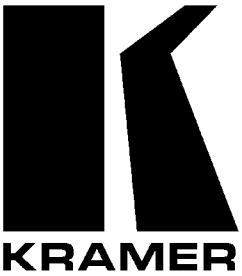
# Kramer Electronics, Ltd.




# USER MANUAL

## Models:

**VS-88A, VS-88V, SD-7588A, SD-7588V, VS-8000**

***88 Series***

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# 1 Introduction

Dedication by Kramer Electronics since 1981, to the development and manufacture of high quality video/audio equipment, makes the Kramer line an integral part of the finest production and presentation facilities in the world. In recent years, Kramer has redesigned and upgraded most of the line, making the best even better!

The Kramer line of professional video/audio electronics is one of the most versatile and complete available, and is a true leader in terms of quality, workmanship, price/performance ratio and innovation. In addition to our excellent switchers and matrices, we also offer distribution amplifiers, presentation processors, interfaces, remote controllers and computer-related products.

Congratulations on purchasing your Kramer *88 Series* switcher[1] and Remote Controller[2].

These products are ideal for the following applications:

- Broadcast studios for on-air switching and signal routing
- Production studios, for connecting various sources to acceptors
- Non-linear editing suites and presentation applications

Each *88 Series* switcher comes with the following items:

- AC power cable
- This user manual
- Kramer concise product catalog/CD
- Rubber feet

# 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

1 *VS-88A*, or *VS-88V*, or *SD-7588A*, or *SD-7588V*

2 *VS-8000*

# 3 Overview

The *88 Series* is a group of 8x8 Vertical Interval Matrix Switchers[1] and a Remote Control Panel for video/stereo audio/data signals that support the simultaneous connection of one or more inputs to several outputs[2]. Vertical Interval Switching[3] ensures an undisturbed picture transition. The major innovation with the *88 Series* is the ability to switch different kinds of signals simultaneously. Section 3.1 outlines the *88 Series* and section 3.2 includes recommendations for achieving high quality performance.

## 3.1 The 88 Series

The *88 Series* includes the following items:

- **VS-88A** (stereo audio matrix switcher for analog balanced audio)
- **VS-88V** (video matrix switcher for analog composite video)
- **SD-7588A** (audio matrix switcher for digital audio)
- **SD-7588V** (video matrix switcher for digital video)
- **VS-8000** (remote controller for use with the switchers)

## 3.2 High Quality Performance Recommendations

Achieving high quality performance means:

- Connecting only good quality connection cables, thus avoiding interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)
- Using good quality sockets and connectors for the sources and acceptors to avoid signal path breaks[4]. Aim for Zero Ohm connection resistance and ensure that sockets and connectors match the required impedance (75 ohms in video)
- Avoiding interference from neighboring electrical appliances that may adversely influence signal quality. Install unbalanced audio and video lines[5] (even though the cables are shielded) away from mains carrying cables, electric motors, and transmitters
- Positioning the switcher correctly. Each switcher is housed in a professional

1 They ensure smooth and glitch-free transition when sources share a common reference sync

2 However, you cannot connect two or more inputs to a single output

3 Frequently used when recording or transmitting a video program involving several video sources

4 Poor quality connectors tend to rust, which may cause breaks

5 Balanced audio lines are less prone to interference

19-inch rack mountable enclosure, requiring one vertical rack space per product [1]. The standard 19-inch (IU) EIA rack assembly requires no specific spacing above or below the unit for ventilation

# 4 Your Matrix Switchers

This section describes the products[2] in the *88 Series* range that can function separately[3] or switch together in the same manner in the *In System* mode[4].

## 4.1 Your VS-88A

The **VS-88A** is a high performance 8x8 stereo audio matrix switcher for balanced audio stereo signals using detachable terminal block connectors. In addition, the **VS-88A**:

- Is a true matrix switcher, enabling the user to simultaneously route any input to any or all outputs
- Delivers excellent audio performance ensuring that it remains transparent in almost any audio application
- Is controllable via the front panel buttons as well as the built-in RS-232 and RS-485 interfaces
- Includes 15 preset memory locations for quickly and easily accessing the most frequently used configurations
- Includes Windows 95/98/NT ™ control software
- May be used with the **VS-8000**, an optional remote controller (see section 4.5)
- Functions as a standalone unit as well as part of a Kramer multi-signal switcher system[5]

Figure 1 illustrates the front and rear panels of the **VS-88A**:

1 To mount a switcher, position the rack ears against the rails of your rack, and insert standard screws through each of the 4 corner holes in the front panel

2 Switchers in the *88 Series* share identical front panel controls. Video switchers with the suffix V, have rear panel BNC connectors. Audio switchers with the suffix A, have rear panel detachable terminal block connectors

3 Standalone

4 Section 6 describes the different modes

5 Which includes digital and analog video, digital and analog audio and RS-422 control switchers. When integrated in a system, it switches together with the video during the vertical interval, thus supporting true IN SYSTEM mode

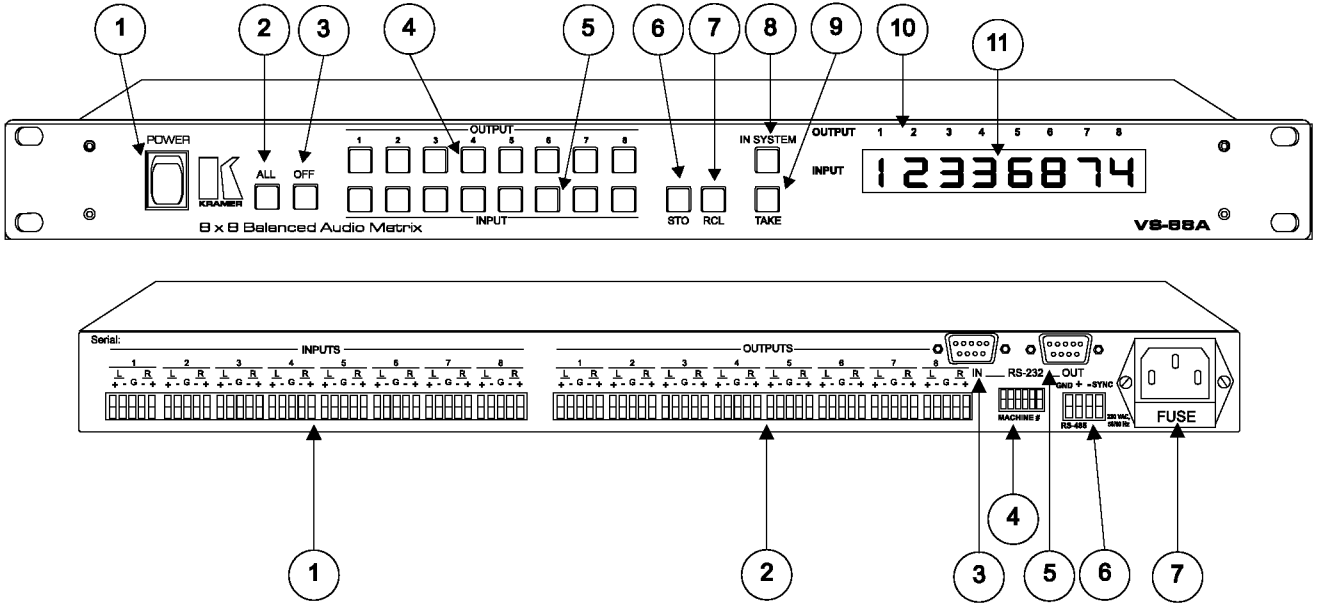


*Figure 1: VS-88A Front/Rear Panel Features*

Table 1 and Table 2 define the features and functions of the **VS-88A**:

*Table 1: VS-88A Front Panel Features*

| No. | Feature | Function |
|---|---|---|
| 1 | *Power* Switch | Illuminated switch supplying power to the unit |
| 2 | *ALL* Button (ALL= All Outputs) | Pressing *ALL* before pressing an *INPUT* button, connects that input to all outputs[1] |
| 3 | *OFF* Button (OFF= All Inputs) | Pressing *OFF* after pressing an *OUTPUT* button disconnects that output from the inputs. To turn off the connections, press the *ALL* button and then the *OFF* button |
| 4 | *OUTPUT* Buttons | Select the output to which the input is switched |
| 5 | *INPUT* Buttons | Select the input to switch to the output |
| 6 | *STO* Button | Pressing STO (STORE) followed by an output button stores the current setting (refer to section 7.2.1)[2] |
| 7 | *RCL* Button | Pressing the *RCL* (*RECALL*) button and the corresponding OUTPUT key recalls a setup. The stored status blinks. Pressing a different OUTPUT button lets you view[3] another setup. After making your choice, pressing the *RCL* button again implements the new status (refer to section 7.2.2) |
| 8 | IN SYSTEM Button | Pressing *IN SYSTEM* twice[4], switches between the *Standalone* mode (in which the switcher implements any action independently from the others) and the *In System* mode (in which all switchers implement the same action simultaneously) |
| 9 | *TAKE* Button (TAKE = CONFIRM) | Pressing *TAKE* toggles the mode between the *CONFIRM* mode[5] and the *AT ONCE* mode (user confirmation per action is unnecessary) |
| 10 | OUTPUT labels | Identifies a connection between the output and the input shown below it |
| 11 | INPUT STATUS Display | Displays the selected input switched to the output (marked above each input) |

*Table 2: VS-88A Rear Panel Features*

| No. | Feature | Function |
|---|---|---|
| 1 | *INPUTS* Connectors | Audio inputs |
| 2 | *OUTPUTS* Connectors | Audio outputs |
| 3 | *RS-232 IN* DB 9F Connector | Connects to PC or Remote Controller[6] |
| 4 | MACHINE # | Dipswitches setup (refer to section 5.1) |
| 5 | *RS-232 OUT* DB 9M Connector | Connects to the RS-232 IN DB 9F port of the next unit in the daisy-chain connection[7] |
| 6 | *RS-485* Connector | RS-485 detachable terminal block port. Pins # 1 to # 3 are for RS 485 and pin # 4 is for vertical sync distribution[8] as Figure 7 illustrates |
| 7 | Power Connector with Fuse | AC connector enabling power supply to the unit |

1 For example, press ALL and then Input button # 2 to connect input # 2 to all the outputs

2 For example, press STO and then the Output button # 3 to store in Setup # 3

3 Only view, nothing is implemented at this stage

4 After pressing IN SYSTEM once, it blinks

5 When in Confirm mode, the TAKE button illuminates

6 If the unit is not the first unit in the line, connects to the RS-232 OUT DB 9F port of the previous unit in the line

7 If the unit is the final unit in the daisy-chain connection, no termination is required

8 The *88 Series* RS-485 connector has 4 pins, and the remote controller RS-485 connector has just 3 pins

## 4.2 Your VS-88V

The **VS-88V** is a high performance 8x8 composite video matrix switcher. In addition, the **VS-88V**:

- Is a true matrix switcher, enabling the user to simultaneously route any input to any or all outputs
- Supports more than 200 MHz video bandwidth
- Switches during the vertical interval[1]
- Accepts analog video as the external source for its vertical interval trigger
- Is controllable via the front panel buttons as well as the built-in RS-232 and RS-485 interfaces
- Includes 15 preset memory locations for quickly and easily accessing the most frequently used configurations
- Includes Windows 95/98/NT ™ control software
- May be used with the **VS-8000**, an optional remote controller (see section 4.5)
- Functions as a standalone unit as well as part of a Kramer multi-signal switcher system[2]
- Can be combined as part of a group of **VS-88V** switchers that comprise a component switcher[3]

Figure 2 illustrates the front and rear panels of the **VS-88V**:

1 Transitions are glitch-free when sources share a common reference sync

2 Which includes digital and analog video, digital and analog audio, and RS-422 control switchers. When integrated into a system, it can provide the rest of switchers with the vertical interval trigger

3 Refer to section 5.5 and Figure 9 on page 20

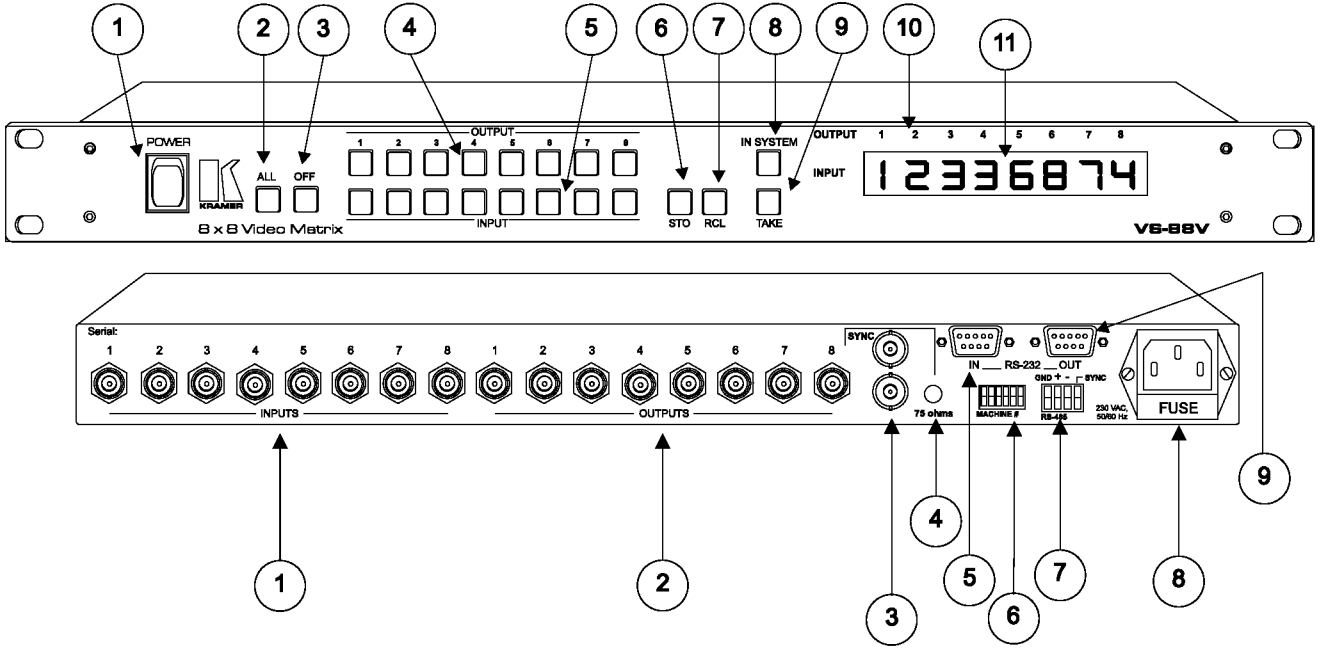


*Figure 2: VS-88V Front/Rear Panel Features*

Table 3 and Table 4 define the features and functions of the **VS-88V**:

*Table 3: VS-88V Front Panel Features*

| No. | Feature | Function |
|---|---|---|
| 1 | *Power* Switch | Illuminated switch supplying power to the unit |
| 2 | *ALL* Button (ALL= All Outputs) | Pressing *ALL* before pressing an *INPUT* button, connects that input to all outputs[1] |
| 3 | *OFF* Button (OFF= All Inputs) | Pressing *OFF* after pressing an *OUTPUT* button disconnects that output from the inputs. To turn off the connections, press the *ALL* button and then the *OFF* button |
| 4 | *OUTPUT* Buttons | Select the output to which the input is switched |
| 5 | *INPUT* Buttons | Select the input to switch to the output |
| 6 | *STO* Button | Pressing STO (STORE) followed by an output button stores the current setting (refer to section 7.2.1)[2] |
| 7 | *RCL* Button | Pressing the *RCL* (*RECALL*) button and the corresponding OUTPUT key recalls a setup. The stored status blinks. Pressing a different OUTPUT button lets you view[3] another setup. After making your choice, pressing the *RCL* button again implements the new status (refer to section 7.2.2) |
| 8 | IN SYSTEM Button | Pressing *IN SYSTEM* twice[4], switches between the *Standalone* mode (in which the switcher implements any action independently from the others) and the *In System* mode (in which all switchers implement the same action simultaneously) |
| 9 | *TAKE* Button (TAKE = CONFIRM) | Pressing *TAKE* toggles the mode between the *CONFIRM* mode[5] and the *AT ONCE* mode (user confirmation per action is unnecessary) |
| 10 | OUTPUT labels | Identifies a connection between the output and the input shown below it |
| 11 | INPUT STATUS Display | Displays the selected input switched to the output (marked above each input) |

*Table 4: VS-88V Rear Panel Features*

| No. | Feature | Function |
|---|---|---|
| 1 | *INPUTS* BNC Connectors | Video inputs |
| 2 | *OUTPUTS* BNC Connectors | Video outputs |
| 3 | *SYNC* BNC Connectors | For looping to external video sync input |
| 4 | *75 ohms* Button | Controls loop termination[6] |
| 5 | *RS-232 IN* DB 9F Connector | Connects to PC or Remote Controller[7] |
| 6 | MACHINE # | Dipswitches setup (refer to section 5.1) |
| 7 | *RS-485* Connector | RS-485 detachable terminal block port. Pins # 1 to # 3 are for RS 485 and pin # 4 is for vertical sync distribution[8] |
| 8 | Power Connector with Fuse | AC connector enabling power supply to the unit |
| 9 | *RS-232 OUT* DB 9M Connector | Connects to the RS-232 IN DB 9F port of the next unit in the daisy-chain connection[9] |

1 For example, press ALL and then Input button # 2 to connect input # 2 to all the outputs

2 For example, press STO and then the Output button # 3 to store in Setup # 3

3 Only view, nothing is implemented at this stage

4 After pressing IN SYSTEM once, it blinks

5 When in Confirm mode, the TAKE button illuminates

6 Push in to terminate the SYNC line. Push out when the line extends to an other unit

7 If the unit is not the first unit in the line, connects to the RS-232 OUT DB 9F port of the previous unit in the line

8 The 88 Series RS-485 connector has 4 pins, and the Remote Controller RS-485 connector has just 3 pins

9 If the unit is the final unit in the daisy-chain connection, no termination is required

## 4.3 Your SD-7588A

The **SD-7588A** is a high performance multi-standard 8x8 digital audio matrix switcher that is adjustment-free, cable-equalized and reclocking. In addition, the **SD-7588A**:

- Provides automatic equalization for losses on 110 Ω twisted pair cable
- Reclocks each output to provide 8 low-jitter digital outputs
- Supports AES/EBU, IEC 958, S/PDIF and EIAJ CP340/1201 professional and consumer formats with sampling frequencies up to 96 kHz
- Comes with all inputs and outputs transformer coupled, supporting 110 Ω impedance twisted pair cable on detachable terminal block connectors
- Is controllable via the front panel buttons as well as the built-in RS-232 and RS-485 interfaces
- Includes 15 preset memory locations for quickly and easily accessing the most frequently used configurations
- Includes Windows 95/98/NT ™ control software
- May be used with the **VS-8000**, an optional remote controller (see section 4.5)
- Functions as a standalone unit as well as part of a Kramer multi-signal switcher system[1]

Figure 3 illustrates the front and rear panels of the **SD-7588A**:

1 Which includes digital and analog video, digital and analog audio and RS-422 control switchers. When integrated in a system, it switches together with the video during the vertical interval, thus supporting true IN SYSTEM mode

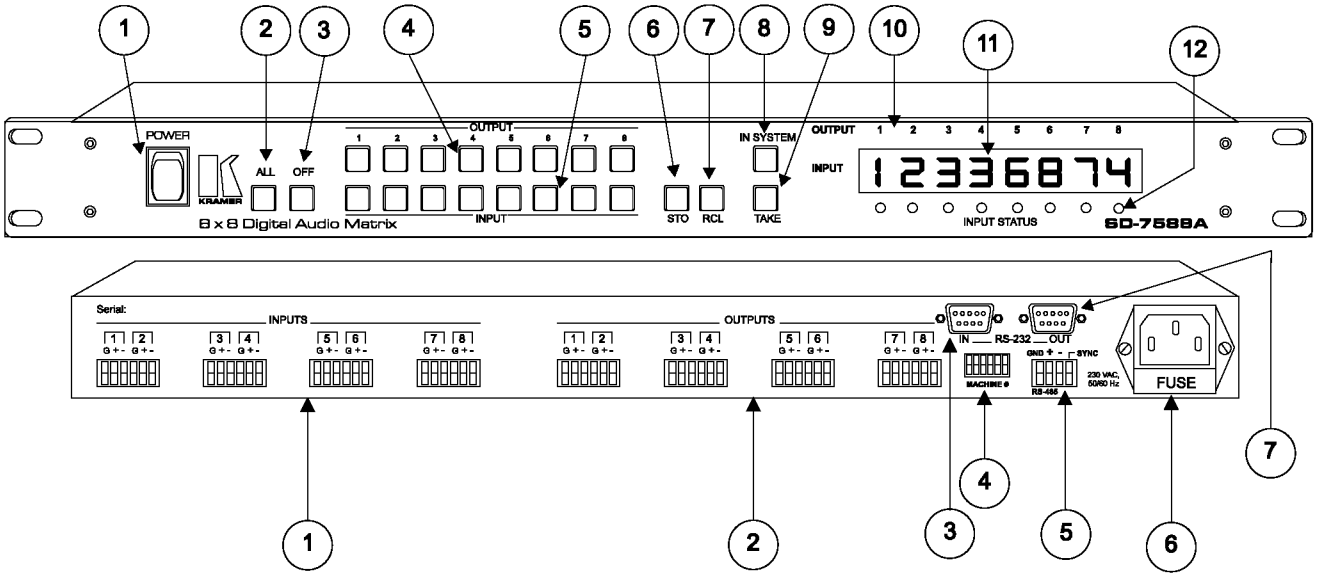


*Figure 3: SD-7588A Front/Rear Panel Features*

Table 5 and Table 6 define the features and functions of the **SD-7588A**:

*Table 5: SD-7588A Front Panel Features*

| No. | Feature | Function |
|---|---|---|
| 1 | *Power* Switch | Illuminated switch supplying power to the unit |
| 2 | *ALL* Button (ALL= All Outputs) | Pressing *ALL* before pressing an *INPUT* button, connects that input to all outputs[1] |
| 3 | *OFF* Button (OFF= All Inputs) | Pressing *OFF* after pressing an *OUTPUT* button disconnects that output from the inputs. To turn off the connections, press the *ALL* button and then the *OFF* button |
| 4 | *OUTPUT* Buttons | Select the output to which the input is switched |
| 5 | *INPUT* Buttons | Select the input to switch to the output |
| 6 | *STO* Button | Pressing STO (STORE) followed by an output button stores the current setting (refer to section 7.2.1)[2] |
| 7 | *RCL* Button | Pressing the *RCL* (*RECALL*) button and the corresponding OUTPUT key recalls a setup. The stored status blinks. Pressing a different OUTPUT button lets you view[3] another setup. After making your choice, pressing the *RCL* button again implements the new status (refer to section 7.2.2) |
| 8 | IN SYSTEM Button | Pressing *IN SYSTEM* twice[4], switches between the *Standalone* mode (in which the switcher implements any action independently from the others) and the *In System* mode (in which all switchers implement the same action simultaneously) |
| 9 | *TAKE* Button (TAKE = CONFIRM) | Pressing *TAKE* toggles the mode between the *CONFIRM* mode[5] and the *AT ONCE* mode (user confirmation per action is unnecessary) |
| 10 | OUTPUT labels | Identifies a connection between the output and the input shown below it |
| 11 | INPUT STATUS Display | Displays the selected input switched to the output (marked above each input) |
| 12 | INPUT STATUS LEDs | Illuminate when the input signal is presented on a corresponding line and complies with the AES/EBU standard |

*Table 6: SD-7588A Rear Panel Features*

| No. | Feature | Function |
|---|---|---|
| 1 | *INPUTS* Connectors | Audio inputs |
| 2 | *OUTPUTS* Connectors | Audio outputs |
| 3 | *RS-232 IN* DB 9F Connector | Connects to PC or Remote Controller[6] |
| 4 | MACHINE # | Dipswitches setup (refer to section 5.1) |
| 5 | *RS-232 OUT* DB 9M Connector | Connects to the RS-232 IN DB 9F port of the next unit in the daisy-chain connection[7] |
| 6 | *RS-485* Connector | RS-485 detachable terminal block port. Pins # 1 to # 3 are for RS 485 and pin # 4 is for vertical sync distribution[8] |
| 7 | Power Connector with Fuse | AC connector enabling power supply to the unit |

1 For example, press ALL and then Input button # 2 to connect input # 2 to all the outputs

2 For example, press STO and then the Output button # 3 to store in Setup # 3

3 Only view, nothing is implemented at this stage

4 After pressing IN SYSTEM once, it blinks

5 When in Confirm mode, the TAKE button illuminates

6 If the unit is not the first unit in the line, connects to the RS-232 OUT DB 9F port of the previous unit in the line

7 If the unit is the final unit in the daisy-chain connection, no termination is required

8 The *88 Series* RS-485 connector has 4 pins, and the Remote Controller RS-485 connector has just 3 pins

## 4.4 Your SD-7588V

The **SD-7588V** is a high performance multi-standard 8x8 serial digital video matrix switcher that is adjustment-free, cable-equalized and reclocking. In addition, the **SD-7588V**:

- Provides automatic equalization for losses on 75 Ω coaxial cable, and reclocks each output to provide eight low-jitter serial digital outputs
- Automatic standard recognition
- Operates with both 10-bit and 8-bit video, automatically recognizing the word length
- Accepts analog video as the external source for its vertical interval trigger
- Is controllable via the front panel buttons as well as the built-in RS-232 and RS-485 interfaces
- Includes 15 preset memory locations for quickly and easily access ing the most frequently used configurations
- Includes Windows 95/98/NT ™ control software
- May be used with the **VS-8000**, an optional remote controller (see section 4.5)
- Functions as a standalone unit as well as part of a Kramer multi-signal switcher system[1]

Figure 4 illustrates the front and rear panels of the **SD-7588V**:

1 Which includes digital and analog video, digital and analog audio, and RS-422 control switchers. When integrated into a system, it provides the rest of switchers with the vertical interval trigger

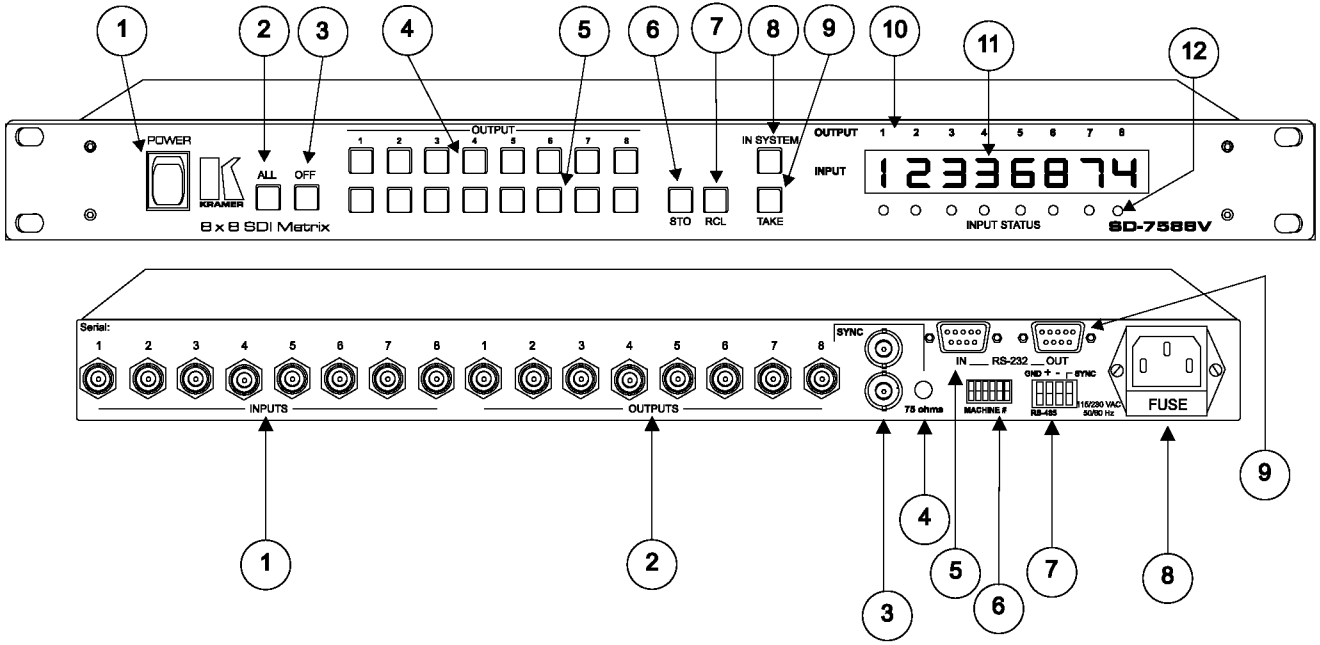


*Figure 4: SD-7588V Front/Rear Panel Features*

Table 7 and Table 8 define the features and functions of the **SD-7588V**:

*Table 7: SD-7588V Front Panel*

| No. | Feature | Function |
|---|---|---|
| 1 | *Power* Switch | Illuminated switch supplying power to the unit |
| 2 | *ALL* Button (ALL= All Outputs) | Pressing *ALL* before pressing an *INPUT* button, connects that input to all outputs[1] |
| 3 | *OFF* Button (OFF= All Inputs) | Pressing *OFF* after pressing an *OUTPUT* button disconnects that output from the inputs. To turn off the connections, press the *ALL* button and then the *OFF* button |
| 4 | *OUTPUT* Buttons | Select the output to which the input is switched |
| 5 | *INPUT* Buttons | Select the input to switch to the output |
| 6 | *STO* Button | Pressing STO (STORE) followed by an output button stores the current setting (refer to section 7.2.1)[2] |
| 7 | *RCL* Button | Pressing the *RCL* (*RECALL*) button and the corresponding OUTPUT key recalls a setup. The stored status blinks. Pressing a different OUTPUT button lets you view another setup. After making your choice, pressing the *RCL* button again implements the new status (refer to section 7.2.2) |
| 8 | IN SYSTEM Button | Pressing *IN SYSTEM* twice[3], switches between the *Standalone* mode (in which the switcher implements any action independently from the others) and the *In System* mode (in which all switchers implement the same action simultaneously) |
| 9 | *TAKE* Button (TAKE = CONFIRM) | Pressing *TAKE* toggles the mode between the *CONFIRM* mode[4] and the *AT ONCE* mode (user confirmation per action is unnecessary) |
| 10 | OUTPUT labels | Identifies a connection between the output and the input shown below it |
| 11 | INPUT STATUS Display | Displays the selected input switched to the output (marked above each input) |
| 12 | INPUT STATUS LEDs | Illuminate when the input signal is presented on a corresponding line and complies with the SDI standard |

*Table 8: SD-7588V Rear Panel Features*

| No. | Feature | Function |
|---|---|---|
| 1 | *INPUTS* BNC Connectors | Video inputs |
| 2 | *OUTPUTS* BNC Connectors | Video outputs |
| 3 | *SYNC* BNC Connectors | For looping to external video sync input |
| 4 | *75 ohms* Button | Controls loop termination[5] |
| 5 | *RS-232 IN* DB 9F Connector | Connects to PC or Remote Controller[6] |
| 6 | MACHINE # | Dipswitches setup (refer to section 5.1) |
| 7 | *RS-485* Connector | RS-485 detachable terminal block port. Pins # 1 to # 3 are for RS 485 and pin # 4 is for vertical sync distribution[7] |
| 8 | Power Connector with Fuse | AC connector enabling power supply to the unit |
| 9 | RS-232 OUT DB 9M Connector | Connects to the RS-232 IN DB 9F port of the next unit in the daisy-chain connection[8] |

1 For example, press ALL and then Input button # 2 to connect input # 2 to all the outputs

2 For example, press STO and then the Output button # 3 to store in Setup # 3

3 After pressing IN SYSTEM once, it blinks

4 When in Confirm mode, the TAKE button illuminates

5 Push in to terminate the SYNC line. Push out when the line extends to another unit

6 If the unit is not the first unit in the line, connects to the RS-232 OUT DB 9F port of the previous unit in the line

7 *The 88 Series* RS-485 connector has 4 pins, and the Remote Controller RS-485 connector has just 3 pins

8 If the unit is the final unit in the daisy-chain connection, no termination is required

## 4.5 Your VS-8000

The **VS-8000** is an optional remote controller for accessing and controlling switchers in the *88 Series*. In addition, the **VS-8000**:

- Supports[1] the creation of any configuration that consists of a PC, an unlimited number of remote controllers, and up to any[2] eight *88 Series* switchers, activating all the functions of the connected devices, individually or grouped
- Includes 8 illuminated MACHINE IN SYSTEM buttons that enable toggling between the standalone and the IN SYSTEM modes of any switcher, and viewing the status and control of the corresponding switcher[3]
- Includes 8 bright LED displays showing the status of any standalone or IN SYSTEM matrix switcher
- Continuously scrutinizes the status of the connecting RS-485 line
- Receives its power from a 12V DC source (also useful for field operation)
- Can be desktop-mounted (by resting it on its base or attaching it to the desktop) or built into a controlling table

Figure 5 illustrates the front and rear panels of the **VS-8000**:

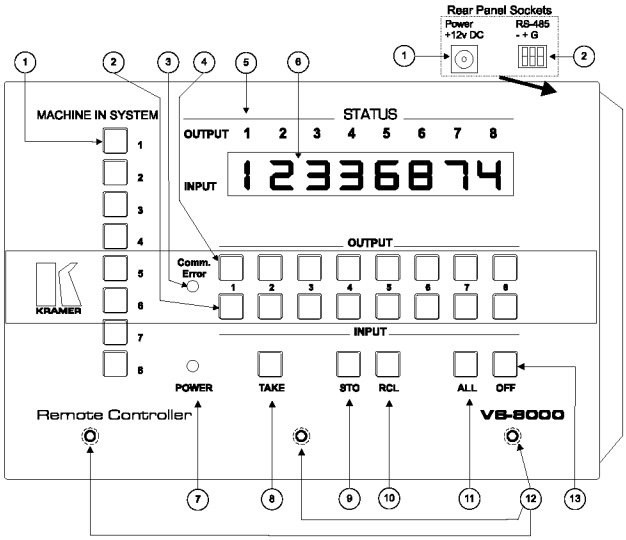


*Figure 5: VS-8000 Top/Rear Panel Features*

1 Using its built-in RS-485 interface

2 You can control different types of machines in a single configuration

3 That is, the switcher with the same MACHINE # as the MACHINE IN SYSTEM #

Table 9 and Table 10 define the features and functions of the **VS-8000**:

*Table 9: VS-8000 Top Panel Features*

| No. | Feature | Function |
|---|---|---|
| 1 | MACHINE IN SYSTEM Button | Enable toggle between the standalone and the IN SYSTEM modes of any switcher, and viewing the status and control of the corresponding switcher (refer to section 6) |
| 2 | *INPUT* Buttons | Select the input to switch to the output |
| 3 | Comm. Error LED (red) | The *Comm. Error* LED illuminates when a connection between the remote controller and a switcher fails[1] |
| 4 | *OUTPUT* Buttons | Select the output to which the input is switched |
| 5 | OUTPUT labels | Identifies a connection between the output and the input shown below it |
| 6 | INPUT STATUS Display | Displays the selected input switched to the output (marked above each input) |
| 7 | *Power* LED (green) | Illuminates when power is activated |
| 8 | *TAKE* Button (TAKE = CONFIRM) | Pressing *TAKE* toggles the mode between the *CONFIRM* mode[2] and the *AT ONCE* mode (user confirmation per action is unnecessary) |
| 9 | *STO* Button | Pressing STO (STORE) followed by an output button stores the current setting (refer to section 7.2.1) |
| 10 | *RCL* Button | Pressing the *RCL* (*RECALL*) button and the corresponding OUTPUT key recalls a setup. The stored status blinks. Pressing a different OUTPUT button lets you view[3] another setup. After making your choice, pressing the *RCL* button again implements the new status (refer to section 7.2.2) |
| 11 | *ALL* Button (ALL= All Outputs) | Pressing ALL before pressing an INPUT button, connects that input to all outputs[4] |
| 12 | 3 Screws | Removing the 3 screws separates the base platform. By drilling 3 holes in the desktop you can screw the remote controller directly in place |
| 13 | *OFF* Button (OFF= All Inputs) | Pressing OFF after pressing an OUTPUT button disconnects that output from the inputs. To turn off the connections, press the ALL button and then the OFF button |

*Table 10: VS-8000 Rear Panel Features*

| No. | Feature | Function |
|---|---|---|
| 1 | *Power* Socket | +12V DC connector enabling power supply to the unit |
| 2 | *RS-485* Connector | RS-485 detachable terminal block port |

# 5 Connecting Your Matrix Switchers

This section describes how to:

- Set the dipswitches (refer to section 5.1)
- Connect a standalone unit (refer to section 5.2)
- Connect several units[5] with/without the remote controller (refer to section 5.3)

1 For example, the switcher is not connected at all, or connected, but with out power

2 When in Confirm mode, the TAKE button illuminates

3 Only view, nothing is implemented at this stage

4 For example, press ALL and then Input button # 2 to connect that input to all outputs

5 With the *88 Series*, you cannot connect two separate IN SYSTEM mode systems as one combined system

- Connect several units and the PC (refer to section 5.4)
- Connect a component switcher (refer to section 5.5)

## 5.1 Dipswitch Settings

Each *88 Series* switcher includes a rear panel set of six dipswitches, as Figure 6, Table 11 and Table 12 define.

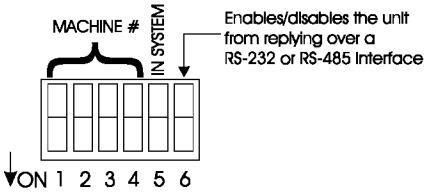


*Figure 6: Rear Panel Dipswitches*

*Table 11: Rear Panel Dipswitches*

| Dipswitch # | Function: |
|---|---|
| 1-4 | Set the MACHINE NUMBER (refer to Table 12) |
| 5 | Disables use of the *IN SYSTEM* button<br>(OFF = enables the *IN SYSTEM* button; ON = disables the *IN SYSTEM* button) |
| 6 | Enables a reply from the unit after it receives an RS-232 / RS-485 command<br>(OFF = disables reply[1] ;ON = enables reply) |

*Table 12: Machine # Dipswitch Settings*

| MACHINE # | DIPSWITCH | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| 1 | OFF | ON | ON | ON |
| 2 | ON | OFF | ON | ON |
| 3 | OFF | OFF | ON | ON |
| 4 | ON | ON | OFF | ON |
| 5 | OFF | ON | OFF | ON |
| 6 | ON | OFF | OFF | ON |
| 7 | OFF | OFF | OFF | ON |
| 8 | ON | ON | ON | OFF |

## 5.2 Connecting a Standalone Unit

To connect a standalone unit, connect the following:

- Power supply
- Audio and/or video input and output cables

1 Helpful, for example, when using three composite video switchers to form one component video switcher

- Video reference input for *VS-88V* and/or *SD-7588V*
- Set dipswitch # 1 OFF and dipswitches # 2, 3, 4, 5 and 6 ON (see section 5.1)

The *IN SYSTEM* button is non responsive

## 5.3 Connecting Several Units with/without the Remote Controller

To connect several units with or without the remote controller, connect as follows:

- Power supply
- Audio and/or video input and output cables
- Video reference input for *VS-88V* or *SD-7588V*
- In a system with more than one video switcher (either *VS-88V* or *SD-7588V*), connect all video switchers to the video reference by looping between the sync BNC connectors
- Set the dipswitches for the different MACHINE # (1 to 8) for each machine and set dipswitch # 5 OFF and dipswitch # 6 ON
- Connect all the 4 terminals to the RS-485 interface connectors
- Operate the front panel controls of any switcher

Figure 7 illustrates a typical system connection:

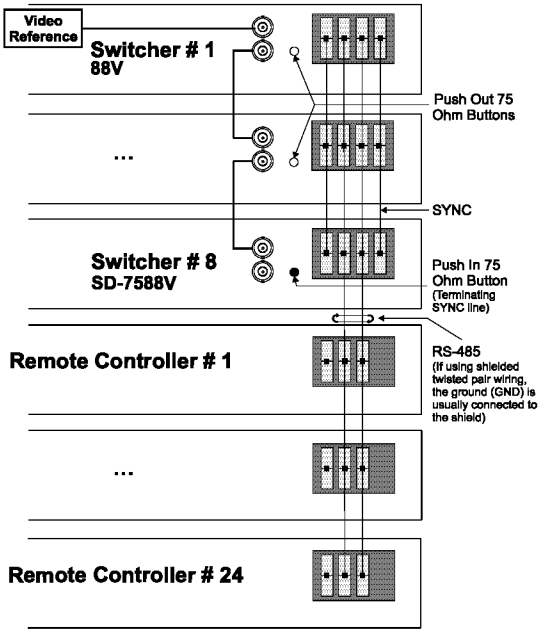


*Figure 7: RS-485 System Connection: Switchers and Remote Controllers*

You can connect up to 24 remote controllers and up to 8 switchers per system. However, when connecting less than 8 switchers, you can connect more remote controllers[1].

## 5.4 Connecting Several Units and the PC

To connect several units and the PC, connect the following:

- Power supply
- Audio and/or video input and output cables
- Reference input (for video) for *VS-88V* and/or *SD-7588V*
- Set the dipswitches for the different MACHINE #. Set dipswitch # 5 OFF and dipswitch # 6 ON
- Switchers in a daisy chain arrangement[2] using the RS-232 *In* and RS-232 *Out* DB9 connectors should be connected using a flat-cable, or with at least the three wires (pins # 2, # 3 and # 5)[3]. **Do not use a null-modem adapter**. Assign PC port to 9600, N, 8, and 1

Figure 8 illustrates a typical system connection with both[4] the RS-232 and the RS-485 connected in a parallel line:

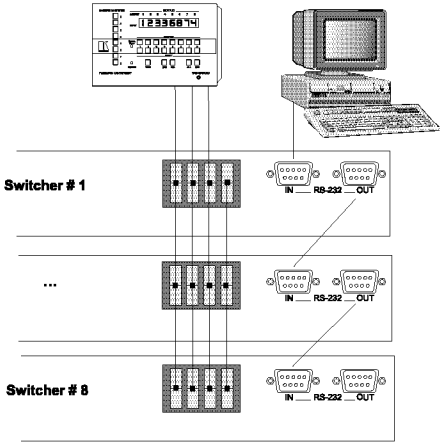


*Figure 8: System Connection: Switchers and the PC*

1 RS-485 connection supports up to 32 devices, that is, switchers and remote controllers. For example, when connecting 2 switchers per system, you can connect up to 30 remote controllers

2 The *88 Series* firmware complies with Kramer Protocol-2000 (version 3.1 and higher)

3 Make one-to-one connections (that is, uncrossed)

4 Often the PC has no RS-485 Com port and so both are required simultaneously

## 5.5 Connecting a Component[1], Y/C, RGBS or RGBHV Switcher

A component[2] switcher consists of 3 **VS-88V** switchers, interconnected as one group, with one of the switchers set as the Master. A component switcher can function in the IN SYSTEM or standalone mode. Similarly, you can configure 2 **VS-88V** switchers for Y/C (s-Video), 4 **VS-88V** switchers for RGBS or 5 **VS-88V** switchers for RGBHV.

To set the **VS-88V** switchers in the group to operate as a single component switcher, do the following with every switcher in the group:

- Set the same MACHINE # for each switcher (for example, MA CHINE # 2)
- Set dipswitch # 5 OFF
- Set dipswitch # 6 OFF (**except on the Master, set Dipswitch # 6** ON)

Except for the Master (whose LEDs illuminate and front panel controls remain unlocked), the LEDs on all switchers in the group are dimmed, and their front panel controls are locked[3]

Figure 9 illustrates a component switcher that consists of a group of 3 VS-88V switchers:

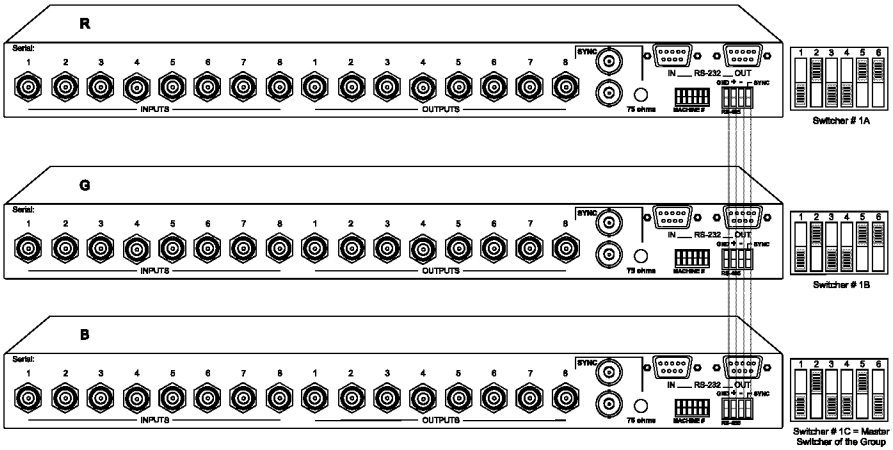


*Figure 9: Component Switcher: VS-88V Group Connection*

1 For RGB or YUV (Y, B-Y, R-Y)

2 Video signal in component form offers the highest professional video quality, superior to composite or s-Video

3 After initially powering up the component switcher, if some of its switchers remain in a different status, press the ALL button followed by the OFF button on the Master to reset all the connections prior to normal operation

# 6 Understanding the Modes

This section describes the different system and confirmation modes.

## 6.1 About the System Modes

By default, a switcher starts in the standalone mode and the IN SYSTEM key does not illuminate. Pressing the IN SYSTEM key twice toggles to the IN SYSTEM mode.

This section describes the Standalone and the IN SYSTEM modes, as follows:

### 6.1.1 Standalone Mode

In the standalone mode:

- The switcher implements actions independently and separately from the others
- Upon starting the system, only one MACHINE IN SYSTEM # illuminates on the remote controller

### 6.1.2 IN SYSTEM Mode

In the IN SYSTEM mode:

- Several switchers with different kinds of signals are connected as a system operating as a universal switcher[1]
- More than one MACHINE IN SYSTEM # illuminates[2] to indicate the units that are connected as part of a system. Each MACHINE IN SYSTEM # for those IN SYSTEM units will not illuminate. However, on each of the IN SYSTEM units, the respective IN SYSTEM button continues to illuminate
- Any executed action affects all units in the system

## 6.2 About the Confirmation Modes

By default, the unit starts in the *AT ONCE* mode, that is, if an *OUT-IN* combination is pressed, it will be implemented immediately. Pressing the TAKE button twice, toggles between the CONFIRM and the AT ONCE modes.

This section describes the CONFIRM and the AT ONCE modes, as follows:

1 Each switches in the same order according to the entered command, with one or more of them following the other units

2 The IN SYSTEM button on each unit also illuminates

### 6.2.1 AT ONCE Mode

In the AT ONCE mode:

- You save time
- Actions require no user confirmation
- Execution is immediate
- No protection is offered to prevent the implementation of a wrongly entered action

### 6.2.2 CONFIRM Mode

In the CONFIRM mode:

- You have a method to help avoid making a mistake
- Every action requires user confirmation
- Execution is delayed until the user confirms the action
- Protection is offered to prevent erroneous switching

# 7 Operation

This section describes the hardware of the machine and the operation of its front panel controls.

For instructions on using the Windows 95/98/ NT ™ Control Software, refer to the separate user manual[1], *Kramer Control Software*.

## 7.1 Technical Information

This section describes setup capacity, switching the power on, timeout and the system settings.

### 7.1.1 Setup Capacity

From every switcher you can store up to 8 setups. From the PC you can store up to 15 setups.

### 7.1.2 Switching the Power On

To switch the power on at all the switchers, do the following:

1. Verify, via the automatic self-test, that all switchers function correctly.

1 Included on the CD-ROM in .pdf format

2. Check the firmware version number indicated by the two fast blinking digits on the display[1].

To switch the power on at the remote controller, do the following:

1. Attach the power adapter plug to the power socket on the remote controller.
2. Verify, via the automatic self-test, that all switchers and the remote controller function correctly.
3. The Comm. Error LED will illuminate to indicate a problem[2], if at all, with any switcher.

### 7.1.3 Timeout

By design, every push button operation is subject to a 30 second timeout. Failure to fully execute an action within 30 seconds will necessitate restarting that action whilst the LED display will show the previous state.

### 7.1.4 System Settings Priority

The design excludes any priority[3]. Any operator[4] can always override the previous system settings. For example, in Figure 7: RS-485 System Connection: Switchers and Remote Controllers, the system setting implemented by the operator of *Remote Controller # 24* will be the current system setting until the operator of say, *Remote Controller # 5*, implements a different system setting.

## 7.2 Push Button Controls

This section describes how to store, recall and lock/unlock settings.

### 7.2.1 Storing a Setting

To store a setting, do the following:

1. Press the STO button. The STO button blinks.
2. Press the Output #. The LED Output display # blinks[5].
3. Press the STO button again. The memory stores the data.

---

1 For example, the digits 10 indicate version 1.0

2 For example, if a switcher is not connected, or its power is switched off

3 Between any or all of the following: remote controllers, front panel controls and a PC

4 Whether he operates a remote controller, a set of front panel controls or a PC

5 At this stage, pressing a different # changes the Output #

4. The LED display returns to its previous state[1].

### 7.2.2 Recalling a Setting

To recall a setting, do the following:

1. Press the RCL button. The RCL button blinks.
2. Press the Output #. The LED Output display # blinks[2], displaying what was previously stored.
3. Press the RCL button again. This recalls the stored data.

By design[3], you cannot recall data that is stored in a particular unit from a different unit. Each unit, even when set to the IN SYSTEM mode, stores its own data separately.

### 7.2.3 Locking and Unlocking Settings

The remote controllers and the PC include a flexible locking[4] mechanism for safeguarding settings on switchers. To prevent changing the settings accidentally[5], lock your switchers. Unlocking releases[6] the protection mechanism.

From any remote controller you can lock and unlock the following[7]:

- A specific switcher
- All switchers
- That specific remote controller

From the PC[8] you can lock and unlock the following:

- A specific switcher
- All switchers

Locking a specific remote controller does not lock any other remote controller. To lock all the remote controllers, press the TAKE and the STO

1 Nothing changes in the setup

2 At this stage, pressing a different # changes the Output #

3 On one occasion the same unit can function in the standalone mode, and on another occasion in the IN SYSTEM mode

4 Locking means that the front panel is locked. In all other respects (for example, recall, changing input and output), the switcher still operates via the remote controller and the PC

5 Especially if the system is complex and the switchers are stored on a rack in another room

6 Restarting (perhaps due to an electricity failure) a switcher or a remote controller also releases the protection mechanism (without wiping out the switcher settings)

7 You cannot lock/unlock from a switcher

8 You cannot lock a PC

push buttons on each remote controller separately. You cannot simultaneously lock or unlock all the remote controllers from one remote controller, or from the PC. When all switchers and remote controllers are locked, the front panel switcher push buttons are inoperative. By design, only specific[1] remote controller push buttons will function, enabling the operator to execute the unlock commands.

Section 7.2.3.1 describes how to lock the switcher and section 7.2.3.2 describes how to unlock the switcher. For a concise summary of the locking/unlocking push button sequence, refer to Table 13 on page 26.

#### 7.2.3.1 Locking Switchers

To lock a specific switcher, do the following:

1. Press the TAKE button on the remote controller. The TAKE button blinks.
2. Press the appropriate MACHINE IN SYSTEM # button on the remote controller. The MACHINE IN SYSTEM # button blinks.
3. Press the STO button on the remote controller. The specific switcher locks and the INPUT STATUS Display numbers on the switcher appear dimmed.

To lock all switchers, do the following:

1. Press the TAKE button on the remote controller. The TAKE button blinks.
2. Press the ALL button on the remote controller. The ALL button blinks.
3. Press the STO button on the remote controller. All the units lock and the INPUT STATUS Display numbers on the switchers appear dimmed.

To lock a remote controller, do the following:

1. Press the TAKE button on the remote controller. The TAKE button blinks.
2. Press the STO button on the remote controller. The remote controller locks and the INPUT STATUS Display numbers on the remote controller appear dimmed[2].

1 That is, TAKE, RCL, and ALL

2 All other remote controllers remain unlocked

#### 7.2.3.2 Unlocking Switchers

To unlock a specific switcher, do the following:

1. Press the TAKE button on the remote controller. The TAKE button blinks.
2. Press the appropriate MACHINE IN SYSTEM # button on the remote controller. The MACHINE IN SYSTEM # button blinks.
3. Press the RCL button on the remote controller. The specific locked switcher unlocks and the INPUT STATUS Display numbers on the switcher no longer appear dimmed.

To unlock all switchers[1], do the following:

1. Press the TAKE button on the remote controller. The TAKE button blinks.
2. Press the ALL button on the remote controller. The ALL button blinks.
3. Press the RCL button on the remote controller. All the switchers unlock and the INPUT STATUS Display numbers on the switchers no longer appear dimmed. The remote controller also unlocks.

To unlock a remote controller, do the following:

1. Press the TAKE button on the remote controller. The TAKE button blinks.
2. Press the RCL button on the remote controller. The locked remote controller unlocks and the INPUT STATUS Display numbers on the remote controller no longer appear dimmed[2].

*Table 13: Push Button Sequence Summary*

| | Lock | Unlock |
|---|---|---|
| **Specific Switcher** | TAKE + MACHINE IN SYSTEM # + STO | TAKE + MACHINE IN SYSTEM # + RCL |
| **All Switchers** | TAKE + ALL + STO | TAKE + ALL + RCL[3] |
| **Remote Controller** | TAKE + STO | TAKE + RCL |

# 8 Technical Specifications

Table 14 lists the technical specifications for the *88 Series* switchers.

1 Including the remote controller, if locked

2 All other remote controllers remain locked. You will need to unlock each remote controller separately

3 Unlocks all units, and in addition, the remote controller

*Table 14: Technical Specifications for 88 Series*

| | VS-88A | VS-88V | SD-7588A | SD-7588V |
|---|---|---|---|---|
| **INPUTS:** | 8 balanced stereo audio, +4 dBm/33k Ω on detachable terminal blocks | 8 composite video, 1Vpp/75 Ω on BNCs, looping Analog sync inputs 1Vpp/75 Ω on BNCs | 8 AES/EBU digital audio, 110 Ω on detachable terminal blocks, transformer coupled | 8 x SMPTE - 259M serial video, 75 Ω on BNCs; looping Analog sync inputs on BNCs |
| **OUTPUTS:** | 8 balanced audio stereo, +4 dBm/50Ω Vpp max) on detachable terminal blocks | 8 composite video, 1Vpp/75 Ω on BNCs | 8 reclocked AES/EBU digital audio, 110 Ω on detachable terminal blocks, transformer coupled | 8 reclocked SMPTE-259M outputs, 75 Ω on BNCs |
| **SAMPLING:** | | | 32, 44.1, 48, 96 kHz sampling frequencies | |
| **RESOLUTION:** | | | Up to 24-bit, automatic according to input resolution | 10-bit or 8-bit, automatic according to input resolution |
| **STANDARDS:** | | | AES/EBU, IEC 958, S/PDIF and EIAJ CP340/1201 | 4fsc PAL, 4fsc NTSC, 4:2:2 (525/625), and 360Mb/s wide screen (525/625) |
| **VIDEO BANDWIDTH:** | | 200 MHz 3dB | | |
| **VIDEO CROSSTALK:** | | < -50 dB @ 5 MHz | | |
| **VIDEO S/N:** | | >74 dB | | |
| **DIFF. GAIN:** | | <0.05% | | |
| **DIFF. PHASE:** | | <0.03 Deg | | |
| **K-FACTOR:** | | < 0.05% | | |
| **AUDIO BANDWIDTH:** | > 40 kHz; 0.3db | | | |
| **AUDIO CROSSTALK:** | < - 90 dB | | | |
| **AUDIO S/N:** | > 90 dB unweighted (1Vpp) | | | |
| **AUDIO THD:** | < 0.02% (1Vpp, 1kHz) | | | |
| **MAXIMAL AUDIO** | 20 dBm | | | |
| **EQUALIZATION:** | | | Automatic up to 200mV eye pattern | Automatic for up to 300m for 270 Mb/s using Belden 8281 cable |
| **DISPLAY:** | Current switcher status on eight 7-segment bright LEDs | | Current switcher status on eight 7-segment bright LEDs. Signal presence for each channel on front panel LEDs | |
| **CONTROLS:** | 22 front-panel touch switches, RS-232 and RS-485 control interface | | | |

| | VS-88A | VS-88V | SD-7588A | SD-7588V |
|---|---|---|---|---|
| **SWITCHING:** | During vertical interval from Analog sync | | | |
| **DIMENSIONS:** | 19-inch (W) x 7-inch (D) x 1U (H), rack mountable | | | |
| **POWER SOURCE:** | AC-110V/60Hz, 220V/50Hz (switchable inside the unit) | | | Universal, 85-264 VAC, 47-440 Hz, 25 VA max |
| **WEIGHT:** | 3.5 kg. (7.8 lbs.) approx. | | | |
| **ACCESSORIES:** | Power cord, Windows 95/98/NT ™ control software | | | |

| | VS-8000 |
|---|---|
| **INPUTS/OUTPUTS:** | 1x RS-485 connector on detachable terminal blocks |
| **CONTROLS:** | 8 illuminated pushbuttons each assigned to a different controlled unit address. 8 out / 8 in / 5 operational pushbuttons similar to the *88 Series* |
| **DIMENSIONS:** | 8.5-inch (W) x 1.5-inch (D) x 5.5-inch (H), (21.6 cm x 3.8 cm x 14 cm) |
| **POWER SOURCE:** | 12V DC, 200 mA |
| **WEIGHT:** | 0.4 kg (0.9 lbs.) approx. |
| **ACCESSORIES:** | Wall Power supply |

**LIMITED WARRANTY**

Kramer Electronics (hereafter *Kramer*) warrants this product free from defects in material and workmanship under the following terms.

**HOW LONG IS THE WARRANTY**

Labor and parts are warranted for three years from the date of the first customer purchase.

**WHO IS PROTECTED?**

Only the first purchase customer may enforce this warranty.

**WHAT IS COVERED AND WHAT IS NOT COVERED**

Except as below, this warranty covers all defects in material or workmanship in this product. The following are not covered by the warranty:

1. Any product which is not distributed by Kramer, or which is not purchased from an authorized Kramer dealer. If you are uncertain as to whether a dealer is authorized, please contact Kramer at one of the agents listed in the web site www.kramerelectronics.com.
2. Any product, on which the serial number has been defaced, modified or removed.
3. Damage, deterioration or malfunction resulting from:
   - i) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature
   - ii) Product modification, or failure to follow instructions supplied with the product
   - iii) Repair or attempted repair by anyone not authorized by Kramer
   - iv) Any shipment of the product (claims must be presented to the carrier)
   - v) Removal or installation of the product
   - vi) Any other cause, which does not relate to a product defect
   - vii) Cartons, equipment enclosures, cables or accessories used in conjunction with the product

**WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR**

We will pay labor and material expenses for covered items. We will not pay for the following:

1. Removal or installations charges.
2. Costs of initial technical adjustments (set-up), including adjustment of user controls or programming. These costs are the responsibility of the Kramer dealer from whom the product was purchased.
3. Shipping charges.

**HOW YOU CAN GET WARRANTY SERVICE**

1. To obtain service on you product, you must take or ship it prepaid to any authorized Kramer service center.
2. Whenever warranty service is required, the original dated invoice (or a copy) must be presented as proof of warranty coverage, and should be included in any shipment of the product. Please also include in any mailing a contact name, company, address, and a description of the problem(s).
3. For the name of the nearest Kramer authorized service center, consult your authorized dealer.

**LIMITATION OF IMPLIED WARRANTIES**

All implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this warranty.

**EXCLUSION OF DAMAGES**

The liability of Kramer for any effective products is limited to the repair or replacement of the product at our option. Kramer shall not be liable for:

1. Damage to other property caused by defects in this product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss; or:
2. Any other damages, whether incidental, consequential or otherwise. Some countries may not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights, which vary from place to place.
**NOTE**: All products returned to Kramer for service must have prior approval. This may be obtained from your dealer.
This equipment has been tested to determine compliance with the requirements of:

| | |
|---|---|
| EN-50081: | "Electromagnetic compatibility (EMC);<br>generic emission standard.<br>Part 1: Residential, commercial and light industry" |
| EN-50082: | "Electromagnetic compatibility (EMC) generic immunity standard.<br>Part 1: Residential, commercial and light industry environment". |
| CFR-47: | FCC Rules and Regulations:<br>Part 15: "Radio frequency devices<br>Subpart B – Unintentional radiators" |

**CAUTION!**

- ☒ Servicing the machines can only be done by an authorized Kramer technician. Any user who makes changes or modifications to the unit without the expressed approval of the manufacturer will void user authority to operate the equipment.
- ☒ Use the supplied DC power supply to feed power to the machine.
- ☒ Please use recommended interconnection cables to connect the machine to other components.

**The list of Kramer distributors appears on our web site:**
**www.kramerelectronics.com**

**We welcome your questions, comments and feedback.**

**Kramer Electronics, Ltd.**
3 Am VeOlamo Street. Jerusalem 95463, Israel Tel: (+972-2)-654-4000
Fax: (+972-2)-653-5369, E-mail: kramerel@netvision.net.il
**P/N: 2900-002011 REV 2**