



KRAMER ELECTRONICS LTD.

USER MANUAL

MODEL:

VS-6464DN
64x64 Digital Matrix Switcher

P/N: 2900-300045 Rev 5



VS-6464DN Quick Start Guide

This guide helps you install and use your product for the first time. For more detailed information, go to http://www.kramerelectronics.com/support/product_downloads.asp to download the latest manual or scan the QR code on the left.

Step 1: Check what's in the box

- VS-6464DN 64x64 Digital Matrix Switcher 1 Power cord 1 Quick Start sheet



Save the original box and packaging materials in case you need to return your **VS-6464DN** for service.

Step 2: Install the VS-6464DN

Mount the **VS-6464DN** in a rack (using the included rack "ears").

Step 3: Install the Cards

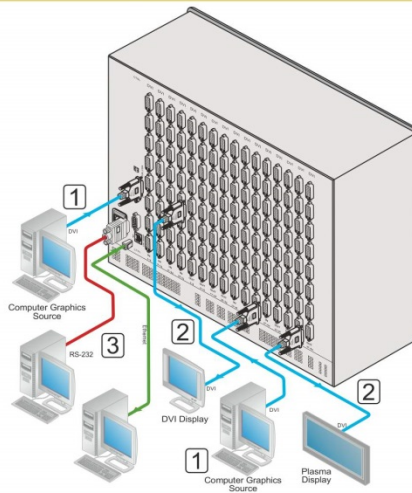
Follow the installation instructions supplied with the modules.

Step 4: Connect the inputs and outputs

Always switch off the power on each device before connecting it to your **VS-6464DN**.

- 1 Connect up to 64* inputs
- 2 Connect up to 64* outputs
- 3 Optional—Connect a PC via RS-232 and/or Ethernet for remote control

* The maximum number of ports may vary - see Section 8



Always use Kramer high-performance cables for connecting AV equipment to the **VS-6464DN**.

Step 5: Connect a controller

If required connect to a controller via RS-232 or Ethernet.

Step 6: Connect the power

Connect the power cord to the **VS-6464DN** and plug it into the mains electricity.



Step 7: Configure and operate the VS-6464DN

Use the Setup and Config menus to set the device configuration. Operate the device using the front panel buttons, IR remote control, RS-232 and Ethernet.

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1 Introduction

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

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

Congratulations on purchasing your Kramer **VS-6464DN** *64x64 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 64 DVI inputs and 64 DVI outputs as a representation only. The following cards are available and may be mixed in the same chassis:

- DVI
- DVI (HDCP)
- DVI (over 4LC fiber optic cable)

2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual



Go to www.kramerav.com/support/product_downloads.asp to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

2.1 Achieving the Best Performance

To achieve the best performance:

- Use only good quality connection cables (we recommend Kramer high-performance, high-resolution cables) to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)
- Do not secure the cables in tight bundles or roll the slack into tight coils
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality
- Position your Kramer **VS-6464DN** away from moisture, excessive sunlight and dust



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

2.2 Safety Instructions



Caution: There are no operator serviceable parts inside the unit

Warning: Use only the power cord that is supplied with the unit

Warning: Do not open the unit. High voltages can cause electrical shock! Servicing by qualified personnel only

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

2.3 Recycling Kramer Products

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

3 Overview

The Kramer **VS-6464DN** is a high performance matrix switcher chassis that supports up to 64 x 64 ports (it can also be configured for other sizes (up to a maximum of 64 x 64)) for various signals (depending on the type of cards installed). 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 card type see Technical Specifications in [Section 13](#)

The **VS-6464DN** is highly configurable—you can add or remove inputs and outputs independently in groups of eight and mix different types of input/output cards in the same chassis. For example, you can configure a device as an 8 x 24 or a 64 x 8 matrix switcher to exactly suit your needs.

The **VS-6464DN** features:

- Full 64 x 64 non-blocking matrix array to switch any of the 64 input digital signals to any or all of the 64 outputs (with limitations, see [Section 5.1](#))
- Easy access to 59 preset memory locations for quick access to user-defined setups
- The Kramer 2000 Protocol for serial control
- A 40 character by 2 line LCD that shows the operational status or the configuration menu
- A lock function to prevent tampering with the front panel
- A default EDID (Extended Display Identification Data) for each input
- I-EDIDPro™ Kramer Intelligent EDID Processing™ – Intelligent EDID handling and processing algorithm ensures plug and play operation for DVI/HDMI systems
- Non-volatile EDID storage

- 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
- Equalization and re-clocking on all card types
- Support for redundant, hot-swappable power-supplies

You can operate the **VS-6464DN** 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-6464DN** is a sophisticated device but has been designed to be as simple as possible to operate. Due to space limitations on the front panel, 128 input/output selector buttons are instead substituted by a keypad. For details of how to route inputs to outputs, see [Section 6.2](#).

The **VS-6464DN** is housed in a 19" rack-mountable enclosure.

3.1 About the Power Connect™ Feature

The Power Connect™ feature here means that the **VS-6464DN** can supply power to the TP transmitters and receivers (for example, the **TP-573** and **TP-574**) as long as 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 CAT 5 cable. For longer distances, heavier gauge cable should be used. (TP cable is still suitable for the video/audio transmission, but not for feeding the power at these distances).

3.2 Redundant, Hot-Swappable Power Supplies

The **VS-6464DN** is supplied with two power supplies accessible from the front of the device (see [Figure 1](#)) that are held in place with thumb-screws. You can install a third power supply to provide redundancy for mission critical installations. When three power supplies are installed, they operate in a redundant mode whereby the failure of any one power supply does not cause the device to stop operating.

The PS-1DN is a hot-swappable power supply. It is not necessary to power down the chassis to replace a power supply.

Note: The device must have at least two working power supplies to operate correctly.

3.3 Defining the VS-6464DN 64x64 Digital Matrix Switcher

This section defines the **VS-6464DN**.

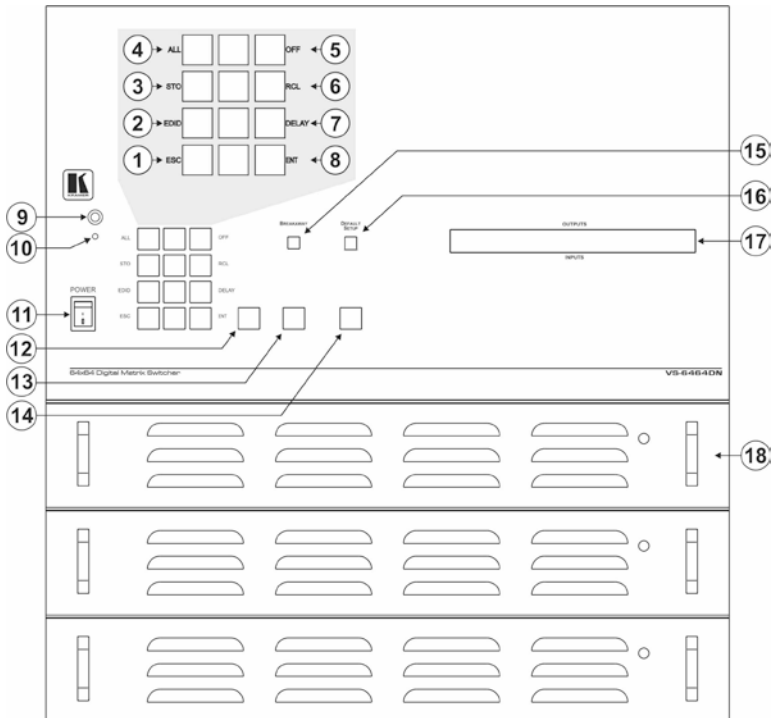


Figure 1: VS-6464DN 64x64 Digital Matrix Switcher

Note: Buttons 12, 13 and 14 function as the TAKE, MENU and LOCK buttons respectively.

#	Feature		Function	
1	Double-function Selector Buttons Area	Menu Button Functions	<i>ESC</i>	Press to exit the current operation
2			<i>EDID</i>	Press to assign EDID channels
3			<i>STO</i>	Press to store the current setup in the preset
4			<i>ALL</i>	Press to connect an input to all outputs
5			<i>OFF</i>	Press to turn off an output
6			<i>RCL</i>	Press to recall a preset
7			<i>DELAY</i>	Press to set the delay between confirming an action and execution of the action
8			<i>ENT</i>	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	IR Receiver		Infrared remote control sensor	
10	IR LED		Lights yellow when receiving commands from the IR remote control transmitter	
11	<i>POWER</i> Switch		Switch to turn the device on and off	
12	<i>TAKE</i> Button		Press to confirm actions (see Section 6.3.2)	
13	<i>MENU</i> Button		Press once to enable the ALL, OFF STO and RCL buttons (see Section 7). Press again to enter the configuration menu (see Section 7.2). When in a Menu, press to cycle through the menu items	
14	<i>LOCK</i> Button		Press and hold for approximately 2 sec to lock/unlock the front panel buttons (see Section 6.5)	
15	<i>BREAKAWAY</i> Button		Press to exit a Menu (see Section 7)	
16	<i>DEFAULT SETUP</i> Button		Press to recall the default setup (see Section 6.4.5)	
17	<i>OUTPUTS/INPUTS</i> LCD Display		Displays the outputs (upper row) switched to the selected inputs (lower row), (see Section 6.1). Displays user interface messages and menus	
18	Power Supplies		Supplies power to the device (see Section 11).	

Note: After pressing the MENU button, the STO, ALL, OFF and RCL buttons light and are enabled.



Figure 2: VS-6464DN Front Panel Numeric Keypad

#	Feature	Function
19	◀ (Backward)	Press to shift the sliding window to the right
20	1, 2, 3, 4, 5, 6, 7, 8, 9, 0	Numeric keypad, 1 to 0
21	▶ (Forward)	Press to shift the sliding window to the left Since the LCD display is large enough to show only 13 cross-points out of a total of 64

[Figure 3](#) defines the rear panel of the **VS-6464DN** showing DVI cards installed as an example.

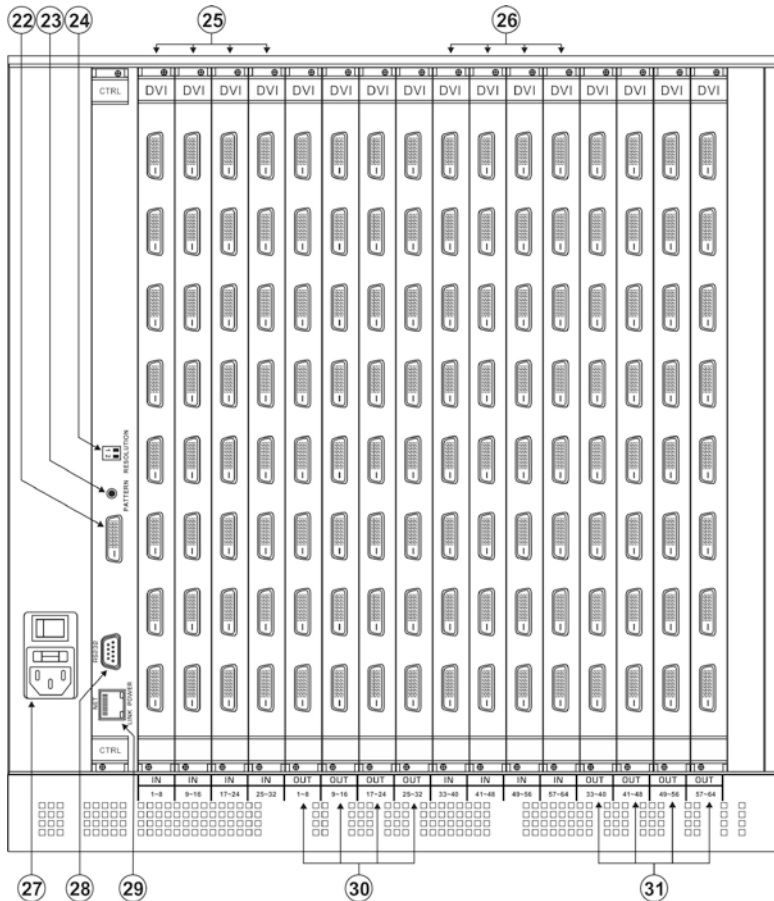


Figure 3: VS-6464DN 64x64 Digital Matrix Switcher Rear Panel Showing DVI Cards

#	Feature	Function
22	Video Generator Output Connector	Connect to one of the relevant video inputs to aid in troubleshooting (see Section 9)
23	<i>PATTERN</i> Button	Press the button repeatedly to change the video pattern generated by the video generator (see Section 9.3)
24	RESOLUTION DIP-switches	Set the resolution for video generated by the Test module (see Section 9.2)
25	<i>IN 1~32</i> Connectors	Connect to the relevant video sources, depending on the cards installed (1 to 32, see Section 5)
26	<i>IN 33~64</i> Connectors	Connect to the relevant video sources, depending on the cards installed (33 to 64, see Section 5)
27	AC Mains Power Module	Fuse holder and power cord socket. Connect to the AC mains supply

#	Feature	Function
28	RS-232 9-pin D-sub Port	Connects to the remote operation PC or remote controller (see Section 5.1)
29	NET Ethernet RJ-45 Connector	Connect to a PC or controller via the Ethernet LAN (see Section 5.3). The <i>LINK</i> LED flashes when communication is active. <i>POWER</i> LED lights when the interface receives power
30	OUT 1~32 Connectors	Connect to the relevant video acceptors, depending on the cards installed (1 to 32, see Section 5)
31	OUT 33~64 Connectors	Connect to the relevant video acceptors, depending on the cards installed (33 to 64, see Section 5)

3.4 Using the IR Transmitter

You can use the **RC-IR3** IR transmitter to control the machine via the built-in IR receiver on the front panel.

4 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:	0° to +40°C (32° to 104°F)
STORAGE TEMPERATURE:	-40° to +70°C (-40° to 158°F)
HUMIDITY:	10% to 90%, RHL non-condensing



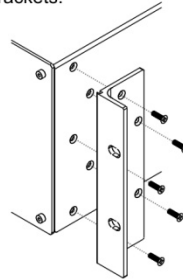
CAUTION!

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

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

To rack-mount a machine:

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



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

Note:

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

5 Connecting the VS-6464DN



Always switch off the power to each device before connecting it to your **VS-6464DN**. After connecting your **VS-6464DN**, connect its power and then switch on the power to each device.

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 [Section 5.1](#)). Exactly the same principles apply to installations using DVI dual link, DVI (HDCP), DVI (over 4LC fiber cable) and HDMI cards.

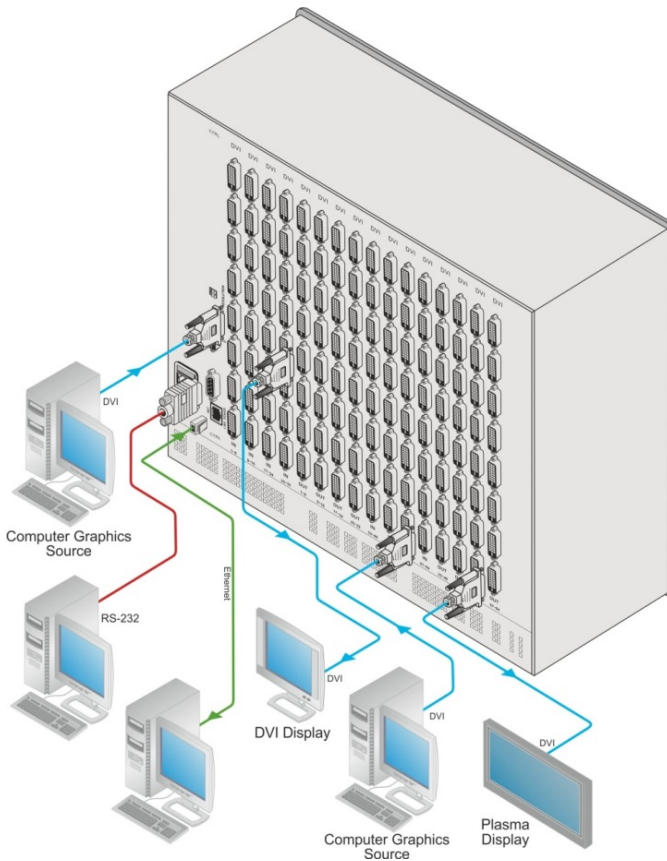


Figure 4: Connecting the VS-6464DN

To install the **VS-6464DN** as illustrated in the example in [Figure 4](#):

1. Connect up to 64 DVI video sources (for example, computer graphics sources).
2. Connect up to 64 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 5.1](#)) and/or the Ethernet port (see [Section 5.3](#)).
4. Connect the power cord (in this example only two inputs and two outputs are connected).
5. If necessary, review and set the system configuration using the Menu (see [Section 7](#)).

Note: Following HDCP regulations, if an input signal is HDCP encoded the **VS-6464DN** outputs a signal only if the output port to which it is switched supports HDCP.

5.1 Port Numbering

On all cards apart from the DVI dual link cards, there are eight physical ports and the numbering of ports is sequential from top to bottom and left to right. Each DVI dual link card provides four physical ports which causes the loss of four numbers in the numbering sequence. [Figure 5](#) illustrates a sample numbering showing only the top of each card and is explained in the following table.

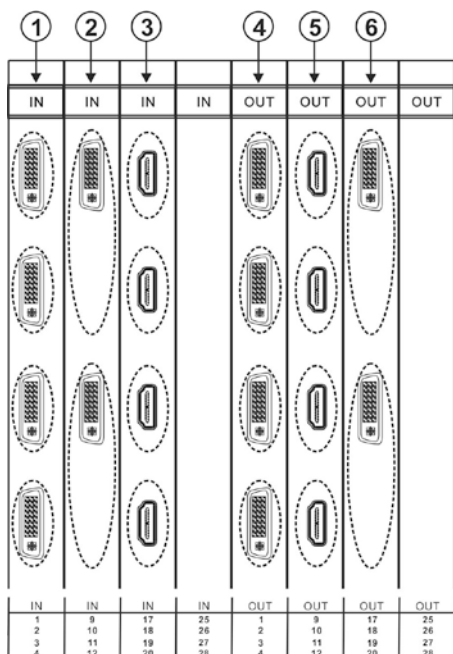


Figure 5: Sample Port Numbering

#	Port Number	#	Port Number
1	IN 1, IN 2, IN 3, IN 4	4	OUT 1, OUT 2, OUT 3, OUT 4
2	IN 9, IN 10	5	OUT 9, OUT 10, OUT 11, OUT 12
3	IN 17, IN 18, IN 19, IN 20	6	OUT 17, OUT 18

Note: There is no IN 13, IN 14, IN 15, IN 16, OUT 21, OUT 22, OUT 23 or OUT 24 because these slots contain DVI dual link cards.

5.1.1 Port Switching and EDID Numbering Examples

The following table is based on the port numbering shown in [Figure 5](#) and lists EDID configuration requests and their results.

EDID Request	EDID Sent
From OUT 21	Blank (256 bytes of 0xFF)
From IN 25	None (error message displayed)

5.2 Connecting to the VS-6464DN via RS-232

You can connect to the **VS-6464DN** 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-6464DN** via RS-232:

- Connect the RS-232 9-pin D-sub rear panel port on the **VS-6464DN** 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

5.3 Connecting to the VS-6464DN via Ethernet

You can connect the **VS-6464DN** via Ethernet using a crossover cable (see [Section 5.3.1](#)) for direct connection to the PC, or a straight through cable (see [Section 5.3.2](#)) 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 www.kramerav.com.

5.3.1 Connecting the Ethernet Port directly to a PC

You can connect the Ethernet port on the **VS-6464DN** 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-6464DN** 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.

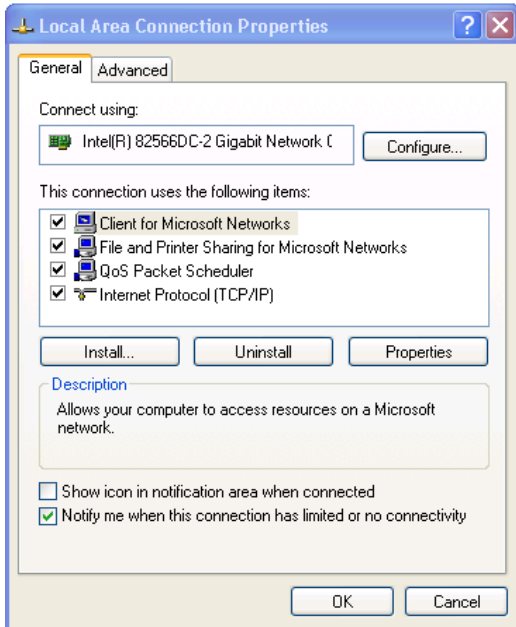


Figure 6: Local Area Connection Properties Window

6. Select **Use the following IP Address** and enter the details as shown in [Figure 7](#). 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.

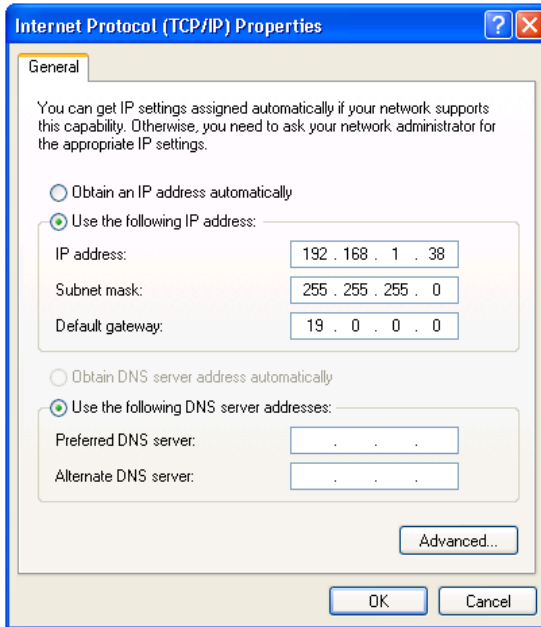


Figure 7: Internet Protocol (TCP/IP) Properties Window

7. Click **OK**.

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

To connect to the Ethernet port on the **VS-6464DN** via a network switch/hub:

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

6 Operating Your Video Matrix Switcher

This section describes:

- The startup display (see [Section 6.1](#))
- Using the selector buttons (see [Section 6.2](#))
- Confirming actions (see [Section 6.3](#))
- Switching options (see [Section 6.4](#))
- Locking the front panel (see [Section 6.5](#))

6.1 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).

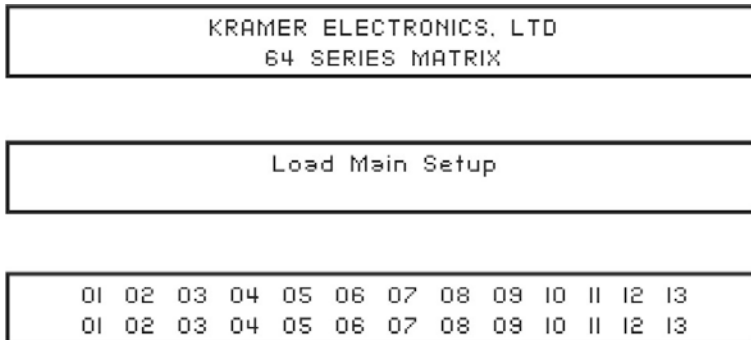


Figure 8: Default Startup Status Display Sequence

The front panel of the **VS-6464DN** 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 6.2](#)).

When the unit is powered-on, the last matrix setup that was used is loaded. Use either the recall setup (see [Section 7.1.6](#)) or default setup recall (see [Section 6.4.5](#)) functions to retrieve other setups.

6.1.1 Viewing the Display

[Figure 8](#) shows the output-input matrix on the LCD display. The LCD display can show 13 out of the 64 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.

6.2 Using the Selector Buttons

For numbers between 1 and 9, the **VS-6464DN** 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-6464DN** to exit the operation and revert to the output/input display.

6.3 Confirming Actions

You can choose to work in the At Once (default for all actions except storing/recalling) or the Confirm mode.

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

6.3.1 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.

6.3.2 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.

6.4 Switching Actions

This section describes how to:

- Switch one input to one output (see [Section 6.4.1](#))
- Switch several inputs to several outputs (see [Section 6.4.2](#))
- Turn off several outputs (see [Section 6.4.3](#))

6.4.1 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

6.4.2 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.

6.4.3 Turning an Output Off

Turning off an output 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 2](#)).

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 6.4.1](#)) and set the input to 00.

6.4.4 Turning Off Several Outputs

To turn off several outputs in the Confirm mode, repeat the switching actions described in [Section 6.4.2](#) but set the inputs to 00.

6.4.5 Recalling the Default Setup

You can store a commonly used setup as the default setup (see [Section 7.2.6](#)) 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.

6.5 Locking the Front Panel Buttons

You can lock the **VS-6464DN** to prevent tampering with the unit or prevent the settings from being changed accidentally via the front panel buttons.

You can still operate the device remotely via RS-232 or Ethernet 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 Using the Configuration Menu

The configuration menus let you configure the **VS-6464DN** 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 7.1](#)
- Config Menu—those that are accessed only occasionally (for example, setting the interface or communication protocol), see [Section 7.2](#)

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

7.1 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 7.1.1](#))
- **3: outXX=OFF**, turning off an output (see [Section 7.1.2](#))
- **7: EDID**, assignment to an output (see [Section 7.1.3](#))
- **9: Delay** setting for an output (see [Section 7.1.4](#))
- **4: store setup XX**, storing the setup in a preset (see [Section 7.1.5](#))
- **6: recall setup XX**, recalling a preset (see [Section 7.1.6](#))

7.1.1 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 2](#)).
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.

7.1.2 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 2](#)).
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.

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

This option assigns an EDID to between one and eight inputs at a time 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-6464DN** has a factory default EDID loaded (see [Section 15](#)). The EDID for each input can be changed independently via the menu (described below) or by uploading an EDID binary file to each input via the RS-232 port using Kramer EDID Designer software (available for download from www.kramerav.com).

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 2](#)).

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 2](#)).
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

7.1.4 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 2](#)).
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.

7.1.5 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 2](#)).
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.

7.1.6 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 2](#)).

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.

7.2 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 7.2.1](#))
- Output load detection ([Section 7.2.2](#))
- Interface configuration ([Section 7.2.3](#))

- Interface Reply configuration ([Section 7.2.4](#))
- Protocol configuration ([Section 7.2.5](#))
- Storing the default setup ([Section 7.2.6](#))
- Resetting the **VS-6464DN** ([Section 7.2.7](#))
- Firmware revision display ([Section 7.2.8](#))

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.

7.2.1 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

7.2.2 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

7.2.3 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.

7.2.4 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.

7.2.5 Config Menu—Protocol Configuration

The **VS-6464DN** supports Kramer Protocol 2000. There are currently no options to modify.

7.2.6 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 6.4.5](#)).

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.

7.2.7 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 OFF 2:Factory default
```

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

Caution: 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.

7.2.8 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
- Wait approximately 15 seconds for the operation to time out

8 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-6464DN** recognizes the new configuration. Refer to [Section 5.1](#) 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:64 MaxOutput:64
```

Note: The number of input and output ports can only be set in units of eight, for example, 8 x 8, 64 x 8 or 40 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.

9 Using the Video Generator to Troubleshoot Video Problems

The **VS-6464DN** includes a video generator which can be used to diagnose video/audio issues in an operating environment.

The video generator must be configured in the setup before it can be used. When installing the video generator, the number of configured inputs and outputs must be increased by one. For example:

- If your **VS-6464DN** has eight inputs and twelve outputs, you must configure the **VS-6464DN** as 9 x 13
- If your **VS-6464DN** has 64 inputs and 64 outputs, you must configure the **VS-6464DN** as 65 x 65

9.1 Installing the Video Generator

To install the video generator 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:64 MaxOutput:64
```

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 8](#)).

The test module is now installed and may be used.

9.2 Setting the Resolution of the Generated Video

The video generator produces 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 following tables.

DIP-Switch Position		Resolution
1	2	
OFF	OFF	1024 x 768 @60Hz
ON	OFF	1280 x 1024 @60Hz
OFF	ON	1600 x 1200 @60Hz
ON	ON	1920 x 1200 @60Hz

DIP-Switch Position		Resolution
1	2	
OFF	OFF	480p (default)
ON	OFF	720p
OFF	ON	1080i
ON	ON	1080p

[Figure 9](#) shows the Resolution DIP-switch with both switches in the default off position, (up, 480p).



Figure 9: Resolution DIP-switch

9.3 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.

9.4 Using the Video Generator to Troubleshoot Video Problems

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

The following examples are based on the signal paths shown in [Figure 10](#) and a **VS-6464DN** device installed as follows:

- 32 inputs and 32 outputs
- The test module is installed and configured (see [Section 9.1](#))
- 33 configured inputs and 33 configured outputs (see [Section 8](#))

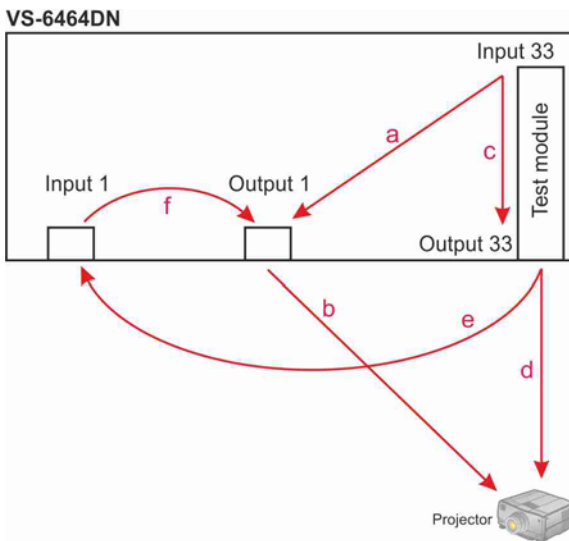


Figure 10: Signal Paths for Isolating problems

9.4.1 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 6.4](#)).
2. Connect Output 33 to the projector.

3. Set the generated video resolution (see [Section 9.2](#)).
4. Set the pattern for the generated video (see [Section 9.3](#)).
5. Verify that the projector output is as expected.

9.4.2 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 6.4](#)).
2. Connect Output 1 to the projector.
3. Set the generated video resolution (see [Section 9.2](#)).
4. Set the pattern for the generated video (see [Section 9.3](#)).
5. Verify that the projector output is as expected.

9.4.3 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 6.4](#)).
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 9.2](#)).
6. Set the pattern for the generated video (see [Section 9.3](#)).
7. Verify that the projector output is as expected.

10 I/O Card Hardware Installation Instructions

The **VS-6464DN** I/O cards mount in one of the 16 slots on the rear of the **VS-6464DN** 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 32 and IN 33 to 64) and an output card must only be mounted in a slot designated for output cards (slots OUT 1 to 32 and OUT 33 to 64).

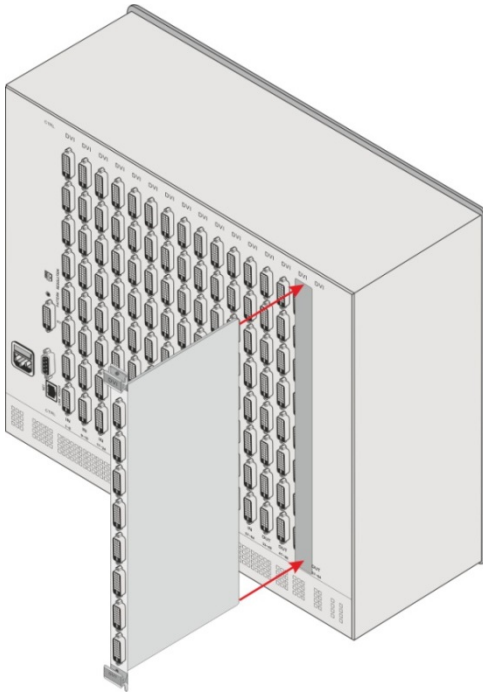


Figure 11: Inserting the Card into a Slot

To install an I/O card as shown in [Figure 11](#):

1. Power off the **VS-6464DN** 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 possible 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 12](#)).

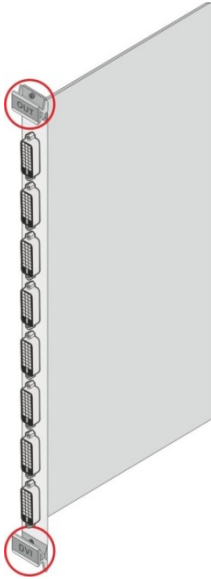


Figure 12: Card Handles

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-6464DN** and follow the procedure to configure the new card (see [Section 8](#)).
10. Power on the peripheral devices.

11 Power Supply Installation

The **VS-6464DN** is supplied with two power supplies. You can install a third power supply to provide hot-swappable redundancy for mission critical installations.

Note: The device must have at least two working power supplies to operate correctly.

To install a third power supply:

1. Remove the new power supply from its shipping carton and anti-static bag.
2. Remove the blank panel covering the third power supply location..
3. Align the new power supply with the rails on the bottom of the slot.
4. Slide the power supply into the slot until it makes contact with the rear connector, insuring that it remains straight.
5. Press the power supply firmly until the front panel of the power supply is flush with the front panel of the **VS-6464DN**.
6. Tighten the four thumbscrews to secure the power supply in place.

12 Upgrading the VS-6464DN Firmware

Upgrading the firmware on the **VS-6464DN** is performed only by authorized service personnel.

13 Technical Specifications

BANDWIDTH:	Supports up to 3.2Gbps bandwidth per channel (limited by the card installed)
MAX RESOLUTION:	Up to UXGA; 1080p
CONTROLS:	Front panel buttons, Infrared remote control transmitter, RS-232, Ethernet
POWER CONSUMPTION:	100-240V AC, 50/60Hz, 420VA
OPERATING TEMPERATURE:	0° to +40°C (32° to 104°F)
STORAGE TEMPERATURE:	-40° to +70°C (-40° to 158°F)
HUMIDITY:	10% to 90%, RHL non-condensing
DIMENSIONS:	19" x 14.2" x 10U (W, D, H) rack-mountable
WEIGHT:	24.0kg (52.9lbs) approx.
INCLUDED ACCESSORIES:	Power cord, Infrared remote control transmitter, PS-1DN power supply
Specifications are subject to change without notice at www.kramerav.com	

The following table lists the technical specifications of the cards that are compatible with the **VS-6464DN** chassis.

MAX RESOLUTION: Up to UXGA; 1080p, 1920x1200							
Card	Ports	Bandwidth per Channel	Compliance	HDMI Support	3D Pass Through	Features	HDTV Compatible
DVI	8 DVI	1.65Gbps	DVI 1.0			Kramer Equalization & re-Klocking™ Technology	Yes
HDCP	8 HDCP	2.25Gbps	HDCP/HDMI	Deep Color, x.v.Color™	Yes		
DVI (4LC Fiber Optic)	8 4LC	1.65Gbps	DVI 1.0				

Multi-mode glass fiber cables with LC connections must be used for the 4LC Fiber Optic card, such as the Kramer C-4LC/4LC

14 Default Communication Parameters

The following table lists the default communication parameters for the **VS-6464DN**.

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	
Default Values	
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-64DVIS
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..... 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 - IBM VGA
720 x 400p at 88Hz - IBM XGA2
640 x 480p at 60Hz - IBM VGA
640 x 480p at 67Hz - Apple Mac II
640 x 480p at 72Hz - VESA
640 x 480p at 75Hz - VESA
800 x 600p at 56Hz - VESA
800 x 600p at 60Hz - VESA
800 x 600p at 72Hz - VESA
800 x 600p at 75Hz - VESA
832 x 624p at 75Hz - Apple Mac II
1024 x 768i at 87Hz - IBM
1024 x 768p at 60Hz - VESA
1024 x 768p at 70Hz - VESA
1024 x 768p at 75Hz - VESA
1280 x 1024p at 75Hz - VESA
1152 x 870p at 75Hz - Apple Mac II
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,36,34,44,56,49,53,0A,20,20,20,00,00,00,FD,00,32,55,1F,5E,11,00,0A,20,20,20,20,20,00,4D

15.2 DVI (HDCP) Input Card

Monitor

Model name..... VS-64HDCP
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 - IBM VGA
720 x 400p at 88Hz - IBM XGA2
640 x 480p at 60Hz - IBM VGA
640 x 480p at 67Hz - Apple Mac II
640 x 480p at 72Hz - VESA
640 x 480p at 75Hz - VESA
800 x 600p at 56Hz - VESA
800 x 600p at 60Hz - VESA
800 x 600p at 72Hz - VESA
800 x 600p at 75Hz - VESA
832 x 624p at 75Hz - Apple Mac II
1024 x 768i at 87Hz - IBM
1024 x 768p at 60Hz - VESA
1024 x 768p at 70Hz - VESA
1024 x 768p at 75Hz - VESA
1280 x 1024p at 75Hz - VESA
1152 x 870p at 75Hz - Apple Mac II
1280 x 720p at 60Hz - VESA STD
1280 x 800p at 60Hz - VESA STD
1440 x 900p at 60Hz - VESA STD
1280 x 960p at 60Hz - VESA STD
1280 x 1024p at 60Hz - VESA STD

1400 x 1050p at 60Hz - VESA STD
1680 x 1050p at 60Hz - VESA STD
1600 x 1200p at 60Hz - VESA STD

EIA/CEA-861 Information

Revision number..... 3
IT underscan..... Not supported
Basic audio..... Supported
YCbCr 4:4:4..... Supported
YCbCr 4:2:2..... Supported
Native formats..... 1
Detailed timing #1..... 720x480p at 60Hz (4:3)
Modeline..... "720x480" 27.000 720 736 798 858 480 489 495 525 -hsync -vsync
Detailed timing #2..... 1920x1080i at 60Hz (16:9)
Modeline..... "1920x1080i" 74.250 1920 2008 2052 2200 1080 1084 1094 1124 interlace +hsync +vsync
Detailed timing #3..... 1920x1080i at 50Hz (16:9)
Modeline..... "1920x1080i" 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,36,34,48,44,43,50,0A,20,20,00,00,00,FD,00,32,55,1F,5E,11,00,0A,20,20,20,20,20,20,01,DE,
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,00,00,00,00,00,00,00,00,00,00,00,00,00

16 Communication Protocols

This RS-232 communication protocol uses four bytes of information as defined below.

For RS-232, a null-modem connection between the machine and controller is used. The default data rate is 9600 baud, with no parity, 8 data bits and 1 stop bit.

16.1 Syntax

MSB								LSB
1st Byte	DESTINATION	INSTRUCTION						
0	D	N5	N4	N3	N2	N1	N0	
7	6	5	4	3	2	1	0	
2nd Byte	INPUT							
1	I6	I5	I4	I3	I2	I1	I0	
7	6	5	4	3	2	1	0	
3rd Byte	OUTPUT							
1	O6	O5	O4	O3	O2	O1	O0	
7	6	5	4	3	2	1	0	
4th Byte	MACHINE NUMBER							
1	OVR	X	M4	M3	M2	M1	M0	
7	6	5	4	3	2	1	0	

1st Byte: Bit 7 – Defined as 0
 D – DESTINATION:
 0 – Sends information to the switchers (from the PC)
 1 – Sends information to the PC (from the switcher)
 N5...N0 – INSTRUCTION

The 6-bit INSTRUCTION defines the function performed by the switcher(s). If a function is performed using the machine's keyboard, these bits are set with the INSTRUCTION NO. performed. The instruction codes are defined according to the table below (INSTRUCTION NO. is the value set in N5...N0).

2nd Byte: Bit 7 – Defined as 1
 I6...I0 – INPUT

When switching (i.e. instruction codes 1 and 2), the 7-bit INPUT is set as the input number to be switched. If switching is done using the machine's front panel, these bits are set with the INPUT NUMBER switched. For other operations, these bits are defined according to the table.

3rd Byte: Bit 7 – Defined as 1
 O6...O0 – OUTPUT

When switching (i.e. instruction codes 1 and 2), the 7-bit OUTPUT is set as the output number to be switched. If switching is done using the machine's front panel, these bits are set with the OUTPUT NUMBER switched. For other operations, these bits are defined according to the table.

4th Byte: Bit 7 – Defined as 1
 Bit 5 – Don't care
 OVR – Machine number override
 M4...M0 – MACHINE NUMBER

This byte is used to address machines in a system by their machine numbers. When several machines are controlled from a single serial port, they are usually configured together and each machine has an individual machine number. If the OVR bit is set, then all machine numbers accept (implement) the command and the addressed machine replies. When a single machine is controlled over the serial port, always set M4...M0 to 1, and make sure that the machine itself is configured as MACHINE NUMBER = 1.

16.2 Instruction Codes

Instruction Codes for Protocol 2000							
Instruction	R/W	Format				Notes	
#	Description		#1	#2	#3	#4	
0	Reset Device	W	00H	80	80	81	
1	AV Switch	W	01H	80+IN	80+OUT	81	IN=0, Close OUT=0, All
3	Setup Save / Delete	W	03H	80+SETUP	80+MARK	81	0<SETUP<=65 MARK=0, Save MARK=1, Delete
4	Recall Setup	W	04H	80+SETUP	80H	81	0<SETUP<=65
5	Switching Status	R	05H	80+SETUP	80+OUT	81	SETUP=0, Get switching status of one output currently 0<SETUP<=65, the switching status of one output in SETUP
7	Set Output Delay Time for All Output Ports	W	07H	80+DLY	A0H	81	DLY: 0-127
8	Set Follow Mode	W	08H	81	80+MODE	81	MODE=0, Follow mode MODE=1, Normal mode
9	Set Video Type	W	09H	80	87	81	07=DVI
10 / 11	Get Breakaway Setting	R	0AH/ 0BH	80	81	81	
12	Get Video Type	R	0CH	80	80	81	
		R	0CH	FE	80+MARK	81	MARK=0, Video type MARK=Else, return 0x80 constantly
		R	0CH	FF	80+MARK	81	MARK=0, return 0x81 constantly MARK=Else, return 0x80 constantly
15	Validate Setup / Input Signal	R	0FH	80+SETUP	80	81	Get SETUP validity 0<SETUP<=65
		R	0FH	81+IN	81	81	Get Input signal validity 0<IN<=65
30	Set Lock	W	1EH	80+MODE	80	81	MODE=0, Unlock MODE=1, Lock
31	Get Lock	R	1FH	80	80	81	
44	Set EDID	W	2CH	80+IN	80+OUT	81	0<IN<=65 0<=OUT<=65 OUT=0, Set default EDID to IN OUT=ELSE, Copy output EDID to input
46	Write EDID to Input Port	W	2EH	80+IN	80+LEN	81	0<IN<=65 LEN=01H/41H (01H=128 DATA, 41H=256 DATA)
47	Read Input / Output port's EDID	R	2FH	80+IN	80+OUT	81	Read Input port's EDID 0<IN<=65 OUT: 01H/03H
		R	2FH	80+IN	80+OUT	81	Read Output port's EDID 0<IN<=65 OUT: 02H/04H

Instruction Codes for Protocol 2000							
Instruction		R/W	Format				Notes
#	Description		#1	#2	#3	#4	
56	Switch from PK2000 to PK3000	W	38H	80	83	81	
57	Set Auto-Save	W	39H	80+IN	80	81	IN=0, Not Auto-Save IN=1, Auto-Save
58	Execute Loaded Data	W	3AH	80	80+MODE	81	MODE=1, Load MODE=2, Delete
59	Load Video Data	W	3BH	80+IN	80+OUT	81	0<=IN<=65/7F, IN=0, Close. IN=7F, Load Setup 0<=OUT<=65. OUT=0, All
61	Get MAX_INPUT, MAX_OUTPUT, First / Second Prefix, or Version	R	3DH	81	80+OUT	81	OUT=0, Get MAX_INPUT, MAX_OUTPUT OUT=10, Get First Prefix OUT=11, Get Second Prefix
		R	3DH	83	80	81	Get Version
62	Get MAX_INPUT, MAX_OUTPUT, or MAX_SETUP		3EH	80+IN	81	81	IN=1, GET MAX_INPUT IN=2, GET MAX_OUTPUT IN=3, GET MAX_SETUP

16.3 Example Hex Table

The following Protocol 2000 hex codes switch inputs and outputs on the **VS-6464DN**:

First Byte	Input Byte	Output Byte	Fourth Byte
01	8+input number	8+input number	81

01 input byte output byte 81

where the input and output bytes may be any of the values in the following table limited by the number of ports installed in your device.

For example, to switch input 57 to output 10:

01 B9 8A 81

Input/Output Number	Hex Value	Input/Output Number	Hex Value	Input/Output Number	Hex Value	Input/Output Number	Hex Value
1	81	17	91	33	A1	49	B1
2	82	18	92	34	A2	50	B2
3	83	19	93	35	A3	51	B3
4	84	20	94	36	A4	52	B4
5	85	21	95	37	A5	53	B5
6	86	22	96	38	A6	54	B6
7	87	23	97	39	A7	55	B7
8	88	24	98	40	A8	56	B8
9	89	25	99	41	A9	57	B9
10	8A	26	9A	42	AA	58	BA
11	8B	27	9B	43	AB	59	BB
12	8C	28	9C	44	AC	60	BC
13	8D	29	9D	45	AD	61	BD
14	8E	30	9E	46	AE	62	BE
15	8F	31	9F	47	AF	63	BF
16	90	32	A0	48	B0	64	C0

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Web site: www.kramerav.com

E-mail: info@kramerel.com



SAFETY WARNING

Disconnect the unit from the power supply before opening and servicing



P/N: 2900-300045



Rev: 5