



KRAMER ELECTRONICS LTD.

USER MANUAL

MODEL:

VS-88DT

HDMI/HDBT Matrix Switcher

P/N: 2900-300275 Rev 5

VS-88DT 8x8 HDMI/HDBT Matrix Switcher Quick Start Guide



This guide helps you install and use your VS-88DT for the first time. Go to <http://www.kramerav.com/manual/VS-88DT> to download the latest user manual (or scan the QR code) and check if firmware upgrades are available.

Step 1: Check what's in the box

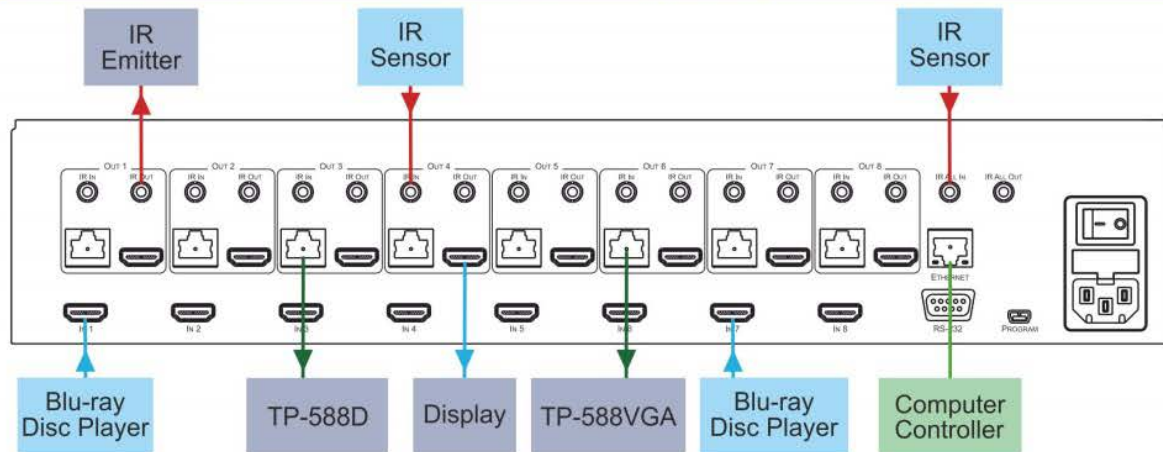
- VS-88DT 8x8 HDMI/HDBT Matrix Switcher
- 1 Power cord
- 1 Set of rack "ears"
- 1 Quick Start Guide
- Kramer RC-IR3 Infrared RC Transmitter
- 4 Rubber feet

Step 2: Install the VS-88DT

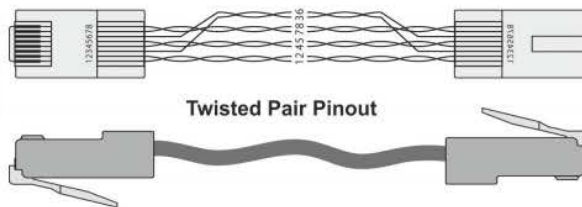
Mount the machine in a rack (using the included rack "ears") or attach the rubber feet and place it on a shelf.

Step 3: Connect the inputs and outputs

Always switch off the power to all devices before connecting them to your VS-88DT.



For optimum performance we recommend the Kramer **BC-HDKat6a** (CAT 6 23 AWG) cable. This specially built cable significantly outperforms regular CAT 5/CAT 6/CAT 7a cables.



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

Step 4: Connect the power

Connect the power cord to the VS-88DT and plug it into the mains electricity.



Step 5: Operate the VS-88DT

To switch an input to an output:

1. Press a button on the top row to select an output.
2. Press a button on the bottom row to select an input to switch to the output.

Use the Menu to configure the device:

1. Press Menu to enter the menu.
2. Navigate the menu using the Enter and arrow buttons.
3. Press Menu to exit the Menu.

To Copy an EDID from an output to an input:

1. Press EDID.
2. Press the required Out button.
3. Press the required In button.
4. Press EDID.

To Copy an EDID from an output to all inputs:

1. Press EDID.
2. Press the required Out button.
3. Press the required In button.
4. Repeat steps 2 and 3 for each EDID to copy.
5. Press EDID.

Contents

1	Introduction	1
2	Getting Started	2
2.1	Achieving the Best Performance	2
2.2	Safety Instructions	2
2.3	Using TP cables	3
2.4	Recycling Kramer Products	3
3	Overview	4
3.1	About HDBaseT™ Technology	5
4	Defining the VS-88DT HDMI/HDBT Matrix Switcher	6
5	Installing the VS-88DT in a Rack	9
6	Connecting the VS-88DT	10
6.1	Connecting a Serial Controller to the VS-88DT	11
6.2	Connecting to the VS-88DT via Ethernet	11
7	Operating the VS-88DT	15
7.1	Switching Inputs to Outputs	15
7.2	Storing and Recalling Preset Configurations	16
7.3	Acquiring an EDID	17
7.4	Cancelling One or All Outputs	17
7.5	Resetting the Device to Factory Default Configuration	18
7.6	Locking and Unlocking the Front Panel	19
7.7	RS-232 Data Routing over HDBaseT	19
8	Configuring the VS-88DT	20
8.1	Using the Menu	20
8.2	Selecting the HDBaseT or HDMI Outputs	22
8.3	Selecting DHCP	22
8.4	Configuring the IP Network Address	23
8.5	Resetting the VS-88DT to Factory Default Configuration	24
9	Operating the VS-88DT Remotely Using the Web Pages	25
9.1	Switching Page	25
9.2	Device Settings Page	29
9.3	Authentication Page	30
9.4	RS-232 Routing Page	32
9.5	EDID Page	33
9.6	About Page	34
10	Wiring the DGKat TP RJ-45 Connectors	35
11	Updating the Firmware	36
12	Technical Specifications	38
13	Default Parameters	39
13.1	Default Communication Parameters	39
14	Kramer Protocol	40
14.1	Kramer Protocol 3000 Syntax	40
14.2	Kramer Protocol 3000 Commands	43

Figures

Figure 1: VS-88DT HDMI/HDBT Matrix Switcher Front Panel	6
Figure 2: VS-88DT HDMI/HDBT Matrix Switcher Rear Panel	8
Figure 3: Connecting the VS-88DT HDMI/HDBT Matrix Switcher	10
Figure 4: Local Area Connection Properties Window	12
Figure 5: Internet Protocol Version 4 Properties Window	13
Figure 6: Internet Protocol Properties Window	14
Figure 7: Login Page	25
Figure 8: Switching Page	26
Figure 9: Switching Button Details	27
Figure 10: Input Properties Popup	27
Figure 11: Output Properties Popup	28
Figure 12: Device Settings Page	30
Figure 13: Authentication Page	31
Figure 14: RS-232 Routing Page	32
Figure 15: EDID Page	33
Figure 16: About Page	34
Figure 17: TP Pinout Wiring	35

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 the video, audio, presentation, and broadcasting professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better!

Our 1,000-plus different models now appear in 11 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 and GROUP 11: Sierra Products.

Congratulations on purchasing your **VS-88DT HDMI/HDBT Matrix Switcher** which is ideal for:

- Conference room presentations
- Advertising applications

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-88DT 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 Kramer **VS-88DT** 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 Using TP cables

Kramer engineers have developed a special twisted pair cable to best match our HDBaseT products, the Kramer **BC-HDKat6a** (CAT 6 23 AWG) cable. This specially built cable significantly outperforms regular CAT 5/CAT 6/CAT 7a cables.

2.4 Recycling Kramer Products

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

3 Overview

The high-quality Kramer **VS-88DT** is an *HDMI/HDBT Matrix Switcher* that accepts up to eight HDMI signals and routes any or all of them to any or all eight HDMI outputs or HDBaseT for connection to compatible receivers, for example, the **TP-588D** and **TP-588VGA**.

The **VS-88DT** features:

- Eight HDMI and nine IR inputs
- Eight HDMI, eight HDBaseT and nine IR outputs
- Bandwidth up to 6.75Gbps (2.25Gbps per video channel)
- EDID Capture—copies and stores the EDID from a display device
- Hot-plug Detect (HPD)
- HDBaseT range up to 130m (430ft) at normal mode (2K) when using BC-UNIKat cables
- RS-232 data tunneling over HDBaseT
- HDCP support
- HDTV compatibility
- Support for HDMI – 3D, Deep Color, x.v.Color™, Lip Sync , Dolby® TrueHD, Dolby Digital Plus, DTS-HD® and linear PCM 7.1 surround sound
- A non-volatile memory for matrix configuration
- A store and recall facility for preset configurations
- Automatic output shutdown if no input signal is detected after a configurable idle period
- An LCD display for easy configuration and operation
- Remote control using serial commands (over RS-232 and Ethernet) and built-in, browser-based Web pages
- Support for Kramer Protocol 3000
- A lock button to prevent unwanted tampering with the settings

- 2U height that fits a standard 19" professional rack enclosure

You can control the **VS-88DT** using the front panel buttons, or remotely via:

- Built-in, embedded Web pages using a standard Web browser over Ethernet
- RS-232 serial commands transmitted by a touch screen system, PC or other serial controller
- The Kramer infrared remote control transmitter

3.1 About HDBaseT™ Technology

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

4 Defining the VS-88DT HDMI/HDBT Matrix Switcher

Figure 1 defines the front panel of the VS-88DT.

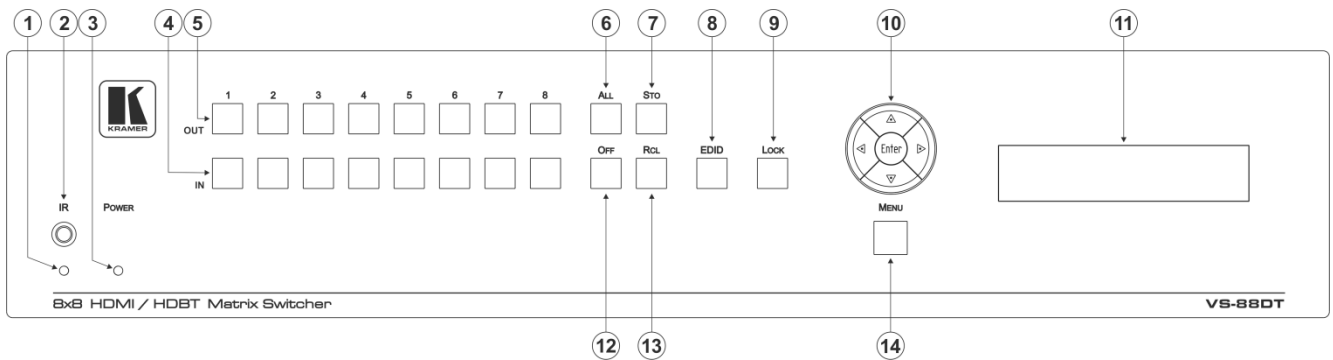


Figure 1: VS-88DT HDMI/HDBT Matrix Switcher Front Panel

#	Feature	Function
1	IR LED	Lights yellow when receiving an IR signal
2	IR Sensor	IR receiver for remote control
3	POWER LED	Lights green when the device is powered on
4	IN 1~8	Press to select an input after selecting an output (see Section 7.1)
5	OUT 1~8	Press to switch, followed by an input or OFF
6	ALL Button	Press, followed by an Input to switch the Input to all outputs or press followed by the Off button to disconnect all switches, (see Section 7.4)
7	STO Button	Press to store a preset configuration followed by the preset number in which to save it (see Section 7.2)
8	EDID Button	Press to copy the EDID from an Output to an Input (see Section 7.3)

#	Feature	Function
9	<i>LOCK</i> Button	Press and hold to lock the front panel buttons, (see Section 7.6). Press and hold again to unlock
10	Menu Navigation Pad	Use the Enter, up (▲), down (▼), left (◀) and right (▶) buttons to navigate the menu, and modify parameters or values (see Section 8.1)
11	LCD Readout (20 char x 2 lines)	Displays either the input/output resolution currently selected or the menu during configuration
12	<i>OFF</i> Button	Press after an output button to cancel the currently selected outputs. Press after the All button to cancel all currently switched outputs (see Section 7.4)
13	<i>RCL</i> Button	Press, followed by a preset number to recall the preset configuration (see Section 7.2)
14	<i>MENU</i> Button	Press to enter the Menu and move one level back when the menu is displayed (see Section 8.1)

Figure 2 defines the rear panel of the VS-88DT.

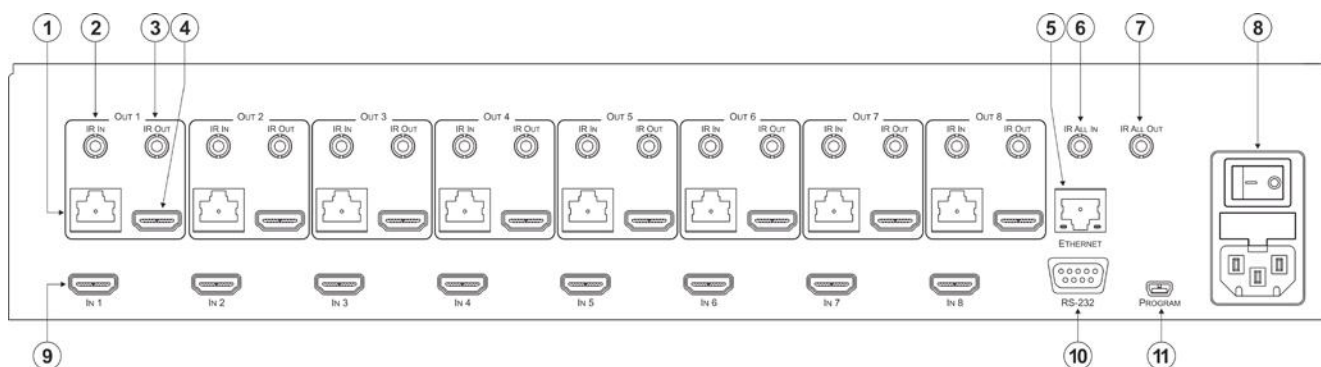


Figure 2: VS-88DT HDMI/HDBT Matrix Switcher Rear Panel

#	Feature	Function	
1	OUT 1~8	RJ-45 HDBaseT Connector	Connect to compatible HDBaseT devices, for example, TP-588D (see Section 6)
2		IR IN 3.5mm Mini Jack	Connect to IR sensors
3		IR OUT 3.5mm Mini Jack	Connect to IR blasters
4		HDMI Connector	Connect HDMI acceptors
5	ETHERNET RJ-45 Connector	Connect to a PC controller via a LAN (see Section 6.2)	
6	IR ALL IN 3.5mm Mini Jack	Connect to an IR sensor	
7	IR ALL OUT 3.5mm Mini Jack	Connect to an IR blaster	
8	AC Mains	Power Socket	Connect the mains power cord
		Fuse	AC mains supply protection fuse
		Power Switch	Turns the device on and off
9	IN 1~8 HDMI Connectors	Connect to HDMI sources	
10	RS-232 9-pin D-sub Serial Port	Connect to a serial controller (see Section 6.1)	
11	PROGRAM Mini USB Connector	For performing firmware upgrade	

5 Installing the VS-88DT in a Rack

Before installing in a rack, be sure that the environment is within the recommended range:

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



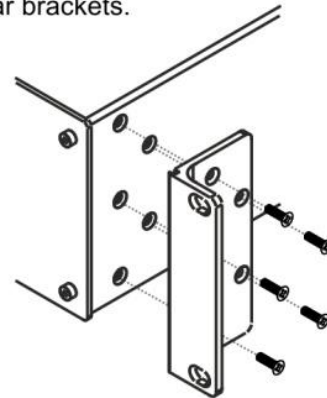
CAUTION!

When installing on a 19" rack, avoid hazards by taking care that:

1. It is located within the recommended environmental conditions, as the operating ambient temperature of a closed or multi unit rack assembly may exceed the room ambient temperature.
2. Once rack mounted, enough air will still flow around the machine.
3. The machine is placed straight in the correct horizontal position.
4. You do not overload the circuit(s). When connecting the machine to the supply circuit, overloading the circuits might have a detrimental effect on overcurrent protection and supply wiring. Refer to the appropriate nameplate ratings for information. For example, for fuse replacement, see the value printed on the product label.
5. The machine is earthed (grounded) in a reliable way and is connected only to an electricity socket with grounding. Pay particular attention to situations where electricity is supplied indirectly (when the power cord is not plugged directly into the socket in the wall), for example, when using an extension cable or a power strip, and that you use only the power cord that is supplied with the machine.

To rack-mount a machine:

1. Attach both ear brackets to the machine. To do so, remove the screws from each side of the machine (5 on each side), and replace those screws through the ear brackets.



2. Place the ears of the machine against the rack rails, and insert the proper screws (not provided) through each of the four holes in the rack ears.

Note:

- In some models, the front panel may feature built-in rack ears
- Detachable rack ears can be removed for desktop use
- Always mount the machine in the rack before you attach any cables or connect the machine to the power
- If you are using a Kramer rack adapter kit (for a machine that is not 19"), see the Rack Adapters user manual for installation instructions available from our Web site

6 Connecting the VS-88DT



Switch off the power to all devices before connecting them to your **VS-88DT**. After connecting your **VS-88DT**, connect its power and then switch on the power to the other devices.

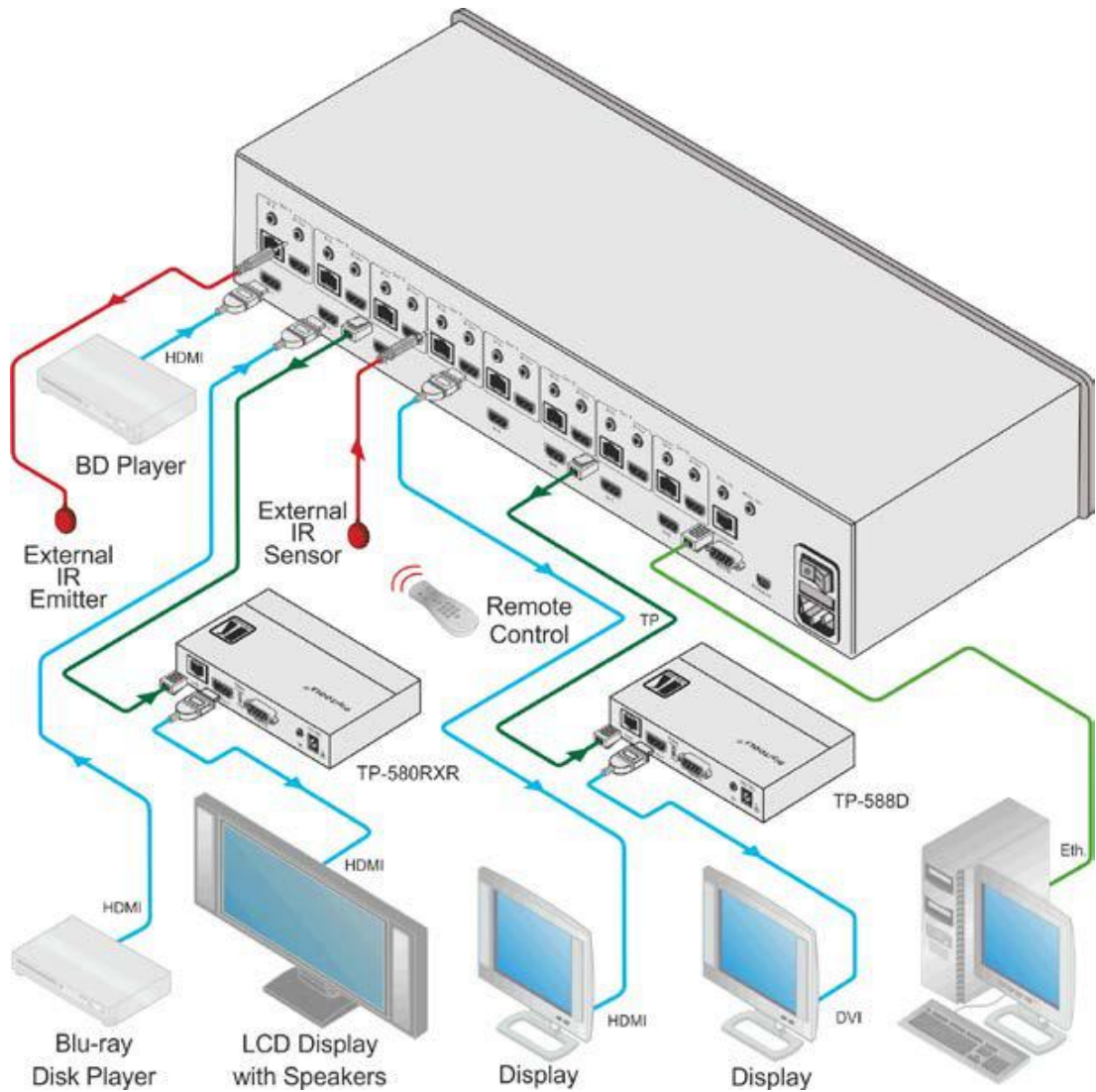


Figure 3: Connecting the VS-88DT HDMI/HDBT Matrix Switcher

To connect the VS-88DT as illustrated in the example in [Figure 3](#):

1. Connect the HDMI sources, (for example, Blu-ray disc players) to the HDMI In 1 and In 2 connectors.
2. Connect an external IR sensor to the In 4 IR In 3.5mm mini jack.
3. Connect the Out 1 IR 3.5mm mini jack to an external IR transmitter.

4. Connect the Out 4 HDMI connector to an HDMI acceptor, (for example, a display).
5. Connect the Out 3 TP RJ-45 HDBT connector to a compatible HDBT receiver, (for example, the **TP-580Rxr**), and connect the HDMI output of the **TP-580Rxr** to a display.
6. Connect the Out 7 TP RJ-45 HDBT connector to a compatible HDBT receiver, (for example, the **TP-588D**), and connect the DVI output of the **TP-588D** to a display.
7. Connect a controller via either RS-232 or a LAN to the Ethernet RJ-45 connector.

6.1 Connecting a Serial Controller to the VS-88DT

You can connect to the **VS-88DT** via an RS-232 connection using, for example, a PC. For information about routing RS-232 data over HDBaseT, see [Section 7.7](#).

To connect to the VS-88DT via RS-232:

- Connect the 9-pin D-sub connector on the rear panel of the **VS-88DT** (pin 5 to pin 5, pin 2 to pin 3, pin 3 to pin 2) to the RS 232 9-pin D-sub port on your PC

6.2 Connecting to the VS-88DT via Ethernet

You can connect to the **VS-88DT** via Ethernet using either of the following methods:

- Directly to the PC using a crossover cable (see [Section 6.2.1](#))
- Via a network hub, switch, or router, using a straight-through cable (see [Section 6.2.2](#))

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.

6.2.1 Connecting the Ethernet Port Directly to a PC

You can connect the Ethernet port of the **VS-88DT** 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-88DT** with the factory configured default IP address.

After connecting the **VS-88DT** 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](#).

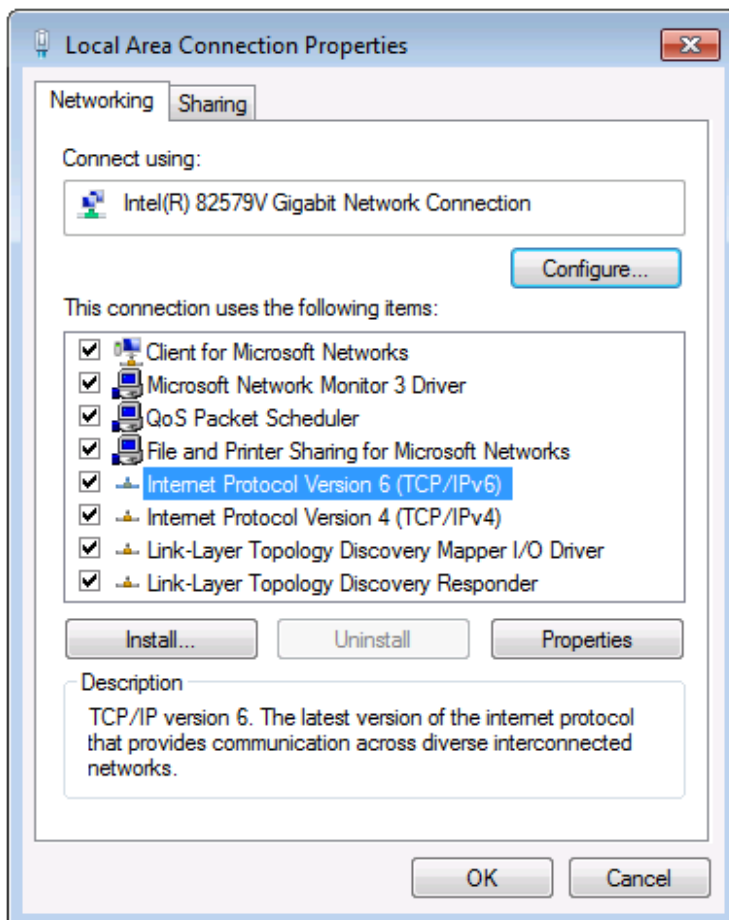


Figure 4: Local Area Connection Properties Window

4. Highlight **Internet Protocol Version 4 (TCP/IPv4)**.
5. Click **Properties**.

The Internet Protocol Properties window appears as shown in [Figure 5](#).

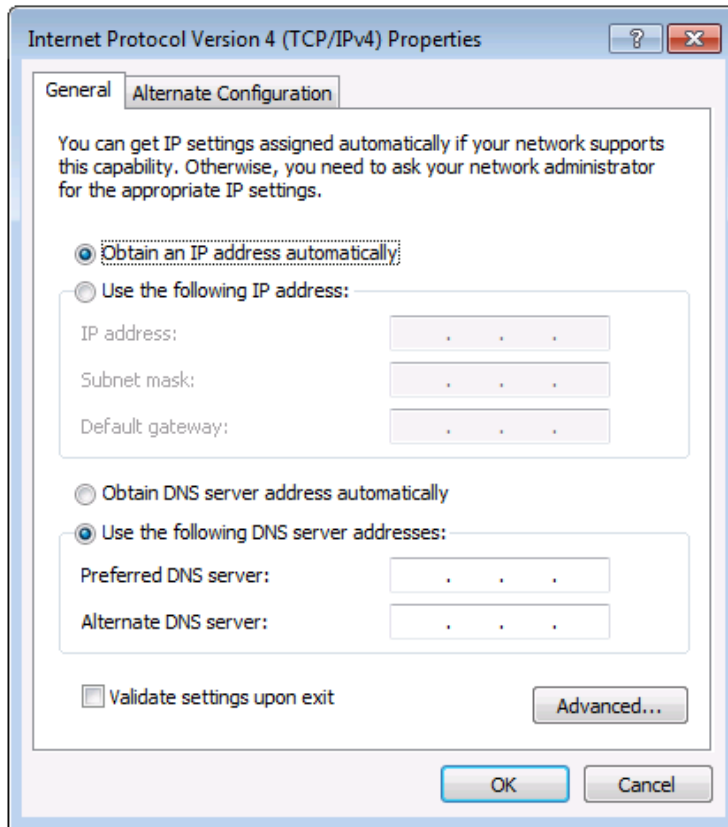


Figure 5: Internet Protocol Version 4 Properties Window

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.

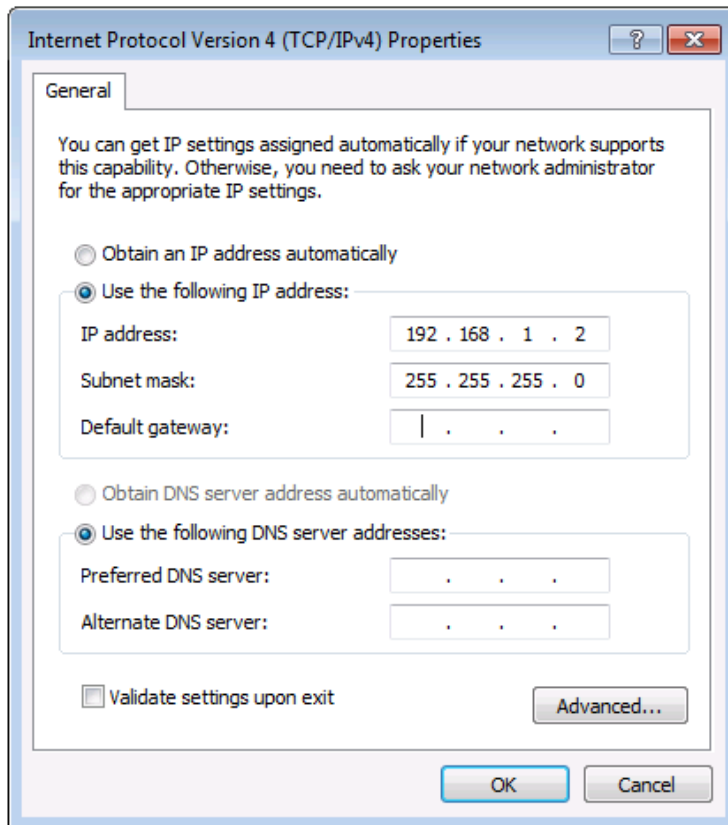


Figure 6: Internet Protocol Properties Window

7. Click **OK**.
8. Click **Close**.

6.2.2 Connecting the Ethernet Port via a Network Hub or Switch

You can connect the Ethernet port of the **VS-88DT** to the Ethernet port on a network hub or using a straight-through cable with RJ-45 connectors.

7 Operating the VS-88DT

When the **VS-88DT** is powered on, the following is displayed briefly on the LCD display:

KRAMER ELEC

8X8 HDMI/HDBT Matrix

Following the self-test the current switching configuration is displayed, an example of which is shown below. The top row indicates the output port and the bottom row indicates which input port is switched to the output port displayed directly above it. An input port showing 0 (zero) indicates that the output port has no input switched to it.

O:	1	2	3	4	5	6	7	8
I:	3	0	1	2	4	5	2	8

Note: If there is no button activity during any procedure for approximately 30 seconds, the procedure is aborted and the display reverts back to the Input/Output display.

7.1 Switching Inputs to Outputs

You can switch:

- Individual inputs to individual outputs
- One input to all outputs

To switch an output to an input, (for example, Input 7 to Output 3):

1. Press Out 3.
The Output button lights red.
2. Press In 7.
The Input button lights red and the switch is performed.

To switch one input to all outputs, (for example, Input 2 to all outputs):

1. Press All.
The All button lights red.
2. Press In 2.
The Input 2 button lights and Input 2 is switched to all outputs.

7.2 Storing and Recalling Preset Configurations

You can store up to eight preset configurations for instant recall. The top row of output buttons relate to presets one to eight.

To store the current configuration in preset 5:

1. Press Sto.
The selection is displayed in the readout.
2. Press Out 5.
The selection is displayed in the readout.
3. Press Sto.
The current configuration is stored in preset 5.

To recall preset 8:

1. Press Rcl.
The selection is displayed in the readout.
2. Press Out 8.
The selection is displayed in the readout.
3. Press Rcl.
The configuration stored in preset 8 is recalled.

7.3 Acquiring an EDID

You can acquire the EDID from an output and assign it to either one or all inputs.

To acquire the EDID from an output and store it on one input, (for example, Output 5 to Input 8):

1. Press EDID.
The button lights red.
2. Press Out 5.
3. Press In 8.
4. Press EDID.
The button no longer lights and the EDID from Output 5 is stored in Input 8.

7.4 Cancelling One or All Outputs

The Off button is used to cancel one or all currently switched outputs.

To cancel one currently switched output, (for example, Output 7):

1. Press Out 7.
2. Press Off.

To cancel all currently switched outputs:

1. Press All.
2. Press Off.

7.5 Resetting the Device to Factory Default Configuration

The **VS-88DT** can be reset to factory default configuration either by sending a Protocol 3000 command or by using the front panel buttons.

To reset the device to the factory default configuration by sending a P3000 command:

1. Connect from a PC to the **VS-88DT** via the serial port using the following parameters:
 - 115200, 8, 1, none
2. Send the P3000 command to reset the device to factory default (see [Section 14.2](#)).

After a few seconds the **VS-88DT** is reset to factory default.

To reset the device to the factory default configuration using the front panel buttons:

1. Press the Menu button.
The Menu button lights and the first option on the menu appears.
2. Use the up (▲) and down (▼) arrows on the keypad to scroll to the RESET TO DEFAULT option.
3. Press the Enter button.
The Reset to Default No and Yes options appear.
4. Use the left (◀) and right (▶) arrows on the keypad to select Yes.
5. Press Enter.
After a few seconds the standby readout is displayed and the device is reset to factory default.

7.6 Locking and Unlocking the Front Panel

You can lock the front panel buttons to prevent unwanted key presses from changing the current configuration.

To lock the front panel:

- Press and hold the Lock button.
The button lights, the Locked message is displayed briefly, and the front panel buttons are locked. Pressing any button causes the Locked message to display briefly and the Lock button to flash

To unlock the front panel:

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

7.7 RS-232 Data Routing over HDBaseT

The **VS-88DT** enables routing data from a source connected to the RS-232 serial port to one of the HDBaseT outputs. This can be performed from the RS-232 Routing Web page (see [Section 9.4](#)) or using the ROUTE command (see [Section 14](#)).

For simulation purposes, the **VS-88DT** also enables routing the RS-232 data to all the HDBaseT outputs, by chaining multiple ROUTE commands. For more information on chaining multiple commands, see [Section 14.1.6](#).

Note: When RS-232 data routing is enabled, the RS-232 serial port cannot be used for connecting a serial controller.

8 Configuring the VS-88DT

8.1 Using the Menu

The main menu comprises three sections:

- Interface Out (see [Section 8.1.1](#))
- RS-232 Routing (see [Section 8.1.2](#))
- DHCP (see [Section 8.1.3](#))
- Ethernet Status (see [Section 8.1.4](#))
- FW version display (see [Section 8.1.5](#))
- Reset to Default (see [Section 8.1.6](#))
- Update Firmware (see [Section 8.1.7](#))

Navigation through the menu is performed as follows:

- Menu—Enter the Menu or exit one level when in the Menu
- Enter—Select a parameter/value
- Up (▲) or Right (▶)—scroll up through the parameter/value list
- Down (▼) or Left (◀)—scroll down through the parameter/value list

Note: If there is no button activity for approximately 30 seconds, the display reverts back to the Input/Output display.

8.1.1 Interface Out Sub-menu

The parameters in the Interface Out sub-menu set the output signal format.

Parameter	Description	Options
Output 1~8:	Sets the required outputs	HDBT, HDMI Default—HDBT

8.1.2 RS-232 Routing Sub-menu

The RS-232 Status sub-menu turns the RS-232 serial communication routing on and off.

Parameter	Description	Options
OFF, ON	Turns the RS-232 routing on and off	OFF, ON Default—OFF

8.1.3 Network Settings Sub-menu

The Network Status sub-menu controls DHCP selection and IP network parameters.

Parameter	Description	Options
OFF, ON	Turns DHCP on and off	OFF, ON Default—OFF
IP Settings	Sets the IP network address	All valid IP addresses
Netmask Settings	Sets the IP netmask	All valid IP netmask addresses
Gateway Settings	Sets the IP gateway	All valid IP gateway addresses

Note: When turning DHCP on, the device performs an automatic reset.

8.1.4 Ethernet Status Sub-menu

The parameters in the Ethernet Status sub-menu display the TCP/IP communication parameters.

Parameter	Description
IP Status:	Displays the TCP/IP address of the device
Netmask Status:	Displays the TCP/IP netmask of the device
Gateway Status:	Displays the TCP/IP gateway
MAC Address:	Displays the MAC address of the device

8.1.5 FW Version Display

Displays the firmware version similar to the following:

V1.1.1123+04A+1.0

8.1.6 Reset to Default Sub-menu

Parameter	Description
NO, YES	Resets the device to default factory parameters

8.1.7 Update Firmware Sub-menu

Parameter	Description
Update I/O FW:	Updates the I/O firmware

8.2 Selecting the HDBaseT or HDMI Outputs

To select the HDBaseT or HDMI outputs:

1. Press the Menu button to display the menu.
The menu is displayed.
2. Using the up (▲) or down (▼) button, move through the menu options until the Interface Out: option is displayed.
3. Press Enter.
The HDBaseT and HDMI options are displayed.
4. Using the left (◀) or right (▶) button, select either HDBaseT or HDMI.
5. Press Enter.
The change is saved.

8.3 Selecting DHCP

Note: Turning DHCP off does not de-encrypt encoded streams, it simply indicates to the source that DHCP is not supported.

To select the DHCP:

1. Press the Menu button to display the menu.
The menu is displayed.
2. Using the up (▲) or down (▼) button, move through the menu options until the Network Settings option is displayed.

3. Press Enter.
The DHCP On and OFF options are displayed.
4. Using the left (◀) or right (▶) button, select either On or Off.
5. Press Enter.
The change is saved.

8.4 Configuring the IP Network Address

To configure the IP network address:

1. Press the Menu button to display the menu.
The menu is displayed.
2. Using the up (▲) or down (▼) button, move through the menu options until the Network Settings option is displayed.
3. Press Enter.
The DHCP Settings option is displayed.
4. Using the up (▲) or down (▼) button, move through the menu options until the IP Settings option is displayed.
5. Press Enter.
6. Using the left (◀) or right (▶) button, move the cursor to the digit you wish to change.
7. Using the up (▲) or down (▼) button, select the required digit.
8. Repeat steps 6 and 7 until the required address is displayed.
9. Press Enter.
The change is saved.

8.5 Resetting the VS-88DT to Factory Default Configuration

To reset the VS-88DT to factory default parameters:

1. Press the Menu button to display the menu.
The menu is displayed.
2. Using the up (▲) or down (▼) button, move through the menu options until the Reset to Default: option is displayed.
3. Press Enter.
The NO and YES options are displayed.
4. Using the left (◀) or right (▶) button, select YES.
5. Press Enter.
The device is reset to factory default parameters and automatically reboots.

9 Operating the VS-88DT Remotely Using the Web Pages

You can configure and control the **VS-88DT** using the embedded Web pages by connecting via a Web browser over Ethernet. For a first time connection or if you have authentication enabled the Login page shown in [Figure 7](#) is displayed.

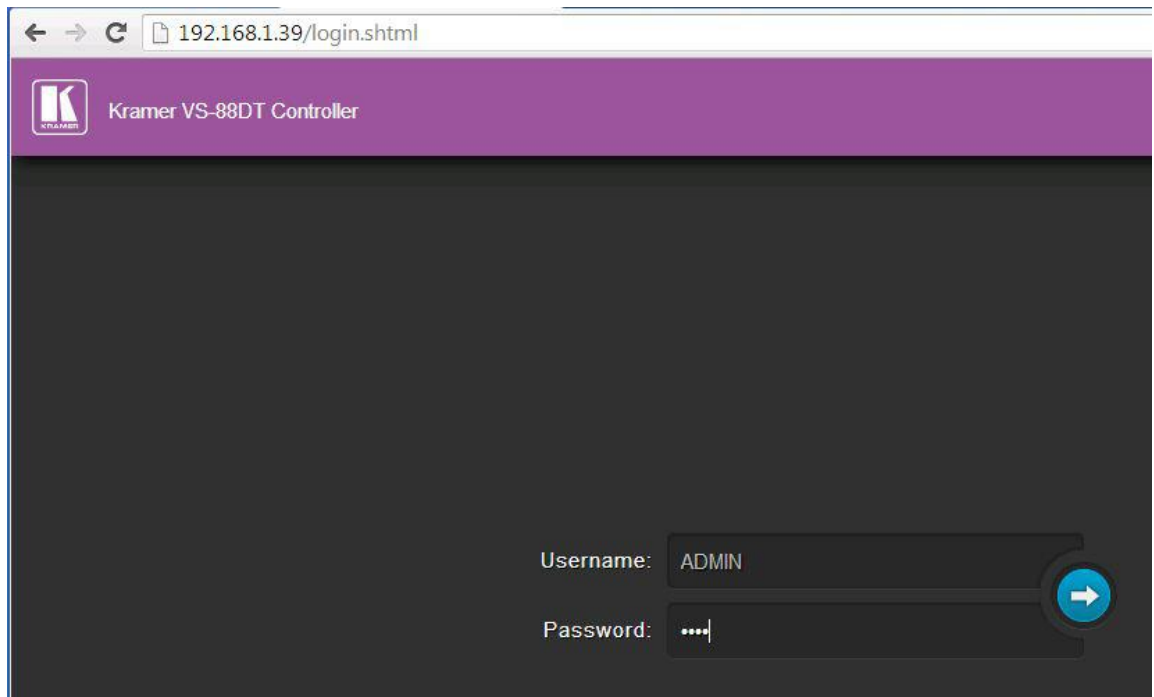


Figure 7: Login Page

If authentication is not enabled, click on the arrow. If authentication is enabled, enter a valid user name and password and click on the arrow. The Switching page shown in [Figure 8](#) is displayed.

9.1 Switching Page

The Switching page allows you to:

- Switch inputs to outputs
- Edit the button name
- Select either the HDMI or HDBT output
- Mute the output

- See what signal is present on the input and output
- See which input is switched to which output

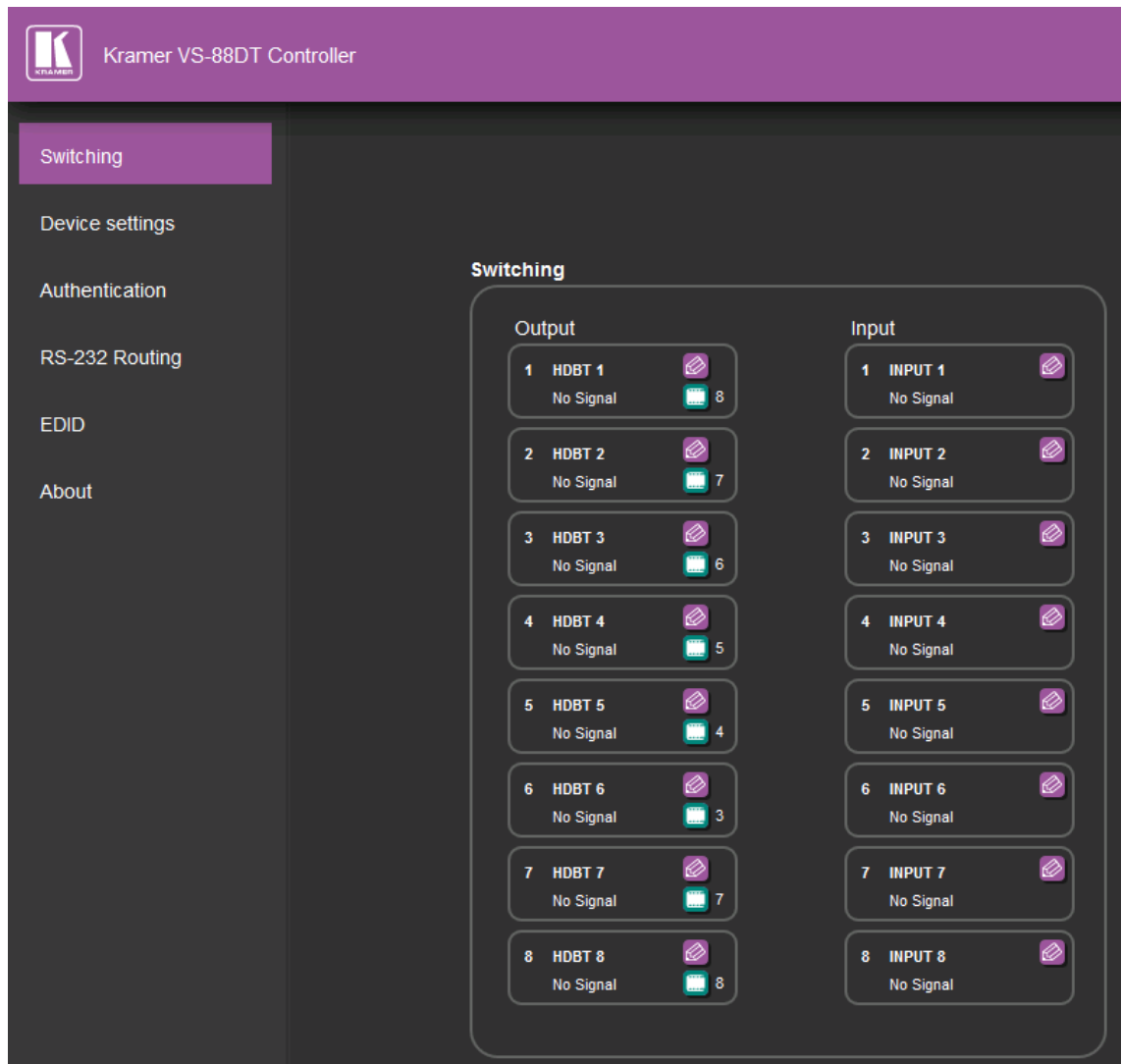


Figure 8: Switching Page

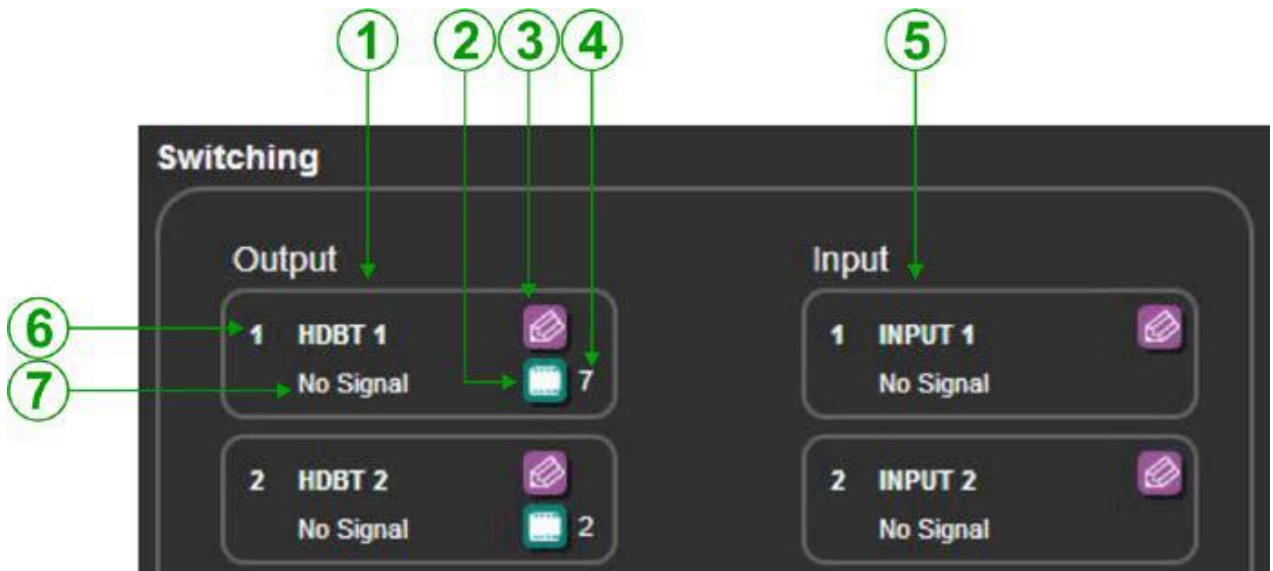


Figure 9: Switching Button Details

#	Item	Description
1	Eight output buttons	Click on the button to select an output
2	Mute button	Click to mute the output
3	Edit button	Click to open the button edit popup
4	Input number	Indicates which input is switched to this output
5	Eight input buttons	Click to select an input
6	Output number	Indicates the output number
7	Signal type	Indicates the signal type present on the output

[Figure 11](#) shows the Input button properties popup.



Figure 10: Input Properties Popup

#	Item	Description
1	Input #1 properties	Displays the input you are currently editing
2	HDMI output label	Enter the text required for the HDMI input label
3	HDCP button	Click to enable/disable HDCP
4	Save button	Click to save changes to either of the labels

[Figure 11](#) shows the Output properties popup.

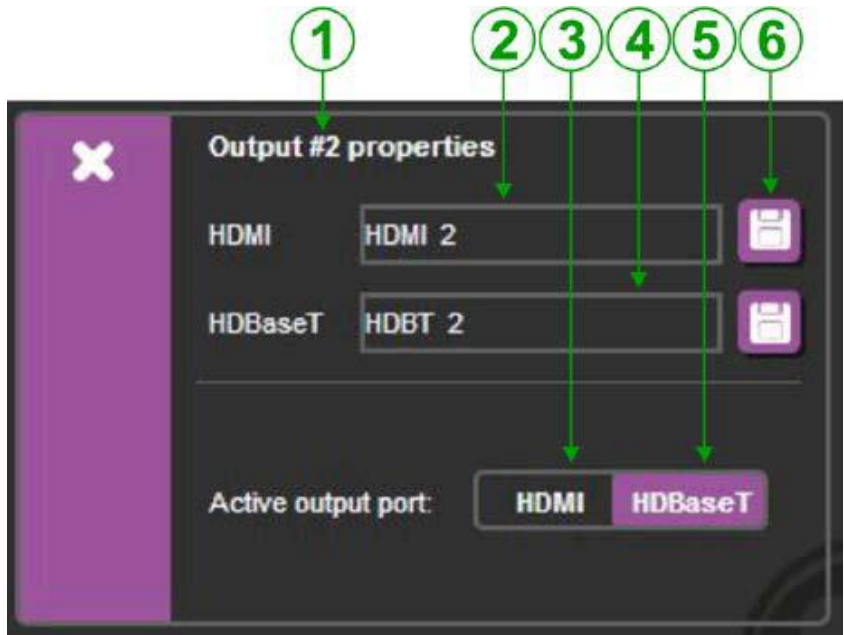


Figure 11: Output Properties Popup

#	Item	Description
1	Output #2 properties	Displays the output you are currently editing
2	HDMI output label	Enter the text required for the HDMI output label
3	HDMI button	Click to enable the HDMI output
4	HDBaseT output label	The current HDBaseT output label
5	HDBaseT button	Click to enable the HDBaseT output
6	Save button	Click to save changes to either of the labels

9.1.1 Updating the Firmware

To update the firmware:

1. Download the latest firmware file from www.kramerav.com
2. Click the Upload button.
The file browser window appears.
3. Browse to the firmware file.
4. Select the required file and click OK.
The new firmware is installed.

Note: Do not interrupt the procedure or the device may be rendered inoperable.

5. Wait until the device reboots automatically at the end of the procedure.

9.2 Device Settings Page

The Device Settings page allows you to:

- See the current IP settings
- Turn DHCP on and off
- Edit the IP settings for static IP

Device Settings

Model: VS-88DT
Name: KRAMER_0000
MAC address: 11-aa-bc-cd-cc-ff
Firmware Version: V1.1.1123

DHCP On

IP Address: 192.168.1.39
Subnet: 255.255.0.0
Gateway: 0.0.0.0
Control port: 80

[Set changes](#)

Figure 12: Device Settings Page

9.3 Authentication Page

There are three levels of authentication:

- No username or password required to access any settings
- Access to all settings limited to entry with a valid username and password
- Access to only the serial port settings limited to entry with a valid username and password

The Authentication page allows you to:

- Turn Web page authentication on and off

- Set the Web page access username and password
- Set the Web page access logout timeout
- Turn serial port settings access on and off
- Set the serial port settings access username and password
- Set the serial port Web page logout timeout

Authentication

Authenticate Web Pages access

Username: ADMIN

Password: ****

Logout after 30 minutes of inactivity

Authenticate Serial Control access

Username: ADMIN

Password: ****

Logout after 2 minutes of inactivity

Set changes

Figure 13: Authentication Page

9.4 RS-232 Routing Page

The RS-232 Routing page allows you to:

- Turn remote RS-232 routing on and off
- Select the HDBaseT output to which to route the RS-232 data
- Select the serial baud rate for each HDBaseT port

RS-232 Routing

Remote Routing

To port

HDBaseT 1 HDBaseT 2 HDBaseT 3 HDBaseT 4 HDBaseT 5 HDBaseT 6 HDBaseT 7 HDBaseT 8

HDBaseT 1 serial configuration

Parity	none
Data bits	8 bits
Flow control	none
Baud rate	<input type="text" value="115200"/>
Stop bits	1 bit

[Set changes](#)

Figure 14: RS-232 Routing Page

Note: When RS-232 data routing is enabled, the RS-232 serial port cannot be used for connecting a serial controller.

9.5 EDID Page

The EDID page allows you to:

- Copy an EDID from:
 - The default EDID
 - Any HDBaseT output
 - Any input
 - An EDID stored in a file
- Copy an EDID to one or more inputs

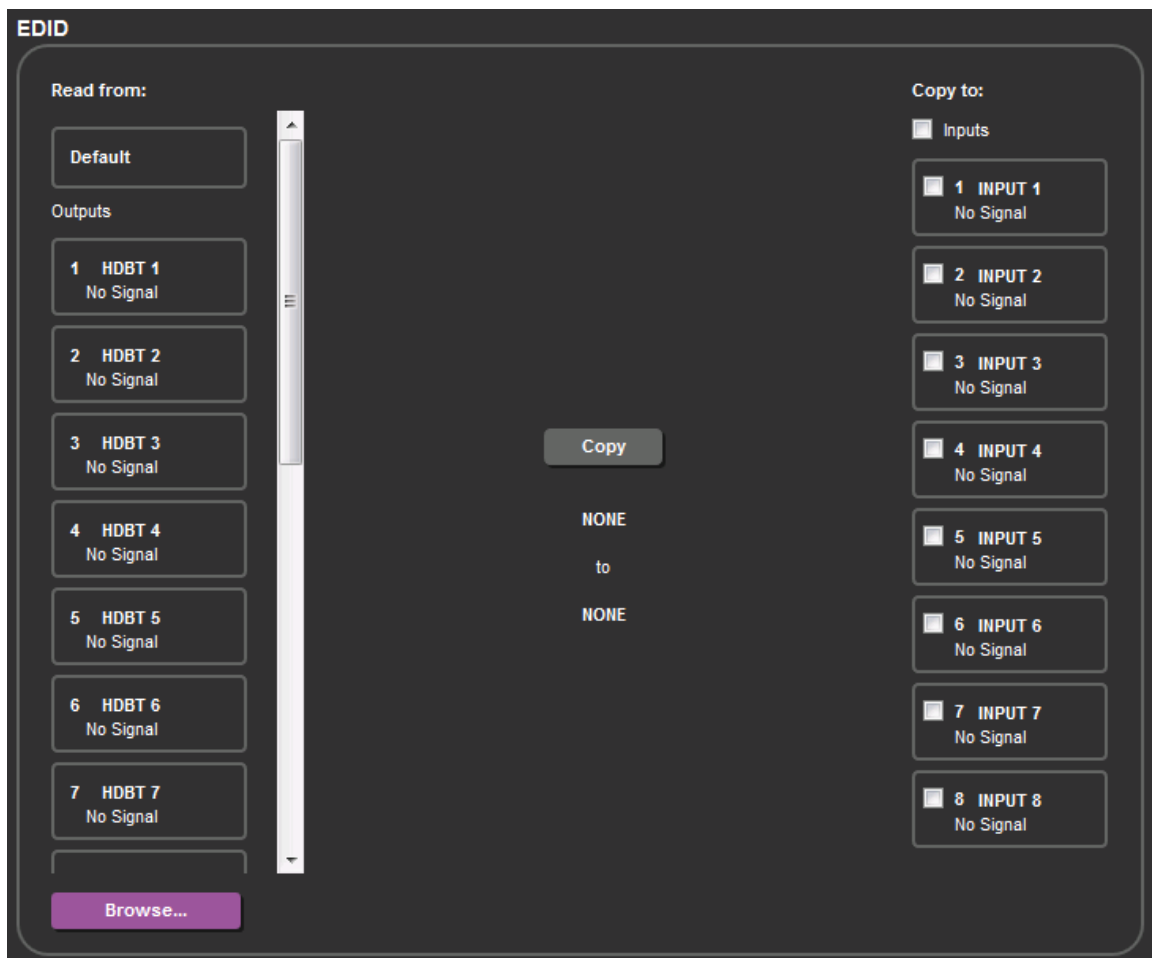


Figure 15: EDID Page

9.6 About Page

The About page displays the device firmware revision and the Kramer company details.



Figure 16: About Page

10 Wiring the DGKat TP RJ-45 Connectors

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



Do not use a crossed TP cable with this product.

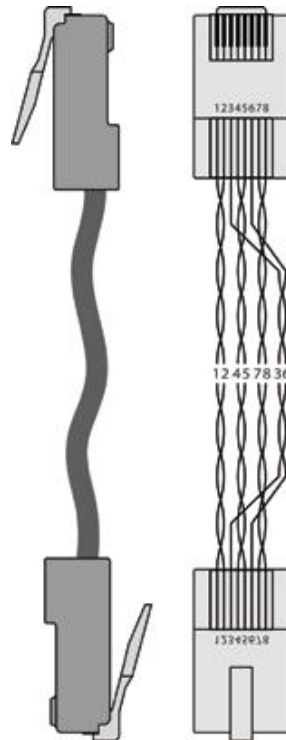
Using a TP cable that is incorrectly wired may cause permanent damage to the device

Do not use unshielded TP cables with this product

[Figure 17](#) 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 17: TP Pinout Wiring



11 Updating the Firmware

The **VS-88DT** uses two microcontrollers that run firmware located in flash memory. The firmware for these microcontrollers may be upgraded independently.

To upgrade the main microcontroller firmware:

1. From www.kramerav.com download the latest firmware file to your PC, (for example, *VS-88DT_V1.1.1111_030713.bin*).
2. Open Windows Explorer on your PC.
3. Power off the **VS-88DT**.
4. Connect the **VS-88DT** to your PC using a USB cable.
5. Power on the **VS-88DT** while holding down the OFF button.
6. After a few seconds a removable drive is displayed in your Windows Explorer. Release the OFF button.
7. Copy the firmware file from your PC to the new removable drive.
8. After the file has been transferred, power-cycle the **VS-88DT**.
As soon as the **VS-88DT** is ready for operation, the upgrade process is complete.

To upgrade the I/O microcontroller firmware:

1. Download the latest firmware file, (for example, *VS-88DT_IO(v02)_030713.bin*) from www.kramerav.com to your PC.
2. Open Windows Explorer on your PC.
3. Power off the **VS-88DT**.
4. Connect the **VS-88DT** to your PC using a USB cable.
5. Power on the **VS-88DT** while holding down the OFF button.

6. Copy the firmware file from your PC to the new removable drive.
7. After the file has been transferred, power-cycle the **VS-88DT**.
As soon as the **VS-88DT** is ready for operation, the upgrade process is complete.

12 Technical Specifications

INPUTS:	8 HDMI on HDMI connectors 9 IR on 3.5mm mini jack connectors
OUTPUTS:	8 HDMI on HDMI connectors 8 HDBaseT on RJ-45 connectors 9 IR on 3.5mm mini jack connectors
PORTS:	1 Ethernet on an RJ-45 connector 1 Program on a mini USB connector 1 RS-232 on a 9-pin D-sub connector
VIDEO BANDWIDTH:	6.75Gbps (2.25Gbps per graphic channel)
SUPPORTED RESOLUTIONS:	VGA to UXGA 480i to 1080p
HDMI RANGE:	15m (49ft) @ 8bit resolution 10m (33ft) @ 12 bit resolution
HDBaseT RANGE:	130m (430ft) at normal mode (2K) when using BC-UNIKat cables
POWER CONSUMPTION:	100-240V AC 50/60Hz 60VA
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
DIMENSIONS:	19" x 13.94" x 2U (W, D, H) rack mountable
WEIGHT:	3.2kg (7.05lbs) approx.
INCLUDED ACCESSORIES:	Rack "ears" , IR blaster, IR receiver
<p>Specifications are subject to change without notice For the most updated resolution list, go to our Web site at www.kramerav.com</p>	

13 Default Parameters

13.1 Default Communication Parameters

RS-232	
Baud Rate	115,200
Data Bits	8
Stop Bits	1
Parity	None
Command Format	ASCII
Example (Output 1 to Input 1)	#AV 1>1<CR>
Ethernet	
IP Address	192.168.1.39
Subnet mask	255.255.0.0
Default gateway	192.168.1.1
TCP Port #	5000
UDP Port #	50000
Maximum UDP Ports	10
Maximum TCP Ports	4

14 Kramer Protocol

The **VS-88DT** supports the Kramer Protocol 3000.

The Protocol 3000 RS-232 communication protocol lets you control the machine from any standard terminal software (for example, Windows® HyperTerminal Application).

14.1 Kramer Protocol 3000 Syntax

14.1.1 Host Message Format

Start	Address (optional)	Body	Delimiter
#	<i>Destination_id@</i>	Message	CR

14.1.1.1 Simple Command

Command string with only one command without addressing:

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

14.1.1.2 Command String

Formal syntax with commands concatenation and addressing:

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

14.1.2 Device Message Format

Start	Address (optional)	Body	delimiter
~	<i>Sender_id@</i>	Message	CR LF

14.1.2.1 Device Long Response

Echoing command:

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

CR = Carriage return (ASCII 13 = 0x0D)

LF = Line feed (ASCII 10 = 0x0A)

SP = Space (ASCII 32 = 0x20)

14.1.3 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.

14.1.4 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, (for example, Crestron) some characters require special coding (such as, /X##). Refer to the controller manual.

14.1.5 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.

14.1.6 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.

14.1.7 Maximum String Length

64 characters

14.2 Kramer Protocol 3000 Commands

Full details for each command are presented in the Kramer Protocol 3000 document available for download from www.kramerav.com.

Command	Description
#	Protocol handshaking
BUILD-DATE?	Read device build date
FACTORY	Reset to factory default configuration
HELP	List of commands
LOCK-FP	Lock the front panel
MACH-NUM	Sets the machine number
MODEL?	Read device model
NAME	Sets the machine (DNS) name
NET-DHCP	Set DHCP mode
NET-GATE	Set Gateway
NET-IP	Set IP address
NET-MAC?	Read MAC address
NET-MASK	Set subnet mask
PROT-VER?	Read device protocol version
PRST-RCL	Recall a saved preset list
PRST-STO	Store the current connections, volumes and modes
PRST-VID?	Get video connections from a saved preset
RESET	Reset device
ROUTE	Set/get data layer routing
SIGNAL?	Get input signal lock status
SN?	Read device serial number
VERSION?	Read device firmware version
VID	Set video switch state

Command - #		Command Type - System-mandatory	
Command Name		Permission	Transparency
Set:	#	End User	Public
Get:	-	-	-
Description		Syntax	
Set:	Protocol handshaking	# <input type="checkbox"/> CR	
Get:	-	-	
Response			
~ <input type="checkbox"/> nn@ <input type="checkbox"/> SPOK <input type="checkbox"/> CR <input type="checkbox"/> LF			
Parameters			
Response Triggers			
Notes			
Use to validate the Protocol 3000 connection and get the machine number			

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 <input type="checkbox"/> CR	
Get:	-	-	
Response			
~ <input type="checkbox"/> nn@ <input type="checkbox"/> BUILD-DATE <input type="checkbox"/> SPdate <input type="checkbox"/> SPtime <input type="checkbox"/> CR <input type="checkbox"/> LF			
Parameters			
<i>date</i> - Format: YYYY/MM/DD where YYYY = Year, MM = Month, DD = Day <i>time</i> - Format: hh:mm:ss where hh = hours, mm = minutes, ss = seconds			
Response Triggers			
Notes			

Command - FACTORY		Command Type - System-mandatory	
Command Name		Permission	Transparency
Set:	FACTORY	End User	Public
Get:	-	-	-
Description		Syntax	
Set:	Reset device to factory default configuration	# FACTORY _{CR}	
Get:	-	-	
Response			
~ _{nn} @ FACTORY _{SP} OK _{CR LF}			
Parameters			
Response Triggers			
Notes			
This command deletes all user data from the device. The deletion can take some time.			

Command - HELP		Command Type - System-mandatory	
Command Name		Permission	Transparency
Set:	-	-	-
Get:	HELP	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get command list or help for specific command	2 options: 1. # HELP _{CR} 2. # HELP _{SP} <i>command_name</i> _{CR}	
Response			
<ul style="list-style-type: none"> 1. Multi-line: ~_{nn}@Device available protocol 3000 commands: _{CR LF}<i>command</i>,_{SP}<i>command...</i>_{CR LF} To get help for command use: HELP (COMMAND_NAME)_{CR LF} 2. Multi-line: ~_{nn}@HELP_{SP}<i>command</i>: _{CR LF}<i>description</i>_{CR LF}USAGE: <i>usage</i> _{CR LF} 			
Parameters			
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? <input type="checkbox"/> <input type="checkbox"/>	
Response			
~ <input type="checkbox"/> <input type="checkbox"/> @ MODEL <input type="checkbox"/> <i>model_name</i> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
Parameters			
<i>model_name</i> - String of up to 19 printable ASCII chars			
Response Triggers			
Notes			

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? <input type="checkbox"/> <input type="checkbox"/>	
Response			
~ <input type="checkbox"/> <input type="checkbox"/> @ PROT-VER <input type="checkbox"/> 3000: <i>version</i> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
Parameters			
<i>Version</i> - 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 <input type="checkbox"/> CR	
Get:	-	-	
Response			
~ <input type="checkbox"/> <input type="checkbox"/> @ RESET <input type="checkbox"/> SP OK <input type="checkbox"/> CR LF			
Parameters			
Response Triggers			
Notes			
To avoid locking the port due to a USB bug in Windows, disconnect USB connections immediately after running this command. If the port was locked, disconnect and reconnect the cable to reopen the port.			

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? <input type="checkbox"/> CR	
Response			
~ <input type="checkbox"/> <input type="checkbox"/> @ SN <input type="checkbox"/> SPserial_number <input type="checkbox"/> 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} <i>firmware_version</i> _{CR LF}			
Parameters			
<i>firmware_version</i> - XX.XX.XXXX where the digit groups are: major.minor.build version			
Response Triggers			
Notes			

Command - LDFW		System - Packets	
Command Name		Permission	Transparency
Set:	LDFW	Internal SW	Public
Get:	-	-	-
Description		Syntax	
Set:	Load new firmware file	Step 1: # LDFW _{SP} <i>size</i> _{CR} Step 2: If ready was received, send FIRMWARE_DATA	
Get:	-	-	
Response			
Response 1: ~ _{nn} @ LDFW _{SP} <i>size</i> _{SP} READY _{CR LF} or ~ _{nn} @ LDFW _{SP} ERRnn _{CR LF}			
Response 2: ~ _{nn} @ LDFW _{SP} <i>size</i> _{SP} OK _{CR LF}			
Parameters			
<i>size</i> - size of firmware data that is sent			
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. Use this command in dedicated SW application			

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			
Set: ~nn@ NET-DHCP _{SP} mode _{SP} OK _{CR LF}			
Get: ~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			

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			
Set: ~nn@NET-GATE _{SP} ip_address _{SP} OK _{CR LF}			
Get: ~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 <input type="text" value="ip_address"/> <input type="text" value="CR"/>	
Get:	Get IP address	# NET-IP? <input type="text" value="CR"/>	
Response			
Set: ~ <input type="text" value="nn"/> @ NET-IP <input type="text" value="ip_address"/> <input type="text" value="SP"/> OK <input type="text" value="CR LF"/>			
Get: ~ <input type="text" value="nn"/> @ NET-IP <input type="text" value="ip_address"/> <input type="text" value="CR LF"/>			
Parameters			
<i>ip_address</i> - 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? <input type="text" value="CR"/>	
Response			
~ <input type="text" value="nn"/> @ NET-MAC <input type="text" value="mac_address"/> <input type="text" value="CR LF"/>			
Parameters			
<i>mac_address</i> - 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] <i>net_mask</i> _[CR]	
Get:	Get subnet mask	# NET-MASK? _[CR]	
Response			
Set: ~ _[nn] @ NET-MASK _[SP] <i>net_mask</i> _[SP] OK _[CR LF]			
Get: ~ _[nn] @ NET-MASK _[SP] <i>net_mask</i> _[CR LF]			
Parameters			
<i>net_mask</i> - 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			

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] <i>portType, ETHPort, portNum</i> _[CR]	
Get:	Get Ethernet port protocol	# ETH-PORT? _[SP] <i>portType, portNum</i> _[CR]	
Response			
~ _[nn] @ ETH-PORT _[SP] <i>portType, ETHPort, portNum</i> _[CR LF]			
Parameters			
<i>portNum</i> - 1-4 TCP/UDP port enumerator (equals the connected com port number from the tunneling port) <i>portType</i> - TCP/UDP <i>ETHPort</i> - TCP/UDP port number			
Response Triggers			
Notes			

Command - LOCK-FP		Command Type - System	
Command Name		Permission	Transparency
Set:	LOCK-FP	End User	Public
Get:	LOCK-FP?	End User	Public
Description		Syntax	
Set:	Lock front panel	Option 1: # LOCK-FP _{SP} <i>lock_mode</i> _{CR} Option 2: # LOCK-FP _{SP} <i>device_id,lock_mode</i> _{CR}	
Get:	Get front panel lock state	Option 1: # LOCK-FP? _{CR} Option 2: # LOCK-FP? _{SP} <i>device_id</i> _{CR}	
Response			
Set: Option 1: ~ <i>nn</i> @ LOCK-FP _{SP} <i>lock_mode</i> _{SP} OK _{CR LF} Option 2: ~01@ LOCK-FP _{SP} <i>device_id,lock_mode</i> _{SP} OK _{CR LF}			
Get: Option 1: ~ <i>nn</i> @ LOCK-FP _{SP} <i>lock_mode</i> _{CR LF} Option 2: ~01@ LOCK-FP _{SP} <i>device_id, lock_mode</i> _{CR LF}			
Parameters			
<i>lock_mode</i> - 0/OFF - unlocks the front panel buttons, 1/ON - locks the front panel buttons <i>device_id</i> - for K-Net controllers, select the button panel to lock. Locking is allowed only from the master			
Response Triggers			
Notes			

Command - MACH-NUM		Command Type - System	
Command Name		Permission	Transparency
Set:	MACH-NUM	End User	Public
Get:	-	-	-
Description		Syntax	
Set:	Set machine number	# MACH-NUM _{SP} <i>machine_number</i> _{CR}	
Get:	-	-	
Response			
~ <i>nn</i> @ MACH-NUM _{SP} <i>machine_number</i> OK _{CR LF}			
Parameters			
<i>machine_number</i> - new device machine number			
Response Triggers			
Notes			
Some devices do not set the new machine number until the device is restarted Some devices can change the machine number only from DIP-switches			

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] <i>machine_name</i> _[CR]	
Get:	Get machine (DNS) name	# NAME? _[CR]	
Response			
Set: ~ <i>nn</i> @ NAME _[SP] <i>machine_name</i> _[SP] OK _[CR LF]			
Get: ~ <i>nn</i> @ NAME? _[SP] <i>machine_name</i> _[CR LF]			
Parameters			
<i>machine_name</i> - 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 - PRST-RCL		Command Type - System	
Command Name		Permission	Transparency
Set:	PRST-RCL	End User	Public
Get:	-	-	-
Description		Syntax	
Set:	Recall saved preset list	# PRST-RCL _[SP] <i>preset</i> _[CR]	
Get:	-	-	
Response			
~ <i>nn</i> @ PRST-RCL _[SP] <i>preset</i> _[CR LF]			
Parameters			
<i>preset</i> - preset number			
Response Triggers			
Notes			
In most units, video and audio presets with the same number are stored and recalled together by commands #PRST-STO and #PRST-RCL			

Command - PRST-STO		Command Type - System	
Command Name		Permission	Transparency
Set:	PRST-STO	End User	Public
Get:	-	-	-
Description		Syntax	
Set:	Store current connections, volumes and modes in preset	#PRST-STO _{SP} preset _{CR}	
Get:	-	-	
Response			
~nn@PRST-STO _{SP} preset _{CR LF}			
Parameters			
preset - preset number			
Response Triggers			
Notes			
In most units, video and audio presets with the same number are stored and recalled together by commands #PRST-STO and #PRST-RCL			

Command - PRST-VID?		Command Type - System	
Command Name		Permission	Transparency
Set:	-	-	-
Get:	PRST-VID?	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get video connections from saved preset	#PRST-VID? <input type="text" value="SP"/> preset, <input type="text" value="out"/> <input type="text" value="CR"/> #PRST-VID? <input type="text" value="SP"/> preset, * <input type="text" value="CR"/>	
Response			
~ <input type="text" value="nn"/> @PRST-VID <input type="text" value="SP"/> preset, in>out <input type="text" value="CR LF"/>			
~ <input type="text" value="nn"/> @PRST-VID <input type="text" value="SP"/> preset, in>1, in>2, in>3, ... <input type="text" value="CR LF"/>			
Parameters			
<p>preset - preset number n - input number or '0' if output disconnected > - connection character between in and out parameters out - output number or '*' for all outputs</p>			
Response Triggers			
Notes			
In most units, video and audio presets with the same number are stored and recalled together by commands #PRST-STO and #PRST-RCL			
Examples			
Store current audio and video connections, volumes and modes to preset 5	#PRST-STO 5 <input type="text" value="CR"/>	~PRST-STO 5 <input type="text" value="CR LF"/>	
Recall audio and video connections from preset 3	#PRCL 3 <input type="text" value="CR"/>	~PRST-RCL 3 <input type="text" value="CR LF"/>	
Show source of video output 2 from preset 3	#PRST-VID? 3,2 <input type="text" value="CR"/>	~PRST-VID 3, 4>2 <input type="text" value="CR LF"/>	

Command - ROUTE		Command Type - Routing	
Command Name		Permission	Transparency
Set:	ROUTE	End User	Public
Get	ROUTE?	End User	Public
Description		Syntax	
Set:	Set data layer routing	#ROUTE _{SP} layer,dest,src _{CR}	
Get:	Get data layer routing	#ROUTE? _{CR}	
Response			
~ _{hn} @ROUTE _{SP} layer,dest,src _{CR LF}			
Parameters			
<i>layer</i> – 3 (Data) <i>dest</i> - 1-8 (Output 1-8) x (Disconnect / Disable routing) <i>src</i> – 0 (Data source ID)			
Response Triggers			
Notes			
The GET command identifies input switching on Step-in clients The SET command is for remote input switching on Step-in clients (essentially via by the Web)			
K-Config Example			
The following example routes RS-232 data from the RS-232 source to HDBaseT Out 4: "#ROUTE 3,4,0",0x0D			

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} <i>inp_id</i> _{CR}	
Response			
~ _{nn} @ SIGNAL _{SP} <i>inp_id,status</i> _{CR LF}			
Parameters			
<i>inp_id</i> - input number			
<i>status</i> - lock status according to signal validation (see Section 14.2.2 Signal Validation)			
Response Triggers			
After execution, a response is sent to the com port from which the Get was received			
Response is sent after every change in input signal status ON to OFF, or OFF to ON			
Notes			

Command - VID		Command Type - Switch	
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, in>out,... _[CR]	
Get:	Get video switch state	#VID? _[SP] out _[CR] #VID? _[SP] * _[CR]	
Response			
Set: ~nn@VID _[SP] in>out _[CR LF] ~nn@VID _[SP] in>out _[CR LF] ... Get: ~nn@VID _[SP] in>out _[CR LF] ~nn@VID _[SP] in>1, in>2, ... _[CR LF]			
Parameters			
in - input number or '0' to disconnect output > - connection character between in and out parameters out - output number or '*' for all outputs			
Response Triggers			
Notes			
When AFV switching mode is active, this command also switches audio and the unit replies with command ~AV.			
Examples			
When AFV switching mode is active, this command also switches audio and the unit replies with command ~AV.			
Switch video and audio input 3 to output 7	#AV 3>7 _[CR]	~01@AV 3>7 _[CRLF]	
Switch video input 2 to output 4	#V 2>4 _[CR]	~01@VID 2>4 _[CRLF]	
Switch video input 4 to output 2 in machine 6	#6@VID 4>2 _[CR]	~06@VID 4>2 _[CRLF]	
Disconnect video and audio output 4	#AV 0>4 _[CR]	~01@AV 0>4 _[CRLF]	
Switch video input 3 to all outputs	#V 3>* _[CR]	~01@VID 3>* _[CRLF]	
Chaining multiple commands	#AV 1>* V 3>4, 2>2, 2>1, 0>2 V 3>9 A 0>1 V? * _[CR] 1. Switch audio and video from input 1 to all outputs 2. Switch video input 3 to output 4, video input 2 to output 2, video input 2 to output 1 and disconnect video output 2 3. Switch video input 3 to output 9 (non-existent) 4. Disconnect audio output 1 5. Get status of all video links Command processing begins after entering _[CR] A response is sent for each command after processing	~AV 1>* _[CRLF] ~VID 3>4 _[CRLF] ~VID 2>2 _[CRLF] ~VID 2>1 _[CRLF] ~VID 0>2 _[CRLF] ~VID ERR003 _[CRLF] ~AUD 0>1 _[CRLF] ~VID 2>1, 0>2, 1>3, 3>4 _[CRLF]	

14.2.1 Video Resolutions

VIC Number	Resolution
0	No Signal (for input) / Native - EDID (for output)
1	640x480p @59.94Hz/60Hz
2	720x480p @59.94Hz/60Hz
3	720x480p @59.94Hz/60Hz
4	1280x720p @59.94Hz/60Hz
5	1920x1080i @59.94Hz/60Hz
6	720(1440)x480i @59.94Hz/60Hz
7	720(1440)x480i @59.94Hz/60Hz
8	720(1440)x240p @59.94Hz/60Hz
9	720(1440)x240p @59.94Hz/60Hz
10	2880x480i @59.94Hz/60Hz
11	2880x480i @59.94Hz/60Hz
12	2880x240p @59.94Hz/60Hz
13	2880x240p @59.94Hz/60Hz
14	1440x480p @59.94Hz/60Hz
15	1440x480p @59.94Hz/60Hz
16	1920x1080p @59.94Hz/60Hz
17	720x576p @50Hz
18	720x576p @50Hz
19	1280x720p @50Hz
20	1920x1080i @50Hz
21	720(1440)x576i @50Hz
22	720(1440)x576i @50Hz
23	720(1440)x288p @50Hz
24	720(1440)x288p @50Hz
25	2880x576i @50Hz
26	2880x576i @50Hz
27	2880x288p @50Hz
28	2880x288p @50Hz
29	1440x576p @50Hz
30	1440x576p @50Hz
31	1920x1080p @50Hz
32	1920x1080p @23.97Hz/24Hz
33	1920x1080p @25Hz
34	1920x1080p @29.97Hz/30Hz
35	2880x480p @59.94Hz/60Hz
36	2880x480p @59.94Hz/60Hz
37	2880x576p @50Hz
38	2880x576p @50Hz
39	1920x1080i @50Hz

VIC Number	Resolution
40	1920x1080i @100Hz
41	1280x720p @100Hz
42	720x576p @100Hz
43	720x576p @100Hz
44	720(1440)x576i @100Hz
45	720(1440)x576i @100Hz
46	1920x1080i @119.88/120Hz
47	1280x720p @119.88/120Hz
48	720x480p @119.88/120Hz
49	720x480p @119.88/120Hz
50	720(1440)x480i @119.88/120Hz
51	720(1440)x480i @119.88/120Hz
52	720x576p @200Hz
53	720x576p @200Hz
54	720(1440)x576i @200Hz
55	720(1440)x576i @200Hz
56	720x480p @239.76/240Hz
57	720x480p @239.76/240Hz
58	720(1440)x480i @239.76/240Hz
59	720(1440)x480i @239.76/240Hz
60	1280x720p @23.97Hz/24Hz
61	1280x720p @25Hz
62	1280x720p @29.97Hz/30Hz
63	1920x1080p @119.88/120Hz
64	1920x1080p @100Hz
65-100	(Reserved)
100	Custom resolution 1
101	Custom resolution 2
102	Custom resolution 3
103	Custom resolution 4
104	Custom resolution 5
104-254	(Reserved)
6	Underscan 1

14.2.2 Signal Validation

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

14.2.3 Ethernet Port Types

Number	Value
0	TCP
1	UDP

LIMITED WARRANTY

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

What is Covered

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

What is Not Covered

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

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

How Long Does this Coverage Last

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

Who is Covered

Only the original purchaser of this product is covered under this limited warranty. This limited warranty is not transferable to subsequent purchasers or owners of this product.

What Kramer Electronics will do

Kramer Electronics will, at its sole option, provide one of the following three remedies to whatever extent it shall deem necessary to satisfy a proper claim under this limited warranty:

1. Elect to repair or facilitate the repair of any defective parts within a reasonable period of time, free of any charge for the necessary parts and labor to complete the repair and restore this product to its proper operating condition. Kramer Electronics will also pay the shipping costs necessary to return this product once the repair is complete.
2. Replace this product with a direct replacement or with a similar product deemed by Kramer Electronics to perform substantially the same function as the original product.
3. Issue a refund of the original purchase price less depreciation to be determined based on the age of the product at the time remedy is sought under this limited warranty.

What Kramer Electronics will not do Under This Limited Warranty

If this product is returned to Kramer Electronics or the authorized dealer from which it was purchased or any other party authorized to repair Kramer Electronics products, this product must be insured during shipment, with the insurance and shipping charges prepaid by you. If this product is returned uninsured, you assume all risks of loss or damage during shipment. Kramer Electronics will not be responsible for any costs related to the removal or re-installation of this product from or into any installation. Kramer Electronics will not be responsible for any costs related to any setting up this product, any adjustment of user controls or any programming required for a specific installation of this product.

How to Obtain a Remedy under this Limited Warranty

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

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

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

Limitation on Liability

THE MAXIMUM LIABILITY OF KRAMER ELECTRONICS UNDER THIS LIMITED WARRANTY SHALL NOT EXCEED THE ACTUAL PURCHASE PRICE PAID FOR THE PRODUCT. TO THE MAXIMUM EXTENT PERMITTED BY LAW, KRAMER ELECTRONICS IS NOT RESPONSIBLE FOR DIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF WARRANTY OR CONDITION, OR UNDER ANY OTHER LEGAL THEORY. Some countries, districts or states do not allow the exclusion or limitation of relief, special, incidental, consequential or indirect damages, or the limitation of liability to specified amounts, so the above limitations or exclusions may not apply to you.

Exclusive Remedy

TO THE MAXIMUM EXTENT PERMITTED BY LAW, THIS LIMITED WARRANTY AND THE REMEDIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, REMEDIES AND CONDITIONS, WHETHER ORAL OR WRITTEN, EXPRESS OR IMPLIED. TO THE MAXIMUM EXTENT PERMITTED BY LAW, KRAMER ELECTRONICS SPECIFICALLY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IF KRAMER ELECTRONICS CANNOT LAWFULLY DISCLAIM OR EXCLUDE IMPLIED WARRANTIES UNDER APPLICABLE LAW, THEN ALL IMPLIED WARRANTIES COVERING THIS PRODUCT, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, SHALL APPLY TO THIS PRODUCT AS PROVIDED UNDER APPLICABLE LAW.

IF ANY PRODUCT TO WHICH THIS LIMITED WARRANTY APPLIES IS A "CONSUMER PRODUCT" UNDER THE MAGNUSON-MOSS WARRANTY ACT (15 U.S.C.A. §2301, ET SEQ.) OR OTHER APPLICABLE LAW, THE FOREGOING DISCLAIMER OF IMPLIED WARRANTIES SHALL NOT APPLY TO YOU, AND ALL IMPLIED WARRANTIES ON THIS PRODUCT, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR THE PARTICULAR PURPOSE, SHALL APPLY AS PROVIDED UNDER APPLICABLE LAW.

Other Conditions

This limited warranty gives you specific legal rights, and you may have other rights which vary from country to country or state to state.

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

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



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.

Web site: www.kramerav.com

E-mail: info@kramerel.com



SAFETY WARNING

Disconnect the unit from the power supply before opening and servicing



P/N: 2900-300275



Rev: 5