ServSwitch Console™ Plus

BLACK BOX®
NETWORK SERVICES

KV101A
KV102A
KV103A

BLACK BOX®
NETWORK SERVICES

Welcome to the ServSwitch™ Family!

Thank you for purchasing a BLACK BOX® ServSwitch™ Brand KVM switch! We appreciate your business, and we think you'll appreciate the many ways that your new ServSwitch keyboard/video/mouse switch will save you money, time, and effort.

That's because our ServSwitch family is all about breaking away from the traditional, expensive model of computer management. You know, the one-size-fits-all-even-if-it-doesn't model that says, "One computer gets one user station, no more, no less." Why not a single user station (monitor, keyboard, and mouse) for multiple computers—even computers of different platforms? Why not a pair of user stations, each of which can control multiple computers? Why not multiple user stations for the same computer?

With our ServSwitch products, there's no reason why not. We carry a broad line of robust solutions for all these applications. Do you have just two PCs, and need an economical alternative to keeping two monitors, keyboards, and mice on your desk? Or do you need to share dozens of computers, including a mix of IBM® PC, RS/6000®, Apple® Macintosh®, Sun Microsystems®, and SGI® compatibles among multiple users with different access levels? Does your switch have to sit solidly on a worktable and use regular everyday cables? Or does it have to be mounted in an equipment rack and use convenient many-to-one cables? No matter how large or small your setup is, no matter how simple or how complex, we're confident we have a ServSwitch system that's just right for you.

The ServSwitch ™ family from Black Box—the one-stop answer for all your KVM-switching needs!

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This manual will tell you all about your new ServSwitch Console Plus™, including how to install, operate, and troubleshoot it. For an introduction to the Matrix ServSwitch, see the introduction section. The ServSwitch Console Plus product codes covered in this manual are:

KV101A   KV102A   KV103A

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Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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This equipment complies with the requirements of the European EMC
Directive 89/336/EEC with respect to EN55022 (Class B),
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NORMAS OFICIALES MEXICANAS (NOM) ELECTRICAL SAFETY STATEMENT

INSTRUCCIONES DE SEGURIDAD

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.

2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.

3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.

4. Todas las instrucciones de operación y uso deben ser seguidas.

5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc.

6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.

7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.

8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.

9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.

10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.

11. El aparato eléctrico deberá ser connectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.

12. Precaución debe ser tomada de tal manera que la tierra fisica y la polarización del equipo no sea eliminada.

13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.

14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.

15. En caso de existir, una antena externa deberá ser localizada lejos de las lineas de energia.

16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.

17. Cuidado debe ser tomado de tal manera que objectos liquidos no sean derramados sobre la cubierta u orificios de ventilación.

18. Servicio por personal calificado deberá ser provisto cuando:

    A: El cable de poder o el contacto ha sido dañado; u

    B: Objectos han caído o líquido ha sido derramado dentro del aparato; o

    C: El aparato ha sido expuesto a la lluvia; o

    D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o

    E: El aparato ha sido tirado o su cubierta ha sido dañada.

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Disclaimer

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About this manual

This manual covers the installation and operations of the ServSwitch Console Plus switches.

Introduction

Thank you for choosing a ServSwitch Console Plus™. Designed with your needs in mind, your new switch will simplify your job by helping you organize your multiple-computer application. 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 a central location. The ServSwitch Console Plus 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 ServSwitch Console Plus, the KVM station, 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.

ServSwitch Console Plus is designed to meet your switching needs, whatever your system demands are, 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 a single user KVM station.

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

Features

Upgradeability
- 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.blackbox.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.
- Four connect modes: View, Share, Control and Private provide flexibility in configuring the ServSwitch Console Plus 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 ServSwitch Console Plus switch easy to extend to other switches.
- Pre-configuration of the switch allows for installation without powering most computers/servers down.
- Multi-language capabilities.
- Switching to computers can be done by keyboard commands, an on-screen list of computers, the front panel switches, or by commands through the RS232 serial port.
- Integrated auto-switching power supply accepts both 110-volt and 220-volt

On-screen display technology
- The ServSwitch Console Plus' 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 ServSwitch Console Plus 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 with a four page scroll buffer for accessing computers, routers, Ethernet hubs, Unix devices and more. 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*

* Requires use of Translator: KV99MCON and a special 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 ServSwitch Console Plus and the equipment used for the KVM station. A KVM cable is needed for the KVM station, a CPU cable is needed for each computer that is connected to the ServSwitch Console Plus , 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 ServSwitch Console Plus
- 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 Black Box so the discrepancy can be quickly resolved.

Models
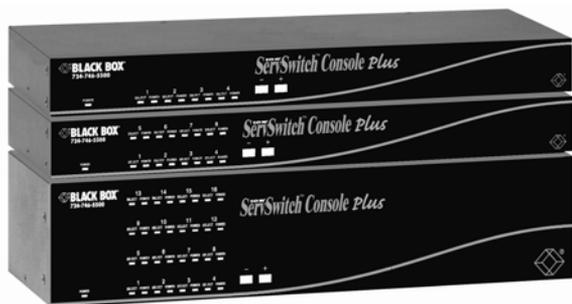
**ServSwitch
Console Plus
Models**

ServSwitch Console plus rear panel	Model number
	KV101A
	KV102A
	KV103A

Connector	Description
	IEC320 power connector
	Optional expansion connectors (HD15M/F) (Part number SW740C-R3-B)
	CPU connectors (DB25F)
	KVM connector (DB25F)
	Serial connector (RJ12 – 6 pin)

System Overview

The ServSwitch Console Plus 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 ServSwitch Console Plus makes the Unit easy to install, expand, and maintain. The addition of an expansion card and additional switches can increase the number of computers that can be connected and accessed to 1,000.

The ServSwitch Console Plus series switches are available in three configurations depending on your system switching needs, 4, 8, or 16 CPU ports and one KVM port.

KVM station

A KVM station, consisting of a **K**eyboard, **V**ideo monitor, and **M**ouse, connects to the DB25F KVM connector 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 11)

KVM Station Keyboard and Mouse

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 translator is used 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 ServSwitch Console Plus can connect to PC's, Unix systems, Sun systems, and USB. Apple ADB computers can be connected using a translator.

The CPU connectors on all models are DB25F. Each connected computer uses a CPU adapter cable compatible with the computer's keyboard, monitor, and mouse ports. (available in lengths of 5 – 100 feet).

The ServSwitch Console Plus 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 ServSwitch Console Plus CPU connectors (DB25F) to a serial interface (Dumb Terminal, CPU, or serial device).
The ServSwitch Console Plus 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 ServSwitch Console Plus in a Bus or Ring configuration, an expansion card must be installed in each ServSwitch Console Plus. Figure 1 shows the expansion card used for all models. (Part number SW740C-R3-B)

The expansion connectors provide the means of sending the system, keyboard, video, and mouse data from one expansion card output to another expansion card input. This allows a KVM station on one ServSwitch Console Plus to connect to a computer connected on another switch. Expansion cables are needed for each expansion Unit.
Expansion cables are available in lengths of 2 – 100 feet.

If an expansion card is permanently removed, a terminator and cover plate must be installed.

Part number SW740C-R3-B
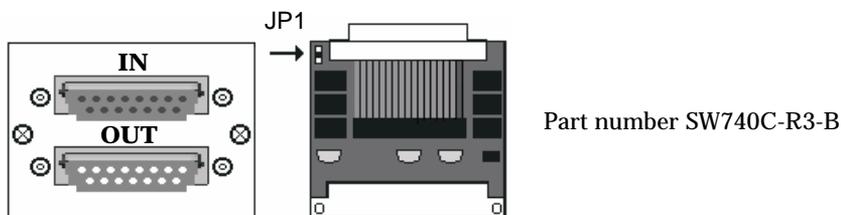
Figure 1. Expansion card

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

1. Remove power from the ServSwitch Console Plus.
2. Remove any expansion cables.
3. Unscrew the two screws securing the expansion card to the chassis.
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.
    (See Bus or Ring installation section for jumper removal/installation)
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 ServSwitch Console Plus models are equipped with an RS232 serial port. This port on all models is an RJ12, 6-conductor connector. It provides a serial interface to the ServSwitch Console Plus 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 (alternative method)
- ■ 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

A KVM station, computers and servers are easily connected to the ServSwitch Console Plus 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 ServSwitch Console Plus.

System security

Security is a very important concern especially in the environment most ServSwitch Console Plus are commonly installed in, such as data centers and server rooms. The ServSwitch Console Plus 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 station 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

Organizing your site and planning the placement of the computers, the KVM station, and the ServSwitch Console Plus is a key part in the installation and configuration process. Care should be taken when connecting the computers, KVM and the ServSwitch Console Plus . Locate the ServSwitch Console Plus 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 ServSwitch Console Plus can be rack mounted with a rack mount kit (see Appendix J & K).

Wherever the ServSwitch Console Plus 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 ServSwitch Console Plus 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 station can also be assigned a unique KVM name.
  The default KVM name is KVM station 1
- 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.

Switch Installation – Single Unit

Please refer to the safety section before installation

The basic installation of a single ServSwitch Console Plus 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 ServSwitch Console Plus will automatically determine the keyboard and mouse types used for that computer and no pre-configuration is needed.
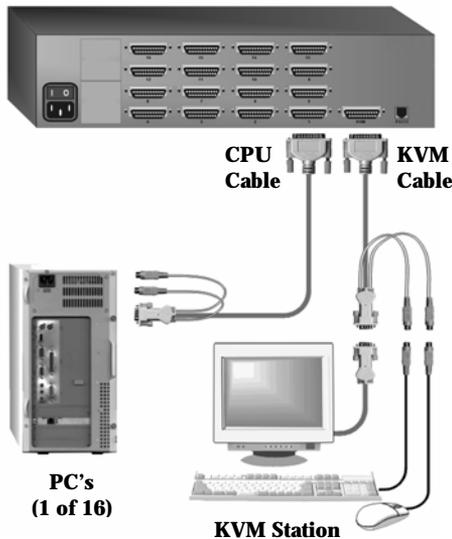
Figure 2. Single Unit configuration
The Unit in Figure 2 can be any ServSwitch Console Plus model

If removing power from a computer is not practical, pre-configure the ServSwitch Console Plus 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-4e).

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

STEPS: (See Figure 2 for an example of a single Unit installation)
(Refer to the troubleshooting section for help if needed)

1. Connect a KVM station to the ServSwitch Console Plus DB25F, KVM connector using the appropriate KVM cable.

2. Turn on the KVM stations video monitor and the ServSwitch Console Plus. (Wait for the internal diagnostic check to complete and fade out)

3. Switch the KVM station 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 17)
   (See Note below on switching methods)

4. Pre-configure the CPU port, if needed, as outlined in steps 4a-e 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

Call up the Configuration menu system by pressing and
releasing the left [Ctrl] key, then the [F12] key. (Figure 5)

   a. Select "Computer" and press [Enter] (Figure 7)
   b. 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.
   c. Select the correct keyboard or mouse type for the selected computer and press [Enter].
   d. Press [ESC] to return to the "Main menu" and save the changes.
   e. 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.

7. Switch the KVM station to the next sequential CPU port as explained in step 3 and perform steps 4-6 for that computer and for the remaining computers.

NOTE: Switching CPU ports can also be performed by pressing the "+ " or "- " select buttons on the front panel. "+ " will switch to the next sequential CPU port, "- " will switch to the previous CPU port. The connection dialog message will display after pressing either button showing which CPU port is connected.

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 5)
  b. Select "System" and press [Enter]. (Figure 6)
  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 14)

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 16).

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 ServSwitch Console Plus.

Switch Installation – Multiple units – "BUS" topology

A "BUS" configuration is usually used when the user is connected to the KVM ports on Unit #1. In a "BUS" configuration, (Figure 3) the video path is from the last Unit in the configuration to the first Unit ("OUT" to "IN"). A user on the first Unit can access all computers on all Units. A user connected to Unit #2 can only access computers on Unit #2, 3, etc. Connect conflicts can occur with multiple users (See Appendix F)
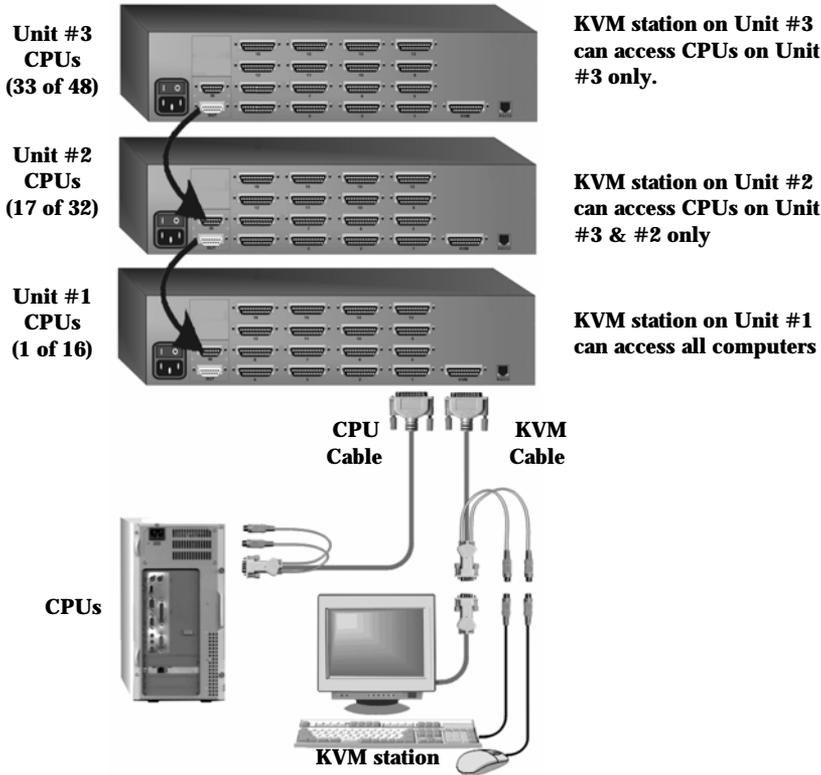
Figure 3. Bus configuration

The Units in Figure 4 can be any ServSwitch Console Plus model. KVM stations on expanded units is not recommended, access conflicts can occur.

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 ServSwitch Console Plus 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. The "Starting computer" number for each Unit.
6. The number of computers, or "Maximum computers", that the ServSwitch Console Plus 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 CPU ports on the first Unit + one or 17, the third Unit would have a "Starting computer" number of 33 (Total CPU ports on unit #1 and unit #2 + 1, and so on.

Maximum computers
The "Maximum computers" value is calculated by counting the total number of CPU ports on all units. If your system consists of 10 ServSwitch Console Plus Units, each with 16 CPU ports, the "Maximum computers" number would be 160. 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 ServSwitch Console Plus models. (NOTE: Expansion cables should not be connected at this point)
Steps:
1. Verify that power is "OFF" on all ServSwitch Console Plus switches.
2. Configure the "Starting computer" number for all the ServSwitch Console Plus switches, starting with Unit #2 by: (Unit #1 default = 1)
   a. Connect a KVM station to Unit #2's KVM connector using the appropriate KVM adapter cable.
   b. Apply power to the KVM monitor and to ServSwitch Console Plus #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].
   Press the "Esc" key to return to the "Main menu".

    f.   Select "Save" and press [Enter]. A "YES/NO" choice box will display. Select "YES" and press [Enter] to save the changes.

    g.   Turn the power off on the ServSwitch Console Plus.

    h.   Connect the KVM station to the KVM connector on Unit #3.

    i.   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 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 13)

    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.

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

    From: Unit #2's "OUT" expansion card connector

    To: Unit #1's "IN" expansion card connector.

    (Connecting the expansion cable from the "IN" connector first to the "OUT" connector can cause termination conflicts and require power to be cycled on all units.

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 ServSwitch Console Plus switches are on, all Bus cabling is in place and a KVM station is connected to ServSwitch Console Plus #1's KVM port.

11. Connect a computer to any CPU port on the last ServSwitch Console Plus 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 ServSwitch Console Plus switches and verify they operate properly. (See Appendix F)

Connecting the computers
If power must be maintained on a computer, perform steps 4a-e 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 ServSwitch Console Plus switches in the system should have power "ON" and no configuration menu displaying on any KVM monitor.)

14. Make sure all ServSwitch Console Plus switches have power applied and a KVM station is connected to 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 (Figure 16).

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-e 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 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 this computer and for the remaining computers.

When all computers are connected to the ServSwitch Console Plus switches and functioning properly, the basic installation of a "BUS" configuration is complete. The KVM station connected to ServSwitch Console Plus 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 ServSwitch Console Plus 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 ServSwitch Console Plus 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.
Connect conflicts can occur with multiple users (See Appendix F)
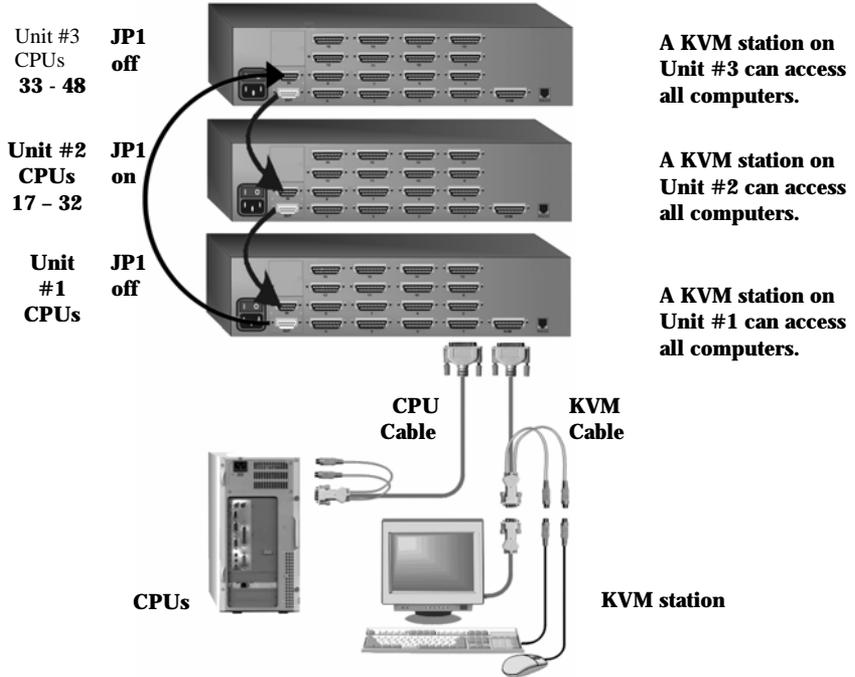
Figure 4. Ring configuration
The Units in Figure 4 can be any ServSwitch Console Plus model

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 4, 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 4 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 ServSwitch Console Plus switches.
2. Connect an expansion cable from Unit #1's "OUT" connector to the last Units "IN" connector 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 1), then replace the expansion cards, cables, and apply power to

   the two ServSwitch Console Plus switches that jumper JP1 was removed. All other ServSwitch Console Plus switches should have power off at this time.
4. Make sure a KVM station is connected to ServSwitch Console Plus #1.
5. Turn on the KVM stations video monitor and apply power to the remaining ServSwitch Console Plus 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-e 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 ServSwitch Console Plus switch and verify they operate properly. (See appendix F)

This completes the basic installation of a "RING" configuration.
A KVM station connected to any ServSwitch Console Plus 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 ServSwitch Console Plus switch.

Menu structure

Use only the numeric keys above the keyboard.
The numeric keypad will not work for entering numbers.

ServSwitch Console Plus
Menu Structure

Main menu

System

System settings
   Configure password
   Starting computer number
   Maximum computers
Keyboard settings
   PC keyboard rate
   PC Keyboard delay
   Sun keyboard language
Appearance
   Menu color scheme
   Screen saver
   Screen saver time
   Background color
   Text color
   Position
   Fadeout

Computer

Computer name
   Keyboard
   Mouse

KVM

KVM name
   Resolution
   Start
   User

User

User name
   Password
   Profile

Status

System status
Information

Language

Menu language
selection

Group

Configure group /
computer access

Profile

Profile name
Access
Mode
Share
Scan
Logout

Save

Exit

To display the main menu, press and release the left control key, then press the F12 key. To navigate through the menu system, use the arrow keys to select the configuration menu needed and press [Enter]. When you press [Enter] that menu will display, an input box will display for a new value, or a list of supported choices will display. Enter or select the information needed and press [Enter]. To return to the previous page or abort an input, press the [Esc] key.

Main Menu

```
ServSwitch Console Plus version MX24   Copyright 1990 - 2003

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


  Use up/down arrow keys        ◆ BLACK BOX
  to choose selection
  then press the Enter key       (724) 746-5500
  or the Escape key to exit


  Configure password, box number, keyboards settings, appearance
```
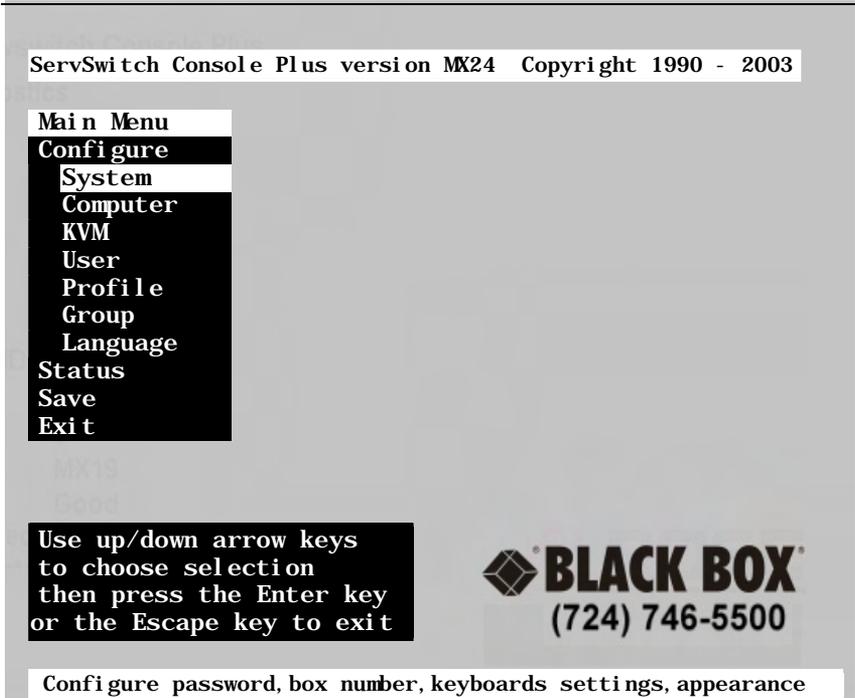
Figure 5. Main configuration menu

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, KVM, 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 ServSwitch Console Plus menus and the options available.

Configure System menu

```
┌─────────────────────────────────────────────────────────┐
│  ┌──────────────────┐                                    │
│  │ Configure system │                                    │
│  └──────────────────┘                                    │
│  ┌──────────────────────────────────────────────────┐    │
│  │ System settings                                  │    │
│  ├──────────────────────────────────────────────────┤    │
│  │ Configure password                      ******** │    │
│  ├──────────────────────────────────────────────────┤    │
│  │ Starting computer number                       1 │    │
│  │ Maximum computers                             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)                 1800 │    │
│  │ Background color                            Cyan │    │
│  │ Text color                                 Black │    │
│  │ Position                     X = 25     Y = 45   │    │
│  │ Fadeout (seconds)                             5  │    │
│  └──────────────────────────────────────────────────┘    │
│                                                           │
│  ┌──────────────────────────────────────────────────┐    │
│  │ Password to configure unit                       │    │
│  └──────────────────────────────────────────────────┘    │
└─────────────────────────────────────────────────────────┘
```

Figure 6. 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 of 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 ServSwitch Console Plus 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 CPU ports on Unit #1 plus 1.

Switch #3's number is the total CPU ports on Unit #1 and Unit #2 plus 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 counting the number of CPU ports on all switches. 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 7. 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®, 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

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

```
  Configure KVM

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




















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

Figure 8. Configure KVM menu

The "Configure KVM" menu allows you to change the KVM 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 1)
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:

- 640 x 480 @ 60Hz
- 640 x 480 @ 72Hz
- 640 x 480 @ 75Hz
- 640 x 480 @ 67Hz
- 832 x 624 @ 75Hz
- 1152 x 900 @ 66Hz
- 1152 x 900 @ 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)
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

```
Configure User

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

Use page up and page down keys to configure more computers
User login name, up to 8 characters
```

Figure 9. 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 10. 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. (See Appendix F.)

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)

Configure Group menu

```
  Configure Group

     Computer                      Group 1
   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    +  + + + + + + + + + + + + + + +


 SPACE BAR adds/removes computer from group Enter renames group
 Page up/down more computers + computer belongs to group
```

Figure 11. Configure group menu

The configure group menu allows you to assign a computer to one or more groups. Users that are assigned a profile that contains a specific group name can only access the computers within that group. It they try to access a computer that is not within the assigned group, the error "Not in access group" will display in the connect box. The left computer column displays the computer names. To change a group name, select it and press [Enter].

This menu is an array of groups (x) and computers (y). Moving the arrow key to the right from one plus (+) to another plus (+) for a selected computer name changes to the next group. A plus (+) means the computer belongs to that group, a blank means the computer is not in that group and cannot be accessed by a user assigned to this group. To change the group membership, select the group for a selected computer and press the space bar to toggle between the two states, + or blank. Default: (All computers in all groups)

Configure Language menu

```
ServSwitch Console Plus version MX24  Copyright 1990 - 2003

Main Menu
Configure
  System
  Computer
  KVM
  User                    English
  Profile                 Francais
  Group                   Deutsch
  Language                Espanol
Status                    Italiano
Save                      Portugues
Exit


Use up/down arrow keys
to choose selection       ◆ BLACK BOX
then press the Enter key
or the Escape key to exit   (724) 746-5500

Language which will be displayed on the screen
```

Figure 12. Configure language menu

Selecting "Language" from the "Main" menu displays a choice box of different language options. Select the language needed and press [Enter]. This changes all the menu and display information to that selected language.

The language options are:
- English
- Francais
- Deutsch
- Espanol
- Italiano*
- Portugues*

Italiano and Portugues languages are available on request.

System Status display

```
┌──────────────────────────────────────────────────────────────────┐
│ System Status                                                      │
│                                                                    │
│ Computers    Power    Pos Ver   KVM   CPU User    Status           │
│     1-4      ■■■■      1  24     PC     1 User 1 Share mode         │
│     5-8      ■■■■      2  24     PC               Share mode        │
│     9-12     ■■■■      3  24     PC               Share mode        │
│    13-16     ■■■■      4  24     PC               Share mode        │
│    17-20               1  24     PC               No response       │
│    21-24               2  24     PC               No response       │
│    25-28               3  24     PC               No response       │
│    29-32               4  24     PC               No response       │
│    33-36               1  24     PC               No response       │
│    37-40               2  24     PC               No response       │
│    41-44               3  24     PC               No response       │
│    45-48               4  24     PC               No response       │
│    49-52               1  24     PC               No response       │
│    53-56               2  24     PC               No response       │
│    57-60               3  24     PC               No response       │
│    61-64               4  24     PC               No response       │
│                                                                    │
│ Pos=Card position | Ver=Program version | KVM=PC/Sun/None          │
│ CPU power ■ =on ■ =off | Line color Good Disconnected Error        │
└──────────────────────────────────────────────────────────────────┘
```

Figure 13. 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 2 user model, slot 4 is the top CPU card for the 4 user model.

OPERATION

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.

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Save menu

```
 ServSwitch Console Plus version MX24   Copyright 1990-2003

 Main Menu
 Configure
   System
   Computer                 ┌─────────────────────┐      ┌──────┐
   KVM                      │  Boards to update = │      │  NO  │
   User                     └─────────────────────┘      │ YES  │
   Profile                  ┌─────────────────────┐      └──────┘
   Group                    │  Save configuration?│
   Language                 └─────────────────────┘
 Status
  Save
 Exit


 Use up/down arrow keys
 to choose selection
 then press the Enter key
 or the Escape key to exit

 Configure password, box number, keyboards settings, appearance
```
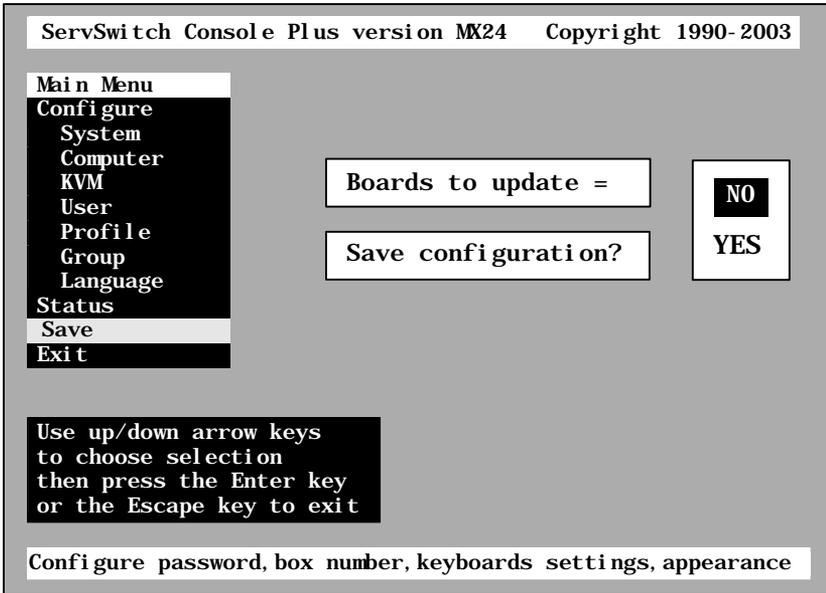
Figure 14. Save menu

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 unit 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 units.

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 models.

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

To start using your ServSwitch Console Plus 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 15, 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.

```
Login    Control Room

User ID
Password
```
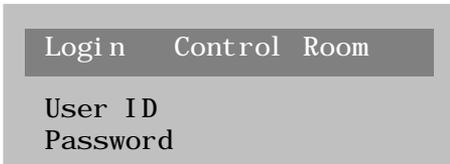
Figure 15. Login screen

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 16 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. Pressing the F1 key will sort the list, F2 key will display the status screen.

```
┌─────────────────────────────────┐
│  Computer select menu           │
│                                 │
│    1   Mail server              │
│    2   NT Server 1              │
│    3   NT server 2              │
│    4   NT server 3              │
│    5   Inventory 1              │
│    6   Inventory 2              │
│    7   Sales                    │
│    8   Marketing                │
│    9   Engineering              │
│   10   Computer      10         │
│   11   Computer      11         │
│   12   Computer      12         │
│   13   Computer      13         │
│   14   Computer      14         │
│   15   Computer      15         │
│   16   Computer      16         │
│                                 │
│                                 │
│  F1 – Sort  F2 – Status #       │
└─────────────────────────────────┘
```
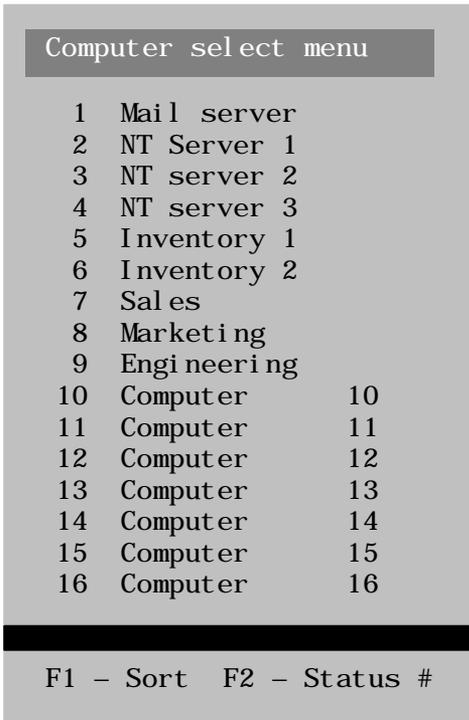
Figure 16. Computer select menu

Figures 16, 17, and 18 show an example of the connection status messages that are displayed when connecting to a computer.

```
┌─────────────────────────────────┐
│  Status Mail server             │
│                                 │
│  Connection successful          │
│  to NT Server                   │
│  On Admin                       │
│  Share mode                     │
└─────────────────────────────────┘
```
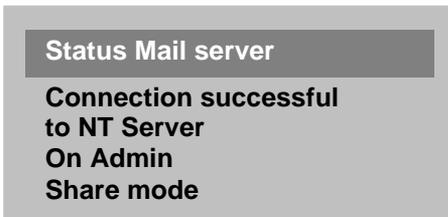
Figure 17. Connection successful message

Status Control Room 5

**Connection failed
to Mail server
On Richard
Not in access group**
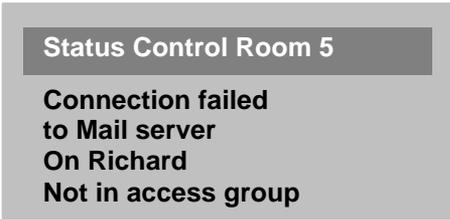
Figure 18. Connection failed message

Status Mail server

**Disconnected
from Payroll
On Sharon
Timed out**

Figure 19. 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 device support

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 supported device with a serial port. The serial device is connected to the DB25F CPU port on the unit 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]. 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 20)

```
 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 20. Serial support

With the CPU port configured for serial support and the appropriate serial
cable connected, the KVM station can access the connected serial device the
same way you would access it using a computer terminal.

When you switch to a CPU port that is configured for serial support, the
powerful OSD will emulate a VT220 terminal. You can also use the KVM
station in a standard TTY mode which will automatically scroll incoming data.
The example below shows a typical screen from a UNIX computer. The data is
shown in a standard 24 x 80 area with two status lines. The first line shows the
current KVM station name, user name, connect mode, and computer name.
The second line shows the command functions available.

```
-r-sr-xr-x    2 uucp      uucp       31258 Aug 14 2000   uusnap
-r-sr-xr-x    2 uucp      uucp       31258 Aug 14 2000   uustat
-r-xr-xr-x    1 uucp      uucp        1759 Feb 09 2000   uuto
-r-sr-xr-x    1 uucp      uucp       50678 Aug 14 2000   uux
-r-xr-xr-x    1 bin       bin         8868 Apr 09 2000   vacation
-r-xr-xr-x    5 bin       bin       224806 Jun 07 2001   vedit
-r-xr-xr-x    5 bin       bin       224806 Jun 07 2001   vi
-r-xr-xr-x    5 bin       bin       224806 Jun 07 2001   view
-r-xr-sr-x    2 root      system     14830 Jun 07 2001   w
-r-xr-xr-x   15 bin       bin         1042 Jun 07 2001   wait
-r-xr-xr-x    1 bin       bin         5050 Jun 07 2001   wc
-r-xr-xr-x    1 bin       bin         3372 Jun 07 2001   what
-r-xr-xr-x    3 bin       bin        96640 Jun 07 2001   whatis
-r-xr-xr-x    1 bin       bin         6840 Jun 07 2001   whereis
-r-xr-xr-x    1 bin       bin          963 Jun 07 2001   which
-r-xr-xr-x    1 bin       bin        10912 Jun 07 2001   who
-r-xr-xr-x    1 bin       bin         1598 Jun 07 2001   whoami
-r-xr-xr-x    1 bin       bin        18624 Jun 07 2001   write
-r-xr-xr-x    1 bin       bin        10694 Jun 07 2001   xargs
-r-xr-xr-x    1 bin       bin        12732 Apr 09 2000   xget
-r-xr-xr-x    1 bin       bin        12272 Apr 09 2000   xsend
-r-xr-xr-x    1 bin       bin         1334 Jun 07 2001   yes
-r-xr-xr-x    3 bin       bin        14552 Jun 07 2001   zcat
# _

 UltraMatrix terminal·NOC station 12  ·Martin  ·Share mode      ·Unix NCC-1701-D
 Page ↑↓ = Scroll     ·F12 = Clear screen                       ·Page 0
```

The page up and page down keys allow you to scroll the incoming pages in the
four page scroll buffer. The F12 key clears the screen.

Serial control port usage (RS232)

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

To access the 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.
- A dedicated computer, Notebook computer with a serial port, or a display terminal. Using a display terminal will allow you to configure the ServSwitch Console Plus switch; however, you will not be able to upgrade new versions of firmware. The computer or Notebook must not be attached to any switch 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 (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 "UC 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 ServSwitch Console Plus 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 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 switches serial port and the baud rate set on your computers COM port are not set to the same value. Disconnect from the ServSwitch Console Plus 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 unit, 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:
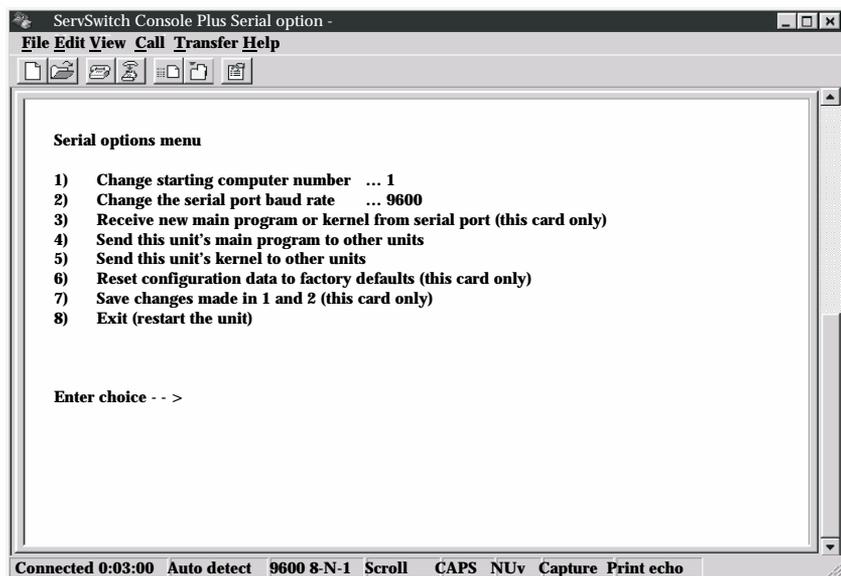

Figure 21. Serial menu

Serial control 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 $\longrightarrow$

The serial option menu will display again. Select Option 7 to save the new starting computer number to flash memory. Cycle power on the unit 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 ServSwitch Console Plus 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.

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

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

You must change or verify that the computer's baud rate matches the ServSwitch Console Plus baud rate. If you are using Windows HyperTerminal on your computer, first disconnect from the ServSwitch Console Plus switch by clicking on the HyperTerminal disconnect ICON. Change the baud rate to match the switch's baud rate and then connect to the ServSwitch Console Plus 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 our web site at www.blackbox.com. The diagnostic screen that is displayed when the ServSwitch Console Plus 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.

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 ServSwitch Console Plus 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 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 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 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 ServSwitch Console Plus 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 ServSwitch Console Plus 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 ServSwitch Console Plus 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.

Safety

This ServSwitch Console Plus switch has been tested for conformance to safety regulations and requirements, and has been certified for international use. Like all electronic equipment, the ServSwitch Console Plus 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.
- 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

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.

Troubleshooting

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 ServSwitch Console Plus is defective. Try using another port. 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 ServSwitch Console Plus or mouse at boot-up time in order for mouse to be recognized by the computer. Reboot computer with the ServSwitch Console Plus 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 ServSwitch Console Plus 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 ServSwitch Console Plus 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 ServSwitch Console Plus 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 ServSwitch Console Plus 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 ServSwitch Console Plus is defective. Try using another port on the ServSwitch Console Plus 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.

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 1
	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	(4/8 CPU Ports)	(16 CPU Ports)
Dimensions	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.
Weight	4lb. / 1.8 kg.	8lb. / 3.6 kg.
Power	100 – 240 VAC / 60 watts	100 – 240 VAC / 45 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	250 MHz.	100 MHz.
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 32 - 113°F	0 – 45°C, 5% – 80% RH 32 - 113°F
Approvals	UL, cUL, TUV, CE, GS	UL, cUL, TUV, CE, GS

Appendix C. Parts and cables

Part number	Description (Multi-Platform models)
EHN206-nnnn*	Coax Sun CPU video-Kbd-mouse to DB25M
EHN215-nnnn*	Apple CPU video-Kbd-mouse to DB25M
EHN225-nnnn*	Coax VGA-Sun Kbd-Sun mouse
EHN242-nnnn*	(Sun 13W3M) DB25M (Video only)
ENH245-nnnn*	(Sun 13W3F) DB25M (Video only)
EHN485-nnnn**	CPU - DB25M to HD15F / USB Type A
EHN485A-nnnn**	CPU - DB25M to HD15F / USB Type A + Audio
EHN500-nnnn*	SGI-KVM 13W3 / PS2
EHN501-nnnn*	SGI-CPU 13W3 / PS2
EHN515-nnnn*	SUN w/ VGA (HD15) Video, SUN Kbd & mouse
EHN520-nnnn*	RS6000 CPU 13W3 / PS2
EHN521-nnnn*	RS6000 KVM 13W3 / PS2
EHN540-nnnn*	Coax Apple video-Kbd-mouse to DB25M
EHN560-nnnn*	Coax Apple video-Kbd-mouse to DB25M
Part number	Description (PC Models)
EHN041-nnnn**	CPU - DB25M to HD15M (VGA Video only)
EHN044-nnnn*	KVM - DB25M to HD15F (VGA Video only)
EHN052-nnnn*	KVM - DB25M to HD15F / DIN5 / DB9 (AT-style)
EHN151-nnnn**	CPU – DB25M to HD15F / PS2 Kbd / PS2 mouse
EHN151A-nnnn**	CPU - DB25M to HD15F / PS2 Kbd / PS2 mouse + Audio
EHN154-nnnn***	KVM - DB25M to HD15F / PS2 Kbd / PS2 mouse
EHN154A-nnnn***	KVM - DB25M to HD15F / PS2 Kbd / PS2 mouse + Audio
EHN270-nnnn*	KVM - DB25M to HD15F / DIN5 / DB9 - Coax (AT-style)
EHN282-nnnn**	CPU - DB25M to HD15F / DIN5 / DB9 – Coax (AT style)
EHN283-nnnn*	KVM - DB25M to HD15F/ PS2 Kbd / PS2 mouse - Coax
EHN284-nnnn*	Cascading Cable DB25M to DB25M
EHN382-nnnn**	CPU - DB25M to HD15F / PS2 Kbd / PS2 mouse
EHN382A-nnnn**	CPU - DB25M to HD15F / PS2 Kbd / PS2 mouse + Audio
EHN383-nnnn*	KVM - DB25M to HD15F / PS2 Kbd / PS2 mouse
EHN383A-nnnn*	KVM - DB25M to HD15F / PS2 Kbd / PS2 mouse + Audio
PS024	110/220 VAC - Power transformer
RMKxxB	1U Rackmount kit (xx = 19, 23, or 24 in.)
RMKxxC	2U Rackmount kit (xx = 19, 23, or 24in)

* Cable lengths in 1, 5, 10, 20, 35, 50, 75, 100 feet
** Cable lengths in 5, 10, 20, 35, 50, 75, 100 feet
*** Max cable length = 20 feet

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.
No Response	Communications error.	Cycle power to the 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.
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.

It is possible, but not recommended, in an expanded system with multiple ServSwitch Console Plus switches, to connect additional KVM stations to other ServSwitch Console Plus units in the system. This allows more than one user access to the computers from multiple access locations.

When doing this, all users share the same video path from switch to switch. (KVM port on ServSwitch Console Plus #1 and KVM port on ServSwitch Console Plus #3)   As long as all KVM users only connect to the computers that are attached to their local ServSwitch Console Plus, they can operate with no conflicts. If a user tries to connect to a computer on a different ServSwitch Console Plus switch and a user is already connected, the video path is canceled and the ServSwitch Console Plus may not function properly, requiring a recycle of the unit's power. If you do use multiple KVM stations, users should be made aware of the possibility of locking up the entire system.

Appendix G. Password jumper

If the configuration password is ever forgotten, the ServSwitch Console Plus 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 ServSwitch Console Plus 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 ServSwitch Console Plus 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 ServSwitch Console Plus switch.
9. Remove the jumper on JP31.
10. Re-install the top cover.
11. Turn the ServSwitch Console Plus on. The ServSwitch Console Plus 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 ServSwitch Console Plus switch is first turned on, checks the switch and provides the information shown on the screen.

```
Welcome to ServSwitch Console Plus

Power on diagnostics
   Kernel version    KX21U
   Overlay version   052B
   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   MK24
   Main program      Good
   PC keyboard detected
   PS2 mouse detected
                              ◆ BLACK BOX
                              (724) 746-5500
```

NOTE: Hardware type reporting will show the following:
KV101A - will report MP2X8E
KV102A - will report MP2X8E
KV103A - will report MP2X16E

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 ServSwitch Console Plus 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 ServSwitch Console Plus 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 ServSwitch Console Plus 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 unit 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 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 extending the video distance is usually due to the quality of the video source. 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. There are further capabilities, not listed here, that will send the higher resolution video longer distances. Please contact Black Box technical support for more details.

Resolution	Video distance capability						
@ 75Hz	5'	10'	20'	35'	50'	75'	100'
640x480	Z4 C4	Z4 C4	Z4 C4	Z3 C4	C4	C4	C4
800X600	Z4 C4	Z4 C4	Z4 C4	Z3 C4	C4	C4	C4
1024x768	Z4 C4	Z4 C4	Z4 C4	Z3 C4	C4	C4	C3
1280x1024	Z4 C4	Z3 C4	Z3 C4	Z3 C3	C3	C3	C2
1600x1200	Z3 C4	Z3 C3	Z2 C3	C3	C3	C2	C2

Z   Standard cabling
C   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

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 ServSwitch Console Plus 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 ServSwitch Console Plus 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