

# ADVANCED 4/8-PORT SECURE KM SWITCH

USM-2S0-MM8

REV: 3.0A

05/19/2022



## MODELS:

- KVS4-1004KX                      4-Port Secure Pro KM w/audio and CAC, PP 4.0
- KVS4-1008KX                      8-Port Secure Pro KM w/audio and CAC, PP 4.0

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**TECHNICAL SPECIFICATIONS**

<b>USB</b>	
Signal Type	USB 1.1 and 1.0 Keyboard and Mouse only. USB 2.0 for CAC connection (Only in models with CAC)
CPU Interface	KVS4-1004KX: (8) USB Type B
	KVS4-1008KX: (16) USB Type B
User Console Interface	(2) USB Type-A for keyboard and mouse connection only
	(1) USB Type-A for CAC connection (only in models with CAC)
<b>AUDIO</b>	
Input	(4)/(8) Connector Stereo 3.5mm Female
Output	(1) Connector Stereo 3.5mm Female
<b>POWER</b>	
Power Requirements	12V DC, 3A (minimum) power adapter with center-pin positive polarity.
<b>ENVIRONMENT</b>	
Operating Temp	32° to 104° F (0° to 40° C)
Storage Temp	-4° to 140° F (-20° to 60° C)
Humidity	0-80% RH, non-condensing
Altitude	0 to 10,000 ft. (0 to 3048 m)
<b>CERTIFICATIONS</b>	
Security Accreditation	Common Criteria Validated To NIAP, Protection Profile PSS Ver. 4.0
<b>OTHER</b>	
Emulation	Keyboard and Mouse
Control	Front Push Buttons, Mouse (hotkeys supported)

**WHAT'S IN THE BOX?**

Secure KM Switch Unit	4/8-port Secure KM Switch
Power Supply	Desktop power supply 100-240V, 12VDC 3A

**SECURITY FEATURES**

**ANTI-TAMPER SWITCHES**

Each model is equipped with internal Anti-Tamper switches, which sense attempts to open the device enclosure. Once the system identifies such an attempt, all the front panel LEDs will flash rapidly and the unit will become useless by shutting off connection with all attached PCs and peripherals disabling any functionality.

**TAMPER-EVIDENT SEAL**

The enclosure of the unit is protected with a tamper-evident seal to provide a visual evidence if the unit has been opened.

**PROTECTED FIRMWARE**

The controller of the unit has a special protection feature that prevents reprogramming or reading the firmware.

**HIGH ISOLATION ON USB CHANNELS**

Opto-isolators are used in the unit to keep USB data paths electrically isolated from each other, providing high isolation and preventing data leakage between ports.

**SELF-TEST**

A self-test is performed each times the KM is powered on as part of its boot-up sequence. If the KM starts up correctly and is functional, the self-test has passed. However, if all Front Panel LEDs are on and not flashing, the power up self-test has failed and all functions are disabled. Check if any of the front panel port selection buttons are jammed. In this case, release the jammed button and recycle the power.



Figure 1-1: KVS4-1004KX Front panel



Figure 1-2: KVS4-1004KX Rear panel

INSTALLATION

SYSTEM REQUIREMENTS

1. Black Box Secure KM is compatible with standard personal/portable computers, servers or thin-clients, running operating systems such as Windows® or Linux.
2. The peripheral devices that are supported by the Secure KM Switch are listed in the following table:

Console Port	Authorized Devices
Keyboard	Wired keyboard and keypad without internal USB hub or composite device functions, unless the connected device has at least one endpoint which is a keyboard or mouse HID class.
Audio out	Analog amplified speakers, Analog headphones.
Mouse / Pointing Device	Any wired mouse or trackball without internal USB hub or composite device functions.
User Authentication Device	USB devices identified as user authentication (base class 0Bh, e.g. Smart-card reader, PIV/CAC reader, Token, or Biometric reader)

Table 1-1

CONNECTING THE SECURE KM SWITCH

1. Ensure that power is turned off or disconnected from the unit and the computers.
2. Use a USB cable (Type-A to Type-B) to connect a USB port on each computer to the respective USB ports of the unit.
3. Optionally connect a stereo audio cable (3.5mm to 3.5mm) to connect the audio output of the computers to the AUDIO IN ports of the unit.
4. Connect a USB keyboard and mouse in the two USB console ports.
5. Optionally connect stereo speakers to the AUDIO OUT port of the unit.
6. For models with CAC, optionally connect CAC (COMMON ACCESS CARD, SMART CARD READER) to the CAC port in the user console interface.
7. Power on the Secure KM Switch by connecting a 12VDC power supply to the power connector, and then turn on all the computers.

**Note:** The computer connected to port 1 will always be selected by default after power up.

**Note:** You can connect up to 4 computers to the 4-port Secure KM Switch and up to 8 computers to the 8-port Secure KM Switch.

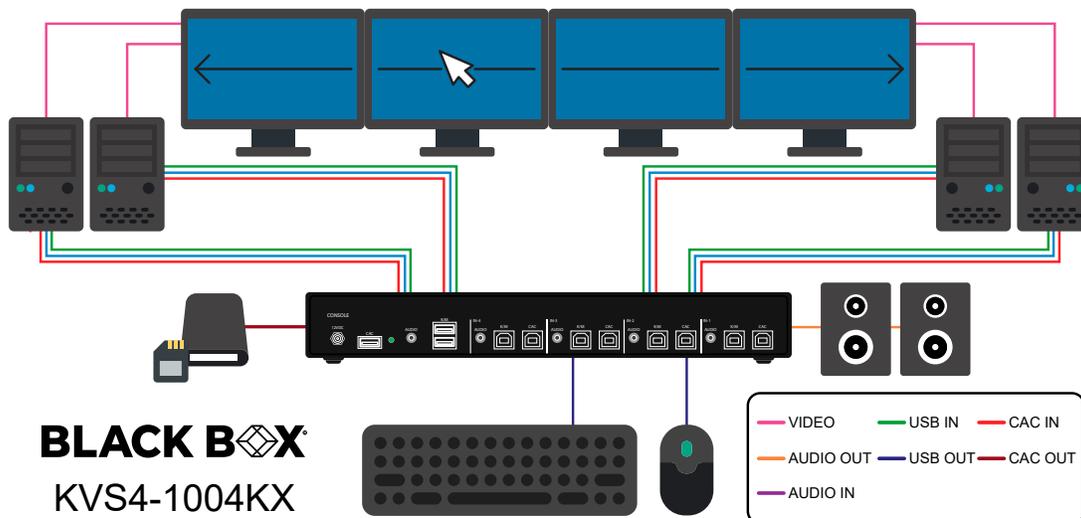


Figure 1-3: KVS4-1004KX

## INSTALLATION (Continued)

### IMPORTANT WARNINGS - FOR SECURITY REASONS:

- This product does not support wireless devices. Do not attempt to use a wireless keyboard or a wireless mouse with this product.
- This product does not support keyboards with integrated USB hubs or USB ports. Only use standard (HID) USB keyboards with this device.
- This product does not support microphone audio input or line input. Do not connect any microphones or headsets with microphones to this device.
- Connection of authentication devices (CAC) with external power sources is prohibited.

**INITIAL SETUP**

After connecting all devices to the Secure KM Switch, a display topology configurations and display mode must be chosen. By default, Secure KM Switch is configured to a topology with 4 screens arranged horizontally starting with port 1 on the most left-hand side.

The installation setup must match one of KM switches' predefined display topology configurations. This can be selected through keyboard hotkey commands. Please refer to the "Display Topology Configuration" for the available display topologies.

**SCROLL WHEEL KM SWITCHING**

Cursor control of selected channels allows switching between computers through the use of simple mouse clicks and gestures. No device driver is required. To switch the active computer, simply press the middle mouse button (scroll wheel button) twice and then 'swipe' in a given direction to change the channel. An audible signal will sound when the selected computer has changed. By default, swiping left will cycle the channel down and swiping right will cycle the channel up.

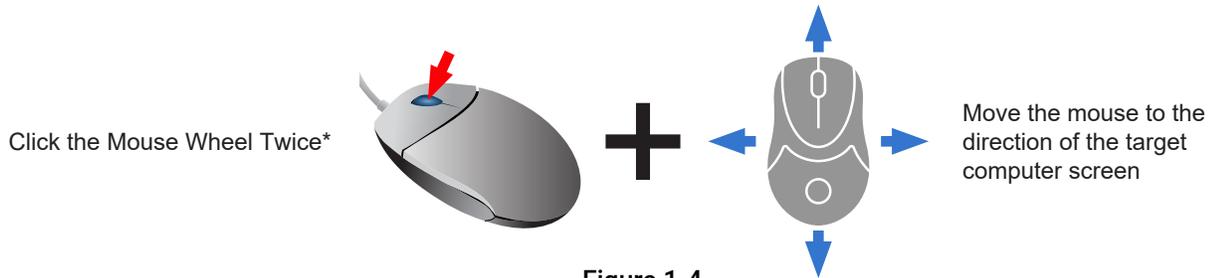


Figure 1-4

\* There is a 2-second timeout for the Scroll-Wheel clicking.

**Note:** In accordance with the KVS4-1004/8KX's CC evaluated configuration, only the default display topology configuration is what should be used. The default display topology for the 4 and 8-Port models are shown in Figure 1-5 in which the channels are arranged from left to right with the first channel in the left-most position and none of the ports are inactive. The hotkeys outlined below to change the topology are not part of the unit's evaluated configuration and should not be used.

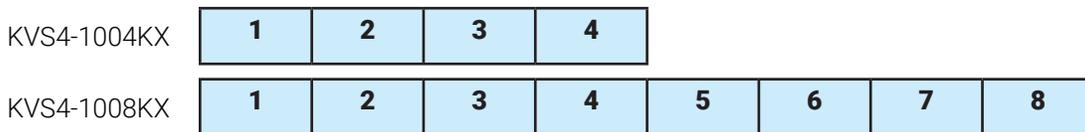


Figure 1-5

**HOTKEY COMMANDS**

The Hotkey command is a keyboard sequence used to trigger an action on the Secure KM Switch through the use of the keyboard connected on the USB port of the Secure KM Switch. To activate the hotkey sequence, press the Left or Right CTRL key twice and then enter the desired hotkey commands.

**Note:** All commands can use upper and/or lower case characters.

COMMANDS	HOTKEYS
Display Topology (multiple rows)	CTRL + CTRL + H(1-4), (1-8) for KM-8P
Limit Input Ports (one row only)	CTRL + CTRL + W(1-4), (1-8) for KM-8P
Cursor Rolling (in single row mode only)	CTRL + CTRL + O(0-OFF) or (1-ON)

Table 1-2

**Note:** Display Topology specifies the number of horizontal columns. The number of vertical rows is calculated in the software by 4/n columns.

**Note:** The Cursor Rolling feature allows the cursor to loop back to the first input after moving past the last input.

## DISPLAY TOPOLOGY CONFIGURATION

The Secure KM Switch has a configurable display topology configuration that can be easily activated through keyboard hotkeys. No software or drivers are required to configure the display topology.

**Note:** Hotkey **CTRL + CTRL** command allows for multiple rows.

(1) Hotkey Command: "**CTRL + CTRL + H + 4**"

1	2	3	4
---	---	---	---

Each of the cells shown represents a display or multiple displays from a computer.

(2) Hotkey Command: "**CTRL + CTRL + H + 2**"

1	2
3	4

(3) Hotkey Command: "**CTRL + CTRL + H + 3**"

1	2	3
---	---	---

(4) Hotkey Command: "**CTRL + CTRL + H + 1**"

1
2
3
4

## LIMIT INPUT PORTS CONFIGURATION

Hotkey Commands: **CTRL + CTRL + W + (X)** commands (**allows one row only**):

**CTRL + CTRL + W + 4**

1	2	3	4
---	---	---	---

**CTRL + CTRL + W + 3**

1	2	3
---	---	---

**Note:** Port 4 N/A

**CTRL + CTRL + W + 2**

1	2
---	---

**Note:** Ports 3, 4 N/A

**CTRL + CTRL + W + 1**

1
---

**Note:** Port 2-4 N/A

**Note:** Limit Input Ports commands reset Display Topology configuration.

## DISPLAY TOPOLOGY CONFIGURATION (8-Port)

The 8-Port Secure KM Switch has a configurable display topology configuration that can be easily activated through keyboard hotkeys. No software or drivers are required to configure the display topology.

**Note:** Hotkey **CTRL + CTRL + H + (X)** command allows for multiple rows.

(1) Hotkey Command: "**CTRL + CTRL + H + 4**"

1	2	3	4
5	6	7	8

Each of the cells shown represents a display or multiple displays from a computer.

**Note:** Cursor control of selected channels can only be used in Single-Head display mode.

(2) Hotkey Command: "**CTRL + CTRL + H + 3**"

1	2	3
4	5	6

- Multi-Head display mode switching must be used if any of the eight computers have multiple displays.

(3) Hotkey Command: "**CTRL + CTRL + H + 2**"

1	2
3	4
5	6
7	8

(4) Hotkey Command: "**CTRL + CTRL + H + 1**"

1
2
3
4
5
6
7
8

**LIMIT INPUT PORTS CONFIGURATION (8-Port)**

Hotkey Commands: **CTRL + CTRL + W + (X)** commands (**allows one row only**):

CTRL + CTRL + W + 8 <CR>

1	2	3	4	5	6	7	8
---	---	---	---	---	---	---	---

CTRL + CTRL + W + 7 <CR>

1	2	3	4	5	6	7
---	---	---	---	---	---	---

**Note:** Port 8 N/A

CTRL + CTRL + W + 6 <CR>

1	2	3	4	5	6
---	---	---	---	---	---

**Note:** Ports 7, 8 N/A

CTRL + CTRL + W + 5 <CR>

1	2	3	4	5
---	---	---	---	---

**Note:** Port 6-8 N/A

CTRL + CTRL + W + 4 <CR>

1	2	3	4
---	---	---	---

**Note:** Port 5-8 N/A

CTRL + CTRL + W + 3 <CR>

1	2	3
---	---	---

**Note:** Port 4-8 N/A

CTRL + CTRL + W + 2 <CR>

1	2
---	---

**Note:** Ports 3-8 N/A

CTRL + CTRL + W + 1 <CR>

1
---

**Note:** Port 2-8 N/A

**Note:** Limit Input Ports commands reset Display Topology configuration.

## CAC (COMMON ACCESS CARD, SMART CARD READER) INSTALLATION

### INSTALLATION

The following steps are intended for the system administrator or IT manager only.

If you have the optional CAC ports there will be 4 ports on a 4-host-port Secure KM Switch and 8 ports on a 8-host-port Secure KM Switch. CAC connection to the computer requires a USB cable connection separate from the keyboard and mouse. This allows the CAC to be connected independently from the keyboard and mouse. It also allows the user to select whether CAC for a certain computer is supported or not.

1. Ensure that power is turned off or disconnected from the unit and the computer.
2. Use a USB cable (Type-A to Type-B) to connect a USB port on a computer to its respective CAC USB ports on the Secure KM Switch. Do not connect the USB cable if CAC functionality is not needed for that computer.
3. Connect a CAC (smart card reader) to the CAC port in the user console interface.
4. Power on the Secure KM Switch by connecting a 12VDC power supply to the power connector, and then turn on all the computers.
5. To disable CAC for any channel (all CAC ports are enabled as default), use the front panel buttons to switch the Secure KM Switch to the channel whose CAC mode you wish to change. Once the channel is selected, the button LED for this specific channel should be on (CAC port enabled). Press and hold the button for 3 seconds until the button LED turns off. The CAC port is now disabled for this channel.
6. To enable CAC for any channel, use the front panel buttons to switch the Secure KM Switch to the channel whose CAC mode you wish to change. Once the channel is selected, the button LED for this specific channel should be off (CAC port disabled). Press and hold the button for 3 seconds until the button LED turns on. The CAC port is now enabled for this channel. An active session on a computer is terminated upon removal of the CAC device

**Note:** The open session will be immediately terminated upon the removal of the registered CAC device.

### CAC PORT CONFIGURATION

The following steps are intended for the system administrator and operators (users).

**Note:** Only one computer connected to port 1 is required for this operation.

CAC port Configuration is an optional feature, allowing registration of any USB peripheral to operate with the Secure KM Switch. Only one peripheral can be registered and only the registered peripheral will operate with the Secure KM Switch. By default, when no peripheral is registered, the Secure KM Switch will operate with any Smart Card Reader.

#### Configure the CAC Port via User Menu Options

1. Open the Administration and Security Management Program.
2. Using the keyboard, press the Alt key twice and type "cnfg".
3. At this stage the mouse connected to the Secure KM Switch will stop functioning.
4. Enter the default username "user" and press Enter.
5. Enter the default password "12345" and press Enter.
6. Select "Register New CAC Device" from the menu on your and press Enter.
7. Connect the peripheral device to be registered to the CAC USB port in the console side of the Secure KM Switch and wait until the Secure KM Switch is reading the new peripheral information.
8. The Secure KM Switch will list the information of the connected peripheral on the screen and buzz 3 times when registration is completed.

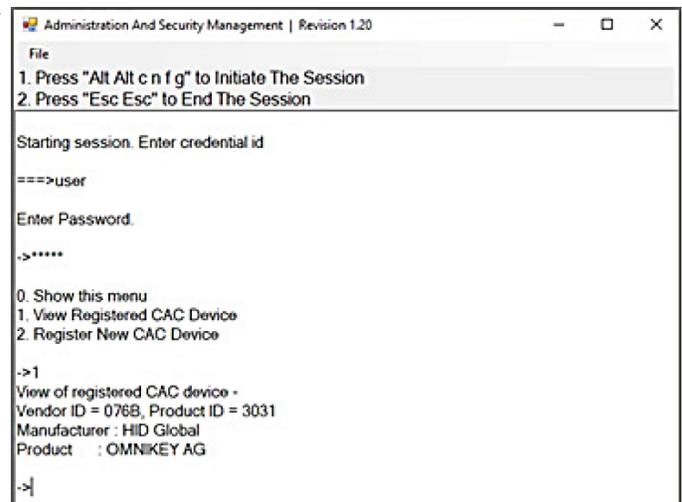


Figure 1-6

## AUDITING: Dumping the Event Log via User Menu Options

The following steps are intended for the system administrator.

**Note:** Only one computer connected to port 1 is required for this operation.

The Event Log is a detailed report of critical activities stored in the Secure KM Switch or Secure KM Switch memory. A comprehensive feature list and guidance for Administration and Security Management Tools can be found in the Administrator’s Guide available for download from: <https://www.blackbox.com/NIAP4/documentation>

1. Open the Administration and Security Management Program.
2. Using the keyboard, press the **Alt** key twice and type “**cnfg**”.
3. Enter the default admin name “**admin**” and press **Enter**.
4. Enter the default password “**12345**” and press **Enter**.
5. Request a Log Dump by selecting “Dump Log” from the menu and press **Enter**.  
(Shown in Figure 1-7.)

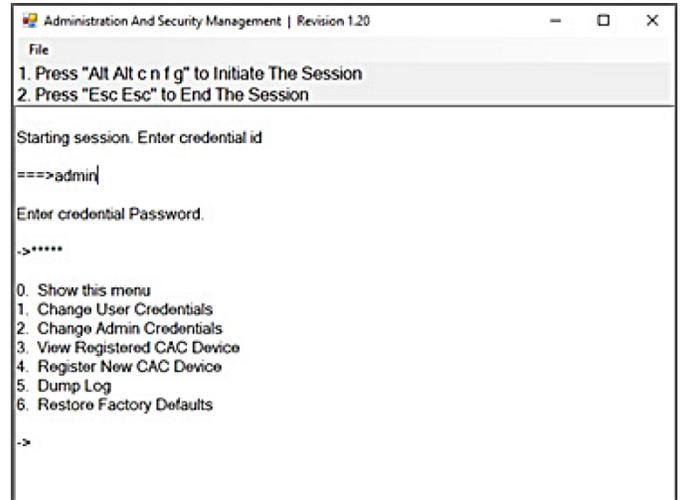


Figure 1-7

\* See Administration and Security Management Tool Guidance for detailed information.

## RESET: Restore Factory Defaults

The following steps are intended for the system administrator.

**Note:** Only one computer connected to port 1 is required for this operation.

Restore Factory Defaults will reset all settings on the Secure KM Switch to their original state.

Secure KM Switch mode.

CAC port registration will be removed.

Secure KM Switch settings will be reset to factory defaults.

To Restore Factory Defaults via User Menu Options:

1. Open the Administration and Security Management Program.
2. Using the keyboard, press the **Alt** key twice and type “**cnfg**”.
3. Enter the default admin name “**admin**” and press **Enter**.
4. Enter the default password “**12345**” and press **Enter**.
5. Select “Restore Factory Defaults” from the menu on your screen and press **Enter**.  
(Menu shown in Figure 1-7)

\* See Administration and Security Management Tool Guidance for detailed information.

**LED's BEHAVIOR**

User Console Interface – CAC LED:

#	Status	Description
1	Off	CAC is not connected
2	On	Authorized and functional CAC is connected
3	Flashing	Non-CAC peripheral is connected

Front Panel – Port Selection LEDs:

#	Status	Description
1	Off	Non-selected port
2	On	Selected port

Front Panel – CAC Selection LEDs:

#	Status	Description
1	Off	CAC port is disabled or non-selected port
2	On	CAC port is enabled

Front Panel - Port and CAC Selection LEDs:

#	Status	Description
1	All Flashing	Connected peripheral to keyboard or mouse console ports is rejected. See Table 5-1 for list of authorized devices.

**IMPORTANT!**

If all the Front Panel LEDs are flashing and the buzzer is beeping, the Secure KM Switch has been TAMPERED with and all functions are permanently disabled. Please contact Black Box technical support at [info@blackbox.com](mailto:info@blackbox.com)

If all Front Panel LEDs are on and not flashing, the POWER UP SELF TEST has failed and all functions are disabled. Check if any of the front panel port selection buttons are jammed. In this case, release the jammed button and recycle the power. If power up self test is still failing, please contact Black Box technical support at [info@blackbox.com](mailto:info@blackbox.com)

**SYSTEM OPERATION**

**SCROLL WHEEL KM SWITCHING**

Cursor control of selected channels allows switching between computers through the use of simple mouse clicks and gestures. No device driver is required. To switch the active computer, simply press the middle mouse button (scroll wheel button) twice and then 'swipe' in a given direction to change the channel. An audible signal will sound when the selected computer has changed. By default, swiping left will cycle the channel down and swiping right will cycle the channel up.

**FRONT PANEL CONTROL**

To switch to an input port, simply push the desired input button on the front-panel of the Secure KM Switch. If an input port is selected, the LED of that port will turn on. An open session is terminated upon switching to a different computer.

## TROUBLESHOOTING

### No Power

- Make sure that the power adapter is securely connected to the power connector of the unit.
- Check the output voltage of the power supply and make sure that the voltage value is around 12VDC.
- Replace the power supply.

### Flashing LEDs in the Front Panel with clicking sound

- Reboot the unit. If the error persists then there is a malfunction or wrong input connections at the K/M ports.
- Verify both Keyboard and Mouse connections are USB 1.0 or 1.1.
- Only USB Keyboard or Mouse can be connected in the designated K/M ports.

### Flashing USB LED

- Make sure that the correct peripheral device is connected to the correct port of the Secure KM.
- Check to see that the K/M USB cable is connected to the K/M port on the back of the unit.
- Check to see that the CAC USB cable is connected to the CAC port on the back of the unit.
- If all the Front Panel LED's are flashing and the buzzer is beeping, the Secure KM Switch has been TAMPERED with and all functions are permanently disabled. Please contact Black Box technical support at [info@blackbox.com](mailto:info@blackbox.com)

### Keyboard is not working

- Check if the keyboard is properly connected to the unit.
- Check if the USB cables connecting the unit and the computers are properly connected.
- Try connecting the USB on the computer to a different port.
- Make sure that the keyboard works when directly connected to the computer.
- Replace the keyboard.

**Note:** The NUM, CAPS, and SCROLL Lock LED indicators on the keyboard are not supposed to light up if connected to the Secure KM Switch.

### Mouse is not working

- Check if the mouse is properly connected to the unit.
- Try connecting the USB on the computer to a different port.
- Make sure that the mouse works when directly connected to the computer.
- Replace the mouse.

### No Audio

- Check if all the audio cables are connected properly.
- Connect the speakers directly to the computer to verify that the speakers and the computer audio are functioning properly.
- Check the audio settings of the computer and verify that the audio output is through the speakers.

### No CAC (COMMON ACCESS CARD, SMART CARD READER)

- Check if the USB cables connecting the unit and the computers are properly connected.
- Make sure the CAC port is enabled by holding down the desired channels button until it lights up.

## TECHNICAL SUPPORT

For product inquiries, warranty questions, or technical questions, please contact [info@blackbox.com](mailto:info@blackbox.com).  
FREE technical support 24 hours a day, 7 days a week: Call 877-877-2269 or fax 724-746-0746.

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