

Multi-Format Video Scaler with Extension - 5-Port

User Manual

Scale and switch five video and six audio inputs to HDMI and HDBaseT outputs up to 230 feet (70 meters).



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Information**

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This equipment generates, uses, and can radiate radio-frequency energy, and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

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

This digital apparatus does not exceed the Class A 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 la classe A 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.

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 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 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.

Safety Precautions

Safety Precautions

For best results, read all instructions carefully before using the transmitter. Save this manual for further reference.

- Unpack the equipment carefully and save the original box and packing material for possible future shipment.
- Follow basic safety precautions to reduce the risk of fire, electrical shock, and injury to persons.
- Do not dismantle the housing or modify the module. This may cause electrical shock or burn.
- Using supplies or parts that do not meet the products' specifications may cause damage, deterioration, or malfunction.
- Refer all servicing to qualified service personnel.
- To prevent a fire or shock hazard, do not expose the unit to rain, moisture, or install this product near water.
- Do not put any heavy items on the extension cable.
- Do not open or remove the housing of the device. This might expose you to dangerous voltage or other hazards.
- Install the device in a place with proper ventilation to avoid damage caused by overheating.
- Keep the module away from liquids.
- Spillage into the housing may cause fire, electrical shock, or equipment damage. If an object or liquid falls or spills on to the housing, unplug the module immediately.
- Do not twist or pull the ends of the optical cable. This can cause the device to malfunction.
- Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.
- Unplug the power cord when the device is unused for a long period of time.
- Disposal information: do not burn or mix the device with general household waste, treat it as electrical waste.

NOTES:

1. *PoC is short for Power over Cable.*
2. *The Video Extender - 4K HDMI, IR, RS-232 Receiver (AVS-HDB-RX) is the only receiver that works with the AVSC-5DA1-HDB.*
3. *The item "far-end" means the device (e.g. display device, third-party RS-232 device etc.) connected to the AVS-HDB-RX.*

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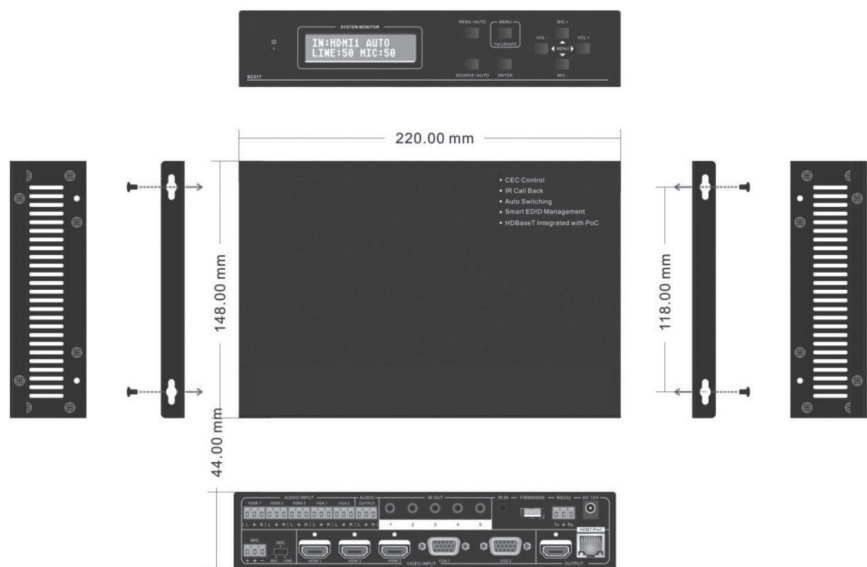
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1. Specifications

Video Input	
Video Input Connectors	(3) HDMI female, (2) VGA (15-pin) female
Video Input Signal	HDMI, YPbPr, C-video, VGA
Video Output	
Video Output Connectors	(1) HDMI female, (1) RJ-45 HDBaseT
Video Output Signal	(1) HDMI, (1) HDBaseT
IR Input	
Input	(1) IR IN
IR Input Connector	(1) 3.5-mm jack
IR Output	
Output	(5) IR out
IR Output Connector	(5) 3.5-mm jacks
Video General	
Resolution	1920 x 1200, 1920 x 1080, 1600 x 1200, 1360 x 768, 1280 x 800, 1280 x 720, 1024 x 768
Bandwidth	HDMI: 4.95 Gbps (1.65 Gbps per color); C-Video:150 MHz; YPbPr: 170 MHz; VGA: 375 MHz
Maximum Pixel Clock	165 MHz
Gain	0 dB
Video Impedance	75 ohms
Input/Output Level	0.5 V to 2.0 Vp-p
HDCP	Compliant with DVI and HDMI 1.3 standards
Audio Input	
Audio Input	(3) Dual-mono stereo audio for HDMI; (2) Dual-mono stereo audio for VGA (Support C-VIDEO, YPbPr, VGA)
Audio Input Connector	3P captive (3.81-mm)
Input Impedance	>10 k-ohms

Audio Output	
Audio Output	(1) stereo
Audio Output Connector	3P captive (3.81-mm)
Output Impedance	70 ohms
Audio General	
Frequency Response	20 Hz to 20 kHz
Stereo Channel Separation	>80 dB @1kHz
Distance	Up to 230 ft. (70 m)
User Controls	IR remote, buttons, and RS-232
Pin Configuration	2 = TX, 3 = RX, 5 = GND
Environmental	
Temperature (Operating)	-14 to +104° F (-10 to +40° C)
Humidity	10 to 90%
Power	
Power Supply	12 VDC $\pm$ 0.5V
Consumption	8 W, supply power to AVSC-5DA1-HDB and AVS-HDB-RX separately, 16 W, AVSC-5DA1-HDB supplies power to AVS-HDB-RX
Mechanical	
Dimensions	1.7"H x 8.7"W x 5.8"D (4.4 x 22 x 14.8 cm)
Weight	1.43 lb. (0.65 kg)

Dimensional Diagram



2. Overview

2.1 Introduction

The Multi-Format Video Scaler with Extension - 5-Port (AVSC-5DA1-HDB) is a compact mini scaler switcher with 5 video inputs (3 HDMI, 2 VGA) and 6 audio inputs (3 HDMI audio and 2 VGA audio: switched following the video; 1 MIC audio input). The VGA input supports VGA, YPbPr, and C-video, so the scaler switcher works with multiple video signals.

The AVSC-5DA1-HDB scales and switches any video signal to HDMI output and HDBaseT output (supports PoC and connects to a Video Extender - 4K HDMI, IR, RS-232 Receiver [AVS-HDB-RX]), up to a maximum transmission distance of 230 feet (70 meters).

With (1) IR IN, (5) IR OUT, and (1) RS-232, the IR and RS-232 signals can be transmitted bi-directionally between the AVSC-5DA1-HDB and the AVS-HDB-RX.

2.2 Features

- Complies with HDCP.
- Supports CEC, with commands to enable/disable this function.
- Supports video source auto-switching.
- Controlled via front-panel buttons, bi-directional IR, and RS-232.
- Supports various output resolutions, including 1920 x 1200, 1920 x 1080, 1600 x 1200, 1360 x 768, 1280 x 800, 1280 x 720, 1024 x 768.
- VGA video supports C-video, YPbPr, and VGA.
- Supports online software upgrading.
- Uses 48-V phantom power for a condenser microphone.
- MIC port supports balance/unbalance signal to suppress external noise.
- 3-level MIC input, supports a condenser microphone, a dynamic microphone, or a wireless microphone.
- Powerful OSD function.

2.3 What's Included

Your package should contain the following items. If anything is missing or damaged, contact Black Box Technical Support at 724-746-5500 or info@blackbox.com.

- (1) Multi-Format Video Scaler with Extension - 5-Port (AVSC-5DA1-HDB)
- (1) Video Extender —4K HDMI, IR, RS-232 Receiver (AVS-HDB-RX)
- (2) Mounting ears (for AVSC-5DA1-HDB)
- (2) Mounting ears (for AVS-HDB-RX)
- (5) Screws (black)
- (7) Captive screw connectors
- (1) IR receiver (with carrier wave)
- (1) IR emitter
- (2) VGA to YPbPr cables
- (2) RS-232 cables
- (8) Plastic cushions
- (1) IR remote (Cell battery is not included)
- (1) Power Adapter (12 VDC)
- (1) user manual

To download this user manual from our Web site:

1. Go to www.blackbox.com
2. Enter the part number (AVSC-5DA1-HDB) in the search box:
3. Click on the “Resources” tab on the product page, and select the document you wish to download.

If you have any trouble accessing the Black Box site to download the manual, you can contact our Technical Support at 724-746-5500 or info@blackbox.com.

2.4 Hardware Description

Figures 2-1 and 2-2 show the front and back panels of the scaler. Tables 2-1 and 2-2 describe the scaler's components.

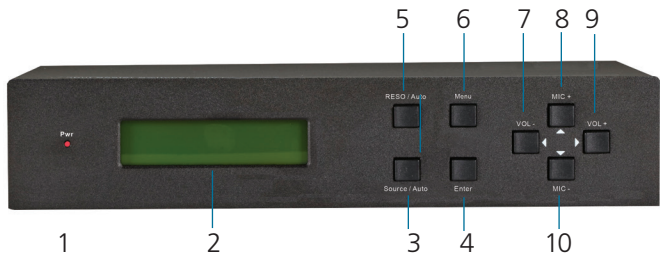


Table 2-1. Front-panel components.

Number in Figure 2-1	Component	Description
1	Power indicator	Lights red when power is on, turns green in standby mode.
2	LCD screen	Shows real-time system working status.
3	SOURCE/ AUTO	- Used as a video source selection button, press to select one source, press again to select next source, switching sequentially between HDMI1, HDMI2, HDMI3, VGA1, and VGA2. The LCD screen will show the name of the selected source. - Used as a switching mode selection button, press and hold for 7 seconds or more to enter Auto-switching mode, press and hold for 7 seconds or more again to enter Manual-switching mode. <i>NOTE: When you set any VGA port to AV or YPbPr in Manual-switching mode, the system will not be able to enter Auto-switching mode. While in Auto-switching mode, setting any VGA port to AV or YPbPr will automatically enter the system in Manual-switching mode, and the LCD screen and RS-232 control software will prompt "Not supported!"</i>

Number in Figure 2-1	Component	Description
4	ENTER	Confirm the selection in the menu.
5	RESO/AUTO	• Used as an output resolution manual switching button, select from 1920 x 1200, 1920 x 1080, 1600 x 1200, 1360 x 768, 1280 x 800, 1280 x 720, 1024 x 768. • Used as an output resolution switching mode selection button, press and hold for 7 seconds or more to enter Auto-switching mode, press and hold for 7 seconds or more to enter Manual-switching mode.
6	MENU/ FWUPDATE	• Used as a menu button, press to enter the OSD menu. • Used as a software update button, press and hold for 7 seconds or more to update the software.
7	VOL-	• Used as a volume down button. • Used as a direction button to go to the NEXT option in menus.
8	MIC+	• Used as a MIC volume up button. • Used as a direction button to MOVE UP to the previous option in menus.
9	VOL+	• Used as a volume up button. • Used as a direction button to go to the PREVIOUS option in menus.
10	MIC-	• Used as MIC volume down button. • Used as a direction button to MOVE DOWN to the subsequent option in menus.

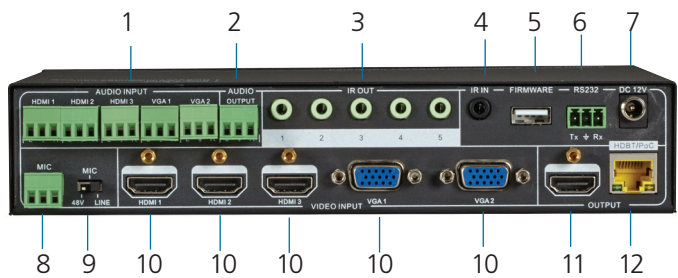


Figure 2-2. Back panel.

Table 2-2. Back panel components.

Number in Figure 2-2	Component	Description
1	AUDIO INPUT	Includes (3) HDMI audio and (2) VGA audio inputs. Users can choose any one audio type (embedded HDMI audio or external input audio) for HDMI audio input by sending RS-232 commands.
2	AUDIO OUTPUT	Audio output port: the audio comes from the input audio corresponding to the selected video source and is mixed with MIC audio.
3	IR OUT	(5) in total, connect with IR emitters to control local source devices or AVSC-5DA1-HDB from the remote, switched along with the corresponding video source.
4	IR IN	Connects with IR receiver (with carrier wave only) to receive the IR signal sent by the IR remote or the remote controller of another input/output device.
5	FIRMWARE	USB port, connects to a USB flash drive or other storage device to update the system firmware.
6	RS-232 serial control port, 3-pin captive screw connector	Connects to a control device (such as a computer) to control an AVSC-5DA1-HDB or other devices connected with an AVS-HDB-RX.
7	12-VDC power connector	Connects to a 12-VDC power adapter.

Table 2-2 (continued). Back panel components.

Number in Figure 2-2	Component	Description
8	MIC port	Connects to microphone.
9	Dial switch	Includes 3 levels: 48-V phantom power mode (connect with condenser microphone), MIC mode (connect with dynamic microphone), and LINE mode (connect with wireless microphone or line audio).
10	VIDEO INPUT	Video input ports include 3 HDMI inputs and 2 VGA inputs. VGA ports support YPbPr, C-video, and VGA format. Factory default is VGA format.
11	OUTPUT*	HDMI local output.
12	OUTPUT*	HDBaseT output, supports PoC.

*The two ports share the same audio signal, and the audio signal is mixed with MIC audio and HDMI embedded audio (output audio). If HDMI embedded audio output is disabled, there will be no audio output through these ports.

3. System Connection

3.1 Usage Precautions

1. Install the system in a clean environment that has a proper temperature and humidity.
2. Make sure that all the power switches, plugs, sockets, and power cords are insulated and safe.
3. Connect all devices before powering on.

3.2 System Diagram

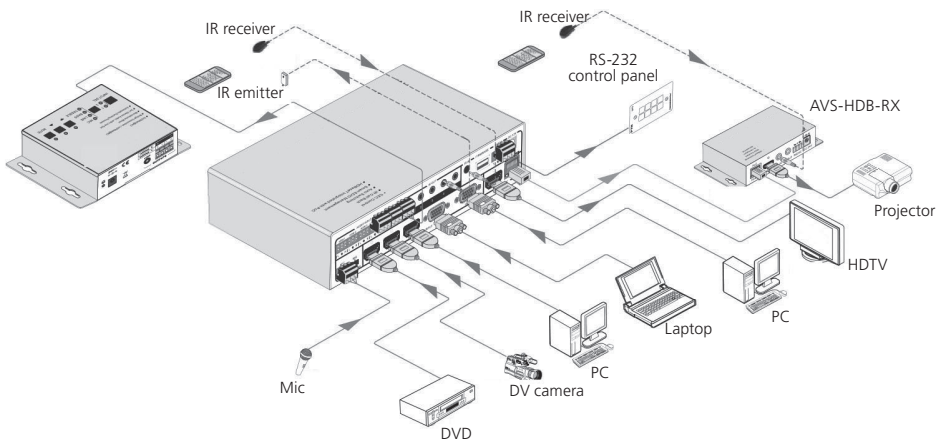


Figure 3-1. Typical application.

3.3 Connection Procedure

- Step 1. Connect HDMI source devices (e.g. Blu-ray™ DVD) to the Scaler's HDMI input ports with HDMI cable. Connect VGA source devices (e.g. PC) to the Scaler's VGA input ports with VGA cable.
- Step 2. Connect audio sources to the corresponding AUDIO INPUT ports on the AVSC-5DA1-HDB with audio cable. The HDMI audio can be embedded or external by sending the right command.
- Step 3. Connect an HDMI display device to the HDMI output port of AVSC-5DA1-HDB with HDMI cable.

- Step 4. Connect an AVS-HDB-RX to the AVSC-5DA1-HDB's HDBaseT output port with twisted pair.
- Step 5. Connect a speaker, headphone, or amplifier to the AVSC-5DA1-HDB's AUDIO OUTPUT port.
- Step 6. Connect a control device (e.g. PC) to the RS-232 port of the AVSC-5DA1-HDB or AVS-HDB-RX (bi-directional RS-232 control, either end is available).
- Step 7. Both AVSC-5DA1-HDB and AVS-HDB-RX have IR IN and OUT. When one model is connected to an IR receiver, the other model should connect to an IR transmitter.

For example: When "IR IN" of AVSC-5DA1-HDB connects with an IR receiver, the IR transmitter must connect to the IR OUT of the AVS-HDB-RX.

NOTE: The IR signal is transmitted bi-directionally between the AVSC-5DA1-HDB and the AVS-HDB-RX.

- Step 8. Select the MIC level and connect the right microphone to the MIC input port. MIC audio will be transmitted to the AUDIO OUTPUT port and mixed with source audio.
- Step 9. Connect the 12-VDC power adapter to the power port (AVS-HDB-RX gets power from AVSC-5DA1-HDB via PoC).

NOTE: The AVSC-5DA1-HDB supports unidirectional PoC, i.e., If the power adapter is connected with AVSC-5DA1-HDB, the AVS-HDB-RX can get power from AVSC-5DA1-HDB.

3.4 Microphone Connection

The AVSC-5DA1-HDB has one 3-level microphone input port to accommodate different microphone input modes, including 48-V phantom power mode, MIC mode, and LINE mode.

48-V phantom power input

48-V phantom power input has good frequency, high input impedance, and high sensitivity.

When switching to "48-V," the MIC input will provide 48-V of phantom power. This is only used for the condenser microphone.

Connect the microphone in this way: "+" connects to positive, "-" connects to negative, and GND connects to ground.

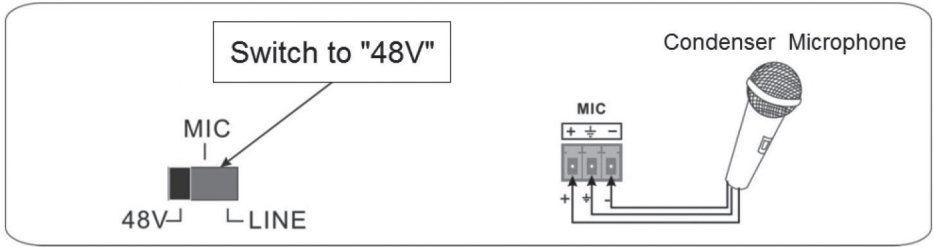


Figure 3-2. 48-V phantom power input.

MIC input

MIC input has low frequency characteristics, and wide frequency response.

When switched to "MIC," the microphone input is used for connecting to a dynamic microphone. There are two different connection methods:

1. Unbalanced connection:

"+" and " " connect to ground, and "-" connects to signal.

"-" and " " connect to ground, and "+" connects to signal.

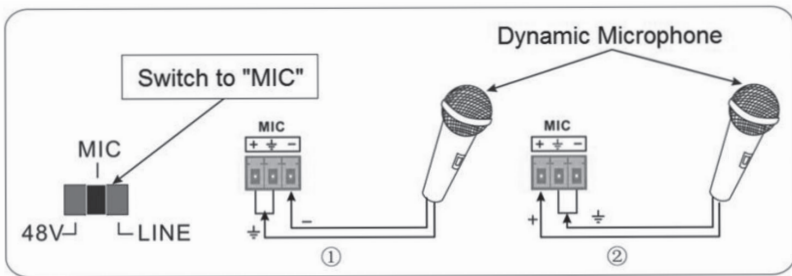


Figure 3-3. Mic input, unbalanced connection.

2. Balanced connection: "+" connects to positive, "-" connects to negative and " " connects to ground.

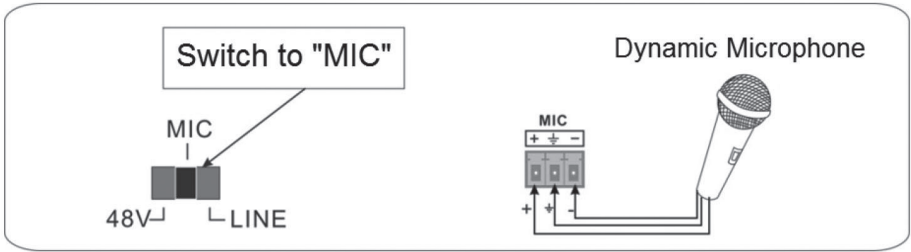


Figure 3-4. Mic input, balanced connection.

LINE input

LINE input has low frequency characteristics and wide frequency response.

When switched to "LINE," the microphone input is used to connect to line audio or wireless microphone output. There are two different connection methods:

1. Unbalanced connection:

"+" and " " connect to ground, and "-" connects to signal.

"-" and " " connect to ground, and "+" connects to signal.

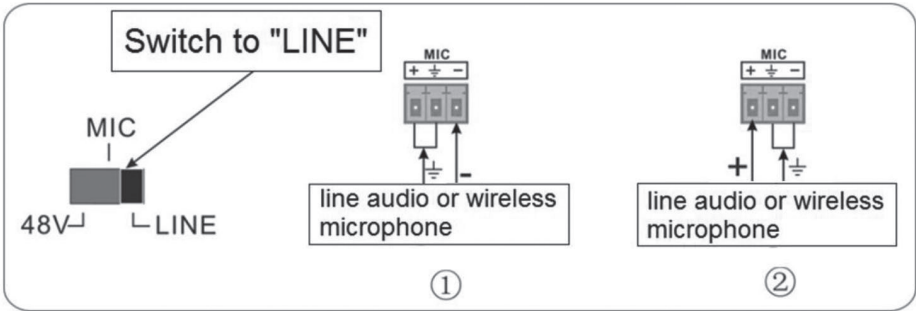


Figure 3-5. LINE input, unbalanced connection.

2. Balanced connection: "+" connects to positive, "-" connects to negative and " " connects to ground.

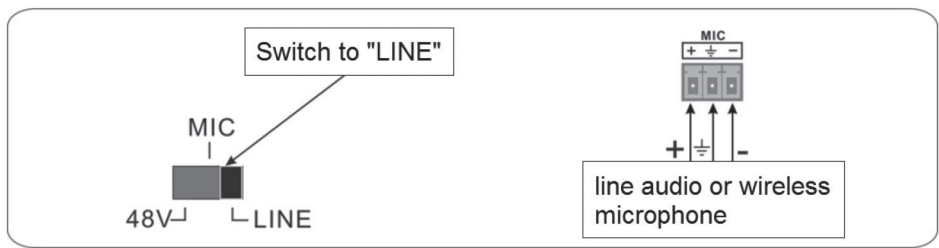


Figure 3-6. LINE input, balanced connection.

3.5 Application

Use the AVSC-5DA1-HDB in various applications, including computer systems, monitoring, conference rooms, large screen displays, television, education, command and control centers, and smart homes.

4. Operation

4.1 Front-Panel Buttons

Use the front-panel buttons to adjust output resolution, for switching, to update software, adjust volume, and for other menu operations.

4.1.1 Adjusting the Resolution

Resolution can be adjusted automatically and manually. Press and hold the RESO/AUTO button for 7 seconds or more to switch between auto-adjusting/manual-adjusting mode.

NOTES:

- In auto-adjusting mode, the AVSC-5DA1-HDB will choose the resolution of the display device at the far-end as the preferred resolution. If you need to choose the resolution of the local HDMI display device:*
 - *Turn off the power to the AVSC-5DA1-HDB and disconnect the AVSC-5DA1-HDB and the AVS-HDB-RX.*
 - *Turn on the power to the AVSC-5DA1-HDB.*
 - *Get the local HDMI output device's resolution.*
 - *Connect the AVS-HDB-RX to the AVSC-5DA1-HDB.*
- In auto-switching mode, the front-panel button control is not active, but you can use IR and RS-232 control to switch modes.*

4.1.2 Switching Operations

Video signals support auto-switching and manual-switching. Press and hold the SOURCE/AUTO button for 7 seconds or more to enter auto-switching/manual-switching mode.



Figure 4-1. Display result.

The display result will be shown for two seconds.

Auto-switching Function

Auto-switching mode follows these principles:

- New input principle: Once it detects a new input signal, the AVSC-5DA1-HDB will switch to this new signal automatically.
- Power reboot principle: AVSC-5DA1-HDB remembers the last displayed signal when rebooting. Once rebooted, the AVSC-5DA1-HDB will automatically enter auto-switching mode, and then detect all inputs and memorize their connection status for future rebooting.

If the last displayed signal is still available, the AVSC-5DA1-HDB will output the signal. If not, there will be no signal on the output devices.

- Signal remove principle: Once you remove the current display signal, AVSC-5DA1-HDB will detect all input signals with priority from INPUT 1 to INPUT 5. It will transfer the signal first detected to be available to output devices.

NOTE: The auto-switching function works only when inputting a new signal, removing a signal, or rebooting power. With any VGA port set to AV or YPbPr, the system will be not able to enter in Auto-switching mode.

Operation Examples:

- Connect INPUT 2, INPUT 4, and INPUT 5 ports with source devices, select INPUT 4 to output.
- Press and hold the front-panel key SOURCE/AUTO for 7 seconds or more to enter auto-switching mode.
- When signals are not removed or new input is entered, the AVSC-5DA1-HDB works in auto-switching mode (Output from INPUT 4).
- Connect INPUT 3 to a source device, and the scaler will choose INPUT 3 to output.
- Remove the INPUT 3 signal, and AVSC-5DA1-HDB will detect INPUT 1 to INPUT 5. When it detects that input 2 is available, it will choose INPUT 2 to output.
- Cut off the power to the AVSC-5DA1-HDB, then reboot. Because AVSC-5DA1-HDB is in auto-switching mode, it will choose INPUT 2 to output.

4.1.3 Adjusting the Volume

In the OSD menu, press VOL – to decrease line volume, VOL + to increase.

In the OSD menu, press MIC – to decrease MIC volume, MIC + to increase.

4.1.4 OSD Menu

Press the MENU button to enter in OSD menu and use the UP, DOWN, LEFT, RIGHT buttons to navigate, then press the ENTER button to confirm the selection. You can also use the MENU button to exit the present menu level by level until you exit the OSD menu.

4.1.5 Updating the Software

AVSC-5DA1-HDB supports software updating via a USB flash drive.

4.2 IR Operation

4.2.1 IR Remote

An IR signal can be transmitted bi-directionally between AVSC-5DA1-HDB and AVS-HDB-RX, so you can use the IR remote at the far-end to control AVSC-5DA1-HDB or HDMI source devices (via CEC function buttons).

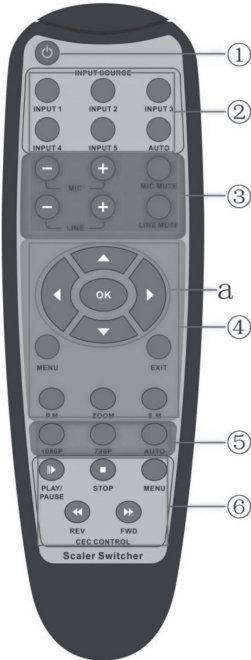


Figure 4-2. Remote control.

1. Standby button: Press this button to enter/exit standby mode.
2. Input channel selection buttons: INPUT 1 is for HDMI1, INPUT 2 for HDMI2...INPUT 5 for VGA2.
AUTO: Enable/disable auto-switching mode.
3. Volume adjustment buttons:
MIC-/+: turn down/up MIC volume
LINE-/+: turn down/up line volume
MIC MUTE: mute/unmute MIC audio
LINE MUTE: mute/unmute line audio
4. Menu operation buttons:
MENU: press to enter the OSD menu or return to the previous menu;
EXIT: exit OSD menu.
OK: confirm button;
Navigation buttons: UP/DOWN/LEFT/ RIGHT button, to set values or go to the next page,
You can also use buttons in area **a** in CEC mode to enter the menu for an HDMI source device; P.P, ZOOM, S.M: shortcut button, to select display mode.
5. Resolution selection buttons:
To select resolution, press the corresponding button.
AUTO: Enable/disable auto-switching mode.
6. CEC function buttons:
For HDMI input signal, which supports CEC only, Including PLAY, PAUSE, STOP, MENU, REV (reverse) and FWD (forward).
a. Buttons in section **a** also work when entered in CEC mode.

4.2.2 IR Operation

The 5 IR OUT ports correspond to the 5 video inputs separately, and the IR signals are switched following the corresponding video source.

- 1. Control the AVSC-5DA1-HDB or far-end display device locally using the corresponding IR remote.

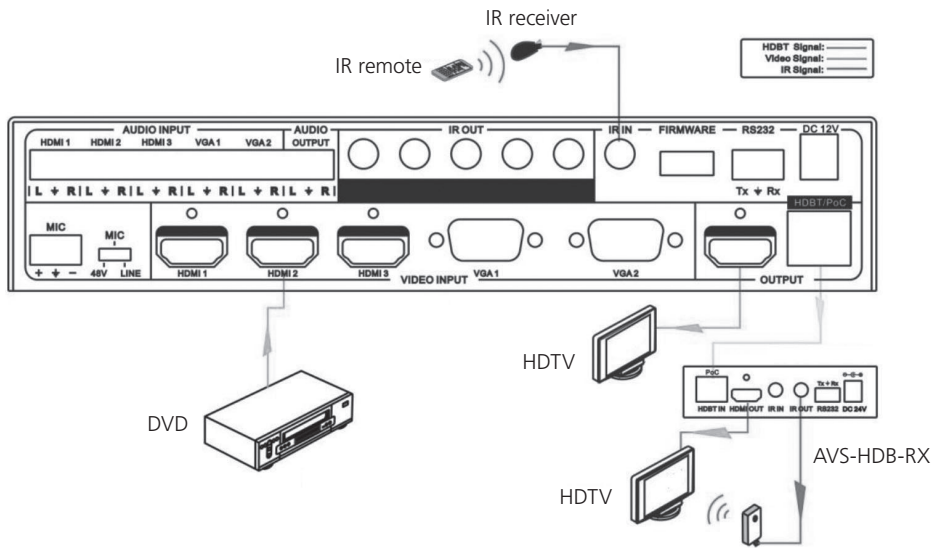


Figure 4-3. Control far-end device locally with IR remote.

- 2. Control the AVSC-5DA1-HDB or local device locally using the corresponding IR remote.

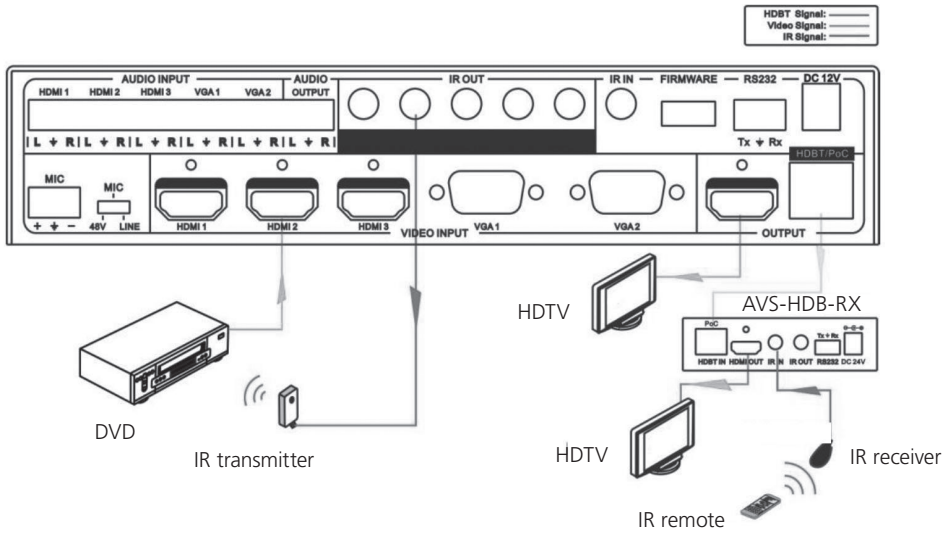


Figure 4-4. Control local device locally with IR remote.

4.3 CEC Operation

The AVSC-5DA1-HDB supports CEC, and it can be turned on/off by sending RS-232 commands or OSD menu options. The default setting is ON.

Commands pertaining to CEC: "50686%" (enable CEC) and "50687%" (disable CEC)

HDMI INPUT ports 1–3 support CEC. If the connected source devices also support CEC and their CEC are on, users can control the source device via the IR remote of AVSC-5DA1-HDB.

The working status related to CEC and STANDBY are shown on the next page.

Table 4-1. CEC and Standby.

Situation	Working Status
CEC: on, Standby: on	Press the STANDBY button on the IR remote, and AVSC-5DA1-HDB enters standby mode, along with all HDMI source devices. Press the STANDBY button again on the IR remote, and the AVSC-5DA1-HDB exits standby mode and the HDMI source devices start working.
CEC: on, Standby: off	Press the STANDBY button on the IR remote, and the AVSC-5DA1-HDB enters standby mode and HDMI 1–3 source devices remain on.
CEC: on	Use CEC function buttons, up-arrow, down-arrow, left-arrow, right-arrow, and OK buttons on the IR remote to control HDMI source devices. Menu buttons include play, pause, fast forward, fast reverse, and operations.
CEC: off	When CEC is set to off, you cannot control HDMI source devices through the IR remote.

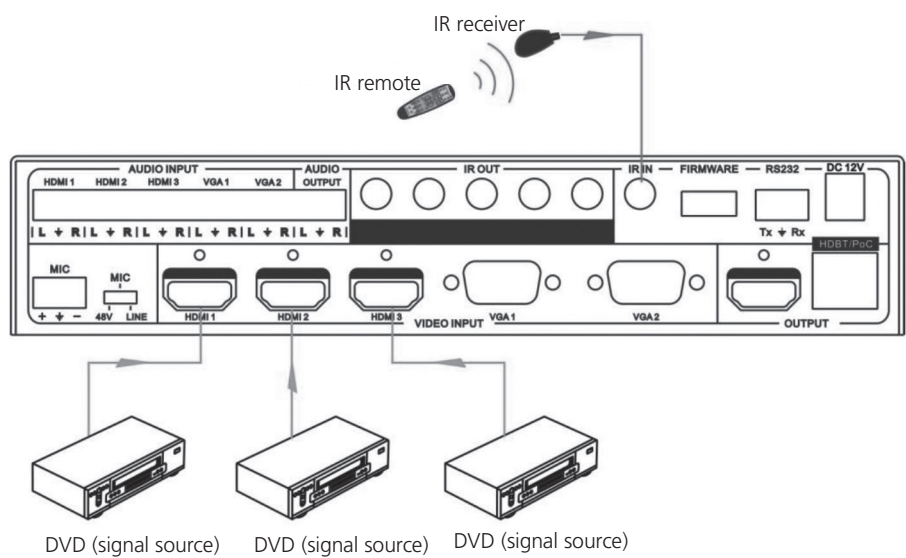


Figure 4-5. CEC: Control HDMI source devices using the AVSC-5DA1-HDB’s IR remote.

4.4 RS-232 Control Operation

RS-232 can be transmitted bi-directionally between AVSC-5DA1-HDB and AVS-HDB-RX, so you can control a third-party RS-232 device locally or control the AVSC-5DA1-HDB remotely. When you want to control a third party RS-232 device, set the baud rate of this device to 2400, 4800, 9600, 19200, 38400, 57600, or 115200.

4.4.1 RS-232 Control Software Installation

- Installation: Copy the control software file to the computer connected to the AVSC-5DA1-HDB.
- Uninstallation: Delete all the control software files in the corresponding file path.

4.4.2 Basic Settings

Connect the AVSC-5DA1-HDB to all necessary all input and output devices, then connect it to a computer that has RS-232 control software installed. Double-click the software icon to run this software.

Accessing through Serial

1. Using the client, select “serial” and enter “115200” for the speed (baud rate).

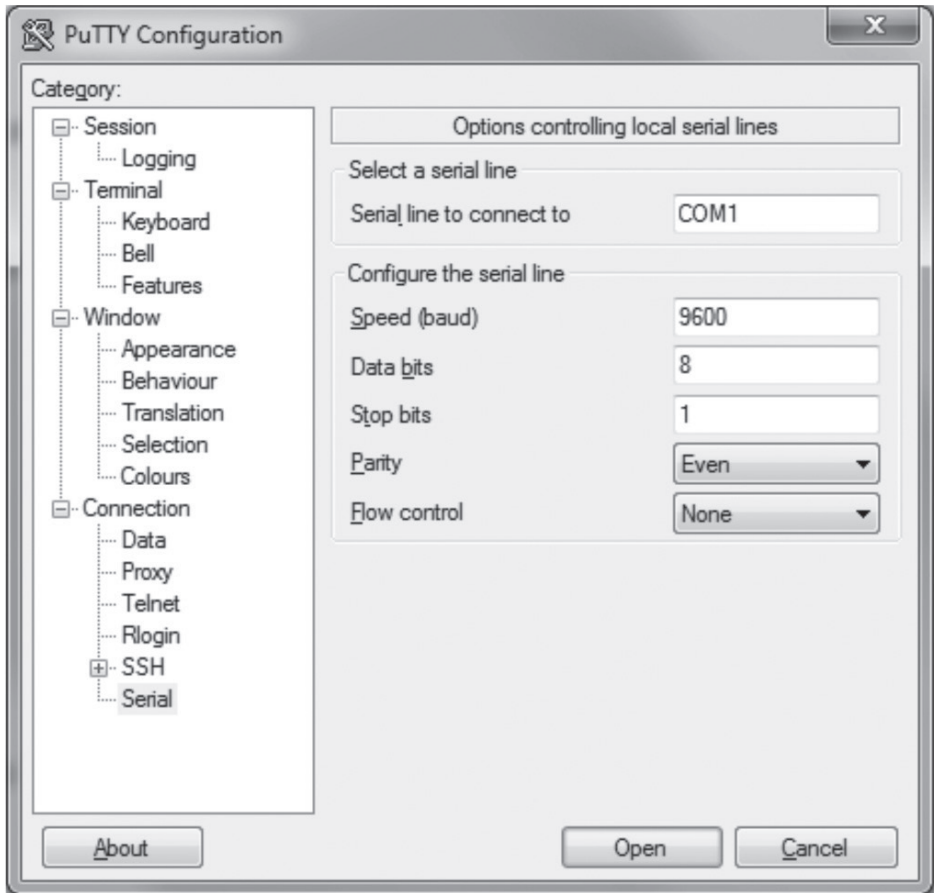


Figure 4-1. PuTTY configuration screen using serial.

2. No username or password is required. Just press enter.

Set the COM number, baud rate, data bit, stop bit, and parity bit correctly so you can send commands in the Command Sending Area of the screen.

NOTE: To control the AVS-HDB-WPTX via an RS-232 port, configure the communication protocol parameters as: Baud rate: 9600; Data bit: 8; Stop bit: 1; Parity bit: none.

4.4.3 RS-232 Communication Commands

Communication protocol: RS-232 Communication Protocol

Baud rate: 9600

Data bit: 8

Stop bit: 1

Parity bit: none

Table 4-2. RS-232 commands.

Switch Commands		
Command	Function	Feedback Example
50701%	Switch to HDMI 1 input	Switch to HDMI 1
50702%	Switch to HDMI 2 input	Switch to HDMI 2
50703%	Switch to HDMI 3 input	Switch to HDMI 3
50704%	Switch to VGA 1/YPbPr 1/AV 1 input	Switch to VGA 1/YPbPr 1/AV 1
50705%	Switch to VGA 2/YPbPr 2/AV 2 input	Switch to VGA 2/YPbPr 2/AV 2
50680%	Select VGA 1 for INPUT 4	Input 4 Set and Switch to VGA 1
50681%	Select YPbPr 1 for INPUT 4	Input 4 Set and Switch to AV 1
50682%	Select AV 1 for INPUT 4	Input 4 Set and Switch to AV 1
50683%	Select VGA 2 for INPUT 5	Input 5 Set and Switch to VGA 2
50684%	Select YPbPr 2 for INPUT 5	Input 5 Set and Switch to YPbPr 2
50685%	Select AV 2 for INPUT 5	Input 5 Set and Switch to AV 2
50785%	Enable auto-switching	Auto Switching
50786%	Disable auto-switching	Manual Switching
Audio Commands		
Command	Function	Feedback Example
50600%	MUTE line audio	LINE Mute
50601%	UnMute line audio	LINE Unmute
50602%	Line audio volume up	LINE Volume: xx (xx=0~60)
50603%	Line audio volume down	LINE Volume: xx (xx=0~60)

Table 4-2 (continued). RS-232 commands.

Audio Commands (continued)		
Command	Function	Feedback Example
50720%	Mute LINE audio and MIC audio	LINE Mute MIC Mute
50721%	Unmute LINE audio and MIC audio	LINE Unmute MIC Unmute
50722%	Mute MIC audio	MIC Mute
50723%	Unmute MIC audio	MIC Unmute
50694%	Enable Mic precedence	Mic precedence: enable
50695%	Disable Mic precedence	Mic precedence: disable
50696%	Check Mic precedence status	Mic precedence: XXXX (XXXX=enable/disable)
50724%	MIC volume up	MIC Volume: xx (xx=0~60)
50725%	MIC volume down	MIC Volume: xx (xx=0~60)
508xx%	Set MIC volume	MIC Volume: xx (xx=0~60)
50706%	Choose embedded audio as HDMI 1 audio input	HDMI 1 Audio from Embedded
50707%	Choose external audio as HDMI 1 audio input	HDMI 1 Audio from LINE
50708%	Choose embedded audio as HDMI 2 audio input	HDMI 2 Audio from Embedded
50709%	Choose external audio as HDMI 2 audio input	HDMI 2 Audio from LINE
50710%	Choose embedded audio as HDMI 3 audio input	HDMI 3 Audio from Embedded
50711%	Choose external audio as HDMI 3 audio input	HDMI 3 Audio from LINE

Table 4-2 (continued). RS-232 commands.

Resolution Commands		
Command	Function	Feedback Example
50619%	Change the resolution to 1360 x 768 HD	Resolution: 1360 x 768
50626%	Change the resolution to 1024 x 768 XGA	Resolution: 1024 x 768
50627%	Change the resolution to 1280 x 720 720P	Resolution: 1280 x 720
50628%	Change the resolution to 1280 x 800 WXGA	Resolution: 1280 x 800
50629%	Change the resolution to 1920 x 1080 1080P	Resolution: 1920 x 1080
50620%	Change the resolution to 1920 x 1200 WUXGA	Resolution: 1920 x 1200
50621%	Change the resolution to 1600 x 1200 UXGA	Resolution: 1600 x 1200
Setup Commands		
50604%	Lock the front panel buttons	Front Panel lock
50605%	Unlock the front panel buttons	Front Panel Unlock
501xx%	Set the volume to xx.	LINE Volume: xx (xx = 0–60)
502xx%	Set the brightness to xx.	Brightness: xx (xx = 0–99)
503xx%	Set the contrast to xx.	Contrast: xx (xx = 0–99)
504xx%	Set the saturation to xx.	Saturation: xx (xx = 0–99)
505xx%	Set the sharpness to xx.	Sharpness: xx (xx = 0–99)
50607%	Adjust the color temperature	Color Temperature: xx (xx= Cool/Medium/Warm/User.)
50608%	Set the aspect ratio	Aspect Ratio: xx (xx= 16:9/4:3/ auto/ panorama/justscan/ zoom1/ zoom2, when the input source is VGA format, xx can only be 4:3, 16:9 or Panorama)
50614%	Set the picture mode	Picture Mode: xx (xx= Dynamic/ Standard/Mild/User)

Table 4-2 (continued). RS-232 commands.

Setup Commands (continued)		
Command	Function	Feedback Example
50615%	Set SM audio mode	Sound Mode: xx (xx= Standard/ Music/Movie/Sports/User)
50655%	Freeze output image	Freeze: enable
50656%	Cancel the freezing of output image	Freeze: disable
50646%	Enable MIC Volume Icon display	Volume Icon: enable
50647%	Disable MIC Volume Icon display	Volume Icon: disable
50648%	Enable HDMI embedded audio output	Embedded Audio Output: enable
50649%	Disable HDMI embedded audio output	Embedded Audio Output: disable
50761%	Do not display mute icon of LINE audio	LINE Mute Icon: disable
50762%	Display mute icon of LINE audio	LINE Mute Icon: enable
50763%	Do not display mute icon of MIC audio	MIC Mute Icon: disable
50764%	Display mute icon of MIC audio	MIC Mute Icon: enable
50765%	Display freeze icon	Freeze Icon: enable
50766%	Do not display freeze icon	Freeze Icon: disable
50644%	Display channel status	Input Icon: enable
50645%	Do not display channel status	Input Icon: disable
50650%	Check the channel status	Input Icon: xx
50606%	Auto-adjust the input parameter (VGA only)	VGA Input Auto
50699%	Check the system version	Version Vx.x.x
50688%	Enable MIC noise detecting	MIC detect: enable
50689%	Disable MIC noise detecting	MIC detect: disable
50690%	Check MIC noise detecting status	MIC detect: XXXX

Table 4-2 (continued). RS-232 commands.

Setup Commands (continued)		
Command	Function	Feedback Example
50767%	Restore default EDID	EDID: initial
50768%	Bypass EDID data from output to input	EDID: bypass
50769%	Upload custom EDID data to the switcher	EDID: user
50770%	Inquire EDID status	EDID: initial EDID: bypass EDID: user
50782%	EDID management, copy the best resolution data of one output to HDMI input	Manage HDMI input with preferred timing timing table=[1] Resolution:1920x1080
50787%	Enable serial control mode 1: control Scaler and far-end from local RS232	RS-232 Mode 1: RS-232 Control Scaler and Remote
50788%	Enable serial control mode 2: control Scaler from local RS232 and far-end)	RS-232 Mode 2: RS-232 and Remote Control Scaler
50697%	Exit standby mode	Wake up!
50797%	Enter standby mode	Go to standby!
50698%	Software update	
50617%	Reset to factory defaults	Factory Reset

Table 4-2 (continued). RS-232 commands.

Menu Commands		
Command	Function	Feedback Example
50609%	OK for OSD selection	Key: ok
50610%	LEFT button	Key: left
50611%	RIGHT button	Key: right
50612%	UP button	Key: up
50613%	DOWN button	Key: down
50616%	MENU button (enter OSD)	OSD: Enter
50618%	EXIT button (exit OSD)	OSD: Exit
Inquire Commands		
Command	Function	Feedback Example
50630%	Check the volume level	LINE Volume: xx (xx=0~66) MIC Volume: xx (xx=0~66)
50631%	Check the input source	Input: xx (xx= HDMI1/HDMI2/ HDMI3/VGA1/VGA2/YPbPr1/ YPbPr2/AV1/ AV2)
50632%	Check the output resolution	Resolution: xx (xx=1920×1200/ 1920×1080/ 1600×1200/ 1360 ×768/ 1280×800/ 1280×720/ 1024×768
50633%	Check the image mode	Picture Mode: xx (xx= Dynamic/ Standard/ Mild/ User)
50634%	Check the audio mode	Sound Mode: xx (xx= Standard/ Music/ Movie/ Sports/ User)
50635%	Check the image aspect ratio	Aspect Ratio: xx (xx= 16:9/ 4:3/ auto/ panorama/ justscan/ zoom1/ zoom2, when the input source is VGA format, xx can only be 4:3, 16:9 or Panorama)
50636%	Check the brightness	Brightness: xx (xx = 0–99)
50637%	Check the contrast	Contrast: xx (xx = 0–99)
50638%	Check the saturation	Saturation: xx (xx = 0–99)
50639%	Check sharpness	Sharpness: xx (xx = 0–99)

Table 4-2 (continued). RS-232 commands.

Inquire Commands (continued)		
Command	Function	Feedback Example
50783%	Display function	
50640%	Check the color temperature	Color Temperature: xx (xx = Cool/Medium/Warm/User.)
50651%	Check Volume Icon display status	Volume Icon: xxxx
50652%	Check Digital audio output status	Embedded Audio Output: enable/disable
50712%	Check the audio input sources for HDMI 1, 2, 3	HDMI1 Audio from XXXX port HDMI2 Audio from XXXX port HDMI3 Audio from XXXX port
50751%	Check whether the LINE audio is muted or not	LINE Mute/Unmute
50752%	Check whether the MIC audio is muted or not	MIC Mute/Unmute
50753%	Check the freeze status	Freeze: enable/disable
50754%	Check the panel locked status	Front Panel Lock/UnLock
Adjustment Commands		
Command	Function	Feedback Example
50678%	Enable screen output adjusting	Enter Output Position Adjust
50679%	Disable screen output adjusting	Exit Output Position Adjust
50670%	Move the image to left	Output Position Adjust X xx
50671%	Move the image to right	Output Position Adjust X xx
50672%	Move the image up	Output Position Adjust Y XX
50673%	Move the image down	Output Position Adjust Y xx
50674%	Stretch left from left side (increase image width)	Output Width Adjust xx
50675%	Pull right from left side (decrease image width)	Output Width Adjust xx
50676%	Stretch upwards from bottom side (decrease image height)	Output Height Adjust xx
50677%	Stretch downwards from bottom side (increase image height)	Output Height Adjust xx

Table 4-2 (continued). RS-232 commands.

Adjustment Commands (continued)		
Command	Function	Feedback Example
50730%	Turn off HDMI output	HDMI power off
50731%	Turn on HDMI output	HDMI power on
50732%	Turn off HDBT output	HDBT power off
50733%	Turn on HDBT output	HDBT power on
50734%	Turn on HDMI and HDBT output synchronously	HDMI HDBT power on
CEC Commands		
Command	Function	Feedback Example
50687%	Disable CEC	HDMI CEC OFF
50686%	Enable CEC	HDMI CEC ON
50901%	Play and pause	CEC cmd: play and pause
50902%	Stop	CEC cmd: stop
50903%	Menu	CEC cmd: menu
50904%	Retreat	CEC cmd: rev
50905%	Forward	CEC cmd: fwd
50906%	Up	CEC cmd: up
50907%	Down	CEC cmd: down
50908%	Left	CEC cmd: left
50909%	Right	CEC cmd: right
50910%	Confirm command	CEC cmd: select
50911%	Exit command	CEC cmd: exit

NOTES:

- 1. Screen output adjusting is available only when the screen output adjusting is on. Send command 50678% to turn this on.*
- 2. CEC commands with a gray background are available only when CEC is on.*
- 3. MIC precedence: In Mute mode, if the MIC noise detection is on, the device will unmute MIC automatically if the outer noise exceeds the noise detection limit. Send 50696% to enable MIC precedence, then the device will not be able to change the mute mode no matter how loud the noise is.*

4.4.4 Control AVSC-5DA1-HDB or a Third-Party Device Locally

1. Connect the AVSC-5DA1-HDB's RS-232 port to the PC's RS-232 port.
2. Send command 50787% (serial control mode 1, factory default) via RS-232 communication software.
3. Send the right command of AVSC-5DA1-HDB or other remote RS-232 device connected in the present system. Connect as shown below:

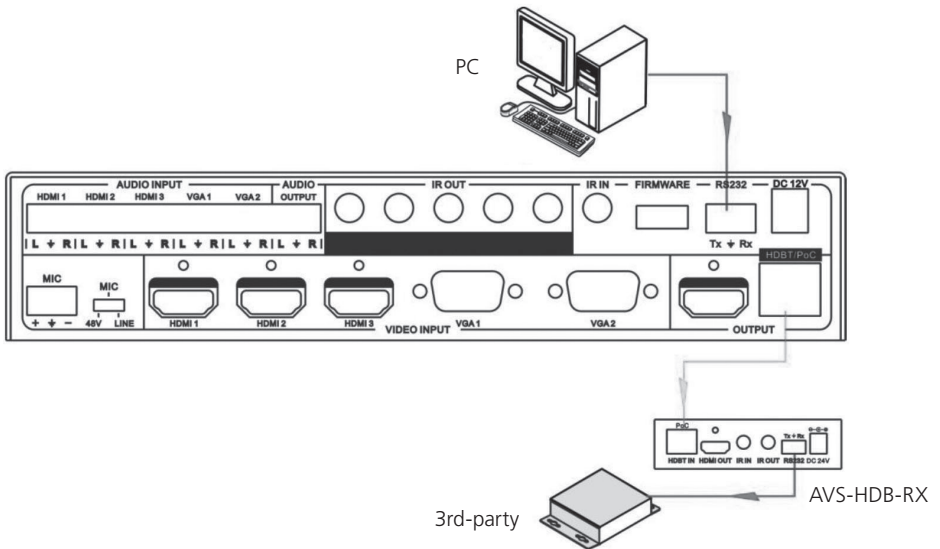


Figure 4-8. Control AVSC-5DA1-HDB or third-party device locally.

4.4.5 Control AVSC-5DA1-HDB from Local or Remote

- Control AVSC-5DA1-HDB locally.
1. Connect the AVSC-5DA1-HDB's RS-232 port to the PC's RS-232 port.
 2. Send command 50788% via RS-232 communication software.
 3. Send the right command to control AVSC-5DA1-HDB. Connect as below:

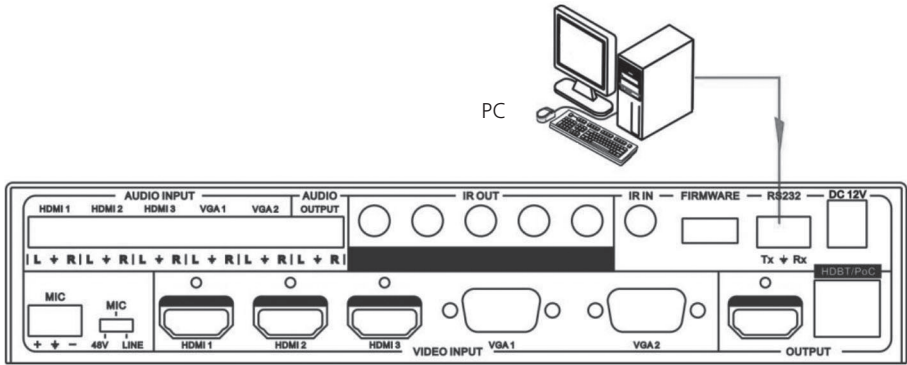


Figure 4-9. Control AVSC-5DA1-HDB locally.

1. Connect the RS-232 port of far-end RS-232 device to the PC's RS-232 port.
2. Send command 50788% via RS-232 communication software.
3. Send the right command to control AVSC-5DA1-HDB. Connect as below:

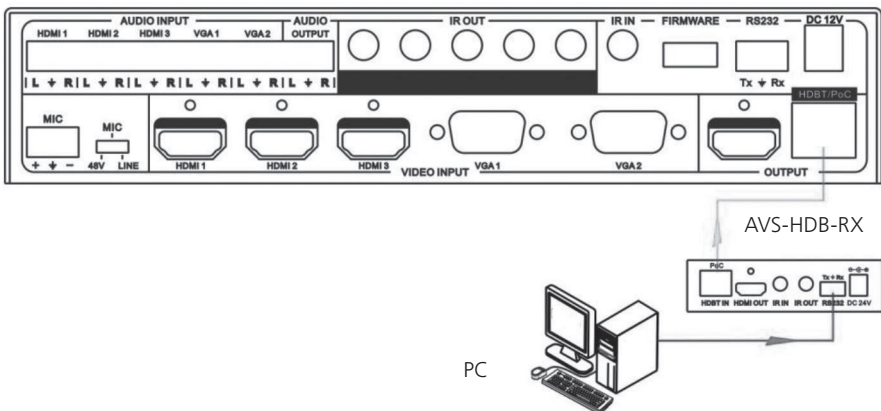


Figure 4-10. Control AVSC-5DA1-HDB remotely.

4.5 OSD Menu Operation

The AVSC-5DA1-HDB provides a powerful OSD operation menu that contains four parts: optional settings, image settings, audio settings, and system settings.

Press the MENU button on front panel (or the MENU button on IR remote or send command 50616%) to enter in OSD menu, so it can set values through the OSD menu.

4.5.1 Option

Options include Output Adjust, Input 4/5 Select, HDMI 1/2/3 Audio select, and Software Update (USB).

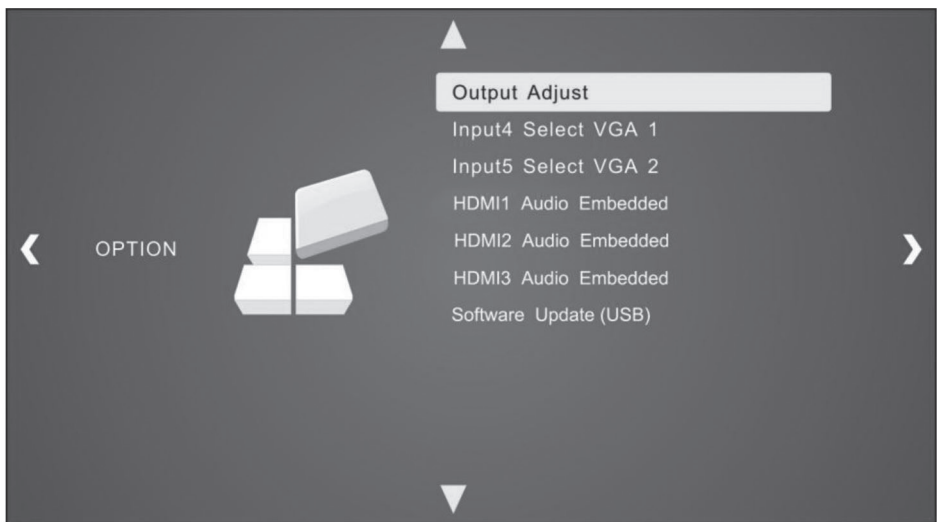


Figure 4-11. OSD Menu.

Output Adjust: Adjust output image position (X: horizontal direction and Y: vertical direction), ratio aspect (width and height), polarity adjustment (H Polarity and V Polarity) and output setting (HDMI on/off and HDB on/off).

Input4 Select: Select the video source format for VGA input, including AV 1 (C-video signal), VGA 1 (VGA signal) and YPbPr 1 (Component video signal). Press ENTER to switch among the options, and press Input 4 on the IR remote to confirm the selection.

Input5 Select: Select the video source for VGA input, including AV 2 (C-video signal), VGA 2 (VGA signal) and YPbPr 2 (Component video signal). Press ENTER to switch among the options, and press Input 5 on the IR remote to confirm the selection.

For INPUT4 and INPUT5, to change to a new format signal:

1. Select a format through this menu (the signal format changes while the video source is still the same).
2. Switch off the present signal channel (e.g. switch to another channel).
3. Switch to channel INPUT4/INPUT5 again.

HDMI1 Audio Select: switch between Embedded and Line to choose the desired audio output port for HDMI1.

HDMI2 Audio Select: switch between Embedded and Line to choose the desired audio output port for HDMI2.

HDMI3 Audio Select: switch between Embedded and Line to choose the desired audio output port for HDMI3.

Software Update (USB): Insert the USB flash disk with update file into the USB port of AVSC-5DA1-HDB, to update the software through this menu.

4.5.2 Picture

The menu includes Picture Mode, Color Temperature, Aspect Ratio, Noise Reduction, Screen and Color Range.

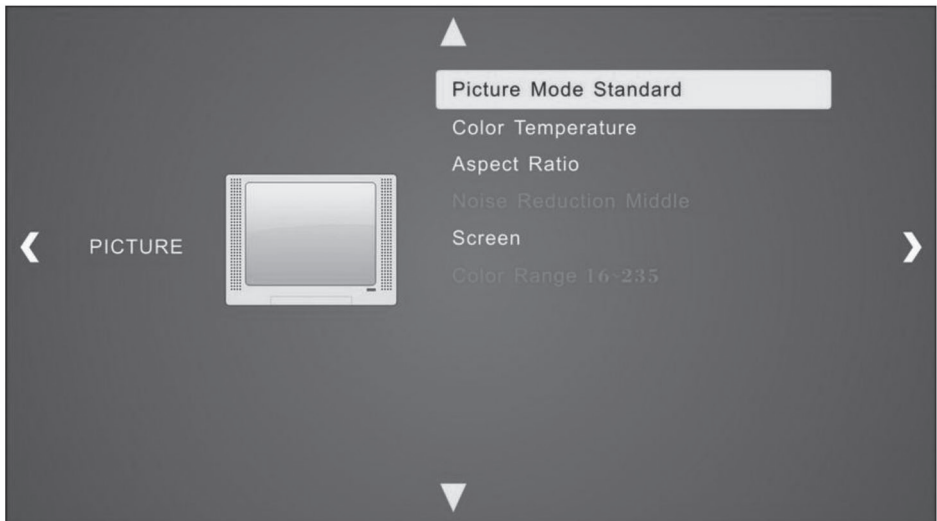


Figure 4-12. Picture menu option.

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Picture mode: Includes Dynamic, Standard, Mild, and User. You can set the image contrast and brightness only in User mode.

Color Temperature: Includes Cool, Medium, Warm, and User. Set to Red, Green and Blue (RGB) only in User mode.

Aspect Ratio: Includes Native, 4:3, 16:9, Zoom1, Zoom2, Just Scan, and Panorama. VGA format only supports 4:3, 16:9 and Panorama.

Noise Reduction (not for VGA format): Includes Off, Low, Middle, High, and Default.

Screen: (not for HDMI source): Includes Auto Adjust, Horizontal, Vertical, Size, and Phase.

Color Range (not for VGA format): 0–255; use the ENTER button to select the color range.

4.5.3 Sound

The Sound menu includes Sound Mode, Surround Sound, and EQ.

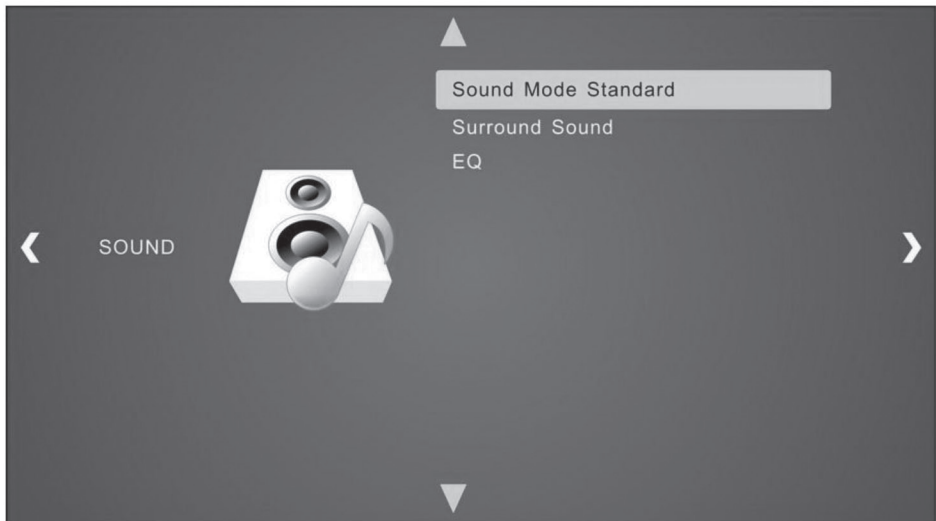


Figure 4-13. Sound menu.

Sound mode: Includes Standard, Music, Movie, Sports, and User. You can set treble and bass only in User mode.

Surround Sound: Includes Off, Surround, and SRS Trusurround XT.

EQ: Adjusts the sound balance.

4.5.4 Setup

The Setup menu includes OSD Language, Restore Factory Default, Blending, HDMI CEC, OSD Duration, and version inquiry.

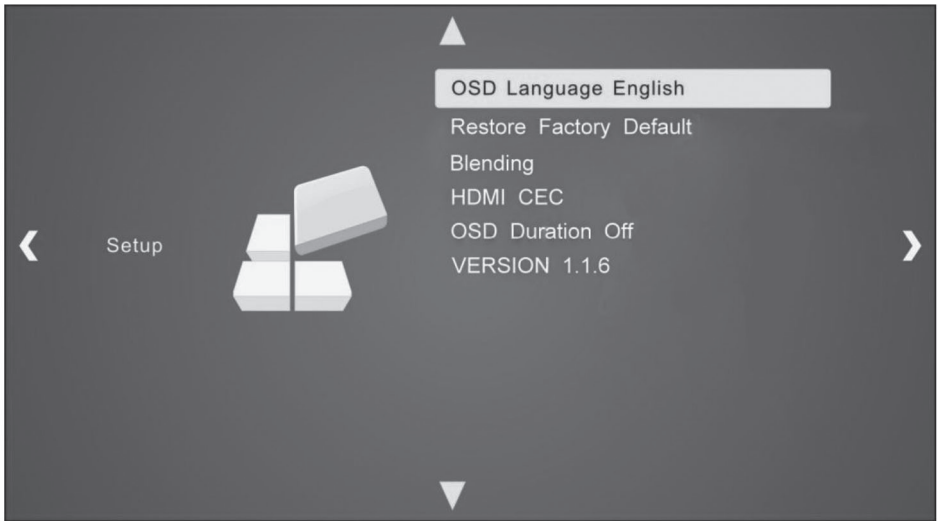


Figure 4-14. Setup menu.

OSD Language: Supports 14 languages, including English (default), Chinese, etc.

Restore Factory Default: Restores settings to original system state.

Blending: Includes Low, Middle, High, and Off. Use the ENTER button to select.

HDMI CEC: Enable/disable CEC and auto-standby function. Default: CEC on, STANDBY on.

OSD Duration: Includes 5 s, 10 s, 15 s and Off. "s" is for Second.

VERSION: Displays software version.

4.6 VGA Converter Cable

Because a VGA source supports YPbPr and C-video source, the AVSC-5DA1-HDB includes two VGA converter cables that comply with these signals.

To select these VGA signals as the input source, switch to channel INPUT 4 (or INPUT 5), and then set the signal type in OSD. Switch to the other input channel and connect INPUT 4 (or INPUT 5) to the corresponding source device. Then switch to INPUT4 (or INPUT 5) again.

Connect to a Component Video (YPbPr) Source

A. Operation Examples:

1. Via front panel buttons and OSD:

Press the MENU button on front panel to enter the OSD, and then in the OPTION setting menu: set "INPUT 4 Select" to YPbPr1, and "INPUT 5 Select" to YPbPr2. Press the SOURCE/AUTO button on front panel to switch to YPbPr1 or YPbPr2 source.

2. Via RS232 commands:

Send command 50681% (or 50684%) to switch to YPbPr1 (or YPbPr2) source.

3. Via IR remote and OSD:

Press the MENU button on the IR remote to enter the OSD, and then in OPTION setting menu, set "INPUT 4 Select" to YPbPr1 and "INPUT 5 Select" to YPbPr2. Press INPUT 4 (or INPUT 5) button to switch to a YPbPr1 (or YPbPr2) source.



Figure 4-15. VGA converter cable connected to YPbPr.

Connect to a Composite Video (C-VIDEO) Source

A. Operation Examples:

1. Via front panel buttons and OSD:

Press the MENU button on the front panel to enter the OSD, then enter the OPTION setting menu and set "INPUT 4 Select" to AV1, and "INPUT 5 Select" to AV2. Press the SOURCE/AUTO button on the front panel to switch to the AV1 or AV2 source.

2. Via RS-232 commands:

Send the 50682% (or 50685%) command to switch to a YPbPr1 (or YPbPr2) source.

3. Via IR remote and OSD:

Press the MENU button on the IR remote to enter the OSD, then in OPTION setting menu, set "INPUT 4 Select" to AV1, and "INPUT 5 Select" to AV2. Press INPUT 4 (or INPUT 5) button to switch to AV1 (or AV2) source.

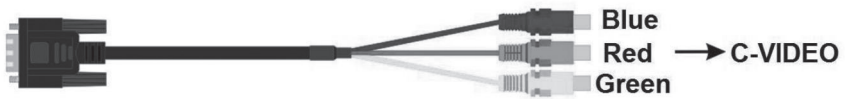


Figure 4-16. VGA convertor cable connected to C-Video.

5. Troubleshooting and Maintenance

Table 5-1. Problems, Causes, Solutions.

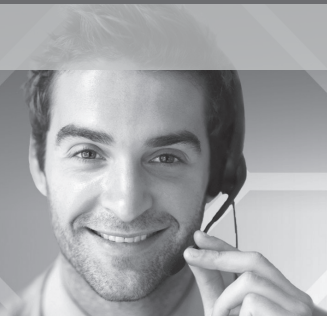
Problems	Causes	Solutions
Output image has snow-flake pattern.	The connecting cable's quality is bad. Failed or loose connection.	Try another high-quality cable. Make sure the connection is good.
No output image when switching.	No signal at the input/output end. Failed or loose connection. The scaler is broken.	Check with oscilloscope or multimeter if there is any signal at the input/output end. Make sure the connection is good. Contact Black Box Technical Support at 724-746-5500 or info@blackbox.com.
POWER indicator doesn't work or does not respond to any operation.	Power cord connection failed.	Make sure the power cord connection is good.
EDID management does not work normally.	The HDMI cable is broken at the output end.	Change to another HDMI cable that is in good working condition.
There is a blank screen on the display when switching.	The display does not support the resolution of the video source.	Manage the EDID data manually to make the resolution of the video source automatically comply with the output resolution.
Static becomes stronger when connecting the video connectors.	Bad grounding.	Check the grounding and make sure it is connected well.

Table 5-1 (continued). Problems, Causes, Solutions.

Problems	Causes	Solutions
Cannot control the device by a control device (e.g. a PC) through the RS-232 port.	Wrong RS-232 communication parameters. Broken RS-232 port.	Type in correct RS-232 communication parameters. Contact Black Box Technical Support at 724-746-5500 or info@blackbox.com .
Cannot control the device by the front-panel buttons, but can control it through the RS-232 port.	The front panel buttons are locked.	Send command 50605% to unlock the front panel buttons.
Cannot control the device by RS-232/IR remote/front panel buttons.	The device is broken.	Contact Black Box Technical Support at 724-746-5500 or info@blackbox.com .

Black Box Tech Support: FREE! Live. 24/7.

Tech support the
way it should be.



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724-746-5500 or blackbox.com.



About Black Box

Black Box provides an extensive range of networking and infrastructure products. You'll find everything from cabinets and racks and power and surge protection products to media converters and Ethernet switches all supported by free, live 24/7 Tech support available in 60 seconds or less.

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