KRAMER

VM-3UHD Quick Start Guide

This guide helps you install and use your **VM-3UHD** for the first time. For more detailed information, go to **http://www.kramerav.com/manual/VM-3UHD** to download the latest manual or scan the QR code on the left.

Step 1: Check what's in the box

☑ **VM-3UHD** 1:3 HDMI DA
☑ 1 Power supply (5V DC)
☑ 4 Rubber feet
☑ 1 Quick start guide

Step 2: Install the VM-3UHD

Attach the rubber feet and place on a table or mount the **VM-3UHD** in a rack (using an optional **RK-3T** rack mount).

Step 3: Connect inputs and outputs

Always switch OFF the power on each device before connecting it to your **VM-3UHD**.
For best results, we recommend that you always use Kramer high-performance cables to connect AV equipment to the **VM-3UHD**.

HDMI In	HDMI Out 1	HDMI Out 2	HDMI Out 3	5V DC
BluRay Disk Player	Display 1 with Speakers	Display 2	Display 3	
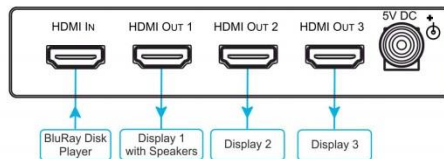
Step 4: Connect the power

Connect the 5V DC power adapter to the **VM-3UHD** and plug the adapter into the mains electricity.

Step 5: Acquire the EDID

Press the EDID Setup button once to display the present EDID. Each additional press cycles through the EDID source options:

LEDs lit:	Chooses:
OUT 1	Output 1 EDID
OUT 2	Output 2 EDID
All LEDS flash	Default EDID

Stop pressing the EDID Setup button when the desired EDID source is lit.

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

Congratulations on purchasing your Kramer **VM-3UHD** *1:3 HDMI DA*, which is ideal for the following typical applications:

- Boardrooms and meeting rooms
- Presentation and multimedia applications
- Home theater
- 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 www.kramerav.com/downloads/VM-3UHD 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 neighbouring electrical appliances that may adversely influence signal quality

- Position your **VM-3UHD** away from moisture, excessive sunlight and dust

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

2.2 Safety Instructions

Caution: There are no operator serviceable parts inside the unit

Warning: Use only the Kramer Electronics power supply that is provided with the unit

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

2.3 Recycling Kramer Products

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

3 Overview

The Kramer TOOLS® **VM-3UHD** is a high-quality 1:3 HDMI distributor that takes one HDMI input, equalizes and reclocks the signal and distributes it to three identical outputs. The **VM-3UHD** distributes signals having resolutions up to 4Kx2K and including WUXGA and 1080p.

In particular, the **VM-3UHD features**:

- A maximum data rate of 10.2Gbps (3.4Gbps per graphic channel)

- HDMI support for Deep Color, x.v.Color™, Lip Sync, HDMI Uncompressed Audio Channels, Dolby TrueHD, DTS-HD, CEC

- HDCP compliance

- Kramer Equalization & re-Klocking™ Technology that rebuilds the digital signal integrity to travel longer distances

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

- A default EDID for fast and efficient connection of the unit
  The default EDID feature lets you connect the **VM-3UHD** without having to connect a display to the output

- 3D pass-through

- A USB port for firmware upgrading

- Software support for Protocol 3000, EDID Designer and K-Upload

- A compact TOOLS® enclosure with a 5V DC power source

3.1 Defining the VM-3UHD 1:3 HDMI DA

This section defines the **VM-3UHD**.
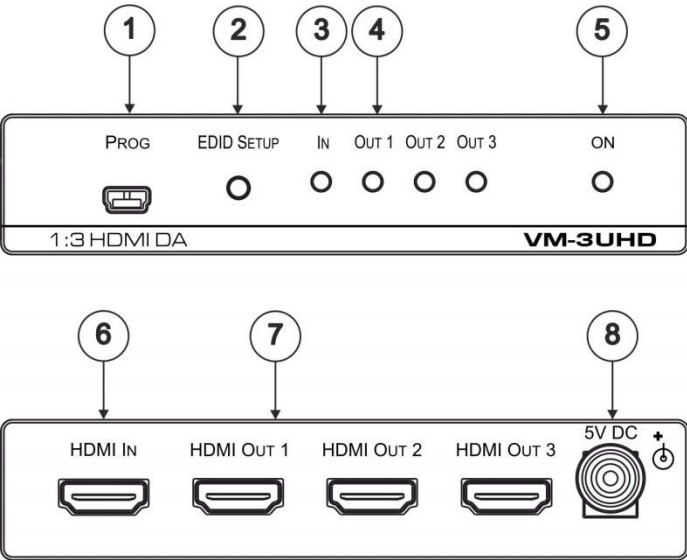
Figure 1: VM-3UHD 1:3 HDMI DA

#	Feature	Function
1	*PROGRAM* 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: www.kramerav.com/downloads/)
2	*EDID SETUP* Button	Press to capture the input EDID or select the default EDID (see Section 4.1)
3	*IN* LED	Lights when an active input signal is detected
4	*OUT 1-3* LEDS	Lights when an active output acceptor is detected
5	*ON* LED	Lights when the device is powered on
6	*HDMI IN* Connector	Connects to the HDMI source
7	*HDMI OUT 1-3* Connectors	Connect to up to 3 HDMI acceptors
8	*5V DC* Connector	Connects to the 5V DC power supply

4 Connecting the VM-3UHD

Always switch off the power to each device before connecting it to your **VM-3UHD**. After connecting your **VM-3UHD**, connect its power and then switch on the power to each device.

You do not have to connect all the inputs and outputs, connect only those that are required.

Connect the **VM-3UHD** as illustrated in the example in Figure 2:

1. Connect an HDMI input source (for example, a DVD player) to the HDMI IN connector.

2. Connect the three OUTPUT connectors to up to three HDMI acceptors, as follows:
   Not all outputs need to be connected.

   - HDMI OUT 1 connector to HDMI acceptor 1 (for example, an LCD TV)

   - HDMI OUT 2 connector to HDMI acceptor 2 (for example, plasma display 1)

   - HDMI OUT 3 connector to HDMI acceptor 3 (for example, plasma display 2)

3. Connect the 5V DC power adapter to the power socket unit and then connect the adapter to the mains electricity (not shown in Figure 2).
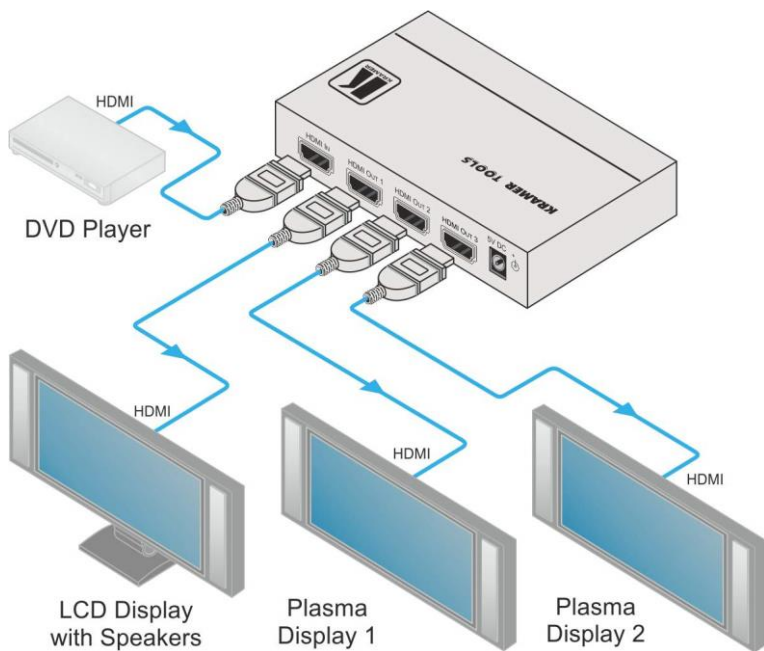   The ON LED lights.

Figure 2: Connecting the VM-3UHD 1:3 HDMI DA

4.1   Acquiring an EDID

To acquire an EDID, press the EDID SETUP button as follows:

1. The first press of the EDID SETUP button displays the present EDID status similar to that shown in the next step.

2. The second press of EDID SETUP enters the read mode and each additional press cycles through the source options:
   OUT 1 -> OUT 2 -> OUT 3 -> all LEDs flash for a default EDID.

3. When the desired EDID source is reached, release the EDID SETUP button.
   The **VM-3UHD** reads the EDID for a few seconds. When finished, all LEDS return to display the present output connection status.
   If an unconnected output is chosen or the EDID cannot be read, the **VM-3UHD** loads the default EDID.

The **VM-3UHD** toggles between "Normal" and "Force RGB" modes.

In "Force RGB" mode, the read EDID is rewritten to identify only RGB support.

- To toggle, press the EDID button for three seconds.

- After setting Force RGB mode you must re-acquire the EDID to update the Force RGB change.

Powering on the device identifies the mode as follows:

- In "Normal mode" (meaning no forcing RGB), the LEDs flash once

- In "Force RGB mode", the LEDS flash four times.

Note: Force RGB modifies the EDID saved on the input to not support YUV format.
In case of a pink display, use the Force RGB mode.

5 Default EDID

Model name............... VM-3UHD
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.......... 11/11/2014
   Software revision........ 2.60.0.972
   Data source.............. Real-time 0x0032
   Operating system......... 6.1.7601.2.Service Pack 1

VM-3UHD - Default EDID

6   Technical Specifications

INPUT:	1 HDMI connector
OUTPUTS:	3 HDMI connectors
PORT:	1 USB for firmware upgrade
MAX. DATA RATE:	10.2Gbps (3.4Gbps per graphic channel)
COMPLIANCE WITH HDMI STANDARD:	Supports HDMI and HDCP
CONTROLS:	EDID Setup button
INDICATOR LEDs:	IN, OUT 1 to 3 LEDs
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
POWER CONSUMPTION:	5V DC, 1.1A
DIMENSIONS:	12cm x 7.15cm x 2.4cm (4.73" x 2.82" x 0.95") W, D, H
WEIGHT:	0.17kg (0.37lb)
SHIPPING DIMENSIONS:	23.2cm x 12cm x 8.9cm (9.41" x 4.73" x 3.51") W, D, H
SHIPPING WEIGHT:	0.67kg (0.67lb)
INCLUDED ACCESSORIES:	Power supply
Specifications are subject to change without notice For the most updated resolution list, go to our Web site at http://www.kramerelectronics.com	

7　Protocol 3000

The **VM-3UHD** can be operated using serial commands from a PC, remote controller, or touch screen. The unit communicates using the default Kramer Protocol 3000.

This section describes:

- Kramer Protocol 3000 syntax (see Section 7.1)

- Kramer Protocol 3000 commands (see Section 7.2)

7.1　Syntax

With Kramer Protocol 3000 you can control a device from any standard terminal software (for example, the Windows® HyperTerminal Application) or from TCP/UDP clients connected to default TCP port 5000 or UDP port 50000 (port numbers can been changed by the user). RS-232/RS-485 communications protocol uses a data rate of 115200 bps, no parity, 8 data bits, and 1 stop bit.

7.1.1　Host Message Format

Start	Address (opt)	Body	Delimiter
#	Destination_id@	Message	CR

7.1.1.1　Simple Command

Command string with only one command without addressing:

Start	Body	Delimiter
#	Command SP Parameter_1,Parameter_2,…	CR

7.1.1.2 Command String

Formal syntax with commands concatenation and addressing:

Start	Address	Body	Delimiter
#	Destination_id@	Command_1 Parameter1_1,Parameter1_2,…| Command_2 Parameter2_1,Parameter2_2,…| Command_3 Parameter3_1,Parameter3_2,…|	CR

7.1.2 Device Message Format

Start	Address (opt)	Body	Delimiter
~	Sender_id@	Message	CR LF

7.1.2.1 Device Long Response

Echoing command:

Start	Address (opt)	Body	Delimiter
~	Sender_id@	Command SP [*Param1,Param2 …*] result	CR LF

CR = Carriage return (ASCII 13 = 0x0D)

LF = Line feed (ASCII 10 = 0x0A)

SP = Space (ASCII 32 = 0x20)

7.1.3 Command Terms

Command

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

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

Parameters

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

Message string

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

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

Message starting character

'#' - For host command/query

'~' - For machine response or machine command performed by keystroke operation on the front panel or IR remote controller.

Device address (Optional when directly connected to the device)

K-Net Device ID or MACHINE NUMBER followed by '@'

(ex. #02@ CR LF)

Query sign

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

All outputs sign

'*' defines all outputs.

Message closing character

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

CR LF - For machine messages; carriage return (ASCII 13) + line-feed (ASCII 10)

Command chain separator character

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

Spaces between parameters or command terms are ignored.

7.1.4   Entering Commands

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

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

7.1.5 Bidirectional Definition

All commands are bidirectional. That is, if the device receives the code, it performs the instruction. If the instruction is performed (due to a keystroke operation on the front panel or IR controller) these codes are sent to the PC or other RS-232 / Ethernet / USB controller.

7.1.6 Command Chaining

Multiple commands can be chained in the same string. Each command is delimited by a pipe character ('|'). When chaining commands, enter the **message starting character** and the **message closing character** once only, at the beginning of the string and at the end.
Commands in the string do not execute until the closing character is entered.
A separate response is sent for every command in the chain.

7.1.7 Maximum String Length

64 characters (except for special commands that are defined in the command syntax description).

7.2 Kramer Protocol 3000 Commands

Command	Description	Type	Permission
#	Protocol handshaking	System-mandatory	End User
BUILD-DATE?	Get device build date	System-mandatory	End User
CPEDID	Copy EDID data from the output to the input EEPROM	EDID Handling	End User
DISPLAY?	Get output HPD status	Switch	End User
FACTORY	Reset to factory default configuration	System-mandatory	End User
GEDID	Set/get EDID data	EDID Handling	End User
HDCP-STAT?	Get HDCP signal status	System	End user
HELP	Get command list	System-mandatory	End User
MODEL?	Get device model	System-mandatory	End User
NAME	Set/get machine (DNS) name	System	Administrator
NAME-RST	Reset machine name to factory default (DNS)	System	Administrator
PROT-VER?	Get device protocol version	System-mandatory	End User
RESET	Reset device	System-mandatory	Administrator
SIGNAL?	Read if input is valid	System	End user
SN?	Get device serial number	System-mandatory	End User

Command - **#**		Command Type - System-mandatory	
Command Name		**Permission**	**Transparency**
Set:	**#**	End User	Public
Get:	**-**	-	-
Description		**Syntax**	
Set:	Protocol handshaking	**#**₍CR₎	
Get:	-	-	
Response			
~[nn]**@** ₍SP₎**OK**₍CR LF₎			
Parameters			
Response Triggers			
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			

Command - **BUILD-DATE**		Command Type - System-mandatory	
Command Name		**Permission**	**Transparency**
Set:	**-**	-	-
Get:	**BUILD-DATE?**	End User	Public
Description		**Syntax**	
Set:	Get device build date	**#BUILD-DATE**₍CR₎	
Get:	-	-	
Response			
~[nn]**@BUILD-DATE**₍SP₎*date*₍SP₎*time*₍CR LF₎			
Parameters			
date - Format: YYYY/MM/DD where YYYY = Year, MM = Month, DD = Day *time* - Format: hh:mm:ss where hh = hours, mm = minutes, ss = seconds			
Response Triggers			
Notes			

Command - **CPEDID**		Command Type - EDID Handling	
Command Name		**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_stg, src_id, dst_type, dest_bitmap*[CR LF]			
Parameters			
src_type - *EDID* source type (usually output) (see <u>Section 9.2 EDID Source</u>) *src_id* - number of chosen source stage (1.. max number of inputs/outputs) *dst_type* - *EDID destination* type (usually input) (see <u>Section 9.2 EDID Source</u>) *dest_bitmap* - bitmap representing destination IDs. Format: XXXX…X, where X is hex digit. The binary form of every hex digit represents corresponding destinations. Setting '1' says that EDID data has to be 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			

Command - **DISPLAY?**		Command Type - System	
Command Name		**Permission**	**Transparency**
Set:	-	-	-
Get	**DISPLAY?**	End User	Public
Description		**Syntax**	
Set:	-	-	
Get:	Get output HPD status	**#DISPLAY?** `SP` *out_io* `CR`	
Response			
~ `nn` **@DISPLAY** `SP` *out_id,status* `CR` `LF`			
Parameters			
out_id - output number *status* - HPD status according to signal validation (see Section 9.3 Signal Validation)			
Response Triggers			
After execution, response is sent to the com port from which the Get was received Response is sent after every change in output HPD status ON to OFF Response is sent after every change in output HPD status OFF to ON and ALL parameters (new EDID, etc.) are stable and valid			
Notes			

Command - **FACTORY**		Command Type - System-mandatory	
Command Name		**Permission**	**Transparency**
Set:	**FACTORY**	End User	Public
Get:	**-**	-	-
Description		**Syntax**	
Set:	Reset device to factory default configuration	**#FACTORY** `CR`	
Get:	-	-	
Response			
~ `nn` **@FACTORY** `SP` **OK** `CR` `LF`			
Parameters			
Response Triggers			
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.			

Command - **HDCP-STAT**		Command Type - System	
Command Name		**Permission**	**Transparency**
Set:	-	-	-
Get:	**HDCP-STAT?**	End User	Public
Description		**Syntax**	
Set:	None	-	
Get:	Get HDCP signal status	#**HDCP-STAT?** sp *stage,stage_io* CR	
Response			
Set / Get: ~ nn @**HDCP-STAT** SP *stage,stage_id,mode* CR LF			
Parameters			
stage – input/output (see Section 9.1 Stage) *stage_id* - number of chosen stage (1.. max number of inputs/outputs) *actual_status* - signal encryption status - valid values ON/OFF (see Section 9.4 HDCP Types)			
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			

Command - **HELP**		Command Type - System-mandatory	
Command Name		**Permission**	**Transparency**
Set:	**-**	-	-
Get:	**HELP**	End User	Public
Description		**Syntax**	
Set:	-	-	
Get:	Get command list or help for specific command	2 options: 1. #**HELP** CR 2. #**HELP** sp *command_name* CR	
Response			
1. Multi-line: ~ nn @**Device available protocol 3000 commands :** CR LF *command,* SP *command…* CR LF **To get help for command use: HELP (COMMAND_NAME)** CR LF 2. Multi-line: ~ nn @**HELP** SP *command :* CR LF *description* CR LF **USAGE :** *usage* CR LF			
Parameters			
Response Triggers			
Notes			
Command - **MACH-NUM**		Command Type - System	

Command - **MODEL?**		Command Type - System-mandatory	
Command Name		**Permission**	**Transparency**
Set:	**-**	-	-
Get:	**MODEL?**	End User	Public
Description		**Syntax**	
Set:	-	-	
Get:	Get device model	**#MODEL?** `CR`	
Response			
~`nn`@**MODEL**`SP` *model_name*`CR LF`			
Parameters			
model_name - String of up to 19 printable ASCII chars			
Response Triggers			
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			

Command - **NAME**		Command Type - System (Ethernet)	
Command Name		**Permission**	**Transparency**
Set:	**NAME**	Administrator	Public
Get:	**NAME?**	End User	Public
Description		**Syntax**	
Set:	Set machine (DNS) name	**#NAME**`SP` *machine_name*`CR`	
Get:	Get machine (DNS) name	**#NAME?**`CR`	
Response			
Set: ~`nn`@**NAME**`SP` *machine_name*`CR LF`			
Get: ~`nn`@**NAME?**`SP` *machine_name*`CR LF`			
Parameters			
machine_name - String of up to 14 alpha-numeric chars (can include hyphen, not at the beginning or end)			
Response Triggers			
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)			

Command - **NAME-RST**		Command Type - System (Ethernet)	
Command Name		**Permission**	**Transparency**
Set:	**NAME-RST**	Administrator	Public
Get:	**-**	-	-
Description		**Syntax**	
Set:	Reset machine (DNS) name to factory default	#**NAME-RST**[CR]	
Get:	-	-	
Response			
~[nn]@**NAME-RST**[SP]**OK**[CR LF]			
Parameters			
Response Triggers			
Notes			
Factory default of machine (DNS) name is "KRAMER_" + 4 last digits of device serial number			

Command - **PROT-VER?**		Command Type - System-mandatory	
Command Name		**Permission**	**Transparency**
Set:	**-**	-	-
Get:	**PROT-VER?**	End User	Public
Description		**Syntax**	
Set:	-	-	
Get:	Get device protocol version	#**PROT-VER?**[CR]	
Response			
~[nn]@**PROT-VER**[SP]3000:*version*[CR LF]			
Parameters			
Version - XX.XX where X is a decimal digit			
Response Triggers			
Notes			

Command - **RESET**		Command Type - System-mandatory	
Command Name		**Permission**	**Transparency**
Set:	**RESET**	Administrator	Public
Get:	**-**	-	-
Description		**Syntax**	
Set:	Reset device	**#RESET**_{CR}	
Get:	-	-	
Response			
~ nn **@RESET** SP **OK** CR LF			
Parameters			
Response Triggers			
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.			

Command - **SIGNAL**		Command Type - System	
Command Name		**Permission**	**Transparency**
Set:	-	-	-
Get	**SIGNAL?**	End User	Public
Description		**Syntax**	
Set:	-	-	
Get:	Get input signal lock status	**#SIGNAL?** SP *inp_id* CR	
Response			
~ nn **@SIGNAL** SP *inp_id,status* CR LF			
Parameters			
inp_id - input number *status* - lock status according to signal validation (see Section 9.3 Signal Validation)			
Response Triggers			
After execution, a response is sent to the com port from which the Get was received Response is sent after every change in input signal status ON to OFF, or OFF to ON			
Notes			

Command - **SN?**		Command Type - System-mandatory	
Command Name		**Permission**	**Transparency**
Set:	**-**	-	-
Get:	**SN?**	End User	Public
Description		**Syntax**	
Set:	-	-	
Get:	Get device serial number	**#SN?** `CR`	
Response			
~`nn`@**SN**`SP`*serial_number*`CR LF`			
Parameters			
serial_number - 14 decimal digits, factory assigned			
Response Triggers			
Notes			

Command - **GEDID**		Command Type - EDID Handling	
Command Name		**Permission**	**Transparency**
Set:	**GEDID**	Administrator	Public
Get:	**GEDID?**	End User	Public
Description		**Syntax**	
Set:	Set EDID data from device	**#GEDID** `SP` *stage, stage_id* `CR`	
Get:	Get EDID support on certain input/output	**#GEDID?** `SP` *stage, stage_id* `CR`	
Response			
Set: Multi-line response: ~`nn`@**GEDID** `SP` *stage,stage_id,size* `CR LF` EDID_data `CR LF` ~`nn`@**GEDID** `SP` *stage,stage_id* `SP` **OK** `CR LF` Get: ~`nn`@**GEDID** `SP` *stage,stage_id,size* `CR LF`			
Parameters			
stage - input/output (see <u>Section 9.2 EDID Source</u>) *stage_id* - number of chosen stage (1.. max number of inputs/outputs) *size* - EDID data size. For Set, size of data to be sent from device, for Get, 0 means no EDID support			
Response Triggers			
Response is sent to the com port from which the Set (before execution) / Get command was received			
Notes			
For Get, size=0 means EDID is not supported For old devices that do not support this command, ~nn@ ERR 002 `CR LF` is received			

8 Packet Protocol Structure

The packet protocol is designed to transfer large amounts of data, such as files, IR commands, EDID data, etc.

8.1 Using the Packet Protocol

To use the packet protocol:

4. Send a command: LDRV, LOAD, IROUT, LDEDID

5. Receive Ready or ERR###

6. If Ready:

   ▪ Send a packet

   ▪ Receive OK on the last packet

   ▪ Receive OK for the command

7. Packet structure:

   ▪ Packet ID (1, 2, 3…) (2 bytes in length)

   ▪ Length (data length + 2 for CRC) - (2 bytes in length)

   ▪ Data (data length -2 bytes)

   ▪ CRC - 2 bytes

01	02	03	04	05…	
Packet ID		Length		Data	CRC

8. Response:

~*NNNN*SP**OK**CR LF

Where *NNNN* is the received packet ID in ASCII hex digits.

8.2   Calculating the CRC

The polynomial for the 16-bit CRC is:

CRC-CCITT: 0x1021 = $x^{16} + x^{12} + x^5 + 1$

Initial value: 0000

Final XOR Value: 0

For a code example, see:

http://sanity-free.org/133/crc_16_ccitt_in_csharp.html

CRC example:

Data = "123456789"

Result => 0x31C3

9 Parameters

9.1 Stage

Number	Value
0	Input
1	Output
2	(Reserved)
3	(Reserved)

9.2 EDID Source

Number	Value
0	Input
1	Output
2	Default EDID

9.3 Signal Validation

Number	Value
0	Signal or sink is not valid
1	Signal or sink is valid
2	Sink and EDID is valid

9.4 HDCP Types

Number	Value
0	HDCP Off
1	HDCP On
2	Follow input
3	Mirror output ("MAC mode")

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.

Limitation on 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 APPICABLE 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 APPICABLE 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, please visit our Web site at www.kramerelectronics.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.

KRAMER

⚠ **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 to find updates to this user manual.

We welcome your questions, comments, and feedback.

www.kramerAV.com
info@kramerel.com