

Kramer Electronics, Ltd.



USER MANUAL

Model:

VM-24HDCP

2 Input 1:4 DVI Distributor

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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 groups¹ that are clearly defined by function.

Thank you for purchasing your Kramer **VM-24HDCP 2 Input 1:4 DVI Distributor**, which is ideal for:

- Home theater, presentation and multimedia applications
- Rental and staging

The package includes the following items:

- **VM-24HDCP**
- Power cord
- Infrared remote control transmitter
- This user manual²

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 cables³

¹ 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; GROUP 11: Sierra Products

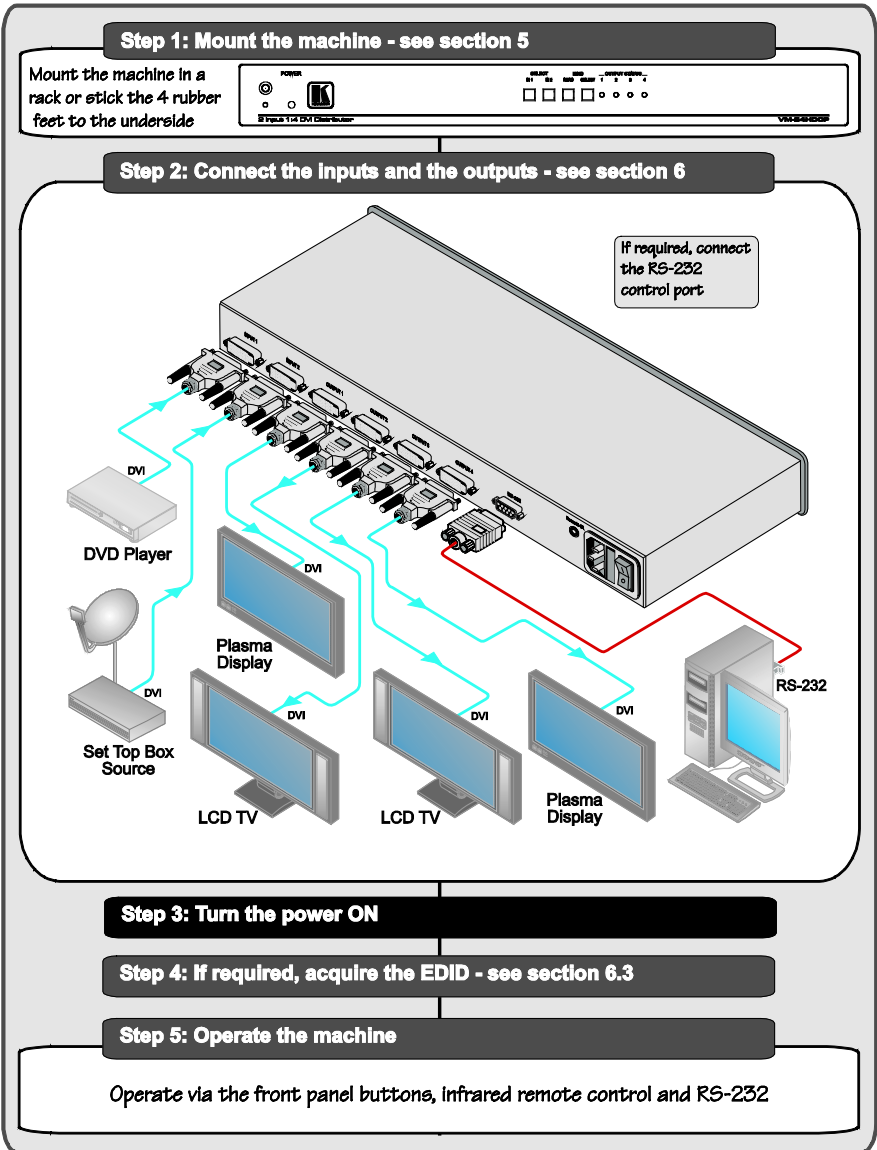
² Download up-to-date Kramer user manuals from the Internet at this URL: <http://www.kramerelectronics.com>

³ The complete list of Kramer cables is on our Web site at <http://www.kramerelectronics.com>



2.1 Quick Start

This quick start chart summarizes the basic setup and operation:



3 Overview

The **VM-24HDCP** is an HDCP compliant distribution amplifier for DVI-D signals. The unit accepts one of two DVI inputs, and distributes the selected signal to four outputs.

The **VM-24HDCP** features:

- Up to 2.25Gbps bandwidth per graphic channel¹
- HDTV compatibility and HDCP compliance
- I-EDIDPro™ Kramer Intelligent EDID Processing™, an intelligent EDID handling and processing algorithm that ensures Plug and Play operation for DVI systems
- Acquisition of the EDID from one output, from several connected outputs (Auto-mix) or it acquires the default EDID for fast and efficient connection of the unit²
- A 19" 1U rack mountable enclosure and is fed from a 100-240 VAC universal switching power supply

Control the **VM-24HDCP** via:

- The front panel buttons
- The infrared remote control transmitter, **RC-IR3**
- The infrared remote extension cable transmitter, see section [4.1](#)
- RS-232 serial commands transmitted by a touch screen system, PC, or other serial controller

3.1 About HDCP

The High-Bandwidth Digital Content Protection (HDCP) standard³ protects digital video and audio signals transmitted over DVI or HDMI connections between two HDCP-enabled devices to eliminate the reproduction of copyrighted material. To protect copyright holders (such as movie studios) from having their programs copied and shared, the HDCP standard provides for the secure and encrypted transmission of digital signals.

¹ Suitable for resolutions up to UXGA at 60Hz, and for all HD resolutions

² Lets you use the EDID default value when no display from which to read the EDID is connected

³ Developed by Intel



3.2 Defining EDID

The Extended Display Identification Data (EDID¹) is a data-structure, provided by a display, to describe its capabilities to an HDCP source. The EDID enables the **VM-24HDCP** to “know” what kind of monitor is connected to the output. The EDID includes the manufacturer’s name, the product type, the timing data supported by the display, the display size, luminance data and (for digital displays only) the pixel mapping data.

3.3 Recommendations for Best Performance

To achieve the best performance:

- Connect only good quality connection cables, thus avoiding 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 and position your **VM-24HDCP** away from moisture, excessive sunlight and dust

4 Your VM-24HDCP 2 Input 1:4 DVI Distributor

[Figure 1](#) illustrates the **VM-24HDCP** and [Table 1](#) defines the front and rear panels.

¹ Defined by a standard published by the Video Electronics Standards Association (VESA)

Your VM-24HDCP 2 Input 1:4 DVI Distributor

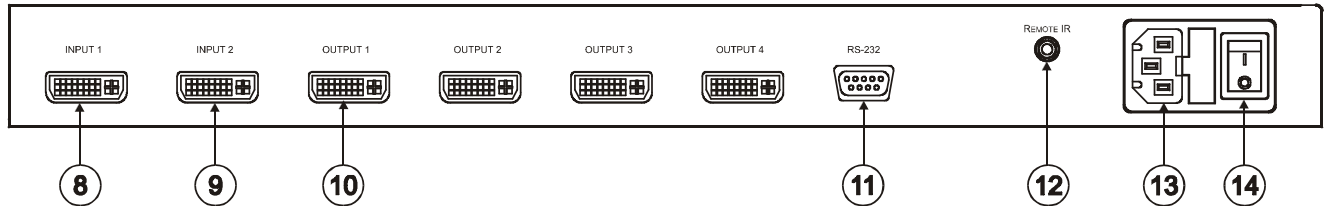
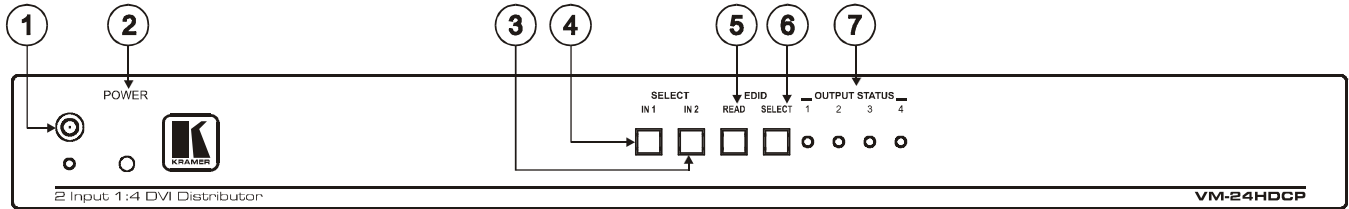


Figure 1: VM-24HDCP 2 Input 1:4 DVI Distributor



Table 1: VM-24HDCP 2 Input 1:4 DVI Distributor Features

#	Feature	Function
1	IR Receiver	The yellow LED is illuminated when receiving signals from the Kramer infrared remote control transmitter
2	POWER LED	The green LED is illuminated when the unit is turned ON
3	SELECT	IN 2 Button ¹
4		IN 1 Button1
5	EDID Buttons ²	READ ³
6		SELECT
7	OUTPUT STATUS LEDs (from 1 to 4)	LEDs light when an output(s) is connected and active; LEDs flash to indicate the type of EDID acquired (see Section 6.3) or when connecting a non-HDCP display while providing HDCP content to the VM-24HDCP
8	INPUT 1 DVI Connector	Connects to the DVI source 1
9	INPUT 2 DVI Connector	Connects to the DVI source 2
10	OUTPUT DVI Connectors	Connects to the DVI acceptor (from 1 to 4)
11	RS-232 9-pin D-sub Port	Connects to the PC or the Remote Controller ⁴
12	REMOTE IR ⁵	Connects to an external IR receiver unit for controlling the machine via an IR remote controller instead of using the front panel IR receiver ⁶ (See Section 4.1)
13	Power Connector with Fuse	AC connector enabling power supply to the unit
14	POWER Switch	Illuminated switch for turning the unit ON or OFF

4.1 Using the IR Transmitter

You can use the **RC-IR3** IR transmitter to control the machine via the built-in IR receiver on the front panel or, instead, via an optional external IR receiver⁷. The external IR receiver can be located 15 meters away from the machine. This distance can be extended to up to 60 meters when used with three extension cables⁸.

Before using the external IR receiver, be sure to arrange for your Kramer dealer to insert the internal IR connection cable⁹ with the 3.5mm connector that fits into the REMOTE IR opening on the rear panel. Connect the external IR receiver to the REMOTE IR 3.5mm connector.

1 Illuminates when selected and there is a signal; blinks when selected but there is no signal

2 See [Section 6.3](#)

3 Illuminates when configuring the EDID

4 Via a null-modem connection

5 Covered by a cap. The 3.5mm connector at the end of the internal IR connection cable fits through this opening

6 Optional. Can be used instead of the front panel (built-in) IR receiver to remotely control the machine (only if the internal IR connection cable has been installed)

7 Model: C-A35M/IRR-50

8 Model: C-A35M/A35F-50

9 P/N: 505-70434010-S

5 Installing in a Rack

This section provides instructions for rack mounting the unit.

Before Installing in a Rack

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

Operating temperature range	+5° to +45° C (41° to 113° F)
Operating humidity range	10 to 90% RHL, non-condensing
Storage temperature range	-20° to +70° C (-4° to 158° F)
Storage humidity range	5 to 95% RHL, non-condensing



CAUTION!

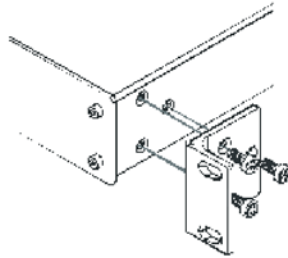
When installing on a 19" rack, avoid hazards by taking care that:

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>

6 Connecting the VM-24HDCP

To connect the **VM-24HDCP**, as illustrated in the example in [Figure 2](#), do the following¹:

1. Connect² the two DVI sources³ (for example, a DVD player and a set top box) to the INPUT 1 and INPUT 2 connectors, respectively.
2. Connect the DVI OUTPUT connectors³ to up to four DVI acceptors, using Kramer DVI cables. In this example, connect the:
 - OUTPUT 1 connector to acceptor 1 (for example, a plasma display)
 - OUTPUT 2 connector to acceptor 2 (for example, an LCD TV)
 - OUTPUT 3 connector to acceptor 3 (for example, an LCD TV)
 - OUTPUT 4 connector to acceptor 4 (for example, a plasma display)
3. If required, connect a PC and/or controller to the RS-232 port (see [Section 6.1](#)).
4. Connect the power cord to the mains electricity (not shown in [Figure 2](#)).
5. If required, acquire the EDID (see [Section 6.3](#)).

1 Switch OFF the power on each device before connecting it to your VM-24HDCP. After connecting your VM-24HDCP, switch on its power and then switch on the power on each device

2 Using the Kramer HDCP copper cables (C-FODM/FODM)

3 As required. Up to two inputs and four outputs can be connected. Not all inputs and outputs need to be connected

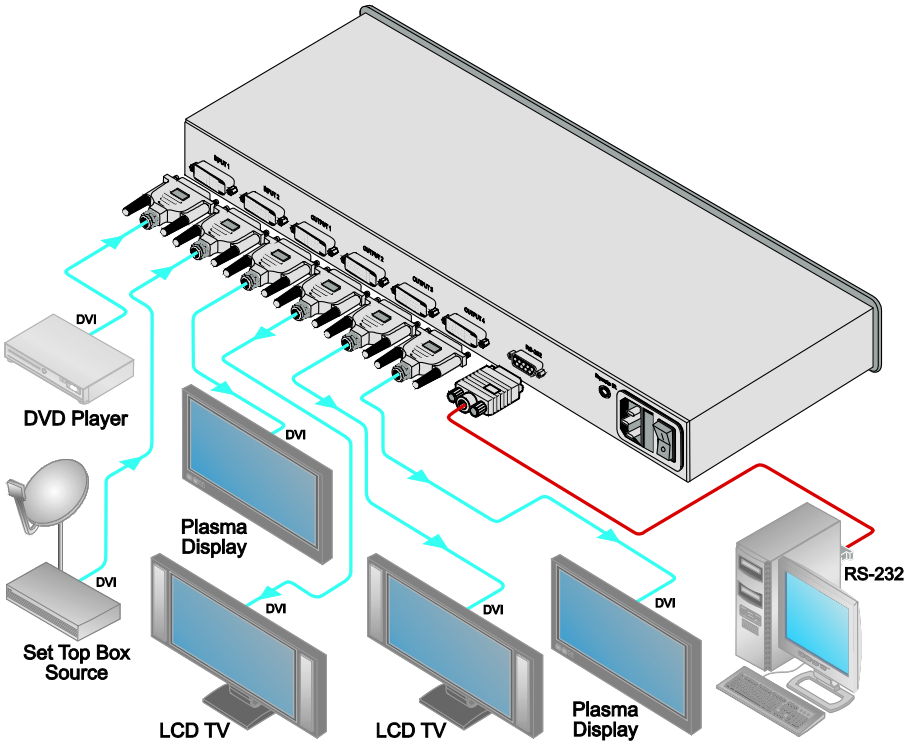


Figure 2: Connecting a VM-24HDCP 2 Input 1:4 DVI Distributor

6.1 Connecting via RS-232 (for example, using a PC)

You can connect a PC (or other controller) to the **VM-24HDCP** via the RS-232 port.

Connect the RS-232 9-pin D-sub port on your PC to the RS-232 9-pin D-sub rear panel port on the **VM-24HDCP**, as [Figure 3](#) illustrates:

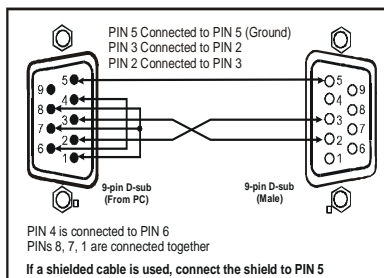


Figure 3: Connecting a PC

6.2 Operating the VM-24HDCP

Control the **VM-24HDCP** using the front panel buttons, or remotely via:

- RS-232 serial commands transmitted by a touch screen system, PC, or other serial controller
- The Kramer infrared remote control transmitter or infrared remote extension cable transmitter (optional)

To operate the **VM-24HDCP** via the front panel button:

1. Turn ON the POWER.
2. Press a SELECT IN front panel button (1 or 2) to select the desired input.
3. If required, press the EDID button to acquire or change the EDID data (see [Section 6.3](#)).

6.3 Using the EDID Buttons

You can acquire the EDID from:

- One output (the selected output LED flashes)
- The default EDID (all the output LEDs flash)
- Several connected outputs, the Auto-mix mode¹ (the output LEDs flash in sequence)

¹ See [Section 6.3.3](#)

To cycle between the different modes (One Output, Default and Auto-mix), as defined in [Table 2](#), press the EDID SELECT button

Table 2: The EDID Modes

Current EDID Mode	Appearance	To cycle to the Default EDID	To cycle to the Auto-mix EDID	To cycle to the One output EDID
One Output	The selected output LED flashes	Press the EDID SELECT button once again after selecting output 4. The output LEDs flash		
Default	The output LEDs flash simultaneously		Press the EDID SELECT button once	
Auto-mix	The output LEDs flash in sequence			Press the EDID SELECT button to select the required output the selected output flashes

To acquire or change the EDID of a new output display from:

- One output, see [Section 6.3.1](#)
- The default EDID, see [Section 6.3.2](#)
- Several connected outputs, see [Section 6.3.3](#)

6.3.1 Acquiring / Changing the EDID from One Output

To acquire or change the EDID of a new output display:

1. Connect the power supply.
2. Connect the new output display device.
3. Press the EDID SELECT button, enter the One output mode as defined in [Table 2](#), and set to the connected output.
The appropriate OUTPUT STATUS LED flashes, indicating that that output channel is selected.
4. Press the EDID READ button to copy the EDID of the selected OUTPUT to the inputs¹.
While the EDID is being copied, the EDID SELECT and READ buttons illuminate.
The new EDID is copied when both buttons no longer illuminate.

¹ If you want to cancel the EDID modification, wait for a few seconds without touching any button



6.3.2 Acquiring the Default EDID

To reset to the default EDID, do the following:

1. Connect the power supply.
2. Press the EDID SELECT button and set it to the Default EDID mode. All the OUTPUT STATUS LEDs flash simultaneously.
3. Press the EDID READ button to copy the default EDID to the inputs¹. While the EDID is being copied, the EDID SELECT and READ buttons illuminate.
The new EDID is copied when both buttons no longer illuminate.

6.3.3 Acquiring the Auto-mix EDID from the Connected Outputs

The EDID acquired is a weighted average of all the connected outputs. For example, if several displays with different resolutions are connected to the outputs, the acquired EDID supports all the resolutions, as well as other parameters included in the EDID.

To acquire the Auto-mix EDID:

1. Connect the power supply.
2. Connect the desired output display devices.
3. Enter the Auto-mix mode as defined in [Table 2](#).
The OUTPUT STATUS LEDs flash in sequence.
4. Press the READ button to copy the EDID of the selected OUTPUT to the inputs¹.
While the EDID is being copied, the EDID SELECT and READ buttons illuminate.
The new EDID is copied when both buttons no longer illuminate.

¹ If you want to cancel the EDID modification, wait for a few seconds without touching any button

7 Technical Specifications

[Table 3](#) includes the technical specifications¹ of the **VM-24HDCP**:

Table 3: VM-24HDCP Technical Specifications

INPUTS:	2 DVI, 1.2Vpp on a DVI Molex 24pin female connector; DDC signal 5Vpp (TTL)
OUTPUTS:	4 DVI, 1.2Vpp on DVI Molex 24pin female connectors; DDC signal 5Vpp (TTL)
BANDWIDTH:	Supports up to 2.25Gbps bandwidth per graphic channel
CONTROLS:	EDID SELECT, EDID READ, IN 1, IN 2 buttons, RS-232, IR
INDICATOR LEDs:	OUTPUT STATUS LEDs
POWER SOURCE:	100-240V AC, 50/60Hz 17VA
DIMENSIONS:	19" x 7" x 1U W, D, H, rack mountable
WEIGHT:	2.5kg (5.5lbs) approx.
ACCESSORIES:	Power cord, rack "ears", null-modem adapter, Windows®-based control software, infrared remote control transmitter
OPTIONS:	DVI/DVI male to male cables, Fiber Optic DVI Cable (C-FODM/FODM), external remote IR receiver cable. ²

¹ Specifications are subject to change without notice

² P/N: C-A35M/IRR-50



8 Communication Protocol

The **VM-24HDCP** is compatible with Kramer's Protocol 2000 (version 0.50) (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.

Table 4: Protocol Definitions

MSB		INSTRUCTION						LSB
		DESTINATION						
0	D	N5	N4	N3	N2	N1	N0	
7	6	5	4	3	2	1	0	
1st byte								
		INPUT						
1	I6	I5	I4	I3	I2	I1	I0	
7	6	5	4	3	2	1	0	
2nd byte								
		OUTPUT						
1	O6	O5	O4	O3	O2	O1	O0	
7	6	5	4	3	2	1	0	
3rd byte								
		MACHINE NUMBER						
1	OVR	X	M4	M3	M2	M1	M0	
7	6	5	4	3	2	1	0	
4th byte								

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 (i.e. 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 (i.e. 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.

Table 5: Instruction Codes for Protocol 2000

Note: All values in the table are decimal, unless otherwise stated.

INSTRUCTION		DEFINITION FOR SPECIFIC INSTRUCTION		NOTE
#	DESCRIPTION	INPUT	OUTPUT	
1	SWITCH VIDEO	Set equal to video input which is to be switched (0 = disconnect)	Set equal to video output which is to be switched (0 = to all the outputs)	2, 15
30	LOCK FRONT PANEL	0 - Panel unlocked 1 - Panel locked	0	2
31	REQUEST WHETHER PANEL IS LOCKED	0	0	16
61	IDENTIFY MACHINE	1 - video machine name 2 - audio machine name 3 - video software version 4 - audio software version 5 - RS-422 controller name 6 - RS-422 controller version 7 - remote control name 8 - remote software version 9 - Protocol 2000 revision	0 - Request first 4 digits 1 - Request first suffix 2 - Request second suffix 3 - Request third suffix 10 - Request first prefix 11 - Request second prefix 12 - Request third prefix	13
62	DEFINE MACHINE	1 - number of inputs 2 - number of outputs 3 - number of setups	1 - for video 2 - for audio 3 - for SDI 4 - for remote panel 5 - for RS-422 controller	14

NOTES on the above table:

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 the HEX code

01 85 88 83
was sent from the PC, then the switcher (machine 3) will switch input 5 to output 8. If the user switched input 1 to output 7 via the front panel keypad, then the switcher will send HEX codes:

41 81 87 83

to the PC.

When the PC sends one of the commands in this group to the switcher, then, if the instruction is valid, the switcher replies by sending to the PC the same four bytes that it was sent (except for the first byte, where the DESTINATION bit is set high).

NOTE 13 - This is a request to identify the switcher/s in the system. If the OUTPUT is set as 0, and the INPUT is set as 1, 2, 5 or 7, the machine will send its name. The reply is the decimal value of the INPUT and OUTPUT. For example, for a 2216, the reply to the request to send the audio machine name would be (HEX codes):

7D 96 90 81 (i.e. 128dec+ 22dec for 2nd byte, and 128dec+ 16dec for 3rd byte).

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 after it. For example, for version 3.5, the reply to the request to send the version number would be (HEX codes):

7D 83 85 81 (i.e. 128dec+ 3dec for 2nd byte, 128dec+ 5dec for 3rd byte).

If the OUTPUT is set as 1, then the ASCII coding of the lettering following the machine's name is sent. For example, for the VS-7588YC, the reply to the request to send the first suffix would be (HEX codes):

7D D9 C3 81 (i.e. 128dec+ ASCII for "Y"; 128dec+ ASCII for "C").

NOTE 14 - The number of inputs and outputs refers to the specific machine which is being addressed, not to the system. For example, if six 16X16 matrices are configured to make a 48X32 system (48 inputs, 32 outputs), the reply to the HEX code

3E 82 81 82 (ie. request the number of outputs)

would be HEX codes

7E 82 90 82

i.e. 16 outputs

NOTE 15 - When the OVR bit (4th byte) is set, then the "video" commands have universal meaning. For example, instruction 1 (SWITCH VIDEO) will cause all units (including audio, data, etc.) to switch. Similarly, if a machine is in "FOLLOW" mode, it will perform any "video" instruction.



Communication Protocol

NOTE 16 - The reply to the "REQUEST WHETHER PANEL IS LOCKED" is as in NOTE 4 above, except that here the OUTPUT is assigned with the value 0 if the panel is unlocked, or 1 if it is locked.

LIMITED WARRANTY

Kramer Electronics (hereafter *Kramer*) warrants this product free from defects in material and workmanship under the following terms.

HOW LONG IS THE WARRANTY

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

WHO IS PROTECTED?

Only the first purchase customer may enforce this warranty.

WHAT IS COVERED AND WHAT IS NOT COVERED

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

1. Any product which is not distributed by Kramer, or which is not purchased from an authorized Kramer dealer. If you are uncertain as to whether a dealer is authorized, please contact Kramer at one of the agents listed in the Web site www.kramerelectronics.com.
2. Any product, on which the serial number has been defaced, modified or removed, or on which the WARRANTY VOID IF TAMPERED 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: www.kramerelectronics.com, where updates to this user manual may be found. We welcome your questions, comments and feedback.



Caution

Safety Warning:

Disconnect the unit from the power supply before opening/servicing.



PN: 2900-000538



Rev: 3

Kramer Electronics, Ltd.

Web site: www.kramerelectronics.com

E-mail: info@kramereel.com

P/N: 2900-000538 REV 3