KRAMER ELECTRONICS LTD.

USER MANUAL

MODEL:

VM-24H
2 Input 1:4 HDMI Distributor

P/N: 2900-000664 Rev 3

VM-24H Quick Start Guide

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

Step 1: Check what's in the box

☑ **VM-24H** 2 Input 1:4 HDMI Distributor
☑ 1 Power cord
☑ 4 Rubber feet

☑ 1 Quick Start sheet
☑ Kramer **RC-IR3** Infrared Remote Control Transmitter with batteries and user manual
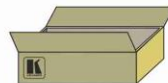
Save the original box and packaging materials in case you need to return your **VM-24H** for service.

Step 2: Install the VM-24H

Mount the **VM-24H** 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 **VM-24H**.

DVD Player

Display 1 with speakers

Display 4 with speakers

Computer Controller
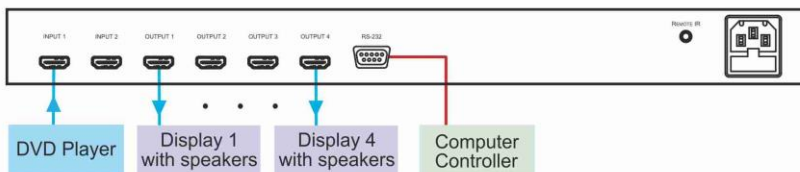
Always use Kramer high-performance cables for connecting AV equipment to the **VM-24H.**

Step 4: Connect the power

Connect the power cord to the **VM-24H** and plug it into the mains electricity.

Step 5: Operate the VM-24H

1. Press the EDID SELECT button to cycle through the EDID sources in the following order:
   Output 1 (Output 1 LED lights)
   Output 2 (Output 2 LED lights)
   Output 3 (Output 3 LED lights)
   Output 4 (Output 4 LED lights)
   Default EDID (all output LEDs flash simultaneously)
   Auto-Mix EDID (all output LEDs light)
2. To store the EDID, cycle to the desired EDID and press EDID READ. The EDID is acquired.

Contents

Figures

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 11 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 and GROUP 11: Sierra Products.

Congratulations on purchasing your Kramer **VM-24H** *2 Input 1:4 HDMI Distributor*, which is ideal for the following typical applications:

- Home theater, presentation and multimedia applications
- 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

> Go to http://www.kramerelectronics.com/support/product_downloads.asp 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 **VM-24H** 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 power cord that is supplied with the unit

Warning: Do not open the unit. High voltages can cause electrical shock! Servicing by qualified personnel only

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 *http://www.kramerelectronics.com/support/recycling/*.

3 Overview

The **VM−24H** is a distribution amplifier for HDMI signals. The unit reclocks and equalizes one of two selectable input signals and distributes it to four identical outputs.

The **VM-24H** features:

- A maximum data rate of 6.75Gbps (2.25Gbps per graphic channel)

- HDMI support for Deep Color, x.v.Color™, Lip Sync, CEC

- 3D pass-through

- I-EDIDPro™ Kramer Intelligent EDID Processing™, an intelligent EDID handling and processing algorithm that ensures Plug and Play operation for HDMI systems

- The ability to acquire the EDID from one output, from several connected outputs (auto-mix) or acquire the default EDID for fast and efficient connection of the unit

- Housing in a 19" 1U rack mountable enclosure

- Power feeding from a 100-240V AC universal switching power supply

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

- The front panel buttons

- The infrared remote control transmitter

- The infrared remote extension cable transmitter, see Section 3.2

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

3.1 Defining the VM-24H 2 Input 1:4 HDMI Distributor
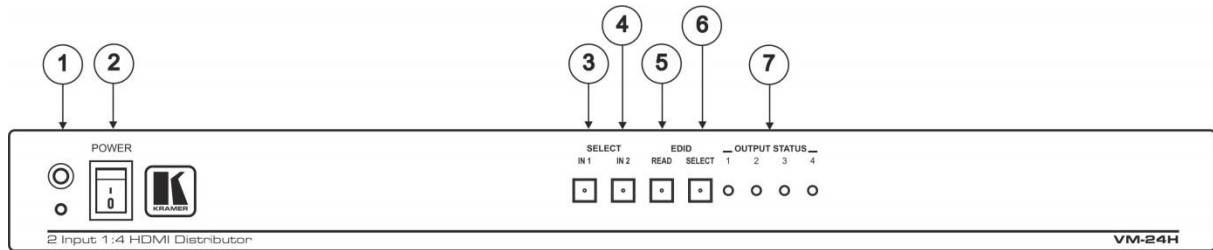
This section defines the **VM-24H**.

Figure 1: VM-24H 2 Input 1:4 HDMI Distributor Front Panel

#	Feature	Function
1	IR Receiver	The red LED is illuminated when receiving signals from the Kramer infrared remote control transmitter
2	*POWER* Switch	Illuminated switch for turning the unit ON or OFF
3	*SELECT IN 1* Button	Press to select source 1 and distribute this signal to the outputs
4	*SELECT IN 2* Button	Press to select source 2 and distribute this signal to the outputs
5	*EDID READ* Button	Press, after pressing the EDID SELECT button, to acquire the EDID Press to show the EDID status
6	*EDID SELECT* Button	Select the EDID mode (One Output, Auto-mix or Default)
7	*OUTPUT STATUS 1-4* LEDs	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-24H**
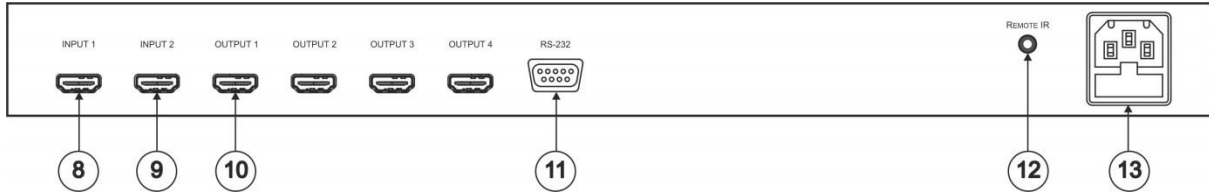
Figure 2: VM-24H 2 Input 1:4 HDMI Distributor Rear Panel

#	Feature	Function
8	*INPUT 1* HDMI Connector	Connects to the HDMI source 1
9	*INPUT 2* HDMI Connector	Connects to the HDMI source 2
10	*OUTPUT* HDMI Connectors	Connects to the HDMI acceptor (from 1 to 4)
11	*RS-232* 9-pin D-sub Port	Connects to the PC or the Remote Controller (via a null modem connection)
12	*REMOTE IR* Opening	Connects to an external IR receiver unit for controlling the machine via an IR remote controller instead of using the front panel IR receiver 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)
13	Power Connector with Fuse	AC connector enabling power supply to the unit

3.2 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 receiver (Model: C-A35M/IRR-50). The external IR receiver can be located up to 15 meters away from the machine. This distance can be extended to up to 60 meters when used with three extension cables (Model: C-A35M/A35F-50).

Before using the external IR receiver, be sure to arrange for your Kramer dealer to insert the internal IR connection cable (P/N: 505-70434010-S) 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.

4 Installing in a Rack

This section provides instructions for rack mounting the unit.

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

| 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

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.

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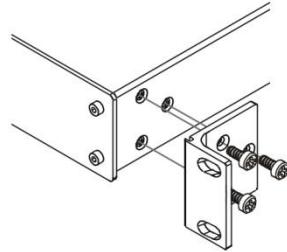
2. Place the ears of the machine against the rack rails, and insert the proper screws (not provided) through each of the four holes in the rack ears.

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 our Web site

5 Connecting the VM-24H

> Always switch off the power to each device before connecting it to your **VM-24H**. After connecting your **VM-24H**, connect its power and then switch on the power to each device.

To connect the VM-24H, as illustrated in the example in Figure 3, do the following:

1. Connect the two HDMI sources, for example, a DVD player and a set top box, to the INPUT 1 and INPUT 2 connectors, respectively.

2. Connect the HDMI OUTPUT connectors to up to 4 HDMI acceptors, using Kramer HDMI copper 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)
   Up to four outputs can be connected. Not all outputs need to be connected.

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 3).

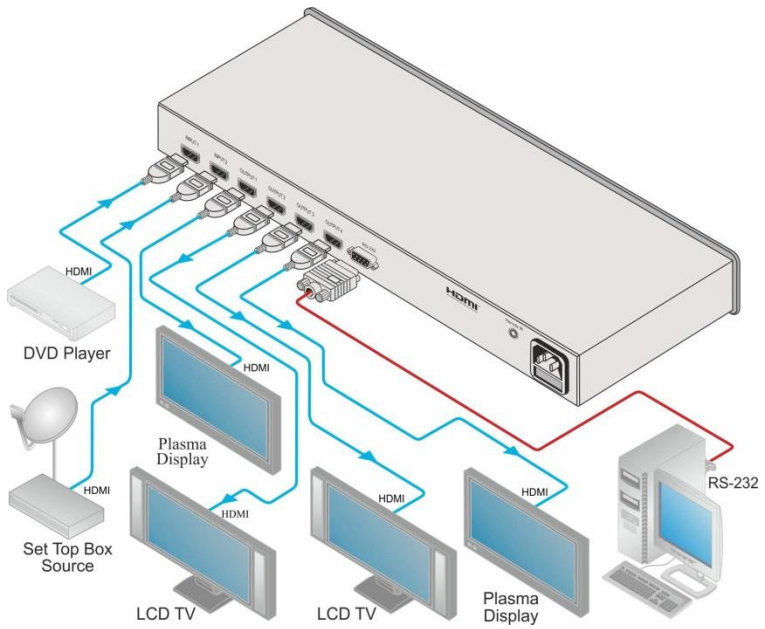5. If required, acquire the EDID (see Section 6.3).

Figure 3: Connecting the VM-24H 2 Input 1:4 HDMI Distributor

6 Operating the VM-24H

This section describes how to:

- Control the **VM-24H** via RS-232, see Section 6.1

- Operate the **VM-24H**, see Section 6.2

- Use the EDID button, see Section 6.3

6.1 Controlling 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.
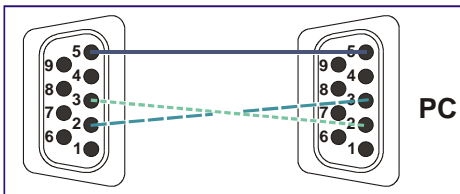
Figure 4: Crossed Cable RS-232 Connection

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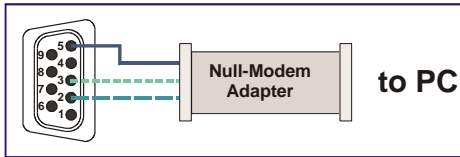
Figure 5: Straight Cable RS-232 Connection with a Null Modem Adapter

6.2   Operating the VM-24H

To operate the **VM-24H**:

1. Turn ON the POWER.

2. 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 Mode (the output LEDs flash in sequence)

  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 cycle between the different modes (One Output, Default and Auto-mix), as defined in the following table, press the EDID SELECT button.

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	All the output LEDs light			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 one of the output displays:

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 the previous table, 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 inputs.
   If you want to cancel the EDID modification, wait for a few seconds without touching any button

5. While the EDID is being copied, the EDID SELECT and READ buttons illuminate.
   The new EDID is copied when both buttons no longer illuminate.

6.3.2 Acquiring the Default EDID

To reset to the default EDID (the factory-default programmed into the **VM-24H** before it is shipped), 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 inputs.
   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

To acquire the Auto-mix EDID:

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.

1. Connect the power supply.

2. Connect the desired output display devices.

3. Enter the Auto-mix mode as defined in the preceding table.
   All the OUTPUT STATUS LEDs light.

4. Press the READ button to copy the EDID of the selected OUTPUT to the inputs.
   While the EDID is being copied, the EDID SELECT and READ buttons illuminate.
   The new EDID is copied when both buttons no longer illuminate.

7   Technical Specifications

INPUTS:	2 HDMI connectors
OUTPUTS:	4 HDMI connectors
MAX. DATA RATE:	6.75Gbps (2.25Gbps per graphic channel)
COMPLIANCE WITH HDMI STANDARD:	Supports HDMI and HDCP
CONTROLS:	EDID SELECT, EDID READ, IN 1, IN 2 buttons, RS-232, IR
INDICATOR LEDs:	OUTPUT STATUS LEDs
POWER CONSUMPTION:	100-240V AC 50/60Hz, 16VA
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:	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:	External remote IR receiver cable (P/N: C-A35M/IRR-50)
Specifications are subject to change without notice at http://www.kramerelectronics.com	

8 Communication Protocol

The **VM-24H** is compatible with Kramer's Protocol 2000. 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.

Note: Compatibility with Kramer's Protocol 2000 does not mean that a machine uses all of the commands below. Each machine uses a sub-set of Protocol 2000, according to its needs.

8.1 Syntax

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

2nd Byte	INPUT						
1	I6	I5	I4	I3	I2	I1	I0
7	6	5	4	3	2	1	0

3rd Byte	OUTPUT						
1	O6	O5	O4	O3	O2	O1	O0
7	6	5	4	3	2	1	0

4th Byte			MACHINE NUMBER				
1	OVR	X	M4	M3	M2	M1	M0
7	6	5	4	3	2	1	0

1st Byte: Bit 7 – Defined as 0
D – DESTINATION:
0 – Sends information to the switchers (from the PC)
1 – Sends information to the PC (from the switcher)
N5…N0 – INSTRUCTION

The 6-bit INSTRUCTION defines the function performed by the switcher(s). If a function is performed using the machine's keyboard, these bits are set with the INSTRUCTION NO. performed. The instruction codes are defined according to the table below (INSTRUCTION NO. is the value set in N5…N0).

2nd Byte: Bit 7 – Defined as 1
I6…I0 – INPUT

When switching (i.e. instruction codes 1 and 2), the 7-bit INPUT is set as the input number to be switched. If switching is done using the machine's front panel, these bits are set with the INPUT NUMBER 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 7-bit OUTPUT is set as the output number to be switched. If switching is done using the machine's front panel, these bits are set with the OUTPUT NUMBER 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

This byte is used to address machines in a system by their machine numbers. When several machines are controlled from a single serial port, they are usually configured together and each machine has an individual machine number. If the OVR bit is set, then all machine numbers accept (implement) the command and the addressed machine replies. When a single machine is controlled over the serial port, always set M4…M0 to 1, and make sure that the machine itself is configured as MACHINE NUMBER = 1.

8.2 Instruction Codes

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

Instruction Codes for Protocol 2000			
Instruction		**Definition for Specific Instruction**	**Notes**
#	**Description**	**Input**	**Output**	
1	SWITCH VIDEO	Set equal to video input that is switched (0 = disconnect)	Set equal to video output that is switched (0 = to all the outputs)	2, 15
30	LOCK FRONT PANEL	Unlock panel Lock panel	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 10 – Control data machine name 11 – Control data software version	For names: 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 For versions: 0 – main board or the number of external board	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 6 – For control data	14
63	EXTENDED DATA	7 MSBs for INPUT data	7 MSBs for OUTPUT data	20

NOTES on the above table:

NOTE 2 – These are bi-directional definitions. If the switcher receives the code, it performs the instruction. If the instruction is performed (due to a keystroke operation on the front panel), then these codes are sent.
For example, if the PC sends HEX code:
01   85   88   83
then the switcher (machine 3) switches input 5 to output 8.
If the user switches input 1 to output 7 using the front panel buttons, the switcher sends HEX code:
41   81   87   83
to the PC.
When the PC sends one of the commands in this group to the switcher, if the instruction is valid, the switcher replies by sending the same four bytes to the PC that it received (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 sends 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 is HEX code:
 7D   96   90   81 (i.e. 128_{dec}+ 22_{dec} for 2nd byte, and 128_{dec}+ 16_{dec} for 3rd byte).

If the request for identification is sent with the INPUT set as 3 or 4, the appropriate machine sends 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 code:
7D   83   85   81 (i.e. 128_{dec}+ 3_{dec} for 2nd byte, 128_{dec}+ 5_{dec} 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 code:
7D   D9   C3   81 (i.e. 128_{dec}+ ASCII for "Y"; 128_{dec}+ ASCII for "C").

NOTE 14 – The number of inputs and outputs refers to the specific machine 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 (i.e. request the number of outputs)
would be HEX code:
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) causes all units (including audio, data, etc.) to switch. Similarly, if a machine is in FOLLOW mode, it performs any video instruction.

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

NOTE 20 – When data (i.e. the INPUT and/or OUTPUT bytes) of more than 7 bits is required, instruction 63 is sent before sending the instruction needing the additional bits. The data in this instruction then becomes the most significant bits of that next instruction.

For example, to set the audio gain (instruction 22) of output 3 to 681dec (2A9hex), send HEX code:

3F	80	85	81

followed by HEX code:

16	83	A9	81.

To set the audio gain of output 6 to 10013dec (271Dhex), send HEX code:

3F	80	CE	81

followed by HEX code:

16	86	9D	81.

VM-24H - Communication Protocol

LIMITED WARRANTY

The warranty obligations of Kramer Electronics for this product are limited to the terms set forth below:

What is Covered

This limited warranty covers defects in materials and workmanship in this product.

What is Not Covered

This limited warranty does not cover any damage, deterioration or malfunction resulting from any alteration, modification, improper or unreasonable use or maintenance, misuse, abuse, accident, neglect, exposure to excess moisture, fire, improper packing and shipping (such claims must be presented to the carrier), lightning, power surges, or other acts of nature. This limited warranty does not cover any damage, deterioration or malfunction resulting from the installation or removal of this product from any installation, any unauthorized tampering with this product, any repairs attempted by anyone unauthorized by Kramer Electronics to make such repairs, or any other cause which does not relate directly to a defect in materials and/or workmanship of this product. This limited warranty does not cover cartons, equipment enclosures, cables or accessories used in conjunction with this product.

Without limiting any other exclusion herein, Kramer Electronics does not warrant that the product covered hereby, including, without limitation, the technology and/or integrated circuit(s) included in the product, will not become obsolete or that such items are or will remain compatible with any other product or technology with which the product may be used.

How Long Does this Coverage Last

Seven years as of this printing; please check our Web site for the most current and accurate warranty information.

Who is Covered

Only the original purchaser of this product is covered under this limited warranty. This limited warranty is not transferable to subsequent purchasers or owners of this product.

What Kramer Electronics will do

Kramer Electronics will, at its sole option, provide one of the following three remedies to whatever extent it shall deem necessary to satisfy a proper claim under this limited warranty:

1. Elect to repair or facilitate the repair of any defective parts within a reasonable period of time, free of any charge for the necessary parts and labor to complete the repair and restore this product to its proper operating condition. Kramer Electronics will also pay the shipping costs necessary to return this product once the repair is complete.

2. Replace this product with a direct replacement or with a similar product deemed by Kramer Electronics to perform substantially the same function as the original product.

3. Issue a refund of the original purchase price less depreciation to be determined based on the age of the product at the time remedy is sought under this limited warranty.

What Kramer Electronics will not do Under This Limited Warranty

If this product is returned to Kramer Electronics or the authorized dealer from which it was purchased or any other party authorized to repair Kramer Electronics products, this product must be insured during shipment, with the insurance and shipping charges prepaid by you. If this product is returned uninsured, you assume all risks of loss or damage during shipment. Kramer Electronics will not be responsible for any costs related to the removal or re-installation of this product from or into any installation. Kramer Electronics will not be responsible for any costs related to any setting up this product, any adjustment of user controls or any programming required for a specific installation of this product.

How to Obtain a Remedy under this Limited Warranty

To obtain a remedy under this limited warranty, you must contact either the authorized Kramer Electronics reseller from whom you purchased this product or the Kramer Electronics office nearest you. For a list of authorized Kramer Electronics resellers and/or Kramer Electronics authorized service providers, please visit our web site at www.kramerelectronics.com or contact the Kramer Electronics office nearest you.

In order to pursue any remedy under this limited warranty, you must possess an original, dated receipt as proof of purchase from an authorized Kramer Electronics reseller. If this product is returned under this limited warranty, a return authorization number, obtained from Kramer Electronics, will be required. You may also be directed to an authorized reseller or a person authorized by Kramer Electronics to repair the product.

If it is decided that this product should be returned directly to Kramer Electronics, this product should be properly packed, preferably in the original carton, for shipping. Cartons not bearing a return authorization number will be refused.

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SAFETY WARNING
Disconnect the unit from the power supply before opening and servicing