Control 4 ®

Audio Matrix Switch – 16
Installation and User Guide

AVM-16S1-B

Contact Us

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Audio Matrix Switch - 16 Installation and User Guide
Part Number: 21-0140 Rev A Draft 9
Hardware Model Number: AVM-16S1-B

Contents

About This Guide

Notes, Tips, Cautions, and Warnings

Audio Matrix Switch Installation and User Guide Note, Tip, Caution, and Warning paragraphs draw your attention to safe practices and additional information which may help you avoid losing data or time.

NOTE: These contain notes on related information about the current topic.

TIP: These provide tips that may save you time or effort.

CAUTION! These provide specific cautions about improper use of equipment or failure to follow safety instructions that may cause bodily injury. DO NOT IGNORE A CAUTION!

WARNING! These provide specific warnings about improper use of equipment or failure to follow safety instructions that may cause data loss or equipment damage. DO NOT IGNORE A WARNING!

Additional Resources

The following resources are available to provide you with additional support.

▸ *Your authorized* Control4 *representative or reseller.*

▸ Control4 Web Site: http://www.Control4.com/

1 Introduction to Audio Matrix Switch

Control4 systems are uniquely configured for every customer and every site. A popular component among music lovers is the Control4 Audio Matrix Switch.

This chapter introduces the Control4 Audio Matrix Switch and its features.

Features and Benefits

▶ Switches up to 16 input sources to up to 16 simultaneous output zones.

▶ Front display for adjustments to zone settings and routing sources. (Adjustments can also be made by trained installers using Composer Pro software.)

▶ Adjustable gain, treble, bass, and balance for each zone.

▶ Audio sensing on inputs.

▶ EZ ID, which includes Light Emitting Diodes (LEDs) on the back to indicate current associations between Source Inputs and Audio Output. During setup activities, one "Source" and one "Output" LED will light to indicate a current association.

▶ Device chassis is three standard rack units (RU) tall and rack mountable configuring to EIA 19" rack standards (5.25" x 17.34" x 14").

▶ Communicates with control devices via Ethernet 10/100 port and ZigBee (a wireless standard for mesh-networking).

▶ Backlighting feature turns on with any button push or Select Dial push and stays lit for a preset time (default is 30 seconds).

Home Network Requirements

In order for Audio Matrix Switch to be managed and controlled from the Control4 user interfaces, it must communicate with the system through either a wired (Ethernet) or wireless (ZigBee) network. If you want to use an Ethernet connection for Audio Matrix Switch, ensure that your home network wiring is in place before starting your system setup.

What's in the Box

The following items are included in your Control4 Audio Matrix Switch box.

▸ Control4 Audio Matrix Switch

▸ IEC power cord

▸ This manual

About the Audio Matrix Switch

Front View with Door Opened
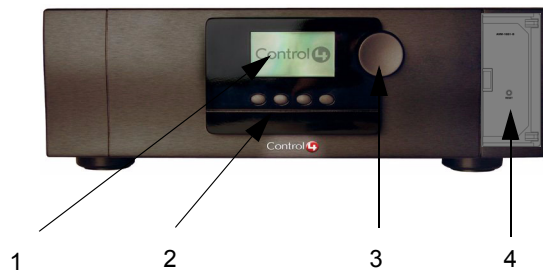
1. **Front Display**—For displaying or setting audio switch settings and navigating system menus.

2. **Buttons**—For choosing options or menus displayed in the front panel user interface.

3. **Select Dial**—For scrolling through and selecting screen elements or options displayed in the LCD.

4. **Reset Button**—For troubleshooting option behind the door to refresh the system.

Back View

1   2   3   4
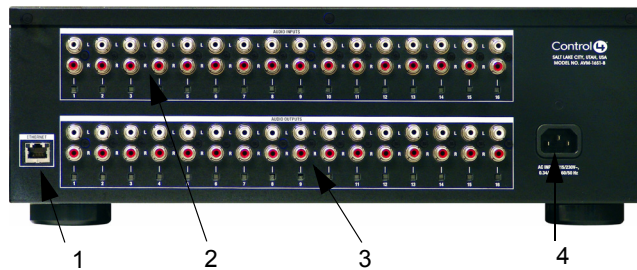
1. **Ethernet**—RJ-45 for a 10/100 Mb Ethernet connection.

2. **Audio In (Left-Right pairs) 1-16**—RCA jacks and supporting LED for stereo channel input for up to 16 stereo analog sources.

3. **Audio Out (Left-Right pairs) 1-16**—RCA jacks and supporting LED for stereo channel line output for up to 16 amplifiers.

4. **Power Plug Port**—For standard IEC cord (included). Supports universal AC input (90-240 ACV 50/60 Hz).

Source Inputs

Each of the 16 signal sensing analog audio inputs (the RCA style ports) is labeled 1-16 for each individual source.

Audio Outputs

The system automatically creates generic source names that are displayed in the front display. To change these names, you must update your system using the supported system designing software (such as Composer Pro on a PC). For more information, refer to the documentation that shipped with your Control4 controller or contact your professional installer or reseller.

Front Display

The best method of initially setting up routing for the Audio Matrix Switch is using the Composer Pro software on a PC (for trained installers only). But you can also make adjustments from the front display.

The front display allows you to set or change audio source routing and change zone settings for volume, bass, treble, and mute. The display also shows the current source and zone activity.

LED Lights

This device has EZ ID, which includes Light Emitting Diodes (LEDs) on the back to indicate current associations between Source Inputs and Audio Output. During setup activities, one "Source" and one "Output" LED will light to indicate a current association.

Technical Specifications

Table 1-1. Audio Matrix Switch Technical Specifications

Inputs	
# of Channels	16 L/R Stereo Pairs
Input Connectors	RCA Jacks
Input Impedance	10 k? typical
Nominal Input Level	-10 dBV
Maximum Output Level	+4 dBV (to be verified)
Outputs	
# of Channels	16 L/R Stereo Pairs
Output Connectors	RCA Jacks
Output Impedance	50 ? typical
Nominal Output Level	-10 dBV
Maximum Output Level	+4 dBV (to be verified)
Zone (Output) Control:	
Available Gain	Mute (-?) to -44 to +4 dB
Treble	-12 to +12 dB, 2 dB steps, ? kHz (-3dB) High Shelving EQ
Bass	-12 to +12 dB, 2 dB steps, ? Hz (-3dB) Low Shelving EQ
Balance	0 dB mid position; 0 dB on the favored side 0 to -44 dB to Mute (-?) on the unfavored side
Frequency Response:	

Table 1-1. Audio Matrix Switch Technical Specifications

Any In to Any Out	? Hz to ? kHz, +0/-3 dB
Any In to All Outs	? Hz to ? kHz, +0/-3 dB
Signal-to-Noise Ratio:	
Any In to Any Out	? dB typical, 22 Hz to 22 kHz, unweighted ? dB typical, 22 Hz to 22 kHz, A-weighted
Dynamic Range:	
Any In to Any Out	? dB typical, 22 Hz to 22 kHz, unweighted ? dB typical, 22 Hz to 22 kHz, A-weighted
THD+Noise:	
Any In to Any Out	Typically < 0.0x% at 1 kHz, -10 dBV, unity gain Typically < 0.0x%, 20 Hz to 20 kHz, -10 dBV, unity gain
Crosstalk:	
Inter-channel (any L/R In to Any L/R Out)	Typically < ? dB at 1 kHz Typically < ? dB at 1 kHz, 20 Hz to 20 kHz
Intra-channel (any L In to R Out, or R In to L Out)	Typically < ? dB at 1 kHz Typically < ? dB at 1 kHz, 20 Hz to 20 kHz
Power:	
Voltage	100 VAC to 240 VAC nominal 90 (?) VAC min to 264 VAC max
Frequency	50 to 60 Hz nominal 47 Hz min to 63 Hz max

CHAPTER 2 Set Up Audio Matrix
Switch

This device operates as part of the Control4 home
system, which requires physical and logical connections
to function as designed.

The essential setup tasks are:

1.Plan Your Physical Layout

2.Connect Input and Output Devices

3.Connect to the Network and Power

4.Set Up Logical Connections

This chapter describes, in general terms, how to set up
the *physical connections* required for the Audio Matrix
Switch and all of the devices associated with it. You
should also refer to any device-specific documentation for
additional installation instructions.

To set up the *logical connections* required, refer to
Control4 Composer Pro User Guide software
documentation.

Plan Your Physical Layout

This section explains physical and logical connections
and can help you plan your physical connections.

Use a worksheet to plan your audio zones: Using the
worksheet provided in Table 2-1 on page 10, identify the
ports you will use for each planned devices and zones.

Table 2-1. Audio Matrix Switch Routing Worksheet

RCA Pair #	Audio In Sources—RCA (Left-Right) pairs for stereo channel input for up to 16 stereo analog sources.	Audio Out Zones—RCA (Left-Right) pairs for stereo channel output for up to 16 output zones.
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		

Connect Input and Output Devices

1. Connect the audio source devices (such as CD changers or players, DVD changers or players, or tape players) you want included in the system to the Audio In jacks.

2. Connect amplifiers or amplified speakers as needed to the Audio Out jacks.

NOTE: If you are not sure which jacks to use, try using the worksheet provided in Table 2-1 to plan your routes.

Connect to the Network and Power

1. If you are using an Ethernet connection for Audio Matrix Switch, plug the data cable from the home network connection into the Audio Matrix Switch RJ-45 port (labeled "Ethernet") and the network port in your wall or at the network hub or switch.

2. Connect the power cord provided to the back of the Audio Matrix Switch and to the power outlet. Once the power cord is connected, the Audio Matrix Switch should power up.

Set Up Logical Connections

Physical and logical connections are required in order to control, navigate, and use the Audio Matrix Switch as designed.

Thus far you have set up the physical connections for the Control4 Audio Matrix Switch. To complete the logical setup, trained installers must use a PC connected to the home network with Control4 Composer software installed. If you are a trained Control4 installer, refer to the *Control4 Composer Pro User Guide*.

3 Use Audio Matrix Switch

This chapter introduces the user interface available to Audio Matrix Switch users and the common system tasks you can perform with Audio Matrix Switch from the front display.

NOTE: Following the initial setup, you may never need to overtly communicate with the Audio Matrix Switch again. This device simply assists in fulfilling a room-specific music request. To play music, use a system navigation device available to your current room to choose a specific music source or a device. That device may or may not need to make use of this switch.

View Output Assignments

Once you complete the physical and logical setup tasks, you can view or change your setup in the Audio Matrix Switch front display.

When you first power up the Audio Matrix Switch, the following System Status screen appears momentarily.

```
----------------------------
Control4

AVM-16S1-B
VER 00.01.02
----------------------------
```

The System Status screen is then replaced by the *Output to Input* screen.

```
Output to Input

1-1      5-      9-      13-

2-       6-3     10-     14-

3-4      7-      11-     15-

4-       8-      12-     16-

OUT/IN      NETWORK           DISPLAY
```

Manage Outputs

Change Output Assignments

To change up your "Output to Input" assignments:

1. Ensure your Audio Matrix Switch is powered up and that the *Output to Input* screen is displaying in the front display.

2. On the *Output to Input* screen, view the current output-to-input associations.

```
Output to Input

1-1      5-      9-      13-

2-       6-3     10-     14-

3-4      7-      11-     15-

4-       8-      12-     16-
```

```
Output to Input

OUT/IN      NETWORK          DISPLAY
```

The screen consists of 16 output zones and any assigned input source. When an input source is highlighted (as Input 1 in this example), the highlighting indicates that a signal is present.

The buttons on the front panel provide access to these menu options:

▸ **Out/In:** Displays an Output-specific screen. The most recent screen accessed is displayed by default, but you can choose to view a different output's setting by changing the Output number.

▸ **Network:** Displays a Network screen. This is essentially view-only information.

▸ **Display:** Displays the *Display Configuration* Screen.

Configure an Output

To view or change output source settings:

1. On the *Output to Input* screen, press the **Out/In** button to view the output settings of the default output screen (which is the last output screen accessed).

```
Output   3    Kitchen

Input    4    CD

Gain    -10

Treble   4

Bass    -3

Bal      0

INPUTS                       EXIT
```

From the output screen, you can: (1) change to another output screen; (2) change the output settings on the screen; or (3) toggle to the Input Signal Sensing screen.

1a. If the Output-specific screen that you want to view did not display (such as Output 3 in the previous example), use the Select Dial to highlight and select the Output number and then change it.

1b. (Optional) Change settings for the current output using the supported ranges:

▸ **Input:** Displays the number of the currently assigned input source and any label that has been given to the input source (such as "CD" in the sample provided). You can change this setting to any of the available input sources.

▸ **Gain:** Supported range: Mute and -44 to +4 dB (default: 0 dB)

▸ **Treble:** Supported range: -12 to +12 dB (default: 0 dB)

▸ **Bass:** Supported range: -12 to +12 dB (default: 0 dB)

▸ **Balance:** Supported range: -50 to +50dB (default: 0 dB)

1c. If you want to toggle to view *Input Signal Sensing* information, choose the **Inputs** button.

1d. If you want to Exit the screen, choose the **Exit** button.

2. Rotate the Select Dial to highlight a setting.

3. Press the Select Dial to enter Edit mode.

4. Rotate the dial to change the setting; then press the dial to *Save* the new setting and exit the Edit mode OR, to exit without saving, use the front panel button indicated to choose the Cancel option.

5. Press the Inputs button to go to the Input Signal Sensing screen, OR press the Exit button to return to the *Output to Input* screen.

Check Signal Status

1. From the *Output to Input* screen, press the **Out/In** button, then press the **Inputs** button to access the Input Signal Sensing screen.

```
Input Signal Sensing

1 ●      5 o       9 o      13 o

2 o      6 o      10 o      14 o

3 o      7 o      11 o      15 o

4 o      8 o      12 o      16 o

OUTPUTS                     EXIT
```

2. On the *Input Signal Sensing* screen, view a shaded circle by the device connection number of any input device with a signal present.

View Network Settings

To view network settings, access the Network settings screen. These are view-only fields: MAC Address, DHCP, IP Address, Subnet Mask, and Default Gateway Configuration. By default, the system uses DHCP.

```
Network — Ethernet

MAC             00:00:00:00:00:00
```

```
Network — Ethernet

DHCP          enabled

 IP           255.255.255.255

Mask          0.0.0.0

GWay          0.0.0.0

                        EXIT
```

Set Front Display Preferences

To set your viewing preferences for the front display:

1. On the *Output to Input* screen, press the **Display** button. The *Display Configuration* screen displays.

```
Display Configuration

Brightness:    100

Contrast:      100

Backlight Time: 10


DOWN    UP     SELECT  EXIT
```

2. Use the buttons and/or the Select Dial to choose a setting to change: Once you press the Select button (or press the dial), you enter Edit mode.

```
Display Configuration

Brightness:    100

Contrast:      100

Backlight Time: 10
```

```
DOWN     UP      SELECT   EXIT
```

3. In Edit mode, use the buttons or Select Dial to change the highlighted setting; then press the **OK** button (or press the dial) to save the change and exit Edit mode.

Brightness: Supported range: 0 to 100
Contrast: Supported range: 0 to 100
Backlight Timeout: Supported settings are:

> ▸ *OFF* (Always Off)
> ▸ *1 to 90* seconds (default is 30 seconds)
> ▸ *ON* (Always On)

CHAPTER
4 Warranty and Regulatory Compliance

Warranty

Important: Warranty terms may be different with the country of purchase; contact your Authorized Control4 Sales and Service office for detailed product warranty information.

Limited Hardware Warranty

Control4 warrants its Audio Matrix Switch product to be free from defects in material and workmanship during the warranty period. If the Audio Matrix Switch proves to be defective in material or workmanship during the warranty period, Control4 will, at its sole option, repair or replace the product with a like product. The warranty extends only to products purchased directly from Control4 Corporation or an Authorized Control4 Dealer.

How long the warranty is effective:

Control4 Audio Matrix Switch are warranted for one (1) year from the date of the first consumer purchase.

What the warranty does not cover:

▶ Misuses; unauthorized modification; opening for any reason except to perform an official upgrade using a proper tools/kit
▶ Operation or storage outside the environmental specifications for the product
▶ In-transit damage and improper maintenance
▶ Physical damage to the unit, such as a cracked or broken screen or defect resulting from use of improper software, accessories, media, supplies, consumables, or such items not designed for use with the product.

Hardware Warranty Terms

READ THESE WARRANTY TERMS CAREFULLY BEFORE
INSTALLING OR USING THE CONTROL4 SYSTEM OR
COMPONENTS. YOUR INSTALLATION AND USE OF THE
SYSTEM OR ANY OF ITS COMPONENTS INDICATES THAT
YOU AGREE TO BE BOUND BY THESE TERMS. IF YOU DO
NOT AGREE TO ALL OF THE TERMS OF THIS WARRANTY,
RETURN THE PRODUCT TO THE PLACE OF PURCHASE
FOR A FULL REFUND.

ONE-YEAR LIMITED WARRANTY

1.   WARRANTY

Control4, Corporation. ("Control4") warrants that at the time of
sale the Audio Matrix Switch (the "product") will be free from
defects in material and manufacture and will conform to
Control4's specifications for the components. Control4 further
warrants that for a period of 12 months after sale the product will
function in accordance with its specification, PROVIDED THAT
it is installed and maintained in accordance with Control4's
instructions and is not subjected to (a) alteration or
unauthorized repairs, (b) misuse or abuse, (c) Acts of God
(including without limitation hurricanes, tornadoes, floods,
earthquakes, or other severe weather or natural phenomena),
or (d) improper storage or handling or other treatment or
installations for which it was not intended. This warranty
extends only to products purchased directly from Control4 or an
Authorized Control4 Dealer.

2.   DISCLAIMER OF OTHER WARRANTIES

The preceding warranties are the exclusive and sole express
warranties given by CONTROL4. They supersede any prior,
contrary or additional representations, whether oral or written.
CONTROL4 HEREBY DISCLAIMS AND EXCLUDES ALL
OTHER WARRANTIES-WHETHER EXPRESS, IMPLIED, OR
STATUTORY-INCLUDING ANY ARISING FROM COURSE OF
DEALING OR USAGE OF TRADE, ANY WARRANTY OF

MERCHANTABILITY AND ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, except that for product purchased directly by a consumer, any implied warranties are limited in duration to the term of the express warranties provided above.

Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

3.   EXCLUSIVE REMEDY FOR ANY NONCONFORMITIES

If during the applicable Warranty Period, the product does not conform to the preceding Warranties, the Owner shall notify Control4 as provided below, and within a reasonable time Control4 will provide, at its option, one of the following: (1) a replacement product for any nonconforming or defective component (such replacement product may be new or refurbished to be comparable in function and performance to a new product) or (2) the price at which Control4 sold the non-conforming product. In the event of repair or replacement, there may be a loss of data in the memory of the product for which warranty service is sought. Control4 will not provide, and will not be liable for, labor, costs of removal or reinstallation of product, disposal, freight, taxes, or other incidental charges.

THESE REMEDIES ARE THE EXCLUSIVE AND SOLE REMEDIES FOR ANY BREACH OF WARRANTY.

For any breach of warranty, the Owner must notify Control4 in Section 7 below within thirty (30) days after discovering the nonconformity. The notice must describe the location and nature of the nonconformity. The owner must give Control4 a reasonable opportunity to the claimed nonconformity before undertaking any repairs, removal or replacement. All products returned to Control4 require a Return Merchandise Authorization (RMA) number. The RMA number is obtained from Control4 Customer Support Department. The RMA number must be clearly marked on the outside of each box. The RMA is valid for a 30-day period. After the 30-day period, the

RMA will be cancelled. Any shipments received not consistent with the RMA, or after the RMA is cancelled, will be refused. Control4 is not responsible for products returned without a valid RMA number. Compliance with the requirements of this paragraph is a condition to coverage under the Warranty: If these requirements are not complied with, Control4 will have no obligation to provide any remedy for any breach of warranty.

4. DISCLAIMER OF INCIDENTAL AND CONSEQUENTIAL DAMAGES

IN NO EVENT SHALL CONTROL4 BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, WHETHER RESULTING FROM NONDELIVERY OR FROM THE USE, MISUSE OR INABILITY TO USE THE PRODUCT OR FROM DEFECTS IN THE PRODUCT OR FROM CONTROL4'S OWN NEGLIGENCE. This exclusion applies even if the remedy provided by Control4 fails of its essential purpose.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation may not apply to you.

5. APPLICABLE LAW

This Warranty will be interpreted, construed, and enforced in all respects in accordance with the laws of the State of Utah, without reference to its choice of law rules. The U.N. Convention on Contracts for the International Sale of Goods will not apply to this Warranty.

6. SEVERABILITY

If any provision of this warranty is found to be invalid or unenforceable, then the remainder shall have full force and effect, and the invalid provision shall be partially enforced to the maximum extent permitted by law to effectuate the purpose of the agreement.

7.   ADDRESS FOR NOTICES TO CONTROL4

Control4 Corporation
11734 Election Road, Suite 200
Salt Lake City, UT 84020
Fax # 801-523-3199
Telephone # 801-523-3100

This warranty gives you specific legal rights, and you may also have other rights which vary from State to State.

Software Agreement

The Control4 Audio Matrix Switch contains preinstalled software. Please read the following Control4 terms before proceeding:

> **NOTE:** Carefully read this License Agreement and the Limited Warranty statement before operating the equipment. The rights to the software are licensed, not sold. Control4 or its licensors continue to own all intellectual property rights to the software, and you will be granted certain rights to use the software upon your acceptance of this license. Rights in the software are offered only on the condition that you agree to all terms and conditions of the License Agreement. Operating the equipment indicates your acceptance of these terms and conditions. If you do not agree to the terms and conditions of the License Agreement, return the complete package for a full refund now.

Terms that Govern Software Use

You may only use the software as designed on the device on which it comes pre-installed. You may not reverse, assemble, or decompile the software.

Limited Software Warranty, Liability, and Remedy

Important: This Control4 Software Limited Warranty shall cover all software that is provided to you, the customer, as part of the Control4 product, including any operation system software.

The Remedies provided in this document are your sole and exclusive remedies. In no event shall Control4 be liable for any direct, indirect, special, incidental, or consequential damages (including lost profit), whether based on warranty, contract, tort, or any other legal theory.

In no case shall Control4's liability exceed the purchase price for the software and/or product. The limitations set forth above will apply regardless of whether you accept the software.

Regulatory Compliance

This product complies with standards established by the following regulatory bodies:

Federal Communications Commission ("FCC")
Canadian Electromagnetic Compatibility ("EMC")
Underwriters Laboratory ("UL")

FCC Interference Statement

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

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

FCC Caution

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

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Canadian EMC Statement

This Class B digital apparatus complies with Canada ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

UL

This device is NOT yet approved by UL.