

# UltraMatrix™

Keyboard-video-mouse matrix switch with on-screen display

## ULTRAMATRIX 2xE/4xE INSTALLATION AND OPERATIONS MANUAL



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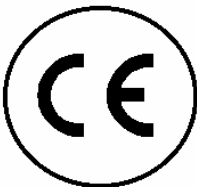
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This equipment is in conformity with the requirements of the European EMC directive 89/336/EEC in respect of:  
EN55022: (Class B)  
EN50082-1 / EN60555-2, and  
The Low Voltage Directive.

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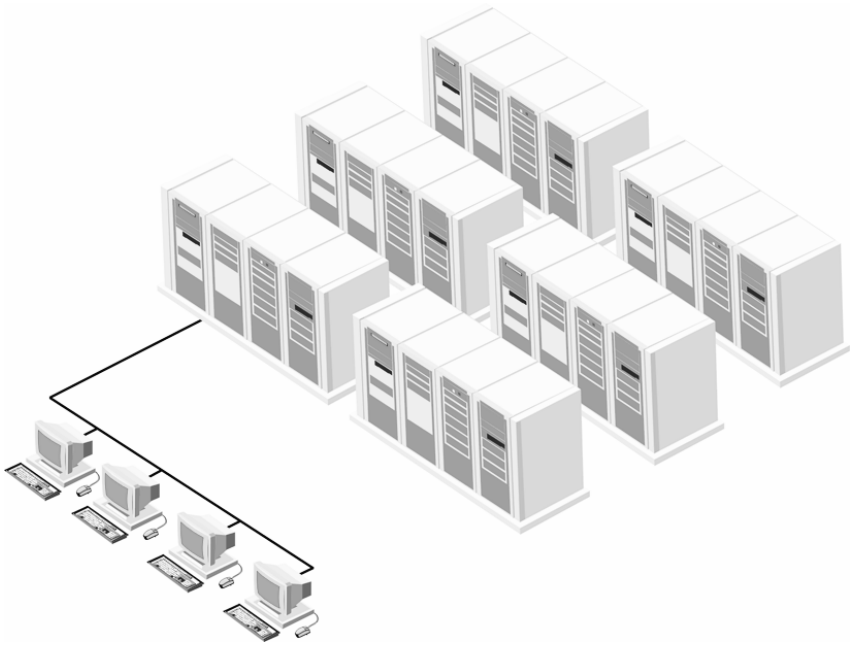
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# INTRODUCTION

## Disclaimer

While every precaution has been taken in the preparation of this manual, the manufacturer assumes no responsibility for errors or omissions. Neither does the manufacturer assume any liability for damages resulting from the use of the information contained herein. The manufacturer reserves the right to change the specifications, functions, or circuitry of the product without notice.

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## About this manual

This manual covers the installation and operations of the UltraMatrix 2xE and 4xE series switches.

## Introduction

Thank you for choosing the Rose Electronics® UltraMatrix™ keyboard-video-mouse matrix switch. The UltraMatrix switch is the result of Rose Electronics commitment to providing continued state-of-the-art switching solutions for today's demanding workplace. The family of UltraMatrix switches has proven to be a valuable investment for all types of businesses that have the need to monitor, maintain and share information with multiple computer systems. Its use in large computer facilities gives the IT professional the added flexibility to monitor and maintain hundreds of systems, running on different platforms, from one or multiple KVM stations. The UltraMatrix switch is the common sense switching solution that provides the flexibility, integrity, and security required for today's business environment.

**NOTE:** A **K**eyboard, **V**ideo monitor, and **M**ouse are referred to throughout this manual as a **KVM** station.

The advanced On-Screen-Display (OSD) menus guide you through the configuration process with on-screen information for each configuration section, making it easy to configure the UltraMatrix switch, the KVM stations, the computers, and security for the system. There are also additional configuration parameters that can be used to personalize the look of the menus and dialog boxes. A help line is provided for each menu selection giving a brief explanation of the selected menu item.

Rose Electronics UltraMatrix switches are designed to meet your switching needs, whatever your system demands are, one user or multiple users, one computer or hundreds. All models offer standard features that allow for easy, secure, and complete access to as many as 1,000 computers from one or multiple KVM stations.

Reliability, security, flash memory technology, and other features ensure the UltraMatrix switch will streamline your data center or server room and simplify the maintenance, access, and updating of your systems.

## Features

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### Upgradability

- Free lifetime base firmware upgrades, based on flash memory technology, provide improvements and new features. Base firmware upgrades are available from our web site at [www.rose.com](http://www.rose.com).

### Security

- Unique configuration password for persons authorized to perform configuration maintenance.
- User names and passwords allow controlled access to computers with sensitive information, system data, or restricted applications.
- Computers can be assigned to a unique group, allowing authorized access only.
- Four connect modes: View, Share, Control and Private provide flexibility in configuring the UltraMatrix switch to conform to your security requirements.
- Profiles can be defined for the connect mode, sharing and group access.

### Flexibility

- Modular design makes for easy installation, maintenance and expandability.
- Plug-in expansion boards make the UltraMatrix switch easy to extend to other UltraMatrix switches.
- Pre-configuration of the switch allows for installation without powering the computers/servers down.
- Multi-language capabilities.
- Switching to computers can be done by keyboard commands, an on-screen list of computers or by commands through the RS232 serial port.
- Integrated auto-switching power supply accepts both 110-volt and 220-volt sources.



## On-screen display technology

- The UltraMatrix video pops-up over the computer application display or is automatically generated.
- Easy to use menus guide you through the configuration process.
- The connection status for all computers can be displayed.
- Menus and display windows can be configured with solid or transparent colors.
- One of four screen saver options can be selected.

## Compatibility

- A variety of hardware platforms can be connected simultaneously to the UltraMatrix switch without interference, including PCs, Sun systems, IBM RS/6000, HP, DEC, SGI, and others.
- Full keyboard and mouse emulation and video resolutions up to 1600 x 1280 ensures trouble-free access to most software applications.
- Serial support using VT100, VT102, and VT202 terminal emulation.
- Standard TTY mode automatically scrolls incoming data.

KVM compatibility	
Keyboards	PC/Unix US and most foreign QWERTY, Japanese and Korean keyboards with or without Windows keys, (101, 102, 104, 105, 106, 109 keys), Sun*. Some older XT/AT auto-sensing or single mode keyboards may not be compatible.
Monitors	VGA, SVGA, XGA, Composite
Mouse	Standard PS/2, PS/2 wheel, Sun*

CPU compatibility	
Computers	Industry standard PCs, Unix systems, Sun*, IBM RS6000, DEC, HP, SGI, Apple*, and others
Keyboards	Standard PC mode 1, 2, or 3 in PS/2 or AT, USB, Sun*, Apple ADB**, Some older XT/AT auto-sensing or single mode keyboards may not be compatible.
Monitors	VGA, SVGA, XGA, Composite, Sync-on-green
Mouse	Standard PS/2, PS/2 wheel, Serial (2 or 3 button), USB, Sun*, Apple ADB**

\* Multi-Platform models only.

\*\* Requires use of Rose Translator: CNV-MACPS and a Rose cable. Some MAC start-up options are not available using a translator.

## **Cable requirements**

The cable requirements for your system will vary depending on the types of CPUs connected to the UltraMatrix switch and the equipment used for the KVM station. A KVM cable is needed for each KVM station, a CPU cable is needed for each computer that is connected to the UltraMatrix, and if the Units are connected in a “Bus” or “Ring” topology, expansion cables will be needed to connect the Units together.

(See Appendix B for cable part numbers.)

## **Package contents**

- The UltraMatrix switch
- RJ12 Serial cable
- RJ to DB9 adapter
- Power cord (North American shipments only)
- Installation and operations manual

CPU, KVM, and expansion cables are usually ordered and shipped separately. If the package contents are not correct, contact Rose Electronics or your reseller, so the discrepancy can be quickly resolved.

## **Rose Electronics web site**

Visit our web site at [www.rose.com](http://www.rose.com) for additional information on the UltraMatrix switch and other products offered by Rose Electronics that are designed for data center applications, classroom environments, and many other applications.

# MODELS



UltraMatrix 2xE models

UltraMatrix 2xE – Rear panel	Model number
	EP2-2X4U/E EE2-2X4U/E
	EP2-2X8U/E EE2-2X8U/E
	EP2-2X16U/E EE2-2X16U/E



UltraMatrix 4xE models

UltraMatrix 4xE – Rear panel	Model number
	EP4-4X4U/E2 EE4-4X4U/E2
	EP4-4X8U/E2 EE4-4X8U/E2
	EP4-4X16U/E2 EE4-4X16U/E2

Figure 1. UltraMatrix "E" series models

Note: Model number prefix-EP = PC version / EE = Multi-platform  
 Model number suffix - /E = expansion card installed  
 /E2 = two expansion cards installed

## System Overview

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The UltraMatrix switch is designed with the latest in KVM switching technology. It has the capability and flexibility to configure to most keyboards, video monitors, mice, servers and computers. The modular design of the UltraMatrix makes the Unit easy to install, expand, and maintain. The addition of an expansion card(s) and additional switches can increase the number of computers that can be connected and accessed to 1,000.

The UltraMatrix series switches are available in several configurations depending on your system switching needs. The “E” series switch is available with 4, 8, or 16 CPU ports and one to four KVM ports. (See appendix F for KVM station placement and conflicts)

### KVM station

A KVM station, consisting of a **K**eyboard, **V**ideo monitor, and **M**ouse, connects to the DB25F KVM connectors on the rear panel using a KVM adapter cable. The KVM adapter cable is available with a variety of connector types to accommodate the different types of keyboards, video monitors and mice. The KVM adapter cable connectors must be compatible with the keyboard, video monitor, and mouse cable connectors.

KVM adapter cables are available in lengths of 1 – 100 feet. (Refer to the compatibility table on page 3)

### KVM Station Keyboard and Mouse

PC Models (EP): Require a PS/2 Keyboard and Mouse.

Multi-platform Models (EE): Can use a PS/2 keyboard and mouse or a Sun Keyboard and Mouse.

Note: When using a PS/2 keyboard, the PS/2 keyboard must be capable of communicating in Mode 2 and Mode 3 if the CPU's are PC Mode 3, USB, SUN, or a Rose Translator is used in conjunction with an Apple computer.

### KVM Station Video Monitor

The KVM Station video monitor must be capable of supporting the resolution, frequency, and sync type being sent by all connected computer. It is recommended that the KVM monitor be a multi-sync monitor capable of resolutions up to 1280 x 1024 @ 75Hz or better. The quality of the video depends largely on the type of monitor used, the KVM cable length and cable type. For cable lengths greater than 20 feet, coax cable must be used. Appendix I. shows the video quality distance table for different cable types.

## Computers

The computers that will be connected to the UltraMatrix must be compatible with the UltraMatrix model. The PC model can connect to standard PC's and Unix systems. The multi-platform model can connect to PC's, Unix systems, Sun systems, and USB. Apple ADB computers can be connected using a Rose translator.

The CPU connectors on all UltraMatrix models are DB25F. Each connected computer uses a CPU adapter cable compatible with the computer's keyboard, monitor, and mouse ports.

CPU adapter cables are available in lengths of 5 – 100 feet.

The UltraMatrix switch can support computers and serial devices such as routers and hubs, which require a serial interface. A special cable is used to connect from the UltraMatrix CPU connector (DB25F) to a serial interface (Dumb Terminal, CPU, or serial device).

The UltraMatrix switches CPU port must first be configured for serial functions. Serial CPU cables are available in DB25 to:

■ DB9 ■ DB25 ■ RJ11 ■ RJ12 ■ RJ45 ■ MD8

## Expansion

To expand the UltraMatrix switch in a Bus or Ring configuration, an expansion card must be installed in each UltraMatrix switch. Figure 2 shows the expansion card used for all "E" series models.

The expansion connectors provide the means of sending the system, keyboard, video, and mouse data from one UltraMatrix's expansion card output to another UltraMatrix's expansion card input. This allows a KVM station on one UltraMatrix to switch to a computer connected on another UltraMatrix. Expansion cables are needed for each expansion Unit.

Expansion cables are available in lengths of 2 – 250 feet.

The 4xE model can have two expansion cards installed. The bottom expansion card transmits the signals for KVM 1 and 2; the top expansion card transmits the signals for KVM 3 and 4. If an expansion card is permanently removed, a terminator and cover plate must be installed.

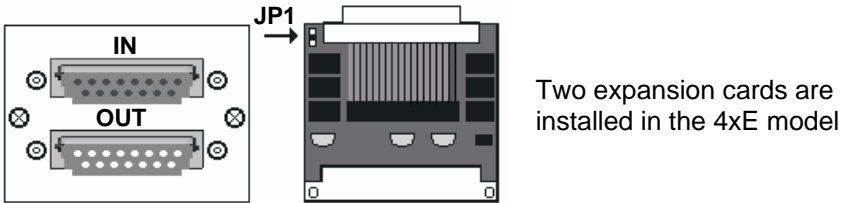


Figure 2. Expansion card

To remove the expansion card and install/remove jumper JP1:

1. Remove power from the UltraMatrix switch.
2. Remove any expansion cables.
3. Unscrew the two screws securing the expansion card to the chassis. (Bottom expansion card only on a 4xE model)
4. Carefully pull the expansion card straight back until it unseats from the backplane connector.
5. Remove/install the jumper JP1, on the expansion cards.
6. Re-install the expansion card. Make sure it seats properly in the backplane connector.
7. Secure the expansion card with the two screws.
8. Replace any expansion cables

### RS232 port

All UltraMatrix switches are equipped with an RS232 serial port on each installed CPU slot. These ports on all UltraMatrix models are RJ12, 6-conductor connectors. They provide a serial interface to the UltraMatrix from a computer terminal, a standalone computer or a Notebook computer that is not connected to a CPU port on the Unit. The RS232 serial port enables you to:

- Upgrade the system firmware
- Restore a Unit to its factory default settings
- Configure an expansion switch
- Switch a KVM station to a CPU port

An adapter and serial cable are provided for serial interface. Firmware cannot be updated from a computer terminal.

## **Cabling**

KVM stations, computers and servers are easily connected to the UltraMatrix switch with the proper cables. Provide adequate strain relief for the CPU, KVM, and expansion cables to relieve excess tension on the connectors.

Avoid routing cables close to fluorescent lights, air compressors, high voltage power sources and machinery that may create electrical noise or interference that may interfere with the operation of the UltraMatrix switch.

## **System security**

Security is a very important concern especially in the environment most UltraMatrix switches are commonly installed in, such as data centers and server rooms. The UltraMatrix system can be secured with a unique configuration password allowing only authorized personnel access to the menus and the system set-up functions, including creating and assigning users, groups, and profiles.

The KVM stations can also be secured by assigning user access names and passwords that restrict access to certain computers or servers that contain sensitive information or restricted applications.

Other security functions include the flexibility of assigning certain computers to a unique Group. This feature allows you to group computers together for access by defined "Profiles". These profiles can be set-up to define the way computers within a "Group" are accessed.

The security functions, "Users", "Profiles", and "Groups" are configured from the main configuration menu and when set-up, form a flexible, reliable, and secure system. These functions are explained in detail in the menu section and the site planning section.

## Site planning

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Organizing your site and planning the placement of the computers, the KVM stations, and the UltraMatrix switches is a key part in the installation and configuration process. Care should be taken when connecting the computers, KVMs, and the UltraMatrix switches. Locate the UltraMatrix as close as possible to the computers so the cables are as short as possible but still give some freedom of movement. Using shorter cables keeps the video noise to a minimum and reduces installation costs. Provide proper strain relief for all cables.

The UltraMatrix switch can be rack mounted with Rose Electronics rack mount kit (see Appendix J & K). Another option that makes for a clutter free installation is the Rose Electronics RackView™. The RackView is a complete KVM station (keyboard, LCD monitor, and mouse) all in a compact, pullout drawer that fits in 1 or 2 rack units. The RackView can also be ordered with an optional UltraMatrix switch installed.

Wherever the UltraMatrix is located, it should be on a secure surface, free from obstructions and objects that may cause damage to the Unit or an individual.

Following are a few items to consider prior to installing or configuring the UltraMatrix switch:

- Identify the computers that do not use a PC2 type keyboard and a PS/2 mouse (default settings). Before connecting these computers to a CPU port, the CPU port must be pre-configured to change the default keyboard and mouse types to the correct types.
- Each computer can be assigned a unique computer name. Names like staff, marketing, and finance make it easy to identify and connect to.  
The default computer names are Computer x (x = 1 – 1,000)
- The KVM stations can also be assigned a unique KVM name.  
The default KVM names are KVM x (x = 1 – 4)
- Access to the system set-up and configuration can be limited by assigning a configuration password.
- Access to the computers can be limited by assigning each user a unique user ID and password and configuring the switch to require a login.
- Pre-plan the expansion cable routing for expanded systems.

The configuration of the system, computers, KVM stations, users, profiles, and groups are defined in the menu section.



# INSTALLATION

## Switch Installation – Single Unit

Please refer to the safety section before installation

The basic installation of a single UltraMatrix switch is an easy and straightforward procedure. Perform the below steps for all computers that will be connected. It is recommended that all computers be powered off. When a computer is connected and then booted, the UltraMatrix will automatically determine the keyboard and mouse types used for that computer and no pre-configuration is needed.

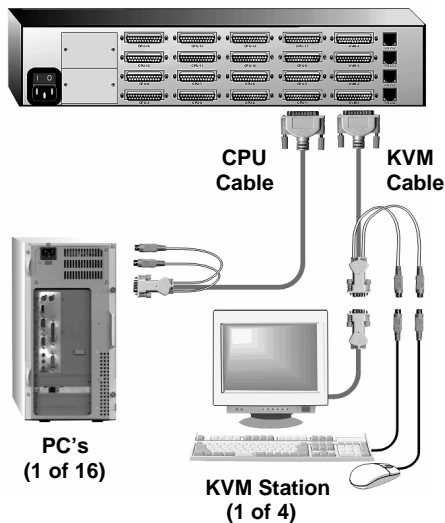


Figure 3. Single Unit configuration

The Unit in Figure 3 can be any UltraMatrix 2xE or 4xE model

If removing power from a computer is not practical, pre-configure the UltraMatrix to define that CPU port's keyboard and mouse types. This procedure should only be done if the CPUs keyboard and mouse can be disconnected and re-connected without affecting the interface. The default keyboard type is PC mode 2, and the default mouse type is PS/2. If the computer being connected, with power applied, uses a PC2 keyboard and PS/2 mouse, no pre-configuration is needed. If not, pre-configure the keyboard and mouse types for that CPU port before connecting the computer (steps 4a-4f).

Perform the following installation steps for each computer that will be connected to the UltraMatrix. Sequentially connect the computers starting with computer #1.

STEPS: (See Figure 3 for an example of a single Unit installation)  
(Refer to the troubleshooting section for help if needed)

1. Connect all KVM stations to the UltraMatrix switches DB25F, KVM connectors using the appropriate KVM cables.
2. Turn on all KVM stations video monitors and the UltraMatrix.  
(Wait for the internal diagnostic check to complete and fade out)
3. Switch KVM station #1 to the CPU port being configured (starting with CPU port #1). This is done by pressing and releasing the left control [Ctrl] key and within 2 seconds, type in the CPU port # being configured (starting with port 1) and press [Enter]. A connection dialog box will display showing the connection status. (Figure 18)
4. Pre-configure the CPU port, if needed, as outlined in steps 4a-f if the computer being connected does not use a PC2 type keyboard or a PS/2 mouse (defaults). Pre-configure the CPU port before connecting the computer. If the computer uses a PC2 type keyboard and PS/2 mouse, connect it to the corresponding CPU port. No pre-configuration is needed.

#### **Pre-Configuration procedure**

- a. Call up the Configuration menu system by pressing and releasing the left [Ctrl] key, then the [F12] key. (Figure 7)

Select "Computer" and press [Enter] (

- b. Figure 9)
  - c. Select the computer to change the default keyboard and/or mouse type, and then select the keyboard or mouse field for the selected computer and press [Enter]. A selection box will display, listing the supported keyboard or mouse types.
  - d. Select the correct keyboard or mouse type for the selected computer and press [Enter].
  - e. Press [ESC] to return to the "Main menu" and save the changes.
  - f. Connect the computer to the pre-configured CPU port.
5. Boot the computer the KVM station is connected to if the computer power was off. You should see the boot up sequence on the KVM monitor. If the computer was connected to a pre-configured CPU port with power applied, you should see that computers video.
  6. Verify that the keyboard, video, and mouse on the connected computer function properly before proceeding. Verify that other KVM stations operate properly.
  7. Switch KVM station #1 to the next sequential CPU port as explained in step 3 and perform steps 4-6 for that computer and for the remaining computers.

8. When all computers are connected and operating properly, change the “Maximum computers” value from the default value of 64 to the correct number of computers connected to the single Unit. This will limit the scanning function to the actual number of computers that are connected. Change the “Maximum computers” value as follows:  
(See page 15 for determining the “Maximum computers” value.)
  - a. Call up the main menu ([Ctrl], F12). (Figure 7)
  - b. Select “System” and press [Enter]. (Figure 8)
  - c. Select “Maximum computers” and press [Enter].
  - d. Enter the correct “Maximum computers” value and press [Enter].
  - e. Press [ESC] to return to the main menu.
  - f. Save the changes and EXIT. (Figure 15)

This completes the basic installation for a single Unit. You can switch to any of the attached computers from the keyboard by pressing and releasing the left control [Ctrl] key, typing in the computer port number to switch to and press [Enter]. You can also switch to a computer by displaying the “Computer select” menu (left control [Ctrl] key, then press the [ESC] key). Select the computer to switch to from the list and press [Enter]. You will be immediately switched to that computer. (Figure 17).

To customize the configuration settings for the system, computers, KVM stations, users, profiles, groups, and language see the Configuration Menu section for details.

Refer to the Operation section for information on the operation of the UltraMatrix switch.

## Switch Installation – Multiple units – “BUS” topology

A “BUS” configuration is usually used when all the users are connected to the KVM ports on Unit #1. In a “BUS” configuration, (Figure 4) the video path is from the last Unit in the configuration to the first Unit (“OUT” to “IN”). KVM users on the first Unit can access all computers on all Units. Users connected to Unit #2 can only access computers on Unit #2, 3, etc.

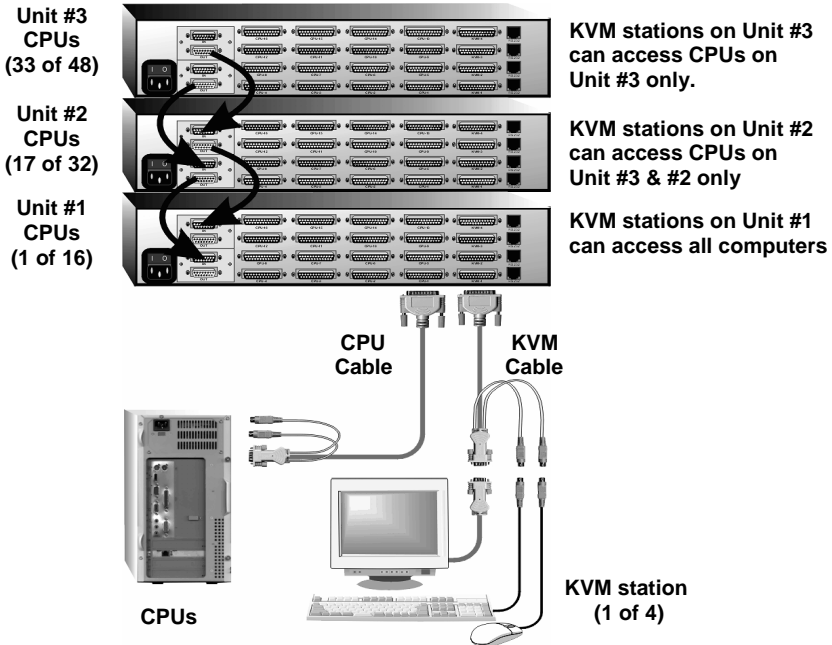


Figure 4. Bus configuration

The Units in Figure 4 can be any UltraMatrix 2xE or 4xE model. Upper expansion card and cabling are on the 4xE model only.

The “BUS” installation procedure is very similar to the single Unit installation with the addition of connecting the expansion cables and changing two configuration parameters, the “Starting computer” number and the “Maximum computers” number. All Units in the system must have an expansion card(s) with a jumper installed on JP1. (NOTE: Jumper JP1 is factory installed on all expansion cards)

To start, identify the following prior to installation:

1. Which UltraMatrix will be #1, #2, and so on.
2. Which computer will be #1, #2, and so on.
3. Which computers do not use a PC2 keyboard or a PS/2 mouse.
4. Which Unit and CPU port each computer will be connected to.
5. Which KVM station will be #1, #2, and so on.
6. The “Starting computer” number for each Unit.
7. The number of computers, or “Maximum computers”, that the UltraMatrix will be managing.

The “Starting computer” and “Maximum computers” values are determined as follows:

### **Starting computer**

The “Starting computer” number will depend on which Unit is being configured. The “Starting computer” number for the first Unit is always one (default). Using Units that have 16 CPU ports, the “Starting computer” number for the second Unit is the total number of RS232 ports on the first Unit times 4 plus (+) one or 17, the third Unit would have a “Starting computer” number of 33 (Total RS232 ports on unit #1 and unit #2 times 4 plus (+) 1, and so on.

### **Maximum computers**

The “Maximum computers” value is calculated by multiplying the total number of RS232 ports on all units by 4. If your system consists of 10 UltraMatrix 4xE Units, each with four (4) RS232 ports, the “Maximum computers” number would be 160 (40 - RS232 ports x 4). The “Maximum computers” value must be entered from a KVM station and when saved, this value is propagated to all connected Units.

## **Connecting the expansion units**

---

The installation steps below are for all UltraMatrix switch models.

Steps:

(NOTE: Expansion cables should not be connected at this point)

1. Verify that power is “OFF” on all Ultramatrix switches.
2. Configure the “Starting computer” number for all the UltraMatrix switches, starting with Unit #2 by: (Unit #1 default = 1)
  - a. Connect a KVM station to Unit #2’s KVM #1 connector using the appropriate KVM adapter cable.
  - b. Apply power to the KVM monitor and to UltraMatrix #2.
  - c. When the internal diagnostic completes, press and release the left control [Ctrl] key, then the F12 key to display the “Main menu”.

- d. Select “System” and press [Enter].
  - e. Next, select “Starting computer number” and press [Enter]. An input box will display for a new starting computer number. Enter the correct “Starting computer” number for this Unit (See page 15) and press [Enter].
  - f. Press the “Esc” key to return to the “Main menu”.
  - g. Select “Save” and press [Enter]. A “YES/NO” choice box will display. Select “YES” and press [Enter] to save the changes.
  - h. Turn the power off on the UltraMatrix.
  - i. Connect the KVM station to the KVM #1 connector on Unit #3.
  - j. Configure this Units “Starting computer” number and then all other Units in the system. When the “Starting computer” number has been entered for all Units, proceed to step 3.
3. Connect the KVM station to Unit #1’s KVM #1 connector and apply power to the monitor and Unit #1.
  4. Enter the “Maximum computers” number
    - a. Display the main menu (left control [Ctrl] key, then the F12 key.)
    - b. Select “System” and press [Enter].
    - c. Select “Maximum computers” and press [Enter]. An input box will display for a new “Maximum computers” number. Enter the correct “Maximum computers” value as explained on page 15 and press [Enter].
    - d. Press the “Esc” key to return to the “Main menu”, select “Save” and press [Enter]. A “YES/NO” choice box will display. Select “YES” and press [Enter] to save the change.
  5. The next item is to connect the Units in a “BUS” configuration and verify that communication between the Units is established. To do this, call up the System status display by pressing and releasing the left control [Ctrl] key, then the F12 key.
  6. Select “Status” from the Main menu and press [Enter]. The system status screen will display showing the following: (Figure 14)
    - a. Computers
    - b. Power (Power on status)
    - c. POS (Card position)
    - d. VER (Program version)
    - e. KVM
    - f. CPU
    - g. User
    - h. Status

The number of system CPU ports that Unit #1 has will be highlighted. If the Unit is a 16-port switch, computers 1–4, 5–8, 9–12, and 13–16 will be highlighted on the status screen. (Note: “System CPU ports” = total RS232 ports times 4)

7. Apply power to the next unit to bus in, then connect an expansion cable (IN THIS ORDER);  
(Lower and upper expansion cards on the 4xE model)  
**From:** Unit #2's "OUT" expansion card connector  
**To:** Unit #1's "IN" expansion card connector.
8. Verify that the block of system CPU ports from Unit #2 is recognized on the status screen. If Unit #2 is a 16-port switch, computers 17–20, 21–24, 25–28, and 29–32 will be highlighted.
9. Sequentially apply power, then connect the expansion cables to the remaining switches as explained in steps 7 and 8. Always with power on the unit and from the "OUT" connector of the Unit being added to the "IN" connector of the previously installed Unit.
10. When all Bus cabling is in place and reporting properly to the status screen, save the configuration to update all boards in the system.

### **Verifying the Video path**

Steps 11, 12, and 13 verify that the video path is properly routed to a KVM station and all cabling is connected properly. Make sure all UltraMatrix switches are on, all Bus cabling is in place and a KVM station is connected to UltraMatrix #1, KVM #1 port.

11. Connect a computer to any CPU port on the last UltraMatrix switch. Switch the KVM station to this CPU port by pressing and releasing the left control [Ctrl] key, type in the CPU port number, then press [Enter]. This connects the KVM station to that CPU port.
12. Boot the computer; you should see the boot-up sequence on the KVM monitor. If no video is seen, see the troubleshooting section.
13. Connect other KVM stations, if needed, to the UltraMatrix switches and verify they operate properly. (See Appendix F. for proper KVM station placement)

### **Connecting the computers**

If power must be maintained on a computer, perform steps 4a-f on page 12 to pre-configure the keyboard and mouse types, if needed, before connecting the computers. Though not required, the following steps assume that all CPU ports will be utilized and the computers installed sequentially.

(All UltraMatrix switches in the system should have power "ON" and no configuration menu displaying on any KVM monitor.)

14. Make sure all KVM stations video monitors and all UltraMatrix switches have power applied and a KVM station on Unit #1.

15. Switch the KVM station to CPU port # “x” (starting with x=1) by pressing and releasing the left control [Ctrl] key and within 2 seconds, type in 1 (or the CPU port # being configured) and press [Enter]. A connection dialog box will display.
16. If the computer being connected does not use a PC2 type keyboard or a PS/2 mouse (defaults), pre-configure the CPU port as outlined in steps 4a-f on page 12 before connecting the computer. If the computer uses a PC2 type keyboard and a PS/2 mouse, connect it to the corresponding CPU port with the appropriate CPU cable. No pre-configuration is needed.
17. Boot the computer if power is not applied. You should see the boot up sequence on the KVM monitor. If the computer was connected to a pre-configured CPU port with power applied, you should see that computer's video.
18. Verify that the keyboard, video, and mouse on the connected computer function properly before proceeding.
19. Switch the KVM station to the next sequential CPU port as explained in step 14 and perform steps 15 - 17 for this computer and for the remaining computers.

When all computers are connected to the UltraMatrix switches and functioning properly, the basic installation of a “BUS” configuration is complete. KVM stations connected to UltraMatrix switch #1 can switch to any computer in the system.

Other configuration parameters can be set-up for the system, computers, KVM stations, users, profiles, groups, and languages. See the “Configuration menu” section for instructions on setting up these items and the Operations section for using the UltraMatrix switch.

These installation steps are a guideline for installing multiple switches in a “BUS” topology. Following these steps verify, that through the installation process, everything functions properly.



## Switch Installation – Multiple units – “RING” topology

A “RING” configuration is usually used when the users are connected to different UltraMatrix switches and need access to all computers. In a “RING” configuration, users on any KVM station in the ring can access all the computers in the system on a first-come-first-serve basis.

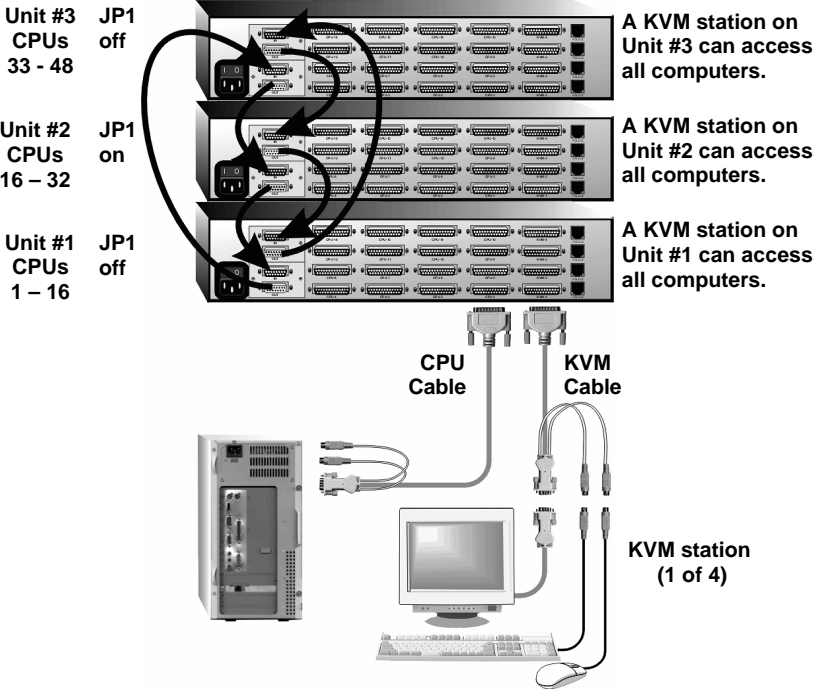


Figure 5. Ring configuration

The Units in Figure 5 can be any UltraMatrix model

The “RING” installation procedure is very similar to installing a “BUS” configuration with the exception of removing jumper JP1 on the expansion cards on two Units and adding an expansion cable(s) from the first Unit to the last Unit. This additional expansion cable(s) from the first Unit to the last Unit creates the “RING”.

In the example used in Figure 5, removing jumper JP1 on Unit #1 and #3 divides the total ring cable length approximately in half.  
 Unit #3 (IN) to Unit #1 (OUT) = 20’  
 Unit #3(OUT) to Unit #2 (IN), Unit #2 (OUT) to Unit #1 (IN) = 20’.

All Units must be equipped with an expansion card(s).

To begin setting up your system in a “RING” configuration, perform steps 1 – 13 as outlined in setting up a “BUS” configuration. When doing this, keep in mind that the “OUT” expansion card connector on the first Unit will be connected with an expansion cable to the “IN” expansion card connector on the last Unit to complete the “Ring”.

Jumper JP1 must be removed from the lower expansion cards on two Units in the system to properly maintain cable termination. To identify which Units must have jumper JP1 removed, calculate the total cable length around the “RING”. This is from Unit #1’s “IN” connector, around the “RING” and back to Unit #1’s “OUT” connector.

Jumper JP1 should be removed on Unit #1 and another switch that will divide the “RING” into approximately equal cable length distances. (See Figure 5 for a typical example)

#### Steps:

(Perform steps 1-13 described in the “BUS” installation first, page 14)  
(NOTE: Disconnect all cables before removing any expansion card)

1. Remove power from all UltraMatrix switches.
2. Connect an expansion cable from Unit #1’s “OUT” connector (top and bottom expansion cards on the 4xE model) to the last Units “IN” connector (top and bottom expansion cards on the 4xE model) to complete the “Ring”.
3. Remove the bottom expansion card on Unit #1 and the other switch that divide the “RING” into equal distances and remove jumper JP1 (See Figure 2), then replace the expansion cards, cables, and apply power to the two UltraMatrix switches that jumper JP1 was removed. All other UltraMatrix switches should have power off at this time.
4. Make sure a KVM station is connected to UltraMatrix #1, KVM #1.
5. Turn on all KVM stations video monitors and apply power to all UltraMatrix switches. (Wait for the internal diagnostic check to complete and fade out).
6. Switch the KVM station to CPU port #1 on Unit #1 by pressing and releasing the left control [Ctrl] key, type in “1” and press [Enter].
7. Pre-configure the CPU port, if needed, as outlined in steps 4a-f on page 12 if the computer being connected does not use a PC2 type keyboard or PS/2 mouse (defaults). Pre-configure the CPU port before connecting the computer. If the computer uses a PC2 type keyboard and PS/2 mouse, connect it to the corresponding CPU port. No pre-configuration is needed.
8. Boot the computer if power is not applied. You should see the boot up sequence on the KVM monitor. If the computer was connected to a pre-configured CPU port with power applied, you should see that computers video.

9. Verify that the keyboard, video, and mouse on the connected computer function properly before proceeding.
10. Switch the KVM station to the next sequential CPU port as explained in step 6 and perform steps 7 – 9 for this computer and for the remaining computers.
11. Connect other KVM stations as needed to the UltraMatrix switch and verify they operate properly. (See Appendix F. for proper KVM station placement)

This completes the basic installation of a “RING” configuration. A KVM station connected to any UltraMatrix switch can connect to any computer in the “RING”. Other configuration parameters can be set-up for the system, computers, KVM stations, users, profiles, groups, and languages. See the “Configuration menu” section for instructions on setting up these items.

These installation steps are a guideline for installing multiple switches in a “RING” topology. Following these steps verify, that through the installation process, everything functions properly.

Please refer to the Operations section for using the UltraMatrix switch and Appendix F for KVM placement and usage.

## Switch Installation – Multiple units – “Split-BUS” topology

A “Split Bus” configuration is usually used when the users are connected to the first and last UltraMatrix switch and need access to all connected CPUs. This topology can only be done using the 4xE model with two expansion cards installed in each switch.

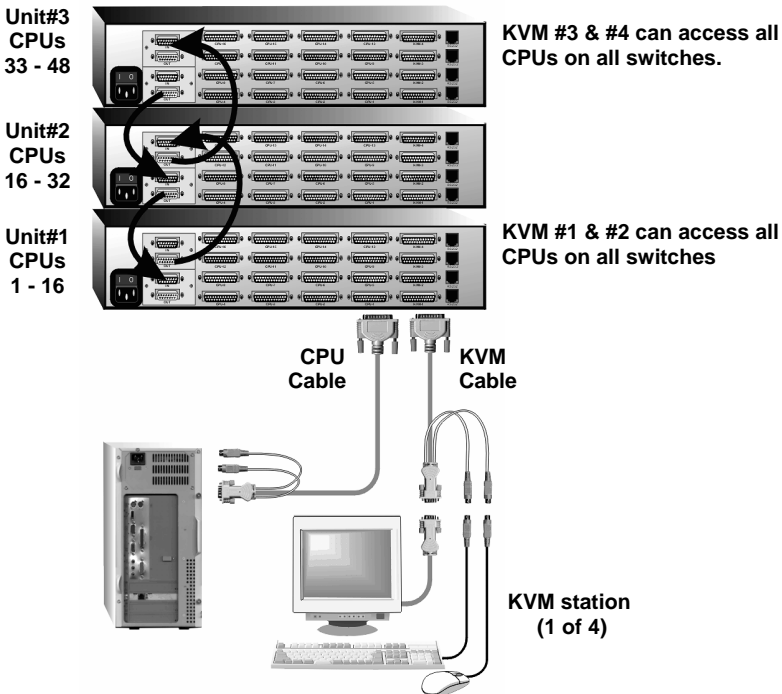


Figure 6. Split-Bus configuration

The Units in Figure 6 must be 4xE models with 2 expansion cards.

Steps:

1. Verify that power is “OFF” on all UltraMatrix switches.
2. Configure the “Starting computer” number for all the UltraMatrix switches, starting with Unit #2 by: (Unit #1 default = 1)
  - a. Connect a KVM station to Unit #2’s KVM #1 connector using the appropriate KVM adapter cable.
  - b. Apply power to the KVM monitor and to UltraMatrix #2.
  - c. When the internal diagnostic completes, press and release the left control [Ctrl] key, then the F12 key to display the “Main menu”.
  - d. Select “System” and press [Enter].

- e. Next, select “Starting computer number” and press [Enter]. An input box will display for a new starting computer number. Enter the correct “Starting computer” number for this Unit (See page 15) and press [Enter].
  - f. Press the “Esc” key to return to the “Main menu”.
  - g. Select “Save” and press [Enter]. A “YES/NO” choice box will display. Select “YES” and press [Enter] to save the change to flash memory.
  - h. Turn the power off on the UltraMatrix.
  - i. Move the KVM station from Unit #2 to Unit #3 and connect it to the KVM #1 connector.
  - j. Configure this Units “Starting computer” number and then all other Units in the system. When the “Starting computer” number has been entered for all Units, proceed to step 3.
3. Connect a KVM station to Unit #1’s KVM #1 connector and apply power to the monitor and Unit #1.
  4. Enter the “Maximum computers” number by:
    - a. Display the main menu. (Left control [Ctrl] key, then F12 key).
    - b. Select “System” and press [Enter].
    - c. Select “Maximum computers” and press [Enter]. An input box will display for a new “Maximum computers” number. Enter the correct “Maximum computers” value as explained on page 15 and press [Enter].
    - d. Press the “Esc” key to return to the main menu, select “Save” and press [Enter]. A YES/NO choice box will display. Select “YES” and press [Enter] to save the change.
  5. Call up the system status display (left [Ctrl] key, then the F12 key).
  6. Select “Status” from the main menu and press [Enter]. The system status screen will display showing the following; (Figure 14)
    1. Computers
    2. Power (Power on status)
    3. POS (Card position)
    4. VER (Program version)
    5. KVM
    6. CPU
    7. User
    8. Status

The number of system CPU ports that Unit #1 has will be highlighted. If the unit is a 16-port switch, computers 1-4, 5-8, 9-12, and 13-16 will be highlighted on the status screen.

(NOTE: System CPU ports = total RS/232 ports times 4)

7. Apply power to the next unit to bus in, then connect an expansion cable (IN THIS ORDER);

**From:** Unit #2’s lower “OUT” expansion card connector,

**To:** Unit #1’s lower “IN” expansion card connector.

8. Verify on the status screen that the next block of system CPU ports from Unit #2 is recognized. If Unit #2 is a 16-port switch, computers 17-20, 21-24, 25-28, and 29-32 will be highlighted.
9. Sequentially apply power then connect the expansion cables to the remaining switches as explained in steps 7 and 8. Always with power on the unit and from the lower "OUT" connector of the Unit being added to the lower "IN" connector of the previously installed Unit.

Steps 3-9 route the video from all units to the KVM #1 and KVM #2 ports on Unit #1. Now the reverse must be performed to route the video from all units to KVM #3 and KVM #4 ports on the last unit. (Refer to Figure 6)

For the steps below, the example in Figure 6 is used. Unit #3 is the last unit in the configuration, Unit #2, the next to last unit and so on.

10. Connect a KVM station to Unit #3's KVM 4 connector and apply power to the monitor. (All UltraMatrix switches power should be ON)
11. Call up the system status display by pressing and releasing the left [Ctrl] key, then the F12 key. Select "Status" from the main menu and press [Enter]. The number of system CPU ports that the last Unit has will be highlighted. If the unit is a 16-port switch, computers 1-4, 5-8, 9-12, and 13-16 will be highlighted on the status screen.
12. Connect an expansion cable  
**From:** Unit #2's upper "OUT" expansion card connector,  
**To:** Unit #3's upper "IN" top expansion card connector.
13. Cable in the remaining switches as explained in step 12 from the upper "OUT" connector to the upper "IN" connector.
14. Verify that the status screen report correctly.

Steps 10-14 complete the expansion cabling for a "Split Bus" configuration. KVMs connected to Unit #1, KVM #1 and #2 can access all computers in the system. KVMs connected to the last unit's KVM #3 and KVM #4 can access all computers in the system.

Next, connect the computers to the UltraMatrix switches.

15. Switch the KVM station to CPU port #1 on Unit #1 by pressing and releasing the left control [Ctrl] key, type in "1" and press [Enter].

16. Pre-configure the CPU port, if needed, as outlined in steps 4a-f on page 12 if the computer being connected does not use a PC2 type keyboard or PS/2 mouse (defaults). Pre-configure the CPU port before connecting the computer. If the computer uses a PC2 type keyboard and PS/2 mouse, connect it to the corresponding CPU port. No pre-configuration is needed.
17. Boot the computer if power is not applied. You should see the boot up sequence on the KVM monitor. If the computer was connected to a pre-configured CPU port with power applied, you should see that computers video.
18. Verify that the keyboard, video, and mouse on the connected computer function properly before proceeding.
19. Switch the KVM station to the next sequential CPU port as explained in step 15 and perform steps 16 – 18 for the remaining computers.
20. Connect other KVM stations as needed to the UltraMatrix switch and verify they operate properly. (See Appendix F. for proper KVM station placement)

Other configuration parameters can be set-up for the system, computers, KVM stations, users, profiles, groups, and languages. See the “Configuration menu” section for instructions on setting up these items.

Please refer to the Operations section for using the UltraMatrix switch and Appendix F for KVM placement and usage.

A variety of cable configurations can be designed to accomplish the switching needs for your system. If you need assistance in designing your system layout, contact our technical staff.





## Main Menu

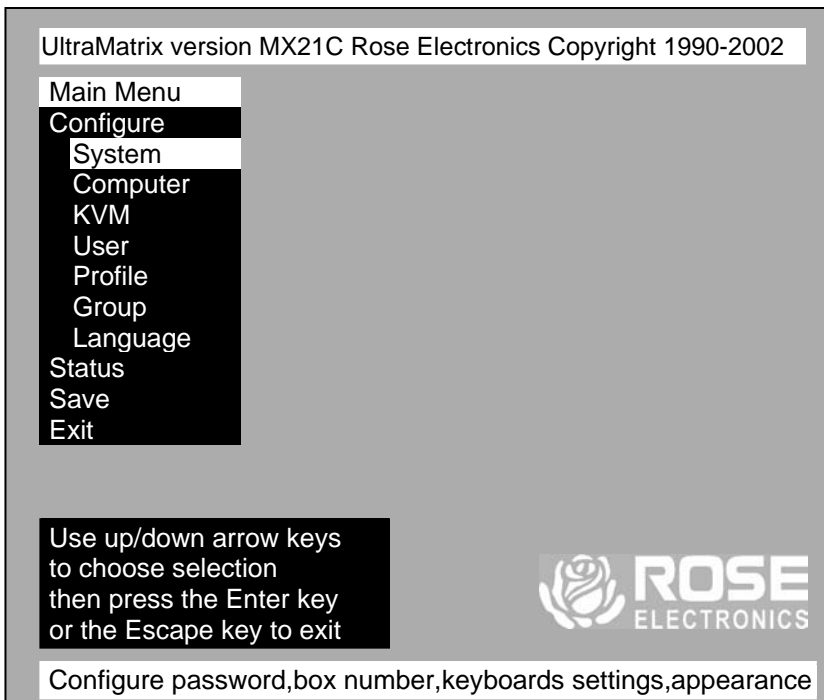


Figure 7. Main configuration menu

**Save the changes made to any menu. If not saved, the changes will be lost when power is removed from a Unit.**

The Main configuration menu is the starting point for the configuration menus. From this menu, you can configure the system, computers, KVMs, users, profiles, groups, and languages. To display the “Main menu”, press and release the left control [Ctrl] key, then the F12 key. The main menu will display on top of a currently connected computers video. If no computer is connected to supply the video, the display’s background is black.

The text box at the bottom of the menu screen provides a brief explanation of the menu option selected.

The following pages explain the UltraMatrix menus and the options available.

## Configure System menu

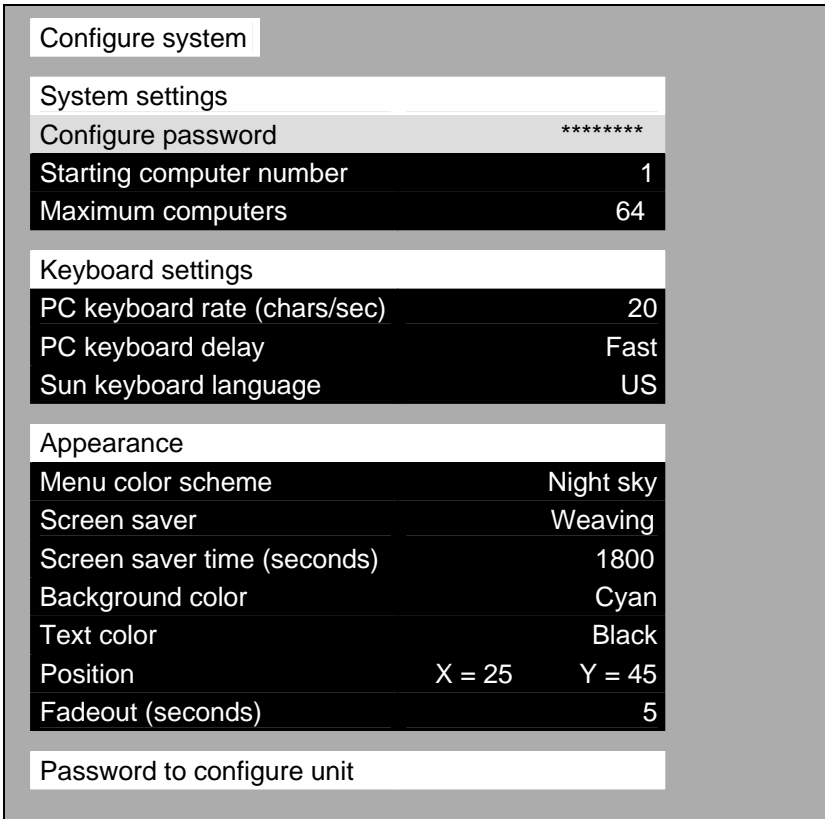


Figure 8. Configure system menu

“**System settings**” selections.

### **Configure password** (Default: no password)

The “Configure password” selection is used to add a new or change an existing password. This password prevents unauthorized access to the configuration menus. Passwords are case sensitive, 8 characters max.

To create or change a password, select “Configure password” and press [Enter]. An input box will display to enter the password. Type in the password and press [Enter]. Whenever the menu system is called up, this password must be entered to gain access to the configuration menus.

See Appendix G. for instructions on resetting a forgotten password.

### **Starting computer number** (Default: 1)

The “Starting computer number” defines to the system, the first CPU port number for a particular UltraMatrix switch that is configured in an expanded topology. (See page 15)

Switch #1’s starting computer number is always 1.

Switch #2’s number is the total RS232 ports on Unit #1 times 4 + 1.

Switch #3’s number is the total RS232 ports on Unit #1 and Unit #2 times 4 + 1 and so forth.

To enter the “Starting computer” number use the up/down arrow keys and select “Starting computer number” and press [Enter]. An input box will display for a new starting computer number. Enter the new “Starting computer” number and press [Enter].

### **Maximum computers** (Default: 64)

The “Maximum computers” value is calculated by multiplying the number of RS232 ports on all switches by 4. This value must be entered from KVM station #1 before all Units are connected in an expansion topology. When saved, this value is propagated to all connected Units. To enter the “Maximum computers” value, select it and press [Enter]. An input box will display to enter the maximum computers value. Type in the new value and press [Enter].

“**Keyboard settings**” selections.

### **PC keyboard rate (chars/sec)** (Default: 20)

This option adjusts the KVM keyboard action when you hold down a key to repeat a single character. Valid inputs are 1-31.

### **PC keyboard delay** (Default: Fast)

This option adjusts the delay between when a key is pressed and held and when it begins to send repeated characters to the selected computer.

The options are:

- Slow
- Medium
- Fast
- Fastest

### **Sun keyboard language** (Default: US)

Determines the response to a Sun computer's query for the keyboard language type used. To change the Sun keyboard language type, select it and press [Enter]. A selection box will display showing the supported Sun language choices. Use the up/down arrow keys to select the desired language and press [Enter]. The Sun keyboard language choices are:

- US
- US-Unix
- Francais
- Dansk
- Deutsch
- Italiano
- Nederlands
- Norsk
- Portugues
- Espanol
- Svenska/Suomea
- Franco-Suisse
- Schw-Deutsch
- United Kingdom
- Hankuko
- Tai-oan
- Nihongo
- Canadienne

“**Appearance settings**” selections.

### **Menu color scheme** (Default: Night sky)

Sets the colors for the configuration menus. To change the color scheme, select “Menu color scheme” and press [Enter]. A selection box will display showing the supported color schemes. Use the up/down arrow keys to select the desired scheme and press [Enter].

The menu color schemes choices are:

- Night Sky – cyan, magenta, white, and blue
- Tuxedo – black, red, and white
- Aquarium – yellow, magenta, blue, cyan, and white
- Forest – green, black, cyan, and blue

### **Screen saver** (Default: Weaving)

A screen saver reduces monitor burn-in and adds an additional level of security. The screen saver automatically activates when there is no keyboard or mouse activity for an adjustable period. To change the screen saver type, select it from the menu and press [Enter]. A selection box will display showing the supported screen saver choices. Use the up/down arrow keys to select the desired screen saver and press [Enter]. The screen saver choices are:

- Black screen
- Fireflies
- Weaving
- Bounce

**Screen saver time (seconds)** (Default: 1800 seconds)

Determines the period of keyboard or mouse inactivity before activating the screen saver. To change the screen saver time, select it from the menu and press [Enter]. An input box will display to enter a new screen saver time. Enter a new value from 0 to 9999 seconds and press [Enter].

Entering a value of 0 (zero) disables the screen saver.

**Background / Text color** (Default: Cyan / Black)

This option sets the background or text colors for the connection status and computer select screens. Colors can be one of eight solid or transparent colors. To change the background or text color, select it from the menu and press [Enter]. The color selections will display showing the solid and transparent color choices. Use the arrow keys to select the desired color and press [Enter].

The color choices are:

■ Black   ■ Red   ■ Green   ■ Yellow  
■ Blue   ■ Magenta   ■ Cyan   ■ White   (Solid or transparent)

NOTE: Do not set the background and text colors the same.

**Position** (Default: x = 25, y = 45)

This option adjusts the screen position of the connection status box. Once set, this position is maintained at all video resolutions. To change the connection status box position, select it from the menu and press [Enter]. Use the arrow keys to position the status box anywhere on the screen and press [Enter] when the desired position is reached. Do not set the screen position off the visible screen area. This could cause rainbows or bars of shaded video.

Valid position ranges are:

Horizontal: 0 – 64, Vertical: 0 – 99

**Fadeout (seconds)** (Default: 5 seconds)

Sets the amount of time the connection status box displays. Valid fadeout times are 0 – 255 seconds. A value of zero disables displaying the connection status box; a value of 255 will cause the connection status box to always be displayed. If the connection status box does not display when switching to a computer, increase the fadeout time. Some monitors will not display the connection status box if the fadeout time is less than the time it takes the monitor to sync to a new video signal. To change the fadeout time, select it from the menu and press [Enter]. Enter a valid new time in seconds and press [Enter].

## Configure Computer menu

Configure computer			
	Computer name	Keyboard	Mouse
1	Computer	1 PC2	PS/2
2	Computer	2 PC2	PS/2
3	Computer	3 PC2	PS/2
4	Computer	4 PC2	PS/2
5	Computer	5 PC2	PS/2
6	Computer	6 PC2	PS/2
7	Computer	7 PC2	PS/2
8	Computer	8 PC2	PS/2
9	Computer	9 PC2	PS/2
10	Computer	10 PC2	PS/2
11	Computer	11 PC2	PS/2
12	Computer	12 PC2	PS/2
13	Computer	13 PC2	PS/2
14	Computer	14 PC2	PS/2
15	Computer	15 PC2	PS/2
16	Computer	16 PC2	PS/2

Use page up and page down keys to configure more computers  
Name of computer, up to 16 characters

Figure 9. Configure computer menu

The “Configure computer” menu allows you to change each selected computers name, keyboard, and mouse types. The left column is the logical location (port) This value is not user changeable.

### Computer name (Default: Computer x)

To change the computer name, select it from the menu and press [Enter]. An input box will display to enter a new computer name. Type in the new name and press [Enter]. Names can be 16 characters in length, case sensitive. The computer name appears on the configure group menu, the computer select list and the connection status window. A diamond character next to a computer name identifies the computer currently connected to this KVM station. Use the page up/down keys to show more computers. The page up/down functions displays in increments of 16 and will only scroll to the “Maximum computers” setting.

## **Keyboard** (Default: PC mode 2)

To change the keyboard type for a selected computer or configure the CPU port for a serial device, use the up/down arrow keys to select the computer whose keyboard needs changing. Use the right arrow key to select the keyboard field and press [Enter]. A selection box will display listing the supported keyboard types and serial support options. Use the up/down arrow keys to select the keyboard type or serial support needed for the selected computer and press [Enter]. The choices are:

- PC1: Supports most IBM compatible PCs, PS/2 models, and PCs that do not use PC mode 2.
- PC2: Supports most PCs.
- PC3: Supports Unix workstations and servers, IBM RS/6000, SGI, HP700 or 9000 series, DEC Alpha<sup>®</sup>, or other computers.
- USB-PC: USB PC keyboard support.
- USB-Sun: USB Sun keyboard support.
- Sun: Supports Sun systems\*
- Serial 9600,N,8,1: Serial support @ 9600 Baud rate\*
- Serial 4800,N,8,1: Serial support @ 4800 Baud rate\*
- Serial 2400,N,8,1: Serial support @ 2400 Baud rate\*
- Serial 1200,N,8,1: Serial support @ 1200 Baud rate\*
- Serial 600,N,8,1: Serial support @ 600 Baud rate\*
- Serial 300,N,8,1: Serial support @ 300 Baud rate\*
- Serial 110,N,8,1: Serial support @ 110 Baud rate\*
- Serial 50,N,8,1: Serial support @ 50 Baud rate\*

\* Available on Multi-platform models only

## **Mouse** (Default: PS/2)

To change the mouse type for a selected computer, use the up/down arrow keys to select the computer whose mouse needs changing. Use the right arrow keys to select the mouse field and press [Enter]. A selection box will display listing the supported mouse types. Use the up/down arrow keys to select the correct mouse type for the selected computer and press [Enter]. The supported mouse types are:

- PS/2 - 6-pin mini-Din connector with 2 or 3 buttons
- PS/2 wheel - incorporates a small wheel for special functions.
- Serial 2-button - connects to a computer's COM port.
- Serial 3-button - connects to a computer's COM port.

Note: If you set the mouse to PS/2 and the CPUs operating system is capable of supporting a wheel mouse, the mouse type will automatically be changed to PS/2 wheel.

## Configure KVM menu

ID	BUS	KVM name	Resolution	Start	User
1	1	KVM station 1	640x480@60	0	User 1
2	2	KVM station 2	640x480@60	0	User 1
3	3	KVM station 3	640x480@60	0	User 1
4	4	KVM station 4	640x480@60	0	User 1

Name of keyboard-video-mouse station (KVM) up to 16 characters

Figure 10. Configure KVM menu

Note: On the 2xE model, only KVMs 1 and 2 will display.  
On the 4xE model, KVMs 1, 2, 3 and 4 will display.

The “Configure KVM” menu allows you to change each selected KVMs name, resolution, start, and user parameters. The ID column indicates the physical location (port) the KVM is connected to. The BUS column is the KVM video bus number. These values are not user changeable.

**KVM name** (Default: KVM Station x)

To change the KVM name, select it from the menu and press [Enter]. An input box will display to enter a new KVM name. Type in a new name and press [Enter]. KVM names can be 16 characters in length, case sensitive.



**Resolution** (Default: 640x480@60Hz)

Selects the resolution and scan rate of the on-screen display when no attached computer video is present. If a computer video is shown, the detected video resolution from the connected computer is used.

To change the resolution for a selected KVM station, select the KVM station to change the resolution and using the left arrow key, select the resolution field and press [Enter]. A list of supported resolutions will display. Select the new resolution from the list and press [Enter]. The supported resolutions are:

- 640x480@60Hz
- 640x480@72Hz
- 640x480@75Hz
- 640x480@67Hz
- 832x624@75Hz
- 1152x900@66Hz
- 1152x900@76Hz

**Start** (Default: 0)

Assigns the CPU port number the KVM station will connect to on start up and login. 0 = no connection. To change the value, select it from the menu and press [Enter]. Type in the CPU port number the selected KVM station will connect to upon start up or login and press [Enter].

**User** (Default: User 1, 2, 3, and 4 (3 and 4 are on the 4xE model only))

This field is used to assign a specific user to a KVM station. To change the user, first select the KVM station, then select the user field and press [Enter]. A selection box will display a list of user names followed by "Login". Select the user to assign to the selected KVM station and press [Enter]. Use the page up/down keys to display more users. If "Login" is selected, the KVM user must login with their user ID and assigned password to gain access to the KVM station.

The configure user, profile, and group menus all tie together to provide access control to the computers. A group defines which computers in the system can and cannot be accessed. This group is assigned to a profile name. The profile defines how the computers (defined by the group) can be accessed. The profile is assigned to a user or users.

When a user logs on to a KVM station, their assigned profile is validated. This profile defines which group has been assigned (which computers can be accessed), what mode the user can connect to the computers with (view, share, control, private), the share time, scan time, and logout time.

The configure user, profile, and group features provide a flexible and reliable security set-up for your system.

### Configure User menu

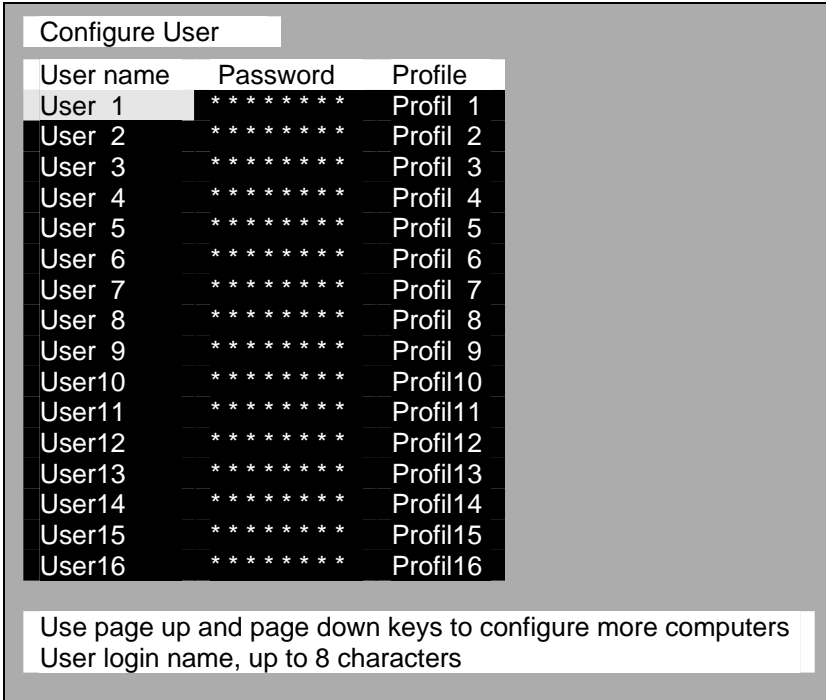


Figure 11. Configure user menu

The configure user menu is used to define a name, assign an access password, and assign a specific profile to the user. Duplicate names are acceptable, however, all persons using the same user name will have the same access rights.

**User name** (Default: User x, where x = 1 to 80)

To change a user name, select it and press [Enter]. An input box will display. Type in a new user name (8 characters max. case sensitive) and press [Enter].

**Password** (Default: no password)

This field assigns a unique password to a selected user. Any KVM station that has "Login" enabled, the user must enter their username

and password to gain access to the KVM station. To assign or change a user password, select the user, then the password field and press [Enter]. An input box will display. Type in a password for the selected user and press [Enter]. Passwords can be up to 8 characters in length and are case sensitive.

**Profile** (Default: Profile x, where x = 1 to 80)

This field is used to assign an access profile to a selected user.

Profiles can be defined to limit the type of access to the computers. To change an assigned profile for a selected user, first select the user, then select the profile to change and press [Enter]. A selection box will display listing the profiles available. Select the profile to assign to the selected user and press [Enter]. Use the page up/down keys for more profiles. Profiles are defined on the "Configure profile" menu.

## Configure Profile menu

Configure Profile					
Name	Access	Mode	Share	Scan	Logout
Profil 1	Group 1	Share	2	5	240
Profil 2	Group 2	Share	2	5	240
Profil 3	Group 3	Share	2	5	240
Profil 4	Group 4	Share	2	5	240
Profil 5	Group 5	Share	2	5	240
Profil 6	Group 6	Share	2	5	240
Profil 7	Group 7	Share	2	5	240
Profil 8	Group 8	Share	2	5	240
Profil 9	Group 9	Share	2	5	240
Profil10	Group10	Share	2	5	240
Profil11	Group11	Share	2	5	240
Profil12	Group12	Share	2	5	240
Profil13	Group13	Share	2	5	240
Profil14	Group14	Share	2	5	240
Profil15	Group15	Share	2	5	240
Profil16	Group16	Share	2	5	240

Use page up and page down keys to configure more profiles  
Profile name, up to 8 characters

Figure 12. Configure profile menu

The configure profile menu is used to assign computer access levels, modes, share, scan and logout times.

**Name** (Default: Profil x, where x = 1 to 80)

The profile name can be changed to any name up to 8 characters in length. The name can be a specific user, a group of users within a department, a business department, or any name that defines the profile. To change the profile name, select the one to change and press [Enter]. An input box will display. Type in a new profile name and press [Enter].

**Access** (Default: Group x, where x = 1 to 80)

This field is used to assign each profile to a group. To change the access for a selected profile, select the profile to change then select the group to change and press [Enter]. A list of groups will display. Select the group that has been set-up for the selected profile and press [Enter]. A group is set up on the configure group menu.

### **Mode** (Default: Share)

Assigns 1 of 4 modes to a profile. To change the mode, select the profile to change the mode, then select the mode to change and press [Enter]. A selection box will display. Select the mode needed and press [Enter]. The modes are:

- View – Profiles set to the view mode allow users to switch to any computer, but have no keyboard or mouse control, only view privileges.
- Share – Profiles set to the share mode allow users to take keyboard and mouse control of a computer on a first come, first serve basis. Control of the computer is based on the time-out value entered in the share column.
- Control – Profiles set to the control mode allow users to take exclusive control of a computer. No time-out value is invoked. Other users that try to connect to the same computer can only view the video. They have no keyboard or mouse control until the user with the control disconnects from the computer.
- Private – This mode is the same as the control mode except other users cannot view the video or access the computer.

### **Share** (Default: 2 seconds)

This feature allows other users to take keyboard and mouse control of a computer after a specific time of no keyboard or mouse activity by a user. To change the Share time for a given profile, select the profile, then the Share to change and press [Enter]. An input box will display. Type in a new share value in seconds and press [Enter]. Valid share values are 0 to 9999 seconds. The share value is only valid if the profile mode is share.

### **Scan** (Default: 5 seconds)

When a user invokes the scan function, this feature sets the time the video is displayed before switching to the next sequential computers video. To change the scan rate, select the profile, then the scan rate to change and press [Enter]. An input box will display. Type in a new scan time and press [Enter]. Valid scan times are 0 to 9999. If the video is not present during the scan mode, the scan value may be set to low and the monitor cannot synchronize to the video fast enough to display it. This usually happens with a scan value of 4 or lower. If this problem occurs, increase the scan value. 0 (zero) is a valid entry but not recommended.

**Logout** (Default: 240 minutes)

This setting disconnects and logs out a user after the set period of no keyboard or mouse activity. To change the logout value, select the profile, then the logout time to change and press [Enter]. An input box will display. Type in a new logout time and press [Enter]. Valid times are 0 to 9999 minutes. A value of 0 (zero) disables the automatic logout function. If login is enabled for a KVM station, but the Logout time is set to zero, the user remains logged in until they manually log out using the [Ctrl] L command. (See Table 1, keyboard commands)



## System Status display

System Status						
Computers	Power	Pos	Ver	KVM	CPU User	Status
1-4	■ ■ ■ ■	1	21C	PC	1 User 1	Share mode
5-8	■ ■ ■ ■	2	21C	PC	2 User 2	Share mode
9-12	■ ■ ■ ■	3	21C	PC	3 User 3	Share mode
13-16	■ ■ ■ ■	4	21C	PC	4 User 4	Share mode
17-20		1	21C	PC		No response
21-24		2	21C	PC		No response
25-28		3	21C	PC		No response
29-32		4	21C	PC		No response
33-36		1	21C	PC		No response
37-40		2	21C	PC		No response
41-44		3	21C	PC		No response
45-48		4	21C	PC		No response
49-52		1	21C	PC		No response
53-56		2	21C	PC		No response
57-60		3	21C	PC		No response
61-64		4	21C	PC		No response

Pos=Card position | Ver=Program version | KVM=PC/Sun/None  
 CPU power ■ =on ■ =off | Line color Good Disconnected Error

Figure 14. System status display

The system status display is a very powerful and useful tool when monitoring, expanding, troubleshooting, or reconfiguring a system. The status screen displays reported information from all CPU cards in the system.

### Computers

Indicates the CPU port numbers for a given CPU card. Highlighted computer numbers are the total computer ports in the system.

### Power

Each CPU card represents 4 CPU ports. These ports are represented by the four squares. The CPU ports are (Left square to right square), CPU port 1, port 2, port 3, and port 4. (Green = CPU is on, Red = CPU is off)



**Pos (Position)**

Displays the slot where a CPU card in the system is installed for a given switch. Slot 1 is the bottom CPU card; slot 2 is the top CPU card for the 2xE model, slot 4 is the top CPU card for the 4xE model.

**Ver (Version)**

Displays the last three digits of the firmware main program version for the CPU card.

**KVM**

Indicates the type of keyboard and mouse detected if a KVM station is attached to this CPU card.

**CPU**

Displays the computer number currently selected by the KVM station.

**User**

Displays the users name that is currently accessing the system.

**Status**

Displays the most recent connect or disconnect status for the KVM station on this CPU card.

## Save menu

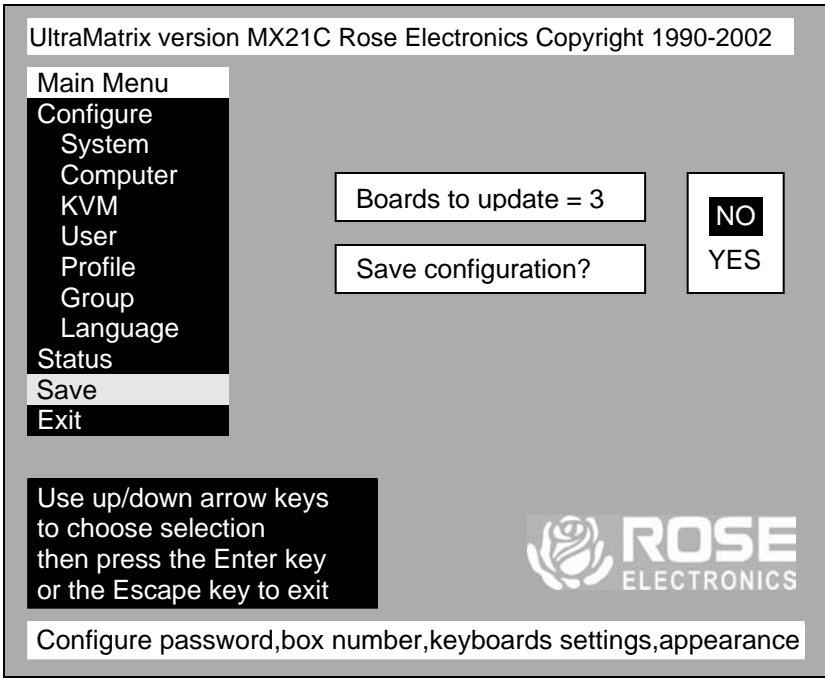


Figure 15. Save menu

When changes are made to any configuration, they must be saved in flash memory to insure that the changes will be active after a power cycle. It is recommended that all users be logged off from all systems prior to saving any configuration changes. To save the settings, select save and press [Enter]. The UltraMatrix will check and display how many CPU cards in the system to update. This is the total number of CPU cards (RS232 ports) in the system not counting the one the KVM station is connected to. (Total boards – 1)

A YES/NO selection box will display. Choose “YES” to save the changes to flash memory on all powered-on UltraMatrix switches.

Choose “NO” for temporary or incorrect changes. The temporary settings will only be in effect as long as power is applied to the Unit. Once power is cycled, unsaved changes, other than the starting computer number, are lost and the previously saved configuration settings will be effective.

## User operating instructions

The following instructions apply to all UltraMatrix switches.

This section explains the operating functions of the on-screen displays, the login procedure, connect procedure and other commands needed to easily use the UltraMatrix switch and its capabilities.

To start using your UltraMatrix switch, you first need to become familiar with the keyboard commands. The available keyboard commands are shown in Table 1. All keyboard commands start with an attention sequence by pressing and releasing the left [Ctrl] key, then the additional command characters. The additional command characters must be entered within two seconds of each other or the command is aborted.

Commands are not case sensitive and are shown in upper or lower case for clarity only. Do not use the [SHIFT] key or the numeric keypad to enter any commands. [Ctrl] in Table 1's, Key Sequence column is a press and release function of the left [Ctrl] key.

### Keyboard commands

Command	Key Sequence	Description
Main Menu	[Ctrl] [F12]	Displays main menu
CPU List	[Ctrl] [Esc]	Displays CPU selection list
Direct CPU connect	[Ctrl] n [Enter]	Connects directly to the specific CPU number "n".
Connect Back	[Ctrl] [Backspace]	Connects to the previous CPU
Connect Down	[Ctrl] [Minus sign]	Connects to the previous CPU in a Group.
Connect Up	[Ctrl] [Plus sign]	Connects to the next sequential CPU in a group
KVM Status	[Ctrl] D	Displays / Removes status box.
Logout	[Ctrl] L	Logs user out if the KVM station is configured for user logins.
Disconnect	[Ctrl] Q	Disconnects the current CPU
Reset Keyboard/ mouse	[Ctrl] R	Resets / enables keyboard and mouse; enables PS/2 mouse on connected CPU

Keyboard commands (continued)		
Command	Key Sequence	Description
Send Null Byte	[Ctrl] N	Sends a null byte to the CPU's PS/2 mouse port. Use this command if the PS/2 mouse gets "out of sync".
Reset Mouse (NT or Unix systems only)	[Ctrl] O (not zero)	Resets the currently selected NT or Unix computers PS/2 mouse. Also switches the NT mouse driver to "wheel" mode.
Start Scan	[Ctrl] S	Sequentially steps through all connected CPUs in a group.
Stop Scan	[Ctrl] X	Turns scan "Off"

Table 1. Keyboard commands

When you first start using a KVM station, it may require you to login. If the KVM station requires a login, the login box, shown in Figure 16, will display. The login box appears when a Unit is powered on, when a user logs off, or when a preset time interval passes with no keyboard or mouse activity. If a login is required, type in your User ID and press [Enter]. (User ID is the user name defined on the configure user menu) If the user ID is validated, you can then type in your password and press [Enter]. If the password is validated, the KVM station can be accessed. A user may login with the same user ID and password at more than one KVM station. Both the User ID and password are case sensitive.

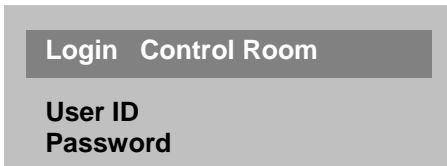


Figure 16. Login screen

Once you have access to a KVM station, you can switch to any of the connected computers provided your security profile allows access to that computer. To connect to a computer, you can use the "Direct CPU Connect" keyboard command or the "Computer select" menu. (See Table 1)

To access the “Computer select” menu, press and release the left [Ctrl] key, then press the [Esc] key. The computer select menu shown in Figure 17 will display. Use the up/down arrow keys and the page up/page down keys and select the computer to switch to and press [Enter]. You will be immediately connected to that computer and a connection status messages will display providing information about the connection between the KVM station and the computer. Figures 18, 19, and 20 show an example of the connection status message that is displayed when connecting to a computer.

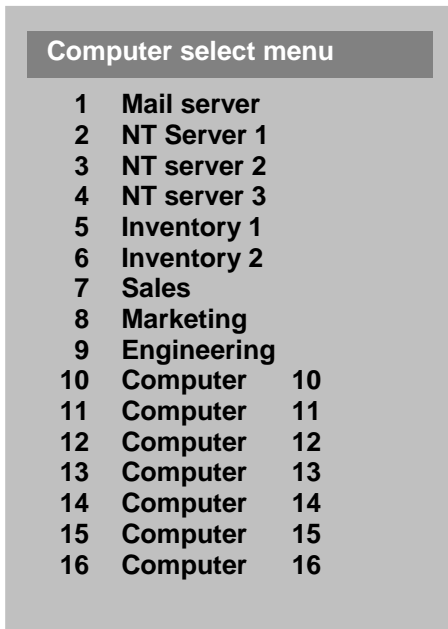


Figure 17. Computer select menu

**Status Mail server**

**Connection successful  
to NT Server  
On Admin  
Share mode**

Figure 18. Connection successful message

**Status Control Room 5**

**Connection failed  
to Mail server  
On Richard  
Not in access group**

Figure 19. Connection failed message

**Status Mail server**

**Disconnected  
from Payroll  
On Sharon  
Timed out**

Figure 20. Disconnect message

See Appendix H. for Connection fail / Disconnect reasons

When you are successfully connected to a computer, you can use that computer and all the functions and applications associated with it from the KVM station. It is a good practice when your tasks on a computer are complete to logout from the computer, especially if you are in the private mode. To Logout of a KVM station, press and release the left control [Ctrl] key, then the "L" key. If the KVM station does not require a login, disconnect from the computer when your tasks are complete by pressing and releasing the left control [Ctrl] key, then the "Q" key.

## Serial port usage (RS232)

The following procedure for establishing a connection from your standalone computer or Notebook computer to the UltraMatrix switch's serial port uses Windows HyperTerminal™. Refer to your users manual if a different communication program is being used.

To access an UltraMatrix serial port, the following items are required:

- A serial cable (RJ12, 6-wire connector and an appropriate adapter for the computer's serial port). The serial cable and adapter are provided with each switch (Rose part number KIT-ATRX)
- A dedicated computer, Notebook computer with a serial port, or a display terminal. Using a display terminal will allow you to configure the UltraMatrix switch, however, you will not be able to upgrade new versions of firmware. The computer or Notebook must not be attached to any UltraMatrix switches in the system being upgraded.
- A communications program such as Windows HyperTerminal.

### Connecting the Serial Cable

Attach the serial cable from the RS232 port #1 on the UltraMatrix (bottom right RJ12 connector) to the COM port on your computer. This COM port must be the same communication port HyperTerminal or your communication software is configured for.

### Setting up Windows HyperTerminal

(The following instructions are using Windows 95/98; the instructions may be different for other operating systems)

Start the Windows HyperTerminal program. The "New Connection" dialog box will display requesting a name for this session. Enter a session name like "UM serial option" and click 'OK". Next, the "Connect To" dialog box will display. Click on the "Connect Using" down arrow to display the connect options. Select the Direct Connect option for the COM port you are using and click "OK". The COMx properties dialog box will display. Using the drop-down selection boxes, select the following values for each setting.

- Bits per second; 9600.
- Data bits; 8
- Parity; None
- Stop bits; 1
- Flow Control; Hardware

Click “OK” when all values have been entered. The HyperTerminal dialog box will display and information can be exchanged with the UltraMatrix switch properly. You can save this setup so the next time its needed, you can select the ICON with the name you gave it and these settings will already be established.

### Starting a serial communication session

Verify that “Connected” appears in the bottom left corner of the HyperTerminal window. If “Connected” is not present, click on the “Call” icon. “Connected” should display in the bottom left corner.

Power on or cycle power on the UltraMatrix switch and press the spacebar when the message, “Hit the spacebar within 5 seconds to get serial options menu” appears on your screen. The serial menu will appear after the diagnostic check completes. If unrecognizable characters appear, the baud rate set on the UltraMatrix switches serial port and the baud rate set on your computers COM port are not set to the same value. Disconnect from the UltraMatrix by clicking on the “Disconnect” ICON. Change the baud rate on your terminal or computers communication program from 9600 (set previously) to 57,600. Re-connect by clicking on the “Call” ICON. Cycle power on the UltraMatrix switch, press the space bar, and the serial option menu will display and should be legible. The serial menu (Figure 21) enables you to perform certain configuration settings and perform flash upgrades. Following explains the serial menu options:

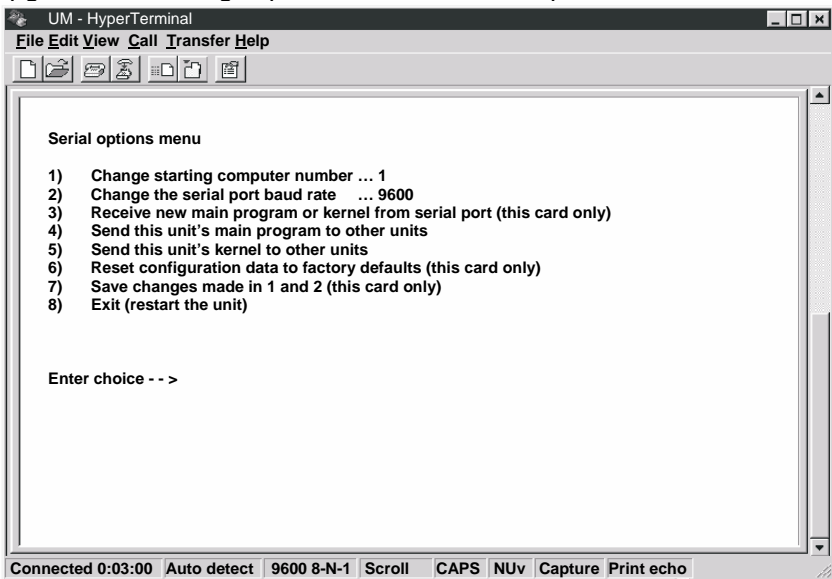


Figure 21. Serial menu



## Serial menu options

Option 3, 4 and 5 are not available when using a display terminal.

### Option 1. Change Starting Computer (From card #1 only)

Select this option to change the starting computer number. To change the current value press 1; a prompt will display, as shown below. Type in the new starting computer number and press [Enter].

Enter the starting CPU number →

The serial option menu will display again. Select Option 7 to save the new starting computer number to flash memory. Cycle power on the UltraMatrix switch to distribute the new value to all the other CPU cards in this switch.

### Option 2. Change the serial port baud rate

Select this option to change the baud rate on the serial ports of the UltraMatrix switch. The serial ports can be set to either 9600 or 57,600 (bps). The option menu shows the current serial port setting. To change this from current setting press 2. The message below will appear.

Baud rate changed to 9600 (or 57,600)  
Set baud rate of your terminal to 9600 (or 57.600) and press return.

Make sure the terminal or computers communication program's baud rate matches the new setting.

You must change or verify that the computer's baud rate matches the UltraMatrix baud rate. If you are using Windows HyperTerminal on your computer, first disconnect from the UltraMatrix switch by clicking on the HyperTerminal disconnect ICON. Change the baud rate to match the UltraMatrix switch's baud rate, then connect to the UltraMatrix switch by clicking on the call ICON. Press [Enter] and the serial menu should display in the HyperTerminal window.

### Option 3. Receive new main program or kernel from serial port (This card only)

When new main or kernel programs are available, they can be obtained from Rose Electronics or downloaded from our web site at [www.rose.com](http://www.rose.com). The diagnostic screen that is displayed when the UltraMatrix switch is first turned on shows the Kernel and main program version that is presently installed.

You cannot update the flash memory using only a display terminal; you must use a standalone computer or Notebook and the new main or kernel program saved on that computer.

It is recommended that this procedure be done on UltraMatrix #1, RS232 port #1. (Lower right RJ12 connector)

To load a flash upgrade file, type 3 in the Enter choice field of the serial options menu. The following message will appear:

```
Waiting for file.....
```

Send the program or kernel file from your computer to the UltraMatrix using ASCII text file protocol. From HyperTerminal, click on "Transfer" and select "Send Text File". The "Send Text File" dialog box will display. Enter the file name of the updated firmware file into the File Name box and click "Open". The file transfer function will start. While the file is being sent, periods are sent to indicate the copying progress. Once the file has been sent, you will see the message:

```
Receive successful  
Flash programming.....  
Flash programming successful
```

After the flash memory is programmed, the serial menu will display.

Updating the firmware or kernel programs does not change any of the custom settings that have been made.

You may receive one of the following errors during the file transfer function: checksum error, record error, or data error. These messages are followed by:

```
Receive failed  
Try again Y/N
```

These error messages may be caused by any of the following items:

- Corrupted firmware upgrade file.
- Loose or defective RS232 cable.
- RS232 protocol not configured correctly.
- Bad transmit or receive levels.
- Hardware problem on transmit or receive side.

Identify and correct the transmit problem and press "Y" and then [Enter] to try again and you can resend the file.

Press "N" and then [Enter] and the prompt "Hit enter to boot " appears. Press the [Enter] key to re-start the UltraMatrix switches diagnostics with the firmware unchanged.

**Option 4. Send this Unit's Main Program to other Units.**

**Option 5. Send this Unit's Kernel to other Units.**

The main program or kernel program updates (Option 3) only have to be done on one port. Make sure power to all UltraMatrix switches is "ON" and they are all connected using the appropriate expansion cables.

Press 4 to send the main program to all other units, all other cards.

Press 5 to send the kernel program to all other cards.

The following messages will appear using either option 4 or option 5.

Boards to update - n  
You are about to copy the firmware from this board to all other boards in the system.  
Are you sure? Y/N

Before responding Y, make sure that the "Boards to update" number in the message above agrees with the total number of boards in the entire system minus 1. If the number does not agree, reply N, turn on the inactive UltraMatrix Units, and press 4 or 5 again. When you reply Y, the following message appears:

Sending flash program code to system.....

When complete, the system returns you to the serial options menu. Wait at least 15 seconds before restarting the UltraMatrix after choosing option 4 or 5 for the program to propagate to the other cards in the system.

**Option 6. Reset to Factory Defaults (This CPU card only)**

NOTE: Before resetting any CPU card to factory defaults, note the starting computer number listed on the Serial menu, Option 1. When resetting a CPU card to factory defaults, this number will be set to one (1) and must be changed back to the original value by using option 1 to change the starting computer number and then saved using option 7. In an expanded system, there cannot be two different UltraMatrix switches in the system with the same starting computer number.

Selecting option 6 restores the CPU card to its original factory configuration. The following message appears:

Flash programming . . . . .

When the factory defaults have been restored, the following message is displayed:

Reset to default successful

The serial options menu is then displayed, indicating that this CPU board has been reset to the factory defaults.

**Option 7. Save Changes**

This option saves the configuration changes made in option 1 and 2 only to the CPU card where the serial cable is attached. It is recommended that all users be logged off from all systems prior to saving any configuration changes.

To save the configuration changes, press 7, and the following message appears:

Flash programming . . . . .

When the flash memory is updated, the following message is displayed:

Configuration saved successfully

**Option 8. Exit (Restart the Unit)**

Selecting option 8 exits the serial option menu. The UltraMatrix switch will reinitialize and the diagnostic check will run. After the diagnostic check finished, the Unit is ready to use with its new configurations. If there are more configurations needed, hit the space bar within 5 seconds and the serial menu will be brought back up to use.

## Switching using the serial port

---

From any RS232 port on any switch, you can switch any KVM station in the system to any computer. Connect a serial cable to the RS232 port on any UltraMatrix and to the COM port on the standalone computer. Start a communication program like HyperTerminal and connect to the UltraMatrix by clicking on the "Call" ICON.

The input format to switch a KVM station to a computer is KnnnCxxxxS [Enter] where nnn is the KVM number of the card desired (1 – 255) and xxxx is the computer number to switch to (1 – 1000). For example, you want to switch the KVM station on CPU card #4 to computer #50; the command would be K4C50S [Enter]. The KVM station connected on CPU card #4 would be switched to computer #50. The response on the screen would be K4C50Rx, where x is one of the following status values

- .  
1 = View
- 2 = Share
- 3 = Control
- 4 = Private

### Serial device support

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The serial feature is available on the multi-platform models only with an OSD (on-screen-display) chips revision of O5.2 or greater, firmware program MXP21C or greater and kernel MXK20 or greater. If the firmware, kernel, or chips are not the correct revision, they must be updated. The chips can be upgraded by purchasing an upgrade kit, part number ICK-O51 (includes chips ICE-89C51/O51 and ICE-1441/A21. All CPU cards in a unit must be upgraded. The firmware and kernel updates are free from our web site at [www.rose.com](http://www.rose.com) (technical support section).

The serial feature allows you to connect a KVM station to a serial device such as the serial port on a Unix or Sun computer, a communication device, or any device with a serial port. The serial device is connected to the DB25F CPU port on the UltraMatrix with a serial cable (See Appendix C for serial cable part numbers). Any CPU port can be configured to be a serial port. When you switch to that port, you are connected to the serial device and can access it as you normally would.

To configure a CPU port for a serial application, call up the main menu ([Ctrl] – F12), and then select computer and press [Enter]. From the configure computer menu, use the up/down arrow keys to select the desired computer to configure for serial, then use the left arrow key and select the keyboard field for the selected computer and press [Enter]. A selection box will display listing the supported choices. Use the up/down arrow keys and select the serial baud rate to configure the CPU port for and press [Enter]. Save the changes to flash memory. Once saved, that CPU port is configured for serial support. (See Figure 22)

Configure Computer				
	Computer name		Keyboard	Mouse
1	Computer	1	PC2	PS/2
2	Computer	2	Serial 9600,N,8,1	
3	Computer	3	PC2	PS/2
4	Computer	4	PC2	PS/2
5	Computer	5	PC2	PS/2
6	Computer	6	PC2	PS/2
7	Computer	7	PC2	PS/2
8	Computer	8	PC2	PS/2
9	Computer	9	PC2	PS/2
10	Computer	10	PC2	PS/2
11	Computer	11	PC2	PS/2
12	Computer	12	PC2	PS/2
13	Computer	13	PC2	PS/2
14	Computer	14	PC2	PS/2
15	Computer	15	PC2	PS/2
16	Computer	16	PC2	PS/2

Use page up and page down keys to configure more computers,  
Type of computer, for PCs this is the computer's keyboard mode

Figure 22. Serial support

Computer 2 is configured for serial support at 9600 baud.

## Service Information

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### Maintenance and Repair

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This Unit does not contain any internal user-serviceable parts. In the event a Unit needs repair or maintenance, you must first obtain a Return Authorization (RA) number from Rose Electronics or an authorized repair center. This Return Authorization number must appear on the outside of the shipping container. See Limited Warranty for more information.

When returning a Unit, it should be double-packed in the original container or equivalent, insured and shipped to:

Rose Electronics  
Attn: RA \_\_\_\_\_  
10707 Stancliff Road  
Houston, Texas 77099 USA

### Technical Support

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If you are experiencing problems, or need assistance in setting up, configuring or operating your switch, consult the appropriate sections of this manual. If, however, you require additional information or assistance, please contact the Rose Electronics Technical Support Department at:

Phone: (281) 933-7673  
E-Mail: [TechSupport@rose.com](mailto:TechSupport@rose.com)  
Web: [www.rose.com](http://www.rose.com)

Technical Support hours are from: 8:00 am to 6:00 pm CST (USA), Monday through Friday.

Please report any malfunctions in the operation of this Unit or any discrepancies in this manual to the Rose Electronics Technical Support Department.



## Safety

This UltraMatrix switch has been tested for conformance to safety regulations and requirements, and has been certified for international use. Like all electronic equipment, the UltraMatrix switch should be used with care. To protect yourself from possible injury and to minimize the risk of damage to this Unit, read and follow these safety instructions.

- Follow all instructions and warnings marked on this Unit.
- Except where explained in this manual, do not attempt to service this Unit yourself.
- Do not use this Unit near water.
- Assure that the placement of this Unit is on a stable surface or rack mounted.
- Provide proper ventilation and air circulation.
- Keep power cord and connection cables clear of obstructions that might cause damage to them.
- Use only power cords, power transformer and connection cables designed for this Unit.
- External equipment connected to the unit must be listed or evaluated per the requirements of **SELV Circuits**.
- Use only a grounded (three-wire) electrical outlet.
- Keep objects that might damage this Unit and liquids that may spill, clear from this Unit. Liquids and foreign objects might come in contact with voltage points that could create a risk of fire or electrical shock.
- Operate this Unit only when the cover is in place.
- Do not use liquid or aerosol cleaners to clean this Unit. Always unplug this Unit from its electrical outlet before cleaning.
- Unplug this Unit from the electrical outlet and refer servicing to a qualified service center if any of the following conditions occur:
  - The power cord or connection cables is damaged or frayed.
  - The Unit has been exposed to any liquids.
  - The Unit does not operate normally when all operating instructions have been followed.
  - The Unit has been dropped or the case has been damaged.
  - The Unit exhibits a distinct change in performance, indicating a need for service.

## Safety and EMC Regulatory Statements

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### Safety Information



Documentation reference symbol. If the product is marked with this symbol, refer to the product documentation to get more information about the product.

#### **WARNING**

A WARNING in the manual denotes a hazard that can cause injury or death.

#### **CAUTION**

A CAUTION in the manual denotes a hazard that can damage equipment.

Do not proceed beyond a WARNING or CAUTION notice until you have understood the hazardous conditions and have taken appropriate steps.

#### **Grounding**

These are Safety Class I products and have protective earthing terminals. There must be an un-interruptible safety earth ground from the main power source to the product's input wiring terminals, power cord, or supplied power cord set. Whenever it is likely that the protection has been impaired, disconnect the power cord until the ground has been restored.

#### **Servicing**

There are no user-serviceable parts inside these products. Only service-trained personnel must perform any servicing, maintenance, or repair.

The user may adjust only items mentioned in this manual.

Informations concernant la sécurité



Symbole de référence à la documentation. Si le produit est marqué de ce symbole, reportez-vous à la documentation du produit afin d'obtenir des informations plus détaillées.

**WARNING** Dans la documentation, un WARNING indique un danger susceptible d'entraîner des dommages corporels ou la mort.

**CAUTION** Un texte de mise en garde intitulé indique un danger susceptible de causer des dommages à l'équipement.

Ne continuez pas au-delà d'une rubrique WARNING ou CAUTION avant d'avoir bien compris les conditions présentant un danger et pris les mesures appropriées.

Cet appareil est un produit de classe I et possède une borne de mise à la terre. La source d'alimentation principale doit être munie d'une prise de terre de sécurité installée aux bornes du câblage d'entrée, sur le cordon d'alimentation ou le cordon de raccordement fourni avec le produit. Lorsque cette protection semble avoir été endommagée, débrancher le cordon d'alimentation jusqu'à ce que la mise à la terre ait été réparée.

Aucune pièce contenue à l'intérieur de ce produit ne peut être réparée par l'utilisateur.

Tout dépannage, réglage, entretien ou réparation devra être confié exclusivement à un personnel qualifié.

## Troubleshooting

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### **Computer does not boot, keyboard or mouse error received**

- CPU cable is loose. Re-seat cable and hit F1 to continue or reboot computer.
- Wrong cable plugged in. Keyboard and mouse cables reversed.
- CPU cable is defective. Try using CPU cable from another computer. If problem goes away, cable is defective.
- Port on UltraMatrix is defective. Try using another port on the UltraMatrix. If problem goes away, port is defective.
- Port on computer is defective. Try plugging in keyboard or mouse directly. If problem remains, computer port is defective. If computer power status LED not lit, fuse on motherboard may be blown.

### **Mouse driver does not load**

- If PS/2 type mouse, computer must be attached to the UltraMatrix or mouse at boot-up time in order for mouse to be recognized by the computer. Reboot computer with the UltraMatrix powered on and a CPU cable attached.
- Incompatible or old mouse driver being used. Update mouse driver.

### **Can't switch computer port from keyboard**

- Power to the UltraMatrix was removed for less than three seconds possibly causing keyboard to lock up. Detach and reattach keyboard.
- The mode of the keyboard does not match that of the computer. Issue the mode command, usually 1 for IBM PS/2s, and 2 for all others. The default setting of the UltraMatrix is mode 2. Sometimes an incorrect mode will confuse the computer or keyboard. This requires re-booting the computer or resetting the keyboard by unplugging and plugging it back in.
- If trying to reach a remote port, that port is busy. Try again later.
- If trying to reach a remote port, the expansion cable is detached or the remote Unit is powered off.
- Keyboard port or computer port cable detached.

### **Wrong or missing characters from those typed**

- The keyboard mode is incorrect; configure computer port for correct keyboard mode.

### **Can't access all functions of mouse**

- If Microsoft BallPoint mouse, get latest Microsoft mouse driver.

### **Mouse does not move**

- The UltraMatrix turned off after or not attached when computer booted or application began using mouse. Exit and re-enter application using mouse or issue reset command.
- PS/2 mouse was not attached when the UltraMatrix powered up or has been detached and reattached. Issue the reset command.

### **PS/2 mouse gets out of sync**

- Reset the mouse by pressing and releasing the left Control Key, and then the R key.
- Cabling was disturbed during mouse movement. Issue the null command once or twice to re-sync the mouse. Get a later mouse driver that does not exhibit this problem.

### **Video fuzzy**

- Cable too long or wrong type. Verify that resolution and distance match Appendix I – Video Quality Chart Upgrade cable if necessary.

### **Video not synchronized or wrong color**

- Cable is loose. Re-seat cable.
- Wrong computer (CPU) cable used. If you have a 9515, 9517, 9518, XGA mono or similar monitor you must use special cables or adapters.
- Cable is defective. Try using cable from another computer (CPU). If problem goes away, cable is defective.
- Port on the UltraMatrix is defective. Try using another port on the UltraMatrix. If problem goes away, port is defective.

### **Lower resolution video OK, but can't enter high resolution mode**

- Wrong CPU cable used. If you have a XGA, XGA-2, or other high-resolution video adapter, you should probably be using the CAB-CX (or C1) cable to attach your computer and KVM station.
- Driver has not been setup. Windows, OS/2, or other driver has not been configured for this resolution. Configure the driver.

## APPENDICES

### Appendix A. Initial factory default settings

Function	Setting	Default value	
System	Password	None	
	Starting Computer Number	1	
	Maximum Computer	64	
	PC keyboard rate (chars/sec)	20	
	PC keyboard delay	Fast	
	Sun keyboard language	US	
	Menu Color Scheme	Night sky	
	Screen saver	Weaving	
	Screen saver time (seconds)	1200 seconds	
	Background color	Cyan	
	Text color	Black	
	Fadeout	5 seconds	
	Computer	Computer name	Computer x
		Keyboard	PC (mode 2)
		Mouse	PS/2
KVM	Name	KVM Station x (x = 1 – 4)	
	Resolution	640x480@60Hz	
	Start	0	
	User	N/A (from user menu)	
User	User name	User x (x = 1 – 80)	
	Password	None	
	Profile	N/A (from profile menu)	
Profile	Name	Profil x (x = 1 – 80)	
	Access	N/A (from group menu)	
	Mode	Share	
	Share	2 seconds	
	Scan	5 seconds	
	Logout	240 minutes	
Group	Name	Group x (x = 1 – 80)	
	Assignment	All computers to all groups	
Language	(Type)	US	

## Appendix B. General specifications

Specification		UM-2xE (4/8/16 CPU Ports)	UM-4xE (4/8/16 CPU Ports)
Dimensions	4/8 port	16.7 x 4.85 x 1.75 in. 42.4 x 12.3 x 4.4 cm.	16.7 x 4.85 x 3.50 in. 42.4 x 12.3 x 8.9 cm.
	16 port	16.7 x 4.35 x 3.50 in. 42.4 x 12.3 x 8.9 cm	16.7 x 4.35 x 3.50 in. 42.4 x 12.3 x 8.9 cm
Weight		4lb. / 1.8 kg.	8lb. / 3.6 kg.
Power		110 – 240 VAC / 60 watts	110 – 240 VAC / 60 watts
Connectors		Power: IEC 320 CPU/KVM: DB25F Expansion: DB15M/F RS232: RJ12	Power: IEC 320 CPU/KVM: DB25F Expansion: DB15M/F RS232: RJ12
Video bandwidth		1x4 / 1x8 / 2x8: 250 KHz. 1x16 / 2x16: 100 KHz.	1x4 / 1x8 / 2x8: 250 KHz. 1x16 / 2x16: 100 KHz.
Video sync		Accepts HV, composite, and sync-on-green	Accepts HV, composite, and sync-on-green
Chassis		Electro galvanized steel, black powder coated	Electro galvanized steel, black powder coated
Controls		Lighted power On/Off switch	Lighted power On/Off switch
Indicators		LEDs: Power 4 – 16 select 4 – 16 CPU Power	LEDs: Power 4 – 16 select 4 – 16 CPU Power
Environmental		0 – 45°C, 5% – 80% RH	0 – 45°C, 5% – 80% RH
Approvals		UL, cUL, TUV, CE, GS	UL, cUL, TUV, CE, GS

## Appendix C. Parts and cables

<b>KVM Cables</b>	
<b>Part number</b>	<b>Description</b>
CAB–CX0606Mnnn	Coax – VGA/PS2 Kbd/Mouse
CAB–WX0606Mnnn	Standard – VGA/PS2 Kbd/Mouse
CAB–CXV0800Mnnn	Coax – Sun Video/kbd-mouse / HD15/MD8
CAB–SBX0800Mnnn	Coax – Sun Video/kbd-mouse / 13W3/MD8
CAB–C1V0400Mnnn	VGA HD15 MAC ADB KM
CAB–AV0400Mnnn	Standard – Apple Video/Kbd/Mouse
CAB–CXAV0400Mnnn	Coax – Apple video/Kbd/Mouse
<b>CPU Cables</b>	
CAB–CX0606Cnnn	Coax – VGA/PS2 Kbd/Mouse
CAB–WX0606Cnnn	Standard – VGA/PS2 Kbd/Mouse
CAB–CX0606Cnnn/AT	Coax – VGA/AT Kbd/Serial mouse
CAB–WX0606Cnnn/AT	Standard – VGA/AT Kbd/Serial mouse
CAB–CXV800Cnnn	Coax – Sun Video/kbd-mouse / HD15/MD8
CAB–SCX0800Cnnn	Coax – Sun Video/kbd-mouse / 13W3/MD8
CAB–C1V0400Cnnn*	Coax – VGA HD15/MAC ADB Kbd/mouse
CAB–CXAV0400Cnnn*	Coax – Apple video(DB15)/ADB Kbd/mouse
CAB–AV0400Cnnn*	Standard – Apple video/Kbd/mouse
CAB–USDTD25FCnnn	Serial to DTE equipment w/DB25F
CAB–USDTD9FCnnn	Serial to DTE equipment w/DB9F
CAB–USDCD9MCnnn	Serial to DTE equipment w/DB9M
CAB–USDCD25MCnnn	Serial to DTE equipment w/DB25M
CAB–USSNMD8MCnnn	Serial to Sun serial port w/MD8M
ACC–CIRX/45	RJ45F to DB25 CPU Port / Cisco switch
CAB–CXUSBCnnn	Coax-VGA HD15/USB keyboard & mouse
CAB–CXUMXnnn	Bus expansion cable (Molded version)
CAB–UMXnnn	Bus expansion cable
CNV–MACPS	Translator-Mac ADB to PS/2 KM
<b>Rack Mount Kits</b>	
RM–UB19 / 23 / 24	19 / 23 / 24 in. – (1 rack unit switches)
RM–UC19 / 23 / 24	19 / 23 / 24 in. – (2 rack unit switches)

nnn = length in feet

\* Requires Rose translator – CNV-MACPS



## Appendix D. Status Connect / Failure Reason Summary

Reason	Description	Action
Can't Find Computer	Unable to communicate to the computer that's being connected to.	Change invalid starting computer number, incorrect expansion cable placement or power up expansion Unit.
Computer is Private	Another user is connected in private mode.	Wait for the private user to disconnect and retry the connect request.
No Response	Communications error.	Cycle power to the UltraMatrix switch where the CPU is attached.
Not in Access Group	A user profile specifies a group without access to this computer.	Connect to another computer, use another group, or include the computer in the user's group.
Out of Range	Attempt to connect to a computer with a number greater than the maximum computer parameter.	Connect to a computer with a lower number than the maximum or reconfigure all Units with a higher maximum computer number.
Queue Full	The Maximum number of KVM stations is already connected to the CPU	Wait until a user disconnects from the CPU
Unknown Computer	Attempt to connect to a computer number greater than the Maximum computer number	Change request to another computer number.
Unknown Reason	Internal error occurred during connect/disconnect.	Cycle power on all Units affected.

## Appendix E. Disconnect Status Reasons

---

Reason	Description	Action
No Response	Disconnect communication error.	Cycle power on the Unit where the CPU being connected is attached.
Private Mode Cancel	User disconnected from computer because another user has connected in Private Mode.	Wait for the private mode user to disconnect and reconnect to the computer.
Timed Out	Keyboard or mouse has not been used for the period specified in the logout configuration parameter.	Re-connect to the CPU.
Unknown Computer	Internal error occurred during disconnect process.	Cycle power on one or more Units
Unknown Reason	Internal error occurred during disconnect process.	Cycle power on one or more Units.
User Request	A logout [CTRL]-L or disconnect [CTRL]-Q command disconnected a user.	None
Video Path Cancel	A KVM station on another Unit and the same slot number is using this station's video path. The computer disconnects to avoid multiple video signals on the path.	Wait for the other user to complete or connect to the computer in private mode.

## Appendix F. KVM placement / conflicts

---

In an expanded system with multiple UltraMatrix switches, no user conflicts will occur provided the KVM stations are on different KVM ports. That is one KVM station on KVM port #1, and one on KVM port #2 for the 2xE model; one on KVM port #3 and one on KVM port #4 for the 4xE model.

It is possible, in an expanded system with multiple UltraMatrix switches, to connect additional KVM stations to the system. This allows more than 2 or 4 users access to the computers.

When doing this, all users on the same KVM port must share the same video path from switch to switch. (KVM port #1 on UltraMatrix #1 and KVM port #1 on UltraMatrix #3) As long as all KVM # 1 users only connect to the computers that are attached to their local UltraMatrix, they can operate with no conflicts. If a user on KVM #1 connects to a computer on a different UltraMatrix switch, the KVM #1 user on that Ultramatrix will be disconnected and the error message "Video path canceled" will appear.

KVM's 2, 3, and 4 do not have the option of more than one concurrent user as does KVM 1. If a second KVM 2, 3, or 4 tries to access the system all other KVM's of the same number will be disconnected. If they try to re-connect, they will simply cause the other KVM user to be disconnected.

## Appendix G. Password jumper

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If the configuration password is ever forgotten, the UltraMatrix switch has a special “Password” reset jumper on the CPU card. This jumper is labeled JP31 on all models. To use this jumper to bypass the password, perform the following:

1. Turn off the UltraMatrix switch and remove the top cover.
2. Install a jumper on JP31 to short the two terminals.  
The login requirement will be bypassed and you will be granted access. This does not delete the password, only bypasses the function.
3. Power on the UltraMatrix with the jumper in place.
4. Call up the main menu; select “System” and press [Enter].
5. Select “Configure password” from the configure system menu and press [Enter].
6. Enter a new configuration password and press [Enter].
7. Save the new configuration password from the “Main Menu”.
8. With the new password saved, turn off the UltraMatrix switch.
9. Remove the jumper on JP31.
10. Re-install the top cover.
11. Turn the UltraMatrix on. The UltraMatrix switch will boot up and the new password will be effective.

## Appendix H. Diagnostic check / error messages

The power on diagnostic screen that appears when the UltraMatrix switch is first turned on, checks the switch and provides the information shown on the screen.

### Welcome to UltraMatrix

#### Power on diagnostics

Kernel version           KX20  
Overlay version         051R  
Kernel program         Good  
Static ram               Good  
Hardware type         MP2X8E  
Configuration         Good  
Board number           1  
Communication ID       1  
Communication         Good  
Local CPU ports        8  
Program version        MX21C  
Main program           Good  
PC keyboard detected  
PS2 mouse detected



Diagnostic	Description
Kernel version	Indicates the version ID of the kernel program.
Overlay version	Indicates the version ID of the firmware of the on-screen display board.
Kernel program	Reports the checksum calculation results of the kernel program. Any results other than GOOD terminates the diagnostic sequence, indicating a hardware failure.
Static ram	Reports the results of the static memory check. Any results other than GOOD terminates the diagnostic sequence, indicating a hardware failure.
Hardware type	Reports the UltraMatrix hardware type (PC or Multi-platform)

Configuration	Reports the results of checksum calculations of configuration memory. Any results other than GOOD terminates the diagnostic sequence, indicating a hardware failure.
Board number	Indicates Unit slot number (1-4) of the KVM or serial port where the diagnostics are reported.
Communication ID	Indicates network board number (1-256) of the KVM or serial port where the diagnostics are reported.
Communication	Reports results of communications test among all the boards in the network.
Local CPU ports	Reports the number of CPU ports detected in this Unit.
Program version	Reports revision ID of the main program.
Main program	Reports results of checksum calculation of main program memory. Any results other than GOOD terminates the diagnostic sequence, indicating a hardware failure.
PC Keyboard detected	Displays the keyboard type detected at the KVM station where the diagnostics are reported.
PS2 mouse detected	Displays the mouse type detected at the KVM station where the diagnostics are reported.

### Kernel halt error messages

Message	Description
BAD Address = nn	Kernel memory is corrupt, hardware failure.
Resetting to factory defaults	A memory error is detected during a read from configuration memory. This also indicates a hardware failure, but the system may continue to initialize successfully. The configuration from another Unit should be saved to this Unit as soon as possible.
Unit Halted	A major error has forced the kernel to stop processing. The UltraMatrix waits to receive a kernel or main firmware file from the bottom board's serial port using the serial parameters: 9600, N, 8, 1. Connect the serial cable supplied with the UltraMatrix as described in the Serial Port section, start a terminal emulator and transfer the file using an ASCII file transfer protocol.
Kernel is bad, load new kernel through serial port.	The UltraMatrix waits to receive a kernel or main firmware file from the bottom board's serial port using the serial parameters: 9600, N, 8, 1. Connect the serial cable supplied with the UltraMatrix as described in the Serial Port Section, start a terminal emulator and transfer the file using an ASCII file transfer protocol.
Checksum error	The kernel writes this message at power up when a memory error is detected during a read from program memory.

## Appendix I. Video distance table

The limitation on driving distance is usually due to the quality of the video. The table below shows the distances, resolution and quality of video that can be expected. Letters shows the cable type, and a number that refers to the quality of the video, as described below. Rose Electronics does not recommend systems where the video quality is 1 or 2. There are further capabilities, not listed here, that will send the higher resolution video longer distances. Please contact Rose Electronics technical support for more details.

Resolution	Video distance capability								
	5'	10'	20'	35'	50'	75'	100'	150'	200'
640x480	W4 Z4 C4	W4 Z4 C4	W3 Z4 C4	Z3 C4	C4	C4	C4	C3	C3
800X600	W4 Z4 C4	W4 Z4 C4	W3 Z4 C4	Z3 C4	C4	C4	C4	C3	C3
1024x768	W3 Z4 C4	W3 Z4 C4	W3 Z4 C4	Z3 C4	C4	C4	C3	C3	C2
1280x1024	W2 Z4 C4	W2 Z3 C4	Z3 C4	Z3 C3	C3	C3	C2	C2	C2
1600x1200	Z3 C4	Z3 C3	Z2 C3	C3	C3	C2	C2	C2	C1

- W Wire cabling
- Z Micro coax cabling
- C Mini coax cabling

- 4 Perfect or near perfect unable to easily detect defects in screen.
- 3 Very acceptable; images clear; small reflections around lettering depending upon color; if you examine the screen closely you will find defects.
- 2 Acceptable; slightly fuzzy images; readable text, acceptable for casual use, prolonged viewing will cause eye fatigue.
- 1 Unusable; images smeared; text not easily readable



## Appendix J. Rack mount

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The optional rack mount kit includes the following items:

- Two black anodized mounting brackets.
- Four 6 - 32 x 3/8" flat head mounting screws.

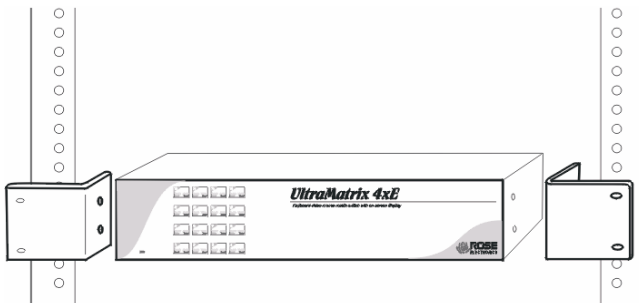
To rack mount your Ultramatrix switch, attach the two rack mounting brackets to your Unit with the short flange against the Unit using the four screws provided. Secure the mounting brackets to the rack using the appropriate size bolts, nuts and lock washers. Using hardware other than that provided could cause damage to the electronics and/or result in loss of mounting integrity. Do not over tighten the screws used to mount the Unit to the mounting brackets.

The following general guidelines should be observed when installing your Unit into a rack.

- a). The Ultramatrix is designed to work in an ambient temperature of 0° C to 45° C (32° F – 113° F).
- b). Do not block power supply vents or otherwise restrict airflow when rack-mounting this Unit.
- c). Mechanical loading of the rack should be considered to prevent instability and possible tipping over.
- d). Tighten all connectors securely and provide adequate strain relief for all cables.
- e). Provide a grounded power source to all Units. Pay special attention to overall branch circuit load ratings before connecting equipment to this source. Overloaded circuits are potential fire hazards and can cause equipment failures or poor performance.

## Appendix K. Rack mount illustration

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# NOTES





**Server Management**



**Solutions**

10707 Stancliff Road  
Houston, Texas 77099



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