instruction codes are defined according to the table below (INSTRUCTION NO. is the value to be set for N5...N0).

2nd BYTE: Bit 7 – Defined as 1.
I6...I0 – "INPUT".

When switching (ie. instruction codes 1 and 2), the INPUT (7 bits) is set as the input number which is to be switched. Similarly, if switching is done via the machine's front-panel, then these bits are set with the INPUT NUMBER which was switched. For other operations, these bits are defined according to the table.

3rd BYTE: Bit 7 – Defined as 1.
O6...O0 – "OUTPUT".

When switching (ie. instruction codes 1 and 2), the OUTPUT (7 bits) is set as the output number which is to be switched. Similarly, if switching is done via the machine's front-panel, then these bits are set with the OUTPUT NUMBER which was switched. For other operations, these bits are defined according to the table.

4th BYTE: Bit 7 – Defined as 1.
Bit 5 – Don't care.
OVR – Machine number override.
M4...M0 – MACHINE NUMBER.

Used to address machines in a system via their machine numbers. When several machines are controlled from a single serial port, they are usually configured together with each machine having an individual machine number. If the OVR bit is set, then all machine numbers will accept (implement) the command, and the addressed machine will reply. For a single machine controlled via the serial port, always set M4...M0 = 1, and make sure that the machine itself is configured as MACHINE NUMBER = 1.

INSTRUCTION #	DESCRIPTION	DEFINITION FOR SPECIFIC INSTRUCTION				NOTE
		INPUT		OUTPUT		
0	RESET MACHINE	0		0		1
1	SWITCH GROUPS	1-2		1-3*		2
		1-4		4*		
		Set equal to video and audio inputs to be switched for the relative group		Set equal to group to which output is to be switched		
2	SWITCH AUDIO OUTPUTS TO MASTER AUDIO OUT	1-4* Set equal to audio output to be switched to Master Audio out		1		2
5	REQUEST GROUP STATUS	0		1-4 Set equal to the group of which status is required		3
6	REQUEST STATUS OF MASTER AUDIO OUTPUT	0		1		3
11	REQUEST BREAKAWAY SETTING	0		0		3
16	ERROR	Don't care		0 – Invalid instruction 1 – Out of range		4
18	RESET MACHINE	0		0		1
22	SET AUDIO PARAMETER	Parameter	Value	Parameter	Value:	2, 7, 8, 9,
		Audio gain:	1 – Audio Master 2 –Microphone	Audio gain:	0-127	
		Mix microphone:	0	Mix microphone:	0 – mix OFF 1 – Mix ON	
24	INCREASE/DECREASE AUDIO PARAMETER	1 – audio master 2 – microphone		0 - increase output 1 - decrease output		8
25	REQUEST AUDIO PARAMETER	Equal to input / output number whose parameter is requested 1 – audio master 2 – microphone		0		9
30	LOCK FRONT PANEL	0 – Panel unlocked 1 – Panel locked		0		2
31	REQUEST WHETHER PANEL IS LOCKED	0		0		3
42	AUDIO PARAMETER SETTINGS FOR INSTRUCTIONS 22, 25	0		0 - Gain 4 - Mix mode		9
57	SET AUTO SAVE	1 – Autosave 2 – No save				5
61	IDENTIFY MACHINE	1 or 2 – Machine name 3 or 4 – Program version		0 – request first 4 digits 1 – request first suffix 10 – request first prefix		6
62	DEFINE MACHINE	1 – Number of inputs 2 – Number of outputs		1 – For video 2 – For audio		3

* 1 – for CV group, 2 – for SV group, 3 – for Comp video group, 4 – for VGA group

NOTE 1

When the master switcher is reset, (e.g. when it is turned on), the reset code is sent to the PC. If this code is sent to the switchers, it will reset according to the present power-down settings.

NOTE 2

These are bi-directional definitions. That is, if the switcher receives the code, it will perform the instruction; and if the instruction is performed (due to a keystroke operation on the front panel), then these codes are sent. For example, if:

0000 0001 Instruction "Switch Groups"
1000 0010 Input #2
1000 0001 in composite video group
1000 0001 Machine #1 (master)

Was sent from the PC, then the switcher (machine #1) will switch input 2 in composite video group to its output. If the user switched input 4 in the VGA group via the front panel keypad, then the switcher will send:

0100 0001
1000 0100
1000 0100

1000 0001 to the PC.

When the PC sends instruction #1 or #2 to the switcher, then, if the instruction is valid, the switcher replies by sending the same four bytes to the PC that were sent (except for the first byte, where the DESTINATION bit is set high).

NOTE 3

The reply to a "REQUEST" instruction is as follows: the same instruction and input codes as were sent are returned, and the OUTPUT is assigned to the value of the requested parameter. The reply to the instruction #5 (what is the status of the VGA group?):

```
0000 0101
1000 0000
1000 0011
1000 0001
Would be:
0100 0101
1000 0000
1000 0100
1000 0001
```

NOTE 4

An error code is returned to the PC if an invalid code was sent to the switcher (for example, when trying to switch an input or a group which is greater than the highest one defined). This code is also returned to the PC if an RS-232 instruction is sent while the machine is being programmed via the front panel. Reception of this code by the switcher will not be valid.

NOTE 5

Under normal conditions, the machine's present status is saved each time a change is made. The power-down save (the auto save) may be disabled using this code. Note that each time that the machine is turned ON, the auto save function is automatically set.

NOTE 6

This is a request to identify the switchers in a system. If the INPUT is set as 1 or 2, the machine will send its name. The reply is the decimal value of the INPUT and the OUTPUT. For example, the reply to the request to send the machine's name (for machine #001) will be:

```
0111 1101
1000 0000 (i.e. 128+0)
1001 0111 (i.e. 128+23)
1000 0001
```

If the request for identification is sent with the INPUT set as 3 or 4, the appropriate machine will send its software version number. Again, the reply would be the decimal value of the INPUT and OUTPUT - the INPUT representing the number in front of the decimal point, and the OUTPUT representing the number following the decimal point. For example, for version 3.5 the reply will be:

```
0111 1101
1000 0011 (i.e. 128+3)
1000 0101 (i.e. 128+5)
1000 0001
```

NOTE 7

GAIN VALUE – Number from 0 to 127

NOTE 8

Answer = Current Audio Gain (0 –127)
If the Audio Gain = 0, the MUTE button is illuminated

NOTE 9

When changing parameters (mix or gain), further information needed in instructions 22 and 25 is sent using instruction 42 – which is sent prior to the instruction. For example, to request the audio gain value of the master audio output

	2A	80	80	81
and then send HEX codes	19	81	80	81.
To set MIX mode, send hex codes	2A	81	84	81
and then send HEX codes	16	80	81	81

LIMITED WARRANTY

We warrant this product free from defects in material and workmanship under the following terms.

HOW LONG IS THE WARRANTY

Labor and parts are warranted for seven years from the date of the first customer purchase.

WHO IS PROTECTED?

Only the first purchase customer may enforce this warranty.

WHAT IS COVERED AND WHAT IS NOT COVERED

Except as below, this warranty covers all defects in material or workmanship in this product. The following are not covered by the warranty:

1. Any product which is not distributed by us 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, or on which the WARRANTY VOID IF TAMPED sticker has been torn, reattached, removed or otherwise interfered with.
3. Damage, deterioration or malfunction resulting from:
 - i) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature
 - ii) Product modification, or failure to follow instructions supplied with the product
 - iii) Repair or attempted repair by anyone not authorized by Kramer
 - iv) Any shipment of the product (claims must be presented to the carrier)
 - v) Removal or installation of the product
 - vi) Any other cause, which does not relate to a product defect
 - vii) Cartons, equipment enclosures, cables or accessories used in conjunction with the product

WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR

We will pay labor and material expenses for covered items. We will not pay for the following:

1. Removal or installations charges.
2. Costs of initial technical adjustments (set-up), including adjustment of user controls or programming. These costs are the responsibility of the Kramer dealer from whom the product was purchased.
3. Shipping charges.

HOW YOU CAN GET WARRANTY SERVICE

1. To obtain service on your product, you must take or ship it prepaid to any authorized Kramer service center.
2. Whenever warranty service is required, the original dated invoice (or a copy) must be presented as proof of warranty coverage, and should be included in any shipment of the product. Please also include in any mailing a contact name, company, address, and a description of the problem(s).
3. For the name of the nearest Kramer authorized service center, consult your authorized dealer.

LIMITATION OF IMPLIED WARRANTIES

All implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this warranty.

EXCLUSION OF DAMAGES

The liability of Kramer for any effective products is limited to the repair or replacement of the product at our option. Kramer shall not be liable for:

1. Damage to other property caused by defects in this product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss; or:
2. Any other damages, whether incidental, consequential or otherwise. Some countries may not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights, which vary from place to place.

NOTE: All products returned to Kramer for service must have prior approval. This may be obtained from your dealer.

This equipment has been tested to determine compliance with the requirements of:

- EN-50081: "Electromagnetic compatibility (EMC);
generic emission standard.
Part 1: Residential, commercial and light industry"
- EN-50082: "Electromagnetic compatibility (EMC) generic immunity standard.
Part 1: Residential, commercial and light industry environment".
- CFR-47: FCC* Rules and Regulations:
Part 15: "Radio frequency devices
Subpart B Unintentional radiators"

CAUTION!

➤ Servicing the machines can only be done by an authorized Kramer technician. Any user who makes changes or modifications to the unit without the expressed approval of the manufacturer will void user authority to operate the equipment.

➤ Use the supplied DC power supply to feed power to the machine.

➤ Please use recommended interconnection cables to connect the machine to other components.

*FCC and CE approved using STP cable (for twisted pair products)



For the latest information on our products and a list of Kramer distributors, visit our Web site where updates to this user manual may be found.

We welcome your questions, comments, and feedback.

Web site: www.kramerelectronics.com

E-mail: info@kramere1.com



SAFETY WARNING

Disconnect the unit from the power supply before opening and servicing