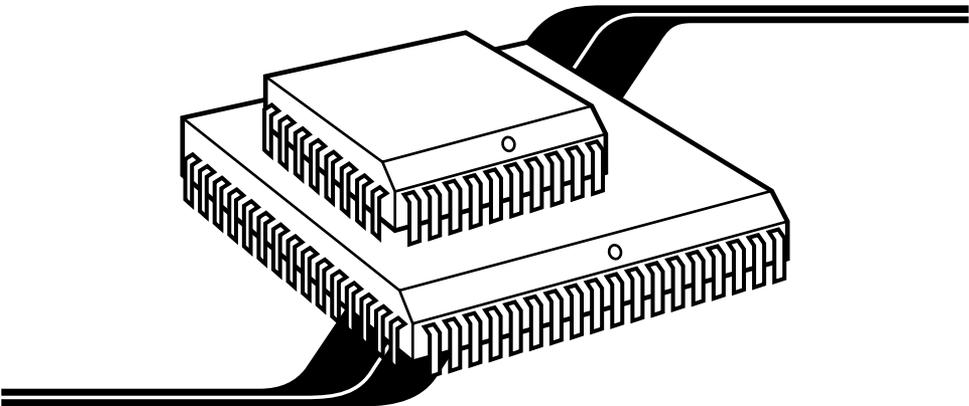




Serial Upgrade Kit for ServSwitch™ Affinity



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INFORMATION**

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FREE technical support 24 hours a day, 7 days a week: Call **724-746-5500** or fax **724-746-0746**
Mailing address: **Black Box Corporation**, 1000 Park Drive, Lawrence, PA 15055-1018
Web site: www.blackbox.com • E-mail: info@blackbox.com

Welcome to the ServSwitch™ Family!

Thank you for purchasing a BLACK BOX® ServSwitch™ Brand KVM-switch accessory! We appreciate your business, and we think you'll appreciate how your enhanced ServSwitch system 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!

*

This manual will tell you all about your Serial Upgrade Kit for ServSwitch™ Affinity, including how to install, operate, and troubleshoot it. For an introduction to the Serial Upgrade Kit, see **Chapter 2**. The Serial Upgrade Kit product code covered in this manual is:

KV130-UPG

FEDERAL COMMUNICATIONS COMMISSION AND INDUSTRY CANADA RADIO-FREQUENCY INTERFERENCE STATEMENTS

Class B Digital Device. This equipment has been tested and found to comply with the limits for a Class B computing device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or telephone reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an experienced radio/TV technician for help.

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

To meet FCC requirements, shielded cables are required to connect this device to other Class B certified devices.

This digital apparatus does not exceed the Class B limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de classe B prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

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 conectado 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 física 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 líneas de energía.
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 objetos líquidos 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: Objetos 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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1. Specifications

The Serial Upgrade Kit adds these characteristics to the ServSwitch™ Affinity:

Interface:	Serial: EIA/TIA RS-232 proprietarily pinned on DB25
Protocol:	RS-232: Asynchronous
Data Format:	RS-232: 8 data bits, no parity, 1 stop bit (fixed)
Data Rate:	RS-232: 50, 110, 300, 600, 1200, 2400, 4800, or 9600 bps (user-selectable)
Flow Control:	RS-232: Transparent to software flow control; doesn't support hardware flow control
Maximum Distance:	100 ft. (30.5 m) to any attached serial device

2. Introduction

The Serial Upgrade Kit for ServSwitch™ Affinity consists of a pair of replacement chips for the Port Cards with user ports (KV1301C) in an Affinity system. When combined with current versions of the Affinity firmware, these chips give the Affinity the ability to conduct communication sessions with serial equipment (PCs, routers, hubs, etc.) attached to their CPU ports. You'll need an Upgrade Kit for each KV1301C Port Card in your ServSwitch Affinity system.

NOTE

If you have -R3 version Matrix ServSwitches attached to your ServSwitch Affinity system, you won't be able to attach serial devices to the Matrix ServSwitches, but you will be able to access serial devices attached to Affinity-chassis CPU ports from user stations attached to the Matrix ServSwitches.

Here are some of the serial features your Affinity will have after you install the upgrade:

- VT100, VT101, VT102, and VT202 terminal emulation.
- Control RS-232 serial DTE or DCE terminal-interfaced devices.
- Easy to use—serial access and switching works the same way as KVM switching always has.
- Has an eight-page scroll buffer.

3. Installation

To install the chips of your Serial Upgrade Kit for ServSwitch™ Affinity on a KV1301C Affinity Port Card, take these steps:

CAUTION!

The Port Card and the Upgrade Kit's chips can be damaged by static electricity, so take every reasonable precaution against it. At the very least, touch a metallic surface before removing the Card and/or replacing its chips; if possible, stand on an anti-static mat and wear a grounding strap or anti-static gloves.

1. Check the current revision level of the OSD firmware installed on your Affinity system's Port Cards. If it's at least "O4.2," you'll be able to install this Serial Upgrade Kit at your site, but if it's an earlier revision, the Upgrade Kit's chips won't be compatible with the OSD daughtercard, and you'll need to call Black Box Technical Support. Without messing around with the Affinity's hardware at all, you can check the revision level in one of two ways:
 - (a) Cycle power to the Affinity and watch the monitor screen at one of the attached user stations (the OSD firmware revision will scroll by quickly); or
 - (b) Cycle power to the Affinity and watch the screen of a terminal or terminal emulator (running 9600,8,N,1) attached to one of its serial ports.You can also check the labels of the OSD chips themselves, as described in step 6.
2. Make sure the Port Card you want to upgrade is a KV1301C. (The KV1301Cs have DB25 female user ports labeled "KVM." The KV1300C Port Cards, which don't have user ports, don't need to be upgraded.)
3. Power off the Affinity chassis and disconnect all cables from the Port Card.
4. Unscrew and remove the screws on the far left and far right ends of the Port Card's front panel. Remove the Port Card from its slot in the chassis.

- Find the OSD daughterboard that rises above the top of the right-hand end of the Port Card, shown in Figure 3-1.

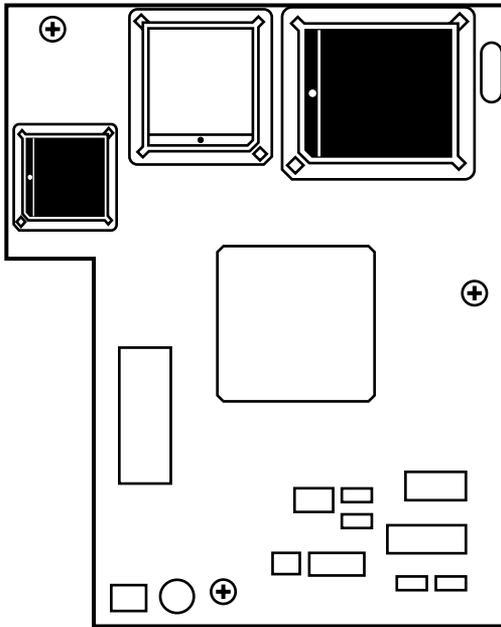


Figure 3-1. Top view of the Port Card's daughterboard, with the two chips you'll be replacing shown in black.

- Look at the two existing chips shown in black in the illustration of the daughterboard in Figure 3-1. The smaller one on the left will be labeled "Aa.b" and the large one on the right will be labeled starting with "Oc.d", where *a*, *b*, *c*, and *d* are revision numbers.

If the large right-hand chip is labeled with a revision earlier than O4.2, you won't be able to install the Upgrade Kit in the field. Please skip the remainder of this procedure and call Black Box Technical Support.

If the large right-hand chip is labeled with revision O4.2 or later, use a PLCC chip puller to carefully remove the two chips from the daughterboard.

- Use the chip puller to carefully replace the chips you removed in step 6 with the two chips from the Serial Upgrade Kit, lining up the DOT or pointer and the notched corners in order to orient the new chips in the same direction that the old chips were facing.

- Slide the Port Card back into its Affinity slot, as shown in Figure 3-2, and screw it in securely.

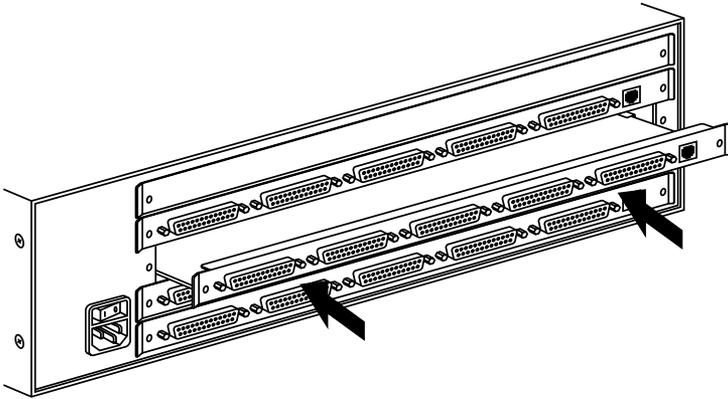


Figure 3-2. Returning the Port Card to its Affinity slot.

- Connect a user station (KVM console) to the Port Card's user port (but don't connect any computers to its CPU ports yet).
- Power up the Affinity chassis and reconnect any CPU cables you disconnected in step 3.
- Press left-[Ctrl] and [F12] to bring up the Affinity's on-screen display at the monitor of the user station attached to the Port Card. Make sure that the Affinity recognizes all of the CPU ports in your Affinity system (use keyboard commands to switch between the ports if necessary).

If any switching commands fail, make sure that the new chips are seated firmly on the daughterboard and that the Port Card is seated firmly in the slot. If they are, call Black Box Technical Support.

If there are no failures, the Affinity is ready to receive a firmware upgrade.

To perform the main-firmware upgrade that the new chips will require, you'll need to connect the Port Card to a PC, download the latest serial-supporting version of the Affinity's main firmware files from our Black Box Web site or FTP, and download the files from the PC to the Affinity. Follow the directions for doing these things in the "Using the Serial Port" chapter of your Affinity manual.

Once the new main firmware has been downloaded into the Affinity, its new serial features (described in **Chapter 4**) will become active.

4. Operation

4.1 Overview and Cabling

Once Serial Upgrade Kits and serial-supporting main firmware have been installed in your ServSwitch™ Affinity system, the new serial features will become active (without changing any of the Affinity's KVM-switching functions). These features allow you to use any attached keyboard/monitor/mouse user station to communicate with an RS-232 device such as a router, hub, or the serial port on a PC, UNIX®, or Sun® computer. Just connect the serial device to one of the CPU ports on the Affinity with a special serial cable (see below), configure that CPU port as a serial port with the desired data rate, and you can access the serial device as you would during any terminal-emulation session.

Here's how it works: The Affinity has always had serial communication chips present on each computer port, so it's no problem for the Affinity to transmit to and receive from serial devices. And the Affinity's OSD (on-screen display) is so powerful that it actually functions as a complete color terminal. The Serial Upgrade Kit modifies the OSD firmware to implement VT100/101/102/202 terminal emulation, scrolling, a hardware cursor, cursor controls, and other necessary elements to convert and format serial data to color VGA signals. In the other direction, the PS/2 or Sun keyboard signals are converted to serial data and transmitted back to the serial device.

Keep in mind that, at this time, the Affinity doesn't support hardware flow control, but is transparent to software flow control.

We offer four types of cables for connecting serial devices to the Affinity. (Note that, even though the Affinity's CPU ports are DB25 male connectors, they are not pinned the same way as the serial ports on a PC, printer, or modem even when they function as serial ports.) The cables are:

Product code	Device-end connector	Device type
EHN290	DB9 female	PC or compatible DTE
EHN291	DB25 female	PC, terminal, or compatible DTE
EHN292	DB9 male	Modem or compatible DCE
EHN293	DB25 male	Modem or compatible DCE

If you need some other type of cable or adapter to reach some other type of serial port or device—for example, the serial ports on some Cisco routers or the 8-pin DIN serial ports on legacy Sun computers—call Black Box Tech Support. We might be able to give you a quote.

4.2 Configuration

To configure a CPU port on an upgraded ServSwitch Affinity as a serial port, press left-[Ctrl] [F12] at the keyboard of a user station attached to your Affinity system. This will bring up the on-screen display. Press the down-arrow key to move the highlight to the “Configure computers” selection, then press [Enter]. The “Configure computer” page will appear. Use the up- and down-arrow keys to scroll to the port you want, then press the right-arrow key once to reach the “Keyboard” column and press [Enter]. The keyboard-type menu will pop up; it will include serial choices with a variety of data rates, as shown in Figure 4-1. (At the time of this writing, the other serial parameters are fixed as 8 data bits, no parity, and 1 stop bit.) Use the down-arrow key to move the highlight bar to the data rate you want, then press [Enter]. In the example shown in Figure 4-1, the “Computer 1” port has already been set to be a 9600-bps serial port, and the “Computer 2” port is about to be.

Configure computer

Computer	Name	Keyboard	Mouse	
1	Computer	1	Serial	9600,N,8,1
2	Computer	2	PC2	PC1
3	Computer	3	PC2	PC2
4	Computer	4	PC2	PC3
5	Computer	5	PC2	USB-PC
6	Computer	6	PC2	USB-Sun
7	Computer	7	PC2	Serial 9600,N,8,1
8	Computer	8	PC2	Serial 4800,N,8,1
9	Computer	9	PC2	Serial 2400,N,8,1
10	Computer	10	PC2	Serial 1200,N,8,1
11	Computer	11	PC2	Serial 600,N,8,1
12	Computer	12	PC2	Serial 300,N,8,1
13	Computer	13	PC2	Serial 110,N,8,1
14	Computer	14	PC2	Serial 50,N,8,1
15	Computer	15	PC2	
16	Computer	16	PC2	

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

Figure 4-1. Selections at the “Configure Computer” page after the upgrade.

4.3 The Terminal Display and Scroll Buffer

With the Serial Upgrade Kit, the ServSwitch Affinity implements industry-standard VT100 terminal emulation. You can also use it in standard TTY mode and it will automatically scroll incoming data. Figure 4-2 shows a typical screen from a UNIX computer. The serial data from the computer is shown in the standard 24 x 80 area. Below the data are two status lines. The first line shows the current user-station name (“NOC station 12”), user name (“Martin”), connect mode (“Share mode”), and computer name (“Unix NCC”) that are currently in use. These fields all reflect the Affinity’s current state.

The Affinity also implements an eight-page scroll buffer. View up to eight pages of previous data using the page-up [PgUp] and page-down [PgDn] keys as shown in the second status line. Use the [F12] key to clear the screen. The number of the page to which you’ve scrolled is shown at the right of the second status line. The two colors on the screen correspond to the background and text colors that you can set in the Affinity’s “Configure System” page (see the “Configuring the System” section in your Affinity manual).

```

-r-sr-xr-x  2 uucp    uucp      31258 Aug 14 2001 uusnap
-r-sr-xr-x  2 uucp    uucp      31258 Aug 14 2001 uustat
-r-xr-xr-x  1 uucp    uucp       1759 Feb 09 2001 uuto
-r-sr-xr-x  1 uucp    uucp      50678 Aug 14 2001 uux
-r-xr-xr-x  1 bin     bin        8868 Apr 09 2001 vacation
-r-xr-xr-x  5 bin     bin       224806 Jun 07 2002 vedit
-r-xr-xr-x  5 bin     bin       224806 Jun 07 2002 vi
-r-xr-xr-x  5 bin     bin       224806 Jun 07 2002 view
-r-xr-sr-x  2 root    system    14830 Jun 07 2002 w
-r-xr-xr-x  15 bin    bin       1042 Jun 07 2002 wait
-r-xr-xr-x  1 bin    bin       5050 Jun 07 2002 wc
-r-xr-xr-x  1 bin    bin       3372 Jun 07 2002 what
-r-xr-xr-x  3 bin    bin      96640 Jun 07 2002 whatis
-r-xr-xr-x  1 bin    bin       6840 Jun 07 2002 whereis
-r-xr-xr-x  1 bin    bin        963 Jun 07 2002 which
-r-xr-xr-x  1 bin    bin      10912 Jun 07 2002 who
-r-xr-xr-x  1 bin    bin       1598 Jun 07 2002 whoami
-r-xr-xr-x  1 bin    bin      18624 Jun 07 2002 write
-r-xr-xr-x  1 bin    bin      10694 Jun 07 2002 xargs
-r-xr-xr-x  1 bin    bin      12732 Apr 09 2001 xget
-r-xr-xr-x  1 bin    bin      12272 Apr 09 2001 xsend
-r-xr-xr-x  1 bin    bin       1334 Jun 07 2002 yes
-r-xr-xr-x  3 bin    bin      14552 Jun 07 2002 zcat
# _
Affinity terminal •NOC station 12 •Martin •Share Mode •Unix NCC
Page = Scroll •F12 = Clear screen •Page 0

```

Figure 4-2. Screen shot of an Affinity terminal session with a UNIX computer.

At times you might see a rapidly changing screen when you switch to a serial port. This is because the first time you connect to a serial port with no data in the buffer, you will get a blank screen with the cursor in the upper left-hand corner. As you interact with the computer, the screen fills up with data. This data is stored in the Affinity in a separate buffer for each computer port. When you disconnect and later reconnect to this serial port, the data that is in the buffer is sent to the user station. So you might see a replay of old buffer data as it is loaded from the buffer to the user station.

5. Troubleshooting

5.1 Calling Black Box

If you determine that your ServSwitch Affinity, its Port Card, or its Upgrade-Kit chips are malfunctioning, *do not attempt to alter or repair them*. They contain no user-serviceable parts. Contact Black Box Technical Support at 724-746-5500.

Before you do, make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description, including:

- the nature and duration of the problem;
- when the problem occurs;
- the components involved in the problem;
- any particular application that, when used, appears to create the problem or make it worse; and
- the results of any testing you've already done.

5.2 Shipping and Packaging

If you need to transport or ship your ServSwitch Affinity, Port Card, or the Upgrade-Kit chips:

- Package it carefully. We recommend that you use the original container.
- If you are shipping the Affinity for repair, make sure you include its power cord, all of the Cards installed in it, and the CPU Cables, User Cables, and Expansion Cables you're using with it. Before you ship, contact Black Box to get a Return Authorization (RA) number.



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