

KRAMER



USER MANUAL

MODEL:

DIP-20 Automatic Video Switcher



DIP-20 Automatic Video Switcher Quick Start Guide

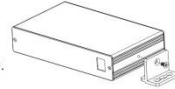
This guide helps you install and use your product for the first time. For more detailed information, go to www.kramerav.com/manual/DIP-20 to download the latest manual or scan the QR code on the left.

Step 1: Check what's in the box

- ✓ DIP-20 Automatic Video Switcher
- ✓ 1 Quick start guide
- ✓ 1 Power adapter (48V)
- ✓ ADC-DPM/HF DisplayPort (M) to HDMI (F) adapter cable
- ✓ 4 Rubber feet
- ✓ 1 Bracket set

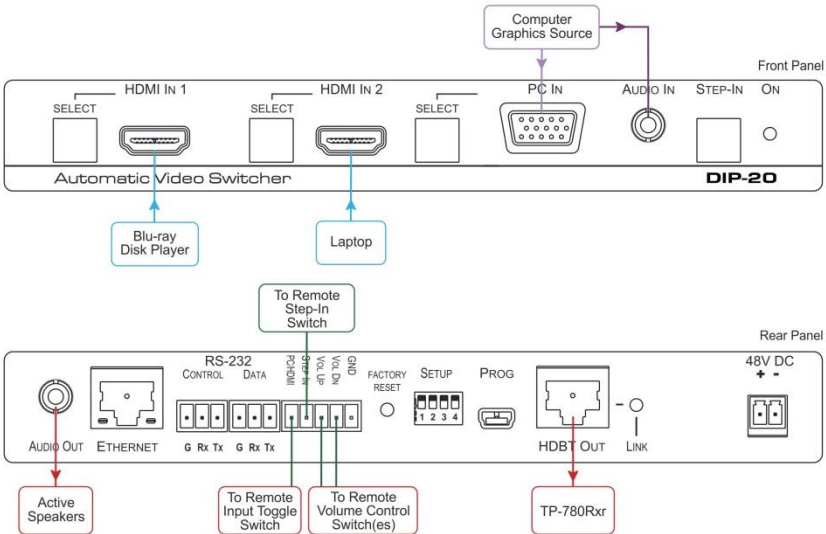
Step 2: Install the DIP-20

Mount the device in a rack (using the optional **RK-T2B** rack adapter available for purchase). Alternatively, attach the rubber feet and place the device on a table to fasten a bracket (included) on each side of the device and attach it to a flat surface. For more information, go to www.kramerav.com/downloads/DIP-20.



Step 3: Connect inputs and outputs

Always switch off the power to all devices before connecting it to your **DIP-20**. For best results, we recommend that you always use Kramer high-performance cables to connect AV equipment to the **DIP-20**.



Step 4: Set the DIP-switches

Video Switching Selection

DIP-switch 1	DIP-switch 2	Video Input Selection
Off (up)	Off (up)	Automatic—Last connected. Where more than one source is connected the last one connected has priority
Off (up)	On (down)	Automatic—Priority selection. HDMI 1 → HDMI 2 → PC IN (default, high to low priority)
On (down)	Off (up)	Manual
On (down)	On (down)	Manual

Audio Switching Selection

DIP-switch 3	DIP-switch 4	Audio Input Selection
Off (up)	Off (up)	Automatic—Priority selection. Embedded HDMI → analog Audio In (high to low priority)
Off (up)	On (down)	Automatic—Priority selection. Analog Audio In → embedded HDMI (high to low priority)
On (down)	Off (up)	Embedded HDMI
On (down)	On (down)	Analog Audio In

Step 5: Connect the power

Connect the power adapter to the **DIP-20**, and plug the adapter into the mains power. Power on all attached devices.



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.

See www.KramerAV.com for updated safety information.

Step 6: Operate the DIP-20

Default IP Parameters

Parameter	Values	Default
Device Name	Any alphanumeric string up to 14 chars (can include hyphen, but not at the beginning or end)	KRAMER_
DHCP	ON/OFF	OFF
IP Address	Any valid IP address	192.168.1.39
Mask	Any valid network mask	255.255.0.0
Gateway	Any valid gateway address	192.168.0.1
TCP Port	0 to 65535	5000
UDP Port	0 to 65535	50000

Default Web Pages Logon Authentication

Parameter	Values
Name	Admin
Password	Admin

You can operate the **DIP-20** via the front panel buttons, remote P3000 commands, or by using a Web browser to access the built in Web pages.

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1 Introduction

Welcome to Kramer Electronics! Since 1981, Kramer Electronics has been providing a world of unique, creative, and affordable solutions to the vast range of problems that confront 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 **DIP-20 Automatic Video Switcher** which are part of the Kramer Audio Distribution System and are ideal for:

- Display systems requiring simple, automatic input selection.
- Multimedia and presentation source selection.
- Video distribution in hotel rooms and schools.

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/DIP-20 to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

2.1 Achieving the Best Performance

To achieve the best performance:

- Use only good quality connection cables (we recommend Kramer high-performance, high-resolution cables) to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables).
- Do not secure the cables in tight bundles or roll the slack into tight coils.
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality.
- Position your **DIP-20 Automatic Video Switcher** away from moisture, excessive sunlight and dust.



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

2.2 Safety Instructions



- Caution:** There are no operator serviceable parts inside the unit
- Warning:** Use only the power cord that is supplied with the unit
- Warning:** Do not open the unit. High voltages can cause electrical shock! Servicing by qualified personnel only
- Warning:** Disconnect the power and unplug the unit from the wall before installing

2.3 Shielded Twisted Pair/Unshielded Twisted Pair

Kramer engineers have developed special twisted pair cables to best match our digital twisted pair products; the Kramer **BC-UNIKAT** (CAT 6 23 AWG) HDBaseT certified, and the Kramer **BC-DGKat7a23** (CAT 7a 23 AWG) cables. These specially built cables significantly outperform regular CAT 6 and CAT 7a cables.

2.4 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/.

3 Overview

The **DIP-20** is a 4K UHD, HDBaseT transmitter and Step-in commander for computer graphics video, HDMI, unbalanced stereo audio signals embedding and de-embedding. The **DIP-20** accepts HDMI and PC graphics video input, an Ethernet signal, serial data, and an unbalanced stereo audio input (that is embedded into the output signal). It transmits the signal via HDBaseT (twisted pair) cable to a compatible receiver (for example, the **TP-588D**, **TP-580RXR** or **TP-780RXR**).

The **DIP-20** is a PoE (Power over Ethernet) provider and can power compatible PoE acceptors (for example, the **TP-588D** or **TP-780RXR**). It supports resolutions of up to 4K@60 UHD (4:2:0).

The **DIP-20** provides a range of up to 130m (427ft) in normal mode for 1080p@60Hz @36bpp, and 100m (328ft) for 4K @30Hz.

When using an extended range receiver and **BC-UNIKAT** cables, the range is up to 180m (590ft) for 1080p@60Hz @24bpp. To use the **DIP-20** in extended range mode you must edit the EDID.



For optimum range and performance, use recommended Kramer cables available at www.kramerav.com/product/DIP-20. Note that the transmission range depends on the signal resolution, graphics card and display used. The distance using non-Kramer CAT 6 and CAT 7 cables may not reach these ranges.

The **DIP-20 Automatic Video Switcher** features:

- Support for 4K UHD (data rate of up to 10.2Gbps)
- Automatic live input detection based on video clock presence
- Automatic input selection based on priority selection or last connected input
- Manual input selection
- Automatic analog audio detection and embedding
- Power over Ethernet that passes electrical power along with data over Ethernet cabling. This allows a single cable to provide both data connection and electrical power to compatible devices

- Control via Kramer Protocol 3000 and embedded Web pages over a LAN
- HDTV support
- HDMI with Deep Color, x.v.Color™ and 3D
- HDCP compliancy—works with sources that support HDCP repeater mode
- I-EDIDPro™ Kramer Intelligent EDID Processing™ – Intelligent EDID handling & processing algorithm ensures Plug and Play operation for HDMI systems
- A lockable EDID
- Step-in control when connected to a device that provides step-in support
- Remote control via contact-closure switches
- Equalization and re-clocking of the data
- Support for digital audio formats

3.1 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.



The products described in this user manual are HDBaseT certified.

4 Defining the DIP-20 Automatic Video Switcher

Figure 1 defines the front panel of the DIP-20.

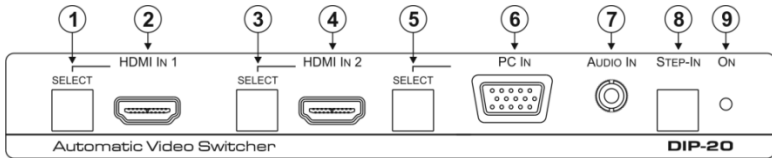


Figure 1: DIP-20 Front Panel

#	Feature	Function
1	HDMI IN 1	SELECT Button Press to select the HDMI 1 input. When HDMI 1 is selected, the button: <ul style="list-style-type: none"> Lights red when analog Audio In audio is selected Lights green when embedded audio is selected
2		HDMI 1 Connector Connect to the first HDMI source
3	HDMI IN 2	SELECT Button Press to select the HDMI 2 input. When HDMI 2 is selected, the button: <ul style="list-style-type: none"> Lights red when analog Audio In audio is selected Lights green when embedded audio is selected
4		HDMI 2 Connector Connect to the second HDMI source
5	PC IN	SELECT Button Press to select the PC graphics input. When PC graphics is selected, the button: <ul style="list-style-type: none"> Lights red when analog Audio In audio is selected Lights green when embedded audio from embedded HDMI is selected, (see Section 8.1)
6		PC Graphics 15-pin HD Connector Connect to the PC graphics source, (for example, a laptop)
7	AUDIO IN 3.5mm Mini Jack	Connect to the unbalanced, stereo audio source, (for example, the audio output of the laptop)
8	Step-In Button	Press to take control of the input that this device is connected to on a compatible switcher
9	ON LED	The LED indicates the following: <ul style="list-style-type: none"> Lights green—power is provided by a power adapter Lights red—power is provided via PoE to another device

Figure 2 defines the rear panel of the **DIP-20**.

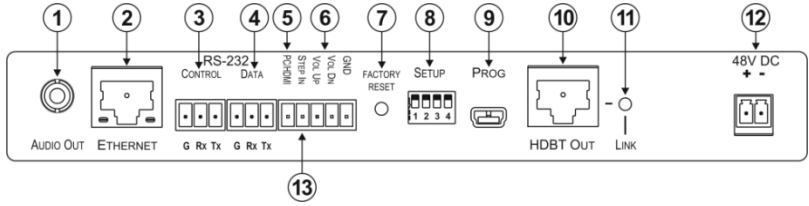


Figure 2: DIP-20 Rear Panel

#	Feature	Function	
1	AUDIO OUT 3.5mm Mini Jack	Connect to the unbalanced, stereo audio acceptor, (for example, active speakers)	
2	ETHERNET RJ-45 Connector	Connect to the LAN, (Ethernet traffic or PC controller)	
3	RS-232	CONTROL 3-pin Terminal Block	Connect to a serial controller or PC
4		DATA 3-pin Terminal Block	Connect to a serial data source or acceptor, (RS-232 data over HDBT)
5	PC/HDMI Remote Toggle Switch Terminal Block	Connect to a remote switch to toggle between the PC graphics and HDMI inputs	
6	Remote Contact-closure 4-pin Terminal Block	Connect to remote momentary switches to control input selection, step-in, and volume up and down	
7	FACTORY RESET Button	Short press to reboot, long press to reset the device to factory default parameters	
8	SETUP 4-way DIP-switch	Switches for setting the device behavior, (see Section 8.1)	
9	PROG Mini USB Connector	Connect to a PC to perform a firmware upgrade	
10	HDBT OUT RJ-45 TP Connector	Connect to a compatible HDBT TP switcher or receiver (for example, the TP-588D / TP-580Rxr / TP-780Rxr)	
11	LINK LED	Lights green when there is a valid HDBT link	
12	48V DC Connector	Connect to the supplied power adapter	
13	STEP IN Remote Toggle Switch Terminal Block	Connect to a remote switch to activate the step in function	

5 Connecting the DIP-20 Automatic Video Switcher



Always switch off the power to each device before connecting it to your **DIP-20**. After connecting your **DIP-20**, connect the power to each of them and then switch on the power to each device.

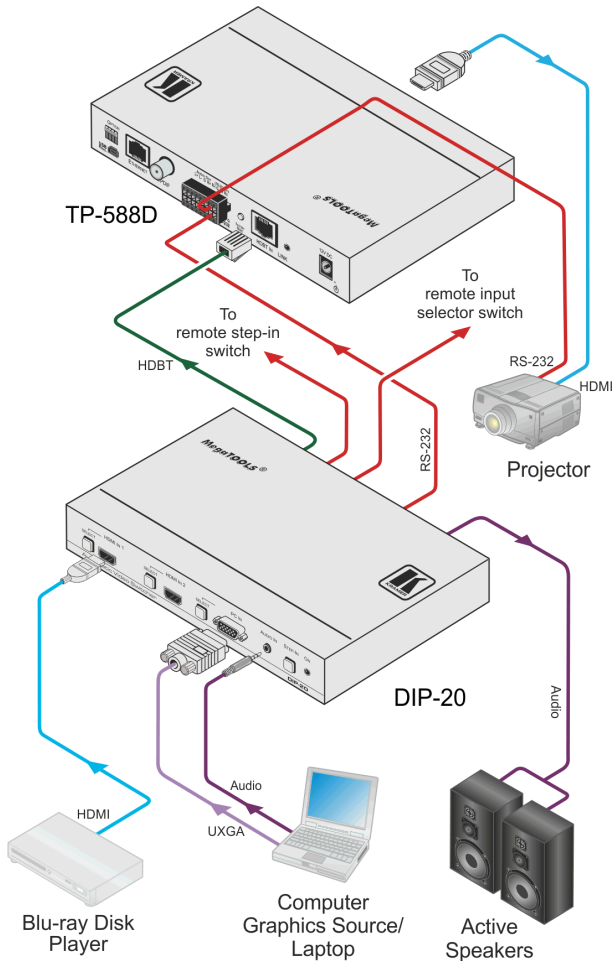


Figure 3: Connecting the DIP-20



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

To connect the DIP-20 as illustrated in [Figure 3](#):

1. Connect an HDMI source, (for example, a Blu-ray disk player) to the HDMI IN 1 input.
2. Connect a PC graphics source, (for example, a laptop) to the PC In input.
3. Connect an unbalanced stereo audio source, (for example, the audio output from the laptop) to the AUDIO IN 3.5mm mini jack.
4. Connect the HDBT OUT RJ-45 connector on the rear panel of the **DIP-20** to an HDBT-compatible receiver (for example, the **TP-588D**, **TP-580Rxr**, or **TP-780Rxr**).
5. Connect the HDMI output of the HDBT acceptor, (for example, the **TP-588D**, **TP-580Rxr**, or **TP-780Rxr**) to the HDMI acceptor, (for example, a projector).
6. Connect the AUDIO OUT 3-pin terminal block on the rear panel of the **DIP-20** to the unbalanced, stereo audio acceptor, (for example, active speakers).
7. Connect the STEP IN 2-way terminal block to a momentary, contact-closure switch, (see [Section 5.1](#)).
8. Connect the PC/HDMI 2-way terminal block to a momentary, contact-closure switch, (see [Section 5.1](#)).
9. Connect the RS-232 DATA 3-pin terminal block to the device to be controlled, (for example, the projector connected in step 5).
10. Connect the power adapter to the **DIP-20** and to the mains power, (not shown in [Figure 3](#)).

5.1 Connecting the Remote Control Switches

You can connect remote, momentary-contact contact-closure switches to the terminal block on the rear panel of the **DIP-20** to control the device.

[Figure 4](#) illustrates the connections from the terminal block to the contact-closure switches.

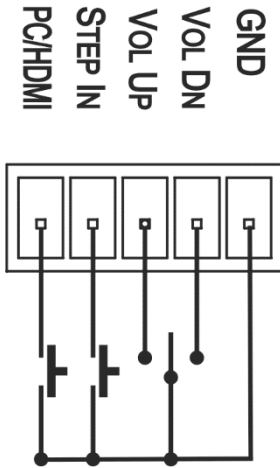


Figure 4: Remote Switches Terminal Block

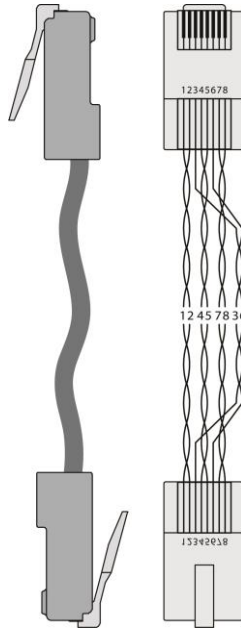
#	Feature	Function
1	PC/HDMI—input selection/VGA phase shift adjustment	Short press—Input toggle Long press—Adjusts the VGA phase shift, (see Section 6.4)
2	STEP IN	Activates the step-in function if relevant
3	VOL UP—analog audio output volume increase control, (see Section 7.3)	Short press—Increases the volume one step Long press—Increases the volume from 0% to 100% in 10 seconds
4	VOL DN—analog audio output volume decrease control, (see Section 7.3)	Short press—Decreases the volume one step Long press—Decreases the volume from 100% to 0% in 10 seconds
G	GND	Connect to the common side of the switches

5.2 Wiring the RJ-45 Connectors

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

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

Figure 5: TP PINOUT



6 Principles of Operation

The **DIP-20** selects video and audio inputs based on the rules described below.

6.1 Input Selection

The video mode selection is set by the DIP-switches (see [Section 8.1](#)) to either of the following modes:

- Manual
- Auto—Last connected or priority mode

In manual mode switching occurs whether or not there is a live signal present on the input. You manually select an input using any of the following methods:

- Front panel buttons
- Remote input selection switches
- RS-232 control
- The Web pages

In auto mode, the switching selection is performed based on either last connected or priority input.

In last connected mode, if the signal on the current input is lost, the **DIP-20** automatically selects the last connected input, (the delay depending on a configurable timeout).

In priority mode, when the input sync signal is lost for any reason, the input with a live signal and next in priority is selected automatically, (the delay depending on the configurable signal-lost timeout). This priority is configurable; the default setting is HDMI 1 → HDMI 2 → PC.

Note: In both last connected and priority modes, manually selecting an input (using the remote input selection switches or any of the above methods) overrides automatic selection.

6.2 Signal Loss and Unplugged Cable Timeouts

In both last connected and priority modes, when the input signal sync is lost (but the cable is not removed) there is a default delay (ten seconds for video, not applicable to the PC input, and five seconds for analog audio) before another input is automatically selected.

When an input cable is removed, there is a delay before automatic switching takes place.

Both timeouts are configurable, (see [Section 8.1](#)).

Note: Analog audio is not output when there is no display connected. If a display is connected analog audio is output even in the absence of a video signal.

6.3 Audio Signal Control

The Option DIP-switches 3 and 4 (see [Section 8.1](#)) control the manner in which audio is handled.

The following table describes which audio signal is embedded in the output.

Selected Video Input	HDMI Embedded Audio Detected	Analog Audio Detected	DIP-switch 3	DIP-switch 4	Audio on HDMI Output
VGA	N/A	Yes	N/A	N/A	Analog audio
VGA	N/A	No	N/A	N/A	No audio
HDMI	N/A	N/A	Manual	Embedded	Embedded audio
HDMI	N/A	N/A	Manual	Analog	Analog audio
HDMI	Yes	No	Auto	N/A	Embedded audio
HDMI	Yes	Yes	Auto	Embedded	Embedded audio
HDMI	Yes	Yes	Auto	Analog	Analog audio
HDMI	No	Yes	Auto	N/A	Analog audio
HDMI	No	No	Auto	N/A	No audio

When there is an audio signal but no video signal the output is a black video pattern in conjunction with the external analog Audio In signal.

Note: The default timeout for audio switching when the input signal is lost is five seconds. This can be changed using either P3000 commands or the Web pages.

6.4 VGA Phase Shift

To minimize phase on the input VGA signal, the VGA sampling phase can be shifted using the following methods:

- A long press on the PC IN select button on the front panel.
Each long press steps the phase shift up one step, starting from 0 and going to 31. When set to 31, another long press steps the shift to 0
- A remote, contact-closure switch connected to pins PC/HDMI and GND of the Remote terminal block.
Each long press steps the phase shift up one step, starting from 0 and going to 31. When set to 31, another long press steps the shift to 0
- Using the Web pages, (see [Section 9.1](#))
- Protocol 3000 commands over RS-232 (see [Section 12](#))

7 Operating the DIP-20

The DIP-20 can be operated using any of the following methods:

- Front panel buttons
- Protocol 3000 command, (see [Section 12](#))
- Remote contact-closure switch, (see [Section 5.1](#))
- Web pages, (see [Section 9](#))

7.1 Locking the EDID

To prevent the stored EDID (either default or read from a device) from being overwritten, either send a Protocol 3000 command or use the Web pages.

7.2 Resetting the DIP-20

To perform a soft reset of the DIP-20:

- Briefly press the Reset button.
The device resets

To reset the DIP-20 to factory default parameters:

- Press and hold the Reset button for five seconds.
The device is reset to factory default parameters

7.3 Analog Audio Output Volume Control

The analog audio output volume can be controlled using the Web pages, (see [Section 9.1](#)) or via the remote, contact-closure switches connected to pins 3 and 4 of the Remote terminal block, (see [Section 5.1](#)).

The volume is adjustable from -83dB to +24dB.

8 Configuring the DIP-20

8.1 Setting the Configuration DIP-switch

The 4-way DIP-switch provides the ability to configure a number of device functions. A switch that is down is on; a switch that is up is off. By default, all the switches are up (off).

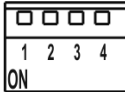


Figure 6: The Configuration DIP-switch

Note: After changing a DIP-switch you must power cycle the device to implement the change.

Video Switching Selection

DIP-switch 1	DIP-switch 2	Video Input Selection
Off (up)	Off (up)	Automatic—Last connected. Where more than one source is connected the last one connected has priority
Off (up)	On (down)	Automatic—Priority selection. HDMI 1 → HDMI 2 → PC IN (default, high to low priority)
On (down)	Off (up)	Manual
On (down)	On (down)	Manual

Audio Switching Selection

DIP-switch 3	DIP-switch 4	Audio Input Selection
Off (up)	Off (up)	Automatic—Priority selection. Embedded HDMI → analog Audio In (high to low priority)
Off (up)	On (down)	Automatic—Priority selection. Analog Audio In → embedded HDMI (high to low priority)
On (down)	Off (up)	Embedded HDMI
On (down)	On (down)	Analog Audio In

8.2 Switching Timeouts

When the **DIP-20** is configured for auto switching, the timeouts (before a new input is automatically selected) can be changed as shown in the tables below. (For the delay settings on the Web page, see [Section 9.4](#).) The following switching timeouts are only for HDMI and not VGA.

Timeout	Minimum Value	Default Value
Delay switching upon signal loss while cable is plugged in (signal off, 5V power on)	5 seconds	10 seconds for video input 5 seconds for audio input
Delay switching upon cable unplug (signal off, power off)	0 seconds	0 seconds
Delay 5V power off upon signal loss (delay must be greater than "Delay switching upon signal loss")	Should at least equal the larger of the above two values (signal loss timeout and cable unplug timeout)	900 seconds

For example, if:

Delay switching upon signal loss = 15 seconds

Delay switching upon cable unplug = 30 seconds

Then:

Delay 5V power off upon signal loss must be ≥ 30 seconds

8.3 Using the Step-in Feature

To be able to use the Step-in feature, you need to assign the RS-232 signal that is transmitted over the HDBT link to control (see [Section 9.4](#)). The Step-in button on the front panel will now operate in conjunction with a compatible receiver, for example, the **VS-622DT**.

9 Operating the DIP-20 Remotely Using the Web Pages

The **DIP-20** can be operated remotely using the embedded Web pages. The Web pages are accessed using a Web browser and an Ethernet connection.

Before attempting to connect:

- Ensure that your browser is supported (see [Section 10.1](#))
- Ensure that JavaScript is enabled

9.1 Accessing the DIP-20 Web Pages



In the event that a Web page does not update correctly, clear your Web browser's cache by pressing CTRL+F5.

To access the DIP-20 Web pages:

1. Open your Internet browser.
2. Type the IP number of the device (see [Section 10.1](#)) in the Address bar of your browser.



If authentication is enabled, the following window appears ([Figure 7](#)) and you must enter the valid username and password to access the Web pages. For default authentication details, see [Section 10.2](#).

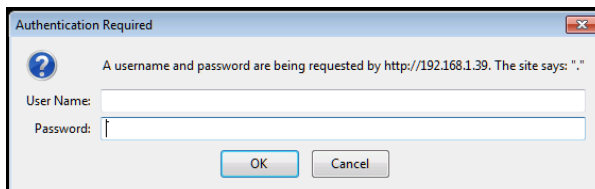


Figure 7: Entering Logon Credentials

Following a successful logon, the screen shown in [Figure 8](#) is displayed.

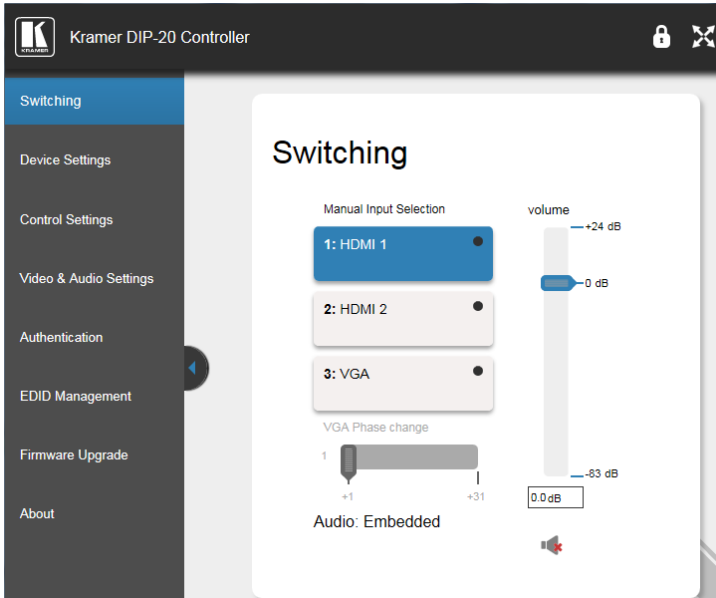






Figure 8: DIP-20 Web pages

- To open / hide the left hand side page navigation panel, click  / .
- To lock the page, click .
- To toggle in and out of full screen mode, click .

The following sections describe how to use the Web pages and their functions:

- Switching Input Signals (see [Section 9.2](#))
- Setting Device Configurations (see [Section 9.3](#))
- Defining Control Settings (see [Section 9.4](#))
- Setting Video and Audio Parameters (see [Section 9.5](#))
- Setting Authentication (see [Section 9.6](#))
- Managing EDID (see [Section 9.7](#))
- Upgrading Firmware (see [Section 9.8](#))
- About (see [Section 9.9](#))

9.2 Switching Input Signals

The Switching page lets you select a video input manually and adjust the audio volume.

Switching

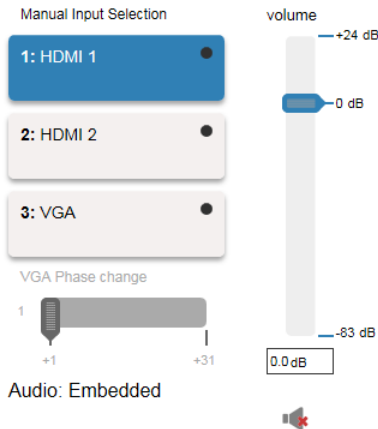


Figure 9: Switching Page

Item	Description
<i>HDMI 1 Button</i>	Click to select the HDMI 1 input. The button color indicates whether or not there is a live signal on the input
<i>HDMI 2 Button</i>	Click to select the HDMI 2 input
<i>VGA Button</i>	Click to select the VGA input
<i>VGA Phase change Slider</i>	Click and slide to the left or right to adjust the VGA phase change (+1 to +31)
<i>Audio Indicator</i>	Indicates the source of the audio that is transmitted on the output
<i>Volume Slider</i>	Click and slide up and down to increase or decrease the audio output volume (-83dB to +24dB)
<i>Mute/Unmute Button</i>	Click to mute or unmute the output audio

Note: To be able to use the Step-in feature, you need to assign the RS-232 signal that is transmitted over the HDBT link to control (see [Section 9.4](#)). The Step-in button on the front panel now operates in conjunction with a compatible receiver, for example, the **VS-622DT**).

9.3 Setting Device Configurations

The Device Settings page enables you to identify your device and:

- View some of the device characteristics, (for example, model and firmware version)
- Edit Ethernet settings, (for example, DHCP and IP address)
- Save and load configurations
- Reset the device to factory default settings

Note: After making any change to the parameters on the Device Settings page, you must power cycle the device to activate the changes.

Device Settings

Unit name

Model **DIP-20**

Firmware version **2.5.36329**

Serial number **02170000200125**

Ethernet Settings

DHCP

IP address

Mask address

Gateway address

Mac address **00-1d-56-03-43-4a**

UDP port

TCP port

All settings

Figure 10: Device Settings Page

Item	Description
Unit name	Enter a descriptive, easy to identify name for the DIP-20
Model	Displays the model of the device
Firmware version	Displays the firmware version of the device
Serial number	Displays the serial number of the device
Ethernet Settings	
DHCP ON/OFF buttons	Click ON to turn DHCP on; click OFF to turn DHCP off and use static IP addressing
IP address	The IP address of the device. To set a new IP address, enter the new valid IP address and click Set
Mask address	The network mask of the device. To set a new mask address, enter the new valid mask address and click Set
Gateway address	The network gateway for the device. To set a new gateway address, enter the new valid gateway address and click Set
Mac address	The MAC address of the device
UDP port	The UDP port number of the device. To set a new UDP port number, enter the new valid port number or use the spin controls and click Set
TCP port	The TCP port number of the device. To set a new TCP port number, enter the new valid port number or use the spin controls and click Set
All settings	
Load & Save buttons	Click Load to retrieve a previously saved configuration, click Save to save the present configuration (see Section 9.3.1).
Factory reset button	Click to reset the device to factory default parameters. After the success message is displayed, power cycle the device (see Section 9.3.2)

9.3.1 Loading and Saving Configurations

The **DIP-20** enables loading and saving device setting configurations. This is especially useful when setting up multiple **DIP-20** devices.

To load a configuration:

1. Click **Load**.
The File Upload browser window appears.
2. Browse to the required file and click **Open**.
The configuration is retrieved and the success message is displayed.

To save the current configuration:

1. Click **Save**.
The Save Configuration success message is displayed.
2. Click **Download** to either open the file or save it to the required location.
Or,
Click **OK** to complete the procedure.

9.3.2 Resetting the Device

To reset the DIP-20 to factory default parameters:

1. Click **Factory reset**.
A confirmation message is displayed.



Clicking **Cancel** exits the reset procedure without making any changes.

2. Click **OK**.
A progress message is displayed. Upon completion, a success message is displayed.
3. Click **OK**.

9.4 Defining Control Settings

The Control Settings page enables specifying how the HDBT Out port and the RS-232 data port (not the control port) can be used for sending data strings, Protocol 3000 control commands, or external device control commands. You can specify this by selecting any of the following in the HDBaseT Serial Settings area:

- **HDBaseT Tunneling from Data Port** – Enables routing all RS-232 data from the RS-232 data port to the HDBT port.
- **DIP-20 Control through HDBaseT** – Enables controlling the **DIP-20** using Protocol 3000 commands received over HDBaseT (for step-in functionality).
- **Remote Device Control over HDBaseT** – Enables sending RS-232 commands over HDBaseT to turn on/off peripheral devices. When using this

option, specify the predefined triggers (5V on – connect, 5V off – disconnect) with delays and default RS-232 parameters.

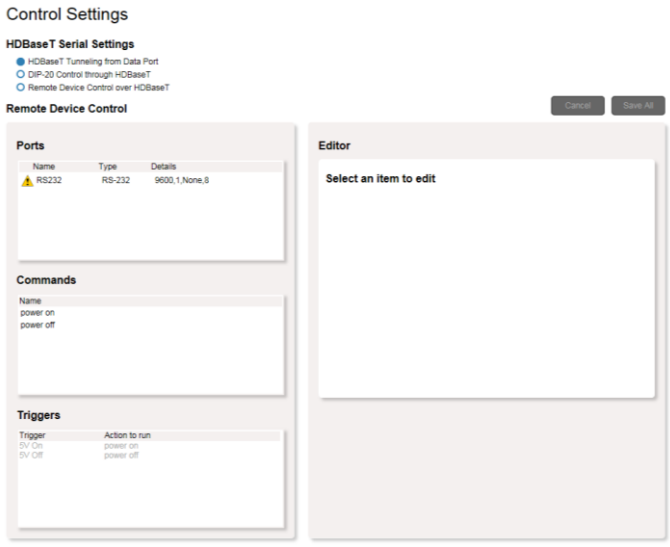


Figure 11: Control Settings Page

The Remote Device Control area in the Control Settings page is divided into four sections: Ports, Commands, Triggers, and Editor.



Clicking Ports, Commands, or Triggers enables you to configure that section in the Editor section.

The following table describes the elements of the Control Settings page:

Item	Description
Ports	Use this section to specify port properties
Commands	Use this section to select a power on or power off command
Triggers	Use this section to select trigger conditions that initiate the power on/off actions
Editor	Use this section to edit information of the selected element
Cancel	Exit control settings without saving changes
Save all	Save the current configuration

To remotely control a device over HDBaseT:

1. In the HDBaseT Serial Settings area, select **Remote Device Control over HDBaseT**.

The Remote Device Control area is enabled.

2. In the Ports section, click the RS-232 port.

The port information is displayed in the Editor:

Control Settings

HDBaseT Serial Settings

- HDBaseT Tunneling from Data Port
- DIP-20 Control through HDBaseT
- Remote Device Control over HDBaseT

Remote Device Control

The screenshot shows the 'Remote Device Control' interface. On the left, the 'Ports' section contains a table with one entry: RS232, RS-232, 9600, 1, None, 8. Below this are sections for 'Commands' (power on, power off) and 'Triggers' (5V On: power on, 5V Off: power off). On the right, the 'Editor: Port' dialog box is open, showing the 'Type' as RS-232 and 'Properties' with dropdown menus for Baud Rate (9600), Stop Bits (1), Parity (None), and Data Bits (8). Buttons for 'Cancel' and 'Save All' are visible at the top right of the main interface, and a 'Cancel' button is at the bottom right of the dialog box.

Name	Type	Details
RS232	RS-232	9600, 1, None, 8

Commands

Name
power on
power off

Triggers

Trigger	Action to run
5V On	power on
5V Off	power off

Editor: Port

Type: RS-232

Properties

Baud Rate: 9600

Stop Bits: 1

Parity: None

Data Bits: 8

Figure 12: Editing an RS-232 Port

3. Edit the port information as necessary and click **Save All**.

4. In the Commands section, select a command.

The command information is displayed in the Editor:

Control Settings

HDBaseT Serial Settings

- HDBaseT Tunneling from Data Port
- DIP-20 Control through HDBaseT
- Remote Device Control over HDBaseT

Remote Device Control

The screenshot shows the 'Remote Device Control' interface. At the top right, there are 'Cancel' and 'Save All' buttons. The interface is divided into two main panels. The left panel contains three sections: 'Ports', 'Commands', and 'Triggers'. The 'Ports' section has a table with columns 'Name', 'Type', and 'Details', containing one entry: RS232, RS-232, 9600,1,None,8. The 'Commands' section has a table with columns 'Name', containing two entries: 'power on' (highlighted) and 'power off'. The 'Triggers' section has a table with columns 'Trigger' and 'Action to run', containing two entries: '5V On' (power on) and '5V Off' (power off). The right panel is titled 'Editor: Command' and contains a form for editing a command. It has fields for 'Name' (power on), 'Delay' (10 sec), and 'Data' (turn on device). There are three buttons: 'FF' (white), 'HEX' (green), and 'CR' (red). Below the data field is a 'User Defined Command' label and a 'Test' button. At the bottom right of the editor is a 'Cancel' button. The text 'on RS-232 port' is displayed below the 'Test' button.

Figure 13: Editing a Command

5. Optionally, edit the delay time before the command is triggered, click **Test** to test the command using the specified port, and click **Save All**.

- In the Triggers section, select a trigger.
The trigger information is displayed in the Editor:

Control Settings

HDBaseT Serial Settings

- HDBaseT Tunneling from Data Port
- DIP-20 Control through HDBaseT
- Remote Device Control over HDBaseT

Remote Device Control

Ports

Name	Type	Details
RS232	RS-232	9600,1,None,8

Commands

Name
power on
power off

Triggers

Trigger	Action to run
5V On	power on
5V Off	power off

Editor: Trigger

Event: 5V On
Description: power on
Status:

Figure 14: Editing a Trigger

- Click **Enabled**.
- Click **Save All**.

9.5 Setting Video and Audio Parameters

Use the Video and Audio Settings page to modify the video, audio and timeout parameters.

Video & Audio Settings

Video

Video selection mode Auto: Last connected

Video auto switching priority

HIGH

HDMI 1

HDMI 2

VGA

LOW

Drag to change the priority

Audio

Audio selection mode Auto: Priority switching

Current selection Embedded

Audio only mode Enabled Disabled

HDCP Support

HDMI 1 Enabled Disabled

HDMI 2 Enabled Disabled

Timeout

Delay switching upon signal loss for (leave 5v ON) Video: 10 sec Audio: 5 sec

Delay switching input upon cable unplug for 0 sec 0 sec

Delay power off 5v upon signal loss for 900 sec

Set Timeout

Figure 15: Video and Audio Settings Page

The following table describes the elements of the Video and Audio Settings page:

Item	Description
<i>Video selection mode</i> Indicator	Indicates the current video selection mode; manual, auto, or auto last connected
<i>Video auto switching priority</i> Buttons	Click and drag the buttons to the required priority level to use when in auto mode
<i>Audio selection mode</i> Indicator	Indicates the current audio selection; manual, auto, or auto last connected
<i>Current selection</i> Audio Indicator	Indicates the current audio selection; Embedded or analog
<i>Audio only mode</i> Buttons	Select to enable/disable audio only mode. When enabled, the DIP-20 disables video on all inputs and only routes audio Disabled—Audio only mode is disabled Enabled—Audio only mode is enabled

Item	Description
<i>HDCP Support (on HDMI input) Buttons</i>	Select HDCP support for HDMI 1 and HDMI 2 Disabled—HDCP encrypted content is not passed Enabled—HDCP support is dictated by the display
<i>Delay switching upon signal loss for (leave 5V on) Box</i>	Sets the delay for video and audio before switching (in auto mode) because of a signal loss on the currently selected input, while the cable is plugged in. Value in seconds (see Section 6.2)
<i>Delay switching input upon cable unplug for Box</i>	Sets the delay for video and audio before switching (in auto mode) because the currently selected input cable is unplugged. Value in seconds (see Section 6.2)
<i>Delay power off 5V upon signal loss for Box</i>	Sets the delay for turning off the 5V output because of a signal loss on the currently selected input. Value in seconds (see Section 6.2)

9.6 Setting Authentication

The Authentication page enables activating device security and defining logon authentication details. When device security is enabled, Web page access requires authentication. The default password is **Admin**.

Authentication

Activate Security Enabled Disabled

Change Password: Current

 New

 Retype New

Figure 16: Authentication Page

The following table describes the elements of the Authentication page:

Item	Description	
Activate Security Button	Click to enable/disable security settings. When enabled, the valid username and password must be provided to allow Web page access	
Change Password	Current password box	Enter the current password
	New password box	Enter the new password, (up to 15 printable ASCII characters)
	Retype New password box	Retype the new password
Change button	Click Change to save the new authentication details	

9.7 Managing EDID

The EDID page lets you copy EDID data to either or all of the inputs from the following sources:

- Output
- Input
- Default EDID
- EDID data file

From this page you can also lock the EDID on each input independently by pressing the lock icon.

EDID Management

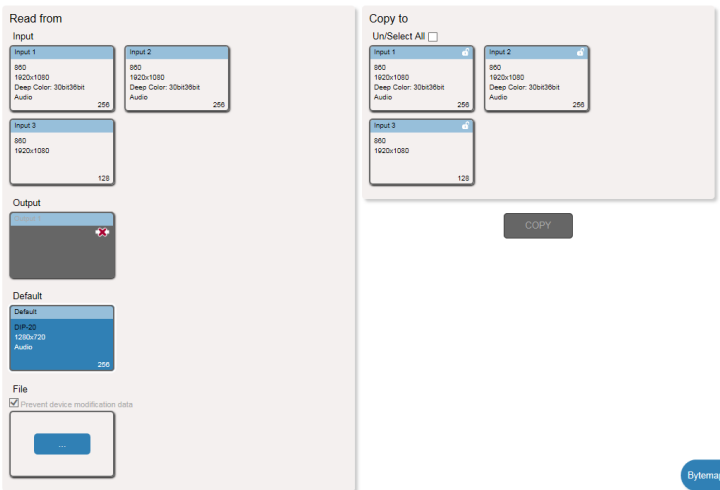


Figure 17: EDID Management Page



When the status of an EDID changes on the device (caused by outputs being exchanged), the display is not updated automatically. In the browser, click **Refresh** to update the display.

Item		Description
<i>Read from Section</i>	<i>Input 1 button</i>	Click to read the EDID from input 1 (HDMI 1)
	<i>Input 2 button</i>	Click to read the EDID from input 2 (HDMI 2)
	<i>Input 3 button</i>	Click to read the EDID from input 3 (VGA)
	<i>Output button</i>	Click to read the EDID from output
	<i>DEFAULT EDID button</i>	Click to read the default EDID
	<i>File ...</i>	Click to open the file browser to select an EDID file on your computer
<i>Short Summary Information Section</i>		Displays the current selection of EDID source, destination, video resolution, and audio availability
<i>Copy to Section</i>	<i>Un/Select All selection box</i>	Check to select or deselect all inputs
	<i>Lock button</i>	Locks the EDID on the currently selected input
	<i>Input 1 button</i>	Click to select input 1 as the destination (HDMI 1)
	<i>Input 2 button</i>	Click to select input 2 as the destination (HDMI 2)
	<i>Input 3 button</i>	Click to select input 3 as the destination (VGA)
<i>COPY Button</i>		Click to copy the EDID from the selected source to the selected destination
<i>Bytemap Button</i>		Click to view the hex code of the EDID

To copy EDID data from a source to one or all inputs:

1. In the *Read from* section, click a source button from which to read the EDID (default, output, input, or EDID file).
The button changes color and the EDID summary information reflects the selection and EDID data.
2. In the *Copy to* section, click an input or select all inputs by checking the **Un/Select All** check-box.
All selected input buttons change color and the EDID summary information reflects the selection and EDID data.
3. Click **Copy**.
The “EDID was copied” success message is displayed and the EDID data is copied to the selected input(s).
4. Click **OK**.



Note: An input must be connected to the device to read the EDID from a connected output. If a video signal is not detected on the input, the output is disabled and the EDID cannot be read.

9.8 Upgrading the Firmware

As problems are fixed or features are added, new firmware versions are released for downloading on the Kramer website.

To upgrade the firmware:

1. Open the Firmware Upgrade page.

Firmware Upgrade

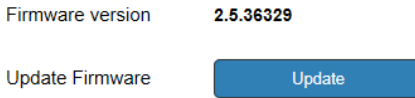


Figure 18: Firmware Upgrade Page

2. Click **Update**.
The Windows Browser opens.
3. Browse to the required file and click **Open**.
The firmware file name is displayed in the Firmware Upgrade page.
4. Click **Start Upgrade**.
The firmware file is loaded and a progress bar is displayed.



Do not interrupt the process or the **DIP-20** may be damaged.

5. When the process is complete reboot the device.
The firmware is upgraded.



You can upgrade firmware for multiple **DIP-20** devices installed in the organization via Kramer Network.

9.9 About Us

The **DIP-20** About Us page displays the Web version and Kramer contact information.



WEB VERSION 3.0.7

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Figure 19: About Us Page

10 Technical Specifications

INPUTS:	Video:	2 HDMI on HDMI connectors 1 VGA on a 15-pin HD (F) connector
	Audio:	1 Unbalanced stereo audio 1V RMS (nominal) on a 3.5mm mini jack
OUTPUTS:	Video:	1 HDBaseT on an RJ-45 connector
	Audio:	1 Unbalanced stereo audio 1V RMS (nominal) on a 3.5mm mini jack
PORTS:	1 Ethernet on an RJ-45 connector 1 RS-232 3-pin terminal block control port 1 RS-232 3-pin terminal block data port 1 USB on mini USB connector	
CONTROLS:	Remote switches for input switching, step-in, volume control, and device reset switch	
STANDARDS:	HDMI with Deep Color, x.v.Color™ and 3D HDCP—works with sources that support HDCP repeater mode HDBT certified	
MAXIMUM ANALOG AUDIO LEVELS:	3.1V p-p	
THD:	0.013%	
SNR:	75dB	
SUPPORTED WEB BROWSERS:	Windows 7 and higher: <ul style="list-style-type: none"> Internet Explorer (32/64 bit) version 11 Firefox version 30 Chrome version 35 MAC: <ul style="list-style-type: none"> Chrome version 35 Firefox version 27 Safari version 7 Android OS: <ul style="list-style-type: none"> Chrome version 35 iOS: <ul style="list-style-type: none"> Chrome version 35 Safari version 7 	
MAXIMUM TRANSMISSION DISTANCE:	180m (590ft) up to 1080p @60Hz @24bpp in extended mode 130m (430ft) up to 1080p @60Hz @36bpp in normal mode	
POWER CONSUMPTION:	48V DC, 630mA 200mA with CAT5e 24AWG	
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	
COOLING:	Convection	
ENCLOSURE TYPE:	Aluminum	

DIMENSIONS:	18.75cm x 11.5cm x 2.54cm (7.38" x 4.53" x 1.0") W, D, H
WEIGHT:	0.46kg (1.01lbs) approx.
SHIPPING WEIGHT:	1.16kg (2.56lbs) approx.
ENVIRONMENTAL REGULATORY COMPLIANCE:	Complies with appropriate requirements of RoHs and WEEE
INCLUDED ACCESSORIES:	Power adapter 48V DC 1.36A ADC-DPM/HF DisplayPort (M) to HDMI (F) adapter cable Power cord
OPTIONS:	Rack adapter RK-T2B
WARRANTY:	7 years parts and labor

10.1 Default IP Parameters

Parameter	Values	Default
Device Name	Any alphanumeric string up to 14 chars (can include hyphen, but not at the beginning or end)	KRAMER_
DHCP	ON/OFF	OFF
IP Address	Any valid IP address	192.168.1.39
Mask	Any valid network mask	255.255.0.0
Gateway	Any valid gateway address	192.168.0.1
TCP Port	0 to 65535	5000
UDP Port	0 to 65535	50000

10.2 Default Logon Credentials

Parameter	Values
Name	Admin
Password	Admin

10.3 Supported HDMI Resolutions

Resolution	Refresh Rate (Hz)
640x480p	85Hz; 75Hz; 72Hz; 60Hz; 59.95Hz
720x480p	60Hz
720x480i	30Hz
720x576p	50Hz
800x600p	85Hz; 75Hz; 72Hz; 60Hz
848x480p	60Hz
852x480p	60Hz
1024x768p	85Hz; 75Hz; 70Hz; 60Hz
1152x864p	75Hz
1280x768p	60Hz

Resolution	Refresh Rate (Hz)
1280x800p	60Hz
1280x960	60Hz
1280x1024p	75Hz; 60Hz
1360x768p	60Hz
1366x768	60Hz; 50Hz
1400x1050p	60Hz
1440x900p	60Hz
1600x900p	60Hz
1600x1200p	60Hz
1680x1050p	60Hz
1920x1080p	50Hz; 60Hz; 30Hz; 24Hz;
1920x1080i	50Hz; 60Hz;
3840x2160	30Hz
4096x2160	30Hz

10.4 Supported VGA Resolutions

Resolution	Refresh Rate
640x480p	60Hz
720x480p	60Hz
800x600p	60Hz
848x480p	60Hz
1024x768p	60Hz
1152x864	75Hz
1280x720p	60Hz; 50Hz
1280x768	60Hz
1280x800	60Hz
1280x960p	60Hz
1280x1024p	60Hz
1360x768	60Hz;
1366x768	60Hz; 50Hz
1400x1050	60Hz
1440x900	60Hz
1920x1080p	60Hz
1920x1200	60Hz

11 Default EDID

Each input on the **DIP-20** is loaded with a factory default EDID.

11.1 HDMI

Monitor

Model name.....DIP-20
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..... n/a

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
800 x 600p at 56Hz - VESA
800 x 600p at 60Hz - VESA
800 x 600p at 72Hz - VESA
800 x 600p at 75Hz - VESA
832 x 624p at 75Hz - Apple Mac II
1024 x 768i at 87Hz - IBM
1024 x 768p at 60Hz - VESA
1024 x 768p at 70Hz - VESA
1024 x 768p at 75Hz - VESA
1280 x 1024p at 75Hz - VESA
1152 x 870p at 75Hz - Apple Mac II
1280 x 1024p at 75Hz - VESA STD
1280 x 1024p at 85Hz - VESA STD
1600 x 1200p at 60Hz - VESA STD
1024 x 768p at 85Hz - VESA STD

800 x 600p at 85Hz - VESA STD
640 x 480p at 85Hz - VESA STD
1152 x 864p at 70Hz - VESA STD
1280 x 960p at 60Hz - 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 audio data (formats supported)

LPCM 2-channel, 16/20/24 bit depths at 32/44/48 kHz

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 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..... 09/08/2015
Software revision..... 2.60.0.972
Data source..... File
Operating system..... 6.1.7601.2.Service Pack 1

Raw data

00,FF,FF,FF,FF,FF,FF,00,2D,B2,00,12,00,00,00,00,FF,19,01,03,80,34,20,78,EA,B3,25,AC,51,30,B4,26,
10,50,54,FF,FF,80,81,8F,81,99,A9,40,61,59,45,59,31,59,71,4A,81,40,01,1D,00,72,51,D0,1E,20,6E,28,
55,00,07,44,21,00,00,1E,00,00,00,FD,00,38,4C,1E,53,11,00,0A,20,20,20,20,20,00,00,00,FC,00,41,
56,53,2D,33,32,20,20,20,20,20,20,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,01,B7,
02,03,1B,F1,23,09,07,07,48,10,05,84,03,02,07,16,01,65,03,0C,00,10,00,83,01,00,00,02,3A,80,18,71,
38,2D,40,58,2C,45,00,07,44,21,00,00,1E,01,1D,80,18,71,1C,16,20,58,2C,25,00,07,44,21,00,00,9E,01,
1D,00,72,51,D0,1E,20,6E,28,55,00,07,44,21,00,00,1E,8C,0A,D0,8A,20,E0,2D,10,10,3E,96,00,07,44,21,
00,00,18,00,47

11.2 PC-UXGA

Monitor

Model name..... DIP-20
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..... Analog 0.700,0.000 (0.7V p-p)
Sync input support..... Separate, Composite, Sync-on-green
Display type..... RGB color
Screen size..... 520 x 320 mm (24.0 in)
Power management..... Standby, Suspend, Active off/sleep
Extension blocs..... None

DDC/CI..... n/a

Color characteristics

Default color space..... 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
800 x 600p at 56Hz - VESA
800 x 600p at 60Hz - VESA
800 x 600p at 72Hz - VESA
800 x 600p at 75Hz - VESA
832 x 624p at 75Hz - Apple Mac II
1024 x 768i at 87Hz - IBM
1024 x 768p at 60Hz - VESA
1024 x 768p at 70Hz - VESA
1024 x 768p at 75Hz - VESA
1280 x 1024p at 75Hz - VESA
1152 x 870p at 75Hz - Apple Mac II
1280 x 1024p at 75Hz - VESA STD
1280 x 1024p at 85Hz - VESA STD
1600 x 1200p at 60Hz - VESA STD
1024 x 768p at 85Hz - VESA STD
800 x 600p at 85Hz - VESA STD
640 x 480p at 85Hz - VESA STD
1152 x 864p at 70Hz - VESA STD
1280 x 960p at 60Hz - VESA STD

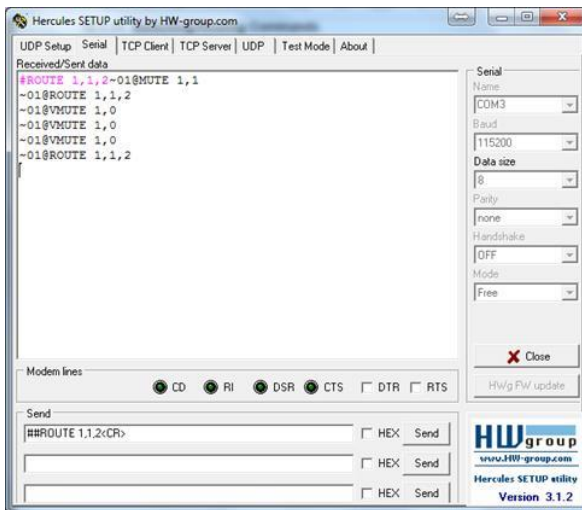
EIA/CEA-861 Information

Revision number..... 3
IT underscan..... Supported

12 Protocol 3000

The **DIP-20 Automatic Video Switcher** can be operated using the Kramer Protocol 3000 serial commands. The command framing varies according to how you interface with the **DIP-20**. For example, a basic video input switching command that routes a layer 1 video signal to HDBT 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):

'Device Code (17)' PROPERTIES	
name	Device Code (17)
data	#ROUTE 1,1,2x0D

- 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 **DIP-20**. 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:

- Using Protocol 3000 commands, see [Section 12.1](#)
- General syntax used for Protocol 3000 commands, see [Section 12.2](#)
- Protocol 3000 commands available for the **DIP-20**, see [Section 12.3](#)

12.1 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.

The maximum string length is 64 characters.

- **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.

12.2 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>	Message	CR

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

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

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

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

- **Device Message Format:**

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

- **Device Long Response** – Echoing command:

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

12.3 Protocol 3000 Commands

This section includes the following commands:

- System Commands (see [Section 12.3.1](#))
- Authentication Commands (see [Section 12.3.2](#))
- Switching/Routing Commands (see [Section 12.3.3](#))
- Video Commands (see [Section 12.3.4](#))
- Audio Commands (see [Section 12.3.5](#))
- Communication Commands (see [Section 12.3.6](#))
- EDID Handling Commands (see [Section 12.3.7](#))

12.3.1 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)
VERSION	Get device firmware version (system mandatory)
AV-SW-MODE	Set/get auto switch mode (system)
AV-SW-TIMEOUT	Set/get auto switching timeout (system)
DISPLAY	Get output HPD status (system)
DPSW-STATUS	Get the DIP-switch status (system)
FPGA-VER	Get current FPGA version (system)
HDCP-MOD	Set/get HDCP mode (system)
HDCP-STAT	Get HDCP signal status (system)
NAME	Set/get machine (DNS) name (system – Ethernet)
NAME-RST	Reset machine (DNS) name to factory default (system – Ethernet)
PRIORITY	Set/get priority for all channels (system)
SIGNAL	Get input signal lock status (system)

12.3.1.1

Functions		Permission	Transparency
Set:	#	End User	Public
Get:	-	-	-
Description		Syntax	
Set:	Protocol handshaking	# <code>CR</code>	
Get:	-	-	
Response			
~ <code>nn</code> @ <code>SP</code> <code>OK</code> <code>CR LF</code>			
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			

12.3.1.2 BUILD-DATE

Functions		Permission	Transparency
Set:	-	-	-
Get:	BUILD-DATE?	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get device build date	# BUILD-DATE? <code>CR</code>	
Response			
~ <code>nn</code> @ <code>BUILD-DATE</code> <code>SP</code> <code>date</code> <code>SP</code> <code>time</code> <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			
Response Triggers			
Notes			
K-Config Example			
`"#BUILD-DATE?", 0x0D			

12.3.1.3 FACTORY

Functions		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.			
K-Config Example			
"#FACTORY", 0x0D			

12.3.1.4 HELP

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

12.3.1.5 MODEL

Functions		Permission	Transparency
Set:	-	-	-
Get:	MODEL?	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get device model	# MODEL? <code>CR</code>	
Response			
~ <code>nn</code> @ MODEL <code>SE</code> <code>model_name</code> <code>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			
"#MODEL?", 0x0D			

12.3.1.6 PROT-VER

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

12.3.1.7 RESET

Functions		Permission	Transparency
Set:	RESET	Administrator	Public
Get:	-	-	-

Description		Syntax
Set:	Reset device	#RESET␣
Get:	-	-
Response		
~nn@RESETSEOk␣␣		
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		

12.3.1.8 SN

Functions	Permission	Transparency
Set:	-	-
Get:	SN?	End User
Description		Syntax
Set:	-	-
Get:	Get device serial number	#SN?␣
Response		
~nn@SNSEserial_number␣␣		
Parameters		
serial_number – 11 decimal digits, factory assigned		
Response Triggers		
Notes		
This device has a 14 digit serial number, only the last 11 digits are displayed		
K-Config Example		
"#SN?",0x0D		

12.3.1.9 VERSION

Functions	Permission	Transparency
Set:	-	-
Get:	VERSION?	End User
Description		Syntax
Set:	-	-
Get:	Get firmware version number	#VERSION?␣
Response		

~nn@VERSIONSPfirmware_versionCR LF
Parameters
firmware_version – XX.XX.XXXX where the digit groups are: major.minor.build version
Response Triggers
Notes
K-Config Example
"#VERSION?",0x0D

12.3.1.10 AV-SW-MODE

Functions	Permission	Transparency
Set:		
Get:	AV-SW-MODE?	End user Public
Description	Syntax	
Set:		
Get:	Get input auto switch mode (per output)	#AV-SW-MODE?SPlayer,output_idCR
Response		
~nn@AV-SW-MODESPlayer,output_id,modeCR LF		
Parameters		
layer – 1 (video), 2 (audio) output_id – for video layer: 1 (HDBT Out), for audio layer: 1 (Audio Out) mode – 0 (manual), 1 (priority switch), 2 (last connected switch)		
Response Triggers		
Notes		
K-Config Example		
Get the input audio switch mode for HDBT Out: "#AV-SW-MODE? 1,1",0x0D		

12.3.1.11 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 <i>SP</i> <i>action,time_out</i> <i>CR</i>	
Get:	Get auto switching timeout	#AV-SW-TIMEOUT? <i>SP</i> <i>action</i> <i>CR</i>	
Response			
~nn@AV-SW-TIMEOUT <i>SP</i> <i>action,time_out</i> <i>CR</i>			
Parameters			
<p><i>action</i> – event that triggers the auto switching timeout:</p> <ul style="list-style-type: none"> 0 (video signal lost) 2 (audio signal lost) 4 (disable 5V on video output if no input signal detected) 5 (video cable unplugged) 6 (audio cable unplugged) <p><i>timeout</i> – timeout in seconds: 0-60000</p>			
Response Triggers			
Notes			
<p>The timeout must not exceed 60000 seconds.</p> <p>The timeout for video and audio signal lost (0, 2) events must not be less than 5 seconds.</p> <p>The timeout for video and audio cable unplugged (5, 6) events must not exceed the timeout for the disable 5V on video output if no input signal detected (4) event.</p> <p>The timeout for the disable 5V on video output if no input signal detected (4) event must not be less than the timeout for video and audio cable unplugged (5, 6) events.</p> <p>The timeout for the disable 5V on video output if no input signal detected (4) event overlaps with the timeouts for all other events (0, 2, 5, 6).</p> <p>This does not apply to VGA input.</p>			
K-Config Example			
<p>Set the auto switching timeout to 5 seconds in the event of video signal lost:</p> <pre>"#AV-SW-TIMEOUT 0,5",0x0D</pre>			

12.3.1.12 DISPLAY

Functions		Permission	Transparency
Set:	-	-	-
Get	DISPLAY?	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get output HPD status	# DISPLAY? <code>[SE]</code> <code>out_id</code> <code>[CR]</code>	
Response			
~ <code>[nr]</code> <code>#DISPLAY?</code> <code>[SE]</code> <code>out_id,status</code> <code>[CR]</code> <code>[LF]</code>			
Parameters			
<i>out_id</i> - 1 (HDBT Out) <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)			
Notes			
K-Config Example			
Get the output HPD status of HDBT Out: `#DISPLAY? 1",0xD			

12.3.1.13 DPSW-STATUS

Functions	Permission	Transparency
Set:	-	-
Get	DPSW-STATUS?	End User Public
Description	Syntax	
Set:	-	
Get:	Get the DIP-switch status	#DPSW-STATUS?SEdp_sw_idCR
Response		
~nn@DPSW-STATUS?SEdp_sw_id,statusCR LF		
Parameters		
<i>dp_sw_id</i> - 1 (video switch), 2 (video switch), 3 (audio switch), 4 (audio switch) <i>status</i> - 0 (up / Off), 1 (down / On)		
Response Triggers		
Notes		
K-Config Example		
Get the status of DIP-switch 1 (video switch): "#DPSW-STATUS? 1",0x0D		

12.3.1.14 FPGA-VER

Functions	Permission	Transparency
Set:	-	-
Get:	FPGA-VER?	End User Public
Description	Syntax	
Set:	-	
Get:	Get current FPGA version	#FPGA-VER?SEidCR
Response		
~nn@FPGA-VERSEid,major_ver,minor_verCR LF		
Parameters		
<i>id</i> - 1 (FPGA) <i>major_ver</i> - Major FPGA version number for current firmware <i>minor_ver</i> - Minor FPGA version number for current firmware		
Response Triggers		
Notes		
FPGA – field programmable gate array		
K-Config Example		
Get the FPGA version number for the current firmware: "#FPGA-VER? 1",0x0D		

12.3.1.15 HDCP-MOD

Functions		Permission	Transparency
Set:	HDCP-MOD	Administrator	Public
Get:	HDCP-MOD?	End User	Public
Description		Syntax	
Set:	Set HDCP mode	#HDCP-MOD[SE]inp_id,mode[CR]	
Get:	Get HDCP mode	#HDCP-MOD?[SE]inp_id[CR]	
Response			
Set / Get: ~[nn]eHDCP-MOD[SE]inp_id,mode[CR LF]			
Parameters			
inp_id – input number: 1 (HDMI In 1), 2 (HDMI In 2), 3 (PC In) mode – HDCP mode: 0 (HDCP Off), 3 (Mirror output – MAC mode)			
Response Triggers			
A response is sent to the com port from which the set (before execution) / get command was received A response is sent to all com ports after command execution if HDCP-MOD was set by any other external control device (device button, device menu or other) or if the HDCP mode changed			
Notes			
Set HDCP working mode on the device input: HDCP not supported - HDCP Off HDCP support changes following detected sink - MIRROR OUTPUT			
K-Config Example			
Disable HDCP mode on HDMI In 2: `#HDCP-MOD 2,0",0x0D`			

12.3.1.16 HDCP-STAT

Functions		Permission	Transparency
Set:	-	-	-
Get:	HDCP-STAT?	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get HDCP signal status	# HDCP-STAT? <input type="checkbox"/> stage,stage_id <input type="checkbox"/>	
Response			
~ <input type="checkbox"/> @ HDCP-STAT? <input type="checkbox"/> stage,stage_id,status <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
Parameters			
<i>stage</i> – 0 (input), 1 (output) <i>stage_id</i> – for input stage: 1 (HDMI In 1), 2 (HDMI In 2), 3 (PC In), for output stage: 1 (HDBT Out) <i>status</i> – signal encryption status: 0 (On), 1 (Off)			
Response Triggers			
A response is sent to the com port from which the Get command was received			
Notes			
Output stage (1) – get the HDCP signal status of the sink device connected to HDBT Out Input stage (0) – get the HDCP signal status of the source device connected to the specified input			
K-Config Example			
Get the HDCP input signal status of the source device connected to HDMI In 1: ``#HDCP-STAT? 0,1",0x0D			

12.3.1.17 NAME

Functions		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 characters (can include hyphens but 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			

12.3.1.18 NAME-RST

Functions		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_"			
K-Config Example			
Reset the DNS name of the device to the factory default: "#NAME-RST", 0x0D			

12.3.1.19 PRIORITY

Functions		Permission	Transparency
Set:	PRIORITY	Administrator	Public
Get:	PRIORITY?	Administrator	Public
Description		Syntax	
Set:	Set input priority	# PRIORITY ^[SE] <i>layer, PRIORITY1, PRIORITY2, PRIORITY3</i> ^[CR]	
Get:	Get input priority	# PRIORITY? <i>layer</i> ^[CR]	
Response			
~nn@ PRIORITY ^[SE] <i>layer, PRIORITY1, PRIORITY2, PRIORITY3</i> ^[CR LF]			
Parameters			
<p>layer – 1 (video): <i>PRIORITY1</i> - priority of HDMI In 1: 1 (highest priority), 2 (second priority), 3 (third priority) <i>PRIORITY2</i> - priority of HDMI In 2: 1 (highest priority), 2 (second priority), 3 (third priority) <i>PRIORITY3</i> - priority of PC In: 1 (highest priority), 2 (second priority), 3 (third priority)</p> <p>layer – 2 (audio): <i>PRIORITY1</i> - priority of embedded audio: 1 (highest priority), 2 (second priority) <i>PRIORITY2</i> - priority of Audio In: 1 (highest priority), 2 (second priority)</p>			
Response Triggers			
Notes			
<p>The number of PRIORITY parameters differs according to the selected layer 1 is the highest priority</p>			
K-Config Example			
<p>Set the video input priority of PC In as the highest priority: "#PRIORITY 1,2,3,1",0x0D</p>			

12.3.1.20 SIGNAL

Functions		Permission	Transparency
Set:	-	-	-
Get	SIGNAL?	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get input signal lock status	# SIGNAL? <code>S</code> <code>inp_id</code> <code>CR</code>	
Response			
~ <code>nr</code> <code>SIGNAL</code> <code>S</code> <code>inp_id,status</code> <code>CR LF</code>			
Parameters			
<i>inp_id</i> – input number: 1 (HDMI In 1), 2 (HDMI In 2), 3 (PC In) <i>status</i> – lock 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			
Notes			
K-Config Example			
Get the input signal lock status of HDMI In 2: `#SIGNAL? 2",0x0D`			

12.3.2 Authentication Commands

Command	Description
LOGIN	Set/get protocol permission
LOGOUT	Cancel current permission level
PASS	Set/get password for login level
SECUR	Set/get current security state

12.3.2.1 LOGIN

Functions	Permission	Transparency
Set: LOGIN	Not Secure	Public
Get: LOGIN?	Not Secure	Public
Description	Syntax	
Set: Set protocol permission	# LOGIN [SF login_level,password CR]	
Get: Get current protocol permission level	# LOGIN? CR	
Response		
Set: ~nn@ LOGIN [SF login_level,password SF ok CR LF] or ~nn@ LOGIN [SF ERR SF 004 CR LF] (if bad password entered)		
Get: ~nn@ LOGIN [SF login_level CR LF]		
Parameters		
login_level – level of permissions required: User, Admin password – predefined password (by PASS command). Default password is an empty string		
Response Triggers		
Notes		
When the permission system is enabled, LOGIN enables running commands with the User or Administrator permission level When set, login must be performed upon each connection The permission system works only if security is enabled with the SECUR command. It is not mandatory to enable the permission system in order to use the device		
K-Config Example		
Set the protocol permission level to Admin (when the password defined in the PASS command is 33333): "# LOGIN Admin,33333",0x0D		

12.3.2.2 LOGOUT

Functions	Permission	Transparency
Set: LOGOUT	Not Secure	Public
Get: -	-	-
Description	Syntax	
Set: Cancel current permission level	# LOGOUT CR	
Get: -	-	
Response		

~nn@LOGOUTSPORCR LF
Parameters
Response Triggers
Notes
Logs out from User or Administrator permission levels
K-Config Example
"#LOGOUT",0x0D

12.3.2.3 PASS

Functions		Permission	Transparency
Set:	PASS	Administrator	Public
Get:	PASS?	Administrator	Public
Description		Syntax	
Set:	Set password for login level	#PASSSElogin_level,passwordCR	
Get:	Get password for login level	#PASS?SElogin_levelCR	
Response			
~nn@PASSSElogin_level,passwordCR LF			
Parameters			
login_level – level of login to set: User, Admin password – password for the login_level. Up to 15 printable ASCII chars.			
Response Triggers			
Notes			
The default password is an empty string			
K-Config Example			
Set the password for the Admin protocol permission level to 33333: "#PASS Admin,33333",0x0D			

12.3.2.4 SECUR

Functions		Permission	Transparency
Set:	SECUR	Administrator	Public
Get:	SECUR?	Not Secure	Public
Description		Syntax	
Set:	Start/stop security	#SECURSEsecurity_modeCR	
Get:	Get current security state	#SECUR?CR	
Response			
~nn@SECURSEsecurity_modeCR LF			
Parameters			
security_mode – 1 (On / enable security), 0 (Off / disable security)			

Response Triggers
Notes
The permission system works only if security is enabled with the <code>SECUR</code> command
K-Config Example
Enable the permission system: `#SECUR 0",0x0D`

12.3.3 Switching/Routing Commands

Command	Description
ROUTE	Set/get layer routing

12.3.3.1 ROUTE

Functions		Permission	Transparency
Set:	ROUTE	End User	Public
Get:	ROUTE?	End User	Public
Description		Syntax	
Set:	Set layer routing	#ROUTE[S]layer,dest,src[CR]	
Get:	Get layer routing	#ROUTE?[S]layer,dest[CR]	
Response			
~[n]@ROUTE[S]layer,dest,src[CR LF]			
Parameters			
layer – 1 (video), 3 (data) dest – for video layer: 1 (HDBT Out), for data layer: 1 (HDBT data port), 2 (DIP-20 data port), 3 (DIP-20 internal control port) src – for video layer: 1 (HDMI In 1), 2 (HDMI In 2), 3 (PC In), for data layer: 1 (HDBT data port), 2 (DIP-20 data port), 3 (DIP-20 internal control port)			
Response Triggers			
Notes			
The get command identifies input switching on Step-in clients The set command is for remote input switching on Step-in clients (essentially via by the Web)			
K-Config Example			
Set the remote input switching of data to control mode: `#ROUTE 3,1,3",0x0D` Set the remote input switching of data to data mode: `#ROUTE 3,1,2",0x0D`			

12.3.4 Video Commands

Command	Description
VGA-PHASE	Set/get ADC (VGA) sampling phase
VMUTE	Set/get video on output mute

12.3.4.1 VGA-PHASE

Functions		Permission	Transparency
Set:	VGA-PHASE	End User	Public
Get:	VGA-PHASE?	End User	Public
Description		Syntax	
Set:	Set ADC (VGA) sampling phase	#VGA-PHASE ^{SP} channel,value ^{CR}	
Get:	Get ADC (VGA) sampling phase	#VGA-PHASE? ^{SP} channel ^{CR}	
Response			
~nn@VGA-PHASE ^{SP} channel,value ^{CR LF}			
Parameters			
channel – input number: 3 (PC In)			
value – phase number in LSB units: 1-30, ++ (increase current value), -- (decrease current value)			
Response Triggers			
Notes			
K-Config Example			
Increase the current value of the ADC (VGA) sampling phase: "#VGA-PHASE 3,++,0x0D			

12.3.4.2 VMUTE

Functions		Permission	Transparency
Set:	VMUTE	End User	Public
Get:	VMUTE?	End User	Public
Description		Syntax	
Set:	Set enable/disable video on output	#VMUTE[SE]output_id,flag[CR]	
Get:	Get video on output status	#VMUTE?[SE]output_id[SE][CR]	
Response			
Set / Get: ~[nn]@VMUTE[SE]output_id,flag[CR LF]			
Parameters			
output_id - 1 (HDBT Out)			
flag - 0 (disable video on output), 1 (enable video on output), 2 (blank video)			
Response Triggers			
Notes			
K-Config Example			
Disable the video output on HDBT Out: "#VMUTE 3,0",0x0D			

12.3.5 Audio Commands

Command	Description
AUD-EMB	Get audio in video embedding status
AUD-LVL	Set/get volume for specific amplifier output
AUD-SIGNAL?	Get audio input signal status
MUTE	Set/get audio mute

12.3.5.1 AUD-EMB

Functions	Permission	Transparency
Set:		
Get:	AUD-EMB?	End User Public
Description	Syntax	
Set:		
Get:	Get audio in video embedding status	#AUD-EMB? <u>SF</u> <u>in,out</u> <u>CR</u>
Response		
~ <u>nn</u> @AUD-EMB <u>SF</u> <u>in,out,status</u> <u>CR LF</u>		
Parameters		
<i>in</i> – embedded audio input number: 1 (Audio In) <i>out</i> – video output number in which audio is embedded: 1 (HDBT Out) <i>status</i> – embedded status: 1 (On), 0 (Off)		
Response Triggers		
A response is sent to the com port from which the get command was received After execution, a response is sent to all com ports if AUD-EMB was set by any other external control device (button press, device menu and similar)		
Notes		
K-Config Example		
`#AUD-EMB? 1,1",0x0D`		

12.3.5.2 AUD-LVL

Functions		Permission	Transparency
Set:	AUD-LVL	End User	Public
Get:	AUD-LVL?	End User	Public
Description		Syntax	
Set:	Set volume for specific amplifier output	# AUD-LVL <input type="checkbox"/> <i>stage,channel,volume</i> <input type="checkbox"/>	
Get:	Get volume for specific amplifier output	# AUD-LVL? <input type="checkbox"/> <i>stage,channel</i> <input type="checkbox"/>	
Response			
~ <input type="checkbox"/> <input type="checkbox"/> @ AUD-LVL <input type="checkbox"/> <i>stage,channel,volume</i> <input type="checkbox"/> <input type="checkbox"/> LF			
Parameters			
<i>stage</i> – 1 (audio output) <i>channel</i> – output channel number of selected stage: 1 (Audio Out) <i>volume</i> – audio parameter percentage: 0-100 (percent value), ++ (increase current value by 1 percent), -- decrease current value by 1 percent			
Response Triggers			
Notes			
All values are in percentages A minus sign precedes negative values			
K-Config Example			
Set the volume of the Audio Out (1) output to 75%: "#AUD-LVL 1,1,75",0x0D			

12.3.5.3 AUD-SIGNAL

Functions		Permission	Transparency
Set:	-	-	-
Get	AUD-SIGNAL?	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get audio input signal status	# AUD-SIGNAL? <code>[SP]</code> <i>inp_id</i> <code>[CR]</code>	
Response			
~ <code>[nn]</code> @ AUD-SIGNAL <code>[SP]</code> <i>inp_id,status</i> <code>[CR LF]</code>			
Parameters			
<i>inp_id</i> – audio input number: 1 (Audio In) <i>status</i> – 0 (Off / no signal), 1 (On / signal present)			
Response Triggers			
After execution, a response is sent to the com port from which the get command was received A response is sent to all com ports if the audio status was changed on any input			
Notes			
K-Config Example			
`#AUD-SIGNAL? 1",0x0D			

12.3.5.4 MUTE

Functions		Permission	Transparency
Set:	MUTE	End User	Public
Get:	MUTE?	End User	Public
Description		Syntax	
Set:	Set audio mute	# MUTE <code>[SP]</code> <i>channel,mute_mode</i> <code>[CR]</code>	
Get:	Get audio mute	# MUTE? <code>[SP]</code> <i>channel</i> <code>[CR]</code>	
Response			
~ <code>[nn]</code> @ MUTE <code>[SP]</code> <i>channel, mute_mode</i> <code>[CR LF]</code>			
Parameters			
<i>channel</i> – audio output number: 1 (Audio Out) <i>mute_mode</i> – 0 (Off), 1 (On)			
Response Triggers			
Notes			
K-Config Example			
Mute the Audio Out output: `#MUTE 1,1",0x0D			

12.3.6 Communication Commands

Command	Description
ETH-PORT	Set/get Ethernet port protocol
NET-DHCP	Set/get DHCP mode
NET-GATE	Set/get gateway IP
NET-IP	Set/get IP address
NET-MAC	Get MAC address
NET-MASK	Set/get subnet mask

12.3.6.1 ETH-PORT

Functions		Permission	Transparency
Set:	ETH-PORT	Administrator	Public
Get:	ETH-PORT?	End User	Public
Description		Syntax	
Set:	Set Ethernet port protocol	# ETH-PORT [SP portType,ETHPort] CR	
Get:	Get Ethernet port protocol	# ETH-PORT? [SP portType] CR	
Response			
~nn@ ETH-PORT [SP portType,ETHPort] CR LF			
Parameters			
portType – string of 3 letters indicating the port type: TCP, UDP ETHPort – TCP / UDP port number: 0-65565			
Response Triggers			
Notes			
If the port number you enter is already in use, an error is returned The port number must be within the following range: 0-(2^16-1)			
K-Config Example			
Set the Ethernet port protocol for TCP to port 12457: "#ETH-PORT TCP,12457",0x0D			

12.3.6.2 NET-DHCP

Functions		Permission	Transparency
Set:	NET-DHCP	Administrator	Public
Get:	NET-DHCP?	End User	Public
Description		Syntax	
Set:	Set DHCP mode	#NET-DHCP SP mode CR	
Get:	Get DHCP mode	#NET-DHCP? CR	
Response			
~nn@NET-DHCP SP mode CR LF			
Parameters			
<i>mode</i> – 0 (do not use DHCP. Use the IP address set by the factory or the NET-IP command), 1 (try to use DHCP. If unavailable, use the IP address set by the factory or the NET-IP command)			
Response Triggers			
Notes			
<p>Connecting Ethernet to devices with DHCP may take more time in some networks</p> <p>To connect with a randomly assigned IP by DHCP, specify the device DNS name (if available) using the NAME command. You can also get an assigned IP by direct connection to USB or RS-232 protocol port if available</p> <p>Consult your network administrator for correct settings</p>			
K-Config Example			
<p>Enable DHCP mode, if available:</p> <pre>"#NET-DHCP 1",0x0D</pre>			

12.3.6.3 NET-GATE

Functions		Permission	Transparency
Set:	NET-GATE	Administrator	Public
Get:	NET-GATE?	End User	Public
Description		Syntax	
Set:	Set gateway IP	# NET-GATE [SE] <i>ip_address</i> [CR]	
Get:	Get gateway IP	# NET-GATE? [CR]	
Response			
~ [nn] @ NET-GATE [SE] <i>ip_address</i> [CR LF]			
Parameters			
<i>ip_address</i> – gateway IP address, in the following format: xxx.xxx.xxx.xxx			
Response Triggers			
Notes			
A network gateway connects the device via another network, possibly over the Internet. Be careful of security problems. Consult your network administrator for correct settings.			
K-Config Example			
Set the gateway IP address to 192.168.0.1: "#NET-GATE 192.168.000.001",0x0D			

12.3.6.4 NET-IP

Functions		Permission	Transparency
Set:	NET-IP	Administrator	Public
Get:	NET-IP?	End User	Public
Description		Syntax	
Set:	Set IP address	# NET-IP [SE] <i>ip_address</i> [CR]	
Get:	Get IP address	# NET-IP? [CR]	
Response			
~ [nn] @ NET-IP [SE] <i>ip_address</i> [CR LF]			
Parameters			
<i>ip_address</i> – IP address, in the following format: xxx.xxx.xxx.xxx			
Response Triggers			
Notes			
Consult your network administrator for correct settings			
K-Config Example			
Set the IP address to 192.168.1.39: "#NET-IP 192.168.001.039",0x0D			

12.3.6.5 NET-MAC

Functions		Permission	Transparency
Set:	-	-	-
Get:	NET-MAC?	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get MAC address	#NET-MAC?CR	
Response			
~nn@NET-MACSEmac_addressCR LF			
Parameters			
mac_address – unique MAC address. Format: XX-XX-XX-XX-XX-XX where X is hex digit			
Response Triggers			
Notes			
K-Config Example			
"#NET-MAC?",0x0D			

12.3.6.6 NET-MASK

Functions		Permission	Transparency
Set:	NET-MASK	Administrator	Public
Get:	NET-MASK?	End User	Public
Description		Syntax	
Set:	Set subnet mask	#NET-MASKSEnet_maskCR	
Get:	Get subnet mask	#NET-MASK?CR	
Response			
~nn@NET-MASKSEnet_maskCR LF			
Parameters			
net_mask - format: xxx.xxx.xxx.xxx			
Response Triggers			
The subnet mask limits the Ethernet connection within the local network Consult your network administrator for correct settings			
Notes			
K-Config Example			
Set the subnet mask to 255.255.0.0: "#NET-MASK 255.255.000.000",0x0D			

12.3.7 EDID Handling Commands

Additional EDID data functions can be performed via the DIP-20 web pages or a compatible EDID management application, such as Kramer EDID Designer (see www.kramerav.com/product/EDID%20Designer).

Command	Description
CPEDID	Copy EDID data from the output to the input EEPROM
LOCK-EDID	Lock last read EDID

12.3.7.1 CPEDID

Functions		Permission	Transparency
Set:	CPEDID	End User	Public
Get:	-	-	-
Description		Syntax	
Set:	Copy EDID data from the output to the input EEPROM	#CPEDID ^{SF} <i>src_type,src_id,dst_type,dest_bitmap</i> ^{CR}	
Get:	-	-	
Response			
~nn@CPEDID ^{SF} <i>src_type,src_id,dst_type,dest_bitmap</i> ^{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 (HDMI In 1), 2 (HDMI In 2), 3 (PC In), for output source: 1 (HDBT Out), for default EDID source: 0 (default EDID)			
<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 3 bits, for example bitmap 0x5 means inputs 1 and 3 are loaded with the new EDID.			
K-Config Example			
Copy the EDID data from the HDBT Out output (EDID source) to the HDMI In 1 input: "#CPEDID 1,1,0,0x1",0x0D			
Copy the EDID data from the default EDID source to HDMI In 1 and PC In inputs: "#CPEDID 2,0,0,0x5",0x0D			

12.3.7.2 LOCK-EDID

Functions		Permission	Transparency
Set:	LOCK-EDID	End User	End User
Get:	LOCK-EDID?	End User	End User
Description		Syntax	
Set:	Lock last read EDID	#LOCK-EDID <input type="checkbox"/> <i>input_id</i> , <i>lock_mode</i> <input type="checkbox"/>	
Get :	Get EDID lock state	#LOCK-EDID? <input type="checkbox"/> <i>input_id</i> <input type="checkbox"/>	
Response			
~nn@LOCK-EDID <input type="checkbox"/> <i>input_id</i> , <i>lock_mode</i> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
Parameters			
<i>input_id</i> - 1 (HDMI In 1), 2 (HDMI In 2), 3 (PC In), <i>lock_mode</i> - 0 (Off: unlocks EDID), 1 (On: locks EDID)			
Response Triggers			
Notes			
K-Config Example			
Lock the last read EDID from the HDMI In 2 input: "#LOCK-EDID 2,1",0x0D			

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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.

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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.

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