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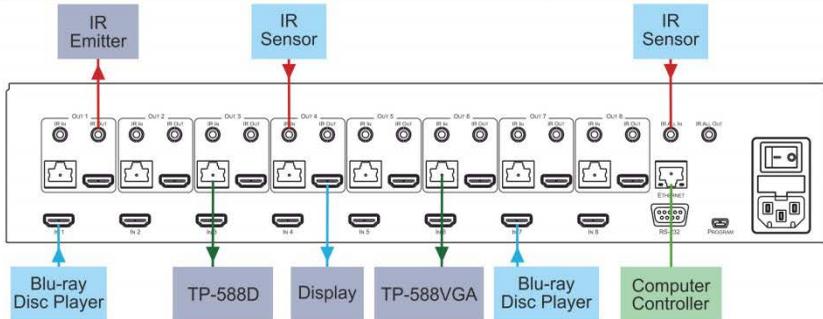
For optimum performance we recommend the Kramer **BC-HDKat6a** (CAT 6 23 AWG) cable. This specially built cable significantly outperforms regular CAT 5/CAT 6/CAT 7a cables.

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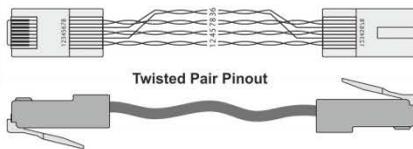
EIA / TIA 568B	
PIN	Wire Color
1	Orange / White
2	Orange
3	Green / White
4	Blue
5	Blue / White
6	Green
7	Brown / White
8	Brown

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.

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1 Introduction

Welcome to Kramer Electronics! Since 1981, Kramer Electronics has been providing a world of unique, creative, and affordable solutions to the vast range of problems that confront 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**.
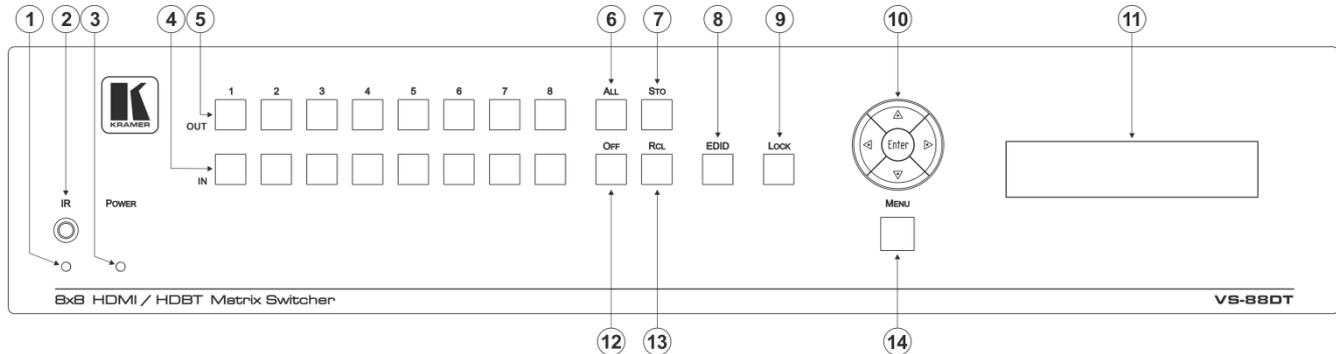
Figure 1: VS-88DT HDMI/HDBT Matrix Switcher Front Panel

#	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	*LOCK* 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	*OFF* 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	*RCL* Button	Press, followed by a preset number to recall the preset configuration (see Section 7.2)
14	*MENU* 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**.
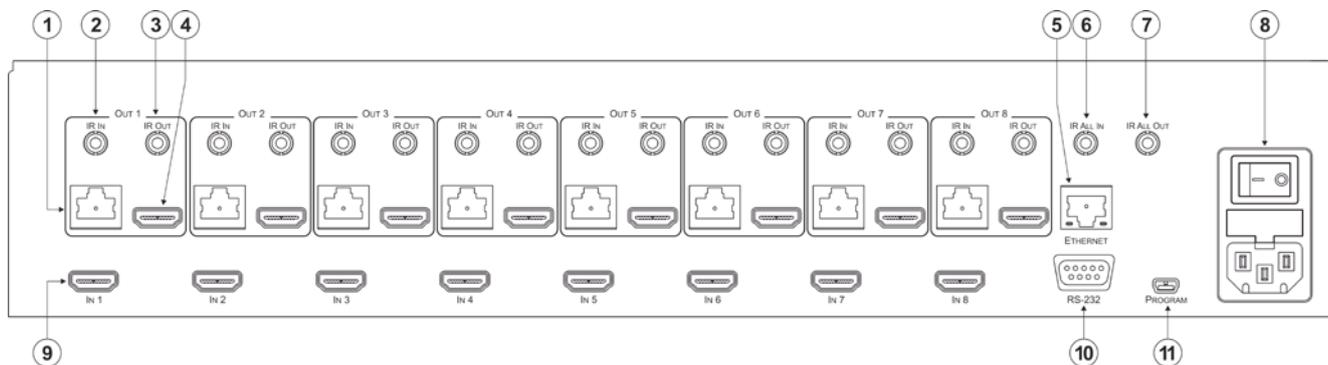
Figure 2: VS-88DT HDMI/HDBT Matrix Switcher Rear Panel

#	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:	0º to +40ºC (32º to 104ºF)
STORAGE TEMPERATURE:	-40º to +70ºC (-40º to 158ºF)
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.
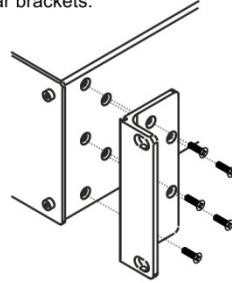
2. Place the ears of the machine against the rack rails, and insert the proper screws (not provided) through each of the four holes in the rack ears.

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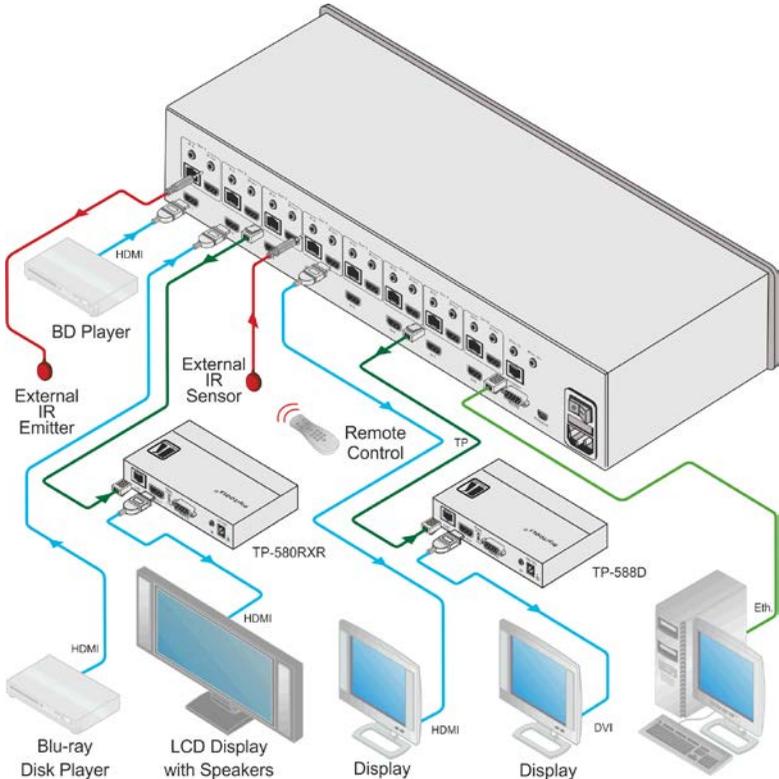
Figure 3: Connecting the VS-88DT HDMI/HDBT Matrix Switcher

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.
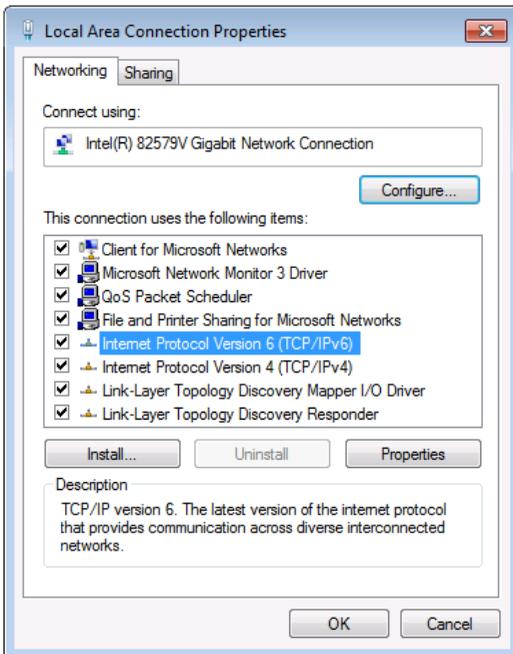
Figure 4: Local Area Connection Properties Window

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

5. Click **Properties**.

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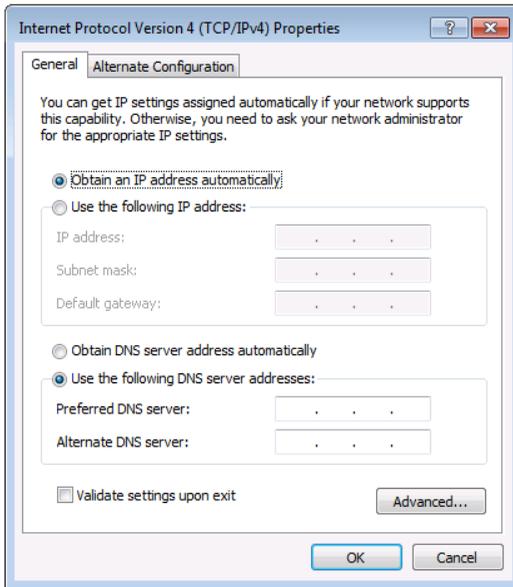
Figure 5: Internet Protocol Version 4 Properties Window

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.
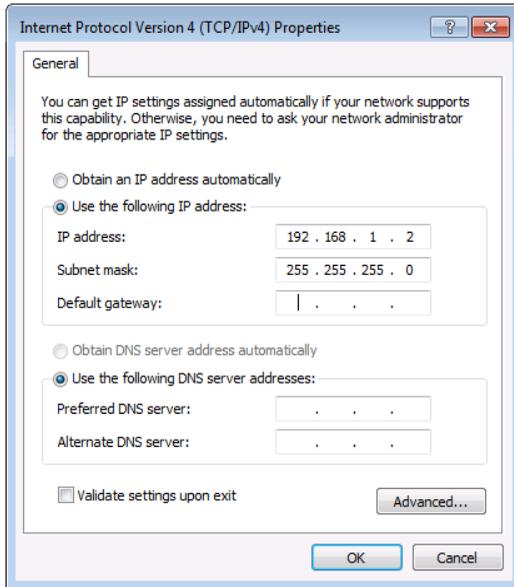
Figure 6: Internet Protocol Properties Window

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.

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.

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.
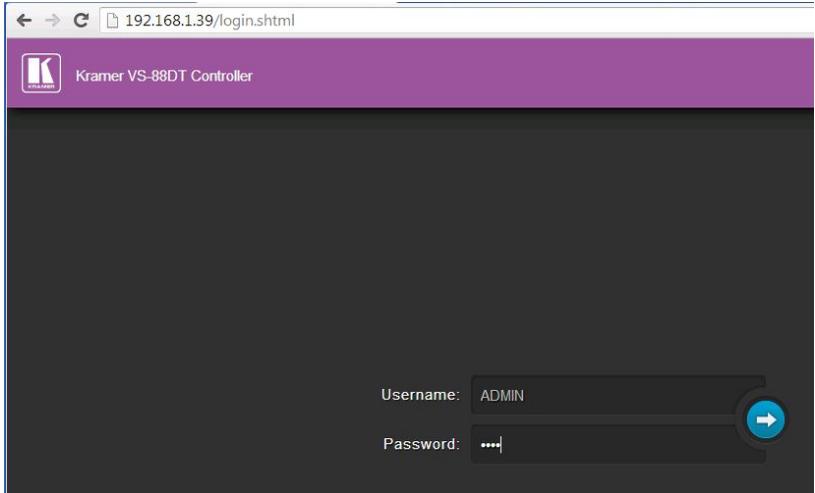
Figure 7: Login Page

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
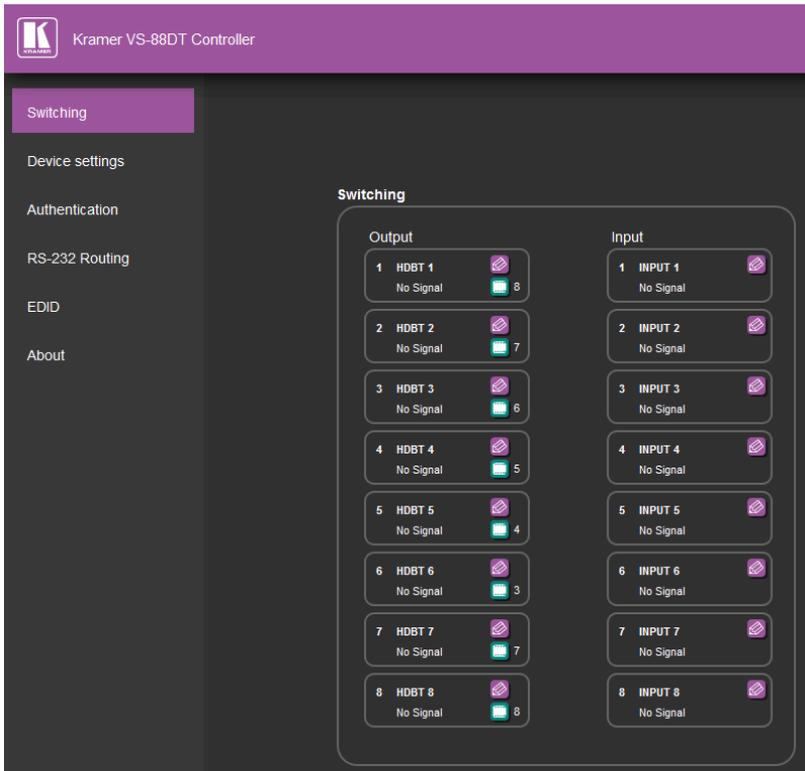
Figure 8: Switching Page
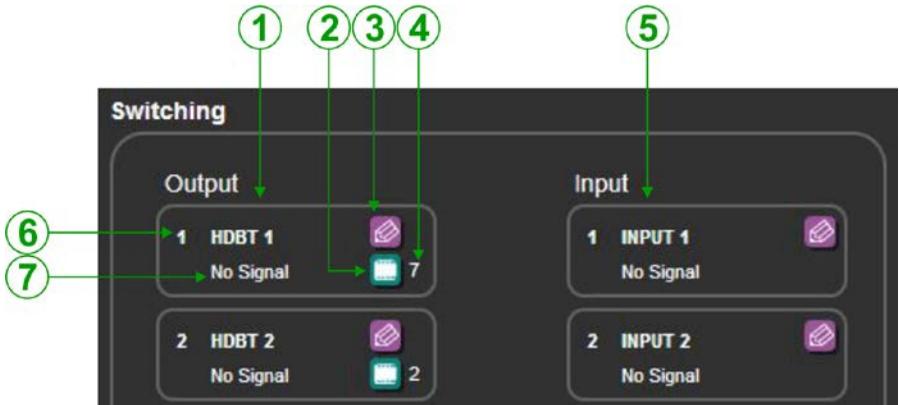
Figure 9: Switching Button Details

#	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.
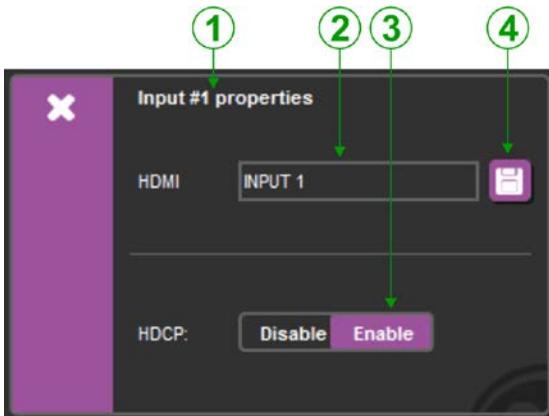
Figure 10: Input Properties Popup

#	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

shows the Output properties popup.
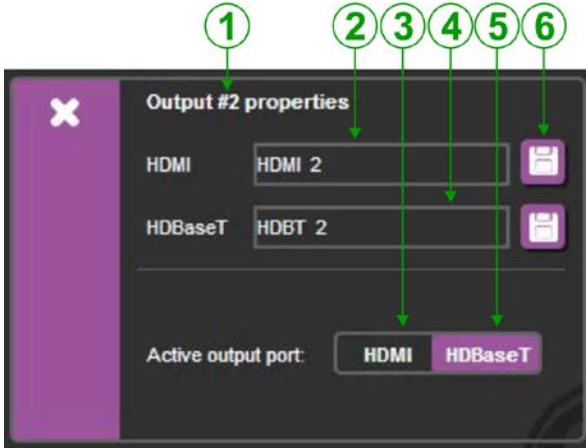
Figure 11: Output Properties Popup

#	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
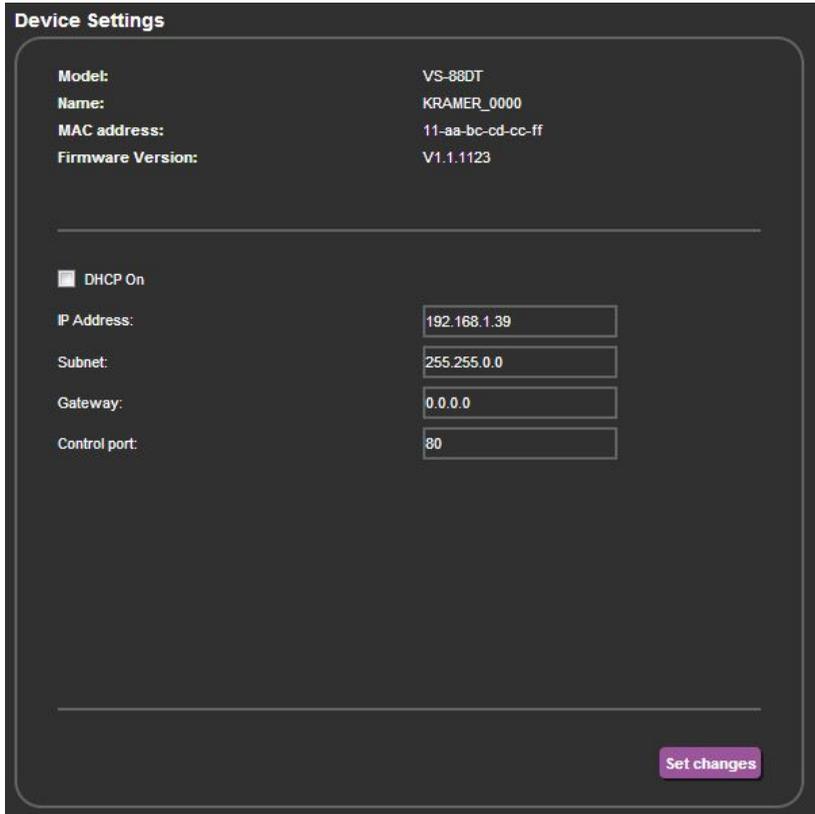
Figure 12: Device Settings Page

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

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
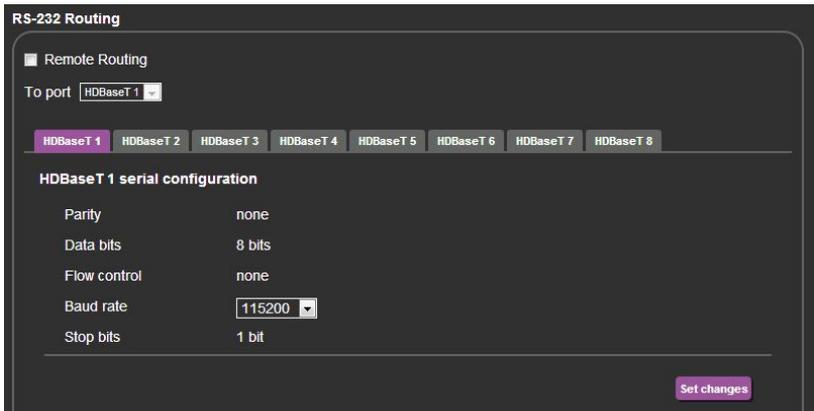
Figure 14: RS-232 Routing Page

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
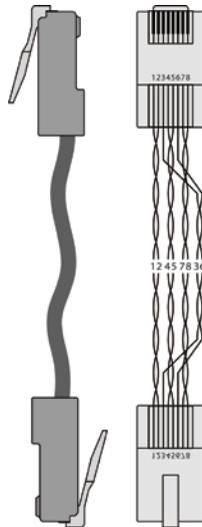
11   Updating the Firmware

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
Specifications are subject to change without notice For the most updated resolution list, go to our Web site at www.kramerav.com	

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
#	*Destination_id@*	**Message**	CR

14.1.1.1 Simple Command

Command string with only one command without addressing:

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

14.1.1.2 Command String

Formal syntax with commands concatenation and addressing:

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

14.1.2 Device Message Format

Start	Address (optional)	Body	delimiter
~	*Sender_id@*	**Message**	CR LF

14.1.2.1 Device Long Response

Echoing command:

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

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

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	#`CR`	
Get:	-	-	
Response			
~`nn`@`SP`**OK**`CR 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**`CR`	
Get:	-	-	
Response			
~`nn`@**BUILD-DATE**`SP`*date*`SP`*time*`CR LF`			
Parameters			
date - Format: YYYY/MM/DD where YYYY = Year, MM = Month, DD = Day *time* - 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			
~<u>nn</u>@**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} *command_name*_{CR}	
Response			
• ⬚ 1. Multi-line: ~<u>nn</u>@**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: ~<u>nn</u>@**HELP**_{SP} *command* : _{CR LF} *description*_{CR LF} **USAGE** : *usage* _{CR LF}			
Parameters			
Response Triggers			
Notes			

Command - **MODEL?**		Command Type - System-mandatory	
Command Name		**Permission**	**Transparency**
Set:	**-**	-	-
Get:	**MODEL?**	End User	Public
Description		**Syntax**	
Set:	-	-	
Get:	Get device model	#MODEL?꜀ᵣ	
Response			
~nn@MODEL ₛₚmodel_name꜀ᵣ ₗբ			
Parameters			
model_name - 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?꜀ᵣ	
Response			
~nn@PROT-VER ₛₚ3000:version꜀ᵣ ₗբ			
Parameters			
Version - XX.XX where X is a decimal digit			
Response Triggers			
Notes			

VS-88DT - Kramer Protocol

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

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

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

Command - **LDFW**		System - Packets	
Command Name		**Permission**	**Transparency**
Set:	**LDFW**	Internal SW	Public
Get:	**-**	-	-
Description		**Syntax**	
Set:	Load new firmware file	Step 1: #**LDFW**[SP]*size*[CR] Step 2: If ready was received, send [FIRMWARE_DATA]	
Get:	-	-	
Response			
Response 1: ~[nn]@**LDFW**[SP]*size*[SP]**READY**[CR LF] or ~[nn]@**LDFW**[SP]**ERRnn**[CR LF]			
Response 2: ~[nn]@**LDFW**[SP]*size*[SP]**OK**[CR LF]			
Parameters			
size - 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**[SP]*ip_address*[CR]	
Get:	Get IP address	#**NET-IP?**[CR]	
Response			
Set: ~[nn]@ **NET-IP**[SP]*ip_address*[SP]**OK**[CR][LF]			
Get: ~[nn]@ **NET-IP**[SP]*ip_address*[CR][LF]			
Parameters			
ip_address - format: xxx.xxx.xxx.xxx			
Response Triggers			
Notes			
For proper settings consult your network administrator			

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

Command - NET-MASK		Command Type - Communication	
Command Name		**Permission**	**Transparency**
Set:	**NET-MASK**	Administrator	Public
Get:	**NET-MASK?**	End User	Public
Description		**Syntax**	
Set:	Set subnet mask	#**NET-MASK**[SP]*net_mask*[CR]	
Get:	Get subnet mask	#**NET-MASK?**[CR]	
Response			
Set: ~[nn]@**NET-MASK**[SP]*net_mask*[SP]**OK**[CR LF]			
Get: ~[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			

Command - ETH-PORT		Command Type - Communication	
Command Name		**Permission**	**Transparency**
Set:	**ETH-PORT**	Administrator	Public
Get:	**ETH-PORT?**	End User	Public
Description		**Syntax**	
Set:	Set Ethernet port protocol	#**ETH-PORT**[SP]*portType, ETHPort, portNum*[CR]	
Get:	Get Ethernet port protocol	#**ETH-PORT?**[SP]*portType, portNum*[CR]	
Response			
~[nn]@ **ETH-PORT**[SP]*portType, ETHPort, portNum*[CR LF]			
Parameters			
portNum - 1-4 TCP/UDP port enumerator (equals the connected com port number from the tunneling port) *portType* - TCP/UDP *ETHPort* - 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]*lock_mode*[CR] Option 2: #**LOCK-FP**[SP]*device_id,lock_mode*[CR]	
Get:	Get front panel lock state	Option 1: #**LOCK-FP?**[CR] Option 2: #**LOCK-FP?**[SP]*device_id*[CR]	
Response			
Set: Option 1: ~nn@**LOCK-FP**[SP]*lock_mode*[SP]**OK**[CR LF] Option 2: ~01@**LOCK-FP**[SP]*device_id,lock_mode*[SP]**OK**[CR LF] Get: Option 1: ~nn@**LOCK-FP**[SP]*lock_mode*[CR LF] Option 2: ~01@**LOCK-FP**[SP]*device_id, lock_mode*[CR LF]			
Parameters			
lock_mode - 0/OFF - unlocks the front panel buttons, 1/ON - locks the front panel buttons *device_id* - 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]*machine_number*[CR]	
Get:	-	-	
Response			
~nn@**MACH-NUM**[SP]*machine_number***OK**[CR LF]			
Parameters			
machine_number - 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` *machine_name* `CR`	
Get:	Get machine (DNS) name	**#NAME?** `CR`	
Response			
Set: ~`nn`@**NAME** `SP` *machine_name* `SP` **OK** `CR LF`			
Get: ~`nn`@**NAME?** `SP` *machine_name* `CR LF`			
Parameters			
machine_name - String of up to 14 alpha-numeric chars (can include hyphen, not at the beginning or end)			
Response Triggers			
Notes			
The machine name is not the same as the model name. The machine name is used to identify a specific machine or a network in use (with DNS feature on)			

Command - **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` *preset* `CR`	
Get:	-	-	
Response			
~`nn`@**PRST-RCL** `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-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?** `SP` preset, out `CR` #**PRST-VID?** `SP` preset, * `CR`	
Response			
~`nn`@**PRST-VID** `SP` preset, in>out `CR LF` ~`nn`@**PRST-VID** `SP` preset, in>1, in>2, in>3, … `CR LF`			
Parameters			
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			
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 `CR`	~PRST-STO 5 `CR LF`
Recall audio and video connections from preset 3		#PRCL 3 `CR`	~PRST-RCL 3 `CR LF`
Show source of video output 2 from preset 3		#PRST-VID? 3,2 `CR`	~PRST-VID 3, 4>2 `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**␣*layer,dest,src*␣CR	
Get:	Get data layer routing	**#ROUTE?**CR	
Response			
~nn@**ROUTE**␣*layer,dest,src*CR LF			
Parameters			
layer – 3 (Data) *dest* - 1-8 (Output 1-8) 　　　x (Disconnect / Disable routing) *src* – 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` *inp_io* `CR`	
Response			
~ `nn`@**SIGNAL** `SP` *inp_id,status* `CR` `LF`			
Parameters			
inp_id - input number *status* - 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

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SAFETY WARNING
Disconnect the unit from the power supply before opening and servicing

P/N: 2900-300275   Rev: 5