KRAMER

USER MANUAL

MODEL:

VS-62DT
6x2 UHD Matrix Switcher
HDMI™ to HDMI & HDBaseT with PoE
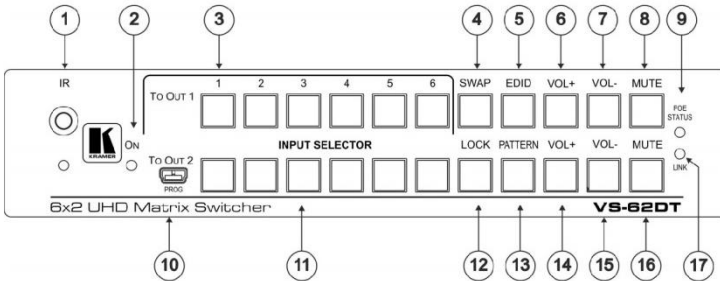
VS-62DT Quick Start Guide

This guide helps you install and use your **VS-62DT** for the first time.

Go to **www.kramerav.com/downloads/VS-62DT** to download the latest user manual and check if firmware upgrades are available.
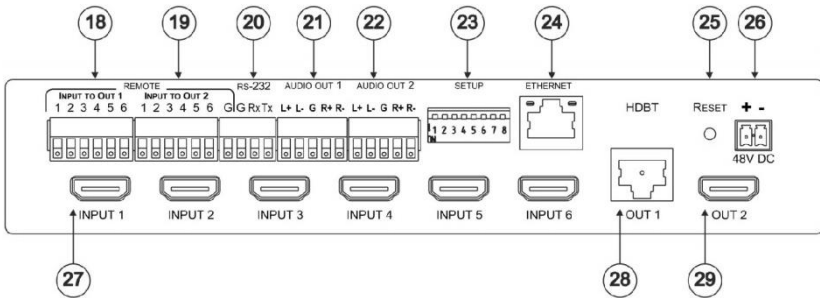
Step 1: Check what's in the box

☑ **VS-62DT** *6x2 UHD Matrix Switcher* ☑ 4 Rubber feet ☑ IR remote control transmitter with batteries

☑ 1 Power supply (48V DC) ☑ 1 Quick start guide

Step 2: Get to know your VS-62DT

| #	Feature	Function
1	*IR* Sensor & LED	Signal receiver for the infrared remote control transmitter. LED lights yellow
2	*ON* LED	Lights when the unit is powered on
3	*INPUT SELECTOR TO OUT 1 (1 to 6)*	Press one of the six inputs to switch it to output 1
4	*SWAP* Button	Press to swap output 1 and output 2 (analog audio only)
5	*EDID* Button	Press to capture the EDID
6	*VOL+* Button	Press to increase the analog audio volume on output 1
7	*VOL-* Button	Press to decrease the analog audio volume on output 1
8	*MUTE* Button	Press to toggle muting of output 1 analog audio
9	*POE STATUS* LED	Lights when transmitting power over Ethernet to another device
10	*PROG* Mini USB Connector	Used for upgrading the firmware
11	*INPUT SELECTOR TO OUT 2 (1 to 6)*	Press one of the six inputs to switch it to output 2
12	*LOCK* Button	Press and hold to toggle locking and unlocking the front panel buttons
13	*PATTERN* Button	Press to toggle activation of the test pattern generator. When the generator is active, press one of the input buttons to select a test pattern
14	*VOL+* Button	Press to increase the analog audio volume on output 2
15	*VOL-* Button	Press to decrease the analog audio volume on output 2
16	*MUTE* Button	Press to toggle muting of output 2 analog audio
17	*LINK* LED	Lights when there is activity on the HDBaseT connection

#	Feature	Function
18	*REMOTE INPUT TO OUT 1* Terminal Block	Connects to external contact closure input switches
19	*REMOTE INPUT TO OUT 2* Terminal Block	Connects to external contact closure input switches
20	*RS-232* Terminal Block	Connects to a local RS-232 source
21	*AUDIO OUT 1* Terminal Block	Connects to a balanced stereo audio acceptor
22	*AUDIO OUT 2* Terminal Block	Connects to a balanced stereo audio acceptor
23	*SETUP* DIP-Switches	Sets the device configuration (see Step 7)
24	*ETHERNET* RJ-45 Connector	Connects to a network for control
25	*RESET* Button	Press while power-cycling the device to reset to factory default parameters
26	*48V DC* Connector	Connects to a power supply for the unit
27	*INPUT 1 to 6* HDMI Connectors	Connect to up to 6 HDMI sources
28	*HDBT OUT 1* RJ-45 Connector	Connects to an HDBaseT TP line
29	*OUT 2* HDMI Connector	Connects to an HDMI acceptor

Step 3: Install the VS-62DT

Attach the rubber feet and place on a table or mount the **VS-62DT** in a rack (using an optional **RK-1** rack mount).

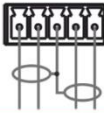## Step 4: Connect the inputs and outputs

Always switch OFF the power on each device before connecting it to your **VS-62DT**. For best results, we recommend that you always use Kramer high-performance cables to connect AV equipment to the **VS-62DT**.
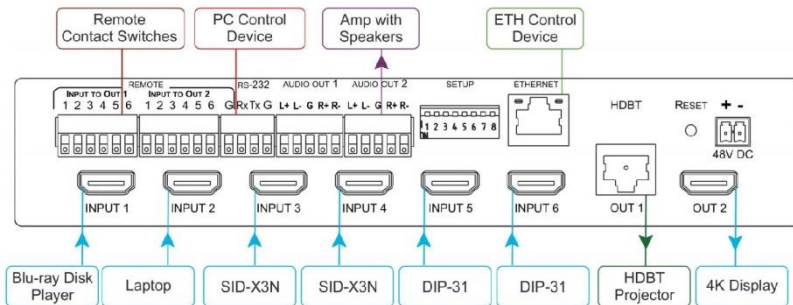
Connect the audio output:

To a balanced stereo audio acceptor:

L+ L- G R+ R-

To a unbalanced stereo audio acceptor:

L+ L- G R+ R-

Step 5: Connect the power

Connect the 48V DC power adapter to the **VS-62DT** and plug it into the mains electricity.

Safety Instructions

Caution: There are no operator serviceable parts inside the unit.
Warning: Use only the Kramer Electronics power supply that is provided with the unit.
Warning: Disconnect the power and unplug the unit from the wall before installing.
See www.KramerAV.com for updated safety information.

Step 6: Acquiring an EDID

To copy the EDID from an Output to one or more Inputs:

1. Press the EDID button to enter the EDID setting mode. The EDID button lights.
2. From the To OUT 1 (top) row, press each of the Inputs to which you want to copy the EDID from Output 1. Each selected Input LED lights.
3. From the To OUT 2 (bottom) row, press each of the Inputs into which you want to copy the EDID from Output 2. Each selected Input LED lights.
4. Press the EDID button. The button no longer lights and the EDID changes are saved.
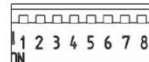
To copy the default EDID to one or more Inputs:

1. Press the EDID button to enter the EDID setting mode. The EDID button lights.
2. For each Input to which you want to copy the default EDID, press both the To OUT 1 and To OUT 2 buttons simultaneously. Both top row and bottom row Input LEDs light.
3. Press the EDID button. The button no longer lights and the EDID changes are saved.

Step 7: Set the DIP-switches

Use the DIP-switches to set the device configuration

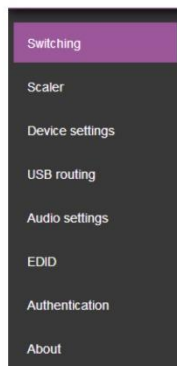| #	Feature	Description
1	HDCP support on inputs	On (down)—Disable HDCP support on all inputs
		Off (up)—Enable HDCP support which is defined by P3000 commands
2	Video mode switching Output 1	On (down)—Auto
		Off (up)—Manual
3	Last connected/Priority mode Output 1	When DIP-switch 2 is set to Auto (ON):
		On (down)—Enable Last Connected mode
		Off (up)—Enable Priority mode where the priority of each input is defined by the input number, (1 is the highest priority)
4	Video mode switching Output 2	On (down)—Auto
		Off—Manual
5	Last connected/Priority mode Output 2	When DIP-switch 4 is set to Auto (ON):
		On (down)—Enable Last-connected mode
		Off (up)—Enable Priority mode where the priority of each input is defined by the input number, (1 is the highest priority)
6	N/A	N/A
7	N/A	N/A
8	N/A	N/A

SETUP

ON 1 2 3 4 5 6 7 8

Step 8: Operate via the front panel buttons and via the:

IR remote controller: **Web pages:**   **RS-232 and Ethernet:**

Default RS-232 Parameters			
Baud Rate:	115,200 (9600)	Parity:	None
Data Bits:	8	Command Format:	ASCII
Stop Bits:	1		
Example (Route the video from the HDMI3 input to the HDMI OUT2 port):	#ROUTE 1,2,3<cr>		
TCP/IP Parameters			
IP Address:	192.168.1.39	Default UDP Port #:	50000
Subnet mask:	255.255.255.000	Maximum combined TCP and UDP Ports:	20
Default gateway:	192.168.1.254		

Web pages:
- Switching
- Scaler
- Device settings
- USB routing
- Audio settings
- EDID
- Authentication
- About

Step 9: Control peripheral devices via IR remote control:

You can use a remote control transmitter (that is used for controlling a peripheral device, for example, a DVD player) to send commands (to the A/V equipment) from/to any of the transmitters /receivers connected to the HDBT connectors.

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 **VS-62DT** *6x2 UHD Matrix Switcher* which is ideal for the following typical applications:

- Conference rooms
- Education
- Hospitality

2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment

- Review the contents of this user manual

  Go to www.kramerav.com/downloads/VS-62DT 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:

- For optimum range and performance, use the recommended Kramer cables available at www.kramerav.com/product/VS-62DT

- 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 **VS-62DT** away from moisture, excessive sunlight and dust

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

2.2 Safety Instructions

Caution: There are no operator serviceable parts inside the unit

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

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

2.3   Recycling Kramer Products

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

3　Overview

The **VS−62DT** is a 6x2 4K@60Hz (4:2:0) HDMI/HDBaseT matrix switcher with HDMI and HDBaseT output transmitters that provide long−reach video and audio transmission. It supports resolutions of up to 4K@60Hz (4:2:0) and WUXGA. The matrix is a PoE provider that provides power over Ethernet to compatible PoE receivers.

The **VS-62DT** features:

- Up to 8.91Gbps data rate (2.97Gbps per graphics channel)

- Maximum resolution of up to 4K@60Hz UHD (4:2:0).

- Long-reach signal extension – Up to 70m (230ft) at 1080p or 40m (130ft) at 4K60 (4:2:0)

- Support for HDCP 1.4 (High Definition Digital Content Protection)

- HDMI 1.4 Support – 3D, Deep Color, x.v.Color™, Lip Sync , Dolby® TrueHD, Dolby Digital Plus, DTS−HD®, and 7.1 multi-channel audio

- Six HDMI inputs that can be routed to an HDMI or HDBT output

- Supply of Power-over-Ethernet to compatible PoE receivers

- Per input EDID capture that copies and stores the EDID from a display device

- Programmable step-in functionality when used in conjunction with compatible step-in devices, such as the **SID-X3N** and **DIP-31** (using an HDMI cable that supports HEC, the HDMI Ethernet Channel)

- True video clock detection

- Advanced auto AV switching modes (last connected and priority switching)

- Non-volatile EDID storage

- Kramer reKlocking™ & Equalization Technology that rebuilds the digital signal to travel longer distances

- A lock button to prevent unwanted tampering with the buttons on the front panel

- Internal pattern generator

- Support for Kramer Protocol 3000

- Static or dynamic DHCP IP addressing

- Flexible control options including front panel buttons, IR remote (included),
  RS−232, Ethernet, contact closure buttons, embedded Web server and step-in.

- Mini-USB port for upgrading firmware

4   Defining the VS-62DT 6x2 UHD Matrix Switcher

This section defines the **VS-62DT**.
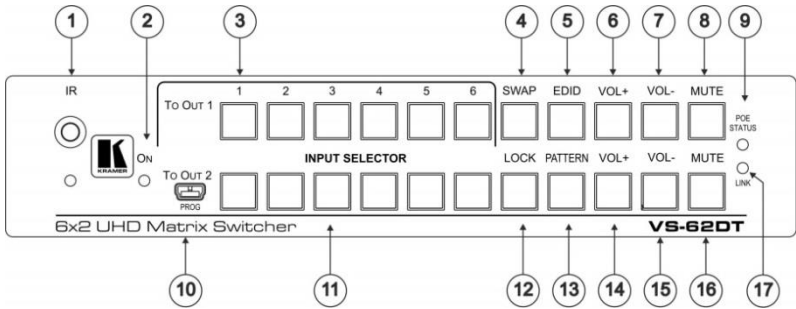
Figure 1: VS-62DT 6x2 UHD Matrix Switcher

#	Feature		Function
1	*IR* Sensor & LED		Signal receiver for the infrared remote control transmitter. LED lights yellow
2	*ON* LED		Lights when the unit is powered on
3		*INPUT SELECTOR (1 to 6)*	Press one of the six inputs to switch it to output 1
4	*TO OUT 1*	*SWAP* Button	Press to swap output 1 and output 2
5		*EDID* Button	Press to capture the EDID (see Section 6.3)
6		*VOL+* Button	Press to increase the volume on output 1
7		*VOL-* Button	Press to decrease the volume on output 1
8		*MUTE* Button	Press to toggle muting of output 1 audio
9	*POE STATUS* LED		Lights when transmitting power over Ethernet to another device
10	*PROG* Mini USB Connector		Used for upgrading the firmware
11		*INPUT SELECTOR (1 to 6)*	Press one of the six inputs to switch it to output 2
12		*LOCK* Button	Press and hold to toggle locking and unlocking the front panel buttons (see Section 7.4)
13	*TO OUT 2*	*PATTERN* Button	Press to toggle activation of the test pattern generator. When the generator is active, press one of the input buttons to select a test pattern
14		*VOL+* Button	Press to increase the volume on output 2
15		*VOL-* Button	Press to decrease the volume on output 2
16		*MUTE* Button	Press to toggle muting of output 2 audio
17	*LINK* LED		Lights when there is activity on the Ethernet connection
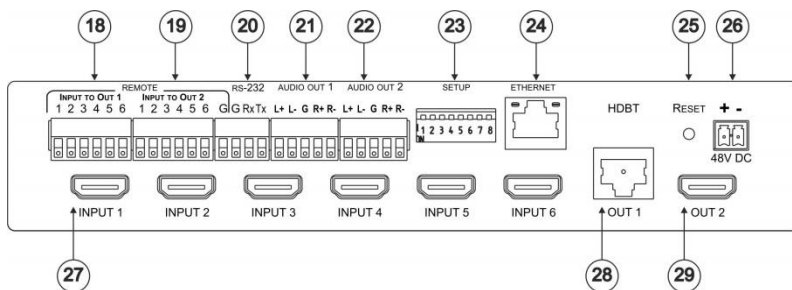
Figure 2: VS-62DT 6x2 UHD Matrix Switcher

#	Feature	Function
18	*REMOTE INPUT TO OUT 1* Terminal Block	Connects to external contact closure input switches
19	*REMOTE INPUT TO OUT 2* Terminal Block	Connects to external contact closure input switches
20	*RS-232* Terminal Block	Connects to a local RS-232 source
21	*AUDIO OUT 1* Terminal Block	Connects to a balanced stereo audio acceptor
22	*AUDIO OUT 2* Terminal Block	Connects to a balanced stereo audio acceptor
23	*SETUP* DIP-Switches	Set switches to configure the device (see Section 8.1)
24	*ETHERNET* RJ-45 Connector	Connects to a network for control
25	*RESET* Button	Press to reset the device or return to factory settings (see Section 8.2)
26	*48V DC* Connector	Connects to a power supply for the unit
27	*INPUT 1* to *6* HDMI Connectors	Connect to up to 6 HDMI sources
28	*HDBT OUT 1* RJ-45 Connector	Connects to an HDBT TP line
29	*OUT 2* HDMI Connector	Connects to an HDMI acceptor

5 Connecting the VS-62DT 6x2 UHD Matrix Switcher

> ⚠ Always switch off the power to each device before connecting it to your **VS-62DT**. After connecting your **VS-62DT**, connect its power and then switch on the power to each device.

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

To connect the **VS-62DT**, as illustrated in Figure 3, do the following:

1. Connect up to six HDMI sources, (for example, a laptop, Blu-ray player, **SID-X3N** or **DIP-31**) to the HDMI In connectors.

2. Connect the HDBT OUT1 connector to an HDBT acceptor, (for example, an HDBT projector).

3. Connect the HDMI OUT2 connector to an HDMI acceptors, (for example, 2K or 4K display).

4. Connect the two balanced AUDIO OUT 5-pin terminal block connectors to up to two analog audio acceptors, (for example, audio amplifiers).

5. If required, connect a PC/controller to the RS-232 port (see Section 5.1) and/or the Ethernet port (see Section 5.2).

6. If required for remote switching, connect up to 6 contact closure switches per channel to their INPUT TO OUT terminal block connectors.

7. Connect the 48V DC power supply to the device and plug it into the mains electricity (not shown in Figure 3).

8. If required, acquire the EDID (see Section 6.3).
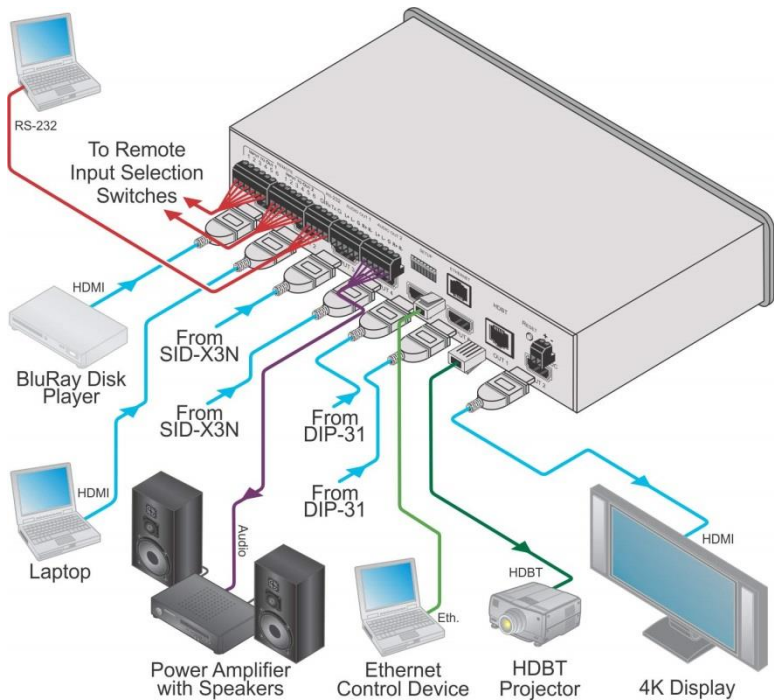
Figure 3: Connecting the VS-62DT 6x2 UHD Matrix Switcher

5.1 Connecting a Serial Controller to the VS-62DT via RS-232

To connect a serial controller to the VS-62DT:

From the RS-232 9-pin D-sub serial port on the serial controller connect:

- Pin 2 to the TX pin on the **VS-62DT** RS-232 terminal block
- Pin 3 to the RX pin on the **VS-62DT** RS-232 terminal block
- Pin 5 to the GND pin on the **VS-62DT** RS-232 terminal block

5.2 Connecting to the VS-62DT via Ethernet

You can connect to the **VS-62DT** via Ethernet using either of the following methods:

- Directly to the PC using a crossover cable (see Section 5.2.1)

- Via a network hub, switch, or router, using a straight-through cable (see Section 5.2.2)

Note: If you want to connect via a router and your IT system is based on IPv6, speak to your IT department for specific installation instructions.

5.2.1 Connecting the Ethernet Port Directly to a PC

You can connect the Ethernet port of the **VS-62DT** directly to the Ethernet port on your PC using a crossover cable with RJ-45 connectors.

This type of connection is recommended for identifying the **VS-62DT** with the factory configured default IP address.

After connecting the VS-62DT to the Ethernet port, configure your PC as follows:

1. Click **Start** > **Control Panel** > **Network and Sharing Center**.

2. Click **Change Adapter Settings**.

3. Highlight the network adapter you want to use to connect to the device and click **Change settings of this connection**.
   The Local Area Connection Properties window for the selected network adapter appears as shown in Figure 4.
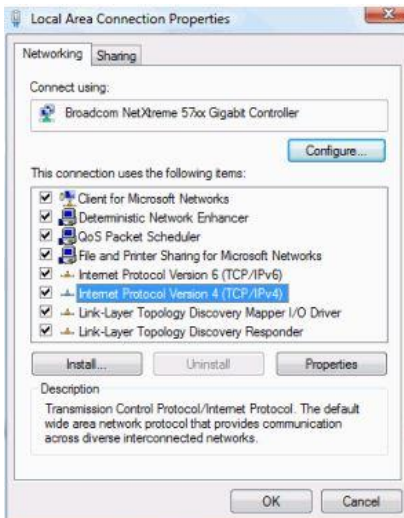
Figure 4: Local Area Connection Properties Window

4. Highlight **Internet Protocol Version 4 (TCP/Ipv4)** by clicking on the item.

5. Click **Properties**.

    The Internet Protocol Properties window appears as shown in Figure 5.
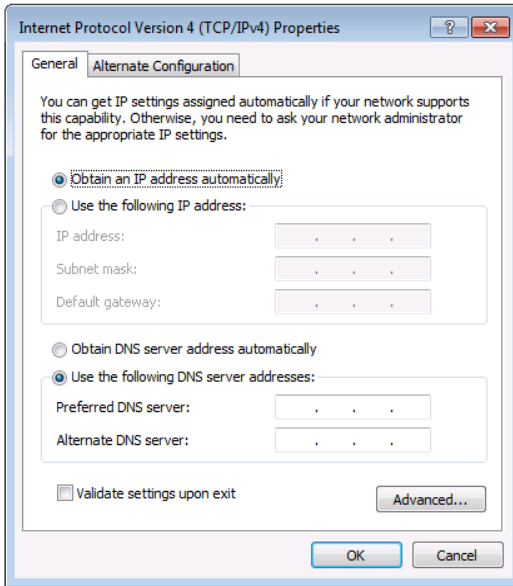
Figure 5: Internet Protocol Version 4 Properties Window

6. Select **Use the following IP Address** for static IP addressing and fill in the details as shown in Figure 6.

    For TCP/Ipv4 you can use any IP address in the range 192.168.1.1 to 192.168.1.255 (excluding 192.168.1.39) that is provided by your IT department.
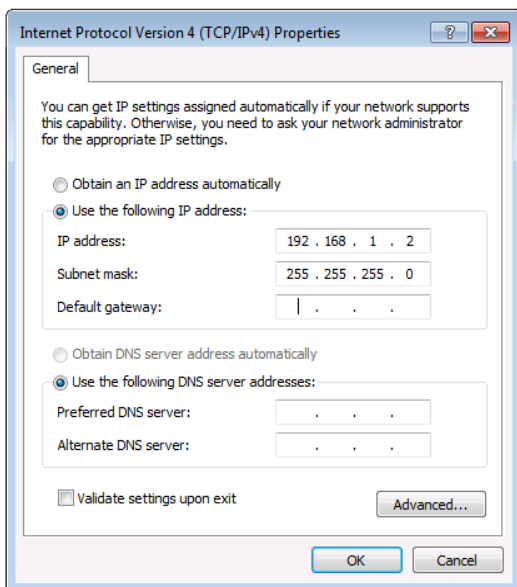
Figure 6: Internet Protocol Properties Window

7. Click **OK**.

8. Click **Close**.

5.2.2   Connecting the Ethernet Port via a Network Hub or Switch

You can connect the Ethernet port of the **VS-62DT** to the Ethernet port on a network hub or using a straight-through cable with RJ-45 connectors.

5.3   Connecting the Remote Contact-Closure Switches

You can connect up to six remote, contact-closure switches per output to control the **VS-62DT** remotely. These switches replicate the Input selection buttons on the front panel of the **VS-62DT**.

Figure 7 illustrates the wiring of the switch connections to the terminal block.
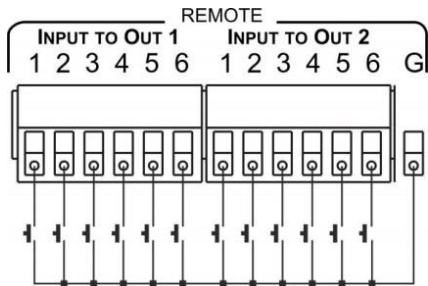
Figure 7: Remote Contact-closure Switch Connections

6 Principles of Operation

This section describes the operating theory of the **VS-62DT** and includes:

- Automatic signal detection (see Section 6.1)

- Input switching modes (see Section 6.2)

- EDID operation (see Section 6.3)

6.1 Automatic Signal Detection

The **VS-62DT** can automatically detect the presence of a video signal on an input based on the presence of a video sync or clock signal.

6.2 Input Switching Modes

6.2.1 Manual Mode

In Manual switching mode, routing is performed according to the front panel button selection or according to the remote command selection.

6.2.2 Automatic Mode

Automatic switching can be performed in either of the following ways:

- **Input priority**. Upon detection of an active input, the input with the highest priority is automatically selected. Input priority is from input 1 (highest priority) to input 6 (lowest priority).

- **Last Connected**. The device automatically selects the most recently connected input. Should this source become inactive, the device automatically switches to the last connected input that was active. When turning the device on and more than one input is active, the input with the highest priority is selected.

If a manual selection is made when the device is in Automatic mode, the device enters Manual Override mode. The manually selected input remains selected as long as it is active. When a manually selected input becomes inactive, the device returns to Automatic mode.

6.3   EDID Operation

The **VS-62DT** has a default EDID (see Section 13) stored on all inputs. This EDID can be exchanged for either:

- A custom EDID which is uploaded to one or more inputs using Protocol 3000 commands (see Section 14)
  –OR–

- The EDID of a display device connected to an output by using either the front panel buttons (see Section 3), a Protocol 3000 command, or the Web pages

The EDID is non-volatile and the last valid EDID is used when the device is powered up.

6.4   Step-in Functionality

The **VS-62DT** can function as a step-in switcher when connected to a suitable HDMI transmitter, (for example, the **SID-X3N**), using the correct HDMI cable with HEC support.

Use the Web pages (see Section 9.2.2) to assign remote device button actions. The default button actions are shown in the following table. Up to three buttons can be active at the same time.

Command	Action
Echo	Allows a connected controller to be programmed to perform a variety of tasks triggered by the user buttons, such as, room control, (lights, screen, and so on)
Out1	Step in current input to Output 1
Out2	Step in current input to Output 2

7 Operating the VS-62DT 6x2 UHD Matrix Switcher

This section describes operating the **VS-62DT** and consists of:

- Switching an input to an output (see Section 7.1)

- Acquiring an EDID from an output (see Section 7.2)

- Controlling analog audio (see Section 7.3)

- Locking and unlocking the front panel buttons (see Section 7.4)

- Generating a test pattern (see Section 7.5)

7.1 Switching an Input to an Output

To switch an input to an output, (for example, Input 5 to Output 2):

- Press the Input 5 button in the bottom Output (To OUT 2) row.
  The LED lights red and Input 5 is switched to Output 2

To turn off audio and video simultaneously:

- Press and hold the currently selected input button.
  The input button turns off and the audio and video are muted for the selected input.

- To turn on the audio and video, press this or any other input select button.

7.2 Acquiring an EDID from an Output

You can acquire the EDID from OUT 1 or OUT 2 and copy it to any or all of the six inputs to be stored in non-volatile memory. You can also reset any or all of the inputs to the default EDID.

To copy the EDID from an Output to one or more Inputs:

1. Press the EDID button to enter the EDID setting mode.
   The EDID button lights.

Note: If there is no button activity for 10 seconds, the device automatically exits the EDID setting mode to normal operation, the EDID button no longer lights and any changes made are lost.

2. From the To OUT 1 (top) row, press each of the Inputs to which you want to copy the EDID from Output 1.
   Each selected Input LED lights.

3. From the To OUT 2 (bottom) row, press each of the Inputs into which you want to copy the EDID from Output 2.
   Each selected Input LED lights.

4. Press the EDID button.
   The button no longer lights and the EDID changes are saved.

To copy the default EDID to one or more Inputs:

1. Press the EDID button to enter the EDID setting mode.
   The EDID button lights.

2. For each Input to which you want to copy the default EDID, press both the To OUT 1 and To OUT 2 buttons simultaneously.
   Both top row and bottom row Input LEDs light.

3. Press the EDID button.
   The button no longer lights and the EDID changes are saved.

7.3   Controlling Analog Audio

Control analog audio using volume, mute and swap buttons.

To change the volume on a selected analog audio output:

- Press VOL+ to increase the volume.

- Press VOL- to decrease the volume.

To mute and unmute the analog audio of a selected output:

1. Press MUTE on the desired channel.
   The MUTE button lights.

2. To unmute, press MUTE again. The analog audio plays.

To swap outputs:

1. To put analog Output 1 on analog Output 2 and vice versa, press SWAP.
   The outputs change places and swap button lights.

2. To return to the initial state, press SWAP again.

7.4   Locking and Unlocking the Front Panel Buttons

To lock and unlock the front panel buttons:

1. Press and hold the Lock button.
   The front panel buttons are locked and the button lights.

2. Press and hold the Lock button again.
   The front panel buttons are unlocked and the button no longer lights.

7.5 Generating a Test Pattern

For diagnostic purposes, the **VS-62DT** can generate a number of test patterns on the outputs.

To generate a test pattern on the outputs:

1. Press the Function button.
   The button lights.

2. Press any of the Input buttons to select a test pattern.
   The selected test pattern is generated on the outputs.

To exit the test pattern generator:

- Press the lit Function button.
  The test pattern generation ceases and the button no longer lights.

Figure 8 shows the test patterns available.
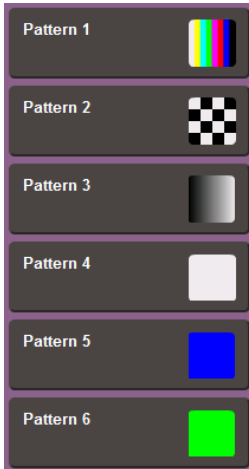
Figure 8: Available Test Patterns

All test pattern outputs are displayed in RGB 720x480/59Hz, 8-bit color resolution.

8 Configuring and Maintaining the VS-62DT

This section describes the configuration and maintenance of the **VS-62DT** and consists of:

- Setting the DIP-switches (see Section 8.1)
- Resetting the device to factory default settings (see Section 8.2)
- Upgrading the firmware (see Section 8.3)

8.1 Setting the DIP-switches

The DIP-switches dictate the behavior of the **VS-62DT**.

All DIP-switches are off by default.

#	Feature	Description
1	HDCP support on inputs	On (down)—Disable HDCP support on all inputs
		Off (up)—Enable HDCP support which is defined by P3000 commands
2	Video mode switching Output 1	On (down)—Auto
		Off (up)—Manual
3	Last connected/Priority mode Output 1	When DIP-switch 2 is set to Auto (ON):
		On (down)—Enable Last Connected mode
		Off (up)—Enable Priority mode where the priority of each input is defined by the input number, (1 is the highest priority)
4	Video mode switching Output 2	On (down)—Auto
		Off—Manual
5	Last connected/Priority mode Output 2	When DIP-switch 4 is set to Auto (ON):
		On (down)—Enable Last-connected mode
		Off (up)—Enable Priority mode where the priority of each input is defined by the input number, (1 is the highest priority)
6	N/A	N/A
7	N/A	N/A
8	N/A	N/A

VS-62DT - Configuring and Maintaining the VS-62DT

8.2 Resetting the VS-62DT to Factory Default Settings

To reset the device to factory default settings:

1. Power off the device.

2. Press and hold down the Reset button on the rear panel.

3. While holding down the Reset button, power on the device.

4. Wait a few seconds and release the button.
   The device is reset to its factory settings.

8.3 Upgrading the Firmware

The **VS-62DT** can be upgraded via any of the following:

- Mini USB

- RS-232

- Ethernet

- Web page

For instructions on upgrading the firmware see "*K-Upload Software*".

9 Operating the VS-62DT Remotely via the Web Pages

The **VS-62DT** 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:

- Perform the procedures in Section 5.2

- Ensure that your browser is supported (see Section 11)

- Ensure that JavaScript is enabled

9.1 Accessing VS-62DT Web Pages

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

To access the VS-62DT Web pages:

1. Open your Internet browser.

2. Type the IP number of the device in the address bar of your browser. The default IP address of the **VS-62DT** is 192.168.1.39

   http://192.168.1.39

   If authentication is enabled, the following window appears (Figure 9) and you must enter the valid username (**Admin**) and password (**Admin**) to access the Web pages.

3. Enter the User Name and Password.
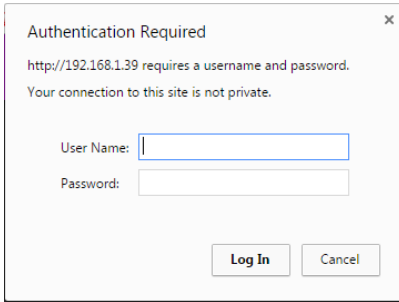
Figure 9: Entering Logon Credentials

Next, the Web Cache window appears.
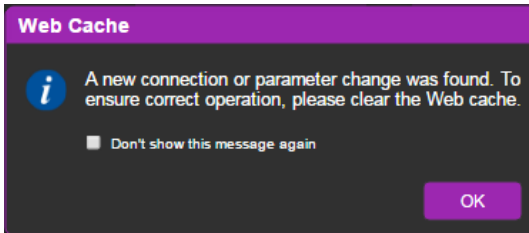
Figure 10: Web Cache Window

4. Clear the Web cache or check "Don't show this message again" and click
   OK.

   The opening (Video Switching) Web page appears:
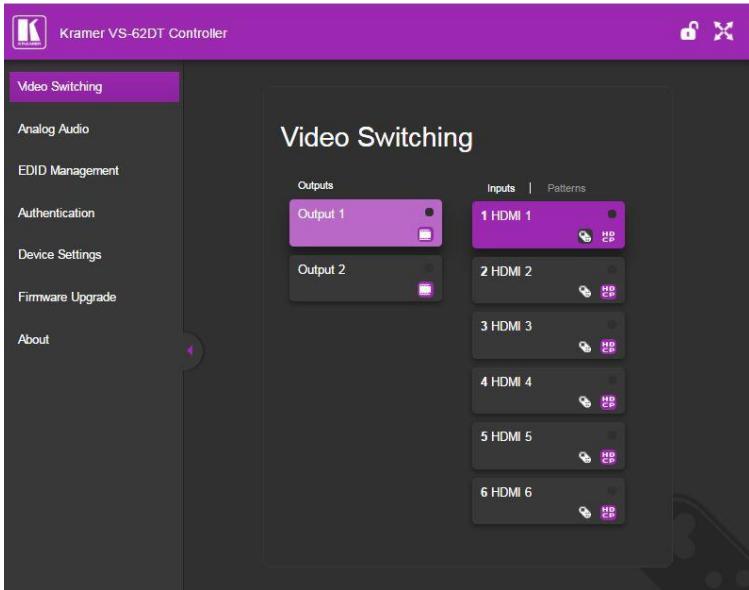
Figure 11: Opening Web Page

- To expand the left-hand side page panel, click the Reveal button ►.

- To hide the left-hand side page panel, click the Hide button ◄.

- To lock the page, click 🔒.

- To toggle in and out of full screen mode, click ✕.

9.2   Selecting Input Signals

The Video Switching page enables you perform operational actions, such as, switching inputs/outputs and selecting HDCP support
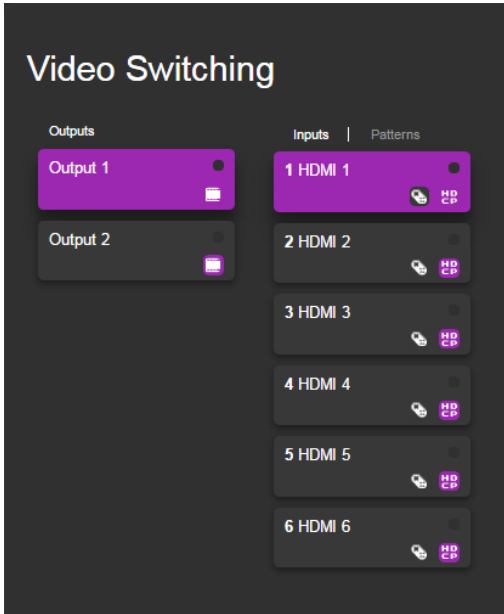
Figure 12: Video Switching Page

Item	Description
Output Buttons 1 and 2	2 Buttons for output selection, signal identification, and audio and video muting (see Section 9.2.1)
HDMI Input Buttons 1 to 6	6 Buttons for input selection, and port and signal identification (see Section 9.2.1)
Patterns	6 Buttons for video pattern generation (see Section 9.2.3)
Video Mute Button	Click the button to mute the video
Input/Output Active Indicator	Lights to indicate active input sources or active output acceptors
Remote Device Control Button	Click the button to display the control window for the remote device connected to this Input (see Section 9.2.2)
HDCP Content Button	Click the button to turn on or off the HDCP support for the input

9.2.1 Switching an Input to an Output

To switch an Input to an Output, (for example, Input 2 to Output 2):

1. Click on Output button 2.
   The button changes color to purple and the Output is selected.

2. Click on Input button 2.
   The button changes color to purple and the output is switched.

9.2.2 Controlling a Remote Transmitter

Compatible remote transmitters, (for example, the **SID-X3N**) that are connected to the **VS-62DT** can be controlled using the Web pages.
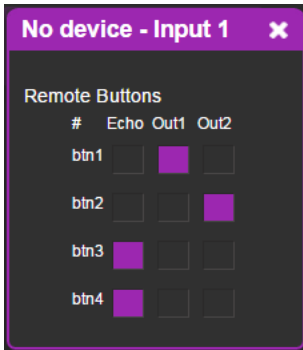
Figure 13: Remote Device Control Window

The **VS-62DT** enables programming the general purpose buttons on remote modules. The table shows the functionality defined for each button. The options are:

- Echo—allows a connected controller to be programmed to perform a variety of tasked triggered by the user buttons, such as, room control, (lights, screen, and so on)

- Out 1—step-in current input to output 1

- Out 2—step-in current input to output 2

Note: These settings are per input and remain valid even if the remote **SID-X3N** is exchanged for another **SID-X3N**.

Up to three of the Echo, Out 1 and Out 2 buttons can be active at the same time.

9.2.3 Using Test Patterns as Video Inputs

You can use one of six built-in, video test patterns as a video Input.

To select a test pattern as an Input for an Output:

1. Click **Patterns**.
   The six test pattern buttons are shown.
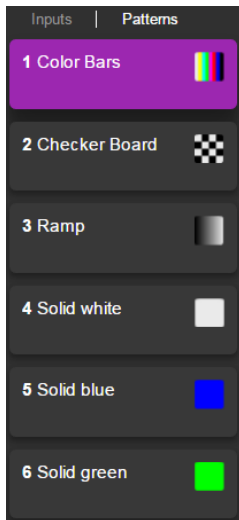
Figure 14: Test Pattern Tab

2. Click the required test pattern button.
   The button changes color and the selected test pattern is switched to the Output.

9.3 Adjusting Analog Audio Output

The Analog Audio page enables you to adjust output levels, mute or unmute the outputs and to swap outputs.
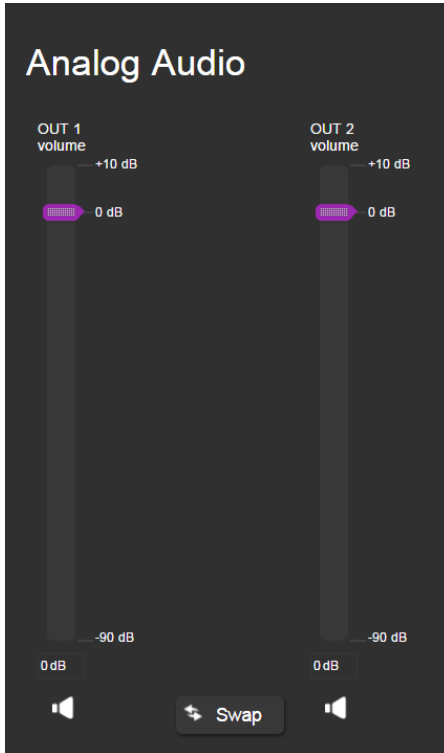
Item	Description
Out 1 and *2* Volume Sliders	The volume of each channel ranges from -90dB to +10dB. Slide the sliders up and down to adjust the volume level
Mute/ Unmute Button	Click to mute the channel output. **X** appears on the icon and the output is muted. Click again to unmute and the red "x" disappears.
Swap Button	Click to toggle swapping output 1 to output 2 and output 2 to output 1 and vice versa.

9.4 Managing the EDID

The **VS-62DT** EDID page lets you copy EDID data to one or more Inputs from an:

- Output
- Input
- Default EDID
- EDID data file
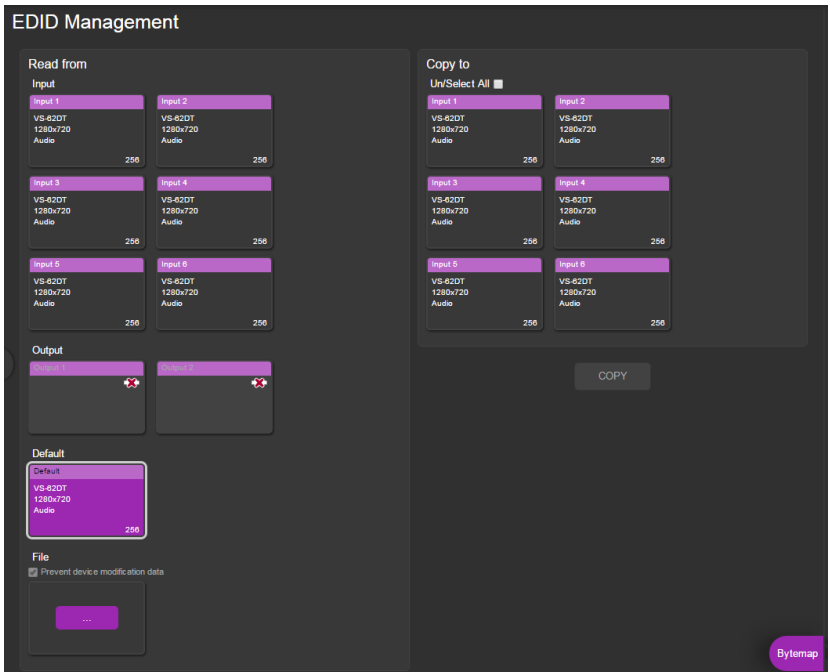
Figure 15: EDID Management Page

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

Item		Description
Read from Section	*Input 1* thru *6* buttons	Click to read the EDID from each HDMI input, 1 through 6
	Output button	Click to read the EDID from output 1 or 2
		Icon indicates output is not connected
	DEFAULT EDID button	Click to read the default EDID
	Prevent Device Modification Data Checkbox	Check to lock the EDID file and prevent any device from changing it.
	File …	Click to open the file browser to select an EDID file on your computer
Short Summary information inside the boxes		Displays the current election of EDID source, destination, video resolution, audio availability, and EDID size in bytes
Copy to Section	*Un/Select All* selection box	Check to select or deselect all inputs
	Input 1 thru *6* buttons	Click to copy the EDID to any HDMI input, 1 through 6
COPY Button		Click to copy the EDID from the selected source to the selected destination
BYTEMAP Button		Click to view the hex code of the EDID

To copy EDID data from an Output or Input or Default to one or more inputs:

1. Click the source button from which to copy the EDID (Output or Input or Default).

    The button changes color and the EDID summary information reflects the EDID data.

2. Click one or more destination Inputs, or select all Inputs by checking the Inputs check-box.

    All selected Input buttons change color and the EDID summary information reflects the Input selection(s).

3. Click the **Copy** button.

    The "EDID was copied" success message is displayed and the EDID data are copied to the selected Input(s).

4. Click **OK**.

To copy EDID data to an Input from an EDID data file:

1. Click the source **Browse** button.

    The Windows Browser opens.

2. Browse to the required file.

3. Select the required file and click **Open**.

   The EDID summary information reflects the selection.

4. Click one or more destination Inputs, or select all Inputs by checking the Inputs check-box.

   All selected Input buttons change color and the EDID summary information reflects the Input selection(s).

5. Click the **Copy** button.

   The "EDID was copied" success message is displayed and the EDID data are copied to the selected Input(s).

6. Click **OK**.

To see the EDID data file:
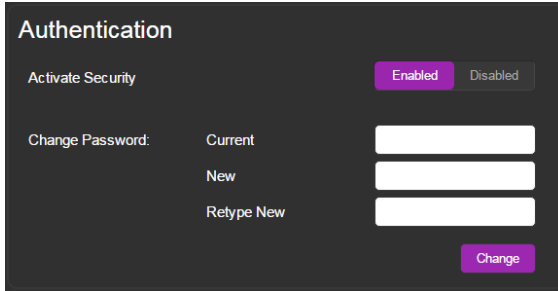
- Click **Bytemap** in the lower right-hand corner.

  The EDID data appears in hexadecimal:

Figure 16: EDID Bytemap

9.5 Setting Authentication

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

Figure 17: Authentication Page

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

9.6 Setting Device Configurations

The Device Settings page enables you to identify your **VS-62DT**:

• Set the unit name and view the model type, firmware version, serial number and MAC address.

• Edit IP settings, (for example, enable DHCP, set IP, mask and gateway addresses and set UDP or TCP ports).

• Save and load configurations.

• Reset the device to factory default settings.

Figure 18: Device Settings Page

Item	Description
Unit Name	Enter a descriptive, easy to identify name for the **VS-62DT**
Model	Displays the model of the device
Firmware version	Displays the firmware version of the device
Serial number	Displays the serial number of the device
Ethernet Settings	
DHCP ON/OFF Buttons	Click ON to turn DHCP on; click OFF to turn DHCP off and use static IP addressing
IP address	The IP address of the device. To set a new IP address, enter the new valid IP address and click Set
Mask address	The network mask of the device. To set a new mask, enter the new valid mask and click Set
Gateway address	The network gateway for the device. To set a new network gateway, enter the new valid gateway and click Set
Set Button	Click to set the Ethernet settings
MAC address	Read-only field showing the MAC address
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**

Item	Description
All settings	
Load & *Save* buttons	Click Load to retrieve a previously saved configuration, click Save to save the present configuration (see Section 9.3.1)
Factory reset button	Click to reset the device to factory default parameters. After the success message is displayed, turn the device off and on (see Section 9.3.2)

9.6.1 Loading and Saving Configurations

The **VS-62DT** enables loading and saving device setting configurations. This is especially useful when setting up multiple **VS-62DT** devices.

To load a configuration:

1. Click **Load**.

   The File Upload browser window appears.

2. Browse to the required file and click **Open**.

   The configuration is retrieved and the success message is displayed.

To save the current configuration:

1. Click **Save**.

   The Save Configuration success message is displayed.

2. Click **Download** to either open the file or save it to the required location.
   Or,
   Click **OK** to complete the procedure.

9.7 Upgrading the Firmware

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

To upgrade the firmware:

1. Open the Firmware Upgrade page.
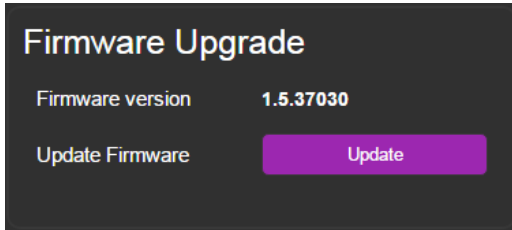
Figure 19: Firmware Upgrade

2. Click **Update**.
   The Windows Browser opens.

3. Browse to the required file and click **Open**.
   The firmware file name is displayed in the Firmware Upgrade page.

4. Click **Start Upgrade**.
   The firmware file is loaded and a progress bar is displayed.

> Do not interrupt the process or the **VS-62DT** may be damaged.

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

> You can upgrade firmware for multiple **VS-62DT** devices installed in the organization via the Kramer Network.

9.8 About Kramer

The **VS-62DT** About Us page displays the web version and Kramer Electronics Ltd company contact details.

Figure 20: About Kramer

VS-62DT - Operating the VS-62DT Remotely via the Web Pages

10 Wiring the Twisted Pair RJ-45 Connectors

Connect/solder the cable shield to the RJ-45 connector shield.

> **Do not use a crossed TP cable with this product**.
> Using a TP cable that is incorrectly wired may cause permanent damage to the device
>
> **Do not** use unshielded TP cables with this product

Figure 21 defines the TP pinout using a straight pin-to-pin cable with RJ-45 connectors.

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

Figure 21: TP Pinout Wiring
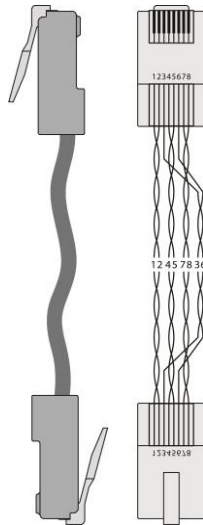
11   Technical Specifications

INPUTS:	6 HDMI connectors
OUTPUTS:	1 HDMI connector, 1 HDBT on an RJ-45 connector
PORTS:	1 Ethernet on an RJ-45 connector 12 remote selection contact-closure switches on 13 terminal block pins 1 serial port on a 3-pin terminal block 1 program port on a mini USB
ANALOG AUDIO:	2 balanced stereo audio on 5-pin terminal blocks
BANDWIDTH:	Up to 8.91Gbps data rate (2.97Gbps per graphic channel)
COMPLIANCE WITH HDMI STANDARD:	HDMI 1.4 and HDCP 1.4
RESOLUTION:	Up to 4K@60Hz UHD (4:2:0)
RANGE:	Up to 40m (130ft) at 4K @60Hz (4:2:0) Up to 70m (230ft) at full HD (1080p @60Hz 36bpp)
SUPPORTED BAUD RATES:	9600, 115200bps
POWER CONSUMPTION:	48V DC 360mA
CONTROLS:	Front panel buttons, infrared remote control transmitter, RS-232, Ethernet, remote input selection switches and LEDS, built-in Web browser
OPERATING TEMPERATURE:	0° to +40°C (32° to 104°F)
LED INDICATORS:	IR active - red, ON - green
STORAGE TEMPERATURE:	-40° to +70°C (-40° to 158°F)
HUMIDITY:	10% to 90%, RHL non-condensing
POWER CONSUMPTION:	48V DC, 360mA
DIMENSIONS:	21.5cm x16.3cm x 4.4cm (8.4" x 6.4" x 7.2") W, D, H
WEIGHT:	1.03kg (2.3lbs) approx.
SHIPPING DIMENSIONS:	35.1cm x 21.2cm x 7.2cm (13.8" x 8.4" x 2.8") W, D, H
SHIPPING WEIGHT:	1.67kg (3.7lbs) approx.
INCLUDED ACCESSORIES:	Power supply, IR remote control
OPTIONS:	RK-1 19" rack adapter
Specifications are subject to change without notice at www.kramerav.com	

12   Default Communication Parameters

RS-232	
Protocol 3000	
Baud Rate:	115,200 (9600)
Data Bits:	8
Stop Bits:	1
Parity:	None
Command Format:	ASCII
TCP/IP Parameters	
IP Address:	192.168.1.39
Subnet Mask:	255.255.225.0
Default Gateway:	192.168.1.254
UDP Port #:	50000
TCP Port #:	5000

13   Default EDID

Monitor
 Model name.............. VS-62DT
 Manufacturer............ KMR
 Plug and Play ID......... KMR0200
 Serial number............ 1
 Manufacture date......... 2010, ISO week 24
 Filter driver............ None

 EDID revision............ 1.3
 Input signal type........ Digital (DVI)
 Color bit depth.......... Undefined
 Display type............. RGB color
 Screen size.............. 700 x 390 mm (31.5 in)
 Power management......... Not supported
 Extension blocs.......... 1 (CEA-EXT)

 DDC/CI.................. n/a

Color characteristics
 Default color space...... Non-sRGB
 Display gamma............ 2.20
 Red chromaticity......... Rx 0.640 - Ry 0.341
 Green chromaticity....... Gx 0.286 - Gy 0.610
 Blue chromaticity........ Bx 0.146 - By 0.069
 White point (default).... Wx 0.284 - Wy 0.293
 Additional descriptors... None

Timing characteristics
 Horizontal scan range.... 31-94kHz
 Vertical scan range...... 50-85Hz
 Video bandwidth.......... 170MHz
 CVT standard............. Not supported
 GTF standard............. Not supported
 Additional descriptors... None
 Preferred timing......... Yes
 Native/preferred timing.. 1280x720p at 60Hz
  Modeline.............. "1280x720" 74.250 1280 1390 1430 1650 720 725 730 746 +hsync -vsync
 Detailed timing #1....... 1920x1080p at 60Hz (16:9)
  Modeline.............. "1920x1080" 148.500 1920 2008 2052 2200 1080 1084 1089 1125 +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 720p at 60Hz - VESA STD
 1280 x 800p at 60Hz - VESA STD
 1440 x 900p at 60Hz - VESA STD
 1280 x 960p at 60Hz - VESA STD
 1280 x 1024p at 60Hz - VESA STD
 1400 x 1050p at 60Hz - VESA STD
 1680 x 1050p at 60Hz - VESA STD
 1600 x 1200p at 60Hz - VESA STD

EIA/CEA-861 Information
 Revision number.......... 3
 IT underscan............. Not supported
 Basic audio............. Supported
 YCbCr 4:4:4.............. Supported
 YCbCr 4:2:2.............. Supported
 Native formats........... 1
 Detailed timing #1....... 720x480p at 60Hz (4:3)
  Modeline.............. "720x480" 27.000 720 736 798 858 480 489 495 525 -hsync -vsync
 Detailed timing #2....... 1920x1080i at 60Hz (16:9)
  Modeline.............. "1920x1080" 74.250 1920 2008 2052 2200 1080 1084 1094 1124 interlace +hsync +vsync
 Detailed timing #3....... 1920x1080i at 50Hz (16:9)
  Modeline.............. "1920x1080" 74.250 1920 2448 2492 2640 1080 1084 1094 1124 interlace +hsync +vsync
 Detailed timing #4....... 1280x720p at 60Hz (16:9)
  Modeline.............. "1280x720" 74.250 1280 1390 1430 1650 720 725 730 750 +hsync +vsync
 Detailed timing #5....... 1280x720p at 50Hz (16:9)
  Modeline.............. "1280x720" 74.250 1280 1720 1760 1980 720 725 730 750 +hsync +vsync

CE video identifiers (VICs) - timing/formats supported
  720 x 576p at 50Hz - EDTV (4:3, 16:15)
  1280 x 720p at 50Hz - HDTV (16:9, 1:1)
  1920 x 1080i at 60Hz - HDTV (16:9, 1:1)
  1920 x 1080i at 50Hz - HDTV (16:9, 1:1)
  1280 x 720p at 60Hz - HDTV (16:9, 1:1) [Native]
  1920 x 1080p at 60Hz - HDTV (16:9, 1:1)
  1920 x 1080p at 50Hz - HDTV (16:9, 1:1)
  NB: NTSC refresh rate = (Hz*1000)/1001

CE audio data (formats supported)
  LPCM   3-channel, 24-bits   at 44/48 kHz

CE speaker allocation data
  Channel configuration.... 3.0
  Front left/right......... Yes
  Front LFE................ No
  Front center............. Yes
  Rear left/right.......... No
  Rear center.............. No
  Front left/right center.. No
  Rear left/right center... No
  Rear LFE................. No

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

Raw data
 00,FF,FF,FF,FF,FF,FF,00,2E,4D,00,02,01,00,00,00,18,14,01,03,81,46,27,78,0A,D5,7C,A3,57,49,9C,25,
 11,48,4B,FF,FF,80,81,C0,81,00,95,00,81,40,81,80,90,40,B3,00,A9,40,01,1D,00,72,51,D0,1A,20,6E,28,
 55,00,7E,88,42,00,00,1A,02,3A,80,18,71,38,2D,40,58,2C,45,00,C4,8E,21,00,00,1E,00,00,00,FC,00,56,
 53,2D,34,32,48,4E,0A,20,20,00,00,00,00,00,FD,00,32,55,1F,5E,11,00,0A,20,20,20,20,20,20,01,7B,
 02,03,1A,71,47,11,13,05,14,84,10,1F,23,0A,06,04,83,05,00,00,65,03,0C,00,10,00,8C,0A,D0,8A,20,E0,
 2D,10,10,3E,96,00,58,C2,21,00,00,18,01,1D,80,18,71,1C,16,20,58,2C,25,00,C4,8E,21,00,00,9E,01,1D,
 80,D0,72,1C,16,20,10,2C,25,80,C4,8E,21,00,00,9E,01,1D,00,72,51,D0,1E,20,6E,28,55,00,C4,8E,21,00,
 00,1E,01,1D,00,BC,52,D0,1E,20,B8,28,55,40,C4,8E,21,00,00,1E,00,00,00,00,00,00,00,00,00,00,00,90

14   Protocol 3000

The **VS-62DT** can be operated using the Kramer Protocol 3000 serial commands. The command framing varies according to how you interface with the **VS-62DT**. For example, a basic video input switching command that routes a layer 1 video signal to HDMI out 1 from HDMI input 2 (ROUTE 1,1,2), is entered as follows:

- Terminal communication software, such as Hercules:
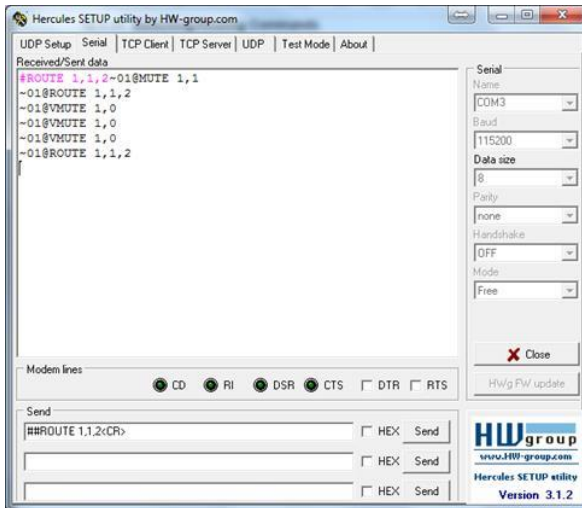
  The framing of the command varies according to the terminal communication software.

- K-Touch Builder (Kramer software):

- K-Config (Kramer configuration software):

VS-62DT - Protocol 3000

Command Syntax		Display Command as	○ Hex	○ Decimal	● ASCII

"#ROUTE 1,1,2",0x0D   **Set**   **Clear**

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

You can enter commands directly using terminal communication software (e.g., Hercules) by connecting a PC to the serial or Ethernet port on the **VS-62DT**. To enter `CR` press the Enter key (`LF` is also sent but is ignored by the command parser).

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

For more information about:

- Using Protocol 3000 commands, see

- General syntax used for Protocol 3000 commands, see

- Protocol 3000 commands available for the **VS-62DT**, see

14.1 Understanding Protocol 3000

Protocol 3000 commands are structured according to the following:

- **Command –** A sequence of ASCII letters (`A-Z`, `a-z` and `-`). A command and its parameters must be separated by at least one space.

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

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

> **ⓘ** A string can contain more than one command. Commands are separated by a pipe (`|`) character.
>
> The maximum string length is 64 characters.

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

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

14.2 Kramer Protocol 3000 Syntax

The Kramer Protocol 3000 syntax uses the following delimiters:

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

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

The Protocol 3000 syntax is in the following format:

- Host Message Format:

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

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

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

- **Command String** – Formal syntax with command 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

- Device Message Format:

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

- Device Long Response – Echoing command:

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

15 Kramer Protocol 3000 Commands

This section lists and describes all the commands of Protocol 3000.

- System Commands - Mandatory (see Section 15.1)

- System Commands (see Section 15.2)

- Switching/Routing Commands (see Section 15.3)

- Communication Commands (see Section 15.4)

- EDID Handling Commands (see Section 15.5)

- Step-in commands (see Section 15.6)

- Audio Commands (see Section 15.7)

- Video Commands (see Section 15.8)

15.1 System Commands - Mandatory

All devices running Protocol 3000 use these commands.

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

15.1.1

Command Name		Permission	Transparency
Set:	#	End User	Public
Get:	-	-	-

Description		Syntax	
Set:	Protocol handshaking	#`CR`	
Get:	-	-	

Response
~`nn`@`SP`OK`CR LF`

Parameters

Response Triggers

Notes
Validates the Protocol 3000 connection and gets the machine number
Step-in master products use this command to identify the availability of a device

K-Config Example
"#",0x0D

15.1.2 BUILD-DATE?

Command Name		Permission	Transparency
Set:	-	-	-
Get:	`BUILD-DATE?`	End User	Public

Description		Syntax	
Set:	-	-	
Get:	Get device build date	`#BUILD-DATE?`CR	

Response
~nn@BUILD-DATE SP *date* SP *time* CR LF

Parameters
`date` - Format: YYYY/MM/DD where YYYY = Year, MM = Month, DD = Day `time` - Format: hh:mm:ss where hh = hours, mm = minutes, ss = seconds

Response Triggers

Notes

K-Config Example
"#BUILD-DATE?",0x0D

15.1.3 FACTORY

Command Name		Permission	Transparency
Set:	`FACTORY`	End User	Public
Get:	-	-	-

Description		Syntax	
Set:	Reset device to factory default configuration	`#FACTORY`CR	
Get:	-	-	

Response
~nn@FACTORY SP OK CR LF

Parameters

Response Triggers

Notes
This command deletes all user data from the device. The deletion can take some time. Your device may require powering off and powering on for the changes to take effect.

K-Config Example
"#FACTORY",0x0D

15.1.4 HELP

Command Name		Permission	Transparency
Set:	–	-	-
Get:	HELP	End User	Public

Description		Syntax	
Set:	-	-	
Get:	Get command list or help for specific command	2 options: 1. `#HELP` CR 2. `#HELP` SP `command_name` CR	

Response
1. Multi-line: ~ nn `@Device available protocol 3000 commands:` CR LF `command,` SP `command...` CR LF
To get help for command use: HELP (COMMAND_NAME) CR LF
2. Multi-line: ~ nn `@HELP` SP `command:` CR LF `description` CR LF `USAGE:` `usage` CR LF

Parameters

Response Triggers

Notes

K-Config Example
"#HELP",0x0D

15.1.5 MODEL?

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

K-Config Example
"#MODEL?",0x0D

15.1.6 PROT-VER

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			
K-Config Example			
"#PROT-VER?",0x0D			

15.1.7 RESET

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.			
K-Config Example			
"#RESET",0x0D			

15.1.8 SN?

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

15.1.9 VERSION?

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			
K-Config Example			
"#VERSION?",0x0D			

15.2 System Commands

Command	Description	Type	Permission
AV-SW-MODE	Set/get auto switch mode	System	End user
HDCP-MOD	Set/get HDCP mode	System	Administrator
HDCP-STAT?	Get HDCP signal status	System	End user
LOCK-FP	Set/get front panel lock	System	Administrator
NAME	Set/get machine (DNS) name	System	Administrator
NAME-RST	Reset machine name to factory default (DNS)	System	Administrator
PRIO	Set/get input priority	System	Administrator
SIGNAL?	Get input signal lock status	System	End User

15.2.1 AV-SW-MODE

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 – 1 (video) *output_id* – for video layer: 1 (HDMI Out) *mode* - 0 (manual), 1 (priority switch), 2 (last connected switch)			
Response Triggers			
Notes			
K-Config Example			
Get the input audio switch mode for HDMI Out: "#AV-SW-MODE? 1,1", 0x0D			

15.2.2 DISPLAY?

Command Name		Permission	Transparency
Set:	-	-	-
Get	`DISPLAY?`	End User	Public

Description		Syntax	
Set:	-	-	
Get:	Get output HPD status	`#DISPLAY?` `SP` `out_id` `CR`	

Response

`~``nn`@DISPLAY`SP``out_id,status``CR LF`

Parameters

`out_id` – `1` (HDMI Out)
`status` – HPD status according to signal validation : `0` (Off), `1` (On), `2` (On and all parameters are stable and valid)

Response Triggers

A response is sent to the comm port from which the Get was received, after command execution and:

After every change in output HPD status from On to Off (0)

After every change in output HPD status from Off to On (1)

After every change in output HPD status form Off to On and all parameters (new EDID, etc.) are stable and valid (2)

Notes

K-Config Example

Get the output HPD status of HDMI Out:
`"#DISPLAY? 1",0x0D`

15.2.3 HDCP-MOD

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?`_{CR}

Response

Set / Get: `~`nn`@HDCP-MOD`SP`mode`CR LF

Parameters

`inp_id` – 1 (Input 1)… 6 (Input 6)
`mode` - 1 (HDCP on), 0 (HDCP off)

Response Triggers

Response is sent to the comm port from which the Set (before execution) / Get command was received
Response is sent to all comm 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:
  HDCP supported - HDCP_ON [default]
  HDCP not supported - HDCP OFF
  HDCP support changes following detected sink - MIRROR OUTPUT

K-Config Example

Disable HDCP mode on HDMI Input 2:
`"#HDCP-MOD 2,0",0x0D`

15.2.4 HDCP-STAT?

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,status `CR LF`

Parameters
stage – 0 (input), 1 (output), 2 (reserved), 3 (reserved)
stage_id – Inputs: 1 (Input 1)… 6 (Input 6), Outputs 1 (HDBT), 2 (HDMI)
status - signal encryption status – 0 (HDCP off), 1 (HDCP on)

Response Triggers
Response is sent to the comm port from which the Set (before execution) / Get command was received
Response is sent to all comm ports after execution if HDCP-STAT was set by any other external control device (button press, device menu and similar) or HDCP mode changed

Notes
On output – sink status
On input – signal status

K-Config Example
Get the HDCP input signal status of the source device connected to HDMI In 1:
"#HDCP-STAT? 0,1",0x0D

15.2.5 LOCK-FP

Command Name		Permission	Transparency
Set:	LOCK-FP	End User	Public
Get:	LOCK-FP?	End User	Public
Description		**Syntax**	
Set:	Lock the port	#LOCK-FP `SP` *PortNumber,Lock/Unlock* `CR`	
Get:	Get the port lock state	#LOCK-FP? `SP` *PortNumber* `CR`	
Response			
~`nn`@PORT-TYPE `SP` *PortNumber,Lock/Unlock* `CR LF`			
Parameters			
PortNumber – 1-2 (port number) *Lock/Unlock* – 0 (unlock), 1 (lock)			
Response Triggers			
Notes			
K-Config Example			
Lock the front panel: "#LOCK-FP 1",0x0D			

15.2.6 NAME

Command Name		Permission	Transparency
Set:	NAME	Administrator	Public
Get:	NAME?	End User	Public
Description		**Syntax**	
Set:	Set machine (DNS) name	#NAME␣*machine_name*␣CR	
Get:	Get machine (DNS) name	#NAME?CR	
Response			
Set: ~nn@NAME␣*machine_name*␣CR LF			
Get: ~nn@NAME?␣*machine_name*␣CR LF			
Parameters			
machine_name - string of up to 15 alpha-numeric chars (can include hyphen, not at the beginning or end)			
Response Triggers			
Notes			
The machine name is not the same as the model name. The machine name is used to identify a specific machine or a network in use (with DNS feature on)			
K-Config Example			

15.2.7 NAME-RST

Command Name		Permission	Transparency
Set:	NAME-RST	Administrator	Public
Get:	–	-	-
Description		**Syntax**	
Set:	Reset machine (DNS) name to factory default	#NAME-RSTCR	
Get:	-	-	
Response			
~nn@NAME-RST␣OK CR LF			
Parameters			
Response Triggers			
Notes			
Factory default of machine (DNS) name is "KRAMER_" + 4 last digits of device serial number			
K-Config Example			
Set the DNS name of the device to "room-442": "#NAME room-442",0x0D			

15.2.8 PRIO

Command Name		Permission	Transparency
Set:	–	–	–
Get	`PRIO?`	Administrator	Public

Description		Syntax	
Set:	–	–	
Get:	Get input priority	`#PRIO?`[SP]`input_id`[CR]	

Response

`~`[nn]`@PRIO`[SP]`input_id,prio`[CR LF]

Parameters

`input_id` - window number setting new source `1` (Input 1)…`6` (Input 6)
`prio` - assigned priority `1` (max. priority), `6` (min. priority)

Response Triggers

After execution, response is sent to the comm port from which the Set/Get was received
After execution, response is sent to all comm ports if PRIO was set by any other external control device (button press, device menu and similar)

Notes

The PRIO max value may vary for different devices

K-Config Example

Get the input priority Input 3:
`"#PRIORITY? 3",0x0D`

15.2.9 SIGNAL?

Command Name		Permission	Transparency
Set:	–	-	-
Get	`SIGNAL?`	End User	Public

Description		Syntax	
Set:	-	-	
Get:	Get input signal lock status	`#SIGNAL?`[SP]`inp_id`[CR]	

Response

`~`[nn]`@SIGNAL`[SP]`inp_id,status`[CR LF]

Parameters

`inp_id` - `1` (Input 1)… `6` (Input 6)
`status` - lock status according to signal validation - `0` (signal off), `1` (signal on)

Response Triggers

After execution, a response is sent to the comm port from which the Get was received
Response is sent after every change in input signal status ON to OFF, or OFF to ON

Notes

K-Config Example

Get the input signal lock status of HDMI In 2:
`"#SIGNAL? 2",0x0D`

15.3 Switching/Routing Commands

Note: Use the **ROUTE** command in preference to legacy AUD, VID, and AV
commands (see below).

Command	Description	Type	Permission
MTX-MODE	Set/get auto-switch mode	Switching	End User
ROUTE	Set/get layer routing	Routing	End User
VID	Set/get video switch state	Switching	End User

15.3.1 MTX-MODE

Command Name		Permission	Transparency
Set:	MTX-MODE	End User	Public
Get:	MTX-MODE?	End User	Public
Description		**Syntax**	
Set:	Set auto-switch mode	#MTX-MODE SP *output_id,mode* CR	
Get :	Get auto-switch mode	#MTX-MODE? SP *output_id* CR	
Response			
~nn @MTX-MODE SP *output_id,mode* CR			
Parameters			
output_id – 1 (HDBT), 2 (HDMI) *mode* – 0 (manual), 1 (auto priority), 2 (auto last connected)			
Response Triggers			
After execution, a response is sent to the comm port from which the Set/Get was received After execution, a response is sent to all comm ports if MTX-MODE was set by any other external control device (button press, WEB, device menu and similar)			
Notes			
Not recommended for new devices			
K-Config Example			
Set the auto switch mode of HDMI Out to last connected input: "#MTX-MODE 1,2",0x0D			

15.3.2 ROUTE

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` – 1 (video) `dest` - * - ALL `x` - disconnect, otherwise destination id `src` - source id: 1 (Input 1)…6 (Input 6)			
Response Triggers			
Notes			
This command replaces all other routing commands			
K-Config Example			
Set the remote input switching of video to HDMI Out from HDMI In 2: `"#ROUTE 1,1,2",0x0D`			

15.3.3 VID

Command Name		Permission	Transparency
Set:	`VID`	End User	Public
Get:	`VID?`	End User	Public

Description		Syntax
Set:	Set video switch state	`#VID`SP`in>out`CR
Get:	Get video switch state	`#VID?`SP`out`CR

Response
Set: ~`nn`@VID`SP`*in>out*`CR LF`
Get: ~`nn`@VID`SP`*in>out*`CR LF`

Parameters
in - 1 (Input 1)…6 (Input 6) or 0 (disconnect output)
> - connection character between in and out parameters
out – 1 (HDBT), 2 (HDMI), * (for all outputs)

Response Triggers

Notes
The GET command identifies input switching on Step-in clients
The SET command is for remote input switching on Step-in clients (essentially via by the Web)
This is a legacy command. New Step-in modules support the ROUTE command

K-Config Example
Set the video switch state of INPUT 1 to HDBaseT:
`"#VID 1>1",0x0D`

15.4   Communication Commands

These commands are used by network devices running Protocol 3000.

Command	Description	Type	Permission
NET-DHCP	Set/get DHCP mode	Communication	Administrator
NET-GATE	Set/get gateway IP	Communication	Administrator
NET-IP	Set/get IP address	Communication	Administrator
NET-MAC?	Get MAC address	Communication	End User
NET-MASK	Set/get subnet mask	Communication	Administrator

15.4.1   ETH PORT

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 *ETHPort* - TCP/UDP port number			
Response Triggers			
Notes			
K-Config Example			
Set the Ethernet port protocol for TCP to port 12457: "#ETH-PORT TCP,12457",0x0D			

15.4.2 NET-DHCP

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)			
`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			
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			
For proper settings consult your network administrator			
K-Config Example			
Enable DHCP mode, if available:			
`"#NET-DHCP 1",0x0D`			

15.4.3 NET-GATE

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			
K-Config Example			
Set the gateway IP address to 192.168.0.1: "#NET-GATE 192.168.000.001",0x0D			

15.4.4 NET-IP

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			
K-Config Example			
Set the IP address to 192.168.1.39: "`#NET-IP 192.168.001.039`",0x0D			

15.4.5 NET-MAC

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			
K-Config Example			
"`#NET-MAC?`",0x0D			

15.4.6　NET-MASK

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 For proper settings consult your network administrator			
Notes			
K-Config Example			
Set the subnet mask to 255.255.0.0: "`#NET-MASK 255.255.000.000`",0x0D			

15.5 EDID Handling Commands

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

15.5.1 CPEDID

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` or #CPEDID`SP`src_type,src_id,dst_type,dest_bitmap, safe_mode`CR`
Get:	-	-

Response
~`nn`@CPEDID`SP`src_stg,src_id,dst_type,dest_bitmap`CR LF`
~`nn`@CPEDID`SP`src_stg,src_id,st_type,dest_bitmap,safe_mode`CR LF`

Parameters
src_type - *EDID* source type (usually input): 0 (input), 1 (output), 2 (default EDID), 3 (custom EDID) src_id - number of chosen source stage (1.. max number of inputs/outputs) dst_type - *EDID destination* type (usually input): 0 (input), 1 (output), 2 (default EDID), 3 (custom EDID) 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 safe_mode - 0 - device accepts the EDID as is without trying to adjust   1 - device tries to adjust the EDID (default value if no parameter is sent)

Response Triggers
Response is sent to the comm port from which the Set was received (before execution)

Notes
Destination bitmap size depends on device properties (for 64 inputs it is a 64-bit word) Example: bitmap 0x0013 means inputs 1,2 and 5 are loaded with the new EDID In certain products *Safe_mode* is an optional parameter. See the HELP command for its availability

K-Config Example
Copy the EDID data from the HDMI Out output (EDID source) to the HDMI In 1 input: "#CPEDID 1,1,0,0x1",0x0D Copy the EDID data from the default EDID source to HDMI In 1 and PC In inputs: "#CPEDID 2,0,0,0x5",0x0D

15.6 Step-In Commands

Command	Description	Type	Permission
PROG-ACTION	Set/get step-in button action list	Step-in	End User

15.6.1 PROG-ACTION

Command Name		Permission	Transparency
Set:	PROG-ACTION	End user	Public
Get:	PROG-ACTION?	End user	Public

Description		Syntax
Set:	Set step-in button action bitmap	`#PROG-ACTION`SP `type,port_id,button_id,actions_bitmap`CR
Get:	Get step-in button action bitmap	`#PROG-ACTION?`SP `port_type,port_id,button_id`CR

Response
~`nn`@PROG-ACTION SP `port_type,port_id,button_id,actions_bitmap`CR LF

Parameters
`port_type` – 0 (input)   `port_id` - port id: 1 (Input 1)…6 (Input 6)   `button_id` - external programmable button ID   `actions_bitmap` – bitmap representing actions to perform after receiving button_id. format: `XXXX…X`, where X is a hex digit. The binary form of every hex digit represents actions from the tab. Setting '1' says that the corresponding action must be executed: 0 (echo controller), 1 (step-in HDBT), 2 (step-in HDMI)

Response Triggers

Notes
Programs matrix action as a response for external event (programmable button pressed)

K-Config Example

15.7 Audio Commands

Command	Description	Type	Permission
AUD-LVL	Set/get volume level	Audio	End User
AUD-SWAP	Set/get audio output swap	Audio	End User
MUTE	Set/get audio mute	Audio	End User

15.7.1 AUD-LVL

Command Name		Permission	Transparency
Set:	AUD-LVL	End User	Public
Get:	AUD-LVL?	End User	Public

Description		Syntax
Set:	Set volume level	#AUD-LVL SP stage,channel,volume CR
Get:	Get volume level	#AUD-LVL? SP stage,channel CR

Response

~nn@AUD-LVL SP stage,channel,volume CR LF

Parameters

stage – 0 (input processing), 1 (output processing)
channel – number of channel: 1 (master), 2 (secondary)
volume – volume level: –90 to 10 (dB)

Response Triggers

Notes

K-Config Example

Set the volume of the Audio Out (1) output to 0dB:
"#AUD-LVL 1,1,0",0x0D

15.7.2 AUD-SWAP

Command Name		Permission	Transparency
Set:	`AUD-SWAP`	End User	Public
Get:	`AUD-SWAP?`	End User	Public
Description		**Syntax**	
Set:	Set audio output swap	`#AUD-SWAP`[SP]*swap_mode*[CR]	
Get:	Get audio output swap status	`#AUD-SWAP?`[CR]	
Response			
`~`[nn]`@AUD-SWAP`[SP]*swap_mode*[CR LF]			
Parameters			
swap_mode – `0` (off), `1` (on)			
Response Triggers			
Notes			
K-Config Example			
Set audio output swapping: `"#AUD-SWAP 1",0x0D`			

15.7.3 MUTE

Command Name		Permission	Transparency
Set:	MUTE	End User	Public
Get:	MUTE?	End User	Public
Description		**Syntax**	
Set:	Set audio mute	#MUTE `SP` channel,mute_mode `CR`	
Get:	Get audio mute	#MUTE? `SP` channel `CR`	
Response			
~`nn`@MUTE `SP` channel,mute_mode `CR LF`			
Parameters			
channel - output number mute_mode – 0 (off), 1 (on)			
Response Triggers			
Notes			
K-Config Example			
Mute the Audio Out output: "#MUTE 1,1",0x0D			

15.8 Video Commands

Command	Description	Type	Permission
VID-PATTERN	Set/get test pattern on output	Video	End User
VMUTE	Set/get video on output mute	Video	End User

15.8.1 VID-PATTERN

Command Name		Permission	Transparency
Set:	VID-PATTERN	End User	Public
Get:	VID-PATTERN?	End User	Public
Description		**Syntax**	
Set:	Set test pattern on output	#VID-PATTERN`SP`*output_id,pattern_id*`CR`	
Get :	Get test pattern on output	#VID-PATTERN?`SP`*output_id*`CR`	

Response

~`nn`@VID-PATTERN`SP`*output_id,pattern_id*`CR`

Parameters

output_id – 1 (HDBT), 2 (HDMI)
pattern_id – 1 (color bar), 2 (checkerboard), 3 (gradient), 4 (white), 5 (blue), 6 (green)

Response Triggers

After execution, response is sent to the comm port from which the set/get was received
After execution, response is sent to all comm ports if VID-PATTERN was set by any other external control device (button press, WEB, device menu and similar)

Notes

K-Config Example

Set HDMI Out 2 to pattern 2 (checkerboard):
"#VID-PATTERN,2,2",0x0D

15.8.2 VMUTE

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 (HDBT), 2 (HDMI)
flag – 0 (disable video on output), 1 (enable video on output), 2 (blank video)

Response Triggers

Notes

Video mute parameter 2 (blank picture) is not supported
K-Config Example
Disable the video output on HDMI Out: "#VMUTE 3,0",0x0D

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