KRAMER ELECTRONICS LTD.

USER MANUAL

MODEL:

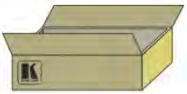
VS-3232DN
32x32 Digital Matrix Switcher

P/N: 2900-300164 Rev 3

VS-3232DN Matrix Switcher Quick Start Guide

This page guides you through a basic installation and first-time use of your **VS-3232DN**. For more detailed information, see the **VS-3232DN** User Manual, the latest version of which can be download from http://www.kramerelectronics.com

Step 1: Check the contents of the box



- **VS-3232DN** 32x32 Digital Matrix Switcher
- 1 Power cord
- 1 Set of rack "ears"
- 1 Quick Start sheet
- Windows®-based Kramer control software
- 4 Rubber feet
- Windows®-based Ethernet Configuration and Virtual Serial Port Manager
- Kramer RC-IR3 Infrared Remote Control Transmitter with batteries and user manual

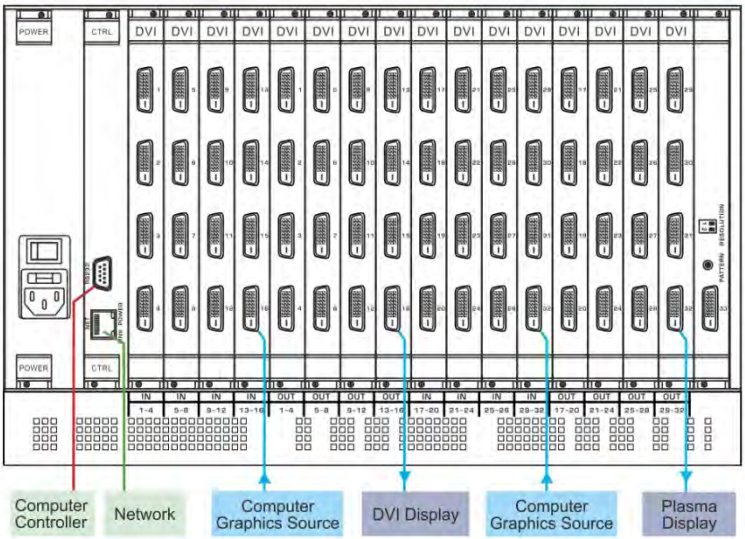
Save the original box and packaging in case your **VS-3232DN** needs to be returned to the factory for service.

Step 2: Install the VS-3232DN

Mount the device in a rack (using the included rack "ears") or attach the rubber feet and place on a table.

Step 3: Connect the inputs and outputs

Always switch off the power to each device before connecting it to your **VS-3232DN**.



Always use Kramer high-performance cables for connecting AV equipment to the **VS-3232DN**.

Step 4: Connect the power

Connect the power cord to the **VS-3232DN** and plug it into the mains electricity.

Step 5: Configure the VS-3232DN

Use the Setup and Config menus to set the device configuration.

Step 6: Operate the VS-3232DN

Operate the device using the front panel buttons, IR remote control, RS-232 or Ethernet.

Contents

1	**Introduction**	**1**
2	**Getting Started**	**2**
2.1	Achieving the Best Performance	2
3	**Overview**	**3**
3.1	Defining EDID	4
3.2	About the Power Connect™ Feature	4
4	**Defining the VS-3232DN 32x32 Digital Matrix Switcher**	**5**
5	**Installing in a Rack**	**10**
6	**Connecting the VS-3232DN**	**11**
6.1	Port Numbering	12
6.2	Serial Data on DGKat Plus RS-232 Cards	14
6.3	Connecting to the VS-3232DN via RS-232	14
6.4	Connecting to the VS-3232DN via Ethernet	15
7	**Operating Your Video Matrix Switcher**	**18**
7.1	Startup Display	18
7.2	Using the Selector Buttons	19
7.3	Confirming Actions	20
7.4	Switching Actions	21
7.5	Locking the Front Panel Buttons	24
7.6	Redundant Power Supplies	25
8	**Using the Configuration Menus**	**26**
8.1	Using the Setup Menu	26
8.2	Using the Config Menu	31
9	**Configuring the Number of Installed Input and Output Ports**	**43**
10	**Installing and Using the Test Module to Troubleshoot Video Problems**	**44**
10.1	Installing the Test Module	44
10.2	Setting the Resolution of the Generated Video	45
10.3	Setting the Pattern of the Generated Video	46
10.4	Using the Test Module to Troubleshoot Video Problems	46
11	**Hardware Installation Instructions**	**49**
11.1	I/O Card Installation	49
11.2	Power Supply Installation	51
12	**Upgrading the VS-3232DN Firmware**	**53**
13	**Technical Specifications**	**54**
14	**Default Communication Parameters**	**55**
15	**Factory Default EDID**	**56**
15.1	DVI Input Card	56
15.2	DVI (HDCP) Input Card	57
15.3	HDMI Input Card	58
15.4	DVI Dual Link Input Card	60
15.5	DGKat Input Card	62
15.6	Fiber Optic F670 Input Card	64
16	**Communication Protocols**	**66**
16.1	Protocol 3000	66
16.2	Protocol 2000	70

Figures

Figure 1: VS-3232DN Front Panel Numeric Keypad 5
Figure 2: VS-3232DN 32x32 Digital Matrix Switcher Front Panel 6
Figure 3: VS-3232DN 32x32 Digital Matrix Switcher Rear Panel 8
Figure 4: Connecting the VS-3232DN 32x32 Digital Matrix Switcher 11
Figure 5: Sample Port Numbering 13
Figure 6: DGKat Card Serial Data Transmission 14
Figure 7: Local Area Connection Properties Window 16
Figure 8: Internet Protocol (TCP/IP) Properties Window 16
Figure 9: Default Startup Status Display Sequence 18
Figure 10: Resolution DIP-switch 45
Figure 11: Signal Paths for Isolating Problems 46
Figure 12: Inserting the Card into a Slot 49
Figure 13: Card Handles 50
Figure 14: Second Power Supply Installation 51

1 Introduction

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

Our 1,000-plus different models now appear in 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 Video Products.

Congratulations on purchasing your Kramer **VS-3232DN** *32x32 Digital Matrix Switcher* which is ideal for the following typical applications:

- Professional display systems requiring video signal routing
- Broadcast, presentation and production facilities, as well as monitoring in large duplication systems
- Rental/staging applications

Note: Throughout this user manual the chassis configuration is shown with 32 DVI inputs and 32 DVI outputs as a representation only. The following cards are available and may be mixed in the same chassis:

- DVI, DVI dual link
- DVI (HDCP), HDMI (HDCP)
- DVI (over 4LC fiber optic cable)
- DVI (over f ber optic cable) with 670 module (HDCP)
- HDMI over DGKat twisted pair cable with RS-232 (HDCP)

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
- Use Kramer high performance high resolution cables
- Use only the power cord that is supplied with this machine

Go to http://www.kramerelectronics.com 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 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-3232DN** away from moisture, excessive sunlight and dust

3 Overview

The Kramer **VS-3232DN** is a high performance matrix switcher chassis that supports up to 32 x 32 ports. It features a very high bandwidth of up to 3.2Gbps (for the chassis only, effective bandwidth of the system depends on the I/O cards) that ensures transparent performance even in the most critical applications. The cards re-clock and equalize the signals and the chassis can route any or all inputs to any or all outputs simultaneously.

For maximum bandwidth supported by each type of card see the Technical Specifications in Section 13.

The **VS-3232DN** is highly configurable–you can add or remove inputs and outputs independently in groups of four and mix different types of input/ouput cards in the same chassis up to 32 x 32. For example, you can configure a device as a 4 x 24 or a 32 x 8 matrix switcher to exactly suit your needs.

The **VS-3232DN** features:

- Full 32 x 32 non-blocking matrix array to switch any of the 32 input digital signals to any or all outputs (with limitations, see Section 6)
- Kramer Core™—flexible infrastructure conversion. Copper, fiber or Twisted Pair, all can be used at the same time according to input/output module selection. The matrix receives signals from compatible Kramer transmitters, automatically converts between available infrastructure options and sends the signals to compatible Kramer receivers
- I-EDIDPro™ Kramer Intelligent EDID Processing™ – Intelligent EDID handling and processing algorithm ensures plug and play operation for DVI/HDMI systems
- A default EDID (Extended Display Identification Data) for each input
- Non-volatile EDID storage
- Equalization and re-clocking on all card types
- Support for dual, redundant power supplies
- Easy access to 59 preset memory locations for quick access to user-defined setups

- The Kramer 2000 Protocol for serial control
- A lock function to prevent tampering with the front panel
- A 40 character by 2 line LCD that shows the operational status or the configuration menu

You can operate the **VS-3232DN** via the front panel buttons or remotely via:

- RS-232 serial commands transmitted by a touch screen system, PC or other serial controller
- Ethernet over a LAN
- The infrared remote control transmitter

The **VS-3232DN** is a sophisticated device but has been designed to be as simple as possible to operate. Due to space limitations on the front panel a keypad substitutes for 64 individual input/output selector buttons. For details of how to route inputs to outputs, see Section 6. The **VS-3232DN** is housed in a 19" rack-mountable enclosure.

3.1 Defining EDID

The Extended Display Identification Data (EDID) is a data-structure provided by a display, to descr be its capabilities to a graphics card (that is connected to the display's source). The EDID enables the **VS-3232DN** to "know" what kind of monitor is connected to the output. The EDID includes the manufacturer's name, the product type, the timing data supported by the display, the display size, luminance data and (for digital displays only) the pixel mapping data. EDID is defined by a standard published by the Video Electronics Standards Association (VESA).

3.2 About the Power Connect™ Feature

The Power Connect™ feature means that the **VS-3232DN** can supply power over the TP cable to compat ble DGKat devices (for example, the **TP-573** or **TP-574**) when the devices are within 90m (270ft) of each other. The Power Connect™ feature applies as long as the cable can carry power and the distance does not exceed 90m on standard TP cable. For longer distances, use heavier gauge cable (TP cable is still suitable for the video/audio transmission, but not for feeding power at these distances).

4 Defining the VS-3232DN 32x32 Digital Matrix Switcher

Figure 1, Figure 2 and Figure 3 define the **VS-3232DN**.

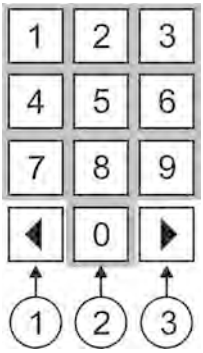


Figure 1: VS-3232DN Front Panel Numeric Keypad

Front Panel Numeric Keypad Labels		
#	**Feature**	**Function**
1	◄ (Backwards)	Press to shift the sliding window to the right (The LCD display is large enough to show only 13 cross-points out of a total of 32)
2	*1, 2, 3, 4, 5, 6, 7, 8, 9, 0*	Numeric keypad, 1 to 0
3	► (Forward)	Press to shift the sliding window to the left

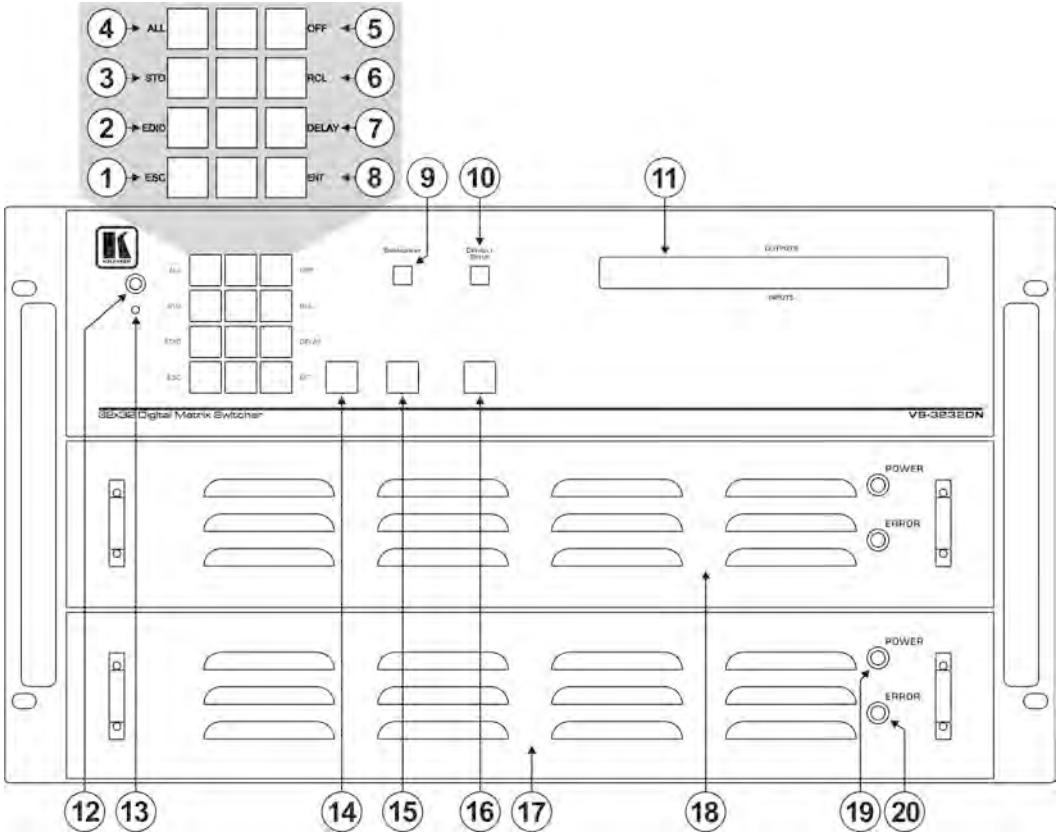


Figure 2: VS-3232DN 32x32 Digital Matrix Switcher Front Panel

#	Feature			Function
1	Double-function Selector Button Area	Menu Button Functions	*ESC*	Press to exit the current operation
2			*EDID*	Press to assign EDID channels
3			*STO*	Press to store the current setup in the a preset. After pressing the MENU button, this button lights and is enabled
4			*ALL*	Press to connect an input to all outputs. After pressing the MENU button, this button lights and is enabled
5			*OFF*	Press to turn off an output. After pressing the MENU button, this button lights and is enabled
6			*RCL*	Press to recall a preset. After pressing the MENU button, this button lights and is enabled
7			*DELAY*	Press to set the delay between confirming an action and the execu ion of he action
8			*ENT*	Press to complete the input-output setup when using a one-digit number instead of two digits. Press to enter the options in a setup menu. (For example, to enter input 5, you can either press 05 or 5, ENT)
9	*BREAKAWAY* Button			Press to exit a Menu (see Section 8)
10	*DEFAULT SETUP* Button			Press to recall he default setup (see Section 7.4.5)
11	*OUTPUTS/INPUTS* LCD Display			Displays the outputs (upper row) switched to the selected inputs (lower row), (see Section 7.1). Displays user interface messages and menus
12	IR Receiver			Infrared remote control sensor
13	IR LED			Lights yellow when receiving commands from the IR remote control transmitter
14	*TAKE* Button			Press to confirm actions (see Sec ion 7.3 2)
15	*MENU* Button			Press once to enable the ALL, OFF STO and RCL buttons (see Section 8). Press again to enter the configuration menu (see Section 8.2). When in a Menu, press to cycle through he menu items
16	*LOCK* Button			Press and hold for approximately 2 sec to lock/unlock the front panel buttons (see Section 7.5)
17	Power Supply			Supplies power to the chassis and cards (see Section 7.6)
18	Power Supply			Supplies power to the device
19	*POWER* LED			Lights green when the device is powered on
20	*ERROR* LED			Lights red when there is a fault with the power supply

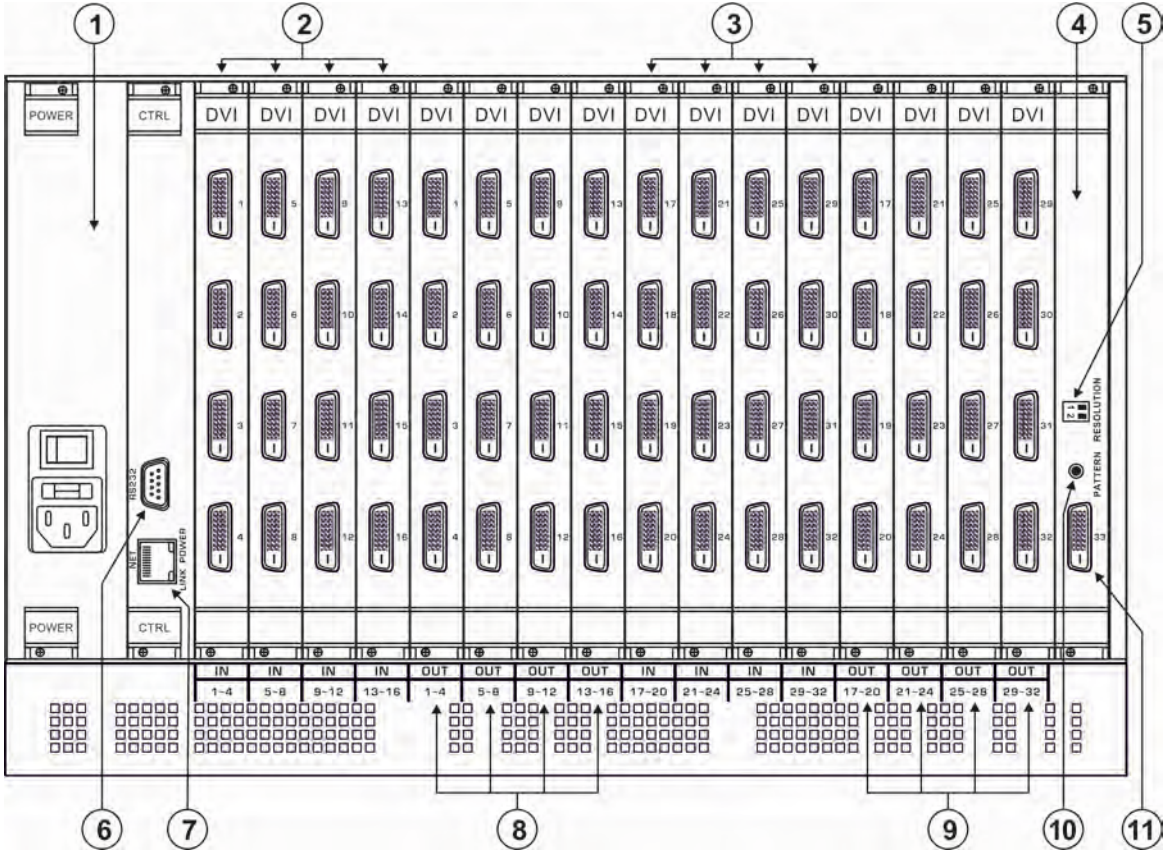


Figure 3: VS-3232DN 32x32 Digital Matrix Switcher Rear Panel

Figure 3 shows DVI cards installed as an example.

#	Feature	Function
1	AC Mains Power Module	Fuse holder and power cord socket. Connect to the AC mains supply
2	*IN 1~16* Connectors	Connect to the relevant video sources, depending on the cards installed (1 to 16, see Section 6)
3	*IN 17~32* Connectors	Connect to the relevant video sources, depending on the cards installed (17 to 32, see Section 6)
4	TEST Module	Signal generator module for testing video outputs (see Section 10)
5	RESOLUTION DIP-switches	Set the resolution for video generated by the Test module (see Section 10.2)
6	RS-232 9-pin D-sub Port	Connects to the remote operation PC or remote controller (see Section 6.1)
7	*NET* Ethernet RJ-45 Connector	Connect to a PC or controller via the Ethernet LAN (see Section 6.4). The *LINK* LED flashes when communication is active. The *POWER* LED lights when the interface receives power
8	OUT 1~16 Connectors	Connect to the relevant video acceptors, depending on the cards installed (1 to 16, see Section 6)
9	OUT 17~32 Connectors	Connect to the relevant video acceptors, depending on the cards installed (17 to 32, see Section 6)
10	PATTERN Button	Press the button repeatedly to change the video pattern generated by the Test module (see Section 10.3)
11	Test Module Output Connector	Connect to one of the relevant video inputs to aid in troubleshooting (see Section 10.4)

5 Installing in a Rack

This section provides instructions for rack mounting the unit.

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

OPERATING TEMPERATURE:	0º to +55ºC (32º to 131ºF)
STORAGE TEMPERATURE:	-45º to +72ºC (-49º to 162ºF)
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.

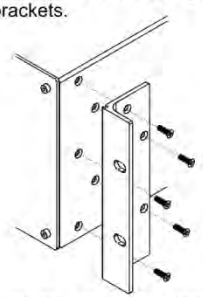
3. The machine is placed straight in the correct horizontal position.

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-3232DN

The configuration of DVI input/output cards shown in Figure 4 is a sample representation and different I/O cards may be mixed as required (for limitations, see page 12). Exactly the same principles apply to installations using other card types.

Always switch off the power to all devices before connecting them to your **VS-3232DN**. After connecting your **VS-3232DN**, connect its power and then switch on the power to each device.

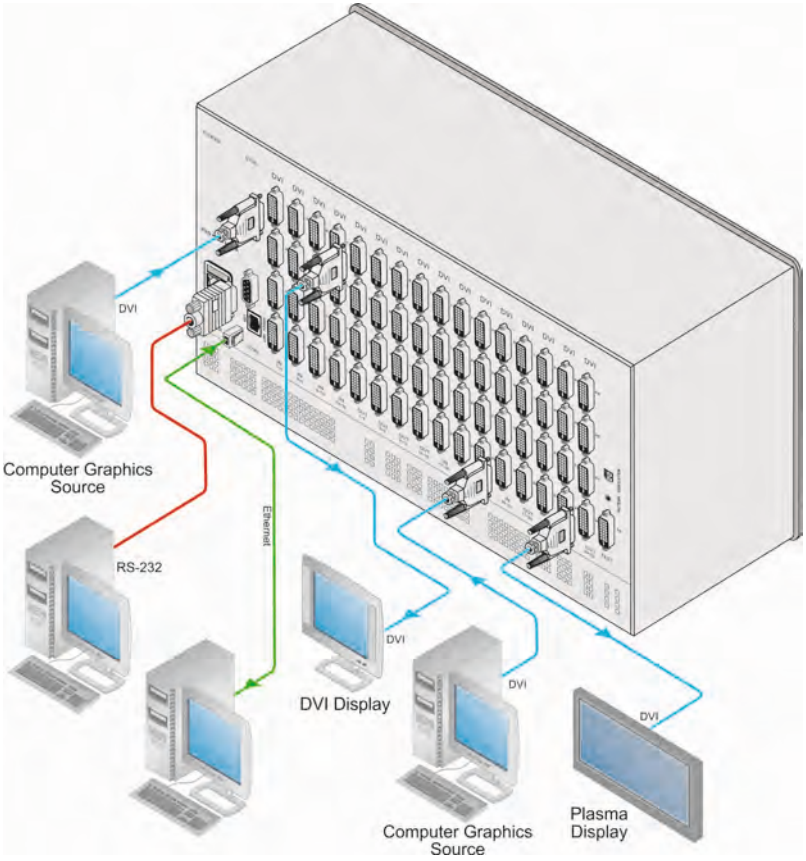


Figure 4: Connecting the VS-3232DN 32x32 Digital Matrix Switcher

To install the VS-3232DN as illustrated in the example in Figure 4:

1. Connect up to 32 DVI video sources (for example, computer graphics sources).
   In this example only two inputs and two outputs are connected.

2. Connect up to 32 DVI video acceptors, (for example, a plasma display and a DVI LCD display).

3. If required, connect a PC or remote controller to the RS-232 port (see Section 6.1) and/or the Ethernet port (see Section 6.4).

4. Connect the power cord.
   We recommend that you use only the power cord that is supplied with the device (not shown in Figure 4).

5. If necessary, review and set the system configuration using the Menu (see Section 8).

Note: Given an input signal that is HDCP encoded, the **VS-3232DN** outputs a signal only if the output port supports HDCP, (for example, HDMI input and DVI with HDCP output).

6.1 Port Numbering

On all cards apart from the DVI dual link cards there are four physical ports. The numbering of ports is sequential from top to bottom and left to right. Each DVI dual link card provides two physical ports which causes the loss of two numbers in the numbering sequence of that card only. A sample numbering is shown in Figure 5.

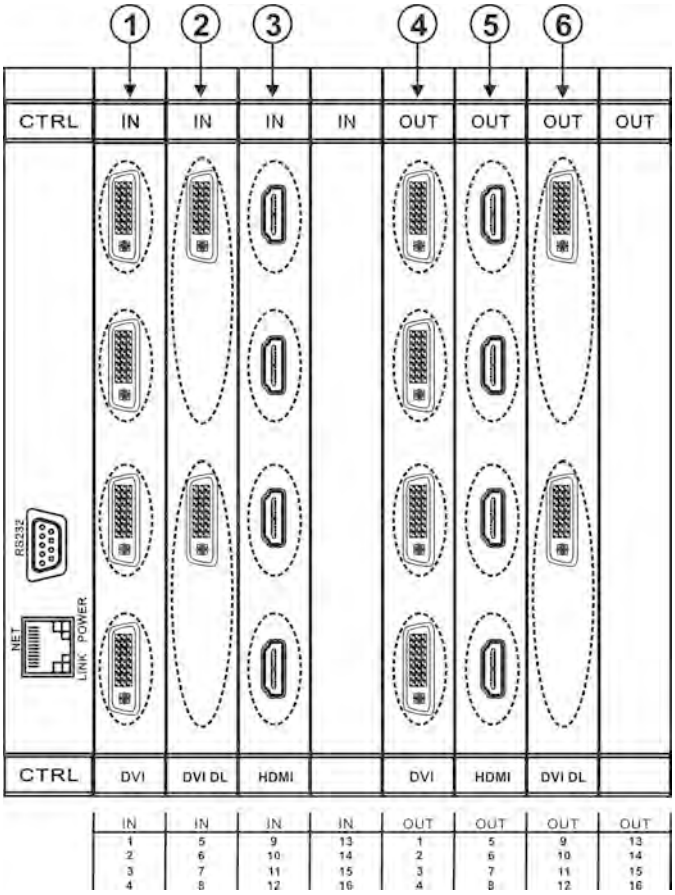


Figure 5: Sample Port Numbering

#	Port Number	#	Port Number
1	IN 1, IN 2, IN 3, IN 4	4	OUT 1, OUT 2, OUT 3, OUT 4
2	IN 5, IN 6	5	OUT 5, OUT 6, OUT 7, OUT 8
3	IN 9, IN 10, IN 11, IN 12	6	OUT 9, OUT 10

Note: There is no IN 7, IN 8, OUT 11 or OUT 12 because these slots contain DVI dual link cards.

6.1.1 EDID Numbering Examples

The table below is based on the port numbering shown in Figure 5. Figure 8 lists EDID configuration requests and the results.

EDID Request	EDID Sent
From OUT 11	Blank (256 bytes of 0xFF)
From IN 13	None (error message displayed)

6.2 Serial Data on DGKat Plus RS-232 Cards

Serial data present on the RS-232 port of a DGKat input card is not transmitted via the switcher. This data is transmitted over the TP cable of the same input card (see Figure 6).

Serial data present on the RS-232 port of a DGKat output card are not transmitted via the switcher. This data are transmitted over the TP cable of the same output card.

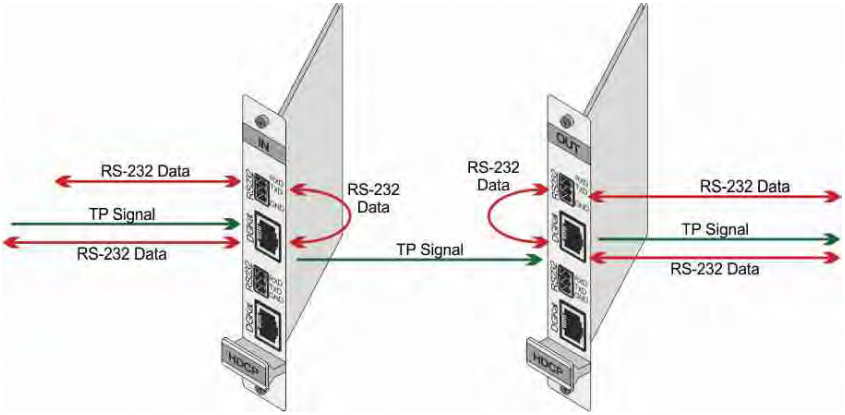


Figure 6: DGKat Card Serial Data Transmission

6.3 Connecting to the VS-3232DN via RS-232

You can connect to the **VS-3232DN** via an RS-232 connection using, for example, a PC. Note that a null-modem adapter/connection is not required.

Note that some early devices require a null modem.

To connect to the VS-3232DN via RS-232:

- Connect the RS-232 9-pin D-sub rear panel port on the **VS-3232DN** unit via a 9-wire straight cable (only pin 2 to pin 2, pin 3 to pin 3, and pin 5 to pin 5 need to be connected) to the RS-232 9-pin D-sub port on your PC

6.4 Connecting to the VS-3232DN via Ethernet

You can connect the **VS-3232DN** via Ethernet using a crossover cable (see Section 6.4.1) for direct connection to the PC, or a straight through cable (see Section 6.4.2) for connection via a network hub or network router.

After connecting the Ethernet port, you have to install and configure your Ethernet Port. For detailed instructions, see the Ethernet Configuration Guide (Lantronix) in the technical support section on our Web site http://www.kramerelectronics.com.

6.4.1 Connecting the Ethernet Port directly to a PC

You can connect the Ethernet port on the **VS-3232DN** to the Ethernet port on your PC via a crossover cable with RJ-45 connectors.

This type of connection is recommended for identification of the factory default IP Address of the **VS-3232DN** during the initial configuration

To configure your PC after connecting the Ethernet port:

1. Right-click the **My Network Places** icon on your desktop.
2. Select **Properties**.
3. Right-click **Local Area Connection Properties**.
4. Select **Properties**.
   The **Local Area Connection Properties** window appears.
5. Select the **Internet Protocol (TCP/IP)** and click the **Properties** Button.

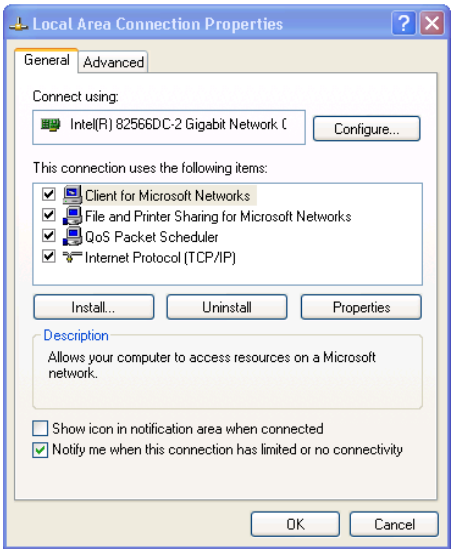


Figure 7: Local Area Connection Properties Window

6. Select **Use the following IP Address** and enter the details as shown in Figure 8. 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.

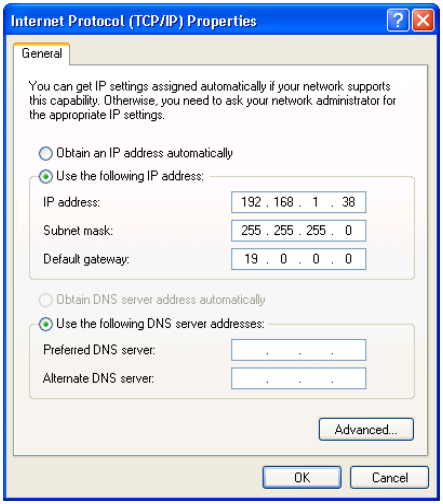


Figure 8: Internet Protocol (TCP/IP) Properties Window

7. Click **OK**.

6.4.2 Connecting to the Ethernet Port via a Network Switch/Hub

To connect to the Ethernet port on the VS-3232DN via a network switch/hub:

- Connect the PC to the Ethernet network switch/hub using a straight through cable

7 Operating Your Video Matrix Switcher

This section describes:

- The startup display (see Section 7.1)
- Using the selector buttons (see Section 7.2)
- Confirming actions (see Section 7.3)
- Switching options (see Section 7.4)
- Locking the front panel (see Section 7.5)

7.1 Startup Display

After switching on the power, the LCD display shows the following screens in sequence.

The text in the LCD Display may vary (according to machine settings)

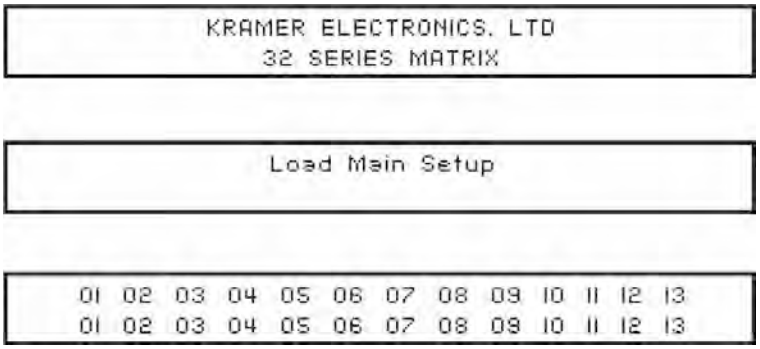


Figure 9: Default Startup Status Display Sequence

The front panel of the **VS-3232DN** includes a numeric keypad within the selector buttons area. This keypad lets you enter both the output and input numbers as well as various numeric configuration values (see Section 7.2).

When the unit is powered-on, the last matrix setup that was used is loaded. Use either the recall setup (see Section 8.1.6) or default setup recall (see Section 7.4.5) functions to retrieve other setups.

Records a stored configuration from a preset. For quick retrieval, you can program a default setup that is commonly used.

7.1.1 Viewing the Display

Figure 9 shows the output-input matrix on the LCD display. The LCD display can show 13 out of the 32 available matrix combinations at once. To view any of the matrix combinations use the ◄ or the ► buttons on the front panel to shift the sliding window to the right or left.

This sliding window functionality is enabled when:

- The switcher is in between operations
  Waiting for its next operation while all previous operations are complete or cancelled.
- Recalling a setup using the ◄ or ► buttons

When entering an output/input combination, the contents of the LCD display automatically shift to indicate the current status of the selected output.

7.2 Using the Selector Buttons

For numbers between 1 and 9, the **VS-3232DN** can handle two digit numbers as well as single digit numbers. When entering a single digit number (for example 5), you can either press 0 followed by 5, or 5 followed by ENT.

Pressing 00 (or 0, ENT) is only relevant for an input selection and is used to disconnect the currently entered output number from the input.

For example, the following display indicates that inputs 8 and 12 are disconnected from any output (note that in the second line representing these inputs the display is blank):

06 07 08 09 10 11 12 13
12 08 10 14 13 06

The ESC button is used to cancel an operation without affecting the current status. For example, if you enter an incorrect number by mistake, press the ESC button to cancel the operation.

Note: At any stage, if no button is pressed within approximately 15 seconds, the automatic timeout causes the **VS-3232DN** to exit the operation and revert to the output/input display.

7.3 Confirming Actions

You can choose to work in the At Once (default) or the Confirm mode.

For all actions except storing/recalling.

In the At Once mode:

- The TAKE button does not light
- Pressing an OUT-IN combination implements the switch without further user confirmation
- You save time as execution is immediate and actions require no user confirmation
- No protection is offered to correct an erroneous action

In the Confirm mode:

- The TAKE button lights
- You enter an action and then confirm it by pressing the TAKE button
- Every action requires user confirmation, protecting against erroneous actions
- Execution is postponed until you confirm the action
  Failure to press the TAKE button within a few seconds results in the action timing out automatically

7.3.1 Toggling between the At Once and Confirm Modes

To toggle between the At Once and Confirm modes:

Note: If the TAKE button is flashing you cannot toggle between the At Once and Confirm modes. A flashing TAKE button indicates that an action is currently pending confirmation.

1. Press TAKE to toggle between the At Once mode and the Confirm mode.
   The TAKE button lights and actions now require user confirmation.

2. Press the lit TAKE button to toggle from the Confirm mode back to the At Once mode.
   The TAKE button is no longer lit and actions no longer require user confirmation.

7.3.2 Confirming a Switching Action

Actions only require confirmation when the device is in the Confirm mode.

To confirm a switching action:

1. Using the numeric keypad, enter an output-input combination.
   The TAKE button flashes.

2. Press the flashing TAKE button to confirm the action.
   The action is confirmed and the TAKE button lights.

7.4 Switching Actions

This section describes how to:

- Switch one input to one output (see Section 7.4.1)
- Switch several inputs to several outputs (see Section 7.4.2)
- Turn off several outputs (see Section 7.4.3)

7.4.1 Switching one Input to one Output

To switch one input to one output:

1. Using the numeric keypad, enter the required output (in this example, 12).
   The following is displayed:
   06 07 08 09 10 11 12 13
   In__ => Out 12

   The left-hand side of the display shows a section of the output/input display automatically sliding the content to include output 12.

2. Using the numeric keypad, enter the required input (in this example, 14):
   - In the At Once mode, the switching takes place immediately and the LCD display shows a segment of the input-output status that includes the switched input and output (for example, 14-12)
     In the Confirm mode, the LCD display shows the following:
     In 14 => Out 12
     Incomplete actions time out after approximately 15 seconds.
   - In the Confirm mode, press the flashing TAKE button to switch the input to the output

7.4.2 Switching Several Inputs to Several Outputs

If you want to switch several inputs to several outputs simultaneously you must be in the Confirm mode.

In the Confirm mode you can enter a batch of several actions and then confirm the batch by pressing TAKE once (simultaneously switching several output-input combinations).

To switch several inputs to several outputs in the Confirm mode:

1. Using the numeric keypad, enter an output-input combination.
   The TAKE button flashes.

2. Enter additional output-input combinations.
   The LCD display can show up to five pending actions (although the batch is not limited to five actions):
   In this example, input 9 is set to switch to output 6 and input 5 is set to switch to output 7.
   09 => 06 05 => 07

3. After entering all output/input combinations, press the flashing TAKE button to confirm the actions.
   The inputs switch to the respective outputs as shown on the LCD display and the TAKE LED is lit.

7.4.3 Turning an Output Off

Turning an output off means that there is no input switched to this output. This is indicated on the display by the Input being blank underneath the relevant Output.

To turn an output off:

1. Press MENU.
   The Menu buttons light and are enabled.

2. Press OFF (3) on the numeric keypad (see Figure 1).
   The following message is displayed:
   out__ => OFF

3. Use the numeric keypad to turn the required output off.
   The output is turned off.

To turn an output off in the Confirm mode:

- Repeat the steps above and then press the flashing TAKE button to confirm the action

Alternatively, you can perform a switching operation (see Section 7.4.1) and set the input to 00.

7.4.4 Turning Off Several Outputs

To turn off several outputs in the Confirm mode, repeat the switching actions described in Section 7.4.2 but set the inputs to 00.

7.4.5 Recalling the Default Setup

You can store a commonly used setup as the default setup (see Section 8.2.8) which can be recalled at any time.

Note: This is not the setup that is loaded when the unit is turned on. When the unit is turned on, the setup that was last used before the unit was turned off is loaded.

To recall the default setup:

1. Press DEFAULT SETUP.
   The DEFAULT SETUP button flashes and the following message is displayed:
   recall DEFAULT setup
   press FLASHING button to confirm

2. Press DEFAULT SETUP.
   The following message is displayed:
   all Setups and Connections change
   press TAKE to confirm

- The TAKE button flashes.

3. Press TAKE.
   The default setup is recalled and the display reverts to the output-input display.

7.5 Locking the Front Panel Buttons

You can lock the **VS-3232DN** to prevent tampering with the unit or prevent the settings from being changed accidentally via the front panel buttons.

You can s ill remotely operate via RS-232 or Ethernet even when the front panel is locked

To lock the front panel buttons:

- Press and hold LOCK until the button lights.
  The front panel buttons are locked

To unlock the front panel buttons:

- Press and hold LOCK until the button is no longer lit.
  The front panel buttons are unlocked

7.6 Redundant Power Supplies

The **VS-3232DN** supports dual, redundant power supplies. The **VS-3232DN** can continue to operate with only one working power supply in the event of a problem with one of the power supplies. The chassis must be powered down to replace a power supply.

8 Using the Configuration Menus

The configuration menus let you configure the **VS-3232DN** to best suit your needs. There are two configuration menus:

- Setup Menu—those that are accessed on a regular basis (for example, storing setups and setting the delay), see Section 8.1
- Config Menu—those that are accessed only occasionally (for example, setting the interface or communication protocol), see Section 8.2

The following rules apply to the menu operation:

- If no selection is made within approximately 15 seconds, the operation times-out and the display reverts to the output/input display
- At any point in the Menu, press ESC to move up one level or press BREAKAWAY to exit the Menu altogether
- At any point in the Menu, only buttons that are active light or flash
- All of the procedures in this section assume that you are starting the procedure from the standard, operational output/input display

8.1 Using the Setup Menu

The Setup Menu provides access to settings that are regularly changed and comprises the following options:

- **1: inXX=>ALL**, switching one input to all outputs (see Section 8.1.1)
- **3: outXX=OFF**, turning off an output (see Section 8.1.2)
- **7: EDID**, assignment to an output (see Section 8.1.3)
- **9: Delay** setting for an output (see Section 8.1.4)
- **4: store setup XX**, storing the setup in a preset (see Section 8.1.5)
- **6: recall setup XX**, recalling a preset (see Section 8.1.6)

8.1.1 Setup Menu—1: inXX=>ALL, Switching one Input to all Outputs

This option switches one input to all outputs.

To switch one input to all outputs:

1. Press MENU.
   The Setup Menu options are displayed.

2. Press 1 (ALL) on the numeric keypad (see Figure 1).
   The following is displayed:
   in__ => ALL

3. Using the numeric keys, enter the input to be switched to all outputs.
   The TAKE button flashes.

4. Press TAKE.
   The selected input is switched to all outputs.
   The display reverts to the output/input display showing that the selected input is switched to all outputs.

8.1.2 Setup Menu—3: outXX=>OFF, Turning an Output Off

This option turns an output off.

To turn an output off:

1. Press MENU.
   The Setup Menu options are displayed.

2. Press 3 (OFF) on the numeric keypad (see Figure 1).
   The following is displayed:
   out__ => OFF

3. Using the numeric keys, enter the output to be turned off.
   The TAKE button flashes.

4. Press TAKE.
   The selected output is turned off.

The display reverts to the output/input display showing that the selected output is turned off with the input being blank.

8.1.3 Setup Menu—7: EDID, Assignment to an Input

This option assigns an EDID to between one and eight inputs which are stored in non-volatile memory. More than eight EDID assignments must be assigned in separate batches of eight.

Each input on the **VS-3232DN** has a factory default EDID loaded (see Section 15). The EDID for each input can be changed independently via the menu (described below).

Note: It is necessary to have a display/device connected to the output from which you want to read the EDID. Failure to do so results in the default EDID being written to storage.

To assign an EDID to between one and eight inputs:

1. Press MENU.
   The Setup Menu options are displayed.

2. Press 7 (EDID) on the numeric keypad (see Figure 1).
   The following is displayed:
   SETUP EDID
   ENTER to View EDID and Set EDID

3. Press ENT.
   The current EDID matrix configuration is displayed.

4. Using the numeric keys, enter the input in which to store the EDID (in this example, 08), and enter the output (in this example, 05) from which to read the EDID.
   The following is displayed:
   00 01 02 03 04 05 06 07 08
   05 out05 => in08

   The TAKE button flashes.

5. Repeat Step 4 for up to eight inputs.

6. Press TAKE.
   The EDID is stored and passed through to the input.
   The display reverts to the output/input display.

7. Repeat the above steps for the next batch of eight EDID assignments.

To view the EDID assignments:

1. Press MENU.
   The Setup Menu options are displayed.

2. Press 7 (EDID) on the numeric keypad (see Figure 1).
   The following is displayed:
   SETUP EDID
   ENTER to View EDID and Set EDID

3. Press ENT.
   The current EDID matrix configuration is displayed. In this example, input 07 is assigned to output 05, all other EDID values are default.
   05 06 07 08 09 10
   05

8.1.4 Setup Menu—9: Delay, Setting for an Output

Some displays require a delay in the negotiation of data between the display and the switcher for reliable negotiation of data between them. This option sets the time delay for an output which lapses between entering a switching action and the execution of the action. This delay can be set for each output independently. The delay is defined in units of 200ms and ranges from 0 to 15, providing delays of between 0 and 3 seconds (15 x 200ms = 3 seconds).

To set the execution delay for an output:

1. Press MENU.
   The Setup Menu options are displayed.

2. Press 9 (DELAY) on the numeric keypad (see Figure 1).
   The output/delay times display is shown.

3. Using the numeric keys, enter the output (in this example, 03).

   The following is displayed:

   ```
   01 02 03 04 05 06 07 08
                  DLY__ =>out03
   ```

4. Using the numeric keys, enter the number of delay units.

5. Press TAKE.

   The selected output delay is set.

   The display reverts to the output/input display.

8.1.5 Setup Menu—4: store setup XX, Storing the Setup in a Preset

This option stores the current setup in a preset (1 to 59).

To store the current setup in a preset:

1. Press MENU.

   The Setup Menu options are displayed.

2. Press 4 (STO) on the numeric keypad (see Figure 1).

   The following is displayed:

   ```
   store => __
   ```

3. Using the numeric keys, enter the preset (1 to 59) in which to store the current setup.

   The following is displayed:

   ```
   Wait …..
   ```

   After a few seconds, if the preset is not empty, the following is displayed:

   ```
   SETUP NOT EMPTY
   CONFIRM
   ```

   The TAKE button flashes.

4. Press TAKE.

   The setup is stored in the selected preset for subsequent recall.

   The display reverts to the output/input display.

8.1.6 Setup Menu—6: recall setup XX, Recalling a Preset

This option recalls a stored configuration from a preset (1 to 59).

To recall a stored configuration:

1. Press MENU.
   The Setup Menu options are displayed.

2. Press 6 (RCL) on the numeric keypad (see Figure 1).
   The following is displayed:
   recall <= __

3. Using the numeric keys, enter the preset (in this example, 02) to recall.
   The following is displayed:
   Wait …..

   After a few seconds, the following is displayed on the right hand side:
   CONFIRM
   RECALL <= 02

   The TAKE button flashes.

4. Press TAKE.
   The preset is recalled.
   The display reverts to the output/input display.

8.2 Using the Config Menu

The Config Menu provides access to configuration settings that are not regularly changed and comprises the following options:

- Input signal detection (Section 8.2.1)
- Input port parameter setting (see Section 8.2.2)
- Output load detection (Section 8.2.3)
- Output port parameter setting (see Section 8.2.4)
- Interface configuration (Section 8.2.5)
- Interface Reply configuration (Section 8.2.6)

- Protocol configuration (Section 8.2.7)
- Storing the default setup (Section 8.2.8)
- Resetting the **VS-3232DN** (Section 8.2.9)
- Firmware revision display (Section 8.2.10)

To enter the Config Menu press MENU twice. The MENU button lights and the following message is displayed:

- Start configuration menu
- MENU to view setups ENT to change them

When browsing through the configuration menu, enabled buttons light or flash.

Use the Config Menu as follows:

1. Press the MENU button to cycle through the menu items.
   The LCD display shows the current status of the selected menu item.
2. Press the ENT button to enter a submenu.
3. After entering a submenu, you can select between several options.
   Select an option by pressing one of the illuminated buttons in the Selector Buttons area.
4. After selecting the desired option, a description of the desired change is displayed and the TAKE button flashes.
5. Press the flashing TAKE button to confirm the change.
   A description of the current state is displayed for about one second. The unit automatically switches to the next item in the menu.

8.2.1 Config Menu—Input Signal Detection Display

This option displays a list of inputs and indicates on which of them signals have been detected.

To display a list of inputs that have detected signals:

1. Press MENU twice.

   The following message is displayed:

   start configuration menu
   MENU to view setup ENT to change them

2. Press MENU.

   The following is displayed:

   IN: 01 02 03 04 05 06 07 08 09 10 11
   SIG: Y X Y Y Y Y X Y Y Y X

   - Y indicates that a signal is detected and X indicates that no signal is detected on the relevant input.

3. Do one of the following:

   - Press BREAKAWAY to exit the Config Menu
   - Wait approximately 15 seconds for the operation to time out
   - Press MENU to move to the next Config Menu option

8.2.2 Config Menu—Input Port Parameter Setting

This option sets input port specific parameters. Ports that show an X have no parameters available to modify. Ports that show a 0 have parameters available to modify. The parameters that are available, such as, audio balance, depend on the type of card installed and whether the card is an input or an output card. Tables listing input cards and their parameters can be found at the end of this section.

To set parameters for a port:

1. Press MENU twice.

   The following message is displayed:

   start configuration menu
   MENU to view setup ENT to change them

2. Press MENU until a display similar to the following is shown:

   IN: 01 02 03 04 05 06 07 08 09 10 11
   SET: X X X X 0 0 0 0 X X X

X indicates that there are no modifiable parameters for the associated port and 0 indicates that there are modifiable parameters for the associated port.

3. Press TAKE to enter the list of ports.
   The cursor flashes on a selected port.

4. Select the required port to modify using the left and right arrow buttons.

5. Press TAKE to enter the parameters list.
   A message similar to the following is displayed with the relevant port number in place of 06:
   IN: 06
   SET: 36.Reset SubBoard

6. To select the next parameter press the right arrow button. (See the table at the end of this section for available parameters.)

Or:

7. To enter the displayed parameter press TAKE.
   The parameter options are displayed.

8. Select the required action or number using the keypad numbers and arrows.

9. Press TAKE to save the change.

10. Repeat from Step 6 to modify other parameters

11. Do one of the following:
    - Press BREAKAWAY to exit the Config Menu
    - Wait approximately 15 seconds for the operation to time out
    - Press MENU to exit to the parameter list

The following tables list the input card types and their relevant parameters.

HDMI plus Analog Audio Input Card		
Parameter	**Options/Description**	**Default**
36.Reset SubBoard	Re-power: power cycles the port Factory: performs a factory reset to default values of the port	Re-power
81.Volume	0 to 100: sets the audio input volume	50

HDMI plus Analog Audio Input Card		
Parameter	**Options/Description**	**Default**
84.Audio Balance	0 to 100: sets the audio input channel balance	50
87.Audio Bass	0 to 100: sets the audio inout bass level	50
88.Audio Treble	0 to 100: sets the audio input treble level	50
91.Audio Mute	MUTE: mutes the audio input Non-MUTE: unmutes the audio input	Non-MUTE
98.Audio Select	Auto: audio signal selection is controlled by the presence or absence of a plug in the 3.5mm mini jack AUD-Embedded: HDMI audio is selected AUD-Ex-Digital: S/PDIF audio is selected (only works on HDMI plus S/PDIF card) AUD-Ex-Analog: Analog audio from the 3.5mm mini jack is selected (only works on HDMI plus analog audio card)	Auto

HDMI plus S/PDIF Audio Input Card		
Parameter	**Options/Description**	**Default**
36.Reset SubBoard	Re-power: power cycles he port Factory: performs a factory reset to default values of the port	Re-power
98.Audio Select	Auto: audio signal selection is controlled by the presence or absence of a plug in he 3.5mm mini jack AUD-Embedded: HDMI audio is selected AUD-Ex-Digital: S/PDIF audio is selected (only works on HDMI plus S/PDIF card) AUD-Ex-Analog: Analog audio from the 3.5mm mini jack is selected (only works on HDMI plus analog audio card)	Auto

8.2.3 Config Menu—Output Load Detection Display

This option displays a list of outputs and indicates which have loads attached to them.

To display a list of outputs and attached loads:

1. Press MENU twice.

   The following message is displayed:

   start configuration menu
   MENU to view setup, ENT to change them

2. Press MENU until the following is displayed:

   OUT: 01 02 03 04 05 06 07 08 09 10 11
   LOAD: Y X Y Y Y Y X Y Y Y X

   Y indicates that a load is attached and X indicates that no load is detected on the relevant output.

3. Do one of the following:
   - Press BREAKAWAY to exit the Config Menu
   - Wait approximately 15 seconds for the operation to time out
   - Press MENU to move to the next Config Menu option

8.2.4 Config Menu—Output Port Parameter Setting

This option sets port specific parameters. Ports that show an X have no parameters available to modify. Ports that show a 0 have parameters available to modify. The parameters that are available, such as, audio balance, depend on the type of card installed and whether the card is an input or an output card. Tables listing output cards and their parameters can be found at the end of this section.

To set parameters for a port:

1. Press MENU twice.
   The following message is displayed:
   start configuration menu
   MENU to view setup ENT to change them

2. Press MENU until a display similar to the following is shown:
   OUT: 01 02 03 04 05 06 07 08 09 10 11
   SET: X X X X 0 0 0 0 X X X

   X indicates that there are no modifiable parameters for the associated port and 0 indicates that there are modifiable parameters for the associated port.

3. Press TAKE to enter the list of ports.
   The cursor flashes on a selected port.

4. Select the required port to modify using the left and right arrow buttons.

5. Press TAKE to enter the parameters list.
   A message similar to the following is displayed with the relevant port number in place of 06:
   OUT: 06
   SET: 36.Reset SubBoard

6. To select the next parameter press the right arrow button. (See the table at the end of this section for available parameters.)

Or:

7. To enter the displayed parameter press TAKE.
   The parameter options are displayed.

8. Select the required action or number using the keypad numbers and arrows.

9. Press TAKE to save the change.

10. Repeat from Step 6 to modify other parameters

11. Do one of the following:

    - Press BREAKAWAY to exit the Config Menu
    - Wait approximately 15 seconds for the operation to time out
    - Press MENU to exit to the parameter list

The following tables list the output port types and their relevant parameters

HDMI plus Analog Audio Output Card		
Parameter	**Options/Description**	**Default**
36.Reset SubBoard	Re-power: power cycles the port Factory: performs a factory reset to default values of the port	Re-power
81.Volume	0 to 100: sets the audio output volume	50
84.Audio Balance	0 to 100: sets the audio output channel balance	50
87.Audio Bass	0 to 100: sets the audio outout bass level	50
88.Audio Treble	0 to 100: sets the audio output treble level	50
91.Audio Mute	MUTE: mutes the audio output Non-MUTE: unmutes the audio output	Non-MUTE
94.Audio Mix-Mode	Close: Downscales the audio channels from 7.1 to 2 to the 3.mm mini jack analog audio output Open: Audio channels are not modified	Close
151.BLINK ON AUDIO	1: No video glitch when the audio is connected or disconnected 0: There is a video glitch when the audio is connected or disconnected	1

HDMI plus S/PDIF Audio Output Card		
Parameter	**Options/Description**	**Default**
36.Reset SubBoard	Re-power: power cycles the port Factory: performs a factory reset to default values of the port	Re-power
151.BLINK ON AUDIO	1: No video glitch when the audio is connected or disconnected 0: There is a video glitch when the audio is connected or disconnected	1

8.2.5 Config Menu—Interface Configuration

This option lets you activate or deactivate the IR (infrared) and Ethernet interfaces.

To activate or deactivate the IR or Ethernet interfaces:

1. Press MENU twice.
   The following message is displayed:
   start configuration menu
   MENU to view setup ENT to change them

2. Press MENU until the following is displayed:
   INTERFACE configuration
   current:IR-ON Ethernet-ON

   The current status of the IR and Ethernet interfaces is displayed.

3. Press ENT to select the Interface Submenu.

4. Select 1 to modify the status of the IR interface or 2 to modify that status of the Ethernet interface (in this example, 2).
   The following is displayed:
   Ethernet interface setup
   1:make it ACTIVE 2:turn it OFF

5. Press 1 to activate the interface or 2 to deactivate it.

6. Press TAKE to confirm the action.
   The interface status is changed. After a few seconds the next option on the Config Menu is displayed.

8.2.6 Config Menu—Interface Reply Configuration

This option lets you switch the Reply configuration on or off. Setting Reply to on causes all interfaces that are set to on to accept and execute commands, and also to reply. Setting Reply to off causes all interfaces that are set to on to accept and execute commands, but not to reply.

To switch the Reply configuration on or off:

1. Press MENU twice.
   The following message is displayed:
   start configuration menu
   MENU to view setup ENT to change them

2. Press MENU until the following is displayed:
   interface REPLY configuration
   current interface REPLY – ON

   This indicates the current Reply configuration status.

3. Press ENT to enter the Reply Submenu.
   The following is displayed:
   interface REPLY configuration
   1:turn REPLY ON 2:never REPLY

4. Press 1 to switch Reply on or 2 to switch it off.

5. Press TAKE to confirm the action.
   A message is displayed indicating the new status of the Reply configuration.
   After a few seconds the next option on the Config Menu is displayed.

8.2.7 Config Menu—Protocol Configuration

The **VS-3232DN** supports Kramer Protocol 2000 and Protocol 3000.

To switch from Protocol 3000 (default) to Protocol 2000:

1. Press MENU twice.
   The following message is displayed:
   start configuration menu
   MENU to view setup ENT to change them

2. Press MENU until the following is displayed:
   PROTOCOL configuration
   Current: Kramer-3000

   This indicates the current Protocol setting.

3. Press ENT to enter the Reply Submenu.
   The following is displayed:
   PROTOCOL configuration
   1:KRAMER-2000 2:KRAMER-3000

4. Press 1 to switch to Protocol 2000.
   The following is displayed:
   Set PROTOCOL to KRAMER-2000?
   press TAKE to confirm

5. Press TAKE to confirm the action.
   A message is displayed indicating the new Protocol status. After a few seconds the next option on the Config Menu is displayed.

8.2.8 Config Menu—Store Default Setup

This option lets you store the current setup as the default setup. The default setup can be recalled at any time using the DEFAULT SETUP button (see Section 7.4.5).

Note: This is not the setup that is loaded when the unit is switched on.

To store the current setup as the default setup:

1. Press MENU twice.
   The following message is displayed:
   start configuration menu
   MENU to view setup ENT to change them

2. Press MENU until the following is displayed:
   store DEFAULT setup
   press ENTER to store

3. Press ENT to store the current configuration as the default configuration.

   The following is displayed:

   current matrix stage is OKAY?
   press TAKE to confirm

4. Press TAKE.

   The following is displayed:

   current matrix stage
   store as DEFAULT setup

   This indicates that the current setup is stored as the default setup. After a few seconds the next option on the Config Menu is displayed.

8.2.9 Config Menu—Total Matrix Reset

This option lets you turn all outputs off or reset the unit to its factory default settings.

To reset the matrix setup:

1. Press MENU twice.

   The following message is displayed:

   start configuration menu
   MENU to view setup ENT to change them

2. Press MENU until the following is displayed:

   TOTAL MATRIX RESET
   exit = ESC ENT = submenu

3. Press ENT to enter the Reset Submenu.

   The following is displayed:

   COMPLETELY MATRIX RESET
   1:ALL outputs OFF2:Factory default

4. Press 1 to turn off all outputs or 2 to perform a factory reset of all options.

Warning: Selecting option 2 to perform a factory default reset clears all setups, options and configuration

5. Press TAKE and wait a few seconds.

   The following is displayed:

   Are you Absolutely sure !!!
   Once more TAKE to confirm

6. Press TAKE.

   The following is displayed:

   Matrix erased!!!
   Please, wait …

The matrix and device configuration are erased. After a few seconds the next option on the Config Menu is displayed.

8.2.10 Config Menu—Display Firmware Versions

This option displays the main and front firmware versions.

To display the firmware versions:

1. Press MENU twice.

   The following message is displayed:

   start configuration menu
   MENU to view setup ENT to change them

2. Press MENU until the following is displayed:

   Main Firmware Version: 1.0
   Front Firmware Version: 1.0

3. Either press BREAKAWAY to exit the Config Menu or wait approximately 15 seconds for the operation to time out.

9 Configuring the Number of Installed Input and Output Ports

After installing or removing a module you need to set the number of input and output ports so that the **VS-3232DN** recognizes the new configuration. Refer to Section 6.1 for an explanation of port numbering before setting the number of input and output ports.

To set the number of input or output ports:

1. Press ESC, ENT and LOCK together.
   The following is displayed:
   Configuration Device

2. Press ENT.
   The following is displayed:
   Test Board: 0 MaxInput:32 MaxOutput:32

Note: The number of input and output ports can only be set in units of four, for example, 4 x 4, 32 x 4 or 12 x 16, and not 5 x 4 or 12 x 17.

3. Using the numeric keys, enter the number of input and output ports installed.
   The TAKE button flashes.

4. Press TAKE.
   The number of installed ports is saved and the display reverts to the output/input display.

5. Reboot the device by turning the power off and then on again.

10 Installing and Using the Test Module to Troubleshoot Video Problems

The **VS-3232DN** includes a test module which acts as a signal generator and can be used to diagnose video/audio issues in an operating environment.

The test module must be installed in the configuration before it can be used. When installing the test module, the number of configured inputs and outputs must be increased by one. For example:

- If your **VS-3232DN** has four inputs and eight outputs, you must configure the **VS-3232DN** as 5 x 9
- If your **VS-3232DN** has 32 inputs and 32 outputs, you must configure the **VS-3232DN** as 33 x 33

10.1 Installing the Test Module

To install the test module in the configuration:

1. Press ESC, ENT and LOCK together.
   The following is displayed:
   Configuration Device
2. Press ENT.
   The following is displayed:
   Test Board: 0 MaxInput:32 MaxOutput:32
   where 0 indicates that the test module is not installed.
3. Using the numeric keys, press 1 to indicate that the test module is installed.
   The TAKE button flashes.
4. Press TAKE.
5. Increase the number of configured inputs and outputs by one (see Section 9).
   The test module is now installed and may be used.

10.2 Setting the Resolution of the Generated Video

The test module generates a range of both PC and HD resolutions which are selected by a combination of DIP-switches and an on-board jumper (labeled **B3**). Install the jumper to select HD resolutions or remove the jumper to select PC resolutions.

The Resolution DIP-switch is used to set the resolution of the generated video as listed in the tables below.

Available PC Resolutions for Generated Video (Jumper off)		
DIP-switch Position		Resolution
1	2	
OFF	OFF	1024 x 768 @60Hz (default)
ON	OFF	1280 x 1024 @60Hz
OFF	ON	1600 x 1200 @60Hz
ON	ON	1920 x 1200 @60Hz

Available HD Resolutions for Generated Video (Jumper on, default)		
DIP-switch Position		Resolution
1	2	
OFF	OFF	480p
ON	OFF	720p
OFF	ON	1080i
ON	ON	1080p

Figure 10 shows the Resolution DIP-switch with both switches off (up, default, 480p).

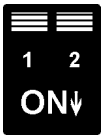


Figure 10: Resolu ion DIP-switch

10.3 Setting the Pattern of the Generated Video

The Pattern button is used to set the pattern of generated video. There are 32 available patterns. Press the button repeatedly to cycle through the patterns.

10.4 Using the Test Module to Troubleshoot Video Problems

The test module may be used in various ways to isolate video problems.

The following examples are based on the signal paths shown in Figure 11 and a **VS-3232DN** device installed as follows:

- 32 inputs and 32 outputs
- The test module is installed and configured (see Section 10.1)
- 33 configured inputs and 33 configured outputs (see Section 9)

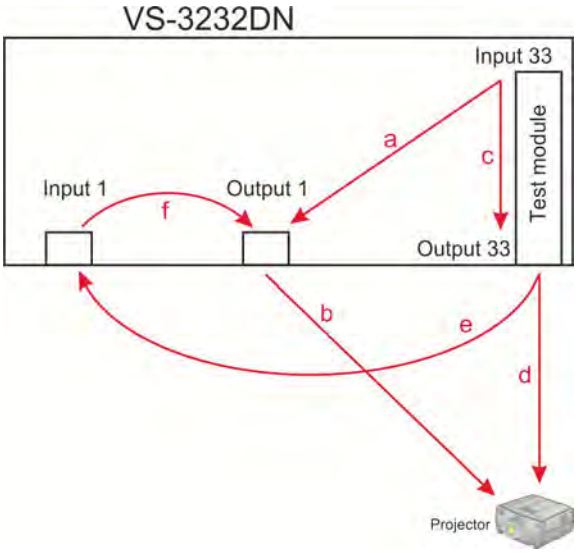


Figure 11: Signal Paths for Isolating Problems

10.4.1 Testing the Projector Output

Signal path: c to d; d to projector

To test the projector output:

1. Configure Input 33 to Output 33 (see Section 7.4).
2. Connect Output 33 to the projector.
3. Set the generated video resolution (see Section 10.2).
4. Set the pattern for the generated video (see Section 10.3).
5. Verify that the projector output is as expected.

10.4.2 Testing the Output Signal Path to the Projector

Signal path: a to b; b to projector

To test the output signal path to the projector:

1. Configure Input 33 to Output 1 (see Section 7.4).
2. Connect Output 1 to the projector.
3. Set the generated video resolution (see Section 10.2).
4. Set the pattern for the generated video (see Section 10.3).
5. Verify that the projector output is as expected.

10.4.3 Testing the Input and Output Signal Path to the Projector

Signal path: c to e; e to f; f to b; b to projector

To test the input and output signal path to the projector:

1. Configure Input 33 to Output 33 (see Section 7.4).
2. Connect Output 33 to Input 1.
3. Configure Input 1 to Output 1.

4. Connect Output 1 to the projector.

5. Set the generated video resolution (see Section 10.2).

6. Set the pattern for the generated video (see Section 10.3).

7. Verify that the projector output is as expected.

11 Hardware Installation Instructions

11.1 I/O Card Installation

The **VS-3232DN** I/O cards mount in one of the 16 slots on the rear of the **VS-3232DN** chassis. Slots are numbered from left to right and must be filled consecutively from left to right, **without leaving empty slots**.

WARNING: An input card must only be mounted in a slot designated for input cards (slots IN 1 to 16 and IN 17 to 32) and an output card must only be mounted in a slot designated for output cards (slots OUT 1 to 16 and OUT 17 to 32).

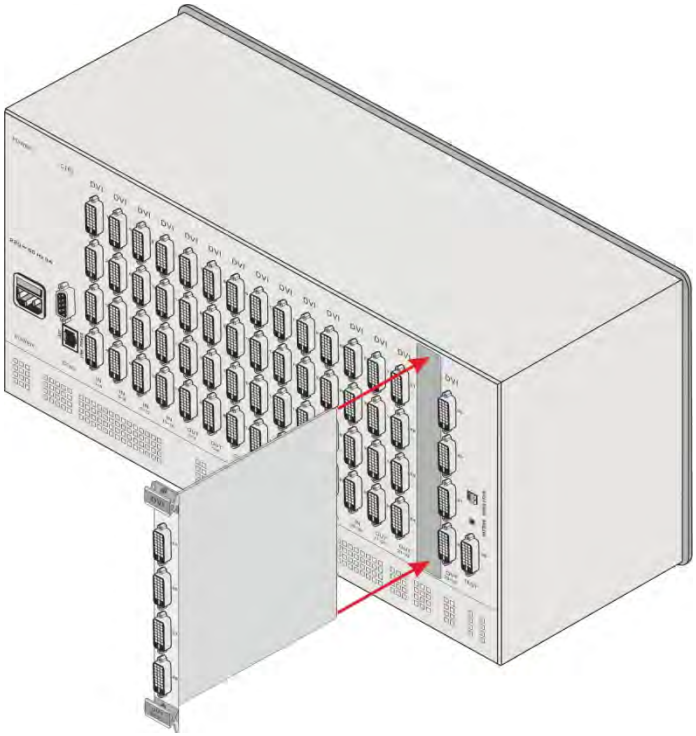


Figure 12: Inserting he Card into a Slot

To install an I/O card as shown in Figure 12:

1. Power off the **VS-3232DN** and all devices connected to it.
2. Using a Phillips screwdriver, loosen the screws at the top and bottom of the blanking plate.
3. Remove the blanking plate from the slot and store it for poss ble future use.
4. Remove the new card from its shipping box and anti-ESD bag.
5. Holding the card by the upper and lower handle, align the card with the plastic guide rails (see Figure 13).

Figure 13: Card Handles

6. Slide the card into the chassis until the front of the card makes contact with the connector inside the chassis.
7. Press the card firmly into the slot until the connector plate is flush with the rear panel of the chassis and the connector is fully seated.
8. Using a Phillips screwdriver, tighten the retaining screws at the top and bottom of the card to secure it to the chassis.

9. Power on the **VS-3232DN** and follow the procedure to configure the new card (see Section 9).

10. Power on the peripheral devices.

11.2 Power Supply Installation

The **VS-3232DN** is supplied with a single power supply. You can install a second power supply to provide redundancy.

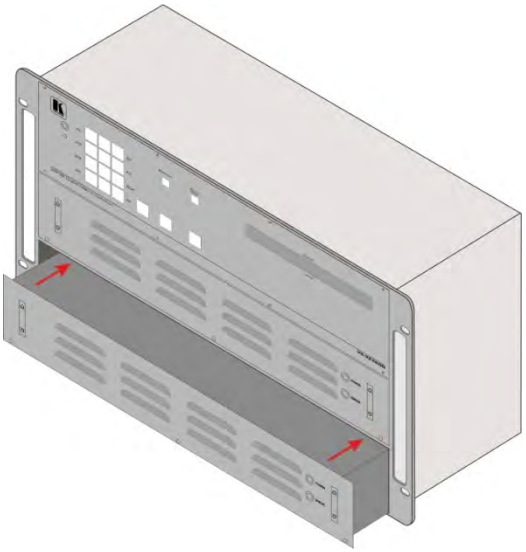


Figure 14: Second Power Supply Installation

To install a second power supply as shown in Figure 12:

1. Remove the new power supply from its shipping carton and anti-static bag.

2. Power down the chassis.

3. Remove the blank panel covering the second power supply location.

4. Align the new power supply with the rails on the bottom of the slot.

5. Slide the power supply into the slot until it makes contact with the rear connector, insuring that it remains straight.

6. Press the power supply firmly until the front panel of the power supply is flush with the front panel of the **VS-3232DN**.

7. Tighten the four thumbscrews to secure the power supply in place.

8. Power on the chassis.

12 Upgrading the VS-3232DN Firmware

Upgrading the firmware on the **VS-3232DN** can be done only by authorized service personnel.

13 Technical Specifications

BANDWIDTH:	Supports up to 3.2Gbps bandwidth per channel (limited by the cards installed)
MAX RESOLUTION:	Up to UXGA; 1080p
CONTROLS:	Front panel buttons, Infrared remote control transmitter, RS-232, Ethernet
OPERATING TEMPERATURE:	0° to +55°C (32° to 131°F)
STORAGE TEMPERATURE:	–45° to +72°C (–49° to 162°F)
HUMIDITY:	10% to 90%, RHL non-condensing
D MENSIONS:	19” x 14.2” x 6U (W, D, H) rack-mountable
POWER CONSUMPTION:	100-240V AC, 50/60Hz, 320VA
WEIGHT:	13.0kg (28.7lbs) approx
ACCESSORIES:	Power cord, Infrared remote control transmitter
OPTIONS:	PS-1DN redundant power supply
Specifications are subject to change without notice at http://www.kramerelectronics.com	

The following table lists the technical specifications of the cards that are compat ble with the **VS-3232DN** chassis.

MAX RESOLUTION: Up to UXGA; 1080p, 1920x1200							
Card	**Ports**	**Data Rate per Channel**	**Compliance**	**HDMI Support**	**3D Pass Through**	**Features**	**HDTV Compatible**
DVI	4 DVI	1.65Gbps	DVI 1.0			Kramer Equalization & re-Klocking™ Technology	Yes
DVI Dual Link	4 DVI	3.3Gbps	DVI 1.0				
HDCP	4 HDCP	2.25Gbps	HDCP/HDMI	V.1.4 with Deep Color, x.v.Color™	Yes		
HDMI	4 HDMI	2.25Gbps					
DVI (4LC Fiber Optic)	4 4 LC	1.65Gbps	DVI 1.0				
DVI (SC Fiber Optic)	4 SC	2.25Gbps	DVI 1.0				
DGKat plus RS-232	4 RJ-45 TP, 4 3-pin terminal blocks	Video: 1.65Gbps Serial Data: 19200	DVI 1.0				

For the DVI 4LC, multi-mode glass f ber cables with LC connections must be used, such as the Kramer **C-4LC/4LC**.

For the DVI SC, Multi-mode glass fiber cables with SC connections must be used, such as the Kramer **C-SC/SC/OM3**.

For DGKat plus RS-232, shielded TP pair cables with RJ-45 connections must be used, such as the Kramer **BC-DGKat623** or **BC-DGKat7a23**.

14 Default Communication Parameters

The following table lists the default communication parameters for the **VS-3232DN**.

EDID	
EDID data is passed between Output 1 and Input 1	
RS-232	
Protocol 2000	
Baud Rate	9600
Data Bits	8
Stop Bits	1
Parity	None
Command Format	HEX
Example (To switch Output 1 to Input 1)	0x01, 0x81, 0x81, 0x81
Ethernet	
IP Address	192.168.1.39
TCP Port	5000
UDP Port	50000

15 Factory Default EDID

15.1 DVI Input Card

```
Monitor
  Model name..... VS-32DVI
  Manufacturer..... KRM
  Plug and Play  D..... KRM0200
  Serial number..... 1
  Manufacture date..... 2006, ISO week 12
  Filter driver..... None
  ------------------------
  EDID revision..... 1.3
  Input signal type..... Digital (DVI)
  Color bit depth..... Undefined
  Display type..... RGB color
  Screen size..... 700 x 390 mm (31 5 in)
  Power management..... Not supported
  Extension blocs..... None
  ------------------------
  DDC/CI..... n/a

Color characteristics
  Default color space..... Non-sRGB
  Display gamma..... 2.20
  Red chromaticity..... Rx 0 640 - Ry 0.341
  Green chromaticity..... Gx 0.286 - Gy 0.610
  Blue chromaticity..... Bx 0.146 - By 0 069
  White point (default).... Wx 0 284 - Wy 0.293
  Additional descriptors... None

Timing characteristics
  Horizontal scan range.... 31-94kHz
  Vertical scan range..... 50-85Hz
  Video bandwidth..... 170MHz
  CVT standard..... Not supported
  GTF standard..... Not supported
  Additional descriptors... None
  Preferred timing..... Yes
  Native/preferred timing.. 1024x768p at 60Hz (4:3)
    Modeline..... "1024x768" 65.000 1024 1048 1184 1344 768 771 777 806 +hsync +vsync

  Detailed timing #1..... 1920x1200p at 60Hz (16:10)
    Modeline..... "1920x1200" 154.000 1920 1968 2000 2080 1200 1203 1209 1235 +hsync -vsync

Standard timings supported
    720 x  400p at  70Hz -  BM VGA
    720 x  400p at  88Hz -  BM XGA2
    640 x  480p at  60Hz -  BM VGA
    640 x  480p at  67Hz - Apple Mac II
    640 x  480p at  72Hz - VESA
    640 x  480p at  75Hz - VESA
    800 x  600p at  56Hz - VESA
    800 x  600p at  60Hz - VESA
    800 x  600p at  72Hz - VESA
    800 x  600p at  75Hz - VESA
    832 x  624p at  75Hz - Apple Mac II
   1024 x  768i at  87Hz - IBM
   1024 x  768p at  60Hz - VESA
   1024 x  768p at  70Hz - VESA
   1024 x  768p at  75Hz - VESA
   1280 x 1024p at  75Hz - VESA
   1152 x  870p at  75Hz - Apple Mac II
   1360 x  765p at  60Hz - VESA STD
   1280 x  800p at  60Hz - VESA STD
   1440 x  900p at  60Hz - VESA STD
   1280 x  960p at  60Hz - VESA STD
   1280 x 1024p at  60Hz - VESA STD
   1400 x 1050p at  60Hz - VESA STD
```

1680 x 1050p at 60Hz - VESA STD
1600 x 1200p at 60Hz - VESA STD

Raw data
00,FF,FF,FF,FF,FF,FF,00,2E,4D,00,02,01,00,00,00,0C,10,01,03,81,46,27,78,0A,D5,7C,A3,57,49,9C,25,
11,48,4B,FF,FF,80,8B,C0,81,00,95,00,81,40,81,80,90,40,B3,00,A9,40,64,19,00,40,41,00,26,30,18,88,
36,00,6F,13,11,00,00,1E,28,3C,80,A0,70,B0,23,40,30,20,36,00,06,44,21,00,00,1A,00,00,00,FC,00,56,
53,2D,33,32,44,56,49,0A,20,20,20,20,00,00,00,FD,00,32,55,1F,5E,11,00,0A,20,20,20,20,20,20,00,85

15.2 DVI (HDCP) Input Card

Monitor
Model name..... VS-32HDCP
Manufacturer..... KRM
Plug and Play D..... KRM0200
Serial number..... 1
Manufacture date..... 2006, ISO week 12
Filter driver..... None

EDID revision..... 1.3
Input signal type..... Digital (DVI)
Color bit depth..... Undefined
Display type..... RGB color
Screen size..... 700 x 390 mm (31 5 in)
Power management..... Not supported
Extension blocs..... 1 (CEA-EXT)

DDC/CI..... n/a

Color characteristics
Default color space..... Non-sRGB
Display gamma..... 2.20
Red chromaticity..... Rx 0 640 - Ry 0.341
Green chromaticity..... Gx 0.286 - Gy 0.610
Blue chromaticity..... Bx 0.146 - By 0 069
White point (default).... Wx 0 284 - Wy 0.293
Additional descriptors... None

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

Standard timings supported
720 x 400p at 70Hz - BM VGA
720 x 400p at 88Hz - BM XGA2
640 x 480p at 60Hz - BM VGA
640 x 480p at 67Hz - Apple Mac II
640 x 480p at 72Hz - VESA
640 x 480p at 75Hz - VESA
800 x 600p at 56Hz - VESA
800 x 600p at 60Hz - VESA
800 x 600p at 72Hz - VESA
800 x 600p at 75Hz - VESA
832 x 624p at 75Hz - Apple Mac II
1024 x 768i at 87Hz - IBM
1024 x 768p at 60Hz - VESA
1024 x 768p at 70Hz - VESA
1024 x 768p at 75Hz - VESA
1280 x 1024p at 75Hz - VESA
1152 x 870p at 75Hz - Apple Mac II
1280 x 720p at 60Hz - VESA STD
1280 x 800p at 60Hz - VESA STD

1440 x 900p at 60Hz - VESA STD
1280 x 960p at 60Hz - VESA STD
1280 x 1024p at 60Hz - VESA STD
1400 x 1050p at 60Hz - VESA STD
1680 x 1050p at 60Hz - VESA STD
1600 x 1200p at 60Hz - VESA STD

EIA/CEA-861 Information
Revision number..... 3
IT underscan..... Not supported
Basic audio..... Supported
YCbCr 4:4:4..... Supported
YCbCr 4:2:2..... Supported
Native formats..... 1
Detailed timing #1..... 720x480p at 60Hz (4:3)
Modeline..... "720x480" 27.000 720 736 798 858 480 489 495 525 -hsync -vsync
Detailed timing #2..... 1920x1080i at 60Hz (16:9)
Modeline..... "1920x1080" 74 250 1920 2008 2052 2200 1080 1084 1094 1124 interlace +hsync +vsync
Detailed timing #3..... 1920x1080i at 50Hz (16:9)
Modeline..... "1920x1080" 74 250 1920 2448 2492 2640 1080 1084 1094 1124 interlace +hsync +vsync
Detailed timing #4..... 1280x720p at 60Hz (16 9)
Modeline..... "1280x720" 74.250 1280 1390 1430 1650 720 725 730 750 +hsync +vsync
Detailed timing #5..... 1280x720p at 50Hz (16 9)
Modeline..... "1280x720" 74.250 1280 1720 1760 1980 720 725 730 750 +hsync +vsync

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

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

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

CE vendor specific data (VSDB)
IEEE registration number. 0x000C03
CEC physical address..... 1 0.0.0
Maximum TMDS clock..... 165MHz

Raw data
00,FF,FF,FF,FF,FF,FF,00,2E,4D,00,02,01,00,00,00,0C,10,01,03,81,46,27,78,0A,D5,7C,A3,57,49,9C,25,
11,48,4B,FF,FF,80,81,C0,81,00,95,00,81,40,81,80,90,40,B3,00,A9,40,01,1D,00,72,51,D0,1A,20,6E,28,
55,00,7E,88,42,00,00,1A,02,3A,80,18,71,38,2D,40,58,2C,45,00,C4,8E,21,00,00,1E,00,00,00,FC,00,56,
53,2D,33,32,48,44,43,50,0A,20,20,20,00,00,00,FD,00,32,55,1F,5E,11,00,0A,20,20,20,20,20,20,01,E3,
02,03,1A,71,47,11,13,05,14,84,10,1F,23,0A,06,04,83,05,00,00,65,03,0C,00,10,00,8C,0A,D0,8A,20,E0,
2D,10,10,3E,96,00,58,C2,21,00,00,18,01,1D,80,18,71,1C,16,20,58,2C,25,00,C4,8E,21,00,00,9E,01,1D,
80,D0,72,1C,16,20,10,2C,25,80,C4,8E,21,00,00,9E,01,1D,00,72,51,D0,1E,20,6E,28,55,00,C4,8E,21,00,
00,1E,01,1D,00,BC,52,D0,1E,20,B8,28,55,40,C4,8E,21,00,00,1E,00,00,00,00,00,00,00,00,00,00,00,90

15.3 HDMI Input Card

Monitor
Model name..... VS-32H
Manufacturer..... KRM
Plug and Play D..... KRM0200
Serial number..... 1

Manufacture date..... 2006, ISO week 12
Filter driver..... None

EDID revision..... 1.3
Input signal type..... Digital (DVI)
Color bit depth..... Undefined
Display type..... RGB color
Screen size..... 700 x 390 mm (31 5 in)
Power management..... Not supported
Extension blocs..... 1 (CEA-EXT)

DDC/CI..... n/a

Color characteristics
Default color space..... Non-sRGB
Display gamma..... 2.20
Red chromaticity..... Rx 0 640 - Ry 0.341
Green chromaticity..... Gx 0.286 - Gy 0.610
Blue chromaticity..... Bx 0.146 - By 0 069
White point (default).... Wx 0 284 - Wy 0.293
Additional descriptors... None

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

Standard timings supported
720 x 400p at 70Hz - BM VGA
720 x 400p at 88Hz - BM XGA2
640 x 480p at 60Hz - BM VGA
640 x 480p at 67Hz - Apple Mac II
640 x 480p at 72Hz - VESA
640 x 480p at 75Hz - VESA
800 x 600p at 56Hz - VESA
800 x 600p at 60Hz - VESA
800 x 600p at 72Hz - VESA
800 x 600p at 75Hz - VESA
832 x 624p at 75Hz - Apple Mac II
1024 x 768i at 87Hz - IBM
1024 x 768p at 60Hz - VESA
1024 x 768p at 70Hz - VESA
1024 x 768p at 75Hz - VESA
1280 x 1024p at 75Hz - VESA
1152 x 870p at 75Hz - Apple Mac II
1280 x 720p at 60Hz - VESA STD
1280 x 800p at 60Hz - VESA STD
1440 x 900p at 60Hz - VESA STD
1280 x 960p at 60Hz - VESA STD
1280 x 1024p at 60Hz - VESA STD
1400 x 1050p at 60Hz - VESA STD
1680 x 1050p at 60Hz - VESA STD
1600 x 1200p at 60Hz - VESA STD

EIA/CEA-861 Information
Revision number..... 3
IT underscan..... Not supported
Basic audio..... Supported
YCbCr 4:4:4..... Supported
YCbCr 4:2:2..... Supported
Native formats..... 1
Detailed timing #1..... 720x480p at 60Hz (4:3)
Modeline..... "720x480" 27.000 720 736 798 858 480 489 495 525 -hsync -vsync
Detailed timing #2..... 1920x1080i at 60Hz (16:9)

Modeline..... "1920x1080" 74 250 1920 2008 2052 2200 1080 1084 1094 1124 interlace +hsync +vsync
Detailed timing #3..... 1920x1080i at 50Hz (16:9)
Modeline..... "1920x1080" 74 250 1920 2448 2492 2640 1080 1084 1094 1124 interlace +hsync +vsync
Detailed timing #4..... 1280x720p at 60Hz (16 9)
Modeline..... "1280x720" 74.250 1280 1390 1430 1650 720 725 730 750 +hsync +vsync
Detailed timing #5..... 1280x720p at 50Hz (16 9)
Modeline..... "1280x720" 74.250 1280 1720 1760 1980 720 725 730 750 +hsync +vsync

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

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

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

CE vendor specific data (VSDB)
IEEE registration number. 0x000C03
CEC physical address..... 1 0.0.0
Maximum TMDS clock..... 165MHz

Raw data
00,FF,FF,FF,FF,FF,00,2E,4D,00,02,01,00,00,00,0C,10,01,03,81,46,27,78,0A,D5,7C,A3,57,49,9C,25,
11,48,4B,FF,FF,80,81,C0,81,00,95,00,81,40,81,80,90,40,B3,00,A9,40,01,1D,00,72,51,D0,1A,20,6E,28,
55,00,7E,88,42,00,00,1A,02,3A,80,18,71,38,2D,40,58,2C,45,00,C4,8E,21,00,00,1E,00,00,00,FC,00,56,
53,2D,33,32,48,0A,20,20,20,20,20,20,00,00,00,FD,00,32,55,1F,5E,11,00,0A,20,20,20,20,20,20,01,5A,
02,03,1A,71,47,11,13,05,14,84,10,1F,23,0A,06,04,83,05,00,00,65,03,0C,00,10,00,8C,0A,D0,8A,20,E0,
2D,10,10,3E,96,00,58,C2,21,00,00,18,01,1D,80,18,71,1C,16,20,58,2C,25,00,C4,8E,21,00,00,9E,01,1D,
80,D0,72,1C,16,20,10,2C,25,80,C4,8E,21,00,00,9E,01,1D,00,72,51,D0,1E,20,6E,28,55,00,C4,8E,21,00,
00,1E,01,1D,00,BC,52,D0,1E,20,B8,28,55,40,C4,8E,21,00,00,1E,00,00,00,00,00,00,00,00,00,00,00,90

15.4 DVI Dual Link Input Card

Monitor
Model name..... VS-32DUAL
Manufacturer..... KRM
Plug and Play D..... KRM0200
Serial number..... 1
Manufacture date..... 2006, ISO week 12
Filter driver..... None

EDID revision..... 1.3
Input signal type..... Digital (DVI)
Color bit depth..... Undefined
Display type..... RGB color
Screen size..... 700 x 390 mm (31 5 in)
Power management..... Not supported
Extension blocs..... None

DDC/CI..... n/a

Color characteristics
Default color space..... Non-sRGB
Display gamma..... 2.20
Red chromaticity..... Rx 0 640 - Ry 0.341

Green chromaticity..... Gx 0.286 - Gy 0.610
Blue chromaticity..... Bx 0.146 - By 0 069
White point (default).... Wx 0 284 - Wy 0.293
Additional descriptors... None

Timing characteristics
Horizontal scan range.... 31-94kHz
Vertical scan range..... 50-85Hz
Video bandwidth..... 170MHz
CVT standard..... Not supported
GTF standard..... Not supported
Additional descriptors... None
Preferred timing..... Yes
Native/preferred timing.. 1024x768p at 60Hz (4:3)
Modeline..... "1024x768" 65.000 1024 1048 1184 1344 768 771 777 806 +hsync +vsync
Detailed timing #1..... 1920x1200p at 60Hz (16:10)
Modeline..... "1920x1200" 154.000 1920 1968 2000 2080 1200 1203 1209 1235 +hsync -vsync

Standard timings supported
720 x 400p at 70Hz - BM VGA
720 x 400p at 88Hz - BM XGA2
640 x 480p at 60Hz - BM VGA
640 x 480p at 67Hz - Apple Mac II
640 x 480p at 72Hz - VESA
640 x 480p at 75Hz - VESA
800 x 600p at 56Hz - VESA
800 x 600p at 60Hz - VESA
800 x 600p at 72Hz - VESA
800 x 600p at 75Hz - VESA
832 x 624p at 75Hz - Apple Mac II
1024 x 768i at 87Hz - IBM
1024 x 768p at 60Hz - VESA
1024 x 768p at 70Hz - VESA
1024 x 768p at 75Hz - VESA
1280 x 1024p at 75Hz - VESA
1152 x 870p at 75Hz - Apple Mac II
1360 x 765p at 60Hz - VESA STD
1280 x 800p at 60Hz - VESA STD
1440 x 900p at 60Hz - VESA STD
1280 x 960p at 60Hz - VESA STD
1280 x 1024p at 60Hz - VESA STD
1400 x 1050p at 60Hz - VESA STD
1680 x 1050p at 60Hz - VESA STD
1600 x 1200p at 60Hz - VESA STD

EIA/CEA-861 Information
Revision number..... 3
IT underscan..... Not supported
Basic audio..... Supported
YCbCr 4:4:4..... Supported
YCbCr 4:2:2..... Supported
Native formats..... 1
Detailed timing #1..... 720x480p at 60Hz (4:3)
Modeline..... "720x480" 27.000 720 736 798 858 480 489 495 525 -hsync -vsync
Detailed timing #2..... 1920x1080i at 60Hz (16:9)
Modeline..... "1920x1080" 74 250 1920 2008 2052 2200 1080 1084 1094 1124 interlace +hsync +vsync
Detailed timing #3..... 1920x1080i at 50Hz (16:9)
Modeline..... "1920x1080" 74 250 1920 2448 2492 2640 1080 1084 1094 1124 interlace +hsync +vsync
Detailed timing #4..... 1280x720p at 60Hz (16 9)
Modeline..... "1280x720" 74.250 1280 1390 1430 1650 720 725 730 750 +hsync +vsync
Detailed timing #5..... 1280x720p at 50Hz (16 9)
Modeline..... "1280x720" 74.250 1280 1720 1760 1980 720 725 730 750 +hsync +vsync

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

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

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

CE vendor specific data (VSDB)
IEEE registration number. 0x000C03
CEC physical address..... 1 0.0.0
Maximum TMDS clock..... 165MHz

Raw data
00,FF,FF,FF,FF,FF,FF,00,2E,4D,00,02,01,00,00,00,0C,10,01,03,81,46,27,78,0A,D5,7C,A3,57,49,9C,25,
11,48,4B,FF,FF,80,8B,C0,81,00,95,00,81,40,81,80,90,40,B3,00,A9,40,64,19,00,40,41,00,26,30,18,88,
36,00,6F,13,11,00,00,1E,28,3C,80,A0,70,B0,23,40,30,20,36,00,06,44,21,00,00,1A,00,00,00,FC,00,56,
53,2D,33,32,44,55,41,4C,0A,20,20,20,00,00,00,FD,00,32,55,1F,5E,11,00,0A,20,20,20,20,20,20,00,62,
02,03,1A,71,47,11,13,05,14,84,10,1F,23,0A,06,04,83,05,00,00,65,03,0C,00,10,00,8C,0A,D0,8A,20,E0,
2D,10,10,3E,96,00,58,C2,21,00,00,18,01,1D,80,18,71,1C,16,20,58,2C,25,00,C4,8E,21,00,00,9E,01,1D,
80,D0,72,1C,16,20,10,2C,25,80,C4,8E,21,00,00,9E,01,1D,00,72,51,D0,1E,20,6E,28,55,00,C4,8E,21,00,
00,1E,01,1D,00,BC,52,D0,1E,20,B8,28,55,40,C4,8E,21,00,00,1E,00,00,00,00,00,00,00,00,00,00,00,90

15.5 DGKat Input Card

Monitor
Model name..... VS-32hCat5e
Manufacturer..... KRM
Plug and Play D..... KRM0200
Serial number..... 1
Manufacture date..... 2006, ISO week 12
Filter driver..... None

EDID revision..... 1.3
Input signal type..... Digital (DVI)
Color bit depth..... Undefined
Display type..... RGB color
Screen size..... 700 x 390 mm (31 5 in)
Power management..... Not supported
Extension blocs..... 1 (CEA-EXT)

DDC/CI..... n/a

Color characteristics
Default color space..... Non-sRGB
Display gamma..... 2.20
Red chromaticity..... Rx 0 640 - Ry 0.341
Green chromaticity..... Gx 0.286 - Gy 0.610
Blue chromaticity..... Bx 0.146 - By 0 069
White point (default).... Wx 0 284 - Wy 0.293
Additional descriptors... None

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

Standard timings supported
720 x 400p at 70Hz - BM VGA
720 x 400p at 88Hz - BM XGA2
640 x 480p at 60Hz - BM VGA
640 x 480p at 67Hz - Apple Mac II
640 x 480p at 72Hz - VESA
640 x 480p at 75Hz - VESA
800 x 600p at 56Hz - VESA
800 x 600p at 60Hz - VESA
800 x 600p at 72Hz - VESA
800 x 600p at 75Hz - VESA
832 x 624p at 75Hz - Apple Mac II
1024 x 768i at 87Hz - IBM
1024 x 768p at 60Hz - VESA
1024 x 768p at 70Hz - VESA
1024 x 768p at 75Hz - VESA
1280 x 1024p at 75Hz - VESA
1152 x 870p at 75Hz - Apple Mac II
1280 x 720p at 60Hz - VESA STD
1280 x 800p at 60Hz - VESA STD
1440 x 900p at 60Hz - VESA STD
1280 x 960p at 60Hz - VESA STD
1280 x 1024p at 60Hz - VESA STD
1400 x 1050p at 60Hz - VESA STD
1680 x 1050p at 60Hz - VESA STD
1600 x 1200p at 60Hz - VESA STD

EIA/CEA-861 Information
Revision number..... 3
IT underscan..... Not supported
Basic audio..... Supported
YCbCr 4:4:4..... Supported
YCbCr 4:2:2..... Supported
Native formats..... 1
Detailed timing #1..... 720x480p at 60Hz (4:3)
Modeline..... "720x480" 27.000 720 736 798 858 480 489 495 525 -hsync -vsync
Detailed timing #2..... 1920x1080i at 60Hz (16:9)
Modeline..... "1920x1080" 74 250 1920 2008 2052 2200 1080 1084 1094 1124 interlace +hsync +vsync
Detailed timing #3..... 1920x1080i at 50Hz (16:9)
Modeline..... "1920x1080" 74 250 1920 2448 2492 2640 1080 1084 1094 1124 interlace +hsync +vsync
Detailed timing #4..... 1280x720p at 60Hz (16 9)
Modeline..... "1280x720" 74.250 1280 1390 1430 1650 720 725 730 750 +hsync +vsync
Detailed timing #5..... 1280x720p at 50Hz (16 9)
Modeline..... "1280x720" 74.250 1280 1720 1760 1980 720 725 730 750 +hsync +vsync

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

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

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

CE vendor specific data (VSDB)
IEEE registration number. 0x000C03
CEC physical address..... 1 0.0.0

Maximum TMDS clock..... 165MHz

Raw data
00,FF,FF,FF,FF,FF,FF,00,2E,4D,00,02,01,00,00,00,0C,10,01,03,81,46,27,78,0A,D5,7C,A3,57,49,9C,25,
11,48,4B,FF,FF,80,81,C0,81,00,95,00,81,40,81,80,90,40,B3,00,A9,40,01,1D,00,72,51,D0,1A,20,6E,28,
55,00,7E,88,42,00,00,1A,02,3A,80,18,71,38,2D,40,58,2C,45,00,C4,8E,21,00,00,1E,00,00,00,FC,00,56,
53,2D,33,32,68,43,61,74,35,65,0A,20,00,00,00,FD,00,32,55,1F,5E,11,00,0A,20,20,20,20,20,20,01,28,
02,03,1A,71,47,11,13,05,14,84,10,1F,23,0A,06,04,83,05,00,00,65,03,0C,00,10,00,8C,0A,D0,8A,20,E0,
2D,10,10,3E,96,00,58,C2,21,00,00,18,01,1D,80,18,71,1C,16,20,58,2C,25,00,C4,8E,21,00,00,9E,01,1D,
80,D0,72,1C,16,20,10,2C,25,80,C4,8E,21,00,00,9E,01,1D,00,72,51,D0,1E,20,6E,28,55,00,C4,8E,21,00,
00,1E,01,1D,00,BC,52,D0,1E,20,B8,28,55,40,C4,8E,21,00,00,1E,00,00,00,00,00,00,00,00,00,00,00,90

15.6 Fiber Optic F670 Input Card

Monitor
Model name..... VS-32hOmron
Manufacturer..... KRM
Plug and Play ID..... KRM0200
Serial number..... 1
Manufacture date..... 2006, ISO week 12
Filter driver..... None

EDID revision..... 1.3
Input signal type..... Digital (DVI)
Color bit depth..... Undefined
Display type..... RGB color
Screen size..... 700 x 390 mm (31 5 in)
Power management..... Not supported
Extension blocs..... 1 (CEA-EXT)

DDC/CI..... n/a

Color characteristics
Default color space..... Non-sRGB
Display gamma..... 2.20
Red chromaticity..... Rx 0 640 - Ry 0.341
Green chromaticity..... Gx 0.286 - Gy 0.610
Blue chromaticity..... Bx 0.146 - By 0 069
White point (default).... Wx 0 284 - Wy 0.293
Additional descriptors... None

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

Standard timings supported
720 x 400p at 70Hz - BM VGA
720 x 400p at 88Hz - BM XGA2
640 x 480p at 60Hz - BM VGA
640 x 480p at 67Hz - Apple Mac II
640 x 480p at 72Hz - VESA
640 x 480p at 75Hz - VESA
800 x 600p at 56Hz - VESA
800 x 600p at 60Hz - VESA
800 x 600p at 72Hz - VESA
800 x 600p at 75Hz - VESA
832 x 624p at 75Hz - Apple Mac II
1024 x 768i at 87Hz - IBM
1024 x 768p at 60Hz - VESA
1024 x 768p at 70Hz - VESA
1024 x 768p at 75Hz - VESA
1280 x 1024p at 75Hz - VESA

1152 x 870p at 75Hz - Apple Mac II
1280 x 720p at 60Hz - VESA STD
1280 x 800p at 60Hz - VESA STD
1440 x 900p at 60Hz - VESA STD
1280 x 960p at 60Hz - VESA STD
1280 x 1024p at 60Hz - VESA STD
1400 x 1050p at 60Hz - VESA STD
1680 x 1050p at 60Hz - VESA STD
1600 x 1200p at 60Hz - VESA STD

EIA/CEA-861 Information
Revision number..... 3
IT underscan..... Not supported
Basic audio..... Supported
YCbCr 4:4:4..... Supported
YCbCr 4:2:2..... Supported
Native formats..... 1
Detailed timing #1..... 720x480p at 60Hz (4:3)
Modeline..... "720x480" 27.000 720 736 798 858 480 489 495 525 -hsync -vsync
Detailed timing #2..... 1920x1080i at 60Hz (16:9)
Modeline..... "1920x1080" 74 250 1920 2008 2052 2200 1080 1084 1094 1124 interlace +hsync +vsync
Detailed timing #3..... 1920x1080i at 50Hz (16:9)
Modeline..... "1920x1080" 74 250 1920 2448 2492 2640 1080 1084 1094 1124 interlace +hsync +vsync
Detailed timing #4..... 1280x720p at 60Hz (16 9)
Modeline..... "1280x720" 74.250 1280 1390 1430 1650 720 725 730 750 +hsync +vsync
Detailed timing #5..... 1280x720p at 50Hz (16 9)
Modeline..... "1280x720" 74.250 1280 1720 1760 1980 720 725 730 750 +hsync +vsync

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

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

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

CE vendor specific data (VSDB)
IEEE registration number. 0x000C03
CEC physical address..... 1 0.0.0
Maximum TMDS clock..... 165MHz

Raw data
00,FF,FF,FF,FF,FF,FF,00,2E,4D,00,02,01,00,00,00,0C,10,01,03,81,46,27,78,0A,D5,7C,A3,57,49,9C,25,
11,48,4B,FF,FF,80,81,C0,81,00,95,00,81,40,81,80,90,40,B3,00,A9,40,01,1D,00,72,51,D0,1A,20,6E,28,
55,00,7E,88,42,00,00,1A,02,3A,80,18,71,38,2D,40,58,2C,45,00,C4,8E,21,00,00,1E,00,00,00,FC,00,56,
53,2D,33,32,68,4F,6D,72,6F,6E,0A,20,00,00,00,FD,00,32,55,1F,5E,11,00,0A,20,20,20,20,20,20,01,CF,
02,03,1A,71,47,11,13,05,14,84,10,1F,23,0A,06,04,83,05,00,00,65,03,0C,00,10,00,8C,0A,D0,8A,20,E0,
2D,10,10,3E,96,00,58,C2,21,00,00,18,01,1D,80,18,71,1C,16,20,58,2C,25,00,C4,8E,21,00,00,9E,01,1D,
80,D0,72,1C,16,20,10,2C,25,80,C4,8E,21,00,00,9E,01,1D,00,72,51,D0,1E,20,6E,28,55,00,C4,8E,21,00,
00,1E,01,1D,00,BC,52,D0,1E,20,B8,28,55,40,C4,8E,21,00,00,1E,00,00,00,00,00,00,00,00,00,00,00,90

16 Communication Protocols

16.1 Protocol 3000

The **VS-3232DN** can be operated using serial commands from a PC, remote controller or touch screen using the Kramer Protocol 3000.

This section describes the:

- Kramer Protocol 3000 syntax (see Section 16.1.1)
- Kramer Protocol 3000 commands (see Section 16.1.8)

16.1.1 Kramer Protocol 3000 Syntax

16.1.1.1 Host Message Format

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

16.1.1.2 Simple Command

Command string with only one command without addressing:

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

16.1.1.3 Command String

Formal syntax with commands concatenation and addressing:

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

16.1.2 Device Message Format

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

16.1.2.1 Device Long Response

Echoing command:

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

CR = Carriage return (ASCII 13 = 0x0D)

LF = Line feed (ASCII 10 = 0x0A)
SP = Space (ASCII 32 = 0x20)

16.1.3 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 ID (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.

16.1.4 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 l ke Crestron, some characters require special coding (such as, /X##). Refer to the controller manual.

16.1.5 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.

16.1.6 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.

16.1.7 Maximum String Length

64 characters

16.1.8 Table of Protocol 3000 Commands

Command	Short Form	Description	Permission
#		Protocol handshaking	End User
BUILD-DATE?		Read device build date	End User
CPEDID		Copy EDID data from he output to he input EEPROM	Common
DISPLAY		Valid / Invalid output	Switch
DISPLAY?		Read if output is valid	Switch
FACTORY		Reset to factory default configuration	Common
FCT-MODEL		Set model name	Common-mandatory
FCT-SN		Set Serial Number	Common-mandatory
GEDID		Read EDID data	Common
GEDID-EXT		Read EDID data from external device connected to output	Common
HELP		List of commands	Common-mandatory
IDV		Visual identify device	Common
INFO-IO?		Read in/out count	Switch
INFO-PRST?		Read max preset count	Switch
LDEDID		Load EDID data	Common
LDFW		Load new firmware	Common
LOCK-FP	LCK	Lock front panel	Common
LOCK-FP?	LCK?	GET Lock front panel	Common
MODEL?		Read device model	End User
P2000		Switch to protocol 2000	Common
PROT-VER?		Read device protocol version	Common
PRST-LST?	PLST?	Read saved presets list	Switch
PRST-RCL	PRCL	Recall saved preset	Switch
PRST-STO	PSTO	Store current connections to preset	Switch
PRST-VID?	PVID?	Read video connections from saved preset	Switch
RESET		Reset device	Administrator
SIGNAL		Valid / Invalid input	Switch
SIGNAL?		Read if input is valid	Switch
SN?		Read device serial number	End User
VERSION?		Read device firmware version	End User
VID	V	Switch Video only	Switch
VID?	V?	Get Video switch state	Switch

Note: Not every command listed by the Help command is relevant to every matrix configuration.

16.2 Protocol 2000

Tables of HEX Codes for Serial Communication (Protocol 2000)

The following table lists the Protocol 2000 hex codes for switching inputs 1 to 32 to outputs 1 to 16.

Full details are available on our Web site at http://www.kramerelectronics.com

Hex Table (IN 1-32 to OUT 1-16)

	OUT 1	OUT 2	OUT 3	OUT 4	OUT 5	OUT 6	OUT 7	OUT 8	OUT 9	OUT 10	OUT 11	OUT 12	OUT 13	OUT 14	OUT 15	OUT 16
IN 1	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 2	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82
	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 3	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83
	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 4	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84
	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 5	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85
	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 6	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86
	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 7	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87
	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 8	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88
	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 9	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89
	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 10	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	8A	8A	8A	8A	8A	8A	8A	8A	8A	8A	8A	8A	8A	8A	8A	8A
	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 11	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	8B	8B	8B	8B	8B	8B	8B	8B	8B	8B	8B	8B	8B	8B	8B	8B
	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 12	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	8C	8C	8C	8C	8C	8C	8C	8C	8C	8C	8C	8C	8C	8C	8C	8C
	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 13	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	8D	8D	8D	8D	8D	8D	8D	8D	8D	8D	8D	8D	8D	8D	8D	8D
	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81

	OUT 1	OUT 2	OUT 3	OUT 4	OUT 5	OUT 6	OUT 7	OUT 8	OUT 9	OUT 10	OUT 11	OUT 12	OUT 13	OUT 14	OUT 15	OUT 16
IN 14	01 8E 81 81	01 8E 82 81	01 8E 83 81	01 8E 84 81	01 8E 85 81	01 8E 86 81	01 8E 87 81	01 8E 88 81	01 8E 89 81	01 8E 8A 81	01 8E 8B 81	01 8E 8C 81	01 8E 8D 81	01 8E 8E 81	01 8E 8F 81	01 8E 90 81
IN 15	01 8F 81 81	01 8F 82 81	01 8F 83 81	01 8F 84 81	01 8F 85 81	01 8F 86 81	01 8F 87 81	01 8F 88 81	01 8F 89 81	01 8F 8A 81	01 8F 8B 81	01 8F 8C 81	01 8F 8D 81	01 8F 8E 81	01 8F 8F 81	01 8F 90 81
IN 16	01 90 81 81	01 90 82 81	01 90 83 81	01 90 84 81	01 90 85 81	01 90 86 81	01 90 87 81	01 90 88 81	01 90 89 81	01 90 8A 81	01 90 8B 81	01 90 8C 81	01 90 8D 81	01 90 8E 81	01 90 8F 81	01 90 90 81
IN 17	01 91 81 81	01 91 82 81	01 91 83 81	01 91 84 81	01 91 85 81	01 91 86 81	01 91 87 81	01 91 88 81	01 91 89 81	01 91 8A 81	01 91 8B 81	01 91 8C 81	01 91 8D 81	01 91 8E 81	01 91 8F 81	01 91 90 81
IN 18	01 92 81 81	01 92 82 81	01 92 83 81	01 92 84 81	01 92 85 81	01 92 86 81	01 92 87 81	01 92 88 81	01 92 89 81	01 92 8A 81	01 92 8B 81	01 92 8C 81	01 92 8D 81	01 92 8E 81	01 92 8F 81	01 92 90 81
IN 19	01 93 81 81	01 93 82 81	01 93 83 81	01 93 84 81	01 93 85 81	01 93 86 81	01 93 87 81	01 93 88 81	01 93 89 81	01 93 8A 81	01 93 8B 81	01 93 8C 81	01 93 8D 81	01 93 8E 81	01 93 8F 81	01 93 90 81
IN 20	01 94 81 81	01 94 82 81	01 94 83 81	01 94 84 81	01 94 85 81	01 94 86 81	01 94 87 81	01 94 88 81	01 94 89 81	01 94 8A 81	01 94 8B 81	01 94 8C 81	01 94 8D 81	01 94 8E 81	01 94 8F 81	01 94 90 81
IN 21	01 95 81 81	01 95 82 81	01 95 83 81	01 95 84 81	01 95 85 81	01 95 86 81	01 95 87 81	01 95 88 81	01 95 89 81	01 95 8A 81	01 95 8B 81	01 95 8C 81	01 95 8D 81	01 95 8E 81	01 95 8F 81	01 95 90 81
IN 22	01 96 81 81	01 96 82 81	01 96 83 81	01 96 84 81	01 96 85 81	01 96 86 81	01 96 87 81	01 96 88 81	01 96 89 81	01 96 8A 81	01 96 8B 81	01 96 8C 81	01 96 8D 81	01 96 8E 81	01 96 8F 81	01 96 90 81
IN 23	01 97 81 81	01 97 82 81	01 97 83 81	01 97 84 81	01 97 85 81	01 97 86 81	01 97 87 81	01 97 88 81	01 97 89 81	01 97 8A 81	01 97 8B 81	01 97 8C 81	01 97 8D 81	01 97 8E 81	01 97 8F 81	01 97 90 81
IN 24	01 98 81 81	01 98 82 81	01 98 83 81	01 98 84 81	01 98 85 81	01 98 86 81	01 98 87 81	01 98 88 81	01 98 89 81	01 98 8A 81	01 98 8B 81	01 98 8C 81	01 98 8D 81	01 98 8E 81	01 98 8F 81	01 98 90 81
IN 25	01 99 81 81	01 99 82 81	01 99 83 81	01 99 84 81	01 99 85 81	01 99 86 81	01 99 87 81	01 99 88 81	01 99 89 81	01 99 8A 81	01 99 8B 81	01 99 8C 81	01 99 8D 81	01 99 8E 81	01 99 8F 81	01 99 90 81
IN 26	01 9A 81 81	01 9A 82 81	01 9A 83 81	01 9A 84 81	01 9A 85 81	01 9A 86 81	01 9A 87 81	01 9A 88 81	01 9A 89 81	01 9A 8A 81	01 9A 8B 81	01 9A 8C 81	01 9A 8D 81	01 9A 8E 81	01 9A 8F 81	01 9A 90 81
IN 27	01 9B 81 81	01 9B 82 81	01 9B 83 81	01 9B 84 81	01 9B 85 81	01 9B 86 81	01 9B 87 81	01 9B 88 81	01 9B 89 81	01 9B 8A 81	01 9B 8B 81	01 9B 8C 81	01 9B 8D 81	01 9B 8E 81	01 9B 8F 81	01 9B 90 81
IN 28	01 9C 81 81	01 9C 82 81	01 9C 83 81	01 9C 84 81	01 9C 85 81	01 9C 86 81	01 9C 87 81	01 9C 88 81	01 9C 89 81	01 9C 8A 81	01 9C 8B 81	01 9C 8C 81	01 9C 8D 81	01 9C 8E 81	01 9C 8F 81	01 9C 90 81
IN 29	01 9D 81 81	01 9D 82 81	01 9D 83 81	01 9D 84 81	01 9D 85 81	01 9D 86 81	01 9D 87 81	01 9D 88 81	01 9D 89 81	01 9D 8A 81	01 9D 8B 81	01 9D 8C 81	01 9D 8D 81	01 9D 8E 81	01 9D 8F 81	01 9D 90 81
IN 30	01 9E 81 81	01 9E 82 81	01 9E 83 81	01 9E 84 81	01 9E 85 81	01 9E 86 81	01 9E 87 81	01 9E 88 81	01 9E 89 81	01 9E 8A 81	01 9E 8B 81	01 9E 8C 81	01 9E 8D 81	01 9E 8E 81	01 9E 8F 81	01 9E 90 81

	OUT 1	OUT 2	OUT 3	OUT 4	OUT 5	OUT 6	OUT 7	OUT 8	OUT 9	OUT 10	OUT 11	OUT 12	OUT 13	OUT 14	OUT 15	OUT 16
IN 31	01 9F 81 81	01 9F 82 81	01 9F 83 81	01 9F 84 81	01 9F 85 81	01 9F 86 81	01 9F 87 81	01 9F 88 81	01 9F 89 81	01 9F 8A 81	01 9F 8B 81	01 9F 8C 81	01 9F 8D 81	01 9F 8E 81	01 9F 8F 81	01 9F 90 81
IN 32	01 A0 81 81	01 A0 82 81	01 A0 83 81	01 A0 84 81	01 A0 85 81	01 A0 86 81	01 A0 87 81	01 A0 88 81	01 A0 89 81	01 A0 8A 81	01 A0 8B 81	01 A0 8C 81	01 A0 8D 81	01 A0 8E 81	01 A0 8F 81	01 A0 90 81

The following table lists the hex codes for switching inputs 1 to 32 to outputs 17 to 32.

Hex Table (IN 1-32 to OUT 17-32)

	OUT 17	OUT 18	OUT 19	OUT 20	OUT 21	OUT 22	OUT 23	OUT 24	OUT 25	OUT 26	OUT 27	OUT 28	OUT 29	OUT 30	OUT 31	OUT 32
IN 1	01 81 91 81	01 81 92 81	01 81 93 81	01 81 94 81	01 81 95 81	01 81 96 81	01 81 97 81	01 81 98 81	01 81 99 81	01 81 9A 81	01 81 9B 81	01 81 9C 81	01 81 9D 81	01 81 9E 81	01 81 9F 81	01 81 A0 81
IN 2	01 82 91 81	01 82 92 81	01 82 93 81	01 82 94 81	01 82 95 81	01 82 96 81	01 82 97 81	01 82 98 81	01 82 99 81	01 82 9A 81	01 82 9B 81	01 82 9C 81	01 82 9D 81	01 82 9E 81	01 82 9F 81	01 82 A0 81
IN 3	01 83 91 81	01 83 92 81	01 83 93 81	01 83 94 81	01 83 95 81	01 83 96 81	01 83 97 81	01 83 98 81	01 83 99 81	01 83 9A 81	01 83 9B 81	01 83 9C 81	01 83 9D 81	01 83 9E 81	01 83 9F 81	01 83 A0 81
IN 4	01 84 91 81	01 84 92 81	01 84 93 81	01 84 94 81	01 84 95 81	01 84 96 81	01 84 97 81	01 84 98 81	01 84 99 81	01 84 9A 81	01 84 9B 81	01 84 9C 81	01 84 9D 81	01 84 9E 81	01 84 9F 81	01 84 A0 81
IN 5	01 85 91 81	01 85 92 81	01 85 93 81	01 85 94 81	01 85 95 81	01 85 96 81	01 85 97 81	01 85 98 81	01 85 99 81	01 85 9A 81	01 85 9B 81	01 85 9C 81	01 85 9D 81	01 85 9E 81	01 85 9F 81	01 85 A0 81
IN 6	01 86 91 81	01 86 92 81	01 86 93 81	01 86 94 81	01 86 95 81	01 86 96 81	01 86 97 81	01 86 98 81	01 86 99 81	01 86 9A 81	01 86 9B 81	01 86 9C 81	01 86 9D 81	01 86 9E 81	01 86 9F 81	01 86 A0 81
IN 7	01 87 91 81	01 87 92 81	01 87 93 81	01 87 94 81	01 87 95 81	01 87 96 81	01 87 97 81	01 87 98 81	01 87 99 81	01 87 9A 81	01 87 9B 81	01 87 9C 81	01 87 9D 81	01 87 9E 81	01 87 9F 81	01 87 A0 81
IN 8	01 88 91 81	01 88 92 81	01 88 93 81	01 88 94 81	01 88 95 81	01 88 96 81	01 88 97 81	01 88 98 81	01 88 99 81	01 88 9A 81	01 88 9B 81	01 88 9C 81	01 88 9D 81	01 88 9E 81	01 88 9F 81	01 88 A0 81
IN 9	01 89 91 81	01 89 92 81	01 89 93 81	01 89 94 81	01 89 95 81	01 89 96 81	01 89 97 81	01 89 98 81	01 89 99 81	01 89 9A 81	01 89 9B 81	01 89 9C 81	01 89 9D 81	01 89 9E 81	01 89 9F 81	01 89 A0 81
IN 10	01 8A 91 81	01 8A 92 81	01 8A 93 81	01 8A 94 81	01 8A 95 81	01 8A 96 81	01 8A 97 81	01 8A 98 81	01 8A 99 81	01 8A 9A 81	01 8A 9B 81	01 8A 9C 81	01 8A 9D 81	01 8A 9E 81	01 8A 9F 81	01 8A A0 81
IN 11	01 8B 91 81	01 8B 92 81	01 8B 93 81	01 8B 94 81	01 8B 95 81	01 8B 96 81	01 8B 97 81	01 8B 98 81	01 8B 99 81	01 8B 9A 81	01 8B 9B 81	01 8B 9C 81	01 8B 9D 81	01 8B 9E 81	01 8B 9F 81	01 8B A0 81
IN 12	01 8C 91 81	01 8C 92 81	01 8C 93 81	01 8C 94 81	01 8C 95 81	01 8C 96 81	01 8C 97 81	01 8C 98 81	01 8C 99 81	01 8C 9A 81	01 8C 9B 81	01 8C 9C 81	01 8C 9D 81	01 8C 9E 81	01 8C 9F 81	01 8C A0 81

	OUT 17	OUT 18	OUT 19	OUT 20	OUT 21	OUT 22	OUT 23	OUT 24	OUT 25	OUT 26	OUT 27	OUT 28	OUT 29	OUT 30	OUT 31	OUT 32
IN 13	01 8D 91 81	01 8D 92 81	01 8D 93 81	01 8D 94 81	01 8D 95 81	01 8D 96 81	01 8D 97 81	01 8D 98 81	01 8D 99 81	01 8D 9A 81	01 8D 9B 81	01 8D 9C 81	01 8D 9D 81	01 8D 9E 81	01 8D 9F 81	01 8D A0 81
IN 14	01 8E 91 81	01 8E 92 81	01 8E 93 81	01 8E 94 81	01 8E 95 81	01 8E 96 81	01 8E 97 81	01 8E 98 81	01 8E 99 81	01 8E 9A 81	01 8E 9B 81	01 8E 9C 81	01 8E 9D 81	01 8E 9E 81	01 8E 9F 81	01 8E A0 81
IN 15	01 8F 91 81	01 8F 92 81	01 8F 93 81	01 8F 94 81	01 8F 95 81	01 8F 96 81	01 8F 97 81	01 8F 98 81	01 8F 99 81	01 8F 9A 81	01 8F 9B 81	01 8F 9C 81	01 8F 9D 81	01 8F 9E 81	01 8F 9F 81	01 8F A0 81
IN 16	01 90 91 81	01 90 92 81	01 90 93 81	01 90 94 81	01 90 95 81	01 90 96 81	01 90 97 81	01 90 98 81	01 90 99 81	01 90 9A 81	01 90 9B 81	01 90 9C 81	01 90 9D 81	01 90 9E 81	01 90 9F 81	01 90 A0 81
IN 17	01 91 91 81	01 91 92 81	01 91 93 81	01 91 94 81	01 91 95 81	01 91 96 81	01 91 97 81	01 91 98 81	01 91 99 81	01 91 9A 81	01 91 9B 81	01 91 9C 81	01 91 9D 81	01 91 9E 81	01 91 9F 81	01 91 A0 81
IN 18	01 92 91 81	01 92 92 81	01 92 93 81	01 92 94 81	01 92 95 81	01 92 96 81	01 92 97 81	01 92 98 81	01 92 99 81	01 92 9A 81	01 92 9B 81	01 92 9C 81	01 92 9D 81	01 92 9E 81	01 92 9F 81	01 92 A0 81
IN 19	01 93 91 81	01 93 92 81	01 93 93 81	01 93 94 81	01 93 95 81	01 93 96 81	01 93 97 81	01 93 98 81	01 93 99 81	01 93 9A 81	01 93 9B 81	01 93 9C 81	01 93 9D 81	01 93 9E 81	01 93 9F 81	01 93 A0 81
IN 20	01 94 91 81	01 94 92 81	01 94 93 81	01 94 94 81	01 94 95 81	01 94 96 81	01 94 97 81	01 94 98 81	01 94 99 81	01 94 9A 81	01 94 9B 81	01 94 9C 81	01 94 9D 81	01 94 9E 81	01 94 9F 81	01 94 A0 81
IN 21	01 95 91 81	01 95 92 81	01 95 93 81	01 95 94 81	01 95 95 81	01 95 96 81	01 95 97 81	01 95 98 81	01 95 99 81	01 95 9A 81	01 95 9B 81	01 95 9C 81	01 95 9D 81	01 95 9E 81	01 95 9F 81	01 95 A0 81
IN 22	01 96 91 81	01 96 92 81	01 96 93 81	01 96 94 81	01 96 95 81	01 96 96 81	01 96 97 81	01 96 98 81	01 96 99 81	01 96 9A 81	01 96 9B 81	01 96 9C 81	01 96 9D 81	01 96 9E 81	01 96 9F 81	01 96 A0 81
IN 23	01 97 91 81	01 97 92 81	01 97 93 81	01 97 94 81	01 97 95 81	01 97 96 81	01 97 97 81	01 97 98 81	01 97 99 81	01 97 9A 81	01 97 9B 81	01 97 9C 81	01 97 9D 81	01 97 9E 81	01 97 9F 81	01 97 A0 81
IN 24	01 98 91 81	01 98 92 81	01 98 93 81	01 98 94 81	01 98 95 81	01 98 96 81	01 98 97 81	01 98 98 81	01 98 99 81	01 98 9A 81	01 98 9B 81	01 98 9C 81	01 98 9D 81	01 98 9E 81	01 98 9F 81	01 98 A0 81
IN 25	01 99 91 81	01 99 92 81	01 99 93 81	01 99 94 81	01 99 95 81	01 99 96 81	01 99 97 81	01 99 98 81	01 99 99 81	01 99 9A 81	01 99 9B 81	01 99 9C 81	01 99 9D 81	01 99 9E 81	01 99 9F 81	01 99 A0 81
IN 26	01 9A 91 81	01 9A 92 81	01 9A 93 81	01 9A 94 81	01 9A 95 81	01 9A 96 81	01 9A 97 81	01 9A 98 81	01 9A 99 81	01 9A 9A 81	01 9A 9B 81	01 9A 9C 81	01 9A 9D 81	01 9A 9E 81	01 9A 9F 81	01 9A A0 81
IN 27	01 9B 91 81	01 9B 92 81	01 9B 93 81	01 9B 94 81	01 9B 95 81	01 9B 96 81	01 9B 97 81	01 9B 98 81	01 9B 99 81	01 9B 9A 81	01 9B 9B 81	01 9B 9C 81	01 9B 9D 81	01 9B 9E 81	01 9B 9F 81	01 9B A0 81
IN 28	01 9C 91 81	01 9C 92 81	01 9C 93 81	01 9C 94 81	01 9C 95 81	01 9C 96 81	01 9C 97 81	01 9C 98 81	01 9C 99 81	01 9C 9A 81	01 9C 9B 81	01 9C 9C 81	01 9C 9D 81	01 9C 9E 81	01 9C 9F 81	01 9C A0 81
IN 29	01 9D 91 81	01 9D 92 81	01 9D 93 81	01 9D 94 81	01 9D 95 81	01 9D 96 81	01 9D 97 81	01 9D 98 81	01 9D 99 81	01 9D 9A 81	01 9D 9B 81	01 9D 9C 81	01 9D 9D 81	01 9D 9E 81	01 9D 9F 81	01 9D A0 81

	OUT 17	OUT 18	OUT 19	OUT 20	OUT 21	OUT 22	OUT 23	OUT 24	OUT 25	OUT 26	OUT 27	OUT 28	OUT 29	OUT 30	OUT 31	OUT 32
IN 30	01 9E 91 81	01 9E 92 81	01 9E 93 81	01 9E 94 81	01 9E 95 81	01 9E 96 81	01 9E 97 81	01 9E 98 81	01 9E 99 81	01 9E 9A 81	01 9E 9B 81	01 9E 9C 81	01 9E 9D 81	01 9E 9E 81	01 9E 9F 81	01 9E A0 81
IN 31	01 9F 91 81	01 9F 92 81	01 9F 93 81	01 9F 94 81	01 9F 95 81	01 9F 96 81	01 9F 97 81	01 9F 98 81	01 9F 99 81	01 9F 9A 81	01 9F 9B 81	01 9F 9C 81	01 9F 9D 81	01 9F 9E 81	01 9F 9F 81	01 9F A0 81
IN 32	01 A0 91 81	01 A0 92 81	01 A0 93 81	01 A0 94 81	01 A0 95 81	01 A0 96 81	01 A0 97 81	01 A0 98 81	01 A0 99 81	01 A0 9A 81	01 A0 9B 81	01 A0 9C 81	01 A0 9D 81	01 A0 9E 81	01 A0 9F 81	01 A0 A0 81

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 APPICABLE 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 APPICABLE 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.kramerelectronics.com
E-mail: info@kramerel.com

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

P/N 2900-300164 Rev 3