

XR 8 x 8 HDMI Matrix Switch with Audio

Use this high-performance matrix to switch and extend multiple video and audio signals.

Switch manually, from a remote control unit, RS-232 interface, or Ethernet. Includes built-in HDBaseT® interfaces for 328-ft. (100 m) extension.



Customer Support Information

Order toll-free in the U.S.: Call 877-877-BBOX (outside U.S. call 724-746-5500)
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

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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.

We're here to help! If you have any questions about your application or our products, contact Black Box Tech Support at **724-746-5500** or go to **blackbox.com** and click on "Talk to Black Box." You'll be live with one of our technical experts in less than 30 seconds.

Instrucciones de Seguridad (Normas Oficiales Mexicanas Electrical Safety Statement)

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 debe 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.

Safety Information

Safety Information

NOTE: THIS SAFETY INFORMATION IS OF A GENERAL NATURE AND MAY BE SUPERSEDED BY INSTRUCTIONS CONTAINED WITHIN THIS MANUAL.

1. Save the carton and packing material even if the equipment has arrived in good condition. If you ever need to ship the unit, use only the original factory packing.
2. Read all documentation before operating your equipment. Retain all documentation for future reference.
3. Follow all instructions printed on unit chassis for proper operation.
4. Do not spill water or other liquids into or on the unit, or operate the unit while standing in liquid.
5. Make sure power outlets conform to the power requirements listed on the back of the unit.
6. Do not use the unit if the electrical power cord is frayed or broken. The power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords and plugs, convenience receptacles, and the point where they exit.
7. Always operate the unit with the AC ground wire connected to the electrical system ground. Precautions should be taken so that the means of grounding of a piece of equipment is not defeated.
8. Voltage must be correct and the same as that printed on the rear of the unit. Damage caused by connection to improper AC voltage is not covered by any warranty.
9. Power down and disconnect the unit from mains voltage before making connections.
10. Never hold a power switch in the "ON" position.
11. Do not use the unit near stoves, heat registers, radiators, or other heat-producing devices.
12. Do not block fan intake or exhaust ports. Do not operate equipment on a surface or in an environment which may impede the normal flow of air around the unit, such as a bed, rug, carpet, or completely enclosed rack. If the unit is used in an extremely dusty or smoky environment, the unit should be periodically "blown free" of foreign matter.
13. Do not remove the cover. Removing the cover will expose you to potentially dangerous voltages. There are no user serviceable parts inside.
14. Do not drive the inputs with a signal level greater than that required to drive equipment to full output.
15. Non-use periods. The power cord of equipment should be unplugged from the outlet when left unused for a long period of time.
16. Service information equipment should be serviced by qualified service personnel when:
 - A. The power supply cord or the plug has been damaged.
 - B. Objects have fallen, or liquid has been spilled into the equipment.
 - C. The equipment has been exposed to rain.
 - D. The equipment does not appear to operate normally, or exhibits a marked change in performance
 - E. The equipment has been dropped, or the enclosure damaged.

IMPORTANT SAFETY INSTRUCTIONS

To get the best from this product, please read this manual carefully. Keep it in a safe place for future reference.

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS ARE INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

Do not force switched or external connections.

When moving the unit, disconnect the serial port connections first, then the power cable, and finally the interconnecting cables to other devices.

Do not attempt to clean the unit with chemical solvents or aerosol cleaners, as this may damage the unit. Use a clean dry cloth.

Installation of this unit should be in a cool, dry place, away from sources of excessive heat, vibration, dust, moisture, and cold.

WARNING: To prevent electric shock do not use the (polarized) plug with an extension cord, receptacle, or other outlet unless the blades can be fully inserted to prevent blade exposure. To prevent electric shock, match wide blade of plug to wide slot; fully insert.

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1. Specifications

Technical Specifications

Approvals	CE, FCC, RoHS, REACH
Audio Support	Supports DVI-Audio input and SPDIF output
Controls	IR remote control, IR external port with (1) 3.5-mm earphone jack, Select and Function buttons on front panel, RS-232 or Ethernet series interface, (8) IR room remote controls
Color	Black
Digital Audio Support	Multi audio formats 5.1/7.1, MAT (MLP), Dolby Digital, Dolby TrueHD, Dolby Digital Plus, DTS, DTS-ES-6CH, DTS-HD, DTS-HD-HRA, DTS-HD Master, (PCM-2CH)
Digital Video Support	HD: 480i, 480p, 720p, 1080i, 1080p, up to 36-bit deep color
Function Control Key	ALL/OFF/RECALL/ENTER/MEMORY/LOCK/EDID
HDCP/CEC Support	HDCP 2.0 compliant, CEC compliant
HDMI I/O Connector	HDMI Type A, SMD 19-pin female
HDMI Support	HD 1080p @ 60 Hz, H36-bit deep color, 3D (1.4a) formats
Infrared Frequency	38 kHz
IR External Distance	1000 feet (300 m) maximum
ESD Protection	Human body model: ± 10 kV (air-gap discharge); ± 6 kV (contact discharge)
Number of Rack Units	1U, fits in 19" rack (using the included rackmount brackets)
Source Status	Automatically scan sources inputs via LED
Video Bandwidth	Double data rates: 340 MHz, total 6.75 Gbps bandwidth

Chapter 1: Specifications

Technical Specifications (continued)

Connectors	<p>AVSW-HDMI8X8-X:</p> <p>Input:</p> <ul style="list-style-type: none">(8) HDMI (sources),(8) 3.5-mm analog audio,(8) DB9 RS-232 for extension,(9) IR extension ports (1 to all, 8 for each); <p>Output:</p> <ul style="list-style-type: none">(8) HDMI (sinks);(8) HDBaseT® ports (CAT6/6A/7 cable),(8) RJ-45 CATx (HDBaseT via Category 6/6a/7 cable),(8) SPDIF audio,(9) IR extension ports (1 to all, 8 for each); <p>Control:</p> <ul style="list-style-type: none">(1) DB9 RS-232 for serial control,(1) RJ-45 for telnet control,(1) IR extension port; <p>AVSW-HDMI-RX:</p> <p>Input:</p> <ul style="list-style-type: none">(1) HDBaseT port,(1) IR extension port; <p>Output:</p> <ul style="list-style-type: none">(1) HDMI (sink),(1) 3.5-mm analog audio,(1) RS-232 (control),(1) IR extension port,(2) RJ-45 (unused)
Environment	Temperature: 32 to 100° F (0 to 38° C)
Power	AVX-HDMI8X8-X, AVSW-HDMI-RX Input: 100-240 VAC, 50/60 Hz, internal power supply; Consumption: 10 A maximum
Dimensions	1.75"H x 19"W x 9.85"D (4.4 x 48.2 x 25 cm)
Weight	7.91 lb. (4.75 kg)

2. Overview

2.1 Introduction

The AVSW-HDMI8X8-X is a high-performance 8 x 8 matrix routing switch with (8) HDMI plus DVI-audio inputs. It supports (8) HDMI with SPDIF audio outputs and (8) HDBaseT outputs simultaneously. The AVSW-HDMI8X8-X is based on HDBaseT technology and supports full-resolution HDMI video with embedded audio, RS-232, and IR bi-directional signals, all over a single CATx cable.

With a signal bandwidth of 340 MHz, there is no signal degradation. High-definition digital signals can be selected and distributed to any 16 outputs simultaneously (8 channels x 2). The switch complies with CEC and HDM 2.0 standards, HDMI V1.4a 3D formats, and data rates up to 6.75 Gbps. It also supports UXGA/WUXGA/DVI 1920 x 1200 resolution to any HD displays.

The AVSW-HDMI8X8-X has one CAT6/6A and HDMI connector for each output, effectively making this an 8 x 16 switch (same signal on both outputs). One RJ-45 connection on each output extends the HDMI signal to remote locations via HDBaseT CATx cable extended to the HDBaseT Receiver (AVSW-HDMI-RX).

You can select the EDID from eight different modes. Control the switch via front-panel push buttons, IR remote, or via RS-232 or TCP/IP (not a Web browser).

2.2 Features

- Matrix switches (8) HDMI with DVI-audio source devices to (8) HDMI with HDMI/DVI SPDIF and (8) CATx (6/6A/7) device extender output devices.
- Supports HDMI digital video w/embedded audio, DVI format, and complies with CEC/HDCP 2.0.
- Includes (7) function key controls.
- Supports worldwide EDID modes for HDTV resolutions.
- Enables link speeds of up to 6.75 Gbps (link clock rate of 340MHz), and supports HDMI 1.4a 3D formats.
- Supports DVI audio input and SPDIF (LPCM 2-CH or maximum 5.1CH output).
- Works with wide range of HD resolutions from PC XGA to WUXGA 1920 x 1200 and HDTV/TV resolutions 480i/480p, 576i/576p, 720p, 1080i, and 1080p.
- Compatible with all HDMI source devices, PC monitors, plasma HD displays, HDTV, and audio receivers/amplifiers.
- Provides digital video TMDS formats resolution up to 1080p-60 with deep color 36-bit.
- Supports digital audio: Dolby TrueHD, Dolby Digital, Dolby Digital Plug/ex, DTS, DTS-HD, DTS-HD Master, DTS-EX, PCM, PCM2, LPCM2.
- Choose from four ways to control the user interface: Windows based GUI control via TCP/IP port (not a Web browser), front-panel push button, IR wireless remote control, and third-party RS-232 controller (via simple ASCII).
- Supports worldwide control functions: ALL/OFF/RECALL/ENTER/MEMORY/EDID/LOCK.
- Supports EDID modes:
 - Embedded EDID modes: FSS/H24-3D-M/H36-3D/H36-3D-M/DVI-D 1280x1024-60 Hz/DVI-D 1920x1200-60 Hz/AUTO.
 - External modes: Learning mode.
- Front-panel LEDs automatically show active input and output status.
- Supports IR Remote and IR Extender with distance up to 1000 feet (300 m) maximum.
- Provides EDID configuration via Internal modes.

Chapter 2: Overview

- Consumer Electronic Control (CEC) switch can be all open or OFF.
- Remembers the last state during a power cycle.
- When power is removed and resorted, the last configuration will be restored.

2.3 What's Included

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

AVSW-HDMI-8X8-X includes:

- (1) XR 8 x 8 HDMI Matrix Switch with Audio
- (1) power cord
- (1) DB9 male-female cable
- (9) remote controls (1 main, 8 receiver remotes)
- (1) IR extender receiver kit
- (4) IR transmitter cables
- (4) IR receiver cables
- (4) IR extender transmitter sets
- (4) IR extender receiver sets
- (1) RS-232 Cable
- (1) 19" rackmounting kit
- (1) CD-ROM containing this user's manual in PDF format

AVSW-HDMI-RX includes:

- (1) XR HDMI Matrix Switch Receiver
- (1) 12-V, 2-A power supply w/cord
- (2) IR cables (1 in, 1 out)

2.4 Hardware Description

Figure 2-1 shows the front panel of the switch, and Figure 2-2 shows its back panel. Tables 2-1 and 2-2 describe the components.

2.4.1 Front Panel of the AVSW-HDMI8X8-X

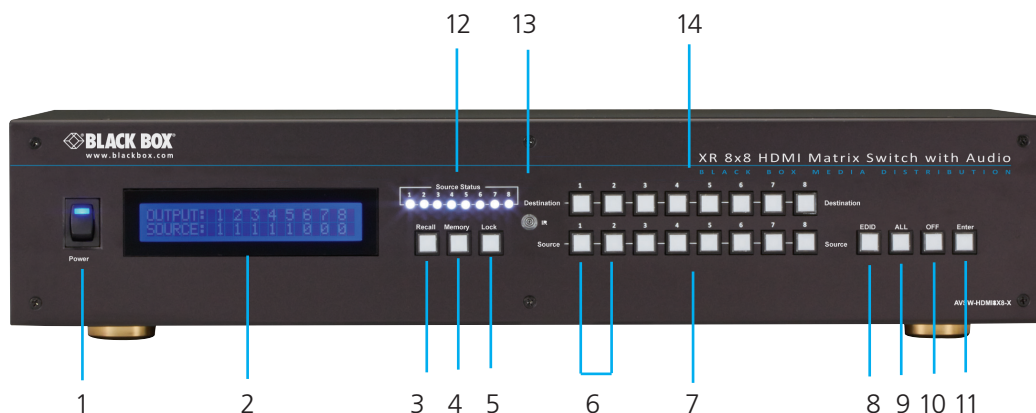


Figure 2-1. Front panel.

Table 2-1. Front panel components.

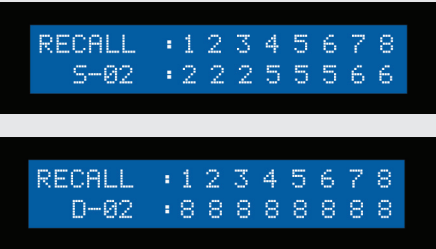
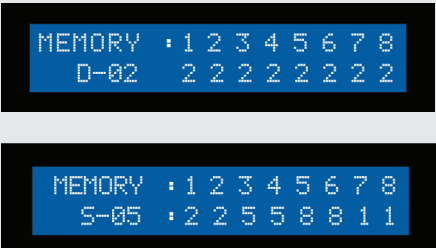
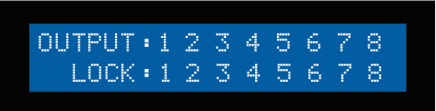
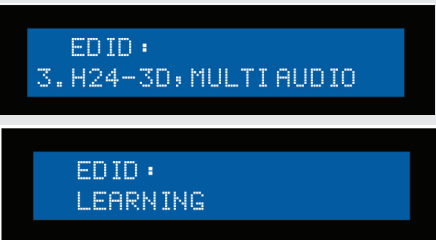


Number	Component	Description
1	Power Switch	The power switch turns the unit on and off. The LED will light red to indicate that the switch is on and is receiving power. The switch will remember that last state during a power cycle. When power is removed and restored, the last configuration will be used.
2	Output Status Display	Each output (destination) channel shows which input (source) is assigned.
3	Function Key — RECALL 	<p>The system will show previously stored presets, up to a total of 16. Presets are stored in local memory using Source keys 1 through 8 or Destination keys 1 through 8 as the memory preset location.</p> <ul style="list-style-type: none"> • Press the RECALL button. • Press 1 through 8 in either Source or Destination row. • Press ENTER. The preset configuration will execute. Operation completes. <p><i>NOTE: Operation will abort if no keys are pressed within 5 seconds.</i></p>
4	Function Key—MEMORY 	<p>The system will store presets, up to a total of 16. Presets are stored in local memory using Source keys 1 through 8 or Destination keys 1 through 8 as the memory preset location.</p> <ul style="list-style-type: none"> • Configure desired matrices. • Press the MEMORY button. • Press 1 through 8 on either Source or Destination row. • Press ENTER to ready memory location. • Or press MEMORY again to cancel operation. <p>Operation completes.</p> <p><i>NOTE: Operation will abort if no keys are pressed within 5 seconds.</i></p>
5	Function Key — LOCK 	<ul style="list-style-type: none"> • Press and hold the LOCK button for two seconds to lockout the front panel. • Press and hold the LOCK button for two seconds to re-enable the front panel.
6	EDID Mode Select Buttons	Select EDID mode using Buttons #1 and 2.
7	Source Select Buttons	Separate inputs 1 through 8 select buttons are provided for each source selection.
8	Function Key — EDID 	<p>Press EDID to select new EDID mode and select source button #1 or #2 to change embedded EDID mode.</p> <p>Press the Destination number to learn EDID. The Destination EDID has been learned.</p> <p>Press the Destination number multiple times to switch between local and HDBaseT EDID.</p>

Table 2-1 (Continued). Front panel components.

Number	Component	Description
9	Function Key — ALL 	Disables (mute) video on all destinations OR selects the same source to all destinations. Option 1: Press ALL followed by the OFF button. The display will show "0," indicating that all destinations have no video selected. Option 2: Press ALL followed by Source 1 through 8. The display will show the source selected. Press ENTER and the preset source selection will be assigned to all destinations.
10	Function Key — OFF 	Disables (mutes) video to selected channels. <ul style="list-style-type: none"> • Press the OFF button followed by any destination channel. • Press button 1 through 8 to select the output destination. The display will show "0" for the selected channel indicating no video selected.
11	Function Key – ENTER	Press the ENTER key to confirm entries.
12	Input Status Display	Input source 1 to 8 LED lights blue to indicate that a video source is present on that input.
13	IR Sensor	The IR sensor receives IR commands from the supplied remote control or third-party emitter.
14	Destination Select Buttons	Separate outputs 1 through 8 select buttons are provided for each destination assignment. Routing can be source to destination or one source to multiple destinations. Example: Press Destination 1, 3, 5, then press Source 2. The switch will route Input 12 to Output 1, 3, 5, respectively.
15 (not shown)	19" rackmount brackets	Brackets included to install the switch in a 19" rack. (Brackets not shown in Figure 2-1; they attach to the sides of the switch.)

2.4.2 Rear Panel of the AVSW-HDMI8X8-X

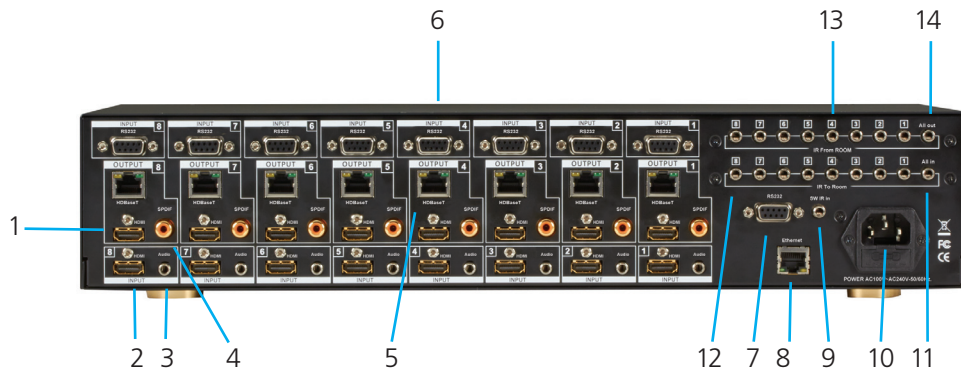


Figure 2-2. Rear panel.

Table 2-2. Rear panel components.

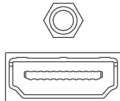
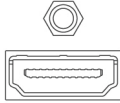


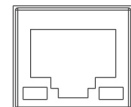
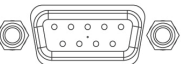
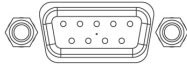
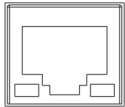






Number	Component	Connector	Connector Description	Component Description
1	Outputs 1–8 HDMI	HDMI out 	HDMI digital video/audio connector with fix screw. <i>NOTE: With the proper adapters, you can use the switch with DVI digital video signals. HDCP compliant.</i>	Connect a signal link of HDMI direct digital video/audio to this female HDMI connector. The connector supports HDMI digital video/audio and DVI digital video sources.
2	Inputs 1–8 HDMI	HDMI in 	HDMI digital video/audio connector with fix screw. <i>NOTE: With the proper adapters, you can use the switch with DVI digital video signals. HDCP compliant.</i>	Connect a signal link of HDMI direct digital video/audio to this female HDMI connector. The connector supports HDMI digital video/audio and DVI digital video sources.
3	3.5-mm audio jack	Analog audio in 	DVI audio	Connect an analog audio input when used with DVI digital video sources. The audio will be embedded into the HDMI signal.
4	Inputs 1–8 audio	SPDIF out 	SPDIF: Use RCA connector with HDMI or DVI digital audio signals output.	Connect SPDIF digital audio output to an audio amplifier.
5	Outputs 1–8 HDBaseT	RJ-45 out 	HDBaseT output	Connect CAT6/6A/7 to AVSW-HDMI-RX unit for HDBaseT extension.
6	(8) DB9 connectors	RS-232 ports 1–8 connections to control room 	Remote port: DB9 female connector	Eight RS-232 control ports interface to a PC, such as a computer, or touch panel control, to the switch via this DB9 female conector for serial RS-232 control through the HDBaseT receiver.

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

Number	Component	Connector	Connector Description	Component Description
7	RS-232 Connection		Remote port: DB9 female connector	RS-232 control port enables interfacing a PC, computer, or touch panel to the switch via the DB9 female connector for serial RS-232 control. <i>NOTE: The Ethernet port and RS-232 port cannot be used simultaneously. Any connection to the Ethernet port will disable serial commands sent to the RS-232 port.</i>
8	Ethernet Connection		Control the switch, RJ-45 female connector	The Ethernet control port enables TCP interfacing to a PC or media control system (not a Web browser) to the switch via the RJ-45 connector to control the matrix switch. <i>NOTE: The Ethernet port and RS-232 port cannot be used simultaneously. Any connection to the Ethernet port will disable serial commands sent to the RS-232 port.</i>
9	IR Extender Control		IR extender jack: Female jack: inner OID 3.5-mm	Support one IR Extender. When you plug the external IR extender into the switch, the front panel IR receiver remains active.
10	AC Power Inlet	 3-prong power plug	Power plug: Power input: 100–240 VAC, 50/60 Hz, 10 A	The switch has an AC power plug input connector.
11	(1) IR extender jack	 IR all out: IR signal from room	IR extender jack: 3.5-mm female connector	IR all out: IR signal from room Support eight IR remote signals from eight rooms via ALL OUT port. Extend cable distance up to 1000 feet (300 m) maximum. When you plug the CAT5e/6/7 IR extender into the external port, the room IR receivers remain active.
12	IR remote inputs 1–8	 Ports 1–8 IR signal to room	IR signal to room: IR Extender 3.5-mm jack	Support eight IR extenders to control signals to eight rooms. Extend cable distance up to 1000 feet (300 m) maximum. When you plug the CAT5e/6/7 extender into the external port, the room IR receiver remains active.
13	IR remote output	 Ports 1–8 IR signal from room	IR extender jack: 3.5-mm female	Supports eight IR extenders to receive signals from eight rooms. Extend the cable distance to 1000 feet (300 m) maximum. When you plug the CAT5e/6/7 IR extender into the external port, the room IR receiver remains active.
14	(1) IR extender jack	 IR all in: IR signal to room	IR extender jack: 3.5-mm female	Supports eight IR remote signals to control eight rooms via ALL IN port. Extends cable distance up to 1000 feet (300 m) maximum. When you plug the CAT5e/6/7 IR extender into the external port, the room IR receiver remains active.

2.4.3 Front and Rear Panels of the AVSW-HDMI-RX

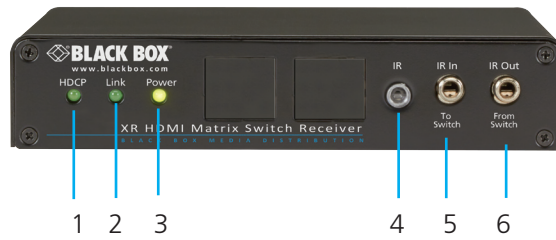


Figure 2-3. AVSW-HDMI-RX front panel.

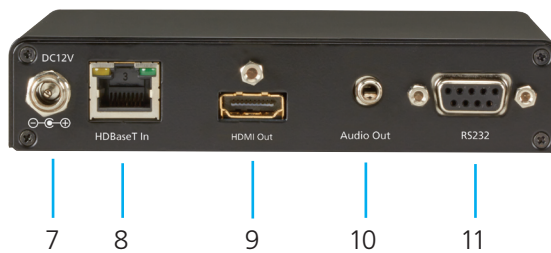


Figure 2-4. AVSW-HDMI-RX back panel.

Table 2-3. AVSW-HDMI-RX components.

Number	Component	Description
1	HDCP LED	Lights when HDCP video is connected
2	Link LED	Lights when linked to the switch
3	Power LED	Light when power to the receiver is on
4	IR	Used with remote to switch this output only
5	IR in port	To switch
6	IR out port	From switch
7	Power connector	Links to 12-VDC power supply
8	RJ-45 connector	HDBaseT in
9	HDMI connector	HDMI out
10	3.5-mm connector	Audio out
11	DB9 connector	RS-232 port for extension

Chapter 3: Installation

3. Installation

3.1 Installation Diagram

Figure 3-1 shows a sample application using the 8x8 HDMI Matrix Switch (AVSW-HDMI8X8-X) and the Receiver (AVX-HDMI-RX).

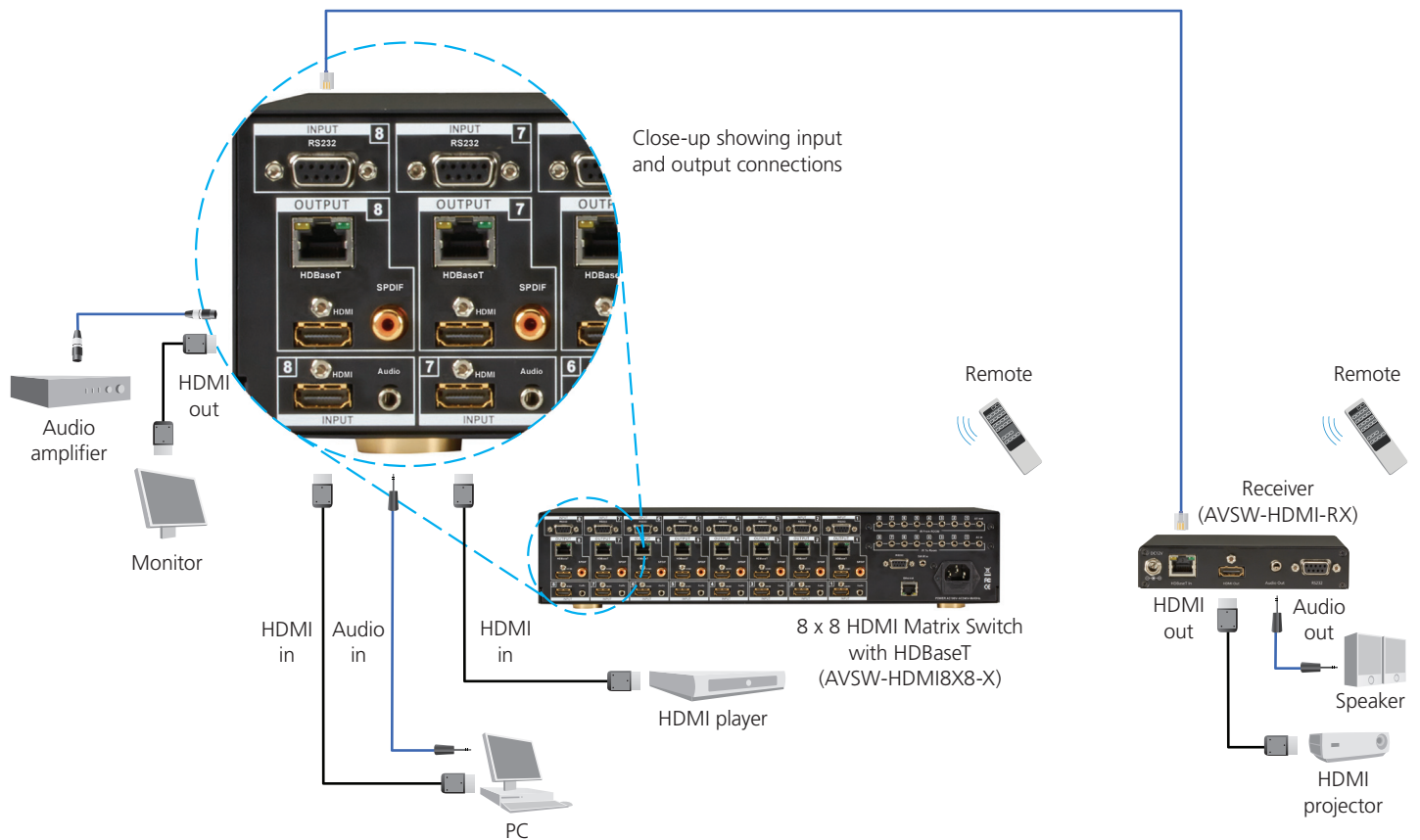


Figure 3-1. Typical application using the 8 x 8 HDMI Matrix Switch.

3.2 IR Extender

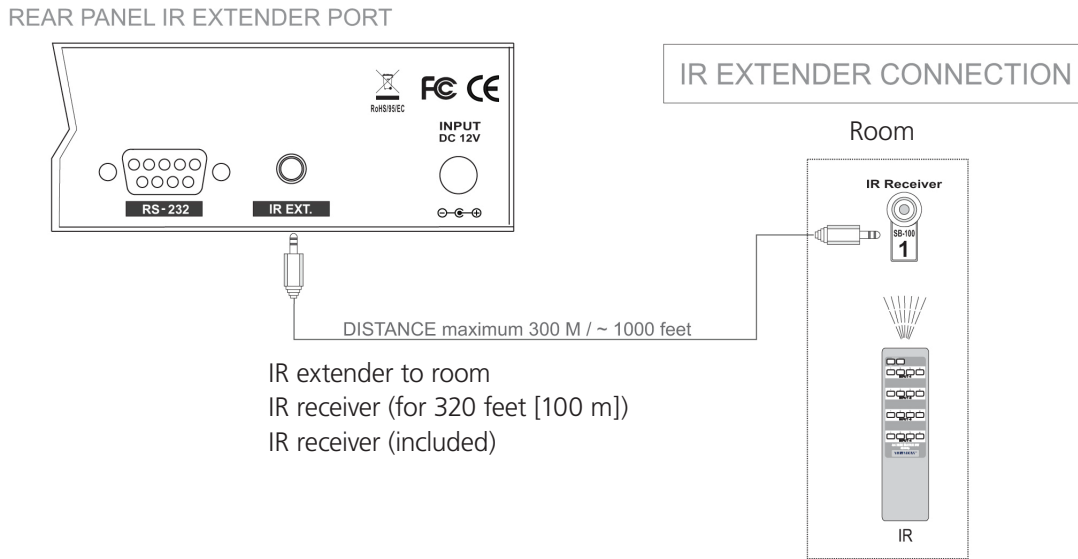


Figure 3-2. IR extender connection.

NOTE: When you plug the external IR extender into the switch, the front panel IR receiver remains active.

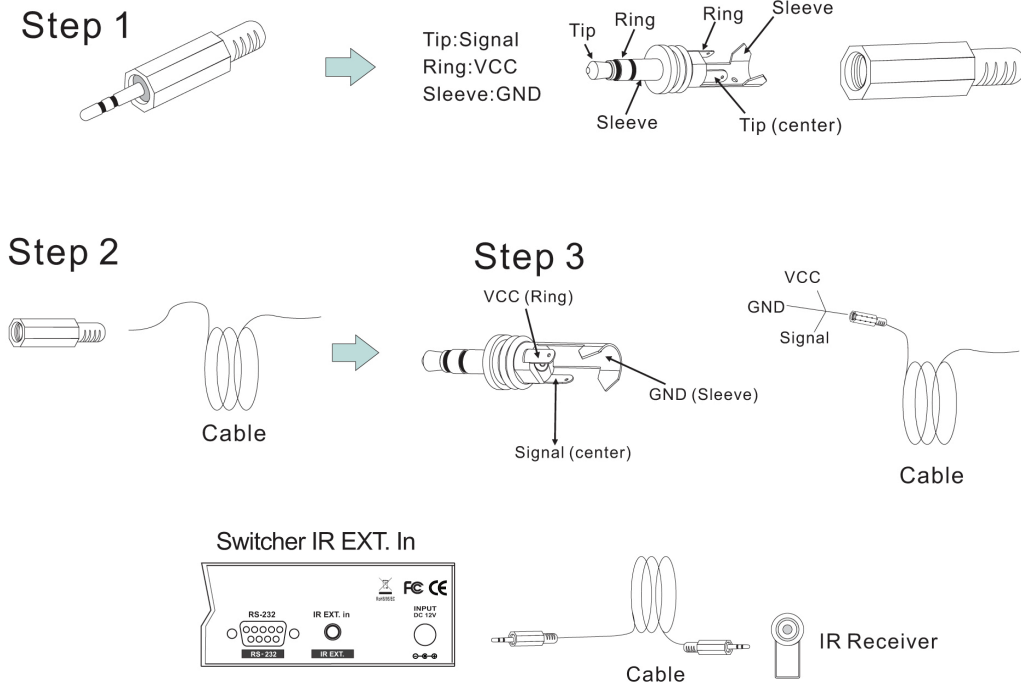


Figure 3-3. How to set up the IR extender components: Steps 1-3

Chapter 4: Operation

4. Operation

4.1 EDID Setup



Table 4-1. EDID function setup for HDMI matrix switch: change the EDID setup.

Step Number	Action	Result
Step 1	Press the EDID button.	The display will show the currently selected EDID mode.
Step 2	Press the SOURCE #1 or #2 button row	The button will flash blue and the display will show the current Embedded EDID status.
Step 3	Press the ENTER button	Set EDID mode. The switch will return to operation mode.

NOTE: Operation will abort if no keys are pressed within five seconds.


4.2 RESET

Table 4-2. Reset function for HDMI matrix switch.

RESET	EDID return to factory default
	<ol style="list-style-type: none">1. Reset to the factory default (1080p-2CH).2. Press the EDID button. The LCM will show the current EDID status.3. Press the RECALL button. The LCM will show the RESET EDID.
To Reset EDID mode: Press EDID > RECALL > ENTER	 <ol style="list-style-type: none">4. Press the ENTER button to confirm the entries. The EDID will return to FSS mode and resolution 1080p-2CH. 


4.3 Embedded EDID Modes

Table 4-3. EDID function for HDMI matrix switch: select embedded EDID mode or LEARNING mode.

Embedded EDID modes	Total 8 EDID modes								
<p>Embedded EDID setup Press EDID > SOURCE > ENTER</p>	<p>Select Embedded EDID mode or LEARNING mode.</p> <ol style="list-style-type: none"> 1. Press the EDID button. The LCM will show the currently selected EDID mode.  <ol style="list-style-type: none"> 2. Repeatedly pressing the Source 1 button will cycle UP through the options. Repeatedly pressing the Source 2 button will cycle DOWN through the options. 3. Select Embedded EDID: <table border="0"> <tr> <td>Mode 1: FSS</td> <td>Mode 5: H36-3D-M</td> </tr> <tr> <td>Mode 2: H24-3D</td> <td>Mode 6: DVI-D 1280 x 1024—60 HZ</td> </tr> <tr> <td>Mode 3: H24-3D-M</td> <td>Mode 7: DVI-D 1920 x 1200—60 HZ</td> </tr> <tr> <td>Mode 4: H36-3D</td> <td>Mode 8: AUTO</td> </tr> </table>	Mode 1: FSS	Mode 5: H36-3D-M	Mode 2: H24-3D	Mode 6: DVI-D 1280 x 1024—60 HZ	Mode 3: H24-3D-M	Mode 7: DVI-D 1920 x 1200—60 HZ	Mode 4: H36-3D	Mode 8: AUTO
Mode 1: FSS	Mode 5: H36-3D-M								
Mode 2: H24-3D	Mode 6: DVI-D 1280 x 1024—60 HZ								
Mode 3: H24-3D-M	Mode 7: DVI-D 1920 x 1200—60 HZ								
Mode 4: H36-3D	Mode 8: AUTO								

4.4 LEARNING EDID








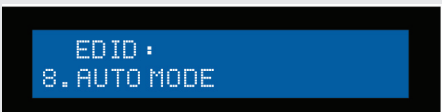
Table 4-4. LEARNING EDID function for HDMI matrix switch.

LEARNING EDID	Learning EDID form Destination to Source
<p>LEARNING EDID setup: Press EDID > DESTINATION > SOURCE > ENTER</p>	<p>Press EDID > DESTINATION button: The LCM will show LEARNING.</p>  <p>The switch will learn the destination EDID and pass the selected source.</p> <p><i>NOTE: The already learned EDID cannot be modified. You can only rebuild a new Learning EDID.</i></p> <p><i>For example, when the Source has "Learned" the EDID data from a Destination, it will save that EDID information into EPROM and the EDID data cannot change.</i></p> <p><i>To remove the learning EDID memory from EPROM, select new learning destination to sources or change one of the embedded EDID modes.</i></p>

Chapter 4: Operation

4.5 EDID Function for HDMI Matrix Switch

Table 4-5. Embedded EDID modes.

Mode Number	Embedded EDID Setup	Description
	FSS (Fast Speed Start)	
Mode 1		<p>Video support: All resolutions up to and including 1080p.</p> <p>Automatically capture the most suitable EDID from Destination to Source.</p>
	H24-3D (1080p-24 bits)	
Mode 2		<p>Video support: All resolutions up to and including 1080p.</p> <p>Audio support: PCM 2CH</p>
	H24-3D-M (1080p-24 bits)	
Mode 3		<p>Video support: All resolutions up to and including 1080p.</p> <p>Audio support: MAT (MLP) 7.1CH, PCM 2CH, one bit audio 2CH, AC3 5.1CH, DTS 5.1CH, PCM 7.1CH, Dolby Digital +7.1CH, DTS-HD 7.1CH</p>
	H36-3D (1080p-36 bits)	
Mode 4		<p>Video support: All resolutions up to and including 1080p.</p> <p>Audio support: PCM 2CH</p>
	H36-3D-M (1080p-36 bits)	
Mode 5		<p>Video support: All resolutions up to and including 1080p.</p> <p>Audio support: MAT (MLP) 7.1CH, PCM 2CH, one bit audio 2CH, AC-3 5.1CH, DTS 5.1CH, PCM 7.1CH, Dolby Digital +7.1CH, DTS-HD 7.1CH</p>
	1280 x 1024-60 Hz (DVI-D)	
Mode 6		<p>DVI support: DVI-D 1280 x 1024, 60 Hz</p>
	1920 x 1200-60 Hz (DVI-D)	
Mode 7		<p>DVI support: DVI-D 1920 x 1200, 60 Hz</p>
	AUTO <Default>	
Mode 8		<p>Video support: All resolutions up to and including 1080p.</p> <p>All outputs will be set to the highest common resolution of all connected display devices.</p>

4.6 EDID Function: LEARNING

Learning EDID: single to single.

Step Number	Action	Result
Step 1	Press the EDID button	The button will flash blue and the display will show the current Embedded EDID Status.
Step 2	Press the Destination #8 button	Copy the Destination #8 Display EDID.
Step 3	Press the Source button #5	Learning the Destination #8 EDID to Source #5.
Step 4	Press the ENTER button	Confirm entries.

Learning EDID: single to multiple.

Step Number	Action	Result
Step 1	Press the EDID button	The button will flash blue and the display will show the current Embedded EDID Status.
Step 2	Press one of the Destination buttons #1-8	Copy EDID from the selected destination.
Step 3	Press to enable all the source buttons (#1-8) to which the EDID should be copied	Copy the destination EDID to selected sources.
Step 4	Press the ENTER button	Confirm entries.

Learning EDID: single to all.

Step Number	Action	Result
Step 1	Press the EDID button	The button will flash blue and the display will show the current Embedded EDID Status.
Step 2	Press one of the Destination buttons #1-8	Copy EDID from selected destination.
Step 3	Press "All" button to select all sources	Copy the destination EDID to all sources.
Step 4	Press the ENTER button	Confirm entries.

4.7 EDID Status

EDID status.

Step Number	Action	Result
Step 1	Press the EDID button	The button will flash blue and the display will show the current Embedded EDID Status.
Step 2	Press the EDID button	To exit.

Chapter 4: Operation

4.8 How to Set Up Fast Speed Start (FSS) Function

Setting up Fast Speed Start (FSS) function.

Step Number	Action	Result
Step 1	Press the Destination #1–8 button row, then press the Source #1–8 button row	Set up and install all devices
Step 2	Press EDID button	Select an optimum status of Embedded EDID mode
Step 3	Press the ENTER button	Confirm entries
Step 4	Press the EDID button	Select the EDID FSS mode
Step 5	Press the ENTER button	Confirm entries

4.9 Auto Mode Definition

The switch will detect and automatically copy the EDID for the highest common supported video mode of the displays.

Example for a single destination:

Destination device #1 will be set to the highest common audio and video mode supported by source #1.

Example for multiple destinations:

The highest supported common audio and video mode for destination devices #1, #2, and #3 will be copied to the active source.

4.10 Consumer Electronics Control (CEC) Setup

In brief, CEC allows HDMI devices to control each other when necessary and allows the user to operate multiple devices with one remote control handset.

To enable CEC:

- Press EDID button.
- Press ALL button.
- Press EDID button. The pre-set configuration will execute.

To disable CEC:

- Press EDID button
- Press OFF button
- Press EDID button The pre-set configuration will execute.

NOTE: Not all devices support CEC. Check with your device's Users Guide for additional information and specifications. For stable operation, only connect HDMI connections with the switch powered OFF.

4.11 Front-Panel Control Functions

See Chapter 2.

4.12 Remote Control

Before making any connections to the switch, observe the following:

- Make sure that the voltage supply matches the label on the supplied plug ($\pm 10\%$).
- Make sure that the power switch is OFF.
- Make sure that all system grounds are connected to a common point.
- Avoid powering equipment with a system from multiple power sources that may be separated by large distances.
- Connect all audio video sources and destination equipment.
- Power on all source and destination audio-visual sources.
- For each destination output, select the appropriate input source by using the front-panel input 1–8 select buttons, the supplied IR remote control, or through the RS-232 serial communications port.
- Upon power up, the switch will return to its last used setting before it was powered down.

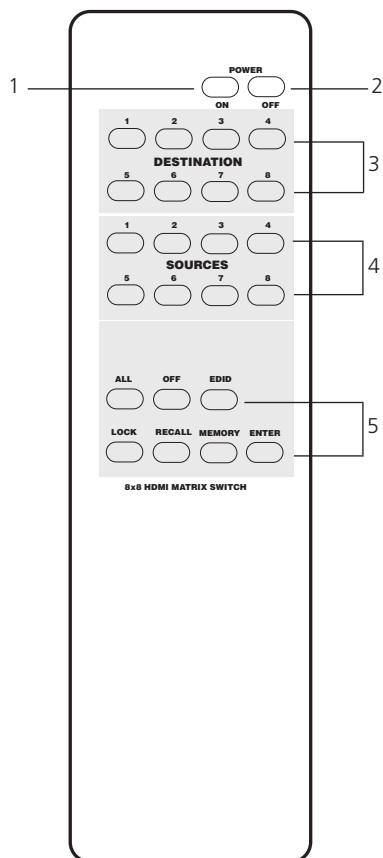


Figure 4-1. IR remote.

Table 4-6. IR Remote Control Key.

Number in Figure 4-1	Description
1	Switch Power ON
2	Switch Power OFF
3	Destination: 1–8 output selection: Press the destination button to select the output display channel
4	Source: 1–8 input source selection: Press input 1–8 sources with selection button
5	Function Keys: ALL: function selection button OFF: function selection button EDID: function selection button LOCK: function selection button RECALL: function selection button MEMORY: function selection button ENTER: function selection button

Chapter 4: Operation

4.13 IR Remote Custom and Data Codes (NEC Standard)

HOW TO SETUP IR CODES:

CUSTOM CODE: 09F6	ALL: 09F6 B04F
POWER ON: 09F6 A15E	OFF: 09F6 B14E
POWER OFF: 09F6 A25D	EDID: 09F6 B748
	LOCK: 09F6 B54A
	RECALL: 09F6 B24D
	MEMORY: 09F6 B44B
	ENTER: 09F6 B34C

PRESS DESTINATION # then PRESS SOURCE #

DESTINATION #1:	09F6 10EF	SOURCE #1 :	09F6 01FE
DESTINATION #2:	09F6 20DF	SOURCE #2 :	09F6 02FD
DESTINATION #3:	09F6 30CF	SOURCE #3 :	09F6 03FC
DESTINATION #4:	09F6 40BF	SOURCE #4 :	09F6 04FB
DESTINATION #5:	09F6 50AF	SOURCE #5 :	09F6 05FA
DESTINATION #6:	09F6 609F	SOURCE #6 :	09F6 06F9
DESTINATION #7:	09F6 708F	SOURCE #7 :	09F6 07F8
DESTINATION #8:	09F6 807F	SOURCE #8 :	09F6 08F7

For example:

Select Destination # 1 to show Source #1-8.

The IR Data Code list:

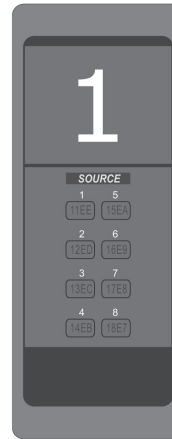
Press Destination #1, Source #1	09F6	10EF	09F6	01FE
Press Destination #1, Source #2	09F6	10EF	09F6	02FD
Press Destination #1, Source #3	09F6	10EF	09F6	03FC
Press Destination #1, Source #4	09F6	10EF	09F6	04FB
Press Destination #1, Source #5	09F6	10EF	09F6	05FA
Press Destination #1, Source #6	09F6	10EF	09F6	06F9
Press Destination #1, Source #7	09F6	10EF	09F6	07F8
Press Destination #1, Source #8	09F6	10EF	09F6	08F7

5. Room Remote Control #1-#8 Custom Code and Data Codes

NOTE: Room remote controls are used with the HDBaseT receiver units to switch outputs from a remote location. Each of the remotes controls the inputs of a specific source only. For example, to switch inputs for the receiver connected to Output 1, point the remote control numbered "1" at the receiver and select the requested source.

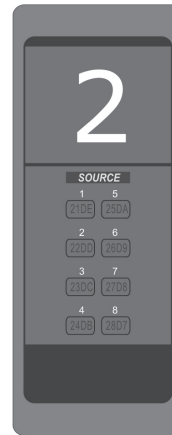
IR-01 DATA CODE

SOURCE #1 DATA CODE:
SOURCE #1: 09F6 11EE
SOURCE #2: 09F6 12ED
SOURCE #3: 09F6 13EC
SOURCE #4: 09F6 14EB
SOURCE #5: 09F6 15EA
SOURCE #6: 09F6 16E9
SOURCE #7: 09F6 17E8
SOURCE #8: 09F6 18E7



IR-02 DATA CODE

SOURCE #1 DATA CODE:
SOURCE #1: 09F6 21DE
SOURCE #2: 09F6 22DD
SOURCE #3: 09F6 23DC
SOURCE #4: 09F6 24DB
SOURCE #5: 09F6 25DA
SOURCE #6: 09F6 26D9
SOURCE #7: 09F6 27D8
SOURCE #8: 09F6 28D7



IR-03 DATA CODE

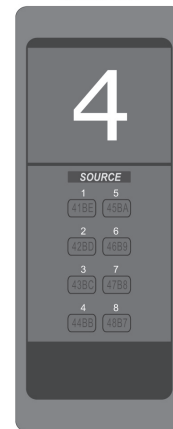
SOURCE #1 DATA CODE:
SOURCE #1: 09F6 31CE
SOURCE #2: 09F6 32CD
SOURCE #3: 09F6 33CC
SOURCE #4: 09F6 34CB
SOURCE #5: 09F6 35CA
SOURCE #6: 09F6 36C9
SOURCE #7: 09F6 37C8
SOURCE #8: 09F6 38C7



IR-04 DATA CODE

SOURCE #1 DATA CODE:

SOURCE #1: 09F6 41BE
SOURCE #2: 09F6 42BD
SOURCE #3: 09F6 43BC
SOURCE #4: 09F6 44BB
SOURCE #5: 09F6 45BA
SOURCE #6: 09F6 46B9
SOURCE #7: 09F6 47B8
SOURCE #8: 09F6 48B7



IR-05 DATA CODE

SOURCE #1 DATA CODE:

SOURCE #1: 09F6 51AE
SOURCE #2: 09F6 52AD
SOURCE #3: 09F6 53AC
SOURCE #4: 09F6 54AB
SOURCE #5: 09F6 55AA
SOURCE #6: 09F6 56A9
SOURCE #7: 09F6 57A8
SOURCE #8: 09F6 58A7



IR-06 DATA CODE

SOURCE #1 DATA CODE:

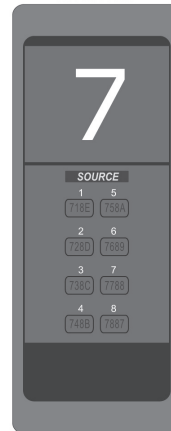
SOURCE #1: 09F6 619E
SOURCE #2: 09F6 629D
SOURCE #3: 09F6 639C
SOURCE #4: 09F6 649B
SOURCE #5: 09F6 659A
SOURCE #6: 09F6 6699
SOURCE #7: 09F6 6798
SOURCE #8: 09F6 6897



IR-07 DATA CODE

SOURCE #1 DATA CODE:

SOURCE #1: 09F6 718E
SOURCE #2: 09F6 728D
SOURCE #3: 09F6 738C
SOURCE #4: 09F6 748B
SOURCE #5: 09F6 758A
SOURCE #6: 09F6 7689
SOURCE #7: 09F6 7788
SOURCE #8: 09F6 7887



IR-08 DATA CODE

SOURCE #1 DATA CODE:

SOURCE #1: 09F6 817E
SOURCE #2: 09F6 827D
SOURCE #3: 09F6 837C
SOURCE #4: 09F6 847B
SOURCE #5: 09F6 857A
SOURCE #6: 09F6 8679
SOURCE #7: 09F6 8778
SOURCE #8: 09F6 8877



Chapter 6: Ethernet Serial Interface

6. Ethernet Serial Interface

Connect a PC to Control System, Version Compatible V2.0

NOTE: For a complete list of commands, refer to the extended Serial Protocol Instruction Manual.

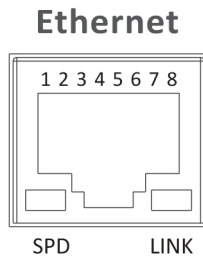


Figure 6-1. RJ-45 Ethernet connector.

Table 6-1. RJ-45 Ethernet serial interface.

Pin	Ethernet	Definition
1	TXOP	TX+
2	TXON	TX-
3	RXIP	RX+
4	—	Not used
5	—	Not used
6	RXIN	RX-
7	—	Not used
8	GND	Ground

Ethernet TCP/IP Protocol Commands (Ethernet/RS-232 Control Driver V2.0.1)

The switch can be controlled via the TCP/IP serial control port connected to a PC, or similar third-party option.

The serial communication parameters are 9600 baud, 8 bit, no parity, and 1 stop bit—this is often referred to as 9600 8N1. When the unit recognizes a complete command, it will perform the requested action—there is no delimiter character required.

7. RS-232 Serial Interface

Connect a PC or Control System Version Compatible V2.0

For a complete list of commands, refer to the extended RS-232 Protocol Instruction Manual.

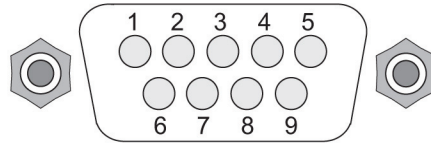


Figure 7-1. RS-232 DB9 connector.

Table 7-1. RS-232 serial interface pinouts.

Pin	RS-232	Definition
1	----	Not used
2	TX	Transmitter
3	RX	Receiver
4	----	Not used
5	GND	Ground
6	----	Not used
7	----	Not used
8	-----	Not used
9	----	Not used

RS-232 Protocol Commands

You can control the switch via the RS-232 serial control port to interface to a PC or similar third-party control system.

The serial communication parameters are 9600 baud, 8 bit, no parity, and 1 stop bit. This is often referred to as 9600 8N1. When the unit recognizes a complete command, it will perform the requested action. There is no delimiter character required.

0 = the number

O = the letter

Chapter 8: Ethernet TCP Setup Guide

8. Ethernet TCP Setup Guide

The Ethernet (TCP) port allows control of the unit via a computer by redirecting serial commands (COM port) to the unit's IP address.

To connect to the unit:

1. Set your PC within the same subnet of the unit (default address 192.168.0.3).
2. Open up a telnet connection to the unit's IP address with port 5000.
3. Send commands as you would with serial.

To change the network settings of the unit:

1. Set your PC within the same Class C subnet of the unit.
 - a. For example, if the unit's default IP address is 192.168.0.3, the PC's IP address could be 192.168.0.5.
 - b. Set your PC's netmask to 255.255.255.0.
2. Run the software included on the CD that came with the unit.
3. Click the search button and select your unit when it is found.
4. Change the unit's network setting as desired and submit.

To change your computer's network settings:

1. Set up your computer in the same network of the unit.
2. Go to "Start" and click on "Control Panel."
3. Double-click on "Network Connections."
4. Click on "Properties."
5. Click to select "Internet protocol (TCP/IP)" and click "Properties."

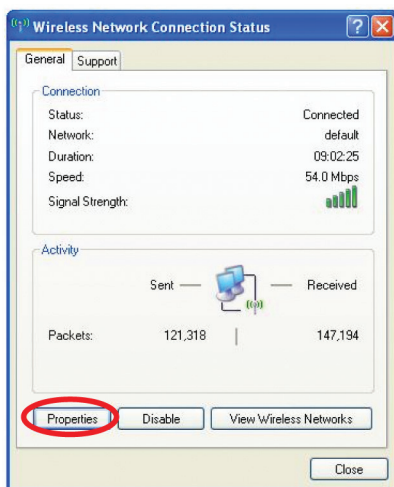


Figure 8-1. Properties selected.

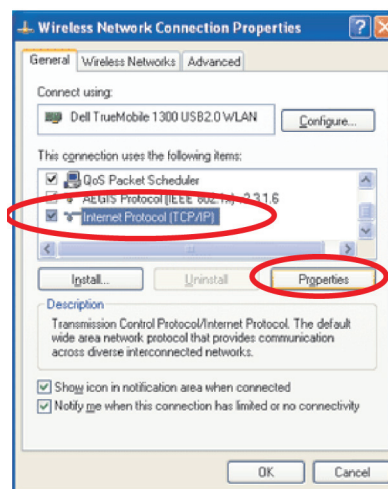


Figure 8-2. Internet protocol selected.

9. Troubleshooting

9.1 Contacting Black Box

If you determine that your 8X8 HDMI Matrix Switch is malfunctioning, do not attempt to alter or repair the unit. It contains no user-serviceable parts. Contact Black Box Technical Support at 724-746-5500 or info@blackbox.com.

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.

9.2 Shipping and Packaging

If you need to transport or ship your 8X8 HDMI Matrix Switch:

- Package it carefully. We recommend that you use the original container.
- If you are returning the unit, make sure you include everything you received with it. Before you ship for return or repair, contact Black Box to get a Return Authorization (RA) number.

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AVSW-HDMI8X8-X, version 1

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