

## USER MANUAL

### MODEL:

TP-580RA  
HDMI Line Receiver



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# 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!

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## 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/TP-580RA](http://www.kramerav.com/downloads/TP-580RA) 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 **TP-580RA** 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.

## 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

## 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

**TP-580RA** is a high-performance, long-reach HDBaseT™ receiver for 4K@60Hz (4:2:0) HDMI™, RS-232, IR and stereo audio signals over twisted pair that extracts (de-embeds) the stereo audio signal on its digital and analog audio ports. It extends video signals to up to 40m (130ft) over CAT copper cables at up to 4K@60Hz (4:2:0) 24bpp video resolution and provides even further reach for lower HD video resolutions.

- High Performance Standard Extender – Professional HDBaseT extender for providing long-reach signals over twisted-pair copper infrastructures. **TP-580RA** is a standard extender that can be connected to any market-available HDBaseT-compliant extension product. For optimum extension reach and performance, use recommended Kramer cables.
- HDMI Signal Extension – HDMI 2.0 and HDCP 1.4 compliant. Supports deep color, x.v.Color™, lip sync, HDMI uncompressed audio channels, Dolby TrueHD, DTS-HD, 2K, 4K, and 3D. EDID and CEC signals are passed through from the source to the display.
- I-EDIDPro™ Kramer Intelligent EDID Processing™ – Intelligent EDID handling, processing and pass-through algorithm that ensure Plug and Play operation for HDMI source and display systems.
- Multi-channel Audio Extension – Up to 32 channels of digital stereo uncompressed signals for supporting studio-grade surround sound.
- Audio Extraction (De-embedding) – According to auto-sensed signal attributes and per user selection, the transmitted digital audio signal or Audio Return Channel (ARC) signal, is extracted from the AV signal. In parallel to being transmitted to the HDMI AV output, this signal is transmitted to the stereo, digital audio output, and converted to an analog signal for transmission to the balanced stereo analog audio output. This enables high-quality audio playback by routing the audio to external speakers in parallel to routing to local speakers on the connected AV acceptor device (such as a TV or laptop).
- Bidirectional RS-232 Extension – Serial interface data flows in both directions, allowing data transmission and device control.
- Bidirectional Infrared Extension – IR interface data flows in both directions, allowing remote control of peripheral devices located at either end of the extended line.
- Easy Maintenance – Status LED indicators for HDMI and HDBT ports facilitate easy local maintenance and troubleshooting. Local firmware upgrade via RS-232 connection ensures lasting, field-proven deployment.
- Easy Installation – Compact DigiTOOLS™ fan-less enclosure for dropped-ceiling mounting, or side-by-side mounting of 3 units in a 1U rack space. For a recommended rack adapter, see [www.kramerav.com/product/TP-580RA](http://www.kramerav.com/product/TP-580RA).

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## About HDBaseT Technology

HDBaseT is an advanced, all-in-one connectivity technology (supported by the HDBaseT Alliance). It is particularly suitable in the ProAV – and also the home – environment as a digital networking alternative, where it enables you to replace numerous cables and connectors by a single LAN cable used to transmit, for example, uncompressed, full high definition video, audio, IR, as well as various control signals.

# Defining the TP-580RA HDMI Line Receiver

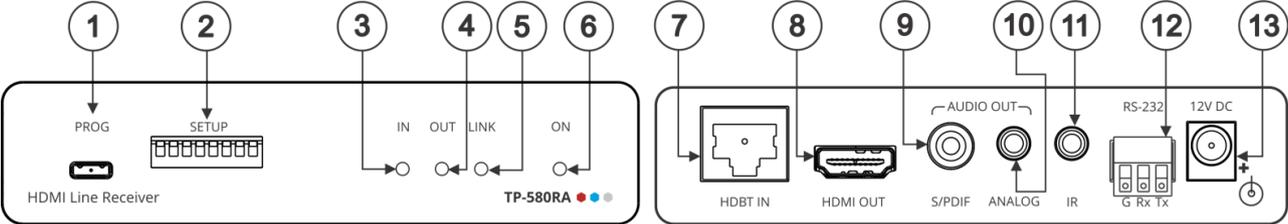


Figure 1: TP-580RA HDMI Line Receiver

#	Feature	Function
①	PROG Micro USB Port	Connect to a PC to perform firmware upgrades (via <b>K-UPLOAD</b> ) and work with the <b>EDID Designer</b> . <b>K-UPLOAD</b> and <b>EDID Designer</b> can be downloaded from our Web site at: <a href="http://www.kramerav.com/support">www.kramerav.com/support</a> .
②	SETUP DIP-switches	Used to set the device behavior (see <a href="#">Setting the DIP-Switches</a> on page 11).
③	IN LED	Lights green when an active far-end source HDMI input signal is detected via the HDBaseT link (an HDMI signal is detected from a source device connected to the HDBaseT transmitter that is connected to this input).
④	OUT LED	Lights green when an acceptor device is detected on the HDMI output.
⑤	LINK LED	Lights green when a link is established between the <b>TP-580RA</b> and the HDBaseT transmitter.
⑥	ON LED	Lights green when the device receives power.
⑦	HDBT IN RJ-45 Connector	Connect to the RJ-45 OUT connector on an HDBaseT transmitter (for example, <b>TP-580T</b> ).
⑧	HDMI™ OUT Connector	Connect to an HDMI acceptor.
⑨	AUDIO OUT S/PDIF RCA Connector	Connect to a digital stereo audio acceptor.
⑩	AUDIO OUT ANALOG 3.5mm Mini Jack	Connect to an analog unbalanced stereo audio acceptor.
⑪	IR 3.5mm Mini Jack Connector	Connect to an external infrared emitter / sensor.
⑫	RS-232 3-pin Terminal Block Connector	Connect to a controlled device (so that it can be controlled from a remote serial controller); connect to a laptop to upgrade the firmware or to a control system to serially control the <b>TP-580RA</b> .
⑬	12V DC Power Connector	12V DC connector for powering the unit.



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

# Connecting the TP-580RA HDMI Line Receiver

**!** Always switch off the power to each device before connecting it to your **TP-580RA**. After connecting your **TP-580RA**, connect the power to each of them and then switch on the power to each device.

You can use the **TP-580RA HDMI Line Receiver** and a compatible transmitter, (for example, the **TP-580T HDMI Line Transmitter**) to configure an HDMI transmitter/receiver system, as shown in the example in [Figure 2](#).

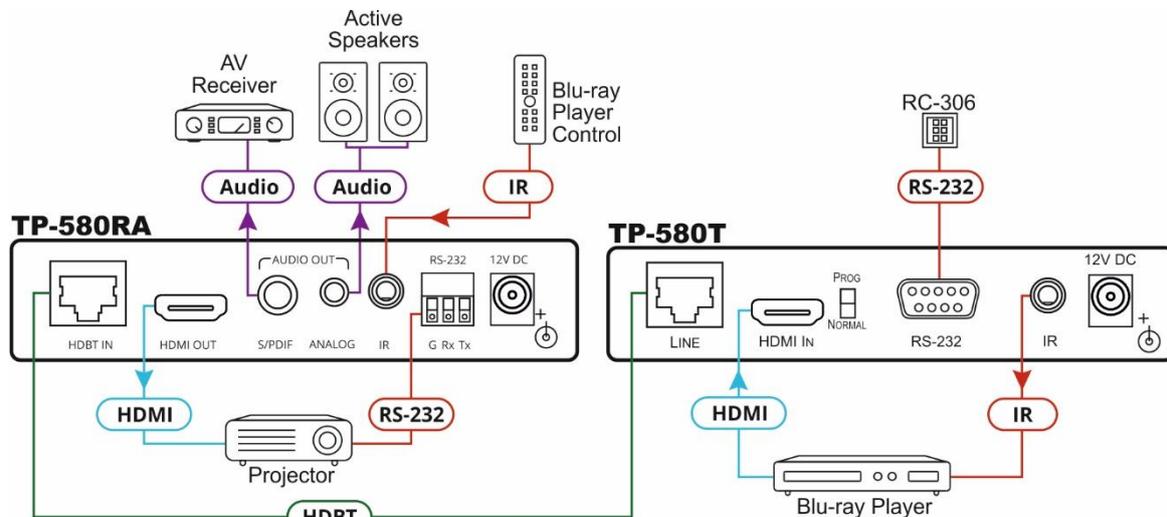


Figure 2: Connecting the TP-580RA HDMI Line Receiver

## To connect the TP-580RA HDMI Line Receiver:

1. Connect the HDMI OUT connector (8) to the HDMI acceptor, (for example, a projector).
2. Connect the RS-232 3-pin terminal block (12) to the device to be controlled, (for example, the projector that is controlled by the **RC-306**).
3. Connect the IR 3.5mm mini jack (11) to an IR sensor.
4. Connect the AUDIO OUT (10) 3.5mm mini jack and/or AUDIO OUT S/PDIF (9) connector to the audio acceptors (for example, amplified speakers).
5. Connect an HDBT cable from the **TP-580RA HDMI Line Receiver** to the transmitter.
6. Connect the supplied power adapter to the 12V DC Power Connector (13) and plug the adapter into the mains electricity (not shown in [Figure 2](#)).

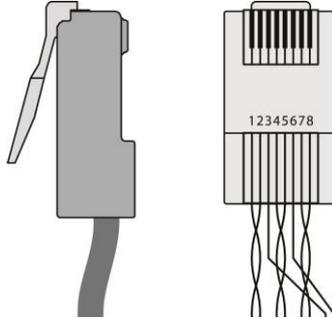
## Wiring the RJ 45 Connectors

This section defines the TP pinout, using a straight pin-to-pin cable with RJ 45 connectors.



Note, that the cable Ground shielding must be connected / soldered to the connector shield.

EIA /TIA 568B	
PIN	Wire Color
1	Orange / White
2	Orange
3	Green / White
4	Blue
5	Blue / White
6	Green
7	Brown / White
8	Brown



## Connecting to TP-580RA via RS-232

The TP-580RA features an RS-232 3-pin terminal block connector, configured via DIP-switch 6 to support:

- RS-232 Extension: To pass data to and from the machines that are connected to the receiver.
- RS-232 Control: To control the TP-580RA.

Connect the RS-232 terminal block on the rear panel of the TP-580RA to a PC/controller, as follows (see [Figure 3](#)):

- TX pin to Pin 2
- RX pin to Pin 3
- GND pin to Pin 5

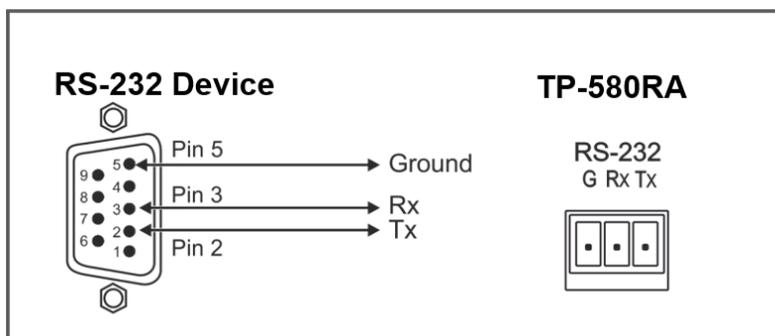


Figure 3: RS-232 Connection

# Operating the TP-580RA HDMI Line Receiver

## Controlling A/V Equipment via an IR Remote Control

You can use an IR remote-control transmitter (that is used for controlling a peripheral device, for example, a Blu-ray disk player) to send commands from the receiver system. To use an IR remote control transmitter, connect the Kramer IR sensor cable at one end, and the Kramer IR emitter cable at the other end.

The example in [Figure 4](#) illustrates how to control a Blu-ray disk player using an IR remote control via the TP-580RA that is connected to the TP-580T. The IR sensor is connected to the TP-580RA and an IR emitter is connected between the TP-580T and the Blu-ray disk player. The Blu-ray disk player IR remote control sends an IR command signal while pointed at the external IR sensor. The IR signal is passed over the HDBT link and the IR emitter to the Blu-ray disk player which responds to the IR command signal sent.

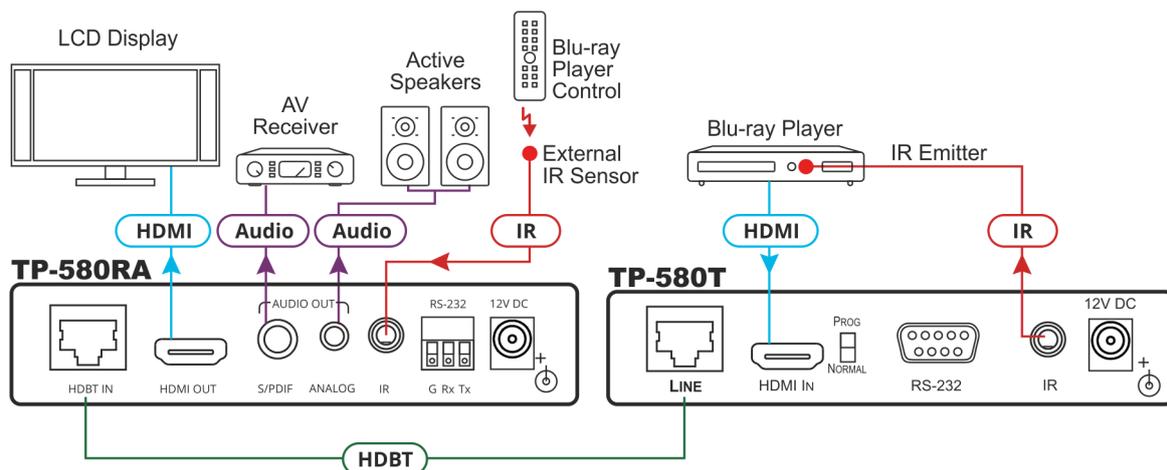


Figure 4: Controlling a Blu-ray Player with IR Remote Control via the TP-580RA

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## Acquiring EDID

The EDID DIP-switch 1 determines the behavior of EDID on the device. For more information about DIP-switch settings, see [Setting the DIP-Switches](#) on page [11](#).

## Pass-Through Mode

In the pass-through mode (DIP-switch 1 set to off), the EDID of the HDMI connected acceptor (a display in the [Figure 6](#) examples) is automatically loaded to the **TP-580RA**.

The OUT LED  flashes three times upon successful load of the designed EDID and then resumes normal operation.



If the display is replaced, the **TP-580RA** captures the new EDID from the new display. Any change in the output automatically changes the EDID that is stored in the **TP-580RA**.

When disconnecting the HDMI acceptor, the last EDID remains stored in the **TP-580RA**.

## EDID Lock Mode

When in the Lock mode (DIP-switch 1 set to on), the current EDID is locked and remains unchanged even if the display is replaced on the output.

When in the lock mode the audio pass-through operation is determined by the DIP-switch 3 audio setup.

You can connect a PC loaded with **EDID Designer** SW tool, to the micro USB port  to modify the EDID via the Kramer **EDID Designer** software.



Note that when using **EDID Designer** to modify the EDID (in the Lock mode), the DIP-switch 3 status is ignored.

## Setting the Default EDID

You can set the **TP-580RA** to its **EDID default value**.

### To set the default EDID:

1. Make sure the **TP-580RA** is set to the Pass-through mode.
2. Disconnect the output.
3. Set DIP-switch 1 to the Lock mode (on).

The default EDID is loaded and locked.

## Extracting the Audio

You can extract the audio of the active traversing signal to the digital (S/PDIF) and analog audio ports in one of two ways:

- Inputting the audio signal from HDBT IN.
- Inputting ARC (Audio Return Channel) signal from HDMI OUT.

To route an input HDMI audio received through HDBT IN from the transmitter:

- Set DIP-Switch 2 to Off (up).

HDBT input audio is extracted to both digital and analog audio ports (see [Figure 5](#)).

In parallel, the active signal keeps traversing transparently between the source and the display.

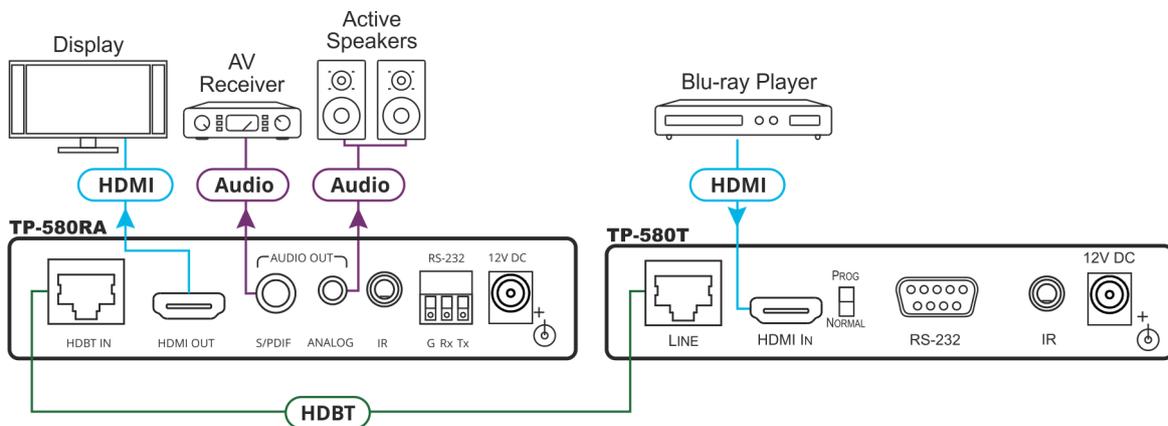


Figure 5: Input audio signal from HDBT IN

To route an input audio-return signal received through HDMI OUT from the connected display:

- Set DIP-Switch 2 to On (down).

HDMI-OUT input audio-return is extracted to both digital and analog audio ports, (see [Figure 6](#)).

In parallel, the active signal keeps traversing transparently between the source and the display.

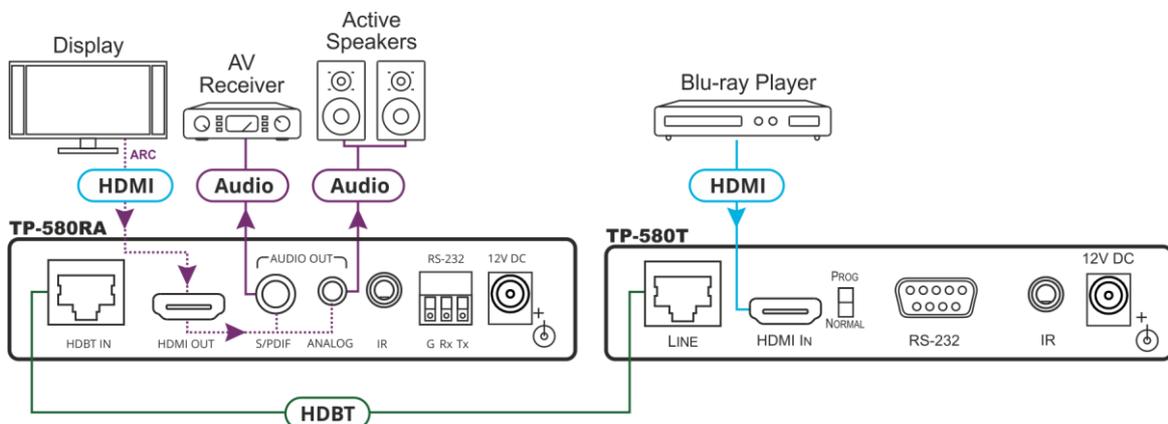


Figure 6: ARC (Audio Return Channel) and HDBT IN Configuration

# Configuring the TP-580RA HDMI Line Receiver

This section describes the following operations:

- [Setting the DIP-Switches](#) on page [11](#).
- [Video Auto Shut-off Delay](#) on page [12](#).
- [Acquiring EDID](#) on page [9](#).
- [Extracting the Audio](#) on page [10](#).

## Setting the DIP-Switches

A DIP-switch that is down is On, up is Off (by default, DIP-switch 6 is set to ON and all the other DIP-switches are set to OFF). Changes to DIP-switches 7 and 8 only take effect after power-cycling the device. Changes to DIP-switches 1 and 3 only take effect after unplugging and then replugging the input cable.

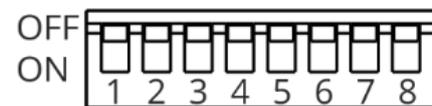


Figure 7: DIP-Switches

#	Function	Status
1	EDID lock	Off (up) – EDID parameters are passed-through. On (down) – EDID Locked. When EDID is locked, the audio parameters are set as defined by DIP-switch 3. In the pass-through mode, DIP-switch 3 setup is ignored.
2	Extracted audio	Off (up) – HDBT IN source audio is selected for extraction. On (down) – HDMI OUT ARC sink audio is selected for extraction.
3	Audio pass-through	Off (up) – Passes the audio parameters. On (down) – Limits the audio to 2-channel LPCM. This setup is enabled after unlocking and relocking the EDID by setting DIP-switch 1 to On (EDID locked).
4	HDCP operation	Off (up) – Passes HDCP. In this state, if the sink supports HDCP, the input declares HDCP support. It will then handle HDCP on the output and input actively. If the sink does not support HDCP then the input will declare HDCP is not supported. On (down) – HDCP off. In this state, the device does not support HDCP on its input, even if HDCP is detected on the output.
5	Color space	Off (up) – Color space parameters are passed-through. On (down) – Forces RGB color space.
6	RS-232 mode	Off (up) – RS-232 control of device; RS-232 extension mode is disabled. On (down) – RS-232 extension mode.
7	HDBT FW upgrade	Off (up) – Normal operation mode. On (down) – HDBT FW upgrade mode, device normal operation is disabled. This setup is enabled only after DIP-switch 6 is set to On (RS-232 extension mode).
8	CPU FW upgrade	Off (up) – Normal operation mode. On (down) – CPU FW upgrade mode, device normal operation is disabled; DIP-switch 6 is set to Off.

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## Video Auto Shut-off Delay

The **TP-580RA** can be configured so that the 5V power on the HDMI output can automatically be shut off after a specified delay when the **TP-580RA** is no longer receiving a video signal.

By default, once no video signal is detected for 5 minutes, the HDMI power is shut off. The user can set the delay by configuring the [AV-SW-TIMEOUT](#) P3K command timeout from 1 second to 15 minutes (900 seconds), where 0 – never shut off. See [Default Parameters](#) on page [16](#) for more details.



Once an active signal is again detected, the **TP-580RA** output 5V power is auto turned on.

# Upgrading the Firmware

Use the Kramer **K-UPLOAD** software to upgrade the firmware via the **TP-580RA** PROG micro USB port ①, or via the RS-232 (when DIP-switch 6 set to Off (up position) allowing RS-232 to control/program the device).

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 micro 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).

# Technical Specifications

Input	HDBT	On an RJ-45 female connector
Outputs	HDMI	On a female HDMI connector
	Unbalanced Stereo Audio	On a 3.5mm mini jack
	S/PDIF	On an RCA connector
	IR	On a 3.5mm mini jack for IR link extension
	RS-232	On a 3-pin terminal block connector for serial link extension and device firmware upgrade
	USB	On a Micro-USB connector for device firmware upgrade
Extension line	Up to 40m (130ft)	At 4K@60Hz (4:2:0)
	Up to 70m (230ft)	At full HD (1080p@60Hz 36bpp)
	Compliance	HDBaseT 1.0
Video	Max. Data Rate	10.2Gbps (3.4Gbps per graphic channel)
	Max. Resolution	4K@60Hz (4:2:0) 24bpp
	Standards Compliance	HDMI 2.0 and HDCP 1.4
Analog Audio	Level	Up to 1 Vrms
	THD + NOISE	0.03% @ 1 kHz at nominal level
Extended RS-232	Baud Rate	300 to 115200
Control RS-232	Baud Rate	115200
Enclosure	Size	DigiTools
	Type	Aluminum
	Cooling	Convection ventilation
Power	Source	12V DC, 2A
	Consumption	570mA
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
Accessories	Included	Power supply unit
General	Product Dimensions	12cm x 7.2cm x 2.4cm (4.7" x 2.8" x 1") W, D, H
	Product Weight	0.3kg (0.6lbs) approx.
	Shipping Dimensions	15.7cm x 12cm x 8.7cm (6.2" x 4.7" x 3.4") W, D, H
	Shipping Weight	0.7kg (1.5lbs) approx.

Specifications are subject to change without notice at [www.kramerav.com](http://www.kramerav.com)

## Default Communication Parameters

RS-232	
Baud Rate:	115,200
Data Bits:	8
Stop Bits:	1
Parity:	None
Command Format:	ASCII
Example (get device model name):	#model?<cr>
Full Factory Reset	
P3k command:	#factory<cr>
Embedded Web pages:	Select Device Settings page and click Factory reset

## Default EDID

The default EDID is set to 720p @ 60 Hz with 2-channel audio.



For some models of NEC displays/projectors there may be no audio heard, while using the default EDID. To solve the issue:

- Change the revision number in the NEC EDID block from 1 to 3.
- Add the specific vendor in NEC EDID Block 1

Detailed default EDID information is:

```

Monitor
Model name..... TP-580RA
Manufacturer..... KMR
Plug and Play ID..... KMR1200
Serial number..... n/a
Manufacture date..... 2015, 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..... Supported
MCCS revision..... 2.1
Display technology..... TFT
Controller..... STMicro 0x9301
Firmware revision..... 2.1
Firmware flags..... 0x006645CC
Active power on time.... Not supported
Power consumption..... Not supported
Current frequency..... 74.00kHz, 60.00Hz

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
720 x 400p at 88Hz - IBM XGA2
640 x 480p at 60Hz - IBM VGA
640 x 480p at 67Hz - Apple Mac II
640 x 480p at 72Hz - VESA
640 x 480p at 75Hz - VESA

```



# Protocol 3000

The **HDMI Line Receiver** can be operated using serial commands from a PC, remote controller or touch screen using the Kramer Protocol 3000.

This section describes:

- Kramer Protocol 3000 syntax (see [Kramer Protocol 3000 Syntax](#) on page 17).
- Kramer Protocol 3000 commands (see [Kramer Protocol 3000 Commands](#) on page 20).

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## Kramer Protocol 3000 Syntax

### 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 commands 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>

**CR** = Carriage return (ASCII 13 = 0x0D)

**LF** = Line feed (ASCII 10 = 0x0A)

**SP** = Space (ASCII 32 = 0x20)

## 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 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**.

**Note:** 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 (Optional, for K-NET)

K-NET Device ID followed by '@'

### Query sign

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

### Message closing character

**CR** – For host messages; carriage return (ASCII 13)

**CRLF** – For device 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.

## Entering Commands

You can directly enter all commands using a terminal with ASCII communications software, such as HyperTerminal, Hercules, etc. Connect the terminal to the serial or Ethernet port on the Kramer device. To enter **CR** press the Enter key.

( **LF** is also sent but is ignored by command parser).

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

## Command Forms

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

## Chaining Commands

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 once, 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.

## Maximum String Length

64 characters

# Kramer Protocol 3000 Commands

## System Commands - Mandatory

All devices running Protocol 3000 use these commands.

Command	Description	Type	Permission
#	Protocol handshaking	System-mandatory	End User
BUILD-DATE?	Get device build date	System-mandatory	End User
FACTORY	Reset to factory default configuration	System-mandatory	End User
HELP	Get command list	System-mandatory	End User
MODEL?	Get device model	System-mandatory	End User
PROT-VER?	Get device protocol version	System-mandatory	End User
RESET	Reset device	System-mandatory	Administrator
SN?	Get device serial number	System-mandatory	End User
VERSION?	Get device firmware version	System-mandatory	End User

#

Functions		Permission	Transparency
Set:	#	End User	Public
Get:	-	-	-
Description		Syntax	
Set:	Protocol handshaking	# <span style="border: 1px solid black;">CR</span>	
Get:	-	-	
Response			
~nn@SP <span style="border: 1px solid black;">OK</span> <span style="border: 1px solid black;">CR</span> 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			
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> <input type="checkbox"/>	
Response			
~ <input type="checkbox"/> @ <b>BUILD-DATE</b> <input type="checkbox"/> <i>date</i> <input type="checkbox"/> <i>time</i> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
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			
Response Triggers			
Notes			
K-Config Example			
"# <b>BUILD-DATE?</b> ", 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> <input type="checkbox"/>	
Get:	-	-	
Response			
~ <input type="checkbox"/> @ <b>FACTORY</b> <input type="checkbox"/> <i>OK</i> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
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.			
K-Config Example			
"# <b>FACTORY</b> ", 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	2 options: 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@Device available protocol 3000 commands: CR LF command, SP command... CR LF</code> To get help for command use: <code>HELP (COMMAND_NAME) CR LF</code>			
2. Multi-line: <code>~nn@HELP SP command: CR LF description CR LF USAGE: usage CR LF</code>			
Parameters			
Response Triggers			
Notes			
K-Config Example			
<code>"#HELP", 0x0D</code>			

**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@MODEL SP model_name CR LF</code>			
Parameters			
<i>model_name</i> – 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			
K-Config Example			
<code>"#MODEL?", 0x0D</code>			

**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> <input type="checkbox"/> CR	
Response			
~ <input type="checkbox"/> <input type="checkbox"/> @ <b>PROT-VER?</b> <input type="checkbox"/> SP3000:version <input type="checkbox"/> CR LF			
Parameters			
version – XX.XX where X is a decimal digit			
Response Triggers			
Notes			
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> <input type="checkbox"/> CR	
Get:	-	-	
Response			
~ <input type="checkbox"/> <input type="checkbox"/> @ <b>RESET</b> <input type="checkbox"/> SPOK <input type="checkbox"/> 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.			
K-Config Example			
"#RESET", 0x0D			

**SN?**

Functions		Permission	Transparency
Set:	-	-	-
Get:	<b>SN?</b>	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get device serial number	#SN? <b>CR</b>	
Response			
~nn@SN <b>SP</b> serial_number <b>CR LF</b>			
Parameters			
serial_number – 14 decimal digits, factory assigned			
Response Triggers			
Notes			
K-Config Example			
"#SN?", 0x0D			

**VERSION?**

Functions		Permission	Transparency
Set:	-	-	-
Get:	<b>VERSION?</b>	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get firmware version number	#VERSION? <b>CR</b>	
Response			
~nn@VERSION <b>SP</b> firmware_version <b>CR LF</b>			
Parameters			
firmware_version – XX.XX.XXXX where the digit groups are: major.minor.build version			
Response Triggers			
Notes			
K-Config Example			
"#VERSION?", 0x0D			

## System Commands

Command	Description	Type	Permission
AV-SW-TIMEOUT	Set/get auto switching timeout	System	End user
DISPLAY?	Get output HPD status	Switch	End User
DPSW-STATUS?	Get the DIP-switch status	System	End User
HDCP-MOD	Set/get HDCP mode	System	Administrator
HDCP-STAT?	Get HDCP signal status	System	End user
NAME	Set/get machine (DNS) name	System	Administrator
NAME-RST	Reset machine name to factory default (DNS)	System	Administrator
SIGNAL?	Get input signal status	System	End User

### AV-SW-TIMEOUT

Functions	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 <b>[SP]</b> action,time_out <b>[CR]</b>	
Get: Get auto switching timeout	#AV-SW-TIMEOUT? <b>[SP]</b> action <b>[CR]</b>	
Response	~nn@AV-SW-TIMEOUT <b>[SP]</b> action,time_out <b>[CR]</b>	
Parameters	<i>action</i> – see Video/Audio Signal Changes <i>time_out</i> – timeout in seconds	
Response Triggers		
Notes		
K-Config Example	Set the auto switching timeout to 5 seconds in the event of video signal lost: "#AV-SW-TIMEOUT 0,5",0x0D	

**DISPLAY?**

Functions		Permission	Transparency
Set:	-	-	-
Get	<b>DISPLAY?</b>	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get output HPD status	#DISPLAY? <input type="text" value="out_id"/> <input type="text" value="CR"/>	
Response			
~ <input type="text" value="nn"/> @DISPLAY <input type="text" value="out_id,status"/> <input type="text" value="CR LF"/>			
Parameters			
<i>out_id</i> – output number <i>status</i> – HPD status according to signal validation <ul style="list-style-type: none"> <li>0 Signal or sink is not valid</li> <li>1 Signal or sink is valid</li> <li>2 Sink and EDID is valid</li> </ul>			
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			
K-Config Example			
Get the output HPD status of OUT 1: "#DISPLAY? 1",0x0D			

**DPSW-STATUS?**

Functions		Permission	Transparency
Set:	-	-	-
Get:	<b>DPSW-STATUS?</b>	End User	Public
Description		Syntax	
Set:	-	-	
Get :	Get the DIP-switch state	# DPSW-STATUS? <input type="text" value="dp_sw_id"/> <input type="text" value="CR"/>	
Response			
~ <input type="text" value="nn"/> @DPSW-STATUS? <input type="text" value="dp_sw_id,status"/> <input type="text" value="CR LF"/>			
Parameters			
<i>dp_sw_id</i> – 1...num of DIP switches <i>status</i> – 0: up, 1: down			
Response Triggers			
Notes			
K-Config Example			
get the DIP-switch 2 status: "#DPSW-STATUS? 2",0x0D			

**HDCP-MOD**

Functions		Permission	Transparency
Set:	HDCP-MOD	Administrator	Public
Get:	HDCP-MOD?	End User	Public
Description		Syntax	
Set:	Set HDCP mode	#HDCP-MOD [SP]inp_id,mode[CR]	
Get:	Get HDCP mode	#HDCP-MOD?[SP]stage_id[CR]	
Response			
Set / Get: ~nn@HDCP-MOD[SP]stage_id,mode[CR LF]			
Parameters			
<p><i>inp_id</i> – input number (1.. max number of inputs)  <i>mode</i> – HDCP mode:</p> <ul style="list-style-type: none"> <li>0 HDCP Off</li> <li>1 HDCP On</li> <li>2 Follow input</li> <li>3 Mirror output (“MAC mode”)</li> </ul> <p><i>stage_id</i> – number of chosen stage (1.. max number of inputs/outputs)</p>			
Response Triggers			
<p>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-MOD was set by any other external control device (button press, device menu and similar) or HDCP mode changed</p>			
Notes			
<p>Set HDCP working mode on the device input:  HDCP supported - HDCP_ON [default]  HDCP not supported - HDCP OFF  HDCP support changes following detected sink - MIRROR OUTPUT</p>			
K-Config Example			
<p>Get the input HDCP-MODE of IN 1 (HDCP Off):  "#HDCP-MOD? 1,0",0x0D</p>			

**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			
Set / Get: ~ <input type="checkbox"/> @ <b>HDCP-STAT</b> <input type="checkbox"/> <i>stage,stage_id,status</i> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
Parameters			
<i>stage</i> – input/output (0 Input, Output)			
<i>stage_id</i> – number of chosen stage (1.. max number of inputs/outputs)			
<i>status</i> – signal encryption status - valid values ON/OFF (0 HDCP Off, 1 HDCP On)			
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 HDCP input signal status of the source device connected to the INPUT: "#HDCP-STAT? 0,1",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> <input type="checkbox"/> <i>machine_name</i> <input type="checkbox"/>	
Get:	Get machine (DNS) name	# <b>NAME?</b> <input type="checkbox"/>	
Response			
Set: ~ <input type="checkbox"/> @ <b>NAME</b> <input type="checkbox"/> <i>machine_name</i> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
Get: ~ <input type="checkbox"/> @ <b>NAME?</b> <input type="checkbox"/> <i>machine_name</i> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
Parameters			
<i>machine_name</i> – string of up to 15 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)			
K-Config Example			
Set the DNS name of the device to "room-442": "#NAME room-442",0x0D			

**NAME-RST**

Functions		Permission	Transparency
Set:	<b>NAME-RST</b>	Administrator	Public
Get:	-	-	-
Description		Syntax	
Set:	Reset machine (DNS) name to factory default	#NAME-RST <input type="checkbox"/>	
Get:	-	-	
Response			
~nn@NAME-RST <input type="checkbox"/> OK <input type="checkbox"/> CR LF			
Parameters			
Response Triggers			
Notes			
Factory default of machine (DNS) name is "KRAMER_" + 4 last digits of device serial number			
K-Config Example			
Reset the machine name (S/N last digits are 0102): "#NAME-RST KRAMER_0102", 0x0D			

**SIGNAL?**

Functions		Permission	Transparency
Set:	-	-	-
Get	<b>SIGNAL?</b>	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get input signal status	#SIGNAL? <input type="checkbox"/> inp_id <input type="checkbox"/>	
Response			
~nn@SIGNAL <input type="checkbox"/> inp_id,status <input type="checkbox"/> CR LF			
Parameters			
<i>inp_id</i> – input number <i>status</i> – see Input Signal Status			
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			
K-Config Example			
Get the input signal status: "#SIGNAL? 1", 0x0D			

## EDID Handling Commands

Command	Description	Type	Permission
CPEDID	Copy EDID data from the output to the input EEPROM	EDID Handling	End User

### 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 or #CPEDID SP src_type,src_id,dst_type,dest_bitmap,safe_mode CR	
Get: -	-	
Response		
~nn@CPEDID SP src_stg,src_id,dst_type,dest_bitmap CR LF		
~nn@CPEDID SP src_stg,src_id,src_type,dest_bitmap,safe_mode CR LF		
Parameters		
<p>src_type – EDID source type (usually output)</p> <ul style="list-style-type: none"> <li>0 Input</li> <li>1 Output</li> <li>2 Default EDID</li> <li>3 Custom EDID</li> </ul> <p>src_id – number of chosen source stage (1.. max number of inputs/outputs)</p> <p>dst_type – EDID destination type (usually input)</p> <ul style="list-style-type: none"> <li>0 Input</li> <li>1 Output</li> <li>2 Default EDID</li> <li>3 Custom EDID</li> </ul> <p>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</p> <p>safe_mode – 0 - device accepts the EDID as is without trying to adjust – 1 - device tries to adjust the EDID (default value if no parameter is sent)</p>		
Response Triggers		
Response is sent to the com port from which the Set was received (before execution)		
Notes		
<p>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 certain products Safe_mode is an optional parameter. See the HELP command for its availability</p>		
K-Config Example		
<p>Copy the EDID data from the HDBT OUT 2 (EDID source) to HDMI INPUT: "#CPEDID 1,2,0,0x1",0x0D</p> <p>Copy the EDID data from the default EDID source to HDMI INPUT: "#CPEDID 2,0,0,0x5",0x0D</p>		

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.

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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.
2. All Kramer fiber optic cables, adapter-size fiber optic extenders, active cables, cable retractors, all Kramer speakers and Kramer touch panels are 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**

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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.



P/N: 2900-300863



Rev: 1



## 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.