KRAMER

USER MANUAL

MODEL:

DIP-30 Automatic Video Switcher

DIP-30 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 http://www.kramerav.com/manual/DIP-30 to download the latest manual or scan the QR code on the left.

Step 1: Check what's in the box

- ☑ The **DIP-30** Automatic Video Switcher
- ☑ 1 Power supply
- ☑ 4 Rubber feet
- ☑ 1 Quick start guide
- ☑ ADC-DPM/HF DisplayPort (M) to HDMI (F) adapter cable

Step 2: Install the DIP-30

Mount the device in a rack (using the optional **RK-T2B rack** adapter available for purchase) or attach the rubber feet and place it on a shelf.

Step 3: Connect the inputs and outputs

Always switch off the power to each device before connecting it to your **DIP-30**.
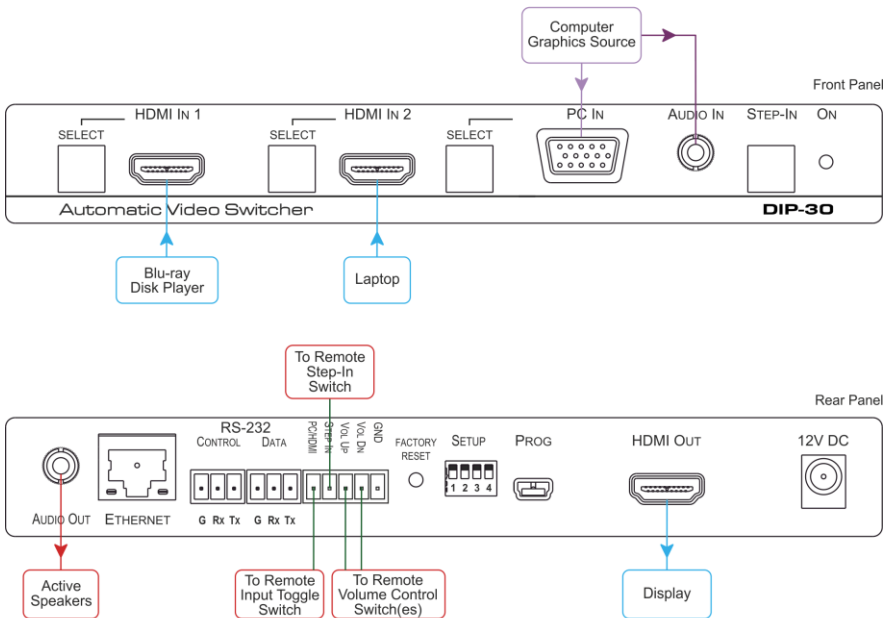
Step 4: Set the DIP-switches

#	Feature	Function	Switch State	
1	Video Input Selection Mode	Selects manual or auto input selection	On—Manual switching Off—Auto switching	
2	Video Auto Selection Mode	Selects priority or last connected mode	On—Priority mode, (HDMI, VGA) Off—Last connected	
3	Audio Selection Mode	Selects manual or auto audio switching mode	On—Manual switching Off—Auto switching	
4	Audio Input Priority	Sets the audio signal selection priority	On	DIP-switch 3 On: Analog audio input
				DIP-switch 3 Off: HDMI → Analog priority
			Off	DIP-switch 3 On: HDMI audio input
				DIP-switch 3 Off: Analog → HDMI priority

DIP-switch 2 Status	DIP-switch 1 Auto Switching (Off)	DIP-switch 1 Manual Switching (On)
Off—Last connected	When more than one source is connected, the last one connected gets priority	Manual video input selection
On—Priority	When more than one source is connected, the active source is selected according to the	Manual video input selection

Audio Output Signal Description

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

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

Step 5: Connect the power

Connect the power adapter to the **DIP-30**, and plug the adapter into the mains power. Power on all attached devices.

Step 6: Operate the DIP-30

You can operate the **DIP-30** via the front panel buttons, remote P3000 commands, or by using a Web browser to access the built in Web pages.

Contents

Figures

1   Introduction

Welcome to Kramer Electronics! Since 1981, Kramer Electronics has been providing a world of unique, creative, and affordable solutions to the vast range of problems that confront video, audio, presentation, and broadcasting professionals on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better!

Our 1,000-plus different models now appear in 14 groups that are clearly defined by function: GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Routers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters; GROUP 11: Sierra Video Products; GROUP 12: Digital Signage; GROUP 13: Audio; and GROUP 14: Collaboration.

Congratulations on purchasing your Kramer **DIP-30** *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 http://www.kramerav.com/downloads/DIP-30 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-30** *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 Recycling Kramer Products

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

3   Overview

The **DIP-30** accepts two HDMI signals and a PC graphics video input, an Ethernet signal, serial data, and an unbalanced stereo audio input (which is embedded into the output signal), and transmits the signal via HDMI cable to a display or an HDMI switcher, (for example, the **VS-62H** which also supports the step-in function).

The **DIP-30** *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

- 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

4 Defining the Automatic Video Switcher

Figure 1 defines the front panel of the **DIP-30**.
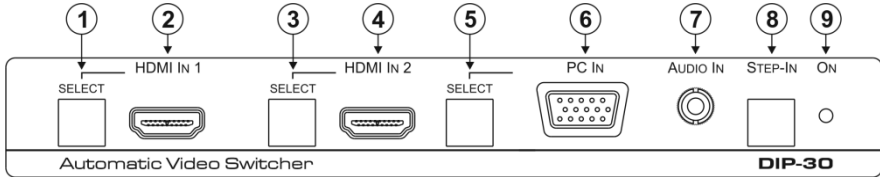
Figure 1: DIP-30 Front Panel

#	Feature		Function
1	HDMI IN 1	*SELECT* Button	Press to select the HDMI 1 input. When HDMI 1 is selected, the button: • Lights red when external audio is selected • Lights green when HDMI 1 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: • Lights red when external audio is selected • Lights green when HDMI 2 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: • Lights red when external audio is selected • Lights green when the PC input selected
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		Lights green when the device is powered on

Figure 2 defines the rear panel of the **DIP-30**.
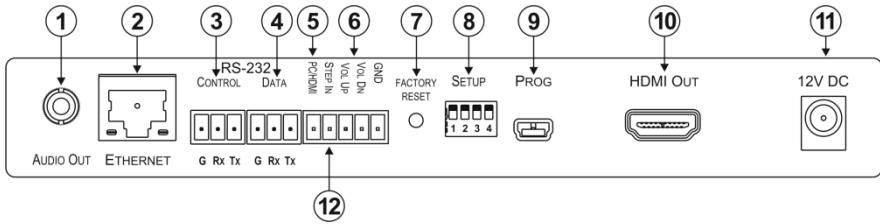
Figure 2: DIP-30 Rear Panel

#	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	For future use
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 step-in and audio volume
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	*HDMI OUT* Connector		Connect to a compatible HDMI display
11	*12V* DC Connector		Connect to the supplied power adapter

DIP-30 - Defining the Automatic Video Switcher

5 Connecting the DIP-30 Automatic Video Switcher

> Always switch off the power to each device before connecting it to your **DIP-30**. After connecting your **DIP-30**, connect the power to each of them and then switch on the power to each device.
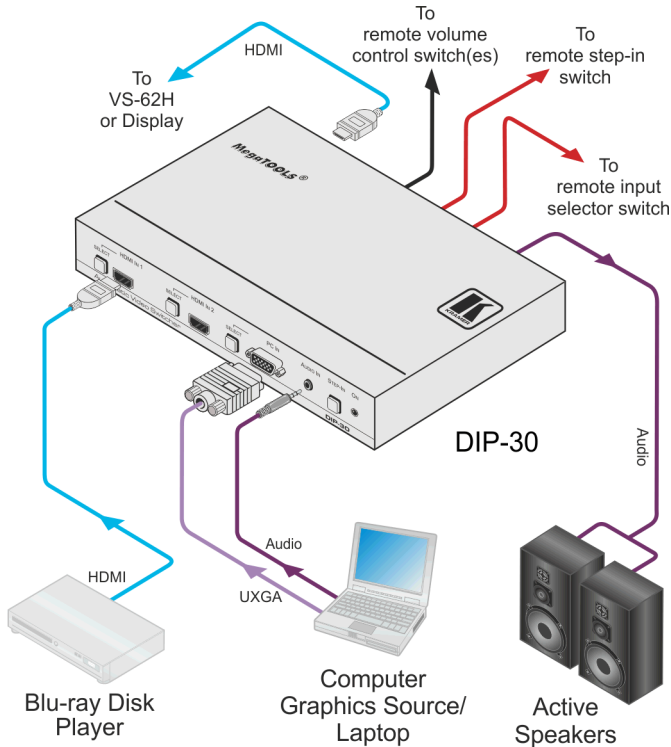
Figure 3: Connecting the DIP-30

To connect the DIP-30 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 HDMI OUT connector on the rear panel of the **DIP-30** to an HDMI compatible switcher or display.

5. Connect the AUDIO OUT 3-pin terminal block on the rear panel of the **DIP-30** to the unbalanced, stereo audio acceptor, (for example, active speakers).

6. Connect the STEP IN 2-way terminal block to a momentary, contact-closure switch, (see Section 5.1).

7. Connect the PC/HDMI 2-way terminal block to a momentary, contact-closure switch for input selection, (see Section 5.1).

8. Connect the Vol Up/Vol Down 3-pin terminal block to remote, contact-closure, volume control switches.

9. Connect the power adapter to the **DIP-30** 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-30** to control the device.

Figure 4 illustrates the connections from the terminal block to the contact-closure switches.
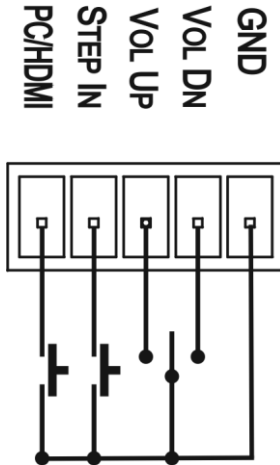
Figure 4: Remote Switches Terminal Block

#	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

6 Principles of Operation

The **DIP-30** 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 <u>Section 8.1</u>) 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 select 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-30** automatically selects the last connected input, (the delay depending on the configurable signal-lost 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 analog audio 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 1 and G 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 12.2)

7   Operating the DIP-30

The **DIP-30** can be operated using any of the following methods:

- Front panel buttons

- Protocol 3000 command, (see Section 12.2)

- Remote contact-closure switch, (see Section 5.1)

- Web pages, (see Section 9)

7.1   Locking the EDID

To lock the EDID and prevent the stored EDID (either default or read from a device) from being overwritten:

- Send a Protocol 3000 command, (see Section 12.2)

- Use the Web pages, (see Section 9)

7.2   Resetting the DIP-30

The **DIP-30** can be reset to factory default by either:

- Using the button on the rear panel

- Using the Web pages, (see Section 9)

To perform a soft reset of the DIP-30:

- Briefly press the Reset button.
  The device resets

To reset the DIP-30 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 number of up/down volume steps per press is detailed in the table below.

Ramp	Volume Reading	Volume (dB)
1	100	0
1	99	–0.5
1	98	–1.0
1	97	–1.5
1	96	–2.0
1	…	(0.5 steps)
1	12	–44.0
1	11	–44.5
1	10	–45.0
1	9	–45.5
2	…	(2.0 steps)
2	8	–47.0
2	7	–49.0
2	6	–51.0
2	5	–53.0
2	4	–55.0
2	3	–57.0
2	2	–59.0
2	1	–61.0
2	0	–63.0

8   Configuring the DIP-30

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).
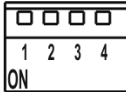
Figure 5: The Configuration DIP-switch

#	Feature	Function	DIP-switch	
1	Manual/Auto Switching	Selects either manual or auto input switching	On—Manual switching Off—Auto switching	
2	Priority/Last Connected Switching	Selects either priority or last connected input switching	On—Priority switching Off—Last connected switching Default video input priority is HDMI 1 → HDMI 2 → PC	
3	Manual/Auto Audio Switching	Selects either manual or auto audio input selection	On—Manual switching Off—Auto switching	
4	Analog/HDMI Audio Priority Switching	Selects either the analog or the HDMI audio input as priority	On	DIP-switch 3 On: Analog audio input
				DIP-switch 4 Off: HDMI → Analog priority
			Off	DIP-switch 3 On: HDMI audio input
				DIP-switch 4 Off: Analog → HDMI priority

The following table describes the switching priorities defined by DIP-switches 1 and 2.

DIP-switch 2 Status	DIP-switch 1 (off) Auto Switching	DIP-switch 1 (on) Manual Switching
Off—Last Connected	When more than one source is connected, the last one connected gets priority	Manual video input selection
On—Priority	When more than one source is connected, the active source is selected according to the pre-defined priority	Manual video input selection

8.2 Video Switching Timeouts

When the **DIP-30** is configured for auto switching, the timeouts before a new input is automatically selected can be changed as shown in the table below.

	Signal Loss, Power Present	Signal and Power Loss
Default Timeout	10 seconds	0 seconds

Note: The minimum value of "Signal Loss, Power Present" is five seconds.

9 Operating the DIP-30 Remotely Using the Web Pages

The **DIP-30** 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 Browsing the DIP-30 Web Pages

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

To browse the DIP-30 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.

Note: If authentication is enabled, the following window appears (Figure 6) and you must enter the valid username and password to access the Web pages. For default authentication details, see Section 10.2.
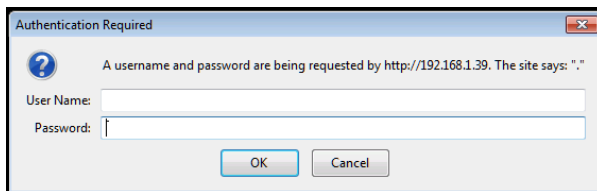
Figure 6: Entering Logon Credentials

Following a successful logon, the screen shown in Figure 7 is displayed.
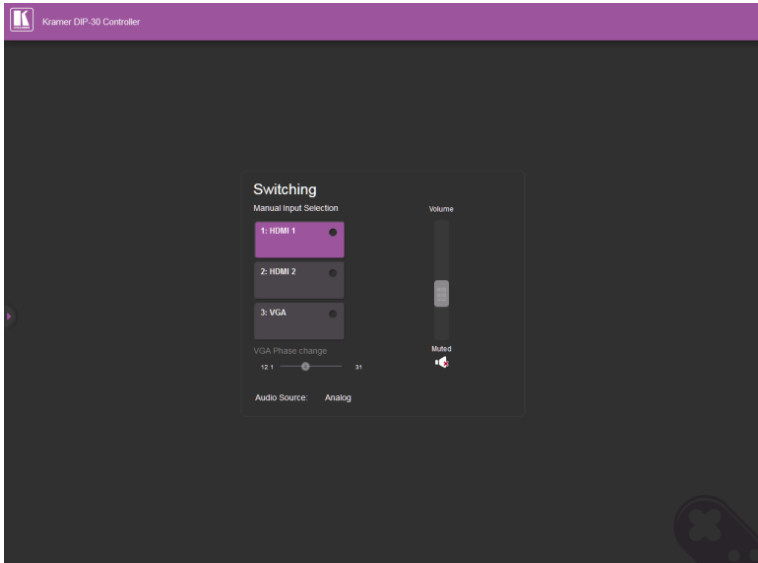
Figure 7: The Default Page

Click the Reveal button to open the left hand side page panel.

The Switching page appears as shown in Figure 8.
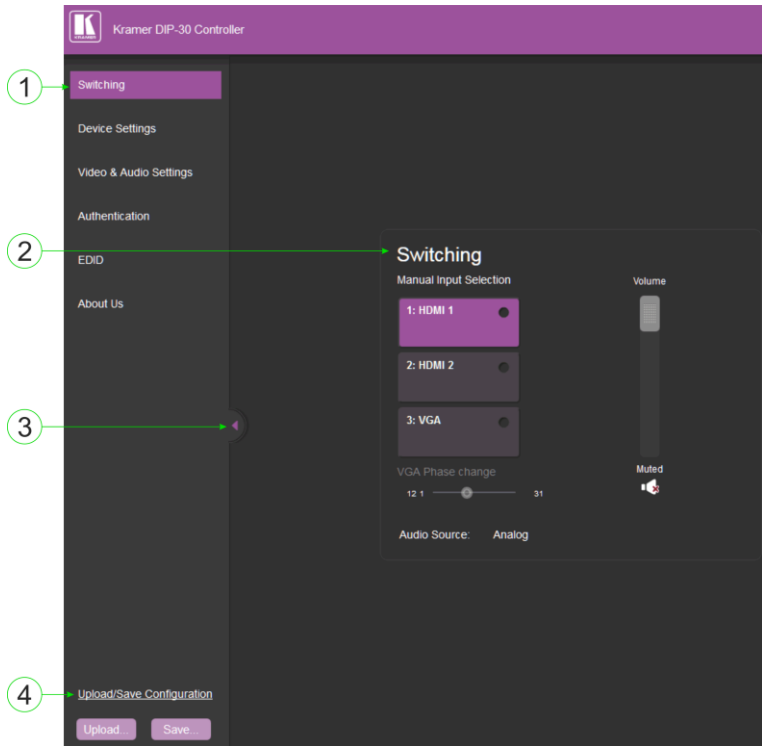
Figure 8: The Main Switching Page

The areas of the main switching page are described in the following table.

#	Item	Description
1	Page Selection Panel	Click one of the buttons to select a page
2	Switching Selection	Switching and control section. Click one of the buttons to select a video input. Adjust the VGA phase shift. Adjust the audio volume. Select data routing mode
3	Hide/Reveal Button	Click to hide or reveal the page selection panel
4	Upload/Save Configuration Area	Click one of the buttons to save or retrieve a configuration, (see Section 9.1.1)

There are six Web pages described in the following sections:

- Switching (see Section 9.2)

- Device Settings (see Section 9.3)

- Video and Audio Settings (see Section 9.4)

- Authentication (see Section 9.5)

- EDID (see Section 9.6)

- About Us (see Section 9.7)

9.1.1 The Upload/Save Configuration Facility

The Upload/Save Configuration facility (see item 4 in Figure 8) lets you retrieve and save a configuration.

To upload a configuration:

1. Click the Upload button.
   The File Upload browser window appears.

2. Browse to the required file and press Open.
   The configuration is retrieved and the success message is displayed.

To save the current configuration:

1. Click the Save button.
   The Save Configuration success message is displayed.

2. Do either of the following:

   - Click Download to either open the file or save it to the required location
     —OR—
   - Click OK to complete the procedure

9.2 The Switching Page

The Switching page lets you select a video input manually, adjust the VGA phase shift, and adjust the audio volume. It also displays the current audio source.
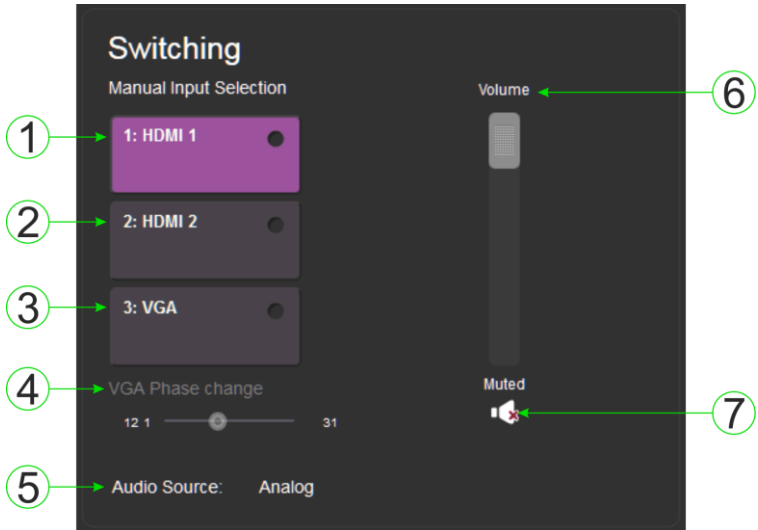
Figure 9: The Switching Page

#	Item	Description
1	*HDMI 1* Button	Click to select the HDMI 1 input. The button color indicates whether or not there is a live signal on the input
2	*HDMI 2* Button	Click to select the HDMI 2 input
3	*VGA* Button	Click to select the VGA input
4	*VGA Phase Change* Slider	Click and slide to the left or right to adjust the VGA phase change
5	*Audio Source:* Indicator	Indicates the source of the audio that is transmitted on the output
6	*Volume* Slider	Click and slide up and down to increase or decrease the audio output volume
7	Mute Button	Click to mute or unmute the output audio

9.3   The Device Settings Page

The Device Settings page lets you:

- View some of the device characteristics, (for example, model and Web version)

- Edit IP settings, (for example, name and IP address)

- Upgrade the firmware

- 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.
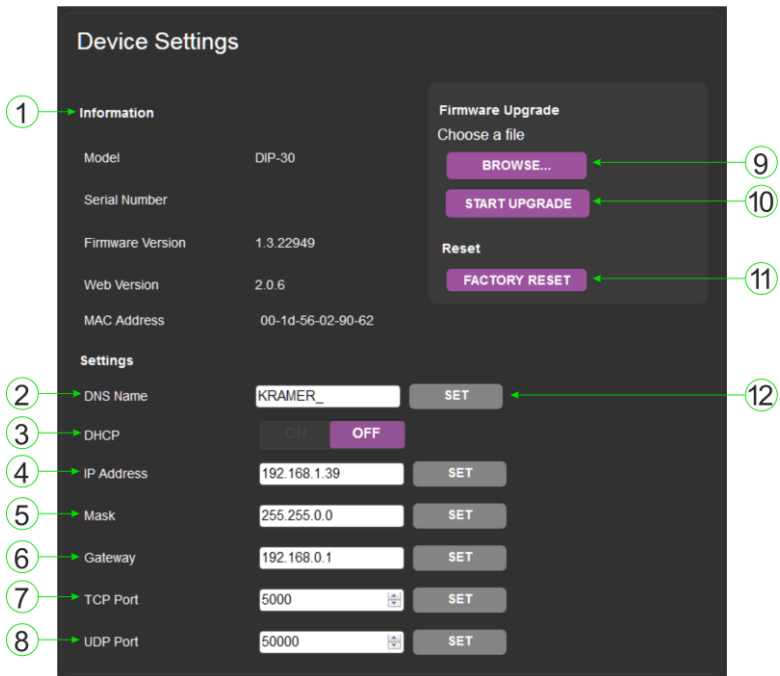
Figure 10: The Device Settings Page

#	Item		Description
1	Information Section		Displays information regarding the device, such as, the model, serial number, and MAC address
2	DNS name		The DNS name of the device. To set a new name, enter the new alphanumeric name and click Set. (For restrictions regarding the name, see Section 10.2)
3	DHCP Buttons		Click ON to turn DHCP on; click OFF to turn DHCP off and use static IP addressing
4	IP address		The IP address of the device. To set a new IP address, enter the new valid IP address and click Set
5	Mask		The network mask of the device. To set a new mask, enter the new valid mask and click Set
6	Gateway		The network gateway for the device. To set a new network gateway, enter the new valid gateway and click Set
7	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
8	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
9	Firmware upgrade Section	BROWSE button	Click to open a window to browse to the new firmware file
10		START UPGRADE button	Click to start the upgrade process following the selection of the new firmware file
11	Factory Reset Button		Click to reset the device to factory default parameters. After the success message is displayed, power cycle the device
12	Set Button		Click to store a changed parameter. **Note**: If you do not click the Set button, the new parameter is not saved

To upgrade the firmware:

1. Click the Browse button.

   The Windows Browser opens.

2. Browse to the required file.

3. Select 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-30** may be damaged.

5. When the process is complete reboot the device.

   The firmware is upgraded.

To reset the DIP-30 to factory default parameters:

1. Click the Factory reset button.

   The confirmation message is displayed.

2. Click OK to continue or Cancel to exit the procedure.

3. Click OK.

   The progress message is displayed.

   On completion, the success message is displayed.

4. Click OK.

9.4 The Video and Audio Settings Page

The Video and Audio Settings page lets you modify the video, audio and timeout parameters.
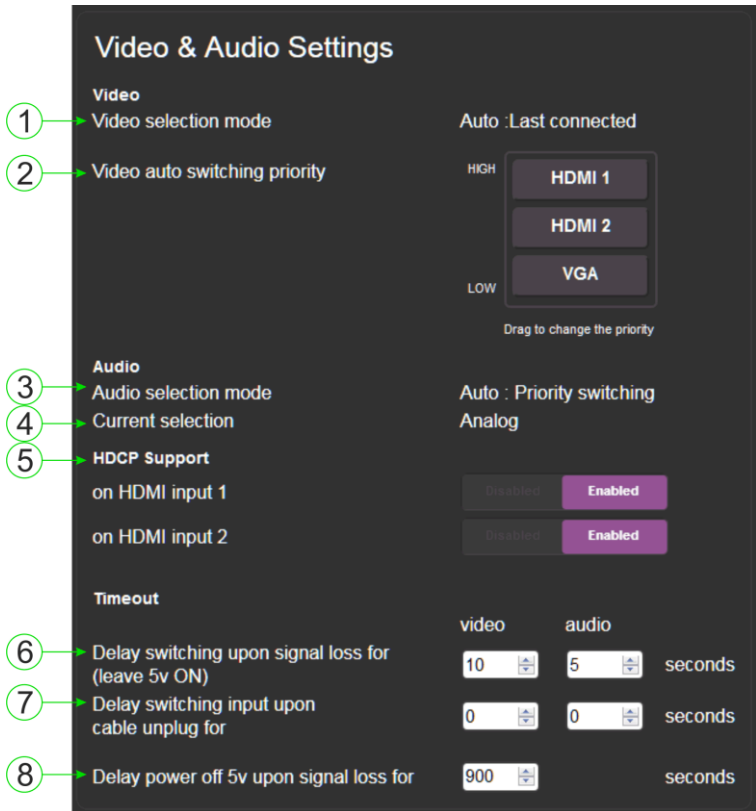
Figure 11: The Video and Audio Settings Page

#	Item	Description
1	*Video selection mode* Indicator	Indicates the current video selection mode; Manual, Auto, or Auto Last connected
2	*Video auto switching priority* Buttons	Click and drag the buttons to the required priority level to use when in auto mode, top is highest priority and bottom is lowest priority
3	*Audio selection mode* Indicator	Indicates the current audio selection mode; Manual, Auto, or Auto Priority switching

#	Item	Description
4	*Current selection* Audio Indicator	Indicates the current audio selection; Embedded or Analog
5	*HDCP Support* (on HDMI input) Buttons	Select HDCP support for HDMI 1 and HDMI 2 Disabled—HDCP encrypted content is not passed Enabled—HDCP support is dictated by the display
6	*Delay switching upon signal loss for (leave 5V on)* Box	Sets the delay for video and audio before switching (in auto mode) because of a signal loss on the currently selected input. Value in seconds
7	*Delay switching input upon cable unplug for* Box	Sets the delay for video and audio before switching (in auto mode) because the currently selected input cable is unplugged. Value in seconds
8	*Delay power off 5V upon signal loss for* Box	Sets the delay for turning off the 5V output because of a signal loss on the currently selected input. Value in minutes

9.5 The Authentication Page

The Authentication page lets you assign or change logon authentication details.

Figure 12: The Authentication Page

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

9.6 The EDID Page

The EDID page lets you copy EDID data to one or more 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.
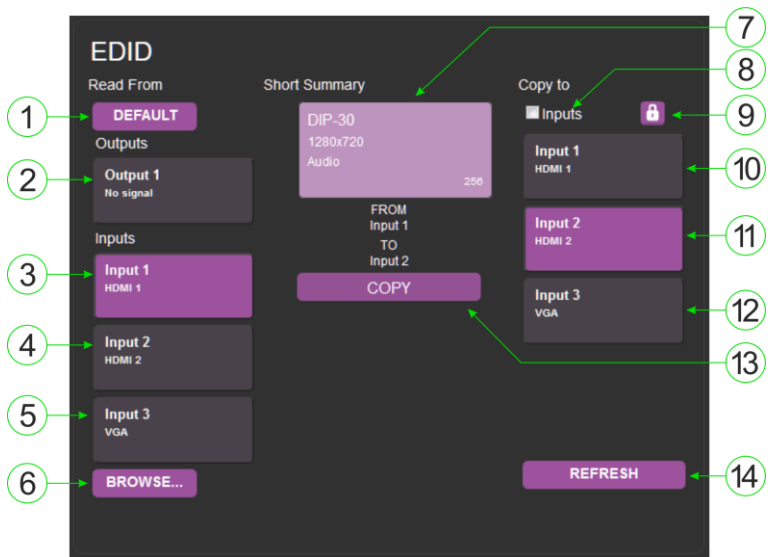
Figure 13: The EDID Page

Note: The display is not updated automatically when the status of an EDID changes on the device caused by outputs being exchanged. Click Refresh to update the display, (see item 14 in the following table).

#	Item		Description
1	*Read from* Section	*DEFAULT* EDID button	Click to read the default EDID
2		*Output 1* button	Click to read the EDID from output 1
3		*Input 1* button	Click to read the EDID from input 1 (HDMI 1)
4		*Input 2* button	Click to read the EDID from input 1 (HDMI 2)
5		*Input 3* button	Click to read the EDID from input 2 (VGA)
6		*BROWSE* button	Click to open the file browser to select an EDID file on your computer
7	*Short Summary* Information Section		Displays the current election of EDID source, destination, video resolution, audio availability, and status
8	*Copy to* Section	*Inputs* selection box	Check the box to select all inputs
9		Lock button	Click to lock the EDID on the currently selected input. Click again to unlock the EDID
10		*Input 1* button	Click to select input 1 as the destination (HDMI 1), (you can select more than one input at the same time)
11		*Input 2* button	Click to select input 2 as the destination (HDMI 2)
12		*Input 3* button	Click to select input 3 as the destination (VGA)
13	*COPY* Button		Click to copy the EDID from the selected source to the selected destination
14	*REFRESH* Button		Click to refresh the display

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

1. Click the 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. Click a destination input, or select all inputs by checking the Inputs check-box.
   All selected input buttons change color and the EDID summary information reflects the selection and EDID data.

3. Click the Copy button.
   The "EDID was copied" success message is displayed and the EDID data is copied to the selected input(s).

DIP-30 - Operating the DIP-30 Remotely Using the Web Pages

4. Click OK.

9.7 The About Us Page

The **DIP-30** About Us page displays the Web page version and Kramer
Electronics Ltd company details.

Figure 14: The 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 HDMI on an HDMI 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, (for internal use only) 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
MAXIMUM ANALOG AUDIO LEVELS:		3.1V p-p
THD:		0.013%
SNR:		75dB
SUPPORTED WEB BROWSERS:		Windows 7 and higher: - Internet Explorer (32/64 bit) version 11 - Firefox version 30 - Chrome version 35 MAC: - Chrome version 35 - Firefox version 27 - Safari version 7 Android OS: - Chrome version 35 iOS: - Chrome version 35 - Safari version 7
POWER CONSUMPTION:		12V DC, 560mA
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:		Aluminium
DIMENSIONS:		18.75cm x 11.5cm x 2.54cm (7.38" x 4.53" x 1.0") W, D, H
WEIGHT:		0.43kg (0.95lbs) approx.
SHIPPING WEIGHT:		0.93kg (2.05lbs) approx.

ENVIRONMENTAL REGULATORY COMPLIANCE:	Complies with appropriate requirements of RoHs and WEEE
INCLUDED ACCESSORIES:	Power adapter, ADC-DPM/HF DisplayPort (M) to HDMI (F) adapter cable
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 Resolutions

10.3.1 HDMI

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
1280x800p	60Hz
1280x960	60Hz

Resolution	Refresh Rate (Hz)
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

10.3.2   VGA

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; 50Hz

DIP-30 - Technical Specifications

11 Default EDID

Each input on the **DIP-30** is loaded with a factory default EDID.

11.1 HDMI

```
Monitor
  Model name...............DIP-30
  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,20,20,20,20,20,20,00,00,00,FC,00,41,
56,53,2D,33,32,20,20,20,20,20,20,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,01,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,
00,00,18,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,47
```

**DIP-30 - Default EDID**

## 11.2  PC-UXGA

Monitor
  Model name.............. DIP-30
  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

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,19,01,03,6E,34,20,78,EE,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,20,20,20,20,20,20,00,00,00,FC,00,41,
  56,53,2D,33,32,20,20,20,20,20,20,20,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,C6,
  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,
  00,00,18,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,47

**DIP-30 - Default EDID**

# 12 Protocol 3000

The **Automatic** Video Switcher 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 Section 12.1)

- Kramer Protocol 3000 commands (see Section 12.2)

## 12.1 Kramer Protocol 3000 Syntax

### 12.1.1 Host Message Format

| Start | Address (optional) | Body | Delimiter |
|-------|--------------------|------|-----------|
| # | *Device_id*@ | **Message** | CR |

#### 12.1.1.1 Simple Command

Command string with only one command without addressing:

| Start | Body | Delimiter |
|-------|------|-----------|
| # | **Command** SP *Parameter_1,Parameter_2,…* | CR |

#### 12.1.1.2 Command String

Formal syntax with commands concatenation and addressing:

| Start | Address | Body | Delimiter |
|-------|---------|------|-----------|
| # | *Device_id*@ | **Command_1** *Parameter1_1,Parameter1_2,…*\| **Command_2** *Parameter2_1,Parameter2_2,…*\| **Command_3** *Parameter3_1,Parameter3_2,…*\|… | CR |

### 12.1.2 Device Message Format

| Start | Address (optional) | Body | Delimiter |
|-------|--------------------|------|-----------|
| ~ | *Device_id*@ | **Message** | CR LF |

### 12.1.2.1 Device Long Response

Echoing command:

| Start | Address (optional) | Body | Delimiter |
|-------|--------------------|------|-----------|
| ~ | *Device_id*@ | **Command** `SP` *[Param1 ,Param2 …]* result | `CR` `LF` |

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

### 12.1.3 Command Terms

**Command**

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

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

**Parameters**

A sequence of 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.

## 12.1.4 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.

## 12.1.5 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.

## 12.1.6 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.

### 12.1.7 Maximum String Length

64 characters

## 12.2 Kramer Protocol 3000 Commands

### 12.2.1 System Commands

| Command | Description |
|---|---|
| # | Protocol handshaking |
| BUILD-DATE? | Get device build date |
| FACTORY | Reset to factory default configuration |
| HELP | Get command list |
| MODEL? | Get device model |
| PROT-VER? | Get device protocol version |
| RESET | Reset device |
| SN? | Get device serial number |
| VERSION? | Get device firmware version |
| AV-SW-MODE | Set/get auto switch mode |
| AV-SW-TIMEOUT | Set/get auto switching timeout |
| DISPLAY? | Get output HPD status |
| FPGA-VER? | Get current FPGA version |
| HDCP-MOD | Set/get HDCP mode |
| HDCP-STAT? | Get HDCP signal status |
| LDFW | Load new firmware file |
| NAME | Set/get machine (DNS) name |
| NAME-RST | Reset machine name to factory default (DNS) |
| PRIORITY | Set/get priority for all channels |
| SIGNAL? | Get input signal lock status |

| Command - # | | Command Type - System-mandatory | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **#** | End User | Public |
| Get: | **-** | - | - |
| **Description** | | **Syntax** | |
| Set: | Protocol handshaking | **#**[CR] | |
| Get: | - | - | |
| **Response** | | | |
| ~[nn]@[SP]**OK**[CR LF] | | | |
| **Parameters** | | | |
| | | | |
| **Response Triggers** | | | |
| | | | |
| **Notes** | | | |
| Validates the Protocol 3000 connection and gets the machine number<br>Step-in master products use this command to identify the availability of a device | | | |


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

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


| Command - **MODEL?** | | Command Type - System-mandatory | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **-** | - | - |
| Get: | **MODEL?** | End User | Public |
| **Description** | | **Syntax** | |
| Set: | - | - | |
| Get: | Get device model | #**MODEL?**⌐CR⌐ | |
| **Response** | | | |
| ~⌐nn⌐@**MODEL**⌐SP⌐model_name⌐CR LF⌐ | | | |
| **Parameters** | | | |
| model_name - String of up to 19 printable ASCII chars | | | |
| **Response Triggers** | | | |
| | | | |
| **Notes** | | | |
| This command identifies equipment connected to Step-in master products and notifies of identity changes to the connected equipment. The Matrix saves this data in memory to answer REMOTE-INFO requests | | | |

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

| Command - **RESET** | | Command Type - System-mandatory | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **RESET** | Administrator | Public |
| Get: | **-** | - | - |
| **Description** | | **Syntax** | |
| Set: | Reset device | #**RESET**CR | |
| Get: | - | - | |
| **Response** | | | |
| ~nn@**RESET**SP**OK**CR LF | | | |
| **Parameters** | | | |
| | | | |
| **Response Triggers** | | | |
| | | | |
| **Notes** | | | |
| To avoid locking the port due to a USB bug in Windows, disconnect USB connections immediately after running this command. If the port was locked, disconnect and reconnect the cable to reopen the port. | | | |

| Command - **SN?** | | Command Type - System-mandatory | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **-** | - | - |
| Get: | **SN?** | End User | Public |
| **Description** | | **Syntax** | |
| Set: | - | - | |
| Get: | Get device serial number | **#SN?**`CR` | |
| **Response** | | | |
| ~`nn`@**SN**`SP`*serial_number*`CR LF` | | | |
| **Parameters** | | | |
| *serial_number* - 11 decimal digits, factory assigned | | | |
| **Response Triggers** | | | |
| | | | |
| **Notes** | | | |
| For new products with 14 digit serial numbers, use only the last 11 digits | | | |

| Command - **VERSION?** | | Command Type - System-mandatory | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **-** | - | - |
| Get: | **VERSION?** | End User | Public |
| **Description** | | **Syntax** | |
| Set: | - | - | |
| Get: | Get firmware version number | **#VERSION?**`CR` | |
| **Response** | | | |
| ~`nn`@**VERSION**`SP`*firmware_version*`CR LF` | | | |
| **Parameters** | | | |
| *firmware_version* - XX.XX.XXXX where the digit groups are: major.minor.build version | | | |
| **Response Triggers** | | | |
| | | | |
| **Notes** | | | |
| | | | |

| Command - **AV-SW-MODE** | | Command Type - System | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **AV-SW-MODE** | End user | Public |
| Get: | **AV-SW-MODE?** | End user | Public |
| **Description** | | **Syntax** | |
| Set: | Set input auto switch mode (per output) | # **AV-SW-MODE** SP *layer,output_id,mode* CR | |
| Get: | Get input auto switch mode (per output) | # **AV-SW-MODE?** SP *layer,output_id* CR | |
| **Response** | | | |
| ~ nn @**AV-SW-MODE** SP *layer,output_id,mode* CR LF | | | |
| **Parameters** | | | |
| layer (see Section 12.2.10) <br> output_id - 1….num of system outputs <br> mode - 0 - manual <br>        1 - priority switch <br>        2 - last connected switch | | | |
| **Response Triggers** | | | |
| | | | |
| **Notes** | | | |
| | | | |

| Command - **AV-SW-TIMEOUT** | | Command Type - System | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **AV-SW-TIMEOUT** | End User | Public |
| Get: | **AV-SW-TIMEOUT?** | End User | Public |
| **Description** | | **Syntax** | |
| Set: | Set auto switching timeout | #**AV-SW-TIMEOUT** SP *action,time_out* CR | |
| Get: | Get auto switching timeout | #**AV-SW-TIMEOUT?** SP *action* CR | |
| **Response** | | | |
| ~ nn @**AV-SW-TIMEOUT** SP *action,time_out* CR | | | |
| **Parameters** | | | |
| *action* (see Section 12.2.11) <br> *timeout* - timeout in seconds | | | |
| **Response Triggers** | | | |
| | | | |
| **Notes** | | | |
| | | | |

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

| Command - **FPGA-VER?** | | Command Type - System | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **-** | - | - |
| Get: | **FPGA-VER?** | End User | Public |
| **Description** | | **Syntax** | |
| Set: | - | - | |
| Get: | Get current FPGA version | #**FPGA-VER?** `SP` *io* `CR` | |
| **Response** | | | |
| ~ `nn` @**FPGA-VER** `SP` *id, expected_ver, actual_ver* `CR LF` | | | |
| **Parameters** | | | |
| *id* - FPGA id<br>*expected_ver* - expected FPGA version for current firmware<br>*actual_ver* - actual FPGA version | | | |
| **Response Triggers** | | | |
| | | | |
| **Notes** | | | |
| | | | |

**DIP-30 - Protocol 3000**

| Command - **HDCP-MOD** | | Command Type - System | |
|---|---|---|---|
| **Command Name** | | **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** | | | |
| *inp_id* - input number (1.. max number of inputs) <br> *mode* - HDCP mode | | | |
| **Response Triggers** | | | |
| Response is sent to the com port from which the Set (before execution) / Get command was received <br> 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 | | | |
| **Notes** | | | |
| Set HDCP working mode on the device input: <br>   HDCP supported - HDCP_ON  [default] <br>   HDCP not supported - HDCP OFF <br>   HDCP support changes following detected sink - MIRROR OUTPUT | | | |

| Command - **HDCP-STAT** | | Command Type - System | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | - | - | - |
| Get: | **HDCP-STAT?** | End User | Public |
| **Description** | | **Syntax** | |
| Set: | None | - | |
| Get: | Get HDCP signal status | #**HDCP-STAT?** `SP` *stage,stage_id* `CR` | |
| **Response** | | | |
| Set / Get: ~ `nn` @**HDCP-STAT** `SP` *stage,stage_id,mode* `CR LF` | | | |
| **Parameters** | | | |
| *stage* – input/output<br>*stage_id* - number of chosen stage (1.. max number of inputs/outputs)<br>*actual_status* - signal encryption status - valid values ON/OFF | | | |
| **Response Triggers** | | | |
| Response is sent to the com port from which the Set (before execution) / Get command was received<br>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<br>On input – signal status | | | |

| Command - **LDFW** | | Command Type - System - Packets | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **LDFW** | Internal SW | Public |
| Get: | **-** | - | - |
| **Description** | | **Syntax** | |
| Set: | Load new firmware file | Step 1: #**LDFW** `SP` *size* `CR` <br> Step 2: If ready was received, send FIRMWARE_DATA | |
| Get: | - | - | |
| **Response** | | | |
| Response 1: ~`nn`@**LDFW** `SP` *size* `SP` **READY** `CR LF`  or ~`nn`@**LDFW** `SP` **ERRnn** `CR LF` <br> Response 2: ~`nn`@**LDFW** `SP` *size* `SP` **OK** `CR LF` | | | |
| **Parameters** | | | |
| *size* - size of firmware data that is sent <br> FIRMWARE_DATA - HEX or KFW file in protocol packets (see Section 4) | | | |
| **Response Triggers** | | | |
| | | | |
| **Notes** | | | |
| In most devices firmware data is saved to flash memory, but the memory does not update until receiving the "UPGRADE" command and is restarted. <br> Use this command in dedicated SW application | | | |


| Command - **NAME** | | Command Type - System (Ethernet) | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **NAME** | Administrator | Public |
| Get: | **NAME?** | End User | Public |
| **Description** | | **Syntax** | |
| Set: | Set machine (DNS) name | #**NAME** `SP` *machine_name* `CR` |
| Get: | Get machine (DNS) name | #**NAME?** `CR` |
| **Response** | | | |
| Set: ~`nn`@**NAME** `SP` *machine_name* `CR LF` <br> Get: ~`nn`@**NAME?** `SP` *machine_name* `CR LF` | | | |
| **Parameters** | | | |
| *machine_name* - String of up to 14 alpha-numeric chars (can include hyphen, not at the beginning or end) | | | |
| **Response Triggers** | | | |
| | | | |
| **Notes** | | | |
| The machine name is not the same as the model name. The machine name is used to identify a specific machine or a network in use (with DNS feature on) | | | |

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


| Command - **PRIORITY** | | Command Type - System | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **PRIORITY** | Administrator | Public |
| Get: | **PRIORITY?** | Administrator | Public |
| **Description** | | **Syntax** | |
| Set: | Set input priority | # **PRIORITY** SP *layer,PRIORITY1, PRIORITY2… PRIORITYn* CR | |
| Get: | Get input priority | # **PRIORITY?** *layer* CR | |
| **Response** | | | |
| ~ nn @ **PRIORITY** SP *layer,PRIORITY1, PRIORITY2… PRIORITYn* CR LF | | | |
| **Parameters** | | | |
| *layer* (see Section 12.2.10) <br> *PRIORITY1* - priority of first input <br> *PRIORITYn* - priority of input n | | | |
| **Response Triggers** | | | |
| | | | |
| **Notes** | | | |
| **WP-577VH** – layer parameter is not used | | | |

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

## 12.2.2 File System Commands

| Command | Description |
|---------|-------------|
| DEL | Delete file |
| DIR | List files in device |
| FORMAT | Format file system |
| FS-FREE? | Get file system free space |
| GET | Get file |
| LOAD | Load file to device |

| Command - **DEL** | | Command Type - File System | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **DEL** | Administrator | Public |
| Get: | **-** | - | - |
| **Description** | | **Syntax** | |
| Set: | Delete file | #**DEL** `SP` *file_name* `CR` | |
| Get: | | | |
| **Response** | | | |
| ~`nn`**@DEL** `SP` *file_name* `CR LF` | | | |
| **Parameters** | | | |
| *file_name* - name of file to delete (file names are case-sensitive) | | | |
| **Response Triggers** | | | |
| | | | |
| **Notes** | | | |
| | | | |

| Command - **DIR** | | Command Type - File System | |
| --- | --- | --- | --- |
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **DIR** | Administrator | Public |
| Get: | **-** | - | - |
| **Description** | | **Syntax** | |
| Set: | List files in device | #**DIR**[CR] | |
| Get: | - | - | |
| **Response** | | | |
| Multi Line:<br>~[nn]@**DIR**[CR LF]<br>*file_name* TAB *file_size*[SP]bytes,[SP] ID:[SP]*file_id*[CR LF]<br>TAB*free_size*[SP]bytes.[CR LF] | | | |
| **Parameters** | | | |
| *file_name* - name of file<br>*file_size* - file size in bytes. A file can take more space on device memory<br>*file_id* - internal ID for file in file system<br>*free_size* - free space in bytes in device file system | | | |
| **Response Triggers** | | | |
| | | | |
| **Notes** | | | |
| | | | |

| Command - **FORMAT** | | Command Type - File System | |
| --- | --- | --- | --- |
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **FORMAT** | Administrator | Public |
| Get: | **-** | - | - |
| **Description** | | **Syntax** | |
| Set: | Format file system | #**FORMAT**[CR] | |
| Get: | - | - | |
| **Response** | | | |
| ~[nn]@**FORMAT**[SP]**OK**[CR LF] | | | |
| **Parameters** | | | |
| | | | |
| **Response Triggers** | | | |
| | | | |
| **Notes** | | | |
| Response could take some time (seconds) until formatting completes | | | |

| Command - **FS-FREE?** | | Command Type - File System | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **-** | - | - |
| Get: | **FS-FREE?** | Administrator | Public |
| **Description** | | **Syntax** | |
| Set: | - | - | |
| Get: | Get file system free space | **#FS-FREE?** CR | |
| **Response** | | | |
| ~nn**@FS_FREE** SP *free_size* CR LF | | | |
| **Parameters** | | | |
| *free_size* - free size in device file system in bytes | | | |
| **Response Triggers** | | | |
| | | | |
| **Notes** | | | |
| | | | |

| Command - **GET** | | Command Type - File System | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **-** | - | - |
| Get: | **GET** | Administrator | Public |
| **Description** | | **Syntax** | |
| Set: | - | - | |
| Get: | Get file | **#GET** SP *file_name* CR | |
| **Response** | | | |
| Multi-line: <br> ~nn**@GET** SP *file_name, file_size* SP **READY** CR LF <br>   *contents* <br> ~nn**@GET** SP *file_name* SP **OK** CR LF | | | |
| **Parameters** | | | |
| *file_name* - name of file to get contents <br> *contents* - byte stream of file contents <br> *file_size* - size of file (device sends it in response to give user a chance to get ready) | | | |
| **Response Triggers** | | | |
| | | | |
| **Notes** | | | |
| | | | |

| Command - **LOAD** | | Command Type - System - Packets | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **LOAD** | Administrator | Public |
| Get: | **-** | - | - |
| **Description** | | **Syntax** | |
| Set: | Load file to device | **#LOAD**[SP]*file_name,size*[CR] | |
| Get: | - | - | |
| **Response** | | | |
| Data sending negotiation:<br>* Device -<br>**~01@LOAD**[SP]*file_name,size*[SP]**READY**[CR LF]<br>* End User (+Device)-<br>  Send file in Protocol Packets<br>* Device -<br>**~01@LOAD**[SP]*file_name, size*[SP]**OK**[CR LF] | | | |
| **Parameters** | | | |
| *file_name* - name of file to save on device<br>*size* - size of file data that is sent. | | | |
| **Response Triggers** | | | |
| | | | |
| **Notes** | | | |
| See the Protocol Packet reference | | | |

## 12.2.3 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 |

| Command - **LOGIN** | | Command Type - Authentication | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **LOGIN** | Not Secure | Public |
| Get: | **LOGIN?** | Not Secure | Public |
| **Description** | | **Syntax** | |
| Set: | Set protocol permission | #**LOGIN**[SP]*login_level, password*[CR] | |
| Get: | Get current protocol permission level | #**LOGIN?**[CR] | |
| **Response** | | | |
| Set: ~[nn]**@LOGIN**[SP]*login_level,password*[SP]**OK**[CR LF]<br>　　or<br>　　~[nn]**@LOGIN**[SP]**ERR**[SP]004[CR LF] (if bad password entered)<br>Get: ~[nn]**@LOGIN**[SP]*login_level*[CR LF] | | | |
| **Parameters** | | | |
| *login_level* - level of permissions required (End User or Admin)<br>*password* - predefined password (by PASS command). Default password is an empty string | | | |
| **Response Triggers** | | | |
| | | | |
| **Notes** | | | |
| For devices that support security, LOGIN allows to the user to run commands with an End User or Administrator permission level<br>In each device, some connections can be logged in to different levels and some do not work with security at all<br>Connection may logout after timeout<br>The permission system works only if security is enabled with the "SECUR" command | | | |

| Command - **LOGOUT** | | Command Type - Authentication | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **LOGOUT** | Not Secure | Public |
| Get: | **-** | - | - |
| **Description** | | **Syntax** | |
| Set: | Cancel current permission level | #**LOGOUT**◌CR◌ | |
| Get: | - | - | |
| **Response** | | | |
| ~◌nn◌@**LOGOUT**◌SP◌**OK**◌CR LF◌ | | | |
| **Parameters** | | | |
| | | | |
| **Response Triggers** | | | |
| | | | |
| **Notes** | | | |
| Logs out from End User or Administrator permission levels to Not Secure | | | |

<br>

| Command - **PASS** | | Command Type - Authentication | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **PASS** | Administrator | Public |
| Get: | **PASS?** | Administrator | Public |
| **Description** | | **Syntax** | |
| Set: | Set password for login level | #**PASS**◌SP◌*login_level, password*◌CR◌ | |
| Get: | Get password for login level | #**PASS?**◌SP◌*login_level*◌CR◌ | |
| **Response** | | | |
| ~◌nn◌@**PASS**◌SP◌*login_level, password*◌CR LF◌ | | | |
| **Parameters** | | | |
| *login_level* - level of login to set (End User or Administrator).<br>*password* - password for the *login_level*. Up to 15 printable ASCII chars | | | |
| **Response Triggers** | | | |
| | | | |
| **Notes** | | | |
| The default password is an empty string | | | |

| Command - **SECUR** | | Command Type - Authentication | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **SECUR** | Administrator | Public |
| Get: | **SECUR?** | Not Secure | Public |
| **Description** | | **Syntax** | |
| Set: | Start/stop security | #**SECUR** SP *security_mode* CR | |
| Get: | Get current security state | #**SECUR?** CR | |
| **Response** | | | |
| ~ nn @**SECUR** SP *security_mode* CR LF | | | |
| **Parameters** | | | |
| *security_mode* – 1/ON - enables security, 0/OFF - disables security | | | |
| **Response Triggers** | | | |
| | | | |
| **Notes** | | | |
| The permission system works only if security is enabled with the "SECUR" command | | | |

## 12.2.4  Switching/Routing Commands

| Command | Description |
|---|---|
| ROUTE | Set/get layer routing |

| Command - **ROUTE** | | Command Type - Routing | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **ROUTE** | End User | Public |
| Get: | **ROUTE?** | End User | Public |
| **Description** | | **Syntax** | |
| Set: | Set layer routing | #**ROUTE** `SP` *layer, dest, src* `CR` | |
| Get: | Get layer routing | #**ROUTE?** `SP` *layer, dest* `CR` | |
| **Response** | | | |
| ~ `nn` @ **ROUTE** `SP` *layer, dest, src* `CR LF` | | | |
| **Parameters** | | | |
| *layer*  (see Section 12.2.10) <br> *dest* -  * - ALL <br>       x - disconnect, otherwise destination id <br> *src* - source id | | | |
| **Response Triggers** | | | |
| | | | |
| **Notes** | | | |
| This command replaces all other routing commands <br> The GET command identifies input switching on Step-in clients <br> The SET command is for remote input switching on Step-in clients (essentially via by the Web) | | | |

## 12.2.5 Video Commands

| Command | Description |
|---------|-------------|
| VMUTE | Set/get video on output mute |

| Command - **VMUTE** | | Command Type - Video | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **VMUTE** | End User | Public |
| Get: | **VMUTE?** | End User | Public |
| **Description** | | **Syntax** | |
| Set: | Set enable/disable video on output | #**VMUTE** `SP` *output_id, flag* `CR` | |
| Get: | Get video on output status | #**VMUTE?** `SP` *output_id* `SP` `CR` | |
| **Response** | | | |
| Set / Get: ~ `nn` @ **VMUTE** `SP` *output_id, flag* `CR LF` | | | |
| **Parameters** | | | |
| *output_id* - 1….num of system outputs<br>flag -  0 - disable video on output<br>        1 - enable video on output<br>        2 - blank video | | | |
| **Response Triggers** | | | |
| | | | |
| **Notes** | | | |
| | | | |

## 12.2.6 Audio Commands

| Command | Description |
|---|---|
| AUD-EMB | Set/get audio in video embedding status |
| AUD-LVL | Set/get audio level in specific amplifier stage |
| AUD-SIGNAL? | Get audio input signal status |

| Command - **AUD-EMB** | | Command Type - Audio | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **AUD-EMB** | End User | Public |
| Get: | **AUD-EMB?** | End User | Public |
| **Description** | | **Syntax** | |
| Set: | Set audio in video embedding status | #**AUD-EMB** SP *in,out,status* CR | |
| Get: | Get audio in video embedding status | #**AUD-EMB?** SP *in,out* CR | |
| **Response** | | | |
| Set/Get: ~ nn @**AUD-EMB** SP *in,out,status* CR LF | | | |
| **Parameters** | | | |
| *in* - audio input to be embedded number (1… max number of inputs)<br>*out* - video output to embed into number (1 .. max number of outputs)<br>*status* - embedded (ON), or not (OFF) status | | | |
| **Response Triggers** | | | |
| Response is sent to the com port from which the Set (before execution)/Get command was received<br>After execution, 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** | | | |
| | | | |

| Command - **AUD-LVL** | | Command Type - Audio | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **AUD-LVL** | End User | Public |
| Get: | **AUD-LVL?** | End User | Public |
| **Description** | | **Syntax** | |
| Set: | Set audio level in specific amplifier stage | **#AUD-LVL** SP *stage, channel, volume* CR | |
| Get: | Get audio level in specific amplifier stage | **#AUD-LVL?** SP *stage, channel* CR | |
| **Response** | | | |
| ~ nn @ **AUD-LVL** SP *stage, channel, volume* CR LF | | | |
| **Parameters** | | | |
| *stage* - input/output or numeric value of present audio processing stage<br>        For example: '1' for input level, '2' for output<br>*channel* - input or output number<br>*volume* - audio parameter in Kramer units, minus sign precedes negative values.<br>        ++ increase current value,<br>        -- decrease current value | | | |
| **Response Triggers** | | | |
| | | | |
| **Notes** | | | |
| | | | |

| Command - **AUD-SIGNAL** | | Command Type - Audio | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | - | - | - |
| Get | **AUD-SIGNAL?** | End User | Public |
| **Description** | | **Syntax** | |
| Set: | - | - | |
| Get: | Get audio input signal status | # **AUD-SIGNAL?** SP *inp_id* CR | |
| **Response** | | | |
| ~ nn @ **AUD-SIGNAL** SP *inp_id, status* CR LF | | | |
| **Parameters** | | | |
| *Inp_id* - input number (1 .. max input number)<br>*status* - 0 - OFF (no signal)<br>        1 - ON (signal present | | | |
| **Response Triggers** | | | |
| After execution, response is sent to the com port from which the Get was received<br>Response is sent to all com ports if audio status state was changed on any input | | | |
| **Notes** | | | |
| | | | |

| Command - **MUTE** | | Command Type - Audio | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **MUTE** | End User | Public |
| Get: | **MUTE?** | End User | Public |
| **Description** | | **Syntax** | |
| Set: | Set audio mute | **#MUTE** ᴤᴘ *channel,mute_mode* ᴄʀ | |
| Get: | Get audio mute | **#MUTE?** ᴤᴘ *channel* ᴄʀ | |
| **Response** | | | |
| ~ nn @**MUTE** ᴤᴘ *channel, mute_mode* ᴄʀ ʟꜰ | | | |
| **Parameters** | | | |
| *channel* - output number<br>*mute_mode* - 0 or OFF / 1 or ON | | | |
| **Response Triggers** | | | |
| | | | |
| **Notes** | | | |
| | | | |

## 12.2.7 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 |

| Command - **ETH-PORT** | | Command Type - Communication | |
|---|---|---|---|
| **Command Name** | | **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* - TCP/UDP<br>*ETHPort* - TCP/UDP port number | | | |
| **Response Triggers** | | | |
| | | | |
| **Notes** | | | |
| | | | |

| Command - **NET-DHCP** | | Command Type - Communication | |
|---|---|---|---|
| **Command Name** | | **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** | | | |
| *mode* - 0 - Do not use DHCP. Use the IP set by the factory or using the IP set command<br>       1 - Try to use DHCP. If unavailable, use IP as above | | | |
| **Response Triggers** | | | |
| | | | |
| **Notes** | | | |
| Connecting Ethernet to devices with DHCP may take more time in some networks<br>To connect with a randomly assigned IP by DHCP, specify the device DNS name (if available) using the command "NAME". You can also get an assigned IP by direct connection to USB or RS-232 protocol port if available<br>For proper settings consult your network administrator | | | |

| Command - **NET-GATE** | | Command Type - Communication | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **NET-GATE** | Administrator | Public |
| Get: | **NET-GATE?** | End User | Public |
| **Description** | | **Syntax** | |
| Set: | Set gateway IP | #**NET-GATE**[SP] *ip_address*[CR] | |
| Get: | Get gateway IP | #**NET-GATE?**[CR] | |
| **Response** | | | |
| ~[nn]@**NET-GATE**[SP] *ip_address*[CR LF] | | | |
| **Parameters** | | | |
| *ip_address* - format: xxx.xxx.xxx.xxx | | | |
| **Response Triggers** | | | |
| | | | |
| **Notes** | | | |
| A network gateway connects the device via another network and maybe over the Internet. Be careful of security problems. For proper settings consult your network administrator | | | |

| Command - **NET-IP** | | Command Type - Communication | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **NET-IP** | Administrator | Public |
| Get: | **NET-IP?** | End User | Public |
| **Description** | | **Syntax** | |
| Set: | Set IP address | #**NET-IP**ₛₚ*ip_address*_CR_ |
| Get: | Get IP address | #**NET-IP?**_CR_ |
| **Response** | | | |
| ~nn@ **NET-IP** SP *ip_address* CR LF | | | |
| **Parameters** | | | |
| *ip_address* - format: xxx.xxx.xxx.xxx | | | |
| **Response Triggers** | | | |
| | | | |
| **Notes** | | | |
| For proper settings consult your network administrator | | | |

| Command - **NET-MAC?** | | Command Type - Communication | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **-** | - | - |
| Get: | **NET-MAC?** | End User | Public |
| **Description** | | **Syntax** | |
| Set: | - | - | |
| Get: | Get MAC address | #**NET-MAC?**_CR_ |
| **Response** | | | |
| ~nn@**NET-MAC** SP *mac_address* CR LF | | | |
| **Parameters** | | | |
| *mac_address* - Unique MAC address. Format: XX-XX-XX-XX-XX-XX where X is hex digit | | | |
| **Response Triggers** | | | |
| | | | |
| **Notes** | | | |
| | | | |

| Command - **NET-MASK** | | Command Type - Communication | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **NET-MASK** | Administrator | Public |
| Get: | **NET-MASK?** | End User | Public |
| **Description** | | **Syntax** | |
| Set: | Set subnet mask | #**NET-MASK**`SP`*net_mask*`CR` | |
| Get: | Get subnet mask | #**NET-MASK?**`CR` | |
| **Response** | | | |
| ~`nn`@**NET-MASK**`SP`*net_mask*`CR LF` | | | |
| **Parameters** | | | |
| *net_mask* - format: xxx.xxx.xxx.xxx | | | |
| **Response Triggers** | | | |
| The subnet mask limits the Ethernet connection within the local network<br>For proper settings consult your network administrator | | | |
| **Notes** | | | |
| | | | |

## 12.2.8 EDID Handling Commands

| Command | Description |
|---------|-------------|
| CPEDID | Copy EDID data from the output to the input EEPROM |
| GEDID | Set/get EDID data |
| LDEDID | Load EDID data |
| LOCK-EDID | Lock last read EDID |

| Command - **CPEDID** | | Command Type - EDID Handling | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **CPEDID** | End User | Public |
| Get: | - | - | - |
| **Description** | | **Syntax** | |
| Set: | Copy EDID data from the output to the input EEPROM | #**CPEDID**~SP~ *src_type, src_id, dst_type, dest_bitmap*~CR~ | |
| Get: | - | - | |
| **Response** | | | |
| ~~nn~@**CPEDID**~SP~ *src_stg, src_id, dst_type, dest_bitmap*~CR LF~ | | | |
| **Parameters** | | | |
| *src_type* - *EDID* source type (usually output) <br> *src_id* - number of chosen source stage (1.. max number of inputs/outputs) <br> *dst_type* - *EDID destination* type (usually input) <br> *dest_bitmap* - bitmap representing destination IDs. Format: XXXX…X, where X is hex digit. The binary form of every hex digit represents corresponding destinations. Setting '1' says that EDID data has to be copied to this destination | | | |
| **Response Triggers** | | | |
| Response is sent to the com port from which the Set was received (before execution) | | | |
| **Notes** | | | |
| Destination bitmap size depends on device properties (for 64 inputs it is a 64-bit word) <br> Example: bitmap 0x0013 means inputs 1,2 and 5 are loaded with the new EDID | | | |

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

| Command - **LDEDID** | | Command Type - EDID Handling | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **LDEDID** | End User | Public |
| Get: | - | - | - |
| **Description** | | **Syntax** | |
| Set: | Write EDID data from external application to device | Multi-step syntax (see following steps) | |
| Get: | None | None | |

**Communication Steps (Command and Response)**

Step 1: #**LDEDID** $_{SP}$ *dst_type, dest_bitmask, size, safe_mode* $_{CR}$

Response 1: ~ nn @**LDEDID** $_{SP}$ *dst_type, dest_bitmask, size, safe_mode* $_{SP}$ **READY** $_{CR\ LF}$ or

~ nn @**LDEDID** $_{SP}$ **ERRnn** $_{CR\ LF}$

Step 2: If **ready** was received, send EDID_DATA

Response 2: ~ nn @**LDEDID** $_{SP}$ *dst_type, dest_bitmask, size, safe_mode* $_{SP}$ **OK** $_{CR\ LF}$ or

~ nn @**LDEDID** $_{SP}$ **ERRnn** $_{CR\ LF}$

**Parameters**

*dst_type* - EDID destination type (usually input)
*dest_bitmask* - bitmap representing destination IDs. Format: 0x********, where * is ASCII presentation of hex digit. The binary presentation of this number is a bit mask for destinations. Setting '1' means EDID data has to be copied to this destination
*size* - EDID data size
*safe_mode* - 0 - Device accepts the EDID as is without trying to adjust
　　　　　　1 - Device tries to adjust the EDID
EDID_DATA - data in protocol packets

**Response Triggers**

Response is sent to the com port from which the **Set** (before execution)

**Notes**

When the unit receives the **LDEDID** command it replies with **READY** and enters the special EDID packet wait mode. In this mode the unit can receive only packets and not regular protocol commands.
If the unit does not receive correct packets for 30 seconds or is interrupted for more than 30 seconds before receiving all packets, it sends timeout error ~ nn @**LDEDID** $_{SP}$ **ERR01** $_{CR\ LF}$ and returns to the regular protocol mode. If the unit received data that is not a correct packet, it sends the corresponding error and returns to the regular protocol mode.
See Protocol Packet reference

| Command – **LOCK-EDID** | | Command Type – EDID Handling | |
|---|---|---|---|
| **Command Name** | | **Permission** | **Command Name** |
| **Set:** | **LOCK-EDID** | End User | End User |
| **Get:** | **LOCK-EDID?** | End User | End User |
| **Description** | | Syntax | |
| Set: | Lock last read EDID | **#LOCK-EDID**[SP] *input_id,lock_mode* [CR] | |
| Get : | Get EDID lock state | **#LOCK-EDID?** [SP] *input_id* [CR] | |
| **Response** | | | |
| ~[nn]**@LOCK-EDID**[SP] *input_id,lock_mode* [CR LF] | | | |
| **Parameters** | | | |
| *input_id* - 1….num of system inputs<br>*lock_mode* - 0/OFF - unlocks EDID, 1/ON - locks EDID | | | |
| **Response Triggers** | | | |
| | | | |
| **Notes** | | | |
| | | | |

## 12.2.9 Factory Commands

| Command | Description |
|---------|-------------|
| UPGRADE | Perform firmware upgrade |

| Command - **UPGRADE** | | Command Type - System | |
|-----------------------|---|-----------------------|---|
| **Command Name** | | **Permission** | **Transparency** |
| Set: | **UPGRADE** | Administrator | Internal |
| Get: | **-** | - | - |
| **Description** | | **Syntax** | |
| Set: | Perform firmware upgrade | **#UPGRADE**[CR] | |
| Get: | - | - | |
| **Response** | | | |
| ~[nn]**@UPGRADE**[SP]OK[CR][LF] | | | |
| **Parameters** | | | |
| | | | |
| **Response Triggers** | | | |
| | | | |
| **Notes** | | | |
| Not necessary for some devices<br>Firmware usually uploads to a device via a command like LDFW<br>Reset the device to complete the process | | | |

### 12.2.10  Layer

| Number | Value |
|--------|-------|
| 1 | Video |
| 2 | Audio |
| 3 | Data |
| 4 | IR |
| 5 | USB |

### 12.2.11  Video/Audio Signal Changes

| Number | Value |
|--------|-------|
| 0 | Video signal lost |
| 1 | New video signal detected |
| 2 | Audio signal lost |
| 3 | Audio signal detected |
| 4 | Disable 5V on video output if no input signal detected |
| 5 | Video cable unplugged |
| 6 | Audio cable unplugged |

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

**What is Covered**

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

**What is Not Covered**

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

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

**How Long Does this Coverage Last**

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

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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:

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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.

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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.

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

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

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

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

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

# KRAMER

ISO 9001:2008 Certified Quality Management System
ISO 14001:2004 Certified Environmental Management System
OHSAS 18001:2007 Certified O.H.S Management System

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## ⚠ SAFETY WARNING

Disconnect the unit from the power supply before opening and servicing

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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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