

## USER MANUAL

### MODEL:

VM-2D

1:2 DVI Distributor



# Contents

<b>Introduction</b>	<b>1</b>
Getting Started	1
Overview	2
Typical Applications	3
<b>Defining VM-2D 1:2 DVI Distributor</b>	<b>4</b>
<b>Mounting VM-2D</b>	<b>5</b>
<b>Connecting VM-2D</b>	<b>6</b>
Acquiring EDID	6
Upgrading Firmware	8
<b>Default EDID</b>	<b>9</b>
<b>Technical Specifications</b>	<b>11</b>
Default Communication Parameters	12
<b>Protocol 3000</b>	<b>13</b>
Understanding Protocol 3000	14
Kramer Protocol 3000 Syntax	15
Protocol 3000 Commands	16

# 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!

---

## Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment.
- Review the contents of this user manual.



Go to [www.kramerav.com/downloads/VM-2D](http://www.kramerav.com/downloads/VM-2D) to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

## Achieving 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-2D** away from moisture, excessive sunlight and dust.

## Safety Instructions



### Caution:

- This equipment is to be used only inside a building. It may only be connected to other equipment that is installed inside a building.
- For products with relay terminals and GPIO ports, please refer to the permitted rating for an external connection, located next to the terminal or in the User Manual.
- There are no operator serviceable parts inside the unit.



### Warning:

- Use only the power cord that is supplied with the unit.
- To ensure continuous risk protection, replace fuses only according to the rating specified on the product label which located on the bottom of the unit.

## Recycling Kramer Products

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

---

## Overview

Congratulations on purchasing your Kramer **VM-2D 1:2 DVI Distributor**.

**VM-2D** is a 1:2 distribution amplifier for up to 4K@60Hz (4:2:0) HDMI™ 2.0 signals, complying with HDCP 1.4 content protection standard, via single-link DVI-I connections. The unit takes one DVI input, equalizes and reclocks the signal, and distributes it to two identical outputs.

**VM-2D** provides exceptional quality, advanced and user-friendly operation.

The terms HDMI, HDMI High-Definition Multimedia Interface, and the HDMI Logo are trademarks or registered trademarks of HDMI Licensing Administrator, Inc.

## Exceptional Quality

- High Performance Distributor – Professional 1:2 DVI distributor for up to 4K@60Hz (4:2:0) video resolution signals. Via single-link DVI-I connections, one HDMI 2.0 and HDCP 1.4 input signal is amplified and distributed to two identical output signals, with signals rebuilt using Kramer Equalization & re-Klocking™ Technology to gain longer distances.
- HDMI Signal Transmission – HDMI 2.0 and HDCP 1.4 compliant signal, supporting Deep Color, x.v.Color™, Lip Sync, 7.1 PCM, Dolby TrueHD, DTS-HD, 2K, 4K, and 3D. EDID signals are passed through from the source to the displays.
- I-EDIDPro™ Kramer Intelligent EDID Processing™ – Intelligent EDID handling, processing and pass-through algorithm that ensures Plug and Play operation for DVI source and display systems.

## Advanced and User-friendly Operation

- Secured Operation – Highly-secured operation is ensured by lockable wiring connectivity with protection against unintentional cables disconnection.
- User-Friendly Operation – Comprehensive signal distribution features and signal mode-forcing options such as RGB forcing, with convenient EDID selection front panel button.
- Cost-Effective Field Maintenance – Mini-USB connection for simple field firmware upgrade. Status indicators for fast and effective troubleshooting.
- Easy Installation – Compact TOOLS™ fan-less enclosure for over-ceiling mounting, or side-by-side mounting of 3 units in a 1U rack space with the optional recommended rack adapter.

## Flexible Connectivity

- 7 input buttons for switching a selected input to the outputs.
- Scaled video outputs – HDMI and 15-pin HD computer graphics video.
- Embedded audio on the HDMI and DisplayPort inputs and outputs.
- One stereo speaker output, 10W per channel into 8Ω, on a 4-pin terminal block connector.

---

## Typical Applications

VM-2D is ideal for the following typical applications:

- Medical market operation rooms and other critical multimedia applications.
- Highly reliable operation of high-quality professional AV deployments via lockable cable connections.
- Governmental market hi-reliability AV applications.
- Rental and staging events.

# Defining VM-2D 1:2 DVI Distributor

This section defines VM-2D.

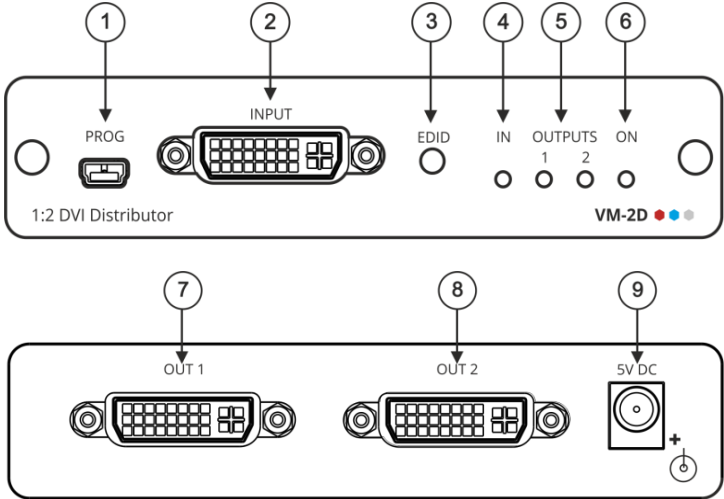


Figure 1: VM-2D 1:2 DVI Distributor Front and Rear Panels

#	Feature	Function
①	PROG Mini USB Connector	Connect to a PC to perform firmware upgrades (via K-Upload) and work with the EDID Designer. K-Upload and EDID Designer can be downloaded from our Web site at: <a href="http://www.kramerav.com/support/product_downloads.asp">www.kramerav.com/support/product_downloads.asp</a> .
②	DVI-I Connector	Connect to a DVI source.
③	EDID Button	Press to capture the input EDID or select the default EDID (see <a href="#">Acquiring EDID</a> on page 6).
④	IN LED	Lights green when an active input signal is detected.
⑤	OUTPUT LEDs (1 to 2)	Lights green when an output device is detected.
⑥	ON LED	Lights green when the device receives power.
⑦	OUT 1 DVI-I Connector	Connect to a DVI acceptor.
⑧	OUT 2 DVI-I Connector	Connect to a DVI acceptor.
⑨	5V DC Power Connector	5V DC connector for powering the unit.

# Mounting VM-2D

This section provides instructions for mounting **VM-2D**. Before installing, verify that the environment is within the recommended range:



- Operation 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:**

- Mount **VM-2D** before connecting any cables or power.

**Warning:**

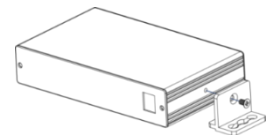
- Ensure that the environment (e.g., maximum ambient temperature & air flow) is compatible for the device.
- Avoid uneven mechanical loading.
- Appropriate consideration of equipment nameplate ratings should be used for avoiding overloading of the circuits.
- Reliable earthing of rack-mounted equipment should be maintained.

## To mount VM-2D on a rack

Mount the unit in a rack using the recommended rack adapter (see [www.kramerav.com/product/VM-2D](http://www.kramerav.com/product/VM-2D))

## To mount VM-2D on a table or shelf

- Attach the rubber feet and place the unit on a flat surface.
- Fasten a bracket (included) on each side of the unit and attach it to a flat surface.



For more information go to [www.kramerav.com/downloads/VM-2D](http://www.kramerav.com/downloads/VM-2D)

# Connecting VM-2D

**i** Always switch off the power to each device before connecting it to your VM-2D. After connecting your VM-2D, connect its power and then switch on the power to each device.

To connect VM-2D as illustrated in the example in [Figure 2](#):

1. Connect a DVI source (for example, a PC) to the INPUT connector (2).
2. Connect the output connectors to one or both DVI acceptors, as follows:
  - OUT 1 connector (7) to DVI acceptor 1 (for example, a projector).
  - OUT 2 connector (8) to DVI acceptor 2 (for example, a display).
3. Connect the 5V DC power adapter (wall transformer) to the 5V DC socket (9) and connect the transformer to the mains electricity.
4. Acquire the EDID (see [Acquiring EDID](#) on page 6).

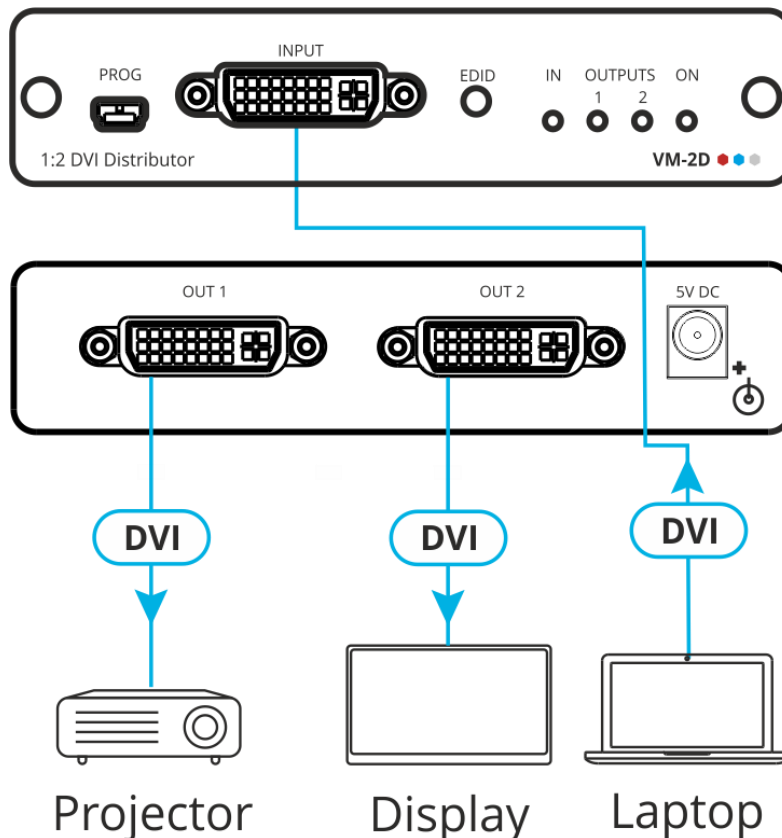


Figure 2: Connecting VM-2D

## Acquiring EDID

**i** VM-2D supports EDID Designer (via the mini USB port) that can be loaded from our Web site: [www.kramerav.com/product/VM-2D](http://www.kramerav.com/product/VM-2D).

To use the mini USB port, you need to download and the Kramer USB driver from our Web site at: [www.kramerav.com/support/product\\_downloads.asp](http://www.kramerav.com/support/product_downloads.asp) and install it.



## Acquiring EDID via front panel

Press **EDID** (3) once to display the current EDID source which is indicated by the flashing of OUT 1, OUT 2, or both (if the default EDID is currently used).

### To acquire an EDID:

1. Press **EDID** (3).  
The current EDID source is displayed.
2. Press **EDID** (3) (a second time) to enter EDID select mode.  
**VM-2D** enters EDID select mode.
3. Press **EDID** (3) repeatedly to cycle through the EDID source selection options.  
The OUT LEDs flash in the following order:  
OUT 1 -> OUT 2 -> all output LEDs flash (default EDID).
4. Stop pressing **EDID** (3) once the required EDID source is reached.  
After a few seconds **VM-2D** acquires the EDID.  
When complete, all output LEDs return to normal operation, displaying the present output connection status.



If an unconnected output is selected or the connected EDID cannot be read, **VM-2D** acquires the default EDID.

## Forcing RGB Mode

Normally (the default state), when acquiring the EDID, the device supports any color space that is defined in the acquired EDID parameters. In case of a color space problem, using the Force RGB mode may improve the colors of the image on the display.

To:	Do the following:
<b>Force the acquired EDID to support only RGB color space:</b>	Press and hold <b>EDID</b> (3) for few seconds until all the output LEDs flash together four times. Continue to acquire the desired EDID. This acquired EDID is then forced to support the RGB color space only.
<b>Return to the normal EDID mode:</b>	Press and hold <b>EDID</b> (3) for few seconds until the output LEDs flash together once. Continue to acquire the desired EDID.
<b>View the force RGB activation status:</b>	Power cycle the unit. All output LEDs flash together once when in normal EDID mode, and four times when in Force RGB mode.



Upon power on, the output LEDs flash according to their EDID mode: four times for RGB mode and once for normal mode.

---

## Upgrading Firmware

Use the Kramer **K-UPLOAD** software to upgrade the firmware via the **VM-2D** PROG. Mini USB port ①.

The latest version of **K-UPLOAD** and installation instructions can be downloaded from our website at: [www.kramerav.com/support/product\\_downloads.asp](http://www.kramerav.com/support/product_downloads.asp).



Note that in order to use the mini USB port, you need to install the Kramer USB driver, available at: [www.kramerav.com/support/product\\_downloads.asp](http://www.kramerav.com/support/product_downloads.asp).

# Default EDID

Model name..... VM-2D  
 Manufacturer..... KMR  
 Plug and Play ID..... KMR0672  
 Data string..... Default-EDID  
 Serial number..... 2  
 Manufacture date..... 2012, ISO week 255  
 Filter driver..... None  
 -----  
 EDID revision..... 1.3  
 Input signal type..... Digital  
 Color bit depth..... Undefined  
 Display type..... RGB color  
 Screen size..... 520 x 320 mm (24.0 in)  
 Power management..... Standby, Suspend, Active off/sleep  
 Extension blocs..... 1 (CEA-EXT)  
 -----  
 DDC/CI..... Not supported  
 Color characteristics  
 Default color space..... Non-sRGB  
 Display gamma..... 2.20  
 Red chromaticity..... Rx 0.674 - Ry 0.319  
 Green chromaticity..... Gx 0.188 - Gy 0.706  
 Blue chromaticity..... Bx 0.148 - By 0.064  
 White point (default).... Wx 0.313 - Wy 0.329  
 Additional descriptors... None  
  
 Timing characteristics  
 Horizontal scan range.... 30-83kHz  
 Vertical scan range..... 56-76Hz  
 Video bandwidth..... 170MHz  
 CVT standard..... Not supported  
 GTF standard..... Not supported  
 Additional descriptors... None  
 Preferred timing..... Yes  
 Native/preferred timing.. 1280x720p at 60Hz (16:10)  
 Modeline..... "1280x720" 74.250 1280 1390 1430 1650 720 725 730 750 +hsync +vsync  
  
 Standard timings supported  
 720 x 400p at 70Hz - IBM VGA  
 640 x 480p at 60Hz - IBM VGA  
 640 x 480p at 75Hz - VESA  
 800 x 600p at 60Hz - VESA  
 800 x 600p at 75Hz - VESA  
 1024 x 768p at 60Hz - VESA  
 1024 x 768p at 75Hz - VESA  
 1280 x 1024p at 75Hz - VESA  
 1280 x 1024p at 60Hz - VESA STD  
 1600 x 1200p at 60Hz - VESA STD  
 1152 x 864p at 75Hz - VESA STD  
  
 EIA/CEA-861 Information  
 Revision number..... 3  
 IT underscan..... Supported  
 Basic audio..... Supported  
 YCbCr 4:4:4..... Supported  
 YCbCr 4:2:2..... Supported  
 Native formats..... 1  
 Detailed timing #1..... 1920x1080p at 60Hz (16:10)  
 Modeline..... "1920x1080" 148.500 1920 2008 2052 2200 1080 1084 1089 1125 +hsync +vsync  
 Detailed timing #2..... 1920x1080i at 60Hz (16:10)  
 Modeline..... "1920x1080" 74.250 1920 2008 2052 2200 1080 1084 1094 1124 interlace +hsync +vsync  
 Detailed timing #3..... 1280x720p at 60Hz (16:10)  
 Modeline..... "1280x720" 74.250 1280 1390 1430 1650 720 725 730 750 +hsync +vsync  
 Detailed timing #4..... 720x480p at 60Hz (16:10)  
 Modeline..... "720x480" 27.000 720 736 798 858 480 489 495 525 -hsync -vsync  
  
 CE video identifiers (VICs) - timing/formats supported  
 1920 x 1080p at 60Hz - HDTV (16:9, 1:1)  
 1920 x 1080i at 60Hz - HDTV (16:9, 1:1)  
 1280 x 720p at 60Hz - HDTV (16:9, 1:1) [Native]  
 720 x 480p at 60Hz - EDTV (16:9, 32:27)  
 720 x 480p at 60Hz - EDTV (4:3, 8:9)  
 720 x 480i at 60Hz - Doublescan (16:9, 32:27)  
 720 x 576i at 50Hz - Doublescan (16:9, 64:45)  
 640 x 480p at 60Hz - Default (4:3, 1:1)  
 NB: NTSC refresh rate = (Hz\*1000)/1001

CE audio data (formats supported)  
LPCM 2-channel, 16/20/24 bit depths at 32/44/48 kHz

CE vendor specific data (VSDB)  
IEEE registration number. 0x000C03  
CEC physical address..... 1.0.0.0  
Maximum TMDS clock..... 165MHz

CE speaker allocation data  
Channel configuration.... 2.0  
Front left/right..... Yes  
Front LFE..... No  
Front center..... No  
Rear left/right..... No  
Rear center..... No  
Front left/right center.. No  
Rear left/right center... No  
Rear LFE..... No

Report information  
Date generated..... 01/12/2016  
Software revision..... 2.90.0.1020  
Data source..... Real-time 0x0071  
Operating system..... 6.1.7601.2.Service Pack 1

# Technical Specifications

Input	1 DVI	On a DVI-I female connector
Outputs	2 DVI	On DVI-I female connectors
Video	Max Data Rate	10.2Gbps (3.4Gbps per graphic channel)
	Max Resolution	4K@60Hz (4:2:0) 24bpp
	Compliance	DVI 1.0, HDMI 2.0 and HDCP 1.4
Port	Mini USB	Female connector for firmware upgrade and using EDID Designer software
Controls	Button	EDID setup button
	LEDs	OUTPUTS 1 to 2, ACTIVE input and power ON LEDs
Power	Consumption	5V DC, 800mA
	Source	5V DC, 4A
Environmental Conditions	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
Regulatory Compliance	Safety	CE
	Environmental	RoHs, WEEE
Enclosure	Size	Tools
	Type	Aluminum
	Cooling	Convection Ventilation
General	Net Dimensions (W, D, H)	12cm x 7.2cm x 2.4cm (4.7" x 2.8" x 1")
	Shipping Dimensions (W, D, H)	15.7cm x 12cm x 8.7cm (6.2" x 4.7" x 3.4")
	Net Weight	0.3kg (0.6lbs) approx.
	Shipping Weight	0.7kg (1.5lbs) approx.
Accessories	Included	Power supply, Bracket set
	Optional	RK-3T 19" rack adapter
Specifications are subject to change without notice at <a href="http://www.kramerav.com">www.kramerav.com</a>		

# Default Communication Parameters

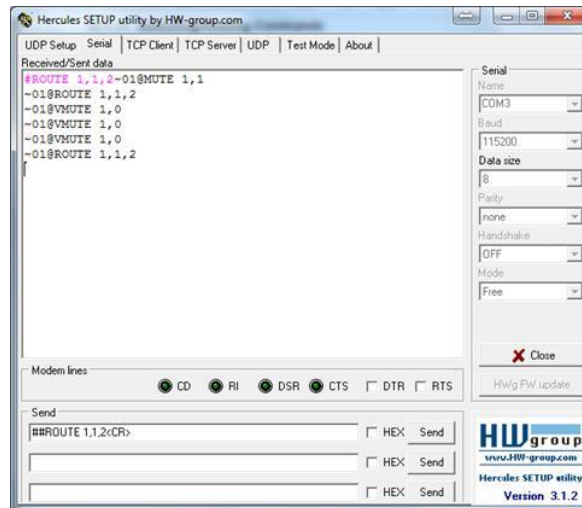
Serial USB	
Baud Rate:	115,200
Data Bits:	8
Stop Bits:	1
Parity:	None
Factory Reset	
Protocol 3000	FACTORY command to reset to factory default configuration
Protocol 3000	
Command Format:	ASCII protocol 3000
Example (get the input signal status):	#SIGNAL? 1,1<cr>


# Protocol 3000

**VM-2D 1:2 DVI Distributor** can be operated using the Kramer Protocol 3000 serial commands. The command framing varies according to how you interface with **VM-2D**.

Generally, a basic video input switching command that routes a layer 1 video signal to HDMI out 1 from HDMI input 2 (ROUTE 1, 1, 2), is entered as follows:

- Terminal communication software, such as Hercules:

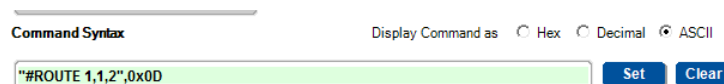



 The framing of the command varies according to the terminal communication software.

- K-Touch Builder (Kramer software):



- K-Config (Kramer configuration software):



 All the examples provided in this section are based on using the K-Config software.

You can enter commands directly using terminal communication software (e.g., Hercules) by connecting a PC to the serial or Ethernet port on the **VM-2D**. To enter `CR` press the Enter key (`LF` is also sent but is ignored by the command parser).

Commands sent from various non-Kramer controllers (e.g., Crestron) may require special coding for some characters (such as, `/x##`). For more information, refer to your controller's documentation.

For more information about Protocol 3000 commands, see:

- [Understanding Protocol 3000](#) on page [14](#).

- [Kramer Protocol 3000 Syntax](#) on page [15](#).
- [Protocol 3000 Commands](#) on page [16](#).

## Understanding Protocol 3000

Protocol 3000 commands are structured according to the following:

- **Command** – A sequence of ASCII letters (A-Z, a-z and -). A command and its parameters must be separated by at least one space.
- **Parameters** – A sequence of alphanumeric ASCII characters (0-9, A-Z, a-z and some special characters for specific commands). Parameters are separated by commas.
- **Message string** – Every command entered as part of a message string begins with a message starting character and ends with a message closing character.



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

- **Message starting character:**
  - # – For host command/query
  - ~ – For device response
- **Device address** – K-NET Device ID followed by @ (optional, K-NET only)
- **Query sign** – ? follows some commands to define a query request
- **Message closing character:**
  - CR – Carriage return for host messages (ASCII 13)
  - CR LF – Carriage return for device messages (ASCII 13) and line-feed (ASCII 10)
- **Command chain separator character** – Multiple commands can be chained in the same string. Each command is delimited by a pipe character (|). When chaining commands, enter the message starting character and the message closing character only at the beginning and end of the string.



Spaces between parameters or command terms are ignored. Commands in the string do not execute until the closing character is entered. A separate response is sent for every command in the chain.



# Kramer Protocol 3000 Syntax

The Kramer Protocol 3000 syntax uses the following delimiters:

- **CR** = Carriage return (ASCII 13 = 0x0D)
- **LF** = Line feed (ASCII 10 = 0x0A)
- **SP** = Space (ASCII 32 = 0x20)

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

The Protocol 3000 syntax is in the following format:

- Host Message Format:

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

- Simple Command – Command string with only one command without addressing:

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

- Command String – Formal syntax with command concatenation and addressing:

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

- Device Message Format:

Start	Address (optional)	Body	Delimiter
~	<i>Device_id@</i>	<b>Message</b>	<b>CR LF</b>

- Device Long Response – Echoing command:

Start	Address (optional)	Body	Delimiter
~	<i>Device_id@</i>	<b>Command</b> <b>SP</b> [ <i>Param1,Param2 ...</i> ] <b>result</b>	<b>CR LF</b>

## Protocol 3000 Commands

This section includes the following commands:

- [System Commands](#) on page [16](#).
- [EDID Handling Commands](#) on page [22](#).

### System Commands

Command	Description
#	Protocol handshaking (system mandatory)
BUILD-DATE	Get device build date (system mandatory)
FACTORY	Reset to factory default configuration
HELP	Get command list (system mandatory)
MODEL	Get device model (system mandatory)
PROT-VER	Get device protocol version (system mandatory)
RESET	Reset device (system mandatory)
SN	Get device serial number (system mandatory)
AV-SW-TIMEOUT	Set/get auto switching timeout
DISPLAY	Get output HPD status
NAME	Set/get machine (DNS) name (system – Ethernet)
SIGNAL	Get input signal lock status (system)
HDCP-STAT	Get HDCP signal status

#

Functions		Permission	Transparency
Set:	#	End User	Public
Get:	-	-	-
Description		Syntax	
Set:	Protocol handshaking	# <input type="checkbox"/> CR	
Get:	-	-	
Response			
~nn@SP <input type="checkbox"/> OK <input type="checkbox"/> CR LF			
Notes			
Validates the Protocol 3000 connection and gets the machine number Step-in master products use this command to identify the availability of a device			
K-Config Example			
`#", 0x0D			

**BUILD-DATE**

Functions		Permission	Transparency
Set:	-	-	-
Get:	<b>BUILD-DATE?</b>	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get device build date	# <b>BUILD-DATE?</b> <code>[CR]</code>	
Response			
~ <code>[nn]</code> @ <b>BUILD-DATE</b> <code>[SP]</code> <i>date</i> <code>[SP]</code> <i>time</i> <code>[CR LF]</code>			
Parameters			
<i>date</i> – Format: YYYY/MM/DD where YYYY (Year), MM = Month, DD = (Day)			
<i>time</i> – Format: hh:mm:ss where hh = hours, mm = minutes, ss = (seconds)			
K-Config Example			
"#BUILD-DATE?", 0x0D			

**FACTORY**

Functions		Permission	Transparency
Set:	<b>FACTORY</b>	End User	Public
Get:	-	-	-
Description		Syntax	
Set:	Reset device to factory default configuration	# <b>FACTORY</b> <code>[CR]</code>	
Get:	-	-	
Response			
~ <code>[nn]</code> @ <b>FACTORY</b> <code>[SP]</code> OK <code>[CR LF]</code>			
Notes			
This command deletes all user data from the device. The deletion can take some time. Your device may require powering off and powering on for the changes to take effect.			
K-Config Example			
"#FACTORY", 0x0D			

**HELP**

Functions		Permission	Transparency
Set:	-	-	-
Get:	<b>HELP</b>	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get command list or help for specific command	1. # <b>HELP</b> <code>[CR]</code> 2. # <b>HELP</b> <code>[SP]</code> <i>COMMAND_NAME</i> <code>[CR]</code>	
Response			
1. Multi-line: ~ <code>[nn]</code> @Device available protocol 3000 commands: <code>[CR LF]</code> <i>command</i> , <code>[SP]</code> <i>command</i> ... <code>[CR LF]</code>			
2. Multi-line: ~ <code>[nn]</code> @ <b>HELP</b> <code>[SP]</code> <i>command</i> : <code>[CR LF]</code> <i>description</i> <code>[CR LF]</code> USAGE: <i>usage</i> <code>[CR LF]</code>			
Parameters			
<i>COMMAND_NAME</i> – name of a specific command			
Notes			
To get help for a specific command use: <b>HELP</b> <code>[SP]</code> <i>COMMAND_NAME</i> <code>[CR LF]</code>			
K-Config Example			
"#HELP", 0x0D			

**MODEL**

Functions		Permission	Transparency
Set:	-	-	-
Get:	<b>MODEL?</b>	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get device model	# <b>MODEL?</b> <code>CR</code>	
Response			
~ <code>nn</code> @ <b>MODEL</b> <code>SP</code> <i>model_name</i> <code>CR LF</code>			
Parameters			
<i>model_name</i> – String of up to 19 printable ASCII chars			
Notes			
This command identifies equipment connected to Step-in master products and notifies of identity changes to the connected equipment. The Matrix saves this data in memory to answer REMOTE-INFO requests			
K-Config Example			
`#MODEL?`, 0x0D			

**PROT-VER**

Functions		Permission	Transparency
Set:	-	-	-
Get:	<b>PROT-VER?</b>	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get device protocol version	# <b>PROT-VER?</b> <code>CR</code>	
Response			
~ <code>nn</code> @ <b>PROT-VER</b> <code>SP</code> 3000: <i>version</i> <code>CR LF</code>			
Parameters			
<b>version</b> - XX.XX where X is a decimal digit			
K-Config Example			
`#PROT-VER?`, 0x0D			

**RESET**

Functions		Permission	Transparency
Set:	<b>RESET</b>	Administrator	Public
Get:	-	-	-
Description		Syntax	
Set:	Reset device	# <b>RESET</b> <code>CR</code>	
Get:	-	-	
Response			
~ <code>nn</code> @ <b>RESET</b> <code>SP</code> OK <code>CR LF</code>			
Notes			
To avoid locking the port due to a USB bug in Windows, disconnect USB connections immediately after running this command. If the port was locked, disconnect and reconnect the cable to reopen the port.			
K-Config Example			
`#RESET`, 0x0D			

## SN

Functions		Permission	Transparency
Set:	-	-	-
Get:	SN?	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get device serial number	#SN? CR	
Response			
~nn@SN <sup>SP</sup> serial_number <sup>CR LF</sup>			
Parameters			
serial_number – 11 decimal digits, factory assigned			
Notes			
This device has a 14 digit serial number, only the last 11 digits are displayed			
K-Config Example			
`#SN?`,0x0D			

## AV-SW-TIMEOUT

Command Name		Permission	Transparency
Set:	AV-SW-TIMEOUT	End User	Public
Get:	AV-SW-TIMEOUT?	End User	Public
Description		Syntax	
Set:	Set auto switching timeout	#AV-SW-TIMEOUT <sup>SP</sup> action,time_out <sup>CR</sup>	
Get:	Get auto switching timeout	#AV-SW-TIMEOUT? <sup>SP</sup> action <sup>CR</sup>	
Response (where 0 - Power 5V feature is off)			
~nn@AV-SW-TIMEOUT <sup>SP</sup> action,time_out <sup>CR LF</sup>			
Parameters			
<i>action</i> - Switching mode 4 – Disable 5V on video output if no input signal detected <i>time_out</i> - timeout in seconds (0, 5 - 900) (where 0 - Power 5V feature is off)			
K-Config Example			
`#av-sw-timeout 4,10`,0x0D			
`#av-sw-timeout? 4`,0x0D			

**DISPLAY**

Functions		Permission	Transparency
Set:	-	-	-
Get:	<b>DISPLAY?</b>	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get output HPD status	# <b>DISPLAY?</b> <u>SP</u> <u>out_id</u> <u>CR</u>	
Response			
~ <u>nn</u> @ <b>DISPLAY</b> <u>SP</u> <u>out_id,status</u> <u>CR LF</u>			
Parameters			
<i>out_id</i> – 1 (Output 1), 2 (Output 2) <i>status</i> – HPD status according to signal validation : 0 (Off), 1 (On), 2 (On and all parameters are stable and valid)			
Response Triggers			
A response is sent to the com port from which the Get was received, after command execution and: After every change in output HPD status from On to Off (0) After every change in output HPD status from Off to On (1) After every change in output HPD status form Off to On and all parameters (new EDID, etc.) are stable and valid (2)			
K-Config Example			
Get the output HPD status of Output 1: ``#DISPLAY? 1``,0x0D			

**NAME**

Functions		Permission	Transparency
Set:	<b>NAME</b>	Administrator	Public
Get:	<b>NAME?</b>	End User	Public
Description		Syntax	
Set:	Set machine (DNS) name	# <b>NAME</b> <u>SP</u> <u>machine_name</u> <u>CR</u>	
Get:	Get machine (DNS) name	# <b>NAME?</b> <u>CR</u>	
Response			
Set: ~ <u>nn</u> @ <b>NAME</b> <u>SP</u> <u>machine_name</u> <u>CR LF</u>			
Get: ~ <u>nn</u> @ <b>NAME?</b> <u>SP</u> <u>machine_name</u> <u>CR LF</u>			
Parameters			
<i>machine_name</i> - String of up to 14 alpha-numeric characters (can include hyphens but not at the beginning or end)			
Notes			
The machine name is not the same as the model name. The machine name is used to identify a specific machine or a network in use (with DNS feature on).			
K-Config Example			
Set the DNS name of the device to "room-442": ``#NAME room-442``,0x0D			

**SIGNAL**

Functions		Permission	Transparency
Set:	-	-	-
Get	<b>SIGNAL?</b>	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get input signal lock status	# <b>SIGNAL?</b> <input type="checkbox"/> <i>inp_id</i> <input type="checkbox"/>	
Response			
~ <input type="checkbox"/> @ <b>SIGNAL</b> <input type="checkbox"/> <i>inp_id,status</i> <input type="checkbox"/> <input type="checkbox"/>			
Parameters			
<i>inp_id</i> – input number: 1 (Input)			
<i>status</i> – signal status according to signal validation: 0 (Off), 1 (On)			
Response Triggers			
After execution, a response is sent to the com port from which the Get was received A response is sent after every change in input signal status from On to Off or from Off to On			
K-Config Example			
Get the input signal status: `#SIGNAL? 1",0x0D			

**HDCP-STAT**

Functions		Permission	Transparency
Set:	-	-	-
Get	<b>HDCP-STAT?</b>	End User	Public
Description		Syntax	
Set:	None	-	
Get:	Get HDCP signal status	# <b>HDCP-STAT?</b> <input type="checkbox"/> <i>stage,stage_id</i> <input type="checkbox"/>	
Response			
~ <input type="checkbox"/> @ <b>HDCP-STAT</b> <input type="checkbox"/> <i>stage,stage_id,status</i> <input type="checkbox"/> <input type="checkbox"/>			
Parameters			
<i>stage</i> – 0 (input), 1 (output)			
<i>stage_id</i> – for input stage: 1 (Input), for output stage 1 (Output 1), 2 (Output 2)			
<i>status</i> – signal encryption On/Off status: 0 (HDCP Off), 1 (HDCP On), 2 (Follow input), 3 (Mirror output (Mac mode))			
Response Triggers			
Response is sent to the com port from which the Set (before execution) / Get command was received Response is sent to all com ports after execution if HDCP-STAT was set by any other external control device (button press, device menu and similar) or HDCP mode changed.			
Notes			
On output – sink status On input – signal status			
K-Config Example			
Get the output HDCP-STATUS of the input: `#HDCP-STAT? 0,1",0x0D			

## EDID Handling Commands

Additional EDID data functions can be performed via a compatible EDID management application, such as Kramer EDID Designer (see [www.kramerav.com/product/EDID%20Designer](http://www.kramerav.com/product/EDID%20Designer)).

Command	Description
CPEDID	Copy EDID data from the output to the input EEPROM

### CPEDID

Functions		Permission	Transparency
Set:	CPEDID	End User	Public
Get:	-	-	-
Description		Syntax	
Set:	Copy EDID data from the output to the input EEPROM	#CPEDID[SP]src_type,src_id,dst_type,dest_bitmap[CR]	
Get:	-	-	
Response			
~nn@CPEDID[SP]src_type,src_id,dst_type,dest_bitmap[CR LF]			
Parameters			
<i>src_type</i> – EDID source type (usually output): 0 (Input), 1 (Output), 2 (Default EDID) <i>src_id</i> – for input source: 1 (Input), for output source: 0 (Default EDID source), 1 (Output 1), 2 (Output 2) <i>dst_type</i> – EDID destination type (usually input): 0 (input), 1 (output), 2 (default EDID) <i>dest_bitmap</i> – bitmap representing destination IDs. Format: XXXX...X, where X is hex digit. The binary form of every hex digit represents corresponding destinations. Setting '1' indicates that EDID data is copied to this destination. Setting '0' indicates that EDID data is not copied to this destination.			
Response Triggers			
Response is sent to the com port from which the Set was received (before execution)			
Notes			
Destination bitmap size depends on device properties (for 64 inputs it is a 64-bit word) Example: bitmap 0x0013 means inputs 1, 2 and 5 are loaded with the new EDID. In this device, if the destination type is input (0), the bitmap size is 1 bits, for example bitmap 0x1 means the input is loaded with the new EDID.			
K-Config Example			
Copy the EDID data from the Output 1 (EDID source) to the Input: `#CPEDID 1,1,0,0x1",0x0D`			
Copy the EDID data from the default EDID source to the Input: `#CPEDID 2,0,0,0x1",0x0D`			



The warranty obligations of Kramer Electronics Inc. ("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 this Coverage Lasts**

The standard limited warranty for Kramer products is seven (7) years from the date of original purchase, with the following exceptions:

1. All Kramer VIA hardware products are covered by a standard three (3) year warranty for the VIA hardware and a standard three (3) year warranty for firmware and software updates; all Kramer VIA accessories, adapters, tags, and dongles are covered by a standard one (1) year warranty.
2. Kramer fiber optic cables, adapter-size fiber optic extenders, pluggable optical modules, active cables, cable retractors, ring mounted adapters, portable power chargers, Kramer speakers, and Kramer touch panels are all covered by a standard one (1) year warranty.
3. All Kramer Cobra products, all Kramer Calibre products, all Kramer Minicom digital signage products, all HighSecLabs products, all streaming, and all wireless products are covered by a standard three (3) year warranty.
4. All Sierra Video MultiViewers are covered by a standard five (5) year warranty.
5. Sierra switchers & control panels are covered by a standard seven (7) year warranty (excluding power supplies and fans that are covered for three (3) years).
6. K-Touch software is covered by a standard one (1) year warranty for software updates.
7. All Kramer passive cables are covered by a ten (10) year warranty.

#### **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, visit our web site at [www.kramerav.com](http://www.kramerav.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 (RMA number). 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.

#### **Limitation of Liability**

THE MAXIMUM LIABILITY OF KRAMER ELECTRONICS UNDER THIS LIMITED WARRANTY SHALL NOT EXCEED THE ACTUAL PURCHASE PRICE PAID FOR THE PRODUCT. TO THE MAXIMUM EXTENT PERMITTED BY LAW, KRAMER ELECTRONICS IS NOT RESPONSIBLE FOR DIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF WARRANTY OR CONDITION, OR UNDER ANY OTHER LEGAL THEORY. Some countries, districts or states do not allow the exclusion or limitation of relief, special, incidental, consequential or indirect damages, or the limitation of liability to specified amounts, so the above limitations or exclusions may not apply to you.

#### **Exclusive Remedy**

TO THE MAXIMUM EXTENT PERMITTED BY LAW, THIS LIMITED WARRANTY AND THE REMEDIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, REMEDIES AND CONDITIONS, WHETHER ORAL OR WRITTEN, EXPRESS OR IMPLIED. TO THE MAXIMUM EXTENT PERMITTED BY LAW, KRAMER ELECTRONICS SPECIFICALLY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IF KRAMER ELECTRONICS CANNOT LAWFULLY DISCLAIM OR EXCLUDE IMPLIED WARRANTIES UNDER APPLICABLE LAW, THEN ALL IMPLIED WARRANTIES COVERING THIS PRODUCT, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, SHALL APPLY TO THIS PRODUCT AS PROVIDED UNDER APPLICABLE LAW. IF ANY PRODUCT TO WHICH THIS LIMITED WARRANTY APPLIES IS A "CONSUMER PRODUCT" UNDER THE MAGNUSON-MOSS WARRANTY ACT (15 U.S.C.A. §2301, ET SEQ.) OR OTHER APPLICABLE LAW, THE FOREGOING DISCLAIMER OF IMPLIED WARRANTIES SHALL NOT APPLY TO YOU, AND ALL IMPLIED WARRANTIES ON THIS PRODUCT, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR THE PARTICULAR PURPOSE, SHALL APPLY AS PROVIDED UNDER APPLICABLE LAW.

#### **Other Conditions**

This limited warranty gives you specific legal rights, and you may have other rights which vary from country to country or state to state.

This limited warranty is void if (i) the label bearing the serial number of this product has been removed or defaced, (ii) the product is not distributed by Kramer Electronics or (iii) this product is not purchased from an authorized Kramer Electronics reseller. If you are unsure whether a reseller is an authorized Kramer Electronics reseller, visit our web site at [www.kramerav.com](http://www.kramerav.com) or contact a Kramer Electronics office from the list at the end of this document.

Your rights under this limited warranty are not diminished if you do not complete and return the product registration form or complete and submit the online product registration form. Kramer Electronics thanks you for purchasing a Kramer Electronics product. We hope it will give you years of satisfaction.



## SAFETY WARNING

Disconnect the unit from the power supply before opening and servicing

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.

The terms HDMI, HDMI High-Definition Multimedia Interface, and the HDMI Logo are trademarks or registered trademarks of HDMI Licensing Administrator, Inc. All brand names, product names, and trademarks are the property of their respective owners.