OVERVIEW

- **Distributed design makes units simple to install, expand, and maintain**

- **Supports 1000's of computers and 100's of KVMs**

- **Multi-platform for PC, Sun, RS/6000, HP, DEC, SGI, and others**

- **Plug-in cards makes the system easy to expand and maintain**

- **Integrated auto-switching power supply, 110/220 VAC**

- **Advanced Visual Interface on-screen display technology**

- **Rich set of features for security and access**

ROSE ELECTRONICS — UltraMatrix 16X

16X HARDWARE

Fully populated 16X box: 16 computers, 4 KVMs, 8 bus in, 8 bus out, 4 serial control ports

UltraMatrix 16X connector layout


Model UM16-CH
Serial # 834561
Made in USA

OUT-8	IN-8	OUT-7	IN-7	OUT-6	IN-6	OUT-5	IN-5
CPU16	CPU15	CPU14	CPU13	KVM4	4
CPU12	CPU11	CPU10	CPU9	KVM3	3
CPU8	CPU7	CPU6	CPU5	KVM2	2
CPU4	CPU3	CPU2	CPU1	KVM1	1
OUT-4	IN-4	OUT-3	IN-3	OUT-2	IN-2	OUT-1	IN-1

CPU ports
KVM ports
Bus in-out ports
Serial cntl ports
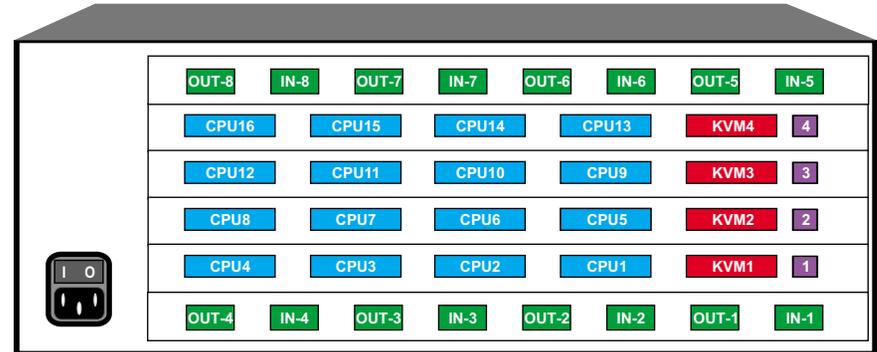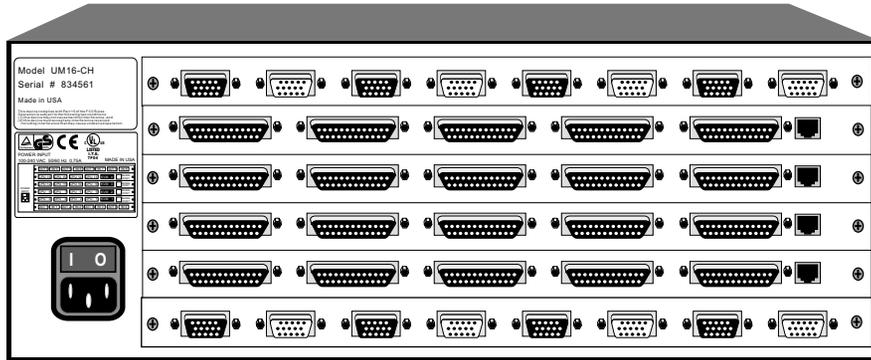
Three types of plug-in cards
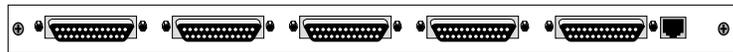
Plug-in card for 4 CPUs and 1 KVM

Plug-in card for 4 CPUs
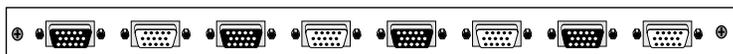
Plug-in card for expansion

UltraMatrix 16X Technical Overview

Confidential

ROSE ELECTRONICS

UltraMatrix 16X

16X EXPANSION

Example of 16x128 system with local KVMs

GLOBAL KVM
LOCAL KVM
COMPUTER
BUS CABLE
KVM CABLE
CPU CABLE

CPUS 65-80
CPUS 81-96
CPUS 97-112
CPUS 113-128

LOCAL KVM
LOCAL KVM
LOCAL KVM
LOCAL KVM

CPUS 1-16
CPUS 17-32
CPUS 33-48
CPUS 49-64

KVM1 KVM2 KVM3 KVM4
KVM5 KVM6 KVM7 KVM8
KVM9 KVM10 KVM11 KVM12
KVM13 KVM14 KVM15 KVM16

UltraMatrix 16X Technical Overview
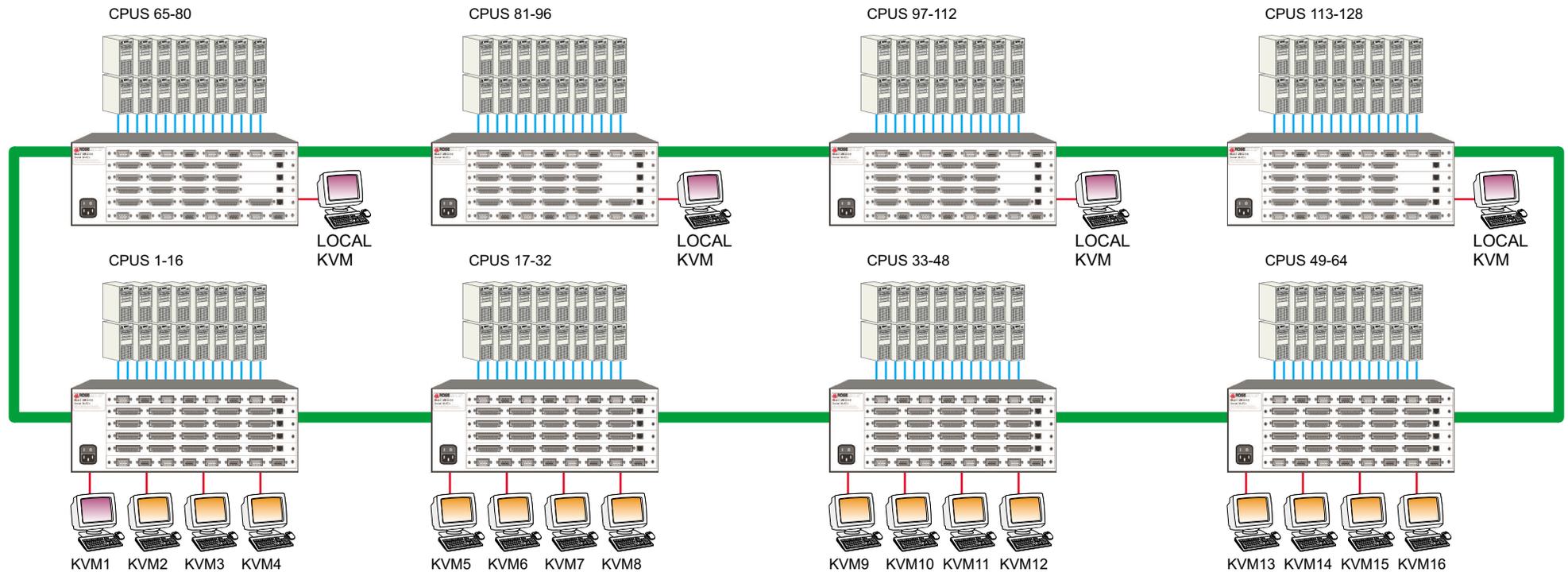
CPU AND KVM ADDRESS CONFIGURATION

CPU ADDRESS
1. Configured from on-screen display or serial options menu
2. Determines computer number for configuration and switching
3. Establishes network address for card
4. When changing, must be saved and box powered off and on
5. Should be configured before connecting boxes together
6. Should be verified from status menu
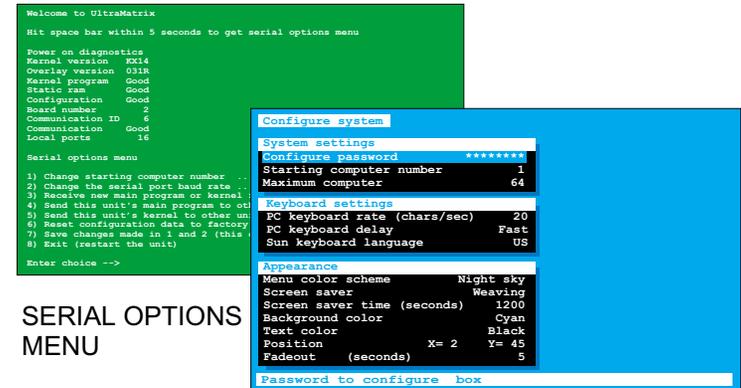
RING/BUS JUMPER
1. On for all but two end units

KVM ADDRESS
1. Configured from jumpers on bus card
2. Sets KVM address to 1-4, 5-8, 9-12, or 13-16
3. Should be configured before connecting boxes together
4. Should be verified from configure KVM page of on-screen display

JUMPER SETTING

KVM	LOWER CARD	UPPER CARD
1-4	FRONT	NONE
5-8	REAR	NONE
9-12	NONE	FRONT
13-16	NONE	REAR

Welcome to UltraMatrix

Hit space bar within 5 seconds to get serial options menu

Power on diagnostics
Kernel version   KX14
Overlay version   031R
Kernel program   Good
Static ram   Good
Configuration   Good
Board number   2
Communication ID 6
Communication   Good
Local ports   16

Serial options menu

1) Change starting computer number ..
2) Change the serial port baud rate .
3) Receive new main program or kernel
4) Send this unit's main program to ot
5) Send this unit's kernel to other un
6) Reset configuration data to factory
7) Save changes made in 1 and 2 (this
8) Exit (restart the unit)

Enter choice -->

SERIAL OPTIONS MENU

Configure system

System settings
Configure password   ********
Starting computer number   1
Maximum computer   64

Keyboard settings
PC keyboard rate (chars/sec)   20
PC keyboard delay   Fast
Sun keyboard language   US

Appearance
Menu color scheme   Night sky
Screen saver   Weaving
Screen saver time (seconds)   1200
Background color   Cyan
Text color   Black
Position   X= 2   Y= 45
Fadeout   (seconds)   5

Password to configure box

ON-SCREEN DISPLAY

EXPANSION CARD

RING/BUS JUMPER

KVM ADDRESS JUMPERS SHOWN REMOVED

FRONT

UltraMatrix 16X Technical Overview

Confidential

POWER UP DIAGNOSTICS

```
UltraMatrix version MX16 Rose Electronics Copyright 1990-1999

Power on diagnostics

Kernel version      KX16B
Overlay version     042B
Kernel program      Good
Hardware type       MP16X
Static ram          Good
Configuration       Good
Board number           2
Communication ID       6
Communication       Good
Local ports            8
Program version     MX18A
Main program        Good
PC keyboard detected
PS2 mouse detected

ROSE ELECTRONICS
```

This screen comes from the on-screen display when the switch first turns on. If there is a failure of the self test, then the reason will be displayed. This screen is blue with white letters.

Slot position in chassis
Address of card in system,
1= CPUs 1-4, 2=CPUs 5-8, 3=CPUs 9-12, and so on
Number of CPU cards present in chassis

UltraMatrix 16X Technical Overview

UltraMatrix 16X

MAIN CONFIGURATION MENU

This screen comes from the on-screen display by pressing and releasing the left control key and the hitting the F12 key. From this page, you reach all other pages to configure the unit.

Navigation through the menus is very simple, use the arrow keys to go to an item and hit enter to go to that page or to change a value. The help line at the bottom, changes to explain what each setting is. When changing a value, pop-up boxes appear,

UltraMatrix version MX18A Rose Electronics Copyright 1990-2000

Main Menu
Configure
   System
   Computer
   KVM
   User
   Profile
   Group
Status
Save
Exit

Use arrow keys to highlight selection and press enter or press escape to exit

Configure password, box numbers, keyboard settings, appearance
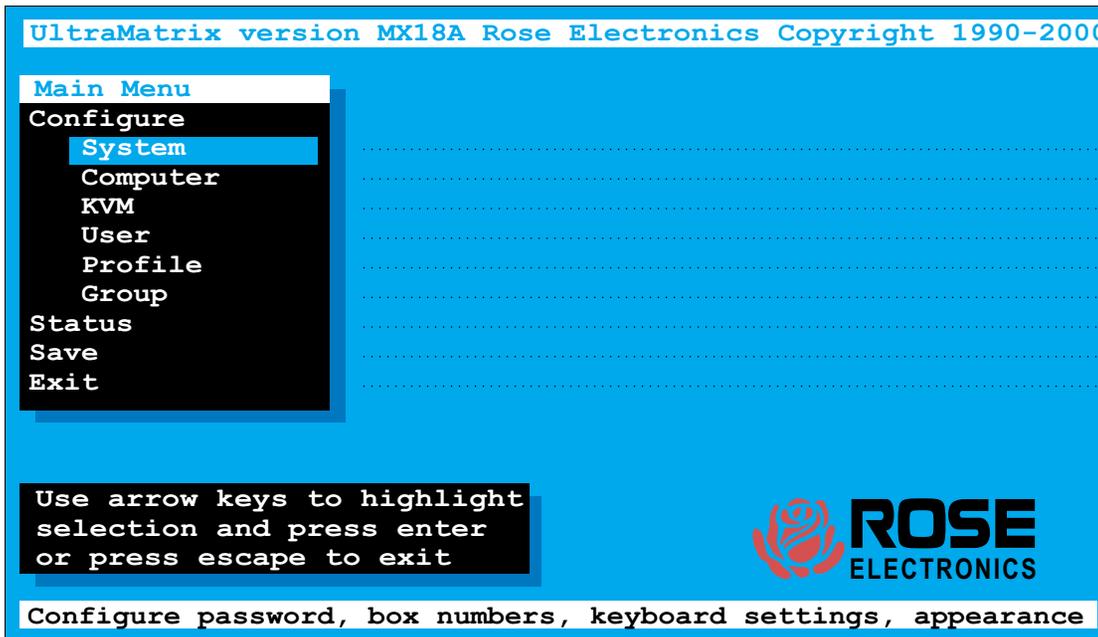
LIST OF HELP MESSAGE FOR EACH ITEM

Configure password, box numbers, keyboard settings, appearance
Configure computer names, keyboard, and mouse type
Configure KVM name, resolution, start port, and login mode
Configure user name, password, and profile
Configure user access and other settings
Configure group names and which computers are in groups
Show communication and connection status
Sends configuration to system and saves to flash memory
Exit this menu and return to normal operation

UltraMatrix 16X Technical Overview

CONFIGURE SYSTEM

```
Configure system

System settings
Configure password                    ********
Starting computer number                     1
Maximum computer                            64

 Keyboard settings
 PC keyboard rate (chars/sec)               20
 PC keyboard delay                        Fast
 Sun keyboard language                      US

 Appearance
Menu color scheme              Night sky
Screen saver                     Weaving
Screen saver time (seconds)         1200
Background color                    Cyan
Text color                         Black
Position              X= 2     Y= 45
Fadeout    (seconds)                   5

Password to configure  box
```

LIST OF HELP MESSAGE FOR EACH ITEM

Password to configure box
Number for first CPU on this box, rounded to multiple of 4 + 1
Maximum number of computers in system

Rate at which key down repeats (1-31)
Delay time before key down starts to repeat
Response to Sun computer's query for language type

Colors of the configuration menu
Shows pattern if no keyboard or mouse activity
Time to screen saver, if no keyboard or mouse activity (0-9999)
Background color of connection status and select menu
Text color of connection status and select menu
Position of connection status
Connect status erase time(0-255), 0=don't show, 255=always show

This is a critical item to configure. The setting on the bottom card determines the addresses of the CPU in the chassis. The settings on the upper cards are ignored, they automatically follow the bottom card sequentially.
1 = CPU 1-4, 5 = CPU 5-8, 9 = CPU 9-12, 13 = CPU 13-16 and so on

UltraMatrix 16X Technical Overview

CONFIGURE COMPUTER

LIST OF HELP MESSAGE FOR EACH COLUMN

Name of computer up to 16 characters
Use page up and page down keys to configure more computers
Type of computer, for PCs this is the computer's keyboard mode
Type of computer mouse used, can be changed for PCs only

```
Configure computer

     Computer   name    Keyboard Mouse
  1◆Computer     1       PC2      PS2
  2 Computer     2       PC2      PS2
  3 Computer     3       PC2      PS2
  4 Computer     4       PC2      PS2
  5 Computer     5       PC2      PS2
  6 Computer     6       PC2      PS2
  7 Computer     7       PC2      PS2
  8 Computer     8       PC2      PS2
  9 Computer     9       PC2      PS2
 10 Computer    10       PC2      PS2
 11 Computer    11       PC2      PS2
 12 Computer    12       PC2      PS2
 13 Computer    13       PC2      PS2
 14 Computer    14       PC2      PS2
 15 Computer    15       PC2      PS2
 16 Computer    16       PC2      PS2

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

CONFIGURE KVM

```
Configure KVM

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 2
3    3   KVM Station 3  640x480@60      0   User 3
4    4   KVM Station 4  640x480@60      0   User 4




                                  LIST OF HELP MESSAGE FOR EACH COLUMN
                                  KVM's profile, either from user' login or specific user
                                  Computer connected to when box is powered on, use 0 for none
                                  Resolution of on-screen-display when no external video
                                  Name of keyboard-video-mouse station (KVM), up to 16 characters



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

CONFIGURE USER

LIST OF HELP MESSAGE FOR EACH COLUMN

```
Configure User
```

User login name, up to 8 characters

```
User name  Password  Profile
User 1     ********   Profil 1
User 2     ********   Profil 2
User 3     ********   Profil 3
User 4     ********   Profil 4
User 5     ********   Profil 5
User 6     ********   Profil 6
User 7     ********   Profil 7
User 8     ********   Profil 8
User 9     ********   Profil 9
User10     ********   Profil10
User11     ********   Profil11
User12     ********   Profil12
User13     ********   Profil13
User14     ********   Profil14
User15     ********   Profil15
User16     ********   Profil16
```

User password, up to 8 characters

User profile, controls access rights and other settings

```
User login name, up to 8 characters
```

UltraMatrix 16X Technical Overview

Confidential

CONFIGURE PROFILE

```
Configure Profile

Name      Access    Connect 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  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


Profile name, up to 8 characters
```

LIST OF HELP MESSAGE FOR EACH COLUMN

Profile name, up to 8 characters
Which group of computers a user may access
Which connect mode (view, share, control, or private) is used
Time(seconds) if no kb-ms activity, another can share computer
Time(seconds) in scan mode between switching to next computer
Time(minutes) with no kb-ms activity that CPU is disconnected

UltraMatrix 16X Technical Overview

CONFIGURE GROUP

```
Configure Group

   Computer          Group 2
 1◆Computer     1    + + + + + + + + + + + + + + + +
 2 Computer     2    + + + + + + + + + + + + + + + +
 3 Computer     3    + + + + + + + + + + + + + + + +
 4 Computer     4    + + + + + + + + + + + + + + + +
 5 Computer     5    + + + + + + + + + + + + + + + +
 6 Computer     6    + + + + + + + + + + + + + + + +
 7 Computer     7    + + + + + + + + + + + + + + + +
 8 Computer     8    + + + + + + + + + + + + + + + +
 9 Computer     9    + + + + + + + + + + + + + + + +
10 Computer    10    + + + + + + + + + + + + + + + +
11 Computer    11    + + + + + + + + + + + + + + + +
12 Computer    12    + + + + + + + + + + + + + + + +
13 Computer    13    + + + + + + + + + + + + + + + +
14 Computer    14    + + + + + + + + + + + + + + + +
15 Computer    15    + + + + + + + + + + + + + + + +
16 Computer    16    + + + + + + + + + + + + + + + +

+ means   computer belong to group PAGE   UP/DOWN-more computers
SPACE BAR-adds/Removes computer from group ENTER-renames group
```

This page determines which computers belong to which group.

Use the arrow keys to go to the desired row(computer) and column(group) and use the space bar to toggle whether that computer is a member of the group or not.

You can also hit enter to change the name of the group depending upon which column the cursor is in.

ROSE ELECTRONICS
UltraMatrix 16X

STATUS

This is a very powerful feature that lets you see many things from one screen.
Each data line can be green, yellow, or red.
Green means the KVM on that card is connected to a CPU
Yellow means the KVM is not connected
Red means the card does not exist or has an error

System Status

Computers	Power	Slot	Ver	KVM	CPU	User	Status
1-4	■■■■	1	017	PC	14	Bob	View mode
5-8	■■■■	2	017	PC	3	David	Share mode
9-12	■■■■	3	017	PC	14	Sharon	View mode
13-16	■■■■	4	017	Sun			Not logged in
17-20	■■■■	1	017	PC	12	User 5	Share mode
21-24	■■■■	2	017	PC	143	Sam	Share mode
25-28	■■■■	3	017	PC	55	Fred	Share mode
29-32	■■■■	4	017	PC	12	Gloria	Share mode
33-36	■■■■	1	017	PC			Not logged in
37-40	■■■■	2	017	PC	34	Temp	Share mode
41-44	■■■■	3	017	PC	128	Master	Share mode
45-48	■■■■	4	017	PC			Not logged in
49-52	■■■■	1	017	PC			Timed out
53-56	■■■■	2	017	PC			Initial state
57-60	■■■■	3	017	PC	399	Godzilla	Share mode
61-64	■■■■	4	017	PC			User request

Slot: card position/Ver: program version/KVM: PC, Sun, or none
CPU power:■=on ■=off Line color: Connect/OK Disconnect Error

Computers	Which card it is
Power	Each square is green for power on to the CPU and red for power off to the CPU
Slot	Which slot the card is installed in
Ver	The firmware version of the main program
KVM	The type of KVM attached either none, PC, or Sun
CPU	If a connection is present, which computer the KVM is connected to
User	If a connection is present, which user is logged on the KVM
Status	What the state of the card is can be any of the following:

Connected (green)

1 View mode	The KVM is connected in view mode
2 Share mode	The KVM is connected in share mode
3 Control mode	The KVM is connected in control mode
4 Private mode	The KVM is connected in private mode

Disconnected (yellow)

5 Initial state	Since power on, the KVM has never been connected
6 User request	The user typed in a control Q command and disconnected
7 Timed out	The disconnect timer elapsed and the user was disconnected
8 Video path cancel	A conflict with a KVM on the same slot position caused a disconnect
9 Private mode cancel	Another user in private mode overrode the connection
10 No response	The last connect was to a non-existent computer
12 Not in access group	Last attempt to connect was to computer not in access group of user
13 Computer is private	Last attempt to connect was to a computer already connected to another user in private mode
14 Queue full	More than 4 KVMs tried to connect to a single computer
15 Unknown reason	Error, call tech support
16 Not logged in	Log in is required and no user has logged in
17 Remote request	The computer was disconnected by RS232 command

The numbers in the connect and disconnect states are result codes returned by the RS232 switching command.

UltraMatrix 16X Technical Overview

Confidential

ROSE ELECTRONICS — *UltraMatrix 16X*

UltraMatrix version MX16 Rose Electronics Copyright 1990-1999

Main Menu

Configure
    System
    Computer
    KVM
    User
    Profile
    Group
Status
Save
Exit

boards to update=3

Saving to flash

Use arrow keys to highlight
selection and press enter
or press escape to exit

ROSE ELECTRONICS

Sends configuration to system and saves to flash memory

The save function is used to save all the settings in flash memory. The configuration is automatically sent to all the other boards in the system. The number of boards (other than the one you are on) is listed and a progress bar is shown as the flash memory is saved.

UltraMatrix 16X Technical Overview

SWITCHING TO COMPUTERS

```
┌─────────────────────────┐
│ Computer select menu    │
│  1 Mail Server          │
│  2 NT Server 1          │
│  3 NT Server 2          │
│  4◆NT Server 3          │
│  5 Inventory            │
│  6 Inventory 2          │
│  7 Sales domain         │
│  8 Computer        8    │
│  9 Computer        9    │
│ 10 Computer       10    │
│ 11 Computer       11    │
│ 12 Computer       12    │
│ 13 Computer       13    │
│ 14 Computer       14    │
│ 15 Computer       15    │
│ 16 Computer       16    │
└─────────────────────────┘
```

You can switch to computers through three different methods:

1. **COMPUTER SELECT MENU** - Pressing and releasing the left control and then hitting the escape key brings up the computer select menu. Use the arrow keys and the page up and page down to highlight a computer and hit enter to switch to it.

2. **DIRECT BY NUMBER** - If you know the number of the computer you want to switch to then press and release the left control key, enter the numeric value using the number keys below the function keys, and hit enter to switch.

3. **USING THE RS232 port** - Specify the KVM value with Knnn where nnn is the 1-255 KVM number of the card desired. Specify the CPU number with Cnnnn where nnnn is the 1 to 1000 computer number of the CPU desired. Send S to switch or question for an inquiry. <cr> below means carriage return (value 13). The last value of K or C is remembered.

For example: K1C3S<cr>   Switches KVM 1 to computer 3
For example: K2?<cr>   Returns which computer KVM 2 is connected to
                           in the form K2CnnnRxx<cr> where nnn is the
                           computer connected or last connected and xx is
                           the status value described previously on the status page.

The on-screen display gives you messages on the status of your connection and you will receive a message of the following type when connecting or disconnecting. The last line is the status and is very important for troubleshooting. This message may also be recalled with the control D command.

```
┌────────────────────────┐   ┌────────────────────────┐   ┌────────────────────────┐
│ Status MIS Console     │   │ Status Control Room 5  │   │ Status App station 1   │
│ Connection successful  │   │ Connect failed         │   │ Disconnected           │
│ to NT Server           │   │ to Mail Server         │   │ from Payroll           │
│ on Admin               │   │ on Richard             │   │ on Sharon              │
│ Share mode             │   │ Not in access group    │   │ Timed out              │
└────────────────────────┘   └────────────────────────┘   └────────────────────────┘
```

SECURITY

There are several types of security features in the product.

1. Configuration password

This feature is used to prevent unauthorized access to the configuration menus. The password is entered from the configure system page. Any subsequent access to the configuration page will require this password.

There is a password defeat jumper, in case the password is forgotten. The jumper is marked on the CPU cards. The unit is shipped with no jumper. If this jumper is installed., the unit will behave as if no password is present.

2. Switch login

On the configure KVM page there is a selection for login yes/no. If you say yes all access to the box from this KVM will require a user id and password as shown to the left. Once the password is entered correctly, the profile assigned to the user via the configure user page will be active. The settings of that profile are assigned on the configure profile page.

3. User access group

Each KVM has a user assigned to it. This is determined by the settings on the configure KVM page. If login=yes, then the user is from the value entered at the login box. If login=no, then the user name is from the user field adjacent to the login=no field. Each user has a profile from the configure user page and each profile has an access group. The access group can be configure to allow or deny access to any computer.

```
UltraMatrix version Mx16 Rose Electronics Copyright 1990-1999

Main Menu
Configure
    System          Enter password
    Computer
    KVM
    User
    Profile
    Group
Status
Save
Exit

Use arrow keys to highlight
selection and press enter          ROSE
or press escape to exit            ELECTRONICS
```

```
Login  Control Room 2
User ID
Password
```

ROSE ELECTRONICS UltraMatrix 16X
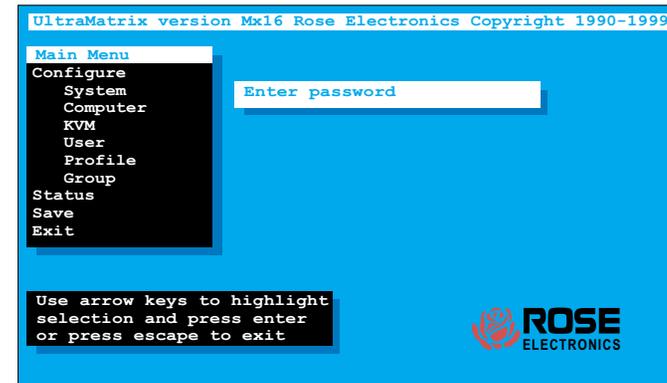
SERIAL OPTIONS MENU

Hit space bar within 5 seconds of power-on of unit
Primarily used for loading flash and initial installation

```
Welcome to UltraMatrix

Hit space bar within 5 seconds to get serial options menu

Power on diagnostics
Kernel version    KX14
Overlay version   031R
Kernel program    Good
Static ram        Good
Configuration     Good
Board number       2
Communication ID   6
Communication     Good
Local ports       16

Serial options menu

1) Change starting computer number  ... 1
2) Change the serial port baud rate ... 9600
3) Receive new main program or kernel from serial port (this card only)
4) Send this unit's main program to other units
5) Send this unit's kernel to other units
6) Reset configuration data to factory default (this card only)
7) Save changes made in 1 and 2 (this card only)
8) Exit (restart the unit)

Enter choice -->
```

To set unit's address if no KVM in slot 1, can be saved with item 7

To set baud rate of serial port, can be saved with item 7
Much faster to use 57600 when loading new flash

To load new flash program or kernel from serial port
Use file copy from dos or send text file from Hyperterminal

To copy flash program or kernel to other boxes
Will display total of boards to update and prompt
Are you sure ? Y/N

Reset to factory default, resets this card only
Other cards must be reset with save configuration from
main configuration menu

To save items 1 and 2 only

Exits serial option menu and restarts box

UltraMatrix 16X Technical Overview