

**Kramer Electronics, Ltd.**



# **USER MANUAL**

**Model:**

**VS-162V**

*16x16 Video Matrix Switcher*

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## 1 Introduction

Welcome to Kramer Electronics! Since 1981, Kramer Electronics has been providing a world of unique, creative, and affordable solutions to the vast range of problems that confront the video, audio, presentation, and broadcasting professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better! Our 1,000-plus different models now appear in 11 groups<sup>1</sup> that are clearly defined by function.

Congratulations on purchasing your Kramer **VS-162V 16x16 Video Matrix Switcher**.

This product is ideal for:

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

The package includes the following items:

- **VS-162V 16x16 Video Matrix Switcher**
- Windows<sup>®</sup>-based Kramer control software<sup>2</sup>
- Power cord and null-modem adapter
- This user manual<sup>3</sup>

## 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

### 2.1 Quick Start

This quick start chart summarizes the basic setup and operation steps.

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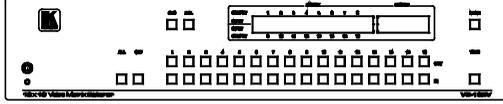
1 GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Matrix Switchers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters; GROUP 11: Sierra Products

2 Download the latest software from our Web site at <http://www.kramerelectronics.com>

3 Download up-to-date Kramer user manuals from our Web site at <http://www.kramerelectronics.com>

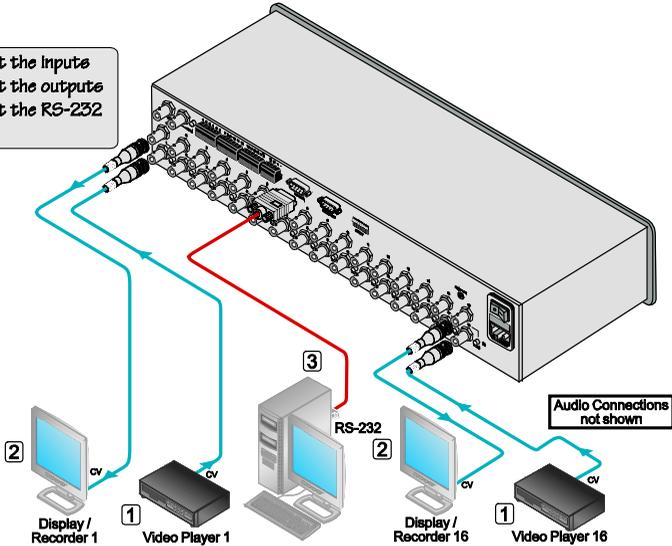
**Step 1: Mount the machine - see section 5**

Mount the machine in a rack or stick the 4 rubber feet to the underside



**Step 2: Connect the Inputs and outputs - see section 6**

- 1 Connect the Inputs
- 2 Connect the outputs
- 3 Connect the RS-232 control



**Step 3: Turn the power ON**

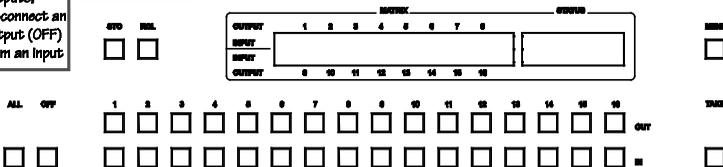
**Step 4: Operate the machine - see section 10**

Connect a selected input to ALL the outputs; disconnect an output (OFF) from an input

Store (STO) and recall (RCL) the status

Read the connections and the status on the 7-segment display

Use MENU to scan and enter commands



Use the IN and OUT buttons to switch the inputs to the outputs

Press TAKE to confirm actions

Operate via the front panel buttons, RS-232, and RS-485

### 3 Overview

The Kramer **VS-162V** is a high-performance 16x16 vertical interval matrix switcher for composite video signals on BNC connectors. In addition to its typical 16x16 operation, the **VS-162V** can be configured as follows:

- 8x8 for s-Video (Y/C)
- 5x5 for YUV or RGB (with the sync on the green signal - RG<sub>S</sub>B)
- 4x4 for RGBS signals

A main advantage of the **VS-162V** is that it forms part of the series of 16x16 matrix switchers that includes, but is not limited to, **VS-1616A** (a 16x16 analog balanced stereo audio matrix switcher), **VS-1616SDI** (a 16x16 digital video matrix switcher), **VS-1616AD** (a 16x16 digital audio matrix switcher), and **VS-1616RS** (an RS-422 control signal matrix switcher).

In particular, the **VS-162V**:

- Produces glitch-free transitions, when sources share a common reference sync<sup>1</sup>
- Offers excellent video performance, which ensures that it remains transparent in almost any video application

In addition the **VS-162V**:

- May be used as a single unit, or expanded to up to 96 x 96 inputs/outputs
- Can be configured into a Kramer multi-signal switcher system including digital and analog video, digital and analog audio, and RS-422 control switchers
- When integrated in a system, all units switch in true audio-follow-video mode
- Recalls up to 99 configuration setups via the non-volatile memory and provides for an unlimited quantity of setups when using the Kramer control software on your PC
- Includes a user-friendly LCD display (making operation even easier)
- With its FLASH memory, lets you upgrade to the latest Kramer firmware version via Internet download
- Comes with a choice of protocol format: hexadecimal or ASCII

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<sup>1</sup> As it switches during the vertical interval

You can control the **VS-162V**:

- Using the front panel buttons
- Remotely, by RS-485 or RS-232 serial commands transmitted by a touch screen system, PC, or other serial controller
- Remotely, from the Kramer **RC-IR2** Infrared Remote Control Transmitter
- An external remote IR receiver (optional), see section [4.1](#)
- Via external dry-contact push buttons

To achieve the best performance:

- Connect 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)
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality and position your Kramer **VS-162V** in a location free from moisture and away from excessive sunlight and dust

## 4 Your Video Matrix Switcher

[Figure 1](#) and [Table 1](#) define the front and rear panels of the **VS-162V**.

# Your Video Matrix Switcher

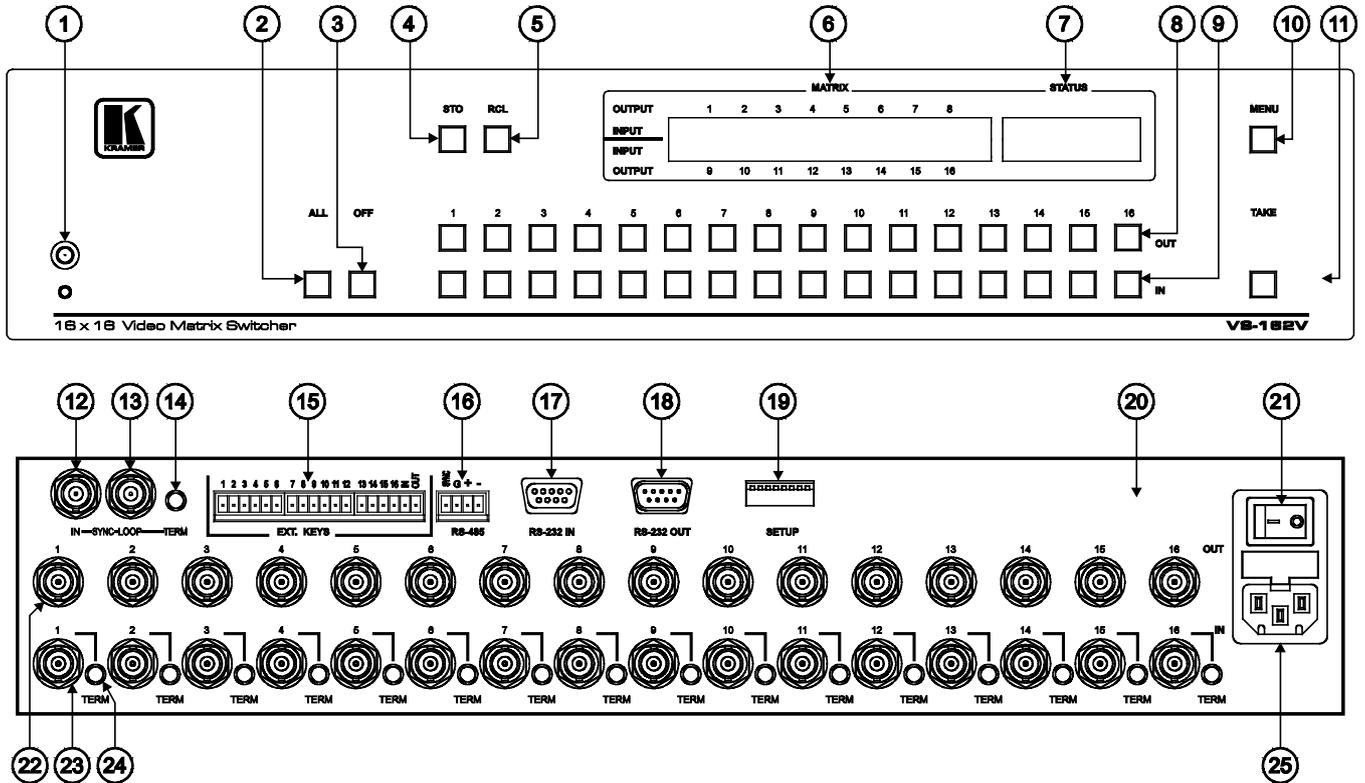


Figure 1: VS-162V 16x16 Video Matrix Switcher

Table 1: Front Panel VS-162V 16x16 Video Matrix Switcher Features

#	Feature	Function	
1	IR Receiver	The red LED is illuminated when receiving signals from the Infrared remote control transmitter	
2	ALL Button	Pressing ALL followed by an INPUT button, connects that input to all outputs	
3	OFF Button	An OFF-OUT combination disconnects that output from the inputs; an OFF-ALL combination disconnects all the outputs	
4	STO Button	Stores the current setting in the non-volatile memory	
5	RCL Button	Recalls a setup from the non-volatile memory	
6	LCD MATRIX display <sup>1</sup>	Displays the selected input(s) switched to the output(s) (above or below the corresponding OUTPUT label) and user interface messages	
7	LCD STATUS Display <sup>1</sup>	Displays the matrix status	
8	OUT Buttons	Select the output to which the input is switched (from 1 to 16)	
9	IN Buttons	Select the input to switch to the output (from 1 to 16)	
10	MENU Button	Selects the programming commands to setup the switcher	
11	TAKE Button	Used to confirm and complete setup and switching	
12	SYNC	IN BNC Connector	Connects to the external video sync source
13		LOOP BNC Connector	Connects to the SYNC IN connector on the next unit
14	TERM SYNC Button		Press to terminate at 75Ω or release for looping <sup>2</sup>
15	EXT. (extension) KEYS Terminal Block Connectors		Connects to an external keyboard (remote unit)
16	RS-485 Detachable Terminal Block Port		Pins # 1 and # 2 are for vertical sync and Ground connection, and Pins # 3 and # 4 are for RS 485
17	RS-232 IN 9-pin D-sub (F) Port		Connects to the PC or the Remote Controller <sup>3</sup>
18	RS-232 OUT 9-pin D-sub (M) Port		Connects to the RS-232 IN 9-pin D-sub port of the next unit in the daisy-chain connection
19	SETUP DIP-Switches		DIP-switches for setup of the unit
20	REMOTE IR 3.5mm Mini Jack		Connect to an external IR receiver unit for controlling the machine via an IR remote controller (instead of using the front panel IR receiver) <sup>4</sup>
21	Power Switch		Illuminated switch for turning the unit ON or OFF
22	OUT BNC Connectors		Connect to the video acceptors (from 1 to 16)
23	IN BNC Connectors		Connect to the video sources (from 1 to 16)
24	TERM IN Buttons		Press to terminate at 75Ω or release for looping <sup>5</sup>
25	Power Connector with Fuse		AC connector enabling power supply to the unit

<sup>1</sup> In sections [11.1](#) and [12.2](#) the word “Displays” refers to the LCD MATRIX and STATUS Displays

<sup>2</sup> Push in to terminate the sync line. Push out when the sync line extends to another unit

<sup>3</sup> If the unit is not the first unit in the line, connects to the RS-232 OUT 9-pin D-sub port of the previous unit in the line

<sup>4</sup> Can be used instead of the front panel (built-in) IR receiver to remotely control the machine, see section [4.1](#)

<sup>5</sup> Push in to terminate the input. Push out when the input extends to another unit (the last unit in the chain must be terminated when looping)

## 4.1 Using the IR Transmitter

You can use the **RC-IR2** IR transmitter to control the machine via the built-in IR receiver on the front panel or, instead, via an optional external IR receiver<sup>1</sup>. The external IR receiver can be located 15 meters away from the machine. This distance can be extended to up to 60 meters when used with three extension cables<sup>2</sup>

Before using the external IR receiver, be sure to arrange for your Kramer dealer to insert the internal IR connection cable<sup>3</sup> with the 3.5mm connector that fits into the REMOTE IR opening on the rear panel. Connect the external IR receiver to the REMOTE IR 3.5mm connector.

---

1 Model: C-A35M/IRR-50

2 Model: C-A35M/A35F-50

3 P/N: 505-70434010-S

## 5 Installing the VS-162V in a Rack

This section describes what to do before installing in a rack and how to rack mount.

### Before Installing in a Rack

Before installing in a rack, be sure that the environment is within the recommended range:	
Operating temperature range	+5° to +45° C (41° to 113° F)
Operating humidity range	10 to 90% RHL, non-condensing
Storage temperature range	-20° to +70° C (-4° to 158° F)
Storage humidity range	5 to 95% RHL, non-condensing



### CAUTION!!

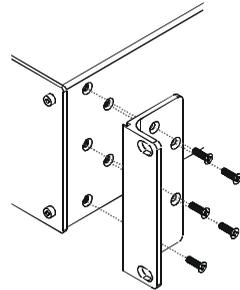
When installing in a 19" rack, avoid hazards by taking care that:

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.

### How to Rack Mount

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 (3 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 that:

- **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 (you can download it at: <http://www.kramerelectronics.com>)

## 6 Installing and Operating a Single VS-162V - Overview

To install the **VS-162V**, connect the following<sup>1</sup> to the rear panel, as required:

- Power cord
- Video input and output cables
- Control interface cables between switcher units, or PC (or other controller), as described in section [9](#)
- Set the DIP-switches, as described in section [8](#)
- Set the system variables using the MENU function, as described in section [11](#)

By default, the **VS-162V** is setup for operation as a single machine.

This means that it is:

- A 16x16 composite video switcher
- Switched during the vertical interval of the external reference

In particular, be sure that the DIP-switches are set as shown in [Figure 2](#) (for more information, see section [8](#)):

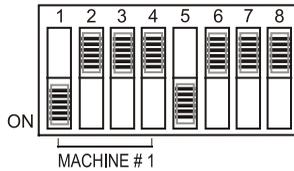


Figure 2: DIP-Switch Setup on a Single Machine

To operate a single machine, see [Table 2](#).

Table 2: Quick Reference Operating Guide for a Single Machine

To perform this command:	Press:
Connect an input with an output	OUT #; IN #
Reset a specific output	OUT #; OFF
Reset all outputs	ALL; OFF
Connect all outputs to a specific input	ALL; IN #
Store a setup	STO; OUT #; TAKE
Recall a setup	RCL; OUT #; TAKE
Lock front panel	MENU; TAKE
Unlock front panel	TAKE; TAKE
Change default setup	Press the Menu button several times until you reach the appropriate Menu setup command and follow the instructions

<sup>1</sup> Switch OFF the power on each device before connecting it to your VS-162V

## 7 Configuring the VS-162V Video Matrix Switcher

Using the **VS-162V** unit and/or other 16x16 matrix switchers in the series<sup>1</sup>, you can assemble the following kinds of systems:

- A standalone switcher (see section [7.1](#))
- A multi-channel video switcher (see section [7.2](#))
- An expanded matrix switcher (see section [7.3](#))
- A system of interconnected switchers (see section [7.4](#))

**Note:** When configuring multiple units, each unit must have an address. For an explanation on addressing and system modes, see section [8](#).

### 7.1 Configuring the Standalone VS-162V

This section describes how to configure your **VS-162V** as a standalone switcher for:

- Composite video (CV) (see section [7.1.1](#))
- s-Video (Y/C) (see section [7.1.2](#))
- YUV (RGB) (see section [7.1.3](#))
- RGBS (see section [7.1.4](#))

[Table 3](#) defines the number of inputs and outputs for each signal configuration:

*Table 3: Standalone Switcher Configuration for CV, Y/C, YUV (RGB) and RGBS*

Configuration	Number of Inputs and Outputs on a Standalone Unit
Composite	16x16
s-Video (Y/C)	8x8
YUV / RGB	5x5
RGBS	4x4

#### 7.1.1 Configuring a 16x16 Composite Video Switcher

By default, a single **VS-162V** unit is configured for composite video with 16 inputs and 16 outputs, as shown in [Figure 3](#):

<sup>1</sup> Including the VS-1616A (a 16x16 analog balanced stereo audio matrix switcher), the VS-1616SDI (a 16x16 digital video matrix switcher), and the VS-1616AD (a 16x16 digital audio matrix switcher)

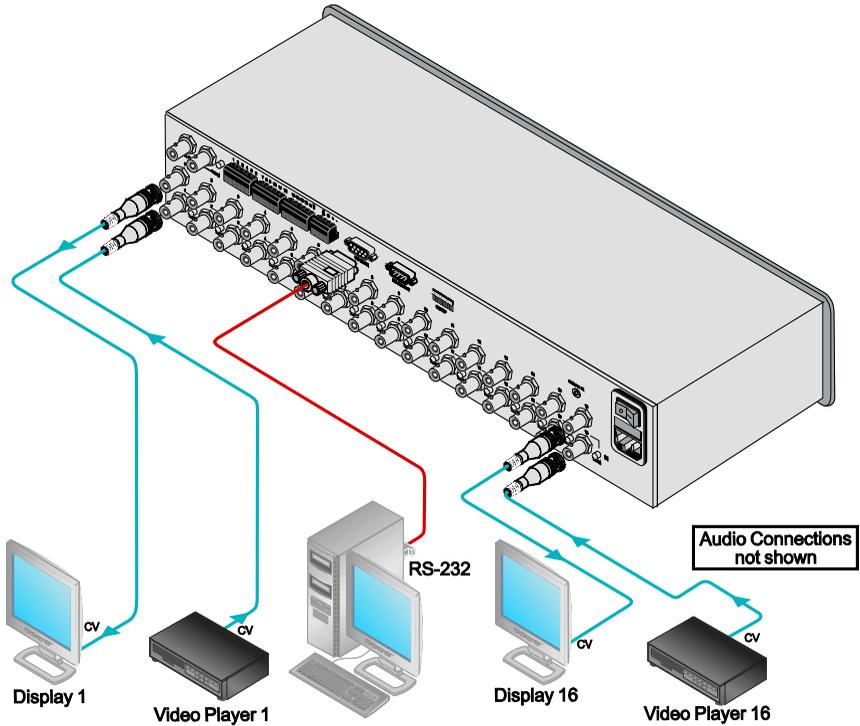


Figure 3: Configuring the VS-162V for Composite Video (CV)

### 7.1.2 Configuring an 8x8 s-Video (Y/C) Switcher

To configure a single VS-162V switcher as an 8x8 video matrix switcher (with 8 inputs and 8 outputs) for s-Video (Y/C), group the inputs and outputs into pairs, as shown in Figure 4:

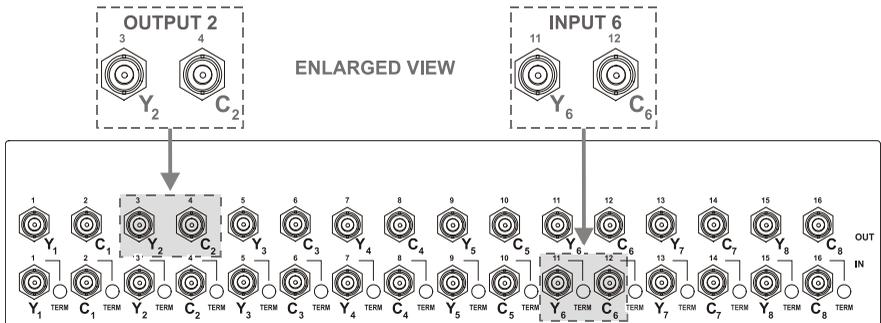


Figure 4: Configuring the VS-162V for s-Video (Y/C)

### 7.1.3 Configuring a 5x5 YUV/RGB Switcher

To configure a single **VS-162V** switcher as a 5x5 video matrix switcher for YUV (or RGB), group the inputs and outputs<sup>1</sup> into sets of 3, as shown in [Figure 5](#). The YUV channel is also appropriate for RG<sub>S</sub>B. In this case, connect G<sub>S</sub> for Y, R for V and B for U.

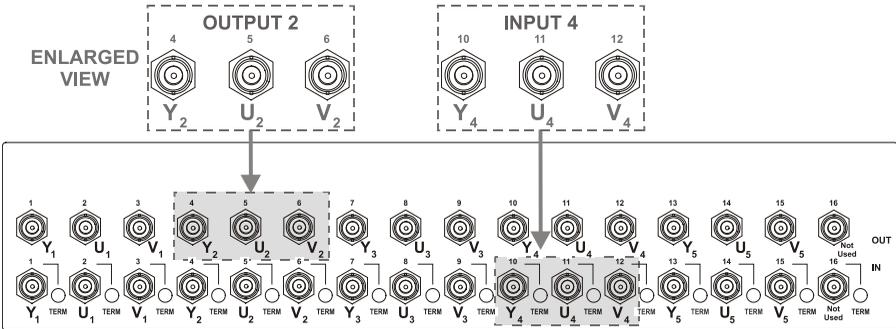


Figure 5: Configuring the VS-162V for YUV (RGB)

### 7.1.4 Configuring a 4x4 RGBS Switcher

To configure a single **VS-162V** switcher as a 4x4 video matrix switcher for RGBS, group the inputs and outputs into sets of 4, as shown in [Figure 6](#):

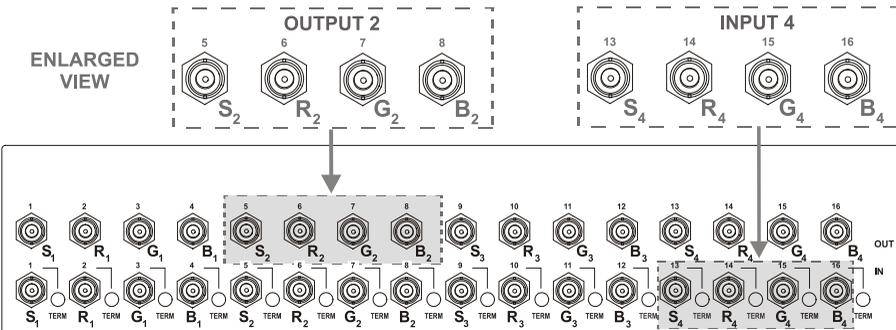


Figure 6: Configuring the VS-162V for RGBS

<sup>1</sup> Input 16 and output 16 are not used

## 7.2 Configuring 16x16 Multi-Channel Video Switchers

You can configure **VS-162V** units as a 16x16 multi-channel video switcher for:

- s-Video (Y/C) (see section [7.2.1](#))
- YUV (RGB) (see section [7.2.2](#))
- RGBS (see section [7.2.3](#))

You may need several **VS-162V** units to expand the system, as [Table 4](#) defines. For example, for composite configuration, a single **VS-162V** unit provides 16 inputs and 16 outputs. However, for s-Video (Y/C) configuration you need two **VS-162V** units to provide 16 inputs and 16 outputs.

In a multi-channel video switcher configuration, one unit must be the master (with DIP 6 OFF) while the other units are slaves (with DIP 6 ON).

The front panel of each slave unit is always locked and the *MATRIX* and *STATUS* LCD displays do not illuminate. The slave units follow the master. The master unit operates in the regular way<sup>1</sup>, leading the slaves in the background.

**Note:** To activate a multi-channel video switcher so that each unit is in the same state from the outset, turn on the master unit power **before** turning on the slave units.

*Table 4: 16x16 Multi-Channel Configurations*

Configuration	No. VS-162Vs Needed to Make a 16x16 Switcher
Composite	1
s-Video (Y/C)	2
YUV / RGB	3
RGBS	4

### 7.2.1 Configuring a 2-Unit 16x16 Y/C Switcher

To configure a 16x16 s-Video (Y/C) video matrix switcher, combine two **VS-162V** switchers. Connect as shown in *Figure 7*, substituting the C unit for the U unit and ignoring the V unit. Set the DIP-switches as shown in [Figure 7](#). Connect the communication line via the RS-232 or RS-485 control interface as described in section 9.

<sup>1</sup> The front panel is not locked and the *MATRIX* and *STATUS* LCD Displays illuminate

### 7.2.2 Configuring a 3-Unit 16x16 YUV/RGB Switcher

To configure a 16x16 YUV video matrix switcher, combine<sup>1</sup> three VS-162V switchers, as shown in [Figure 7](#):

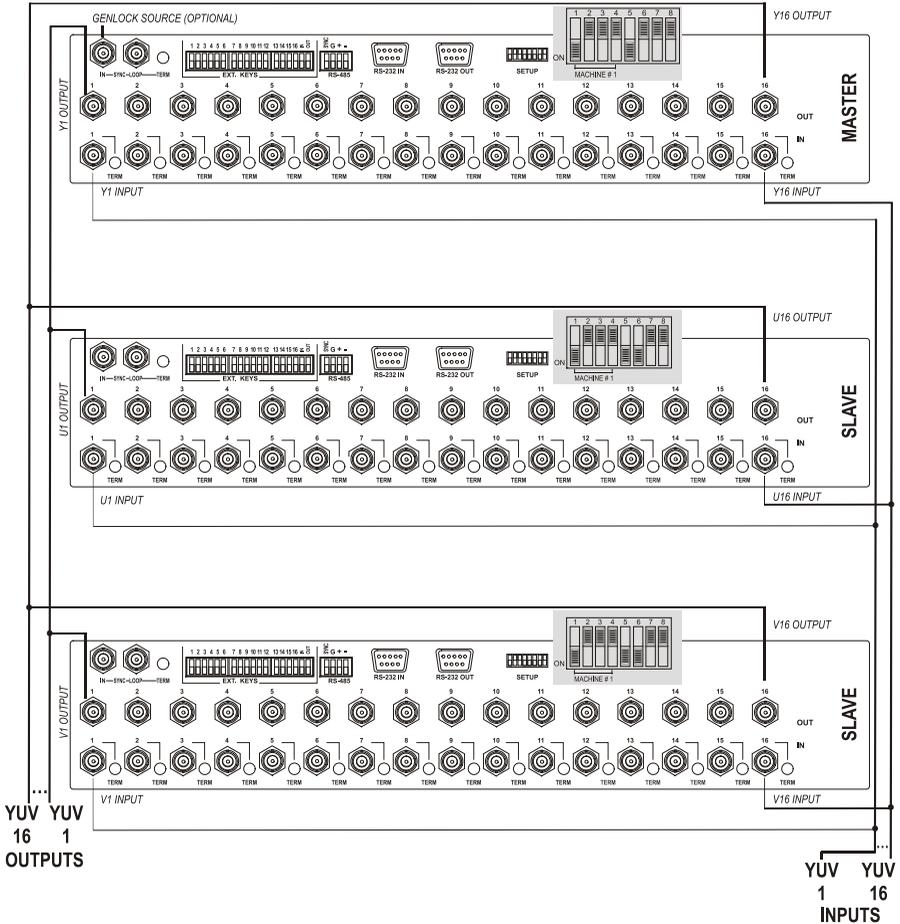


Figure 7: Configuring a 16x16 YUV (RGB) Switcher with 3 VS-162V Units

<sup>1</sup> For a description of how to connect the RS-485 connectors between the VS-162V switchers, refer to section [9.2](#)

### 7.2.3 Configuring a 4-Unit 16x16 RGBS Switcher

To configure four **VS-162V** switchers as a 16x16 RGBS video matrix switcher, combine three **VS-162V** switchers for YUV (RGB) as shown in [Figure 7](#).

### 7.3 Configuring a Multi-Unit Matrix Switcher

You can greatly expand the number of inputs and outputs using several **VS-162V** units<sup>1</sup>. To do this, you must set a unique **MACHINE ADDRESS #** (see section [8.3](#)) on each **VS-162V** unit. This defines which inputs and outputs are configured to a particular unit, as the chart in [Figure 8](#) illustrates.

For example, to connect a 48x64 switcher (48 inputs and 64 outputs), you would configure using **MACHINE ADDRESS #** 1, 2, 3, 4; 7, 8, 9, 10; 13, 14, 15 and 16. You can only choose a rectangular<sup>2</sup> configuration from the chart in [Figure 8](#).

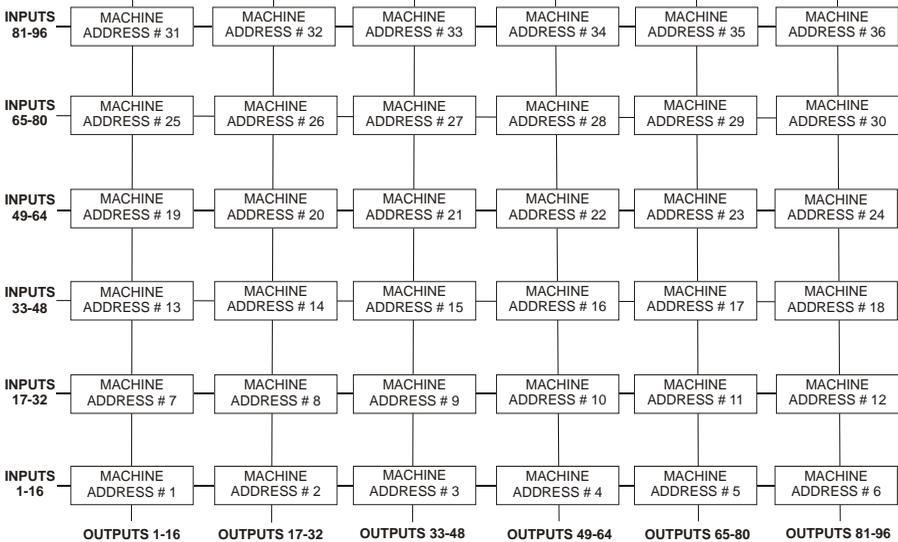


Figure 8: MACHINE ADDRESS # Designation

1 For example, a 32x32 switcher and a 32x16 switcher. In fact, you can connect up to 36 units to form a switcher with 96 inputs and 96 outputs

2 For example, like this:  but not like this: 

### 7.3.1 Configuring a 32x16 Switcher

A 32x16 switcher consists of two **VS-162V** units (MACHINE ADDRESS # 1 and MACHINE ADDRESS # 7), as shown in [Figure 8](#). To make this configuration, as shown in [Figure 9](#):

1. Set the MACHINE # on both **VS-162V** units to #1 (see section [8.2](#)).
2. Set the MACHINE ADDRESS # on one **VS-162V** unit to 1 and on the other **VS-162V** unit to 7 (refer to [Figure 8](#)).
3. **Set DIP 6 OFF** on both **VS-162V** units.
4. Using T-connectors, connect OUTPUTS 1 to 16 on both **VS-162V** units. OUTPUTS 1 to 16 become the SYSTEM OUTPUTS 1 to 16, while the inputs on the MACHINE ADDRESS # 1 are system inputs 1 to 16, and the inputs on the MACHINE ADDRESS # 7 are system inputs 17 to 32. The two **VS-162V** units form a 32x16 switcher.

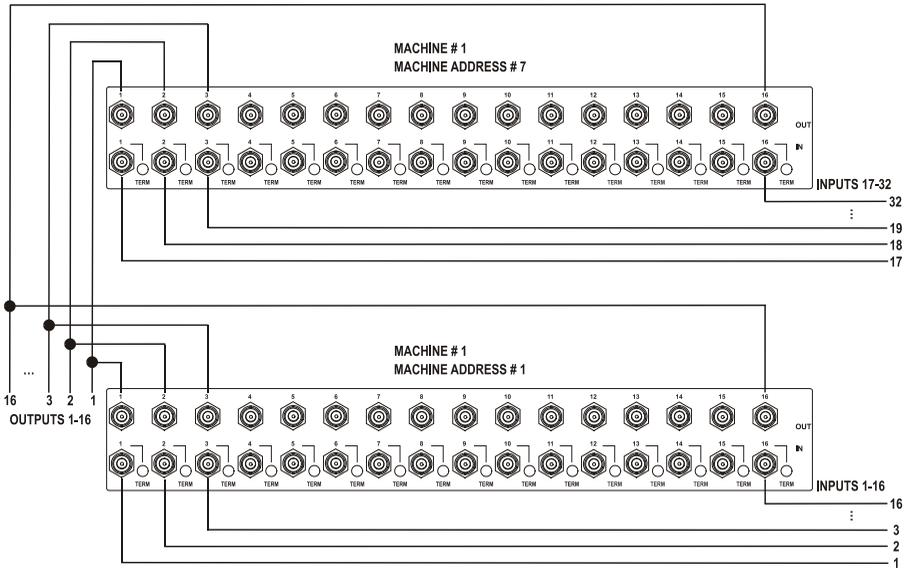


Figure 9: Configuring a 32x16 Switcher

### 7.3.2 Configuring a 32x32 Switcher

As shown in [Figure 8](#), a 32x32 switcher consists of four **VS-162V** units (MACHINE ADDRESS # 1, MACHINE ADDRESS # 2, MACHINE ADDRESS # 7 and MACHINE ADDRESS # 8). To assemble, as shown in [Figure 10](#):

1. Set the **same** MACHINE #<sup>1</sup> on all the four **VS-162V** units.
  2. Set the MACHINE ADDRESS # to 1, 2, 7 and 8 on each of the four units, respectively (refer to [Figure 8](#)).
  3. **Set DIP 6 OFF** on each of the four **VS-162V** units.
  4. Using T-connectors, connect INPUTS 1 to 16 on the **VS-162V** unit designated as MACHINE ADDRESS # 2 with INPUTS 1 to 16 on the **VS-162V** unit designated as MACHINE ADDRESS # 1.
  5. Terminate the INPUTS on MACHINE ADDRESS # 2 to 75Ω (push in the *TERM* button<sup>2</sup> next to the INPUT BNCs) and put the inputs in MACHINE ADDRESS # 1 into Hi-Z state (release the *TERM* buttons next to the INPUT BNCs).  
INPUTS 1 to 16 become the SYSTEM INPUTS 1 to 16.
  6. Using T-connectors, connect INPUTS 17 to 32 on the **VS-162V** unit designated as MACHINE ADDRESS # 8 with INPUTS 17 to 32 on the **VS-162V** unit designated as MACHINE ADDRESS # 7.
  7. Terminate the INPUTS on MACHINE ADDRESS # 8 to 75 Ω. Push in the *TERM* button next to the INPUT BNCs) and put the inputs in MACHINE ADDRESS # 7 into Hi-Z state (release the *TERM* buttons next to the INPUT BNCs).  
INPUTS 17 to 32 become the SYSTEM INPUTS 17 to 32.
  8. Using T-connectors, connect OUTPUTS 1 to 16 on the **VS-162V** unit designated as MACHINE ADDRESS # 7 with OUTPUTS 1 to 16 on the **VS-162V** unit designated as MACHINE ADDRESS # 1.  
OUTPUTS 1 to 16 become the SYSTEM OUTPUTS 1 to 16.
  9. Using T-connectors, connect OUTPUTS 17 to 32 on the **VS-162V** unit designated as MACHINE ADDRESS # 8 with OUTPUTS 17 to 32 on the **VS-162V** unit designated as MACHINE ADDRESS # 2.  
OUTPUTS 17 to 32 become the SYSTEM OUTPUTS 17 to 32.
- The 4 **VS-162V** units form a 32x32 switcher.

---

<sup>1</sup> Set to # 1 in most cases. In the example in [Figure 10](#), the MACHINE # is set to # 2

<sup>2</sup> Item 10 on the rear panel in [Figure 1](#)

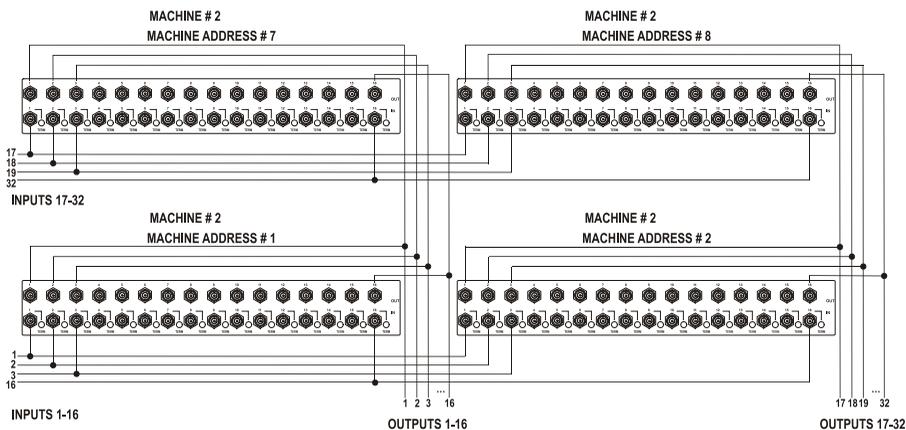


Figure 10: Connecting the 32x32 Switcher

## 7.4 Configuring a System of Interconnected Switchers

A major advantage of the **VS-162V** is that it belongs to the series of 16x16 matrix switchers that can interconnect with other switchers in the series. This series includes, but is not limited to, **VS-1616A** (a 16x16 analog balanced stereo audio matrix switcher), **VS-1616SDI** (a 16x16 digital video matrix switcher), **VS-1616AD** (a 16x16 digital audio matrix switcher), and **VS-1616RS** (an RS-422 control signal matrix switcher).

The block diagram in [Figure 11](#) illustrates how to assemble an interconnected varied-format 16x16 series switcher that consists of a 32x32 composite video matrix switcher, a 32x16 digital video matrix switcher, a 32x32 balanced stereo audio matrix switcher, and a 16x16 digital audio matrix switcher.

Note that each group of switchers has a unique MACHINE # that is shared by all members of the group. In [Figure 11](#), the 32x32 composite video matrix switcher is MACHINE # 1, the 32x16 digital video matrix switcher is MACHINE # 2 and so on. Control of the system is via the MACHINE #s.

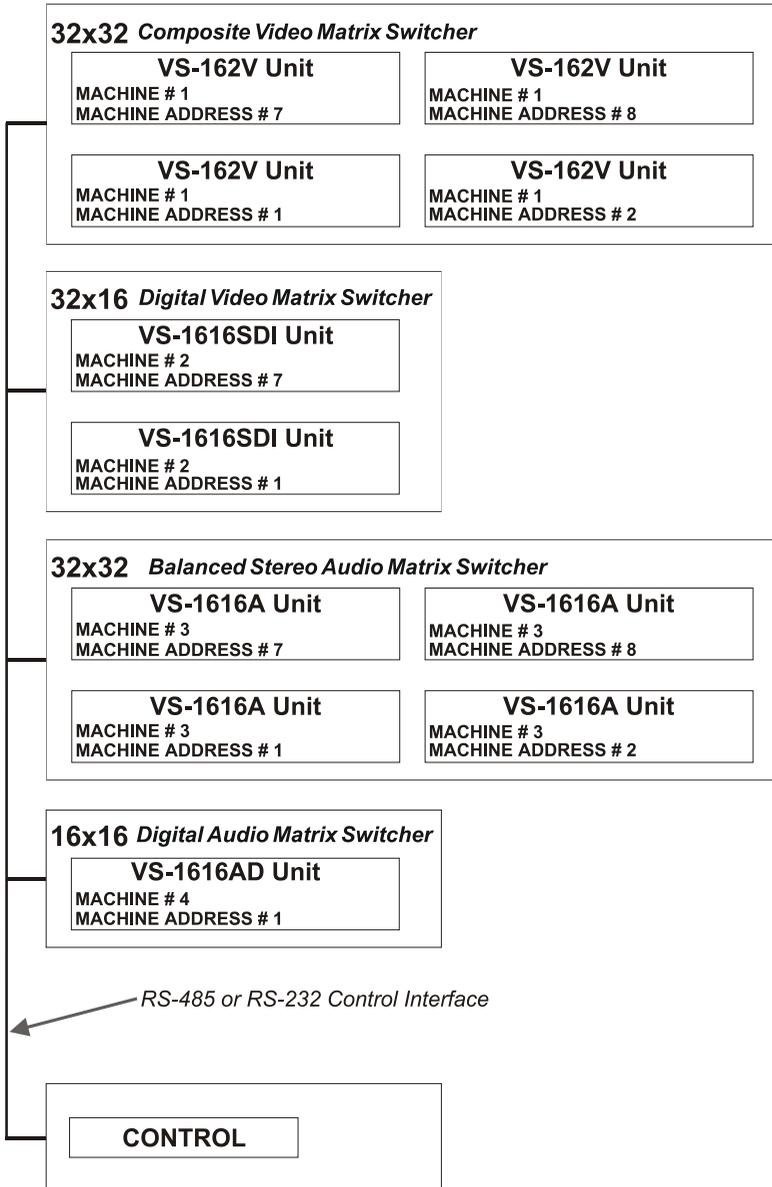


Figure 11: Assembling a System of Interconnected Switchers

Refer to section 8.1 for how to set the DIP-switches, and to section 9 for how to control this group of interconnected varied-format 16x16 series switchers, and other configurations.

## 8 Understanding Addressing and System Modes

In order to control multiple machines, the **VS-162V** uses a system of addressing that includes hardware DIP-switches and menu commands. The DIP-switches are used to set the **MACHINE#** and menu commands are used to set the **MACHINE ADDRESS #**. Note the following:

- A standalone machine is always set to **MACHINE# 1**
- When configuring multiple **VS-162V** units or a matrix of **VS-162V** machines, the array is viewed as one large unit and the DIP-switches of all machines are set to the same **MACHINE#**. However, each machine is set to a unique **MACHINE ADDRESS #** with a menu command on its display panel according to the addressing rule shown in [Figure 8](#)
- When configuring a mix of different model machines, each group of models receives a different **MACHINE#** and each machine is set to a unique **MACHINE ADDRESS #** (see section [7.4](#)).

### 8.1 Setting the DIP-Switches

Configure the **VS-162V** by setting the 8 DIP-switches as [Figure 12](#) and [Table 5](#) define:

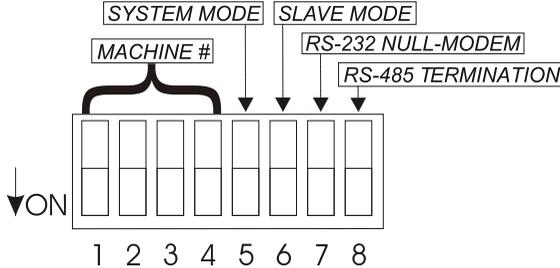


Figure 12: Rear Panel DIP-switches

Table 5: DIP-switch Definitions

DIP-switch #	Function:
1-4	Set the MACHINE # (see <a href="#">Table 6</a> in section <a href="#">8.2</a> )
5	Enables (ON) or disables (OFF) the <i>Follow-SYSTEM</i> mode
6	Enables (ON) or disables (OFF) the <i>SLAVE</i> mode in a multi-channel configuration
7	Disables use of a null-modem adapter <sup>1</sup> with RS-232 OFF = RS-232 connection via a null-modem adapter ON = RS-232 connection without a null-modem adapter
8	RS-485 termination for first and last machine = ON (RS-485 line terminates with 110Ω); for others = OFF (RS-485 line is open)

<sup>1</sup> See section 9.1

## 8.2 Setting the MACHINE #

To control a unit via RS-232 or RS-485, each unit must be identified via its unique MACHINE #. In an extended matrix configuration, in addition to the MACHINE #, each unit is identified via its MACHINE ADDRESS #.

Set the MACHINE #<sup>1</sup> on a **VS-162V** unit according to [Table 6](#).

A valid MACHINE # is from 1 to 15. 0 is not a valid address.

Table 6: Machine # DIP-Switch Settings

MACHINE #	DIP-SWITCH				MACHINE #	DIP-SWITCH			
	1	2	3	4		1	2	3	4
1	ON	OFF	OFF	OFF	9	ON	OFF	OFF	ON
2	OFF	ON	OFF	OFF	10	OFF	ON	OFF	ON
3	ON	ON	OFF	OFF	11	ON	ON	OFF	ON
4	OFF	OFF	ON	OFF	12	OFF	OFF	ON	ON
5	ON	OFF	ON	OFF	13	ON	OFF	ON	ON
6	OFF	ON	ON	OFF	14	OFF	ON	ON	ON
7	ON	ON	ON	OFF	15	ON	ON	ON	ON
8	OFF	OFF	OFF	ON					

## 8.3 Setting the MACHINE ADDRESS #

The MACHINE ADDRESS # is determined via the MACHINE ADDRESS Menu command, as section [11.4](#) describes. The MACHINE ADDRESS # defines which inputs and outputs are configured to that particular unit when expanding, as the chart in [Figure 8](#) illustrates.

A valid MACHINE ADDRESS # is from 1 to 36.

## 8.4 Understanding the SYSTEM Mode

DIP-switch 5 defines whether the **VS-162V** unit communicates with other switchers via a common control line.

You can set **DIP 5 OFF** to disable the *Follow-SYSTEM* mode in the following applications:

- Standalone switcher applications<sup>2</sup>
- A multi-channel video switcher application<sup>3</sup>
- An expanded matrix switcher application<sup>4</sup>

<sup>1</sup> When using a single unit, set the unit to MACHINE # 1

<sup>2</sup> See section [7.1](#)

<sup>3</sup> See section [7.2](#)

<sup>4</sup> See section [7.3](#)

You **must set DIP 5 ON** to enable the *Follow-SYSTEM* mode in an interconnected varied-format switcher application<sup>1</sup>

For a description of the *Follow-SYSTEM* and *Breakaway-from-SYSTEM* menu modes, see section [11.2](#).

## 8.5 Understanding the SLAVE Mode

The SLAVE mode is only used for the multi-channel video switcher configuration<sup>2</sup>, for example, when using three **VS-162V** units to form a YUV switcher, as shown in [Figure 7](#).

One unit is used as the master, and the other two units are slaves. The slaves always follow the master. In the example shown in [Figure 7](#), the first **VS-162V** unit is the master (with DIP 6 set OFF disabling the slave mode) and the second and third **VS-162V** units are slaves (with DIP 6 set ON enabling the slave mode).

On both slave **VS-162V** units, the MATRIX and STATUS Displays do not illuminate and the STATUS Display shows the following message:

**Keyboard LOCKED**

However, the STATUS Display on each slave **VS-162V** unit dynamically shows<sup>3</sup> all changes made from the master **VS-162V** unit.

Front panel control is via the master **VS-162V** unit, on which the front panel buttons are unlocked and both the MATRIX and STATUS displays illuminate.

## 9 Connecting a Control Interface

Connect a control interface (RS-232 or RS-485) unless operating a **VS-162V** as a standalone unit without any control device (that is, with control from the front panel or IR port, and not via a remote controller or a PC).

The control interface must be identical on each switcher in the series of 16x16 matrix switchers; either RS-232 or RS-485. One control interface suffices. Do not use both RS-232 and RS-485 control interfaces in the same configuration. For example, in an interconnected varied-format 16x16 switcher application<sup>1</sup>, if the switcher that connects to the PC connects via

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<sup>1</sup> See section [7.4](#)

<sup>2</sup> See section [7.2](#)

<sup>3</sup> Albeit with an LCD Display that does not illuminate

the RS-232 control interface, each switcher must interconnect via the RS-232 control interface and not via the RS-485 control interface.

Choose the RS-232 control interface for a point-to-point connection with a range of about 25 meters.

Choose the RS-485 control interface to operate the switcher from an extended distance of up to 1000 meters.

## 9.1 Connecting the RS-232 Control Interface

Connect several switchers (from the series of 16x16 matrix switchers) and the control unit in an RS-232 daisy chain arrangement, with or without using a null-modem adapter, as shown in [Figure 13](#).

The RS-232 daisy chain switcher arrangement is transparent. This lets you arrange the switchers (from the series of 16x16 matrix switchers) according to your requirements, and not according to a fixed sequence dependent on the MACHINE # and/or MACHINE ADDRESS #.

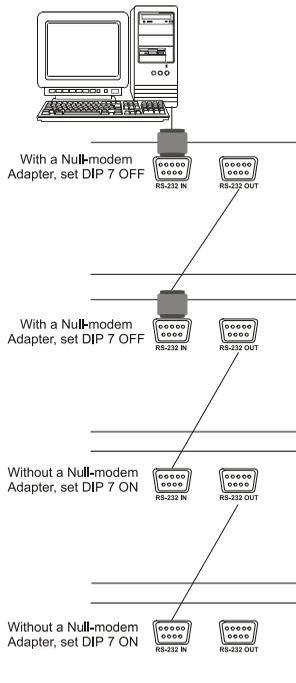


Figure 13: Connecting a PC to 4 VS-162V Units

You can connect any of the following:

- Two **VS-162V** units, using a null-modem adapter (see section [9.1.1](#)) or without using a null-modem adapter (see section [9.1.2](#))
- The 9-pin D-sub COM port of a PC to a **VS-162V** unit with a null-modem adapter (see section [9.1.3](#)) or without a null-modem adapter (see section [9.1.4](#))
- The 25-pin D-sub COM port of a PC to a **VS-162V** unit with a null-modem adapter (see section [9.1.5](#)) or without a null-modem adapter (see section [9.1.6](#))

### 9.1.1 Connecting Two Units with a Null-Modem Adapter

To connect two **VS-162V** units, **using a null-modem adapter** provided with the machine (default):

1. Connect a flat cable<sup>1</sup> between the RS-232 OUT 9-pin D-sub port on the first **VS-162V** unit and the null-modem adapter that attaches to the RS-232 IN 9-pin D-sub port on the second **VS-162V** unit.
2. On the second **VS-162V** unit, set **DIP 7 OFF** (enabling null-modem adapter use).

### 9.1.2 Connecting Two Units without a Null-Modem Adapter

To connect two **VS-162V** units, without using a null-modem adapter:

1. Connect a flat cable<sup>1</sup> between the RS-232 OUT 9-pin D-sub port on the first **VS-162V** unit and the RS-232 IN 9-pin D-sub port on the second **VS-162V** unit.
2. On the second **VS-162V** unit, set **DIP 7 ON** (disabling null-modem adapter use<sup>2</sup>).

### 9.1.3 Connecting to a 9-pin PC COM Port with a Null-Modem Adapter

To connect the 9-pin D-sub COM port of a PC to a **VS-162V** unit, **using a null-modem adapter**:

1. Connect a flat cable<sup>1</sup> between the 9-pin D-sub COM port of the PC and the null-modem adapter that attaches to the RS-232 IN 9-pin D-sub port on the **VS-162V** unit.
2. Set **DIP 7 OFF** (enabling null-modem adapter use<sup>2</sup>) on the **VS-162V** unit.

---

<sup>1</sup> Straight one-to-one uncrossed connections with at least the 3 wires pins # 2, # 3 and # 5

<sup>2</sup> See section 8

### 9.1.4 Connecting to a 9-pin PC COM Port without a Null-Modem Adapter

To connect the 9-pin D-sub COM port of a PC to a **VS-162V** unit, **without using a null-modem adapter**:

1. Connect a flat cable<sup>1</sup> between the 9-pin D-sub COM port of the PC and the RS-232 IN 9-pin D-sub port on the **VS-162V** unit.
2. **Set DIP 7 ON** (disabling null-modem adapter use<sup>2</sup>) on the **VS-162V** unit.

### 9.1.5 Connecting to a 25-pin PC COM Port with a Null-Modem Adapter

To connect the 25-pin D-sub COM port of a PC to a **VS-162V** unit, **using a null-modem adapter**:

1. Connect a flat cable<sup>1</sup> between the 25-pin D-sub COM port and the null-modem adapter that attaches to the RS-232 IN 9-pin D-sub port on the first **VS-162V** unit.
2. **Set DIP 7 OFF** (enabling null-modem adapter use<sup>2</sup>) on the **VS-162V** unit.

### 9.1.6 Connecting to a 25-pin PC COM Port without a Null-Modem Adapter

To connect the 25-pin D-sub COM port of a PC to a **VS-162V** unit, **without using a null-modem adapter**:

1. Connect the 25-pin D-sub COM port to the RS-232 IN 9-pin D-sub port on the **VS-162V** unit, as [Figure 14](#) illustrates:

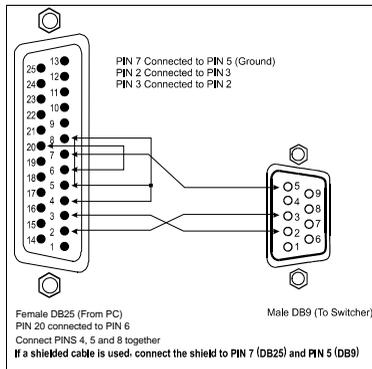


Figure 14: Connecting to a 25-pin PC COM Port without a Null-Modem Adapter

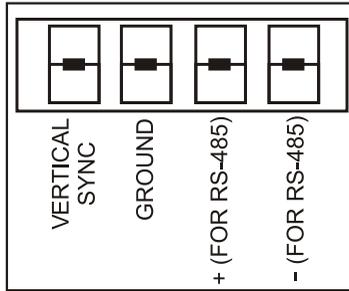
1 Straight one-to-one uncrossed connections with at least the 3 wires pins # 2, # 3 and # 5

2 See section 8

2. **Set DIP 7 ON** (disabling null-modem adapter use<sup>1</sup>) on the **VS-162V** unit.

## 9.2 Connecting the RS-485 Control Interface

[Figure 15](#) defines the RS-485 connector pinout for external RS-485 control. The RS-485 connector is also used (if required) for vertical sync:



*Figure 15: RS-485 Connector PINOUT*

To connect an RS-485 connector on one **VS-162V** unit to an RS-485 connector on one or more other switchers (from the series of 16x16 matrix switchers), as [Figure 16](#) illustrates:

1. Connect the “+” PIN on the first **VS-162V** unit to the “+” PIN on the second **VS-162V** unit or other unit
2. Connect the “-” PIN on the first **VS-162V** unit to the “-” PIN on the second **VS-162V** unit or other unit
3. If shielded cable is used for an RS-485 connection, connect the shield to the Ground PIN.

For details about how to configure the vertical sync (if required), refer to section [9.3](#) and [Figure 21](#) in section [11.5.1](#).

<sup>1</sup> See section 8

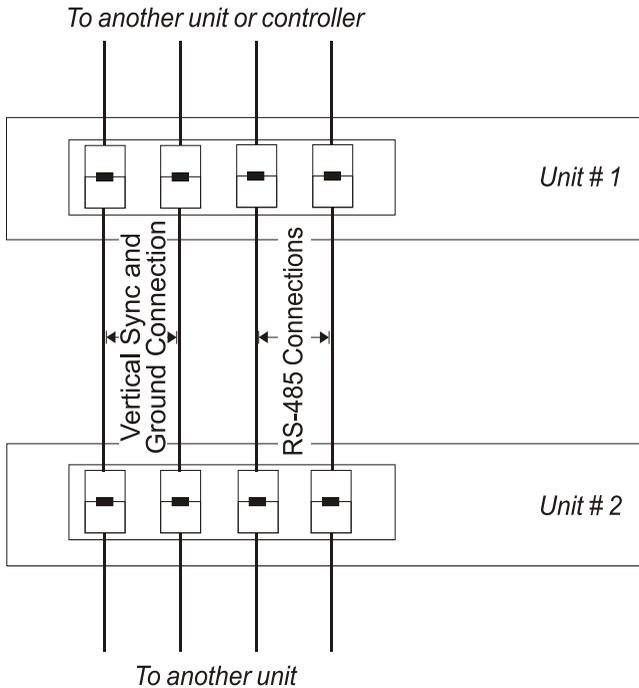


Figure 16: Connecting the RS-485 Connectors between Two VS-162V Units

Figure 17 illustrates the RS-485 line that connects:

- Between each **VS-162V** unit
- To the PC via a Kramer Tools **VP-43xl Interface Converter** (connect the 9-pin D-sub PC COM port to the “RS-232 in” 9-pin D-sub port on the **VP-43xl**. Next, connect the RS-485 port on the **VP-43xl** to the RS-485 ports on the **VS-162V** units)

## Connecting a Control Interface

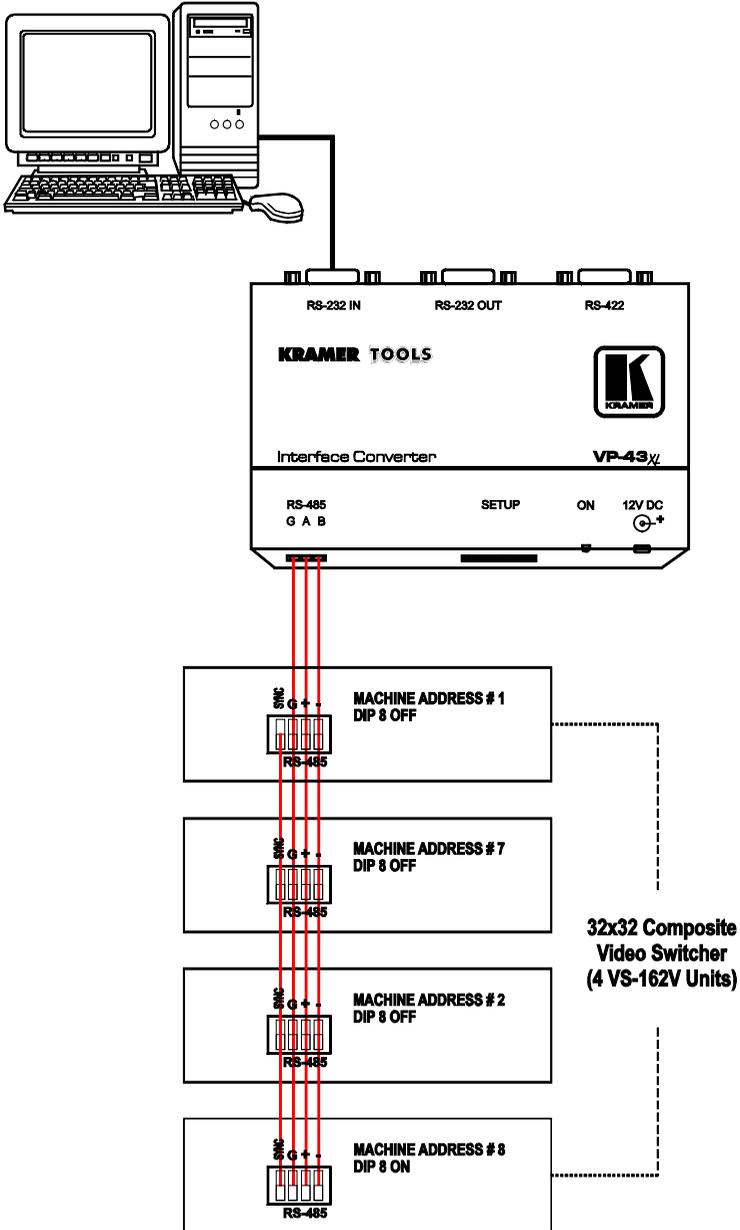


Figure 17: An RS-485 Control Interface Setup

### 9.3 Configuring the Sync

On the **VS-162V**, you can select one of the following, as the sync input:

- EXTERNAL (“sync in” BNC connector)
- INPUT # 1 BNC connector
- MTX (Sync from Matrix) RS-485 terminal block connector, when using multiple machines<sup>1</sup>

Configure the sync via the SWITCHING METHOD menu command setting<sup>2</sup>. When setting up multiple machines (for example, a 48x64 switcher) or a 16x16 YUV switcher, linking a common sync to all the machines may be necessary to facilitate simultaneous vertical interval switching.

Usually, the easiest method is to choose the sync source from the first machine (for example, the Y unit in a 16x16 YUV switcher configuration, as section [7.2.2](#) describes) and then connect all the terminal block connectors, as [Figure 7](#) illustrates.

In this case, set the first machine to select the sync source from the external sync connector or from the INPUT # 1 connector. This sync is now available to the other machines via the RS-485 terminal block connector, as [Figure 15](#) and [Figure 16](#) illustrate. Select the MTX sync on the other machines that receive that sync.

### 9.4 Connecting the KEYBOARD EXTENSION

Connecting dry contact-closure switches to the Keyboard Extension (*EXT. KEYS*) connector enables you to route an input to an output by remote control from a distance of up to 1000 meters. These IN and OUT keys are expandable<sup>3</sup>. [Figure 18](#) shows how to connect the Keyboard Extension (*EXT. KEYS*):

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<sup>1</sup> Refer to section [11.5.1](#)

<sup>2</sup> Refer to section [11.5](#)

<sup>3</sup> Add an unlimited number of push buttons to the existing keys (in parallel) by attaching one end of the push button to the corresponding number and the other end to the IN or OUT

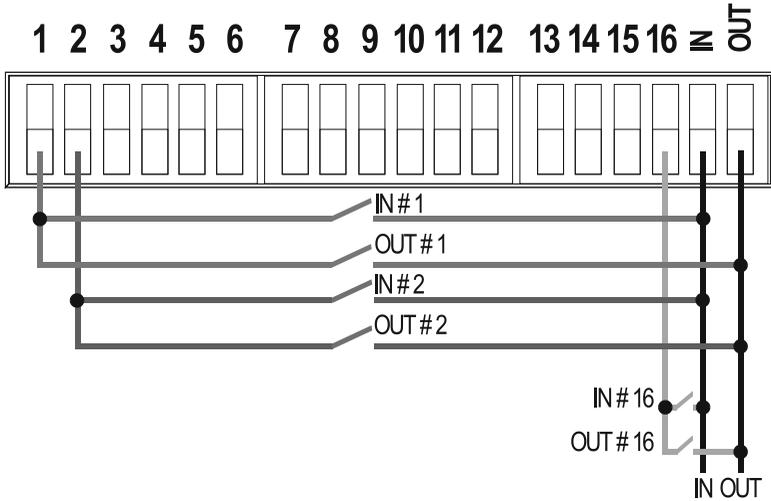


Figure 18: Keyboard Extension (EXT. KEYS) Connector

To use the Keyboard Extension, activate the extended KEYBOARD setting Menu command, as section [11.6](#) describes.

## 10 Operating Your Video Matrix Switcher

You can operate your **VS-162V** using:

- The front panel buttons (as this section describes)
- RS-232 or RS-485 serial commands transmitted by a touch screen system, PC<sup>1</sup>, or other serial controller
- The Kramer **RC-IR2** Infrared Remote Control Transmitter
- Dry contact-closure switches connected to the keyboard extension

### 10.1 Startup Display

After switching on the power, the *MATRIX* and *STATUS*<sup>2</sup> displays show the following screens in sequence:

<sup>1</sup> For instructions on using Kramer Windows 95/98/NT™ Control Software, refer to the separate user manual (included on the CD-ROM in .pdf format), *Kramer Control Software*

<sup>2</sup> Version 1.5 is shown in the Status Display as an example; text in the Matrix Display may vary (according to machine settings)

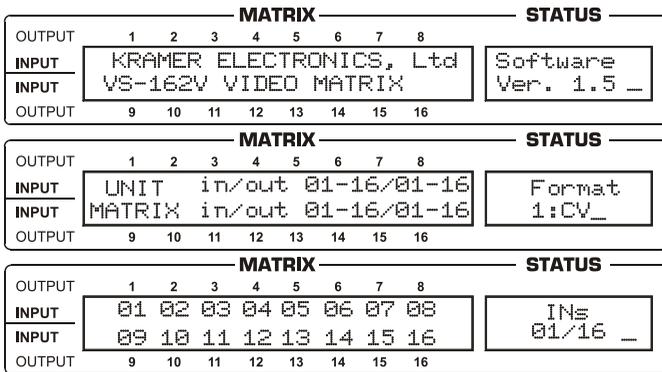


Figure 19: Default Startup Status Display Sequence

## 10.2 Using the Front Panel Buttons

You can switch (see section [10.4](#)) and clear (see section [10.5](#)):

- One input to one output
- Several inputs to several outputs
- One input to all outputs

Choose to work in the *AT ONCE* mode or the *CONFIRM* mode:

In the *AT ONCE* (default<sup>1</sup>) mode:

- Actions require no user confirmation
- Execution is immediate
- No protection is offered against changing an action in error

In the *CONFIRM* mode<sup>2</sup>:

- You have an optional method to help avoid making a mistake
- Every action requires user confirmation
- Execution is delayed<sup>3</sup> until the user confirms the action
- Protection is offered to prevent erroneous switching
- You can key-in several actions and then confirm them by pressing the TAKE button once, to simultaneously switch several monitors

<sup>1</sup> For all actions except storing/recalling setups

<sup>2</sup> The CONFIRM mode is the default for storing/recalling setups (see section [10.6](#))

<sup>3</sup> Failure to press the TAKE button within 30 seconds to one minute (the Timeout) will abort the action

### 10.3 Toggling Between the AT ONCE and CONFIRM Modes

To toggle between the AT ONCE (default) mode and the CONFIRM mode, press the TAKE button.

In CONFIRM mode: Actions require user confirmation and the TAKE LED lights.

In AT ONCE mode: Actions do not require user confirmation and the TAKE LED does not light.

When the TAKE LED flashes:

- You cannot toggle between the AT ONCE and CONFIRM modes
- You can execute the previous action, by pressing the TAKE button
- You can cancel the previous action, by pressing a non-relevant button (for example, the MENU button)

### 10.4 Switching

You can switch:

- One input to one output (see section [10.4.1](#))
- Several inputs to several outputs (see section [10.4.2](#))
- One input to all outputs (see section [10.4.3](#))

#### 10.4.1 Switching One Input to One Output

Pressing an OUT-IN combination when your **VS-162V** operates in the AT ONCE mode implements the switch immediately.

To switch one input to one output (AT ONCE mode):

1. Press the appropriate OUT button.  
The MATRIX display shows the two flashing digits, representing the present input number connected to that specific output<sup>1</sup>. If the present output is clear, the two flashing digits *00* appear in the MATRIX display. The STATUS Display shows the message:

**out # x**

Where x is the output number

2. Press the appropriate IN button.  
The output switches to the input and the MATRIX display shows the Input # instead of the flashing digits.  
The STATUS Display momentarily shows the message:

---

<sup>1</sup> For example, pressing OUT button 9 shows the flashing digits 01 if input 1 was previously routed to OUT 9

**out # x**  
**from in # y**

Where x is the output number and y is the input number

Pressing an OUT-IN combination when your **VS-162V** operates in the CONFIRM mode (and the TAKE LED is lit), requires user confirmation.

To switch one input to one output (CONFIRM mode):

1. Repeat step 1 above.
2. Press the appropriate IN button.  
The MATRIX display shows the two flashing digits, representing the input number and the TAKE LED flashes.  
The STATUS Display shows<sup>1</sup> the message:

**out # x**  
**from in # y**

Where x is the output number and y is the input number

3. Press the TAKE button to confirm the action.  
The output switches to the input and the TAKE LED lights.

#### 10.4.2 Switching Several Inputs to Several Outputs

In the *AT ONCE* mode, you need to execute each OUT-IN combination separately (see section [10.4.1](#)). When switching many inputs to many outputs it is recommended to toggle to the CONFIRM mode.

In the CONFIRM mode you can key-in several actions and then confirm them by pressing the TAKE button once (simultaneously switching several inputs to several outputs).

To switch several inputs to several outputs in the CONFIRM mode (the TAKE LED is lit), do the following:

1. Press the appropriate OUT button.  
The MATRIX display shows the two flashing digits, representing the previous input number for that specific output<sup>2</sup>. If the previous input is clear, the two flashing digits *00* appear in the MATRIX display.  
The STATUS Display shows the message:

**out # x**

Where x is the output number

---

<sup>1</sup> Continuously, within the limit of the timeout (approximately 30 seconds to one minute)

<sup>2</sup> For example, pressing OUT button 9 shows the flashing digits 01 if input 1 was previously routed to OUT 9

2. Press the appropriate IN button.  
The MATRIX display shows the two flashing digits, representing the input number and the TAKE LED flashes.  
The STATUS Display shows<sup>1</sup> the message:

**out # x  
from in # y**

Where x is the output number and y is the input number

3. Press the second appropriate OUT button, repeating step 1 above.
4. Press the appropriate<sup>2</sup> IN button, repeating step 2 above.
5. Continue with this OUT-IN button sequence, pressing the appropriate OUT and IN buttons, as required. You can also combine an OUT-OFF or OFF-OUT combination with this sequence.
6. After completing the sequence, press the TAKE button to confirm the actions.  
The inputs switch to the respective outputs, as the MATRIX display shows (no digits flash) and the TAKE LED lights.

#### 10.4.3 Switching One Input to All Outputs

To switch one input to all the outputs (in the AT ONCE mode):

1. Press the ALL button.  
The MATRIX display shows all the sets of two flashing digits (each representing the present input number for that respective output) flashing simultaneously.  
The STATUS Display shows the message:

**all OUTs**

2. Press the appropriate IN button.  
This input switches to all the outputs and the MATRIX display shows the identical non-flashing two digits (representing that input number).

To switch one input to all the outputs (in the CONFIRM mode, (the TAKE LED is lit)):

1. Repeat steps 1 and 2 above.  
The TAKE LED flashes.
2. Press the TAKE button to confirm the action.  
The selected input switches to all the outputs and the TAKE LED lights.  
The MATRIX display shows the identical two non-flashing digits (representing that input number) for all outputs.

---

<sup>1</sup> Continuously, within the limit of the timeout (approximately 30 seconds to one minute)

<sup>2</sup> That corresponds with the second OUT button

## 10.5 Clearing<sup>1</sup>

You can clear (delete):

- One output (see section [10.5.1](#))
- Several outputs (see section [10.5.2](#))
- All outputs (see section [10.5.3](#))

### 10.5.1 Clearing an Output

To clear an output (in the AT ONCE mode):

1. Press the appropriate OUT button.  
The MATRIX display shows the two flashing digits, representing the present input number for that specific output<sup>2</sup>. If the present input is clear, the two flashing digits *00* appear in the MATRIX display.  
The STATUS Display shows the message:

**out # x**

Where x is the output number

2. Press the OFF button<sup>3</sup>.  
The input is cleared and the MATRIX display does not show any Input # in its place.  
The STATUS Display momentarily shows the message:

**out # x  
reset**

Where x is the output number

To clear an output (in the CONFIRM mode (the TAKE LED is lit)):

1. Repeat step 1 above.
2. Press the OFF button<sup>3</sup>.  
The MATRIX display shows the two flashing digits *00* instead of the previous two flashing digits and the TAKE LED flashes.  
The STATUS Display shows<sup>4</sup> the message:

**out # x  
reset**

Where x is the output number

---

1 "Clearing" means disconnecting the output from any of the inputs, and leaving it disconnected

2 For example, pressing OUT button 9 shows the flashing digits 01 if input 1 was previously routed to OUT 9

3 You can press the OFF button first, and then an OUT button (the order is irrelevant)

4 Continuously, within the limit of the timeout (approximately 30 seconds to one minute)

3. Press the TAKE button to confirm the action.  
The input is cleared and the TAKE LED lights. The MATRIX display does not show any Input # in its place.

### 10.5.2 Clearing Several Outputs

To clear several outputs (in the AT ONCE mode):

1. Press the appropriate OUT button.  
The MATRIX display shows the two flashing digits, representing the present input number for that specific output<sup>1</sup>. If the present output is clear, the two flashing digits 00 appear in the MATRIX display.  
The STATUS Display shows the message:

**out # x**

Where x is the output number

2. Press the OFF button.  
The output is cleared and the MATRIX display does not show any Input # in its place.  
The STATUS Display momentarily shows the message:

**out # x  
reset**

Where x is the output number

To clear several outputs (in the CONFIRM mode (the TAKE LED is lit)):

1. Repeat step 1 above.
2. Press the OFF button.  
The MATRIX display shows the two flashing digits 00 instead of the previous two flashing digits and the TAKE LED flashes.  
The STATUS Display shows<sup>1</sup> the message:

**out # x  
reset**

Where x is the output number

3. Press the second appropriate OUT button, by repeating step 1 above.
4. Repeat step 2 above.
5. Continue with this OUT-OFF button sequence, pressing the appropriate OUT buttons and the OFF, as required.  
The MATRIX display shows the sets of two flashing digits, representing the present input number for each specific output.

---

<sup>1</sup> For example, pressing OUT button 9 shows the flashing digits 01 if input 1 was previously routed to OUT 9

6. After completing the sequence, press the TAKE button to confirm the actions.  
The inputs are cleared and the TAKE LED lights. The MATRIX display does not show any Input # in its place.

### 10.5.3 Clearing All Outputs

To clear all outputs (in the AT ONCE mode):

1. Press the ALL button.  
The MATRIX display shows all the sets of two flashing digits (each representing the present input number connected to that respective output) flashing simultaneously.  
The STATUS Display shows the message:

**all OUTs**

2. Press the OFF button<sup>1</sup>.  
All the outputs are cleared and the MATRIX display momentarily shows the message:

**Reset ALL connections**

**!!!!**

To switch one input to all the outputs (in the CONFIRM mode (the TAKE LED is lit)):

1. Repeat step 1 above.
2. Press the OFF button<sup>1</sup>.  
The TAKE LED flashes and the MATRIX display shows the message:

**Reset ALL ?**

**Press TAKE to execute**

3. Press the TAKE button to confirm.  
All the outputs are cleared and the TAKE LED lights.

## 10.6 Storing and Recalling Setups

You can store up to 99 settings in the non-volatile memory with the ability to recall each of those settings.

### 10.6.1 Storing Setups

To store a setting, do the following:

1. Press the STO button.  
The displays show the messages:

---

<sup>1</sup> You can press the OFF button first, and then the ALL button (the order is irrelevant)

**Enter SETUP number  
use two digit # 01-99**

**Store  
# xy**

Where xy are the OUT buttons.

2. Press two OUT buttons, using the OUTkeys # 1 to 9, and 10 (for 0). The OUTkeys function on a decimal-basis, and not on a positional-basis. For example, to enter the # 14, press # 1 followed by # 4 (not # 14). To enter the # 3, press # 10 followed by # 3<sup>1</sup>. The TAKE LED flashes and The displays show the messages:

**STORE this SETUP ?  
YES -> TAKE**

**Store  
# xy**

3. Press the TAKE button. The memory stores the setup and the MATRIX display shows the message:

**Setup # xy stored**

Note, saving a setup to an already allocated setup #, prompts the message in the MATRIX display:

**Setup already exists  
Press TAKE to overwrite**

Pressing the TAKE button replaces the stored setup with the current setup. Alternatively, press a different OUT button to change the setup #.

### 10.6.2 Recalling Setups

To recall a setting, do the following:

1. Press the RCL button. The displays show the messages:

**Enter SETUP number  
use two digit # 01-99**

**RECALL  
# xy**

Where xy are the OUT buttons.

2. Press the appropriate two OUT buttons, using the OUTkeys # 1 to 9, and 10 (for 0). The OUTkeys function on a decimal-basis, and not on a positional-basis. For example, to enter the # 14, press # 1 followed by # 4 (not # 14). To enter the # 3, press # 10 followed by # 3<sup>2</sup>. The memory recalls the setup. The MATRIX display shows the flashing setup and the TAKE LED flashes. The STATUS Display shows the message:

---

<sup>1</sup> However, pressing # 3 followed by the TAKE button will also enter the # 3

<sup>2</sup> However, pressing # 3 followed by the TAKE button will also enter the # 3

**SETUP # xy**  
**Load ?**

Where xy are the OUT buttons.

3. Preview the setup to decide whether to implement it. If not, you can scan the other setups, by pressing different OUT buttons. To stop previewing the setups, press a non-relevant button, such as an IN button.
4. Press the TAKE button.  
The specific setup is implemented.

If trying to recall an empty setup<sup>1</sup>, the MATRIX display would show a message saying that that particular setup is empty and would return you to step 1 above.

## **11 MENU Commands**

You can press the MENU button up to 13 times in straight sequence to scan the range of commands.

---

<sup>1</sup> That is, a setup # for which no setup is actually stored

## MENU Commands

---

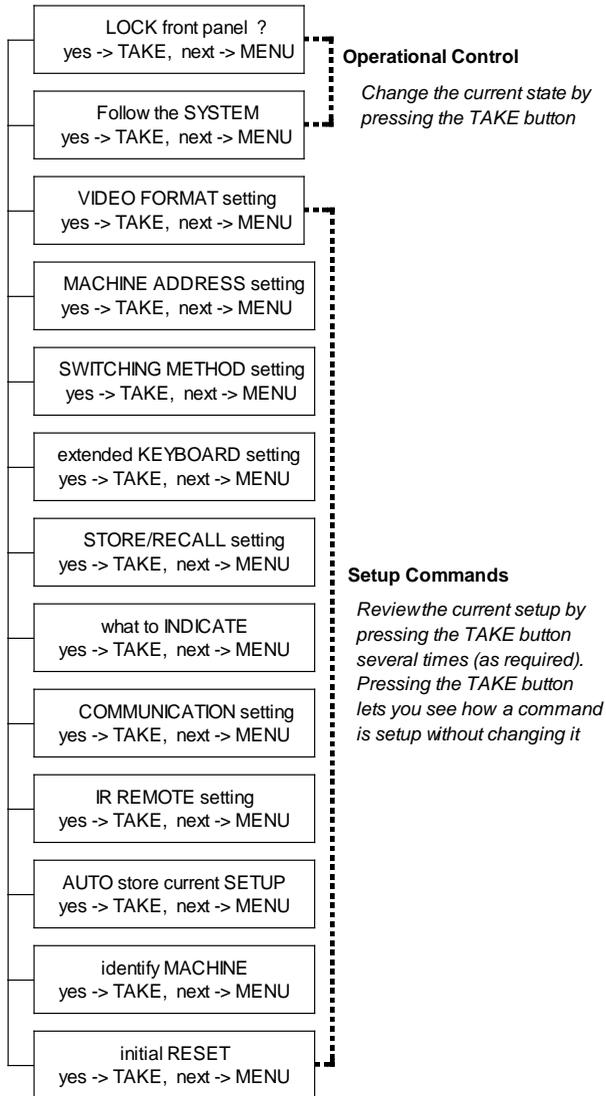


Figure 20: Sequence of MENU Commands

You can stop changing a setup at any time by pressing any IN button.

## 11.1 Locking and Unlocking the Front Panel

To prevent changing the settings accidentally or tampering with the unit via the front panel buttons, lock<sup>1</sup> your **VS-162V**. Unlocking releases the protection mechanism.

- To lock the **VS-162V**:

1. Press the MENU button once.

The MATRIX display shows the message:

**LOCK front panel ?**  
**yes -> TAKE, next -> MENU**

2. Press the *TAKE* button.

The front panel locks and the Displays momentarily show the messages:

**Front panel LOCKED**                      **Keyboard LOCKED**<sup>3</sup>  
**to unlock- press MENU**<sup>2</sup>

Pressing a front panel button has no effect<sup>4</sup> but remote RS-232 and RS-485 commands function and show on the MATRIX display.

- To unlock the **VS-162V**:

**Either:**

1. Press the MENU button.

The MATRIX display shows the message:

**to UNLOCK front panel**  
**press TAKE**

The *TAKE* LED flashes.

2. Press the *TAKE* button.

The front panel unlocks<sup>5</sup> and the MATRIX display momentarily<sup>2</sup> shows the message:

**Front panel**  
**UNLOCKED**

**Or:**

1. Press the *TAKE* button twice.

The front panel unlocks and the same messages show as in steps 1 and 2 above.

<sup>1</sup> Nevertheless, even though the front panel is locked you can still operate via RS-232 or RS-485 serial (remote controller or PC)

<sup>2</sup> After a few seconds, the status of the unit replaces this message

<sup>3</sup> This message appears continuously in the STATUS Display, until the front panel is unlocked

<sup>4</sup> IR and Keyboard Extension (EXT. KEYS) commands are also blocked

<sup>5</sup> Switching the power off and on again also unlocks the front panel

## 11.2 Choosing the Follow or Breakaway from System Mode

The terms *audio-follow-video*<sup>1</sup> and *audio breakaway*<sup>2</sup> are well known. Sometimes signals other than audio signals need to switch simultaneously and at other times, need to switch independently. For example:

- Non-linear editing systems, that sometimes combine video with analog audio and at other times combine video with digital audio
- Duplication systems, that make Master tapes from programs with different formats: composite analog, component analog and component digital

When the **VS-162V** functions in the:

- *Follow-SYSTEM* mode, the **VS-162V** switches with other 16x16 matrix switchers<sup>3</sup>, implementing the same action simultaneously
- *Breakaway-from-SYSTEM* mode, the **VS-162V**<sup>4</sup> functions independently, implementing an action independently of the others

The **VS-162V** unit will function<sup>5</sup> in the *Follow-SYSTEM* mode if at least one other **VS-162V** unit<sup>6</sup> is set to the *Follow-SYSTEM* mode and these units interconnect via an RS-232 and/or RS-485 communication line.

To set the **VS-162V** unit to function in the *Follow-SYSTEM* mode:

1. Press the MENU button twice.  
The MATRIX display shows the message:

**Follow the SYSTEM**  
**yes -> TAKE, next -> MENU**

2. Press the TAKE button.  
The displays show the messages:

<b>set UNIT follow SYSTEM?</b>	<b>current:</b>
<b>Press TAKE to execute</b>	<b>breakaway</b>

3. Press the TAKE button again.  
The MATRIX display momentarily shows this message, followed by the

<sup>1</sup> Video and the audio channels switch simultaneously in the same way

<sup>2</sup> Audio channels switch independently from the video channels

<sup>3</sup> 16x16 matrix switchers in the same series, that include, for example, the VS-1616A (16x16 balanced stereo audio matrix switcher) units and/or the VS-1616AD (16x16 digital audio matrix switcher units)

<sup>4</sup> Also applies to a VS-1616A unit or a VS-1616AD unit

<sup>5</sup> The VS-162V unit changes its status immediately and goes to the Follow-system mode

<sup>6</sup> Or VS-1616A or VS-1616AD unit (as well as other 16x16 matrix switchers in the same series)

status of the switcher and in the STATUS Display the letter “S” is displayed behind the flashing cursor:

**the UNIT is set in mode  
FOLLOW system**

If the status of the **VS-162V** unit differs from that of the other unit(s), set the **VS-162V** unit to the *Follow-SYSTEM* mode. The MATRIX display flashes the new status of the switcher and the TAKE LED flashes. Pressing the *TAKE* button<sup>1</sup> implements all the changes to the same state as the rest of the system placing the switcher in the *Follow-SYSTEM* mode.

To set the **VS-162V** unit to function in the *Breakaway-from-SYSTEM* mode:

1. Press the MENU button twice.  
The MATRIX display shows the message:

**FOLLOW the system  
yes -> TAKE, next -> MENU**

2. Press the *TAKE* button.  
The displays show the messages:

**BREAKAWAY from system?                      current:  
Press TAKE to execute                      follow SYS**

3. Press the *TAKE* button again.  
The MATRIX display shows the message:

**the UNIT is set in mode  
BREAKAWAY from system**

### 11.3 Choosing the Video Format Setting

Choose a VIDEO FORMAT setting from a choice of 4 settings: CV, YC, YUV and RGBS.

WARNING – changing the VIDEO FORMAT resets all the OUTs/INs connections.

To choose the VIDEO FORMAT setting:

1. Press the MENU button until you reach the VIDEO FORMAT setting command.  
The MATRIX display shows the message:

**VIDEO FORMAT setting  
yes -> TAKE, next -> MENU**

---

<sup>1</sup> Pressing a different button cancels the operation and the switcher will remain in its previous state

2. Press the *TAKE* button.

The displays show the messages:

**Use OUTkey to configure** **current: 1: CV<sup>1</sup>**  
**1: CV 2: YC 3: YUV 4: RGBS**

3. Press the appropriate<sup>2</sup> *OUT* button # 2, 3 or 4<sup>3</sup>.

The MATRIX display shows the message:

**Press TAKE to configure**  
**for x**

Where x is the new VIDEO FORMAT setting, either Y/C, YUV or RGBS

(At this stage, you can still configure a different video format by pressing another *OUT* button). To exit the VIDEO FORMAT setting command, press a non-relevant button, such as an *IN* button.

4. Press the *TAKE* button again.

The displays show the messages:

**FORMAT changed!** **current: 1: x**  
**All INs/OUTs reset**

Where x is the new VIDEO FORMAT setting, either Y/C, YUV or RGBS

## 11.4 Setting the MACHINE ADDRESS

Press the MENU button until you reach the Setting the MACHINE ADDRESS command. Choose the standalone or the large matrix setting. You set the MACHINE ADDRESS using the OUTkeys # 1 to 9, and 10 (for 0). The OUTkeys function on a decimal-basis, and not on a positional-basis. For example, to enter the # 15, press # 1 followed by # 5 (not # 15).

You can change the MACHINE ADDRESS from:

- The standalone setting to a large matrix setting (see section [11.4.1](#))
- A large matrix setting to the standalone setting (see section [11.4.2](#))
- A large matrix setting to a large matrix setting with a different MACHINE ADDRESS (see section [11.4.3](#))

---

1 If currently configured for composite (CV)

2 Depending on the required video format

3 Pressing OUT button # 1 when the machine is already configured for composite (CV) will show the message: requested the same format NO CHANGES made

Plan your system according to the chart in [Figure 8](#) before setting the MACHINE ADDRESS, because in a matrix configuration you need to enter the highest MACHINE ADDRESS as well as the MACHINE ADDRESS.

### 11.4.1 Changing the Standalone MACHINE ADDRESS to a Large Matrix

To set the MACHINE ADDRESS:

1. Press the MENU button until you reach the MACHINE ADDRESS command.

The MATRIX display shows the message:

**MACHINE ADDRESS**  
**setting yes -> TAKE, next -> MENU**

2. Press the TAKE button.

The displays show the messages:

<b>OUTkey 1: Stand-Alone UNIT</b>	<b>Current</b>
<b>2: Large Matrix</b>	<b>Alone<sup>1</sup></b>

3. Press the OUT button # 2.

The TAKE LED flashes and The displays show the messages:

<b>Change to the LARGE MATRIX?</b>	<b>Current</b>
<b>Press TAKE to confirm</b>	<b>16x16<sup>2</sup></b>

4. Press the TAKE button again.

The displays show the messages:

<b>READY to set MACHINE ADDRESS</b>	<b>Current #</b>
<b>use OUTkey 1-9, 0</b>	<b>1</b>

5. Enter the MACHINE ADDRESS by pressing an OUT button # 1-9, 0.

The STATUS Display shows the message:

**current:**  
**x**

Where x is the OUT button # pressed

6. Press the TAKE button again.

The displays show the messages:

<b>READY to change MACH. ADDR.</b>	<b>From # 01</b>
<b>Press TAKE to confirm</b>	<b>to # x</b>

At this stage, you can enter another MACHINE ADDRESS by pressing another OUT button.

<sup>1</sup> Indicating that the machine is not set to the large matrix setting

<sup>2</sup> For example, if currently configured for standalone

7. Press the *TAKE* button again.

The displays show the messages:

<b>MACHINE ADDRESS</b>	<b>current #</b>
<b>changed</b>	<b>x</b>

After a few seconds, The displays show the messages:

<b>SET highest MACHINE ADDRESS</b>	<b>current #</b>
<b>use OUTkey 1-9, 0</b>	<b>x</b>

8. Press an *OUT* button # 1-9, 0.

The STATUS Display shows the message:

**current #**  
**x**

Where x is the *OUT* button # pressed

At this stage, you can enter another highest *MACHINE ADDRESS*. The unit may suggest a highest *MACHINE ADDRESS* for your system. If so, it is recommended that you use that address.

9. Press the *TAKE* button again.

The MATRIX display shows the message:

**Change highest MACH. ADDR. ?**  
**Press TAKE to confirm**

10. Press the *TAKE* button again.

The MATRIX display shows the message:

**HIGHEST MACHINE ADDRESS**  
**Changed**

#### 11.4.2 Changing the Large Matrix *MACHINE ADDRESS* to Standalone

To set the *MACHINE ADDRESS*:

1. Press the *MENU* button until you reach the *MACHINE ADDRESS* command.

The MATRIX display shows the message:

**MACHINE ADDRESS**  
**setting yes -> TAKE, next -> MENU**

2. Press the *TAKE* button.

The displays show the messages:

<b>OUTkey 1: Stand-Alone UNIT</b>	<b>Current</b>
<b>2: Large Matrix</b>	<b>Matrix<sup>1</sup></b>

---

<sup>1</sup> Indicating that the machine is not set to standalone

3. Press the *OUT* button # 1.

The displays show the messages:

**STAND ALONE UNIT (Mach# 01)?** **Current**  
**Press TAKE to confirm** **Matrix**

4. Press the *TAKE* button again.

The MATRIX display shows the message:

**MACHINE ADDRESS changed**  
**now STAND-ALONE**

### 11.4.3 Changing to a Different Large Matrix MACHINE ADDRESS

To set the MACHINE ADDRESS:

1. Press the MENU button until you reach the MACHINE ADDRESS command.

The MATRIX display shows the message:

**MACHINE ADDRESS setting**  
**yes -> TAKE, next -> MENU**

2. Press the *TAKE* button.

The displays show the messages:

**OUTkey 1: Stand-Alone UNIT** **Current**  
**2: Large Matrix** **Matrix**

3. Press the *OUT* button # 2.

The displays show the messages:

**set NEW matrix** **current:**  
**new -> TAKE leave old -> MENU** **16x32**

4. Press the *TAKE* button again.

The displays show the messages:

**READY to set MACHINE ADDRESS** **current #**  
**use OUTkey 1-9, 0** **1**

5. Press an *OUT* button # 1-9, 0.

The STATUS Display shows the message:

**current: x**

Where x is the OUT button # pressed

6. Press the *TAKE* button again.

The *TAKE* LED flashes and The displays show the messages:

**READY to change MACH. ADDR.** **from # 01**  
**Press TAKE to confirm** **to #0x**

7. Press the *TAKE* button again.

The displays show the messages:

**MACHINE ADDRESS** **current #**  
**changed** **x**

After a few seconds, The displays show the messages:

**SET highest MACHINE ADDRESS** **current #**  
**use OUTkey 1-9, 0** **x**

8. Press an *OUT* button # 1-9, 0.

The STATUS Display shows the message:

**current:**  
**x**

Where x is the OUT button # pressed

9. Press the *TAKE* button again.

The MATRIX display shows the message:

**Change highest MACH. ADDR. ?**  
**Press TAKE to confirm**

10. Press the *TAKE* button again.

The MATRIX display shows the message:

**HIGHEST MACHINE ADDRESS**  
**Changed**

## 11.5 Choosing the SWITCHING METHOD Setting

Section [11.5.1](#) describes the SWITCHING METHOD settings for standalone units and large matrices. Section [11.5.2](#) describes how to configure a SWITCHING METHOD.

### 11.5.1 Understanding the SWITCHING METHOD Settings

Setting the **VS-162V** unit as a Stand-Alone UNIT<sup>1</sup> provides a choice of three SWITCHING METHOD settings:

- **NoVIS** - switching occurs immediately after completion of front panel or dry-contact operation or immediately after receiving an RS-232 or RS-485 command, or an IR command. The switching is independent of the vertical reference
- **EXT** (external sync) - switching occurs during the vertical interval of the video reference signal connected to the IN SYNC<sup>2</sup>

---

<sup>1</sup> Via the MACHINE ADDRESS setting (as section [11.4](#) describes)

<sup>2</sup> Item 1 in [Figure 1](#)

connector (this signal should be properly terminated via the TERM button<sup>1</sup>)

- **INT# 1** (internal sync) - switching occurs during the vertical interval of the video reference signal connected to IN # 1

Setting the **VS-162V** unit as a Large Matrix<sup>1</sup> (instead of as a Stand-Alone UNIT) provides a choice of 4 SWITCHING METHOD settings:

- **NoVIS, EXT** or **INT# 1** (as described above)
- **MTX** (SYNC from Matrix) - the vertical interval of the video reference (selected on one unit in the Large Matrix system) is present on the “SYNC” RS-485 terminal block connector<sup>2</sup>. This reference signal applies to all switchers in the multi- switcher system and facilitates switching all **VS-162V** units simultaneously

To choose the MTX (SYNC from Matrix) setting<sup>3</sup> as shown in [Figure 21](#):

- Connect the RS-485 terminal block connectors<sup>4</sup> between each switcher in the multi- switcher system
- Connect and set the video reference signal on one of the video units to EXT (external sync) or INT# 1 (internal sync)
- Set the video reference on the other video units to the MTX (SYNC from Matrix) setting

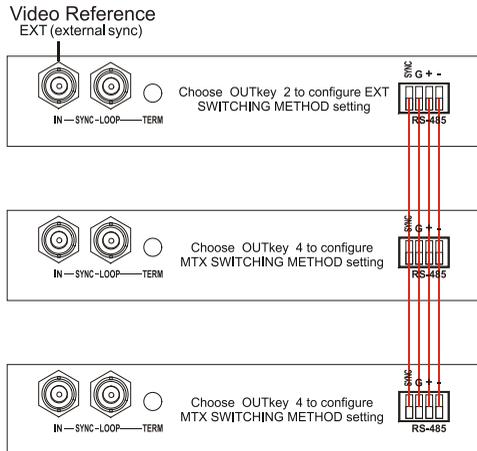


Figure 21: Choosing the MTX (SYNC from Matrix) Setting

1 Item 3 in [Figure 1](#)

2 Item 5 in [Figure 1](#)

3 This sets the matrix sync configuration from another (Master) machine

4 Via a straight connection of all 4 PINS

### 11.5.2 Configuring a SWITCHING METHOD

To choose a SWITCHING METHOD setting, do the following:

1. Press the MENU button until you reach the SWITCHING METHOD setting.

The MATRIX display shows the message:

**SWITCHING METHOD setting**  
**yes -> TAKE, next -> MENU**

2. Press the TAKE button.

The displays show the messages:

<b>Use OUTkey to configure</b>	<b>Current</b>
<b>1: noVIS 2: EXT 3: INT#1 4:MTX</b>	<b>External<sup>1</sup></b>

3. Press an OUT button from 1, 2, 3 or 4. For example, OUT button # 3 to set the internal sync configuration.

The TAKE LED flashes and the MATRIX display shows the message:

**Press TAKE to configure**  
**from INTERNAL (Input #1)**

4. Press the TAKE button.

The displays show the messages:

<b>SWITCHING METHOD</b>	<b>current:</b>
<b>changed</b>	<b>From In #1</b>

### 11.6 Choosing the Extended Keyboard Setting

Section [9.4](#) describes how to connect a remote unit. Activate or deactivate it by setting the extended Keyboard setting ON or OFF.

To set the extended KEYBOARD mode, do the following:

1. Press the MENU button until reaching the extended Keyboard setting.

The MATRIX display shows the message:

**extended KEYBOARD setting**  
**yes -> TAKE, next -> MENU**

2. Press the TAKE button.

The displays show the messages:

<b>Outkey 1: External keys OFF</b>	<b>current:</b>
<b>2: External keys ON</b>	<b>X-key ON<sup>2</sup></b>

---

<sup>1</sup> Indicating that the machine is currently set to the external switching method setting

<sup>2</sup> Indicating that the external keys are currently activated

3. Press the *OUT* button *1* to deactivate the External keys.  
The TAKE LED flashes and the displays show the messages:

**Turn OFF external keys?  
Press TAKE to execute** **current:  
X-key ON**

4. Press the *TAKE* button.  
The displays show the messages:

**External Keyboard mode  
changed** **current:  
X-key OFF**

## 11.7 Setting the STORE/RECALL KEYBOARD Mode

Choose one of these STORE/RECALL KEYBOARD modes:

- At ONCE mode in which setups are stored/recalled immediately without the need for user confirmation
- CONFIRM mode in which storing/recalling setups require user confirmation. The CONFIRM mode is the default<sup>1</sup> for storing/recalling setups and is recommended to prevent erroneously storing/recalling of setups

To set the STORE/RECALL KEYBOARD mode to the AT ONCE mode, instead of the CONFIRM (default) mode, do the following:

1. Press the MENU button until reaching the STORE/RECALL setting.  
The MATRIX display shows the message:

**STORE/RECALL setting  
yes -> TAKE, next -> MENU**

2. Press the *TAKE* button and choose the appropriate Outkey 1 for the AT ONCE mode (Outkey 2 is for the CONFIRM mode).  
The displays show the messages:

**STO/RCL mode  
changed** **current:  
At once**

## 11.8 Choosing the INDICATE Setting

Choose what is displayed during regular operation: between scrolling the switcher setup as [Figure 22](#) illustrates, and showing the IN/OUT range<sup>2</sup>.

---

<sup>1</sup> The AT ONCE mode is the default for all actions except storing/recalling setups

<sup>2</sup> Useful in an expanded matrix configuration

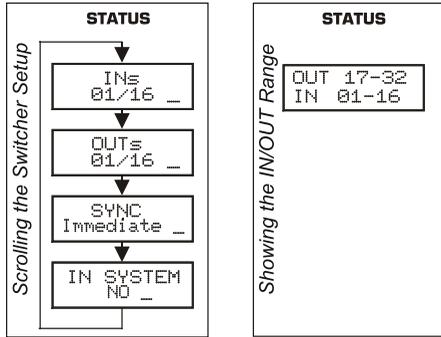


Figure 22: Choosing what to INDICATE

To scroll the switcher setup (instead of showing the IN/OUT range), do the following:

1. Press the MENU button until you reach the what to INDICATE command. The MATRIX display shows the message:

**what to INDICATE**  
yes -> TAKE, next -> MENU

2. Press the TAKE button. The displays show the messages:

**Use OUTkey to configure** **Current:**  
**1: scroll SETUP 2: OUTs/INs** **OUTs/INs**

3. Press the OUT button I. The TAKE LED flashes and The displays show the messages:

**Scroll switcher setup?** **Current:**  
**Press TAKE to execute** **OUTs/INs**

4. Press the TAKE button. The displays show the messages:

**display mode** **Current:**  
**changed** **SETUP**

## 11.9 Choosing the COMMUNICATION Setting

Choose the response option (reply or no reply).

To choose the No Reply response option, for example, do the following:

1. Press the MENU button until you reach the COMMUNICATION setting. The MATRIX display shows the message:

**COMMUNICATION setting**  
yes -> TAKE, next -> MENU



3. Press the *OUT* button 2.

The TAKE LED flashes and The displays show the messages:

**Turn ON infrared REMOTE ?** **Current:**  
**Press TAKE to execute** **remote OFF**

4. Press the *TAKE* button again.

The displays show the messages:

**Infrared REMOTE mode** **Current:**  
**changed** **remote ON**

*Table 8: Summary of Basic RC-IR2 Operations*

To execute this command:	Press the following keys in this sequence:
Switch an Input to an Output	# key (for the output) + # key (for the input) <sup>1</sup>
Store/Recall a setup	SHIFT + STO/RCL + # key (for the setup)

### 11.11 Choosing the AUTO STORE Current SETUP

Choose whether or not to save the current setup automatically, that is, whether to save the machine's status on power down, so that it returns to the same status after cycling power.

To save the current setup automatically (when set OFF), do the following:

1. Press the MENU button until you reach the AUTO Store Current SETUP command.

The MATRIX display shows the message:

**AUTO store current SETUP**  
**yes -> TAKE, next -> MENU**

2. Press the *TAKE* button.

The displays show the messages:

**OUTkey 1: no AutoSave** **current:**  
**2: AutoSave CURRENT setup** **NO save**

3. Press the *OUT* button 2.

The TAKE LED flashes and The displays show the messages:

**Auto store CURRENT setup ?** **Current:**  
**Press TAKE to execute** **NO save**

4. Press the *TAKE* button again.

The displays show the messages:

**AUTOSAVE mode** **Current:**  
**changed** **AutoSave**

<sup>1</sup> For example, press # 6 followed by # 2 to switch input 2 to output 6

## 11.12 Identifying the MACHINE

Display essential information (the product name and version number) to identify your machine, for example, for technical support purposes.

To identify your machine, do the following:

1. Press the MENU button until you reach the Identifying the MACHINE command.

The MATRIX display shows the message:

**identify MACHINE**  
**yes -> TAKE, next -> MENU**

2. Press the TAKE button.

The MATRIX display (as [Figure 23](#) illustrates) shows the message:

MATRIX								STATUS								
OUTPUT	1	2	3	4	5	6	7	8								
INPUT	KRÄMER ELECTRONICS, Ltd							Software								
INPUT	VS-162V VIDEO MATRIX							Ver. 1.5 ...								
OUTPUT	9	10	11	12	13	14	15	16								

*Figure 23: Machine Identification*

## 11.13 Choosing the Initial RESET

Choose to reset the machine<sup>1</sup> to the:

- Current status<sup>2</sup> (reloads the current setup)
- Factory default (resets to the pre-installed factory default state<sup>3</sup>)

Each VS-162V unit ships in its factory default

To reset the machine, do the following:

1. Press the MENU button until you reach the initial RESET command.

The MATRIX display shows the message:

**initial RESET**  
**yes -> TAKE, next -> MENU**

2. Press the TAKE button.

The MATRIX display shows the message:

**Outkey 1: Current status**  
**2: Factory default**

<sup>1</sup> Without having to switch the power off and on

<sup>2</sup> Sometimes called a "soft reset"

<sup>3</sup> Each VS-162V unit ships in its factory default state that is a 16x16 composite video matrix, with all setups empty and each input connected to its corresponding output (for example, 1-to-1)

3. Press the *OUT* button 2, for example, to reset to the factory default.  
The TAKE LED flashes and The displays show the messages:

**Reset to factory default  
Press TAKE to execute**

**WARNING !!!!!**

4. Press the *TAKE* button again.  
The displays show the messages:

**Reset to factory default  
confirm by pressing OUT # 7**

**WARNING !!!!!**

5. Press the *OUT* # 7.  
The machine resets to the factory default and The displays show the first messages of the reloading progress (as [Figure 23](#) illustrates).

## 12 Upgrading the Flash Memory

The main part of the **VS-162V** firmware is located in FLASH<sup>1</sup> memory, which lets you upgrade to the latest Kramer firmware version in minutes!

Download the up-to-date file from the Internet or obtain it from your dealer. The following example shows how to install a file named (for example) "1616-15.hex" to the FLASH memory<sup>2</sup>.

The current **VS-162V** software version shows in the *STATUS* display as [Figure 19](#) illustrates in section [10.1](#).

### 12.1 Connecting the PC to the RS-232 Port

Before installing the latest Kramer firmware version on a **VS-162V** unit, connect:

- The COM port on your PC to the RS-232 IN port on the **VS-162V** unit

When simultaneously upgrading the firmware on several **VS-162V** units:

- Connect the COM port on your PC to the RS-232 IN port on the first **VS-162V** unit
- Connect the RS-232 OUT port on the first **VS-162V** unit to the RS-232 IN port on the second **VS-162V** unit or another 16x16 unit
- Connect All 16x16 units that you want to upgrade, in this way, linking them in a daisy chain connection

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<sup>1</sup> Electrically programmable and erasable

<sup>2</sup> The number "15" in the file name indicates the version number "1.5". Be sure you receive the latest version, and that it is a ".hex" file

- Set DIP 7 according to whether or not a null-modem is being used<sup>1</sup>

## 12.2 Upgrading the Firmware

1. Install and run the *K-Sender* program on your PC.
2. Open the *K-Sender* program.  
The File COM Port Sender window opens.
3. Choose the appropriate COM port.  
Be sure that “9600 Baudrate” is chosen.  
Click the *File* button.
4. Locate the file “1616-15.hex” and click the *Open* button.  
The filename appears in the lower part of the window (in bold script).
5. Press and **hold** the *TAKE* button while simultaneously turning on the *POWER* switch on the **VS-162V**.  
After a few seconds, following the initial machine identification message, the MATRIX display shows the following message:

**Please,  
release key TAKE**

6. Release the *TAKE* button.  
The TAKE LED flashes and the MATRIX display shows the following message:

**Update program?  
Please confirm < TAKE >**

7. Press the *TAKE* button.  
The MATRIX display shows the following message:

**YOU will lose current SETUP<sup>2</sup>  
Confirm < TAKE >**

8. Press the *TAKE* button again.  
The MATRIX display shows the following message:

**Are you ABSOLUTELY sure?  
Press TAKE to execute**

At this stage, and at any time previously, you can cancel the operation by pressing any button, other than the TAKE button.

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<sup>1</sup> Refer to section 8 for full details

<sup>2</sup> Upgrading firmware resets your VS-162V unit to the factory default. This includes erasing all setups



Go to the Menu and restore your specific settings. Prepare and store all necessary setups.

### 13 Technical Specifications

[Table 9](#) includes the technical specifications:

*Table 9: Technical Specifications of the VS-162V Video Matrix Switcher*

INPUTS:	16 composite video, or 8 s-Video, or 4 RGBS, or 5 YUV, 1 Vpp / 75Ω on BNC connectors
OUTPUTS:	16 composite video, or 8 s-Video, or 4 RGBS, or 5 YUV, 1 Vpp / 75Ω on BNC connectors
VIDEO BANDWIDTH:	90 MHz (-3dB)
VIDEO CROSSTALK:	<-52 dB @5MHz
NON-LINEARITY	<0.01%
VIDEO S/N:	70.2 dB
DIFF. GAIN:	<0.01 %
DIFF. PHASE:	<0.01 Deg
K-FACTOR:	<0.05%
CONTROL:	38 selector switches; RS-232, RS-485, IR remote, dry keyboard extension
SWITCHING:	Vertical interval
POWER SOURCE:	230V AC, 50/60 Hz, (115VAC, U.S.A.) 10VA
DIMENSIONS:	19" x 7" x 2U W, D, H, rack mountable
WEIGHT:	3.5kg (7.8lbs) approx.
ACCESSORIES:	Power cord, null-modem adapter, Windows®-based Kramer control software.
OPTIONS:	External IR receiver cable

### 14 Communication Protocol

[Table 10](#) includes the Protocol 2000<sup>1</sup> hexadecimal codes<sup>2</sup>. The communication parameters are: 9600 baud, with no parity, 8 data bits and 1 stop bit.

1 Full details are available on our Web site: [www.kramerelectronics.com](http://www.kramerelectronics.com)

2 This example assumes MACHINE # 1, and node 0



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## 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 seven 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](http://www.kramerelectronics.com).
2. Any product, on which the serial number has been defaced, modified or removed, or on which the WARRANTY VOID IF TAMPERED sticker has been torn, reattached, removed or otherwise interfered with.
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);  
generic emission standard.  
Part 1: Residential, commercial and light industry"
- EN-50082: "Electromagnetic compatibility (EMC) generic immunity standard.  
Part 1: Residential, commercial and light industry environment".
- CFR-47: FCC\* Rules and Regulations:  
Part 15: "Radio frequency devices  
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.  
\* FCC and CE approved using STP cable (for twisted pair products)



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For the latest information on our products and a list of Kramer distributors, visit our Web site: [www.kramerelectronics.com](http://www.kramerelectronics.com), where updates to this user manual may be found. We welcome your questions, comments and feedback.



**Caution**

**Safety Warning:**

Disconnect the unit from the power supply before opening/servicing.



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