Installation and Operation Guide

It's Under Control®

AD-16x

Audio Matrix Switch

70-210163-20 V1.4

Copyright © 2022
Remote Technologies Incorporated
All rights reserved.

FEDERAL COMMUNICATIONS COMMISSION NOTICE

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

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 or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the 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.

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.
2. This device must accept any interference received including interference that may cause undesired operation.

Industry Canada Compliance Statement

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received including interference that may cause undesired operation.

Cet appareil est conforme avec Industrie Canada exempts de licence standard RSS (s). Son fonctionnement est soumis aux deux conditions suivantes:

1. Ce dispositif ne peut causer des interférences nuisibles.
2. Cet appareil doit accepter toute interférence reçue y compris des interférences qui peuvent provoquer un fonctionnement indésirable.

DECLARATION OF CONFORMITY (DOC)

The Declaration of Conformity for this product can be found on the RTI website at: www.rticontrol.com/declaration-of-conformity

SAFETY SUGGESTIONS

Read Instructions. Read all safety and operating instructions before operating the unit.

Retain Instructions. Keep the safety and operating instructions for future reference.

Heed Warnings. Adhere to all warnings on the unit and in the operating instructions.

Follow Instructions. Install and operate in accordance with the manufacturer's instructions.

Accessories. Only use attachments/accessories specified by the manufacturer.

Portable Cart Warning. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/ apparatus combination to avoid injury from tip-over.

Heat. Do not block any ventilation openings.

Heat. Keep the unit away from heat sources such as radiators, heat registers, stoves, etc., including amplifiers that produce heat.

Power. Unplug this apparatus during lightning storms or when unused for long periods of time.

Power Sources. Connect only to the power cord that was included with the unit.

Power Cord Protection. Route power supply cords so that they are not likely to be walked on or pinched by items placed on or against them, paying particular attention to the cords at plugs, at convenient receptacles, and at the point at which they exit from the unit.

Power Cord Grounding Plug. Do not remove the grounding prong of the grounding-type plug. A grounding type plug has two blades and a third grounding prong. The third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

MAINS Outlet. Where MAINS outlets are used, the apparatus shall be connected to a MAINS socket outlet with a protective earthing connection.

MAINS Plug. Where the MAINS plug or an appliance coupler is used as the disconnect device, the disconnect device shall remain readily operable.

Water and Moisture. Do not use the unit near water—for example, near a sink, in a wet basement, near a swimming pool, near an open window, etc.

Object and Liquid Entry. Do not allow objects to fall or liquids to be spilled into the enclosure through openings.

Cleaning. Clean only with dry cloth.

Servicing. Do not attempt any service beyond that described in the operating instructions. Refer all other service needs to qualified service personnel.

SAFETY SUGGESTIONS

Damage Requiring Service. The unit should be serviced by qualified service personnel when:

- Objects have fallen or liquid has been spilled into the unit.
- The power supply cord or the plug has been damaged.
- The unit does not appear to operate normally or exhibits a marked change in performance.
- The unit has been dropped or the enclosure has been damaged.

WARNING!

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THE UNIT TO RAIN OR MOISTURE.

LIMITED WARRANTY

Remote Technologies Incorporated warrants its products for a period of three (3) years from the date of purchase from Remote Technologies Incorporated or an authorized Remote Technologies Incorporated distributor.

This warranty may be enforced by the original purchaser and subsequent owners during the warranty period, so long as the original dated sales receipt or other proof of warranty coverage is presented when warranty service is required. Except as specified below, this warranty covers all defects in material and workmanship in this product. The following are not covered by the warranty:

Damage resulting from:

1. Accident, misuse, abuse, or neglect.
2. Failure to follow instructions contained in this Guide.
3. Repair or attempted repair by anyone other than Remote Technologies Incorporated.
4. Failure to perform recommended periodic maintenance.
5. Causes other than product defects, including lack of skill, competence or experience of user.
6. Shipment of this product (claims must be made to the carrier).
7. Being altered or which the serial number has been defaced, modified or removed.

Remote Technologies Incorporated is not liable for any damages caused by its products or for its failure of its products to perform, including any lost profits, lost savings, incidental damages, or consequential damages.

Remote Technologies Incorporated is not liable for damages based upon inconvenience, loss of use of the product, loss of time, interrupted operation, commercial loss, any claim made by a third party or made by you for a third party.

Remote Technologies Incorporated's liability for any defective product is limited to repair or replacement of the product, at our option.

If any component of your AD-16x Audio Distribution System needs service, please contact Remote Technologies Incorporated by telephone or E-mail for return information. **Please do not return products to Remote Technologies Incorporated without return authorization**.

DISCLAIMER

All rights are reserved. No part of this document may be photocopied, reproduced, or translated without the prior written notice of Remote Technologies Incorporated.

The information contained in this document is subject to change without notice. Remote Technologies Incorporated shall not be liable for errors or omissions contained herein or for consequential damages in connection with the furnishing, performance, or use of this guide.

AD-16x, Integration Designer, and the RTI logo are registered trademarks of Remote Technologies Incorporated.

Other brands and their products are trademarks or registered trademarks of their respective holders.

TABLE OF CONTENTS

Federal Communications Commission Notice 3
Safety Suggestions 4
Limited Warranty 6
Disclaimer 6
Table of Contents 7
Chapter 1 - Welcome 8
- Important Notes 8
- Product Contents 9
Chapter 2 - Features and Description 10
- Front Panel 11
- Rear Panel 12
- RSP-1 Remote Source Plate 14
- PDM-1 Phone/Doorbell Mute Panel 15
Chapter 3 - Installation and Operation 16
- Mounting 16
- Wiring and Connections 17
- Controlling the AD-16x 22
- Connection Diagram 24
- Configuration Using the Web Interface 26
Chapter 4 - Specifications 34
Chapter 5 - Troubleshooting 36
Chapter 6 - Service and Support 38
Index 40

CHAPTER 1 | WELCOME

Thank you for using the AD-16x Audio Matrix Switch.

Wherever you go - let the music move with you.

Ideal for large, multi-zone audio installations, the AD-16x provides routing for 16 audio sources to 16 zones, while an RTI Cool Power® amplifier (CP16i) will drive crystal clear audio to every speaker. For added convenience, the AD-16x also features eight remote source inputs, which allows devices located in other rooms to be used as a global source. If the system grows past 16 zones, up to four AD-16x units can be cascaded for up to 64 output zones. The switch also delivers complete audio management, including parametric equalizing, zone grouping, and balance control — all configurable via a convenient web interface.

Setting the AD-16x apart is the engineering that enables this matrix to become an extension of the RTI ecosystem. At the heart of this powerful integration is the AD64 two-way driver running on an RTI XP processor, providing integrators with unmatched flexibility and programming efficiency. The driver features custom project labeling, allowing integrators to name all of the zones and sources, eliminating tedious programming by ID number. Pushing the user experience to new levels, the driver also allows dynamic audio source management, which tracks the active sources. This allows a user to determine if a source is already in use and select a different one to avoid an inadvertent music change.

*NOTE: Up to eight AD-16x units may be used to reach 128 output zones using Infrared control. There is a limit of four AD-16x units when the AD64 two-way driver is used, for a maximum of 64 output zones.

IMPORTANT NOTES

Please read these important notes about the AD-16x:

- The AD-16x should be placed in an area where it is around normal room temperature (between 60°F to 90°F).
- Avoid installing the AD-16x in a location with little or no air circulation.
- Avoid installing the AD-16x in a location where it can come in contact with direct sunlight.
- Do not let the AD-16x system get wet. It should not be handled with wet hands or placed in an area where it could get wet.
- Do not subject the AD-16x to smoke, dust, or vibrations.
- Only use the power cord that is supplied with the AD-16x. Using the wrong type of power cord may result in damage.
- Do not disassemble the unit. Service of the AD-16x should be performed by authorized personnel only.

CHAPTER 1 | PRODUCT CONTENTS

Contents within the box include the following items:

- One (1) AD-16x Audio Matrix Switch
- One (1) AD-16x Faceplate
- Two (2) Rack Mounting Ears with Screws
- Four (4) Feet with Screws
- One (1) Power Cord
- One (1) Installation Guide

UNPACKING AND INSPECTION

After unpacking the AD-16x Audio Matrix Switch, save all of the packing materials in case you ever have to ship the unit.

Thoroughly inspect the AD-16x and packing materials for signs of damage. Report any damage to the carrier immediately. Report any equipment malfunctions to RTI or an authorized RTI distributor.

CHAPTER 2 | FEATURES AND DESCRIPTION

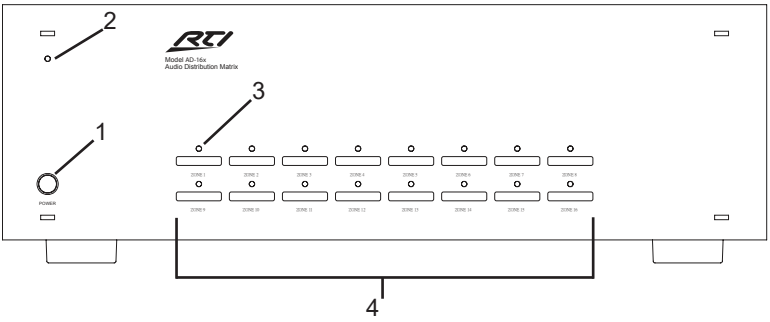
The AD-16x provides superior quality and reliability as well as these specific features:

- Provides routing of 16 stereo audio sources to 16 zones.
- Eight remote source inputs allow devices located in other rooms to be used as a global source using the RSP-1 accessory.
- Up to four AD-16x units may be source-looped, for up to 64 output zones*.
- Custom project labeling allows integrators to name all of the zones and sources for more efficient programming (via AD64 driver).
- Dynamic audio source management tracks the sources that are active, allowing users to select a different one and avoid inadvertent music changes (via AD64 driver).
- Preamp outputs require external amplification via RTI or third-party audio amplifier.
- Eight bands of parametric audio equalizing in all zones.
- Built-in web interface allows zones to be configured and grouped, allowing multiple outputs to be controlled as a single zone.
- Audio input trim adjustment on each source.
- Controlled via IP, RS-232 or Infrared.
- Optional phone and doorbell mute accessory.
- Zone power indicator LEDs.
- Rack mountable (3U rack form factor) or free standing.

*NOTE: Up to eight AD-16x units may be used to reach 128 output zones using Infrared control. There is a limit of four AD-16x units when the AD64 two-way driver is used, for a maximum of 64 output zones.

CHAPTER 2 | FEATURES AND DESCRIPTION

AD-16X FRONT PANEL



1. Power Switch

Turns AD-16x power on or off. During normal use, this switch will remain on at all times.

2. Power LED

A blue LED will be lit when power is on.

3. Zone Power LEDs

A red LED indicates that the corresponding zone is on when lit.

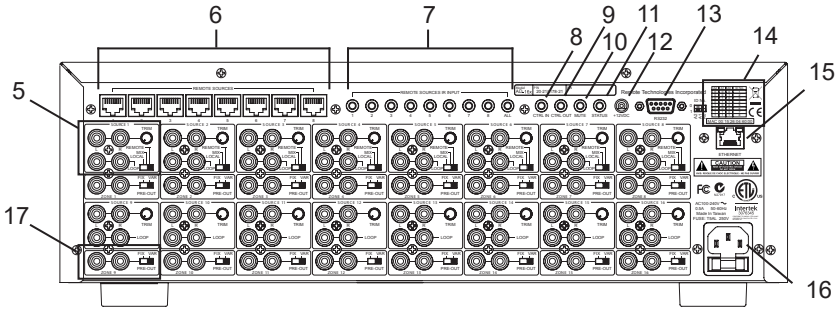
4. Zone Labels

Area for placement of a zone name labels (not included).

CHAPTER 2 | FEATURES AND DESCRIPTION

AD-16X REAR PANEL QUICK REFERENCE

NOTE: See Chapter 3 for full description and connection details.



5. Source Inputs - Loop Outputs - Trim Control - Input Switch

- **Source Inputs:** RCA inputs (Left/Right channels) for audio signal input from audio sources (tuner, music server, satellite radio etc.).
- **Loop Outputs:** These buffered loop outputs allow each source to be distributed to multiple AD-16x systems if more than 16 output zones are required.
- **Trim Control** - Used to equalize signal levels of each input source to ensure that switching between inputs will result in the same output level.
- **Input Switch - Remote/Mix/Local** - Switch determines which input source will be used (Local or Remote). NOTE: The "Mix" option will blend the local and remote audio source.

6. Remote Source Inputs

RJ-45 jacks for connection of up to eight RTI RSP-1 Remote Source wall plates (sold separately) for audio sources located remotely.

7. Remote Source IR Inputs

Mono jacks (3.5mm) for connection of infrared output from control processor to control a remote audio source when using the RSP-1.

NOTE: Use of the "All" port requires the use of the infrared high output port of an RTI control processor.

8. CTRL IN - IR Input

Mono input jack (3.5mm) for infrared control of the AD-16x.

9. CTRL OUT - IR Pass through

Mono input jack (3.5mm) allows IR to pass through from the CTRL IN port, for infrared control of additional AD-16x units (see #14).

10. Mute

Stereo input jack (3.5mm) for the connection of an RTI PDM-1 Phone/ Doorbell Mute Module (sold separately). All AD-16x output zones will mute temporarily when a phone or doorbell system sends a voltage to the PDM-1 which triggers a circuit closure that is sensed by the Mute input.

CHAPTER 2 | FEATURES AND DESCRIPTION

AD-16X REAR PANEL QUICK REFERENCE

11. Status

Mono input jack (3.5mm) provides a +12VDC voltage output when any zone is turned on (15mA max). This can be used to trigger external equipment. When all zones are turned off, 0VDC is present.

12. +12VDC

Mono input jack (3.5mm) provides a constant +12VDC output (500mA max).

13. RS-232

DB-9 jack for RS-232 control of the AD-16x from a control system.

14. ID Number - Discrete IR Control

Up to 8 AD-16x matrix switches can be installed to distribute audio sources to 128 output zones*. Each AD-16x can be assigned a unique ID number to allow discrete IR control. Discrete IR code libraries are available for each unique ID. To set the unique ID for each AD-16x unit, refer to the ID assignment chart to the right of the 3 switches and adjust as necessary.

*NOTE: Up to eight AD-16x units may be used to reach 128 output zones using Infrared control. There is a limit of four AD-16x units when the AD64 two-way driver is used, for a maximum of 64 output zones.

15. Ethernet Port

The Ethernet port (RJ45) allows for bi-directional control from an RTI XP series control processor over an Ethernet network (LAN). A two-way driver is available on the RTI website (dealer section) that will enable this type of control.

16. AC Power Socket and Fuse

A three-pin grounded socket that connects with a removable AC power cord with a T5AL 250V fuse.

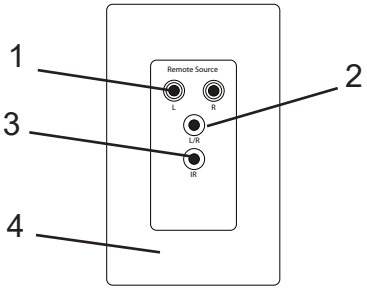
17. PRE-OUT Outputs

Provides line level audio outputs for driving external amplifiers, such as the RTI CP-16i amplifier. The switch can be set to VAR or FIX.

- **VAR** - The output level is variable and will ramp up and down with the corresponding AD-16x zone volume control.
- **FIX** - The ouput level is fixed and is not affected by the corresponding AD-16x zone volume control. **Using this setting requires an external amplifier which supports volume control.**

CHAPTER 2 | FEATURES AND DESCRIPTION

RSP-1* REMOTE SOURCE PLATE - FRONT



1. Audio Input - RCA

RCA input jacks for connection to the output (left and right channel) of a remote audio source (Satellite Tuner etc).

2. Audio Input - 3.5mm

Stereo input jack (3.5mm) for connection to the output of the remote audio source.

3. IR Output

Mono input jack (3.5mm) for connection of an IR emitter to control the remote source from a control system.

4. Decora® faceplate (not included)

Compatible with standard single-gang Decora® style faceplates.

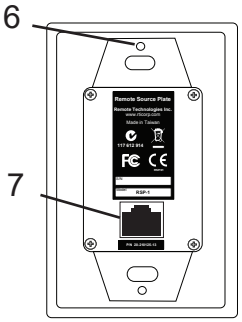
RSP-1* REMOTE SOURCE PANEL - REAR

6. Mounting holes

Use screws to mount the RSP-1 into a standard single-gang electrical box.

7. Audio and IR control - RJ-45

RJ-45 jack for connection of Cat-5/6 wiring between the AD-16x and the remote source. Carries the audio from the remote source and the IR passed through the AD-16x for control of the remote source.

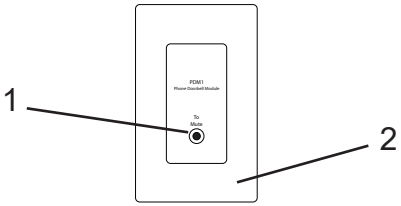


**Note: RSP-1 sold separately.*

CHAPTER 2 | FEATURES AND DESCRIPTION

PDM-1* PHONE/DOORBELL MUTE PLATE - FRONT

The back panel of the AD-16x has a 3.5mm stereo connector input labeled "Mute" that is designed to be used with the PDM-1 Phone/Doorbell Mute module. When the PDM-1 is installed, the system will temporarily mute when the phone or doorbell rings.



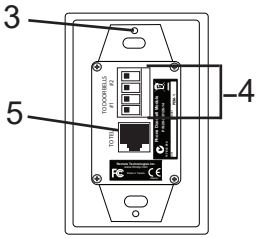
1. Phone - Doorbell Output - 3.5mm

Stereo input jack (3.5mm) for connecting to the "Mute" connection on the rear panel of the AD-16x. (See the AD-16x rear panel description)

2. Decora® faceplate (not included)

Compatible with standard single-gang Decora® style faceplates.

PDM-1 PHONE-DOORBELL MUTE MODULE - REAR



3. Mounting holes

Use screws to mount the PDM-1 in a standard single-gang electrical box.

4. Doorbell Connectors

The PDM-1 Phoenix connector will accept up to two AC or DC voltages from two different doorbell chimes. This connection is done with two conductor wire from the terminals on the doorbell chime to the Doorbell 1 or Doorbell 2 inputs on the back of the PDM-1. Polarity is not important for this connection.

5. Phone System - RJ-11

A single phone line can be brought into the RJ-11 connection on the back of the PDM-1. The ring voltage from the phone line will trigger the AD-16x system to mute.

**Note: PDM-1 sold separately.*

CHAPTER 3 | INSTALLATION AND OPERATION

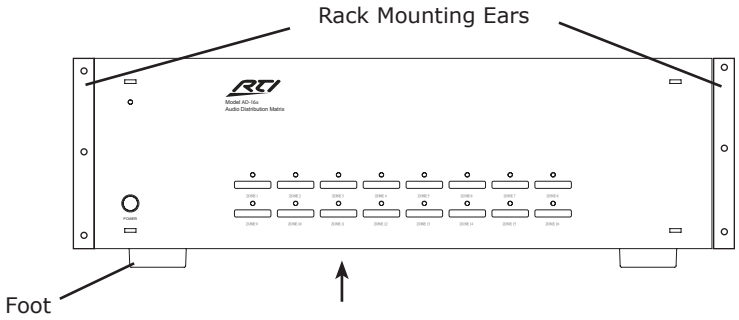
FREE STANDING INSTALLATION

The AD-16x comes with four removable feet that allow the unit to be placed on a flat surface. To maintain proper ventilation and cooling, do not install the AD-16x on a flat surface without the feet.

RACK MOUNT INSTALLATION

The AD-16x can be mounted in a component rack using the included rack mounting ears. Align the rack mounting ears with the screw holes located on the sides of the AD-16x near the front. Fasten the rack ears to the AD-16x using three screws (supplied). Remove feet before mounting in a rack.

NOTE: To maintain proper ventilation, it is recommended that you leave a rack space above and below the AD-16x.



POWER

Insert the included AC power cord into the input receptacle on the AD-16x. When the AC power cord is connected to a power source, press the Power button to turn the AD-16x on and off.

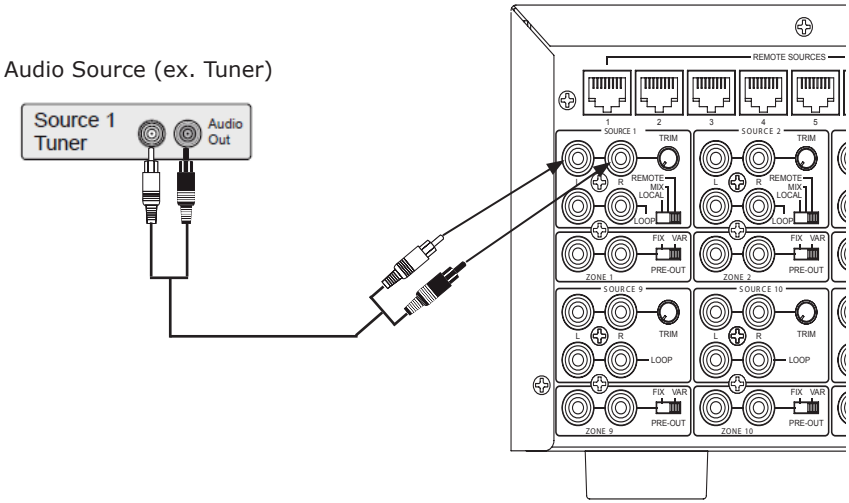
CHAPTER 3 | INSTALLATION AND OPERATION

CONNECTING LOCAL AUDIO SOURCES

The AD-16x has sixteen sets of RCA inputs for connecting up to sixteen audio sources.

- **Trim Control**: The Trim control dials on the AD-16x are used to equalize signal levels of each input source to ensure that switching between inputs will result in the same output level. The Trim Control is initially set at zero (no attenuation).
  NOTE: Adjusting the Trim Control dial will adjust the signal level of both the local source input and remote source input simultaneously. Thereby adjusting the output supplied to the Pre-Out jacks set in either FIX or VAR mode.
- **Local/Mix/Remote Switch:** This switch determines which input source will be used (Local or Remote).
  NOTE (Mix Mode): It is possible to have two audio sources wired to both the local and remote inputs for a source, and the input switch set to "Mix". In this case, it is important that both sources (local and remote) are not "on" at the same time otherwise the signal will be blended.
- **Loop Outputs:** These buffered loop outputs allow each source to be distributed to multiple AD-16x systems if more than sixteen output zones are required.

AD-16x Local Source Inputs



CHAPTER 3 | INSTALLATION AND OPERATION

WIRING FOR REMOTE AUDIO SOURCES

RSP-1 Remote Source wall plates installed for audio sources are wired to the AD-16x remote source inputs.

Use standard Cat-5/6 cable between the RSP-1 Remote Source Plate and the RJ-45 jacks on the rear of the AD-16x. The output of the remote audio source can be wired to either the stereo RCA jacks or the 3.5mm mini stereo jack on the RSP-1.

NOTE: The AD-16x can accommodate a total of 500 feet of Cat-5/6 cable for each zone. For the most reliable operation, it is best that no single run of Cat-5/6 exceeds 250 feet. The wiring scheme for the Cat-5/6 cable is standard EIA/TIA 568B.

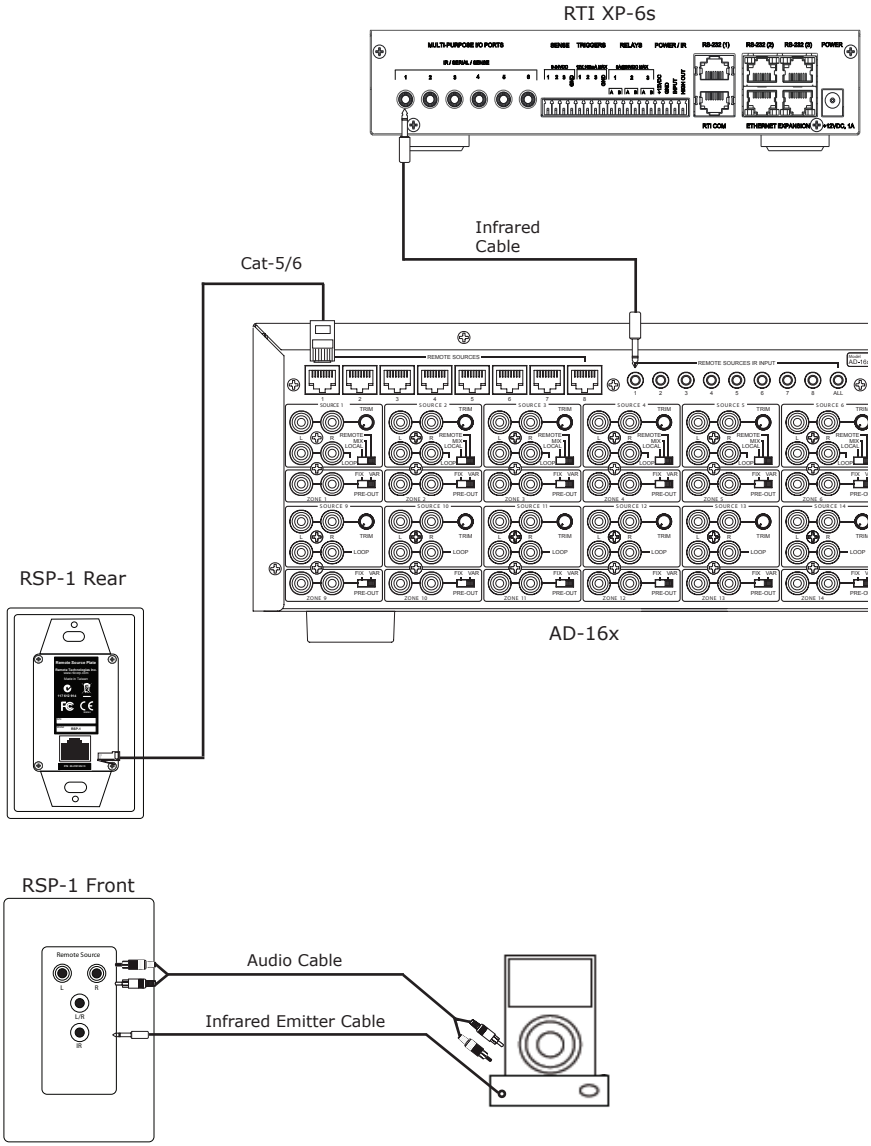
CONTROLLING REMOTE AUDIO SOURCES

The Remote Source IR Inputs allow infrared control to be passed through the AD-16x to an audio source via the Cat-5/6 cable wired to the RSP-1 Remote Source wall plate. The IR output of a control processor is wired to the remote source 3.5mm IR inputs on the rear of the AD-16x. Each remote source has an IR input for independent control. The “All” input on the AD-16x provides IR control to all remote sources when discrete control is not required.

NOTE: When using the “All” input on the AD-16x, the control processor infrared high output port must be used.

CHAPTER 3 | INSTALLATION AND OPERATION

CONNECTING REMOTE AUDIO SOURCES



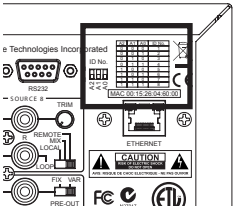
CHAPTER 3 | INSTALLATION AND OPERATION

CASCADING MULTIPLE AD-16X UNITS

It is possible to expand the number of output zones by cascading up to eight AD-16x Audio Matrix Switches together. This allows audio from sixteen sources to be distributed to 128 zones using infrared control.

*NOTE: There is a limit of four AD-16x units when the AD64 two-way driver is used, for a maximum of 64 output zones.

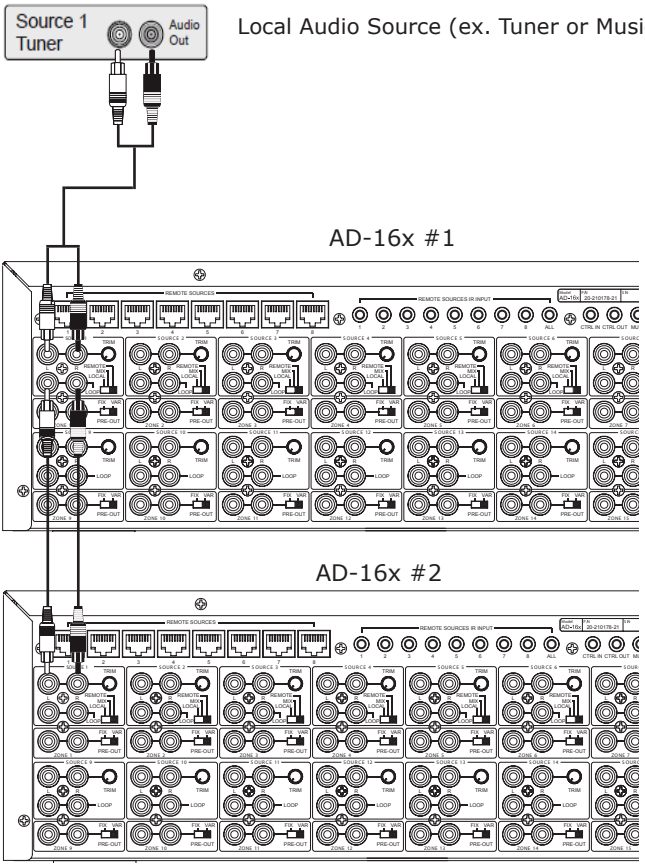
In order to control multiple AD-16x units using IR commands, each unit must have a unique ID number. Set the ID by using the 3 switches and ID assignment grid on the rear of each unit. Control via RS-232 and IP do not require this step.



AD-16x Rear

Source Cabling to Multiple AD-16x - Loop Outs

The loop output connections allow sources to be extended to the source input on additional AD-16x units. Extend audio cable from the “Loop” audio outputs to the Source Input of another AD-16x. See below.



Local Audio Source (ex. Tuner or Music Server)

CHAPTER 3 | INSTALLATION AND OPERATION

WIRING FOR MUTE INPUT

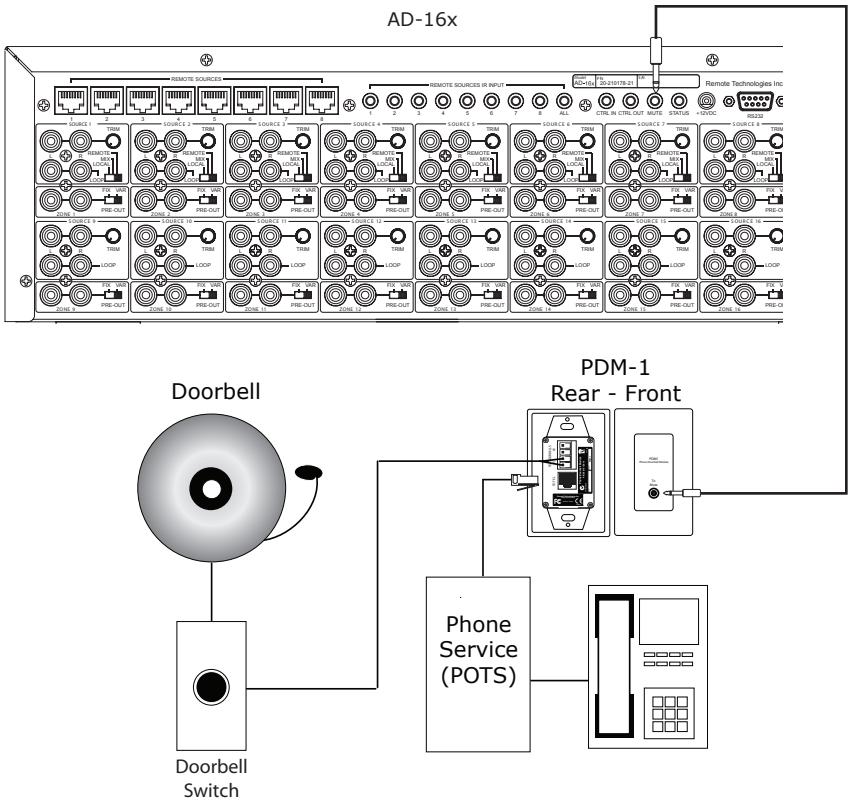
The back panel of the AD-16x has a 3.5mm non-shorting stereo connector input labeled "Mute". This is designed to be used with the PDM-1 Phone-Doorbell-Mute module. When the PDM-1 is connected, the system will temporarily mute when the phone or doorbell rings.

Doorbell

The back of PDM-1 will accept up to two AC or DC voltages from two different doorbell chimes. This connection is done with two conductor wire from the terminals on the doorbell chime to the Doorbell A or Doorbell B inputs on the back of the PDM-1. Polarity is not important for this connection.

Telephone Muting

The ring voltage from a phone line will trigger the AD-16x system to mute.



CHAPTER 3 | INSTALLATION AND OPERATION

IR CONTROL OF AD-16x - CTRL IN

This 3.5mm mono mini-jack is for infrared control of the AD-16x from a control system. A discrete set of IR codes is available within the RTI Integration Designer programming software or on the RTI website (RTI dealer section). NOTE: Mini-jack is mono with tip = IR+, ring=Gnd.

IR PASSTHROUGH TO CONTROL ADDITIONAL AD-16X - CTRL OUT

This 3.5mm mono mini-jack allows IR to "pass through" the AD-16x via the CTRL IN port, for infrared control of additional AD-16x units.

RS-232 CONTROL OF AD-16x

A DB-9 jack offers RS-232 control of the AD-16x from an RTI or third-party control system. A set of RS-232 codes is built into the Integration Designer programming software and a two-way driver is available on the RTI website (dealer section).

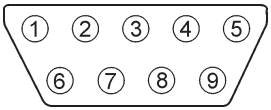
NOTE: DO NOT use both RS-232 and IP for control simultaneously. Using both control methods at the same time will affect control reliability.

Connection Settings:

Baud rate: 9600 • Data bits: 8 • Parity: None • Stop bits: 1

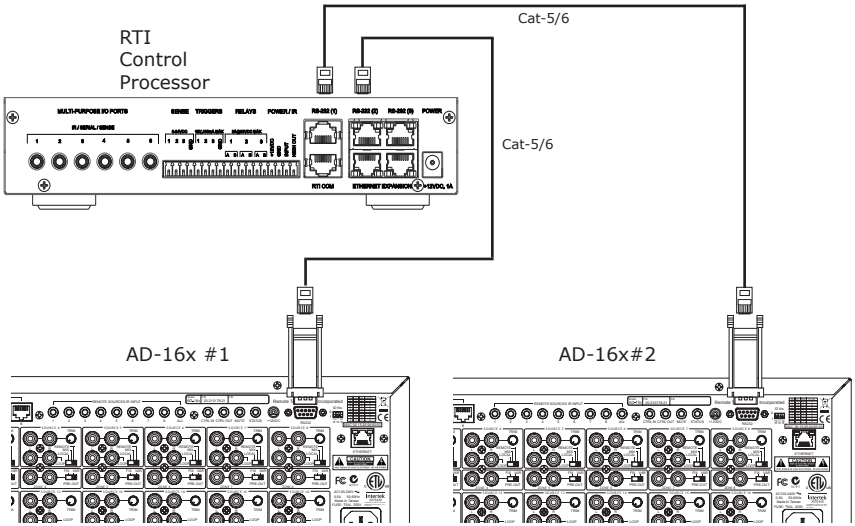
DB-9 Jack Pinout:

Pin 2	TXD Transmit Data
Pin 3	RXD Receive Data
Pin 5	GND Ground



CONTROLLING MULTIPLE AD-16x UNITS - USING RS-232

For RS-232 control, each AD-16x must have it's own RS-232 connection to an RTI control processor.



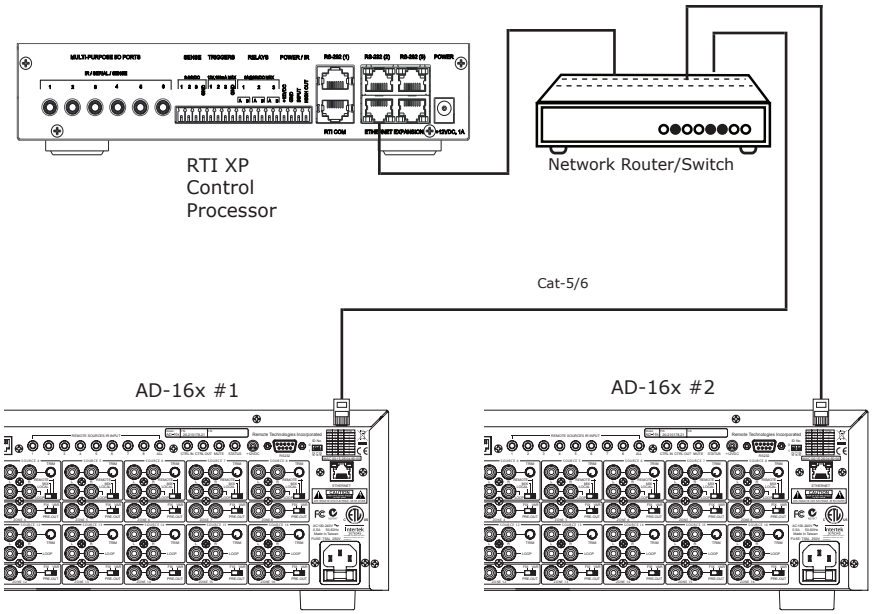
CHAPTER 3 | INSTALLATION AND OPERATION

IP CONTROL OF AD-16x UNITS - ETHERNET

The built-in Ethernet port allows convenient control of one or more AD-16x units (maximum 8) via an Ethernet network (LAN) from an RTI XP processor. Configuration of the AD-16x networking is done through a web interface which is accessible through a web browser (See "CONFIGURING THE AD-16X USING THE WEB INTERFACE" section of this guide).

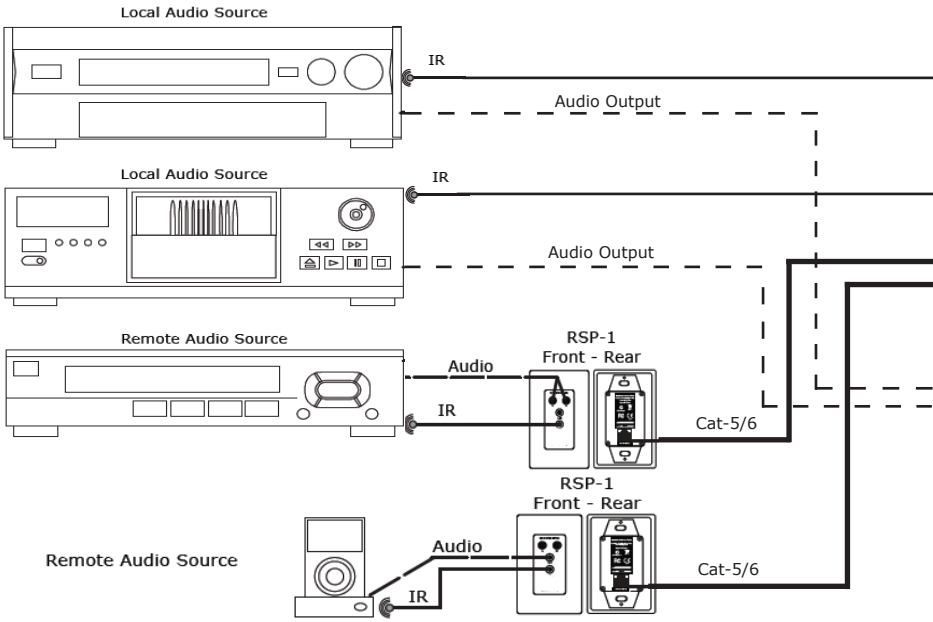
NOTES: For IP control:

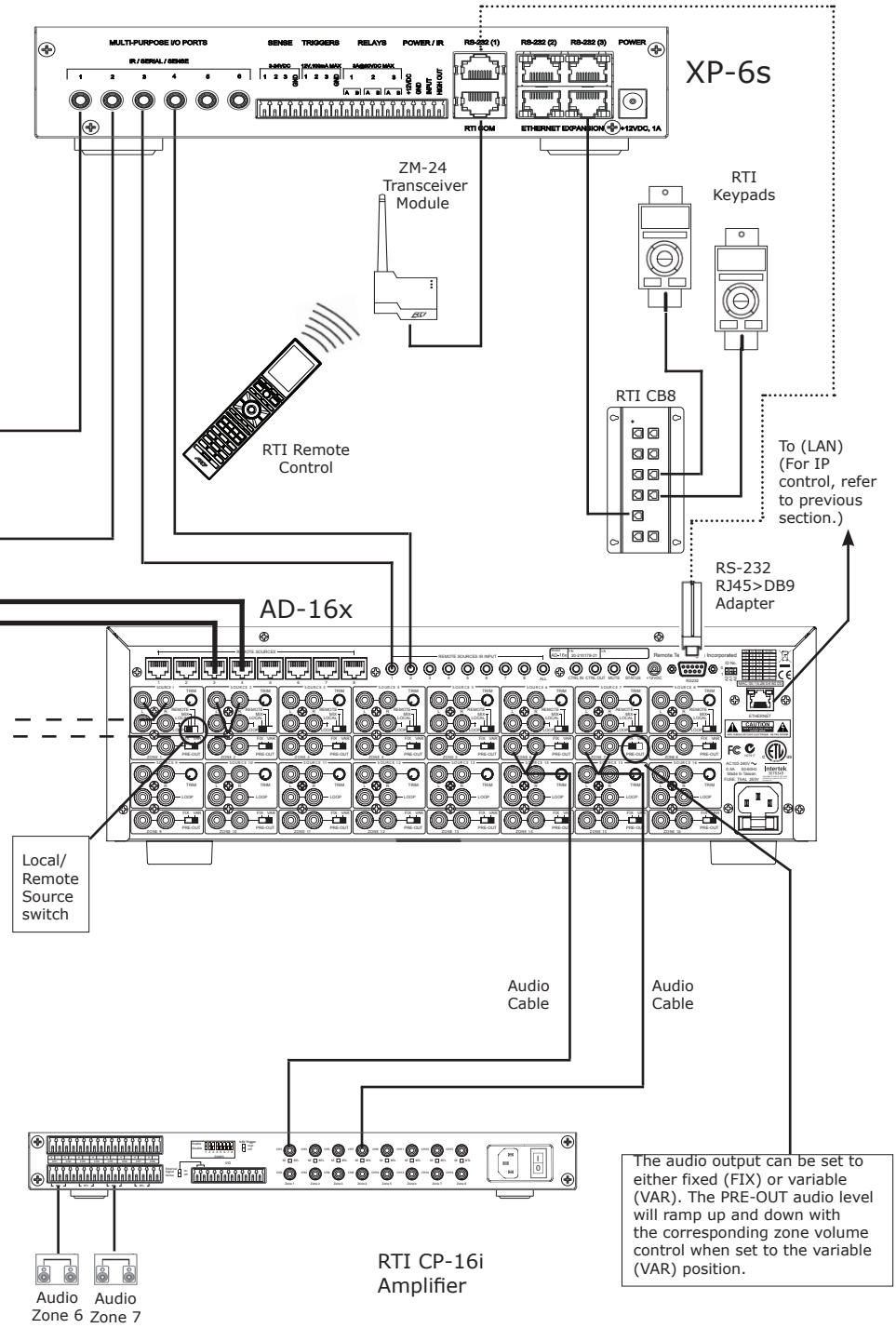
- DO NOT use both RS-232 and IP for control simultaneously. Using both control methods at the same time will affect control reliability.
- The RTI control system must have a two-way driver running on the XP processor.
- The RTI control system and each AD-16x must be connected to the same Ethernet network (LAN).



CHAPTER 3 | INSTALLATION AND OPERATION

AD-16X CONNECTION DIAGRAM




XP-6s
ZM-24
Transceiver
Module
RTI
Keypads
RTI Remote
Control
RTI CB8
To (LAN)
(For IP
control, refer
to previous
section.)
RS-232
RJ45>DB9
Adapter
AD-16x
Local/
Remote
Source
switch
Audio
Cable
Audio
Cable
The audio output can be set to either fixed (FIX) or variable (VAR). The PRE-OUT audio level will ramp up and down with the corresponding zone volume control when set to the variable (VAR) position.
RTI CP-16i
Amplifier
Audio
Zone 6
Audio
Zone 7

CHAPTER 3 | INSTALLATION AND OPERATION

CONFIGURING THE AD-16X USING THE WEB INTERFACE

The AD-16x web interface is accessible via a standard web browser on a PC, tablet, or smartphone.

The web interface is used for:

- Configuring networking - IP address etc.
- Testing output zones - Each zone can have its current source, volume, power and mute status adjusted during the setup process.
- Zone grouping - Output zones may be assigned to a "group", allowing multiple zones to be controlled simultaneously as a single output zone.

IMPORTANT NOTE: Using the web interface and the RTI two-way control driver running on an XP processor at the same time may cause inconsistent communication. To avoid this, remove the XP processor from the network while using the web interface for zone configuration.

ADDING THE AD-16x TO THE ETHERNET NETWORK

Wire the AD-16x to the Ethernet network using Cat-5/6 cable with the RJ45 termination and power the unit on. The network router will assign an IP address to the AD-16x automatically and allow it to join the network.

- The AD-16x is set to use DHCP by default.
- Router must have DHCP enabled.

ACCESSING THE WEB INTERFACE

To access the web interface, first determine the IP address that was assigned to the AD-16x by the network router which can be found by looking for UPNP devices on the network.

NOTE: If using Windows XP, you may need to enable viewing of UPNP devices and "Windows Discovery".

- Click on My Network Places
- If UPNP devices are not displayed, under Network Tasks, click on "Show icons for networked UPNP devices". Click yes to allow the installation wizard.

To view UPNP devices on the network, go to the "network" area in your version of Windows.

- In the "Computer" tab under the Start Menu.
- Click on "Network".
- On the right side window, scroll down to "Other Devices".
- Find the AD-16x in the list of devices and double click on the icon to open the web interface.

OR

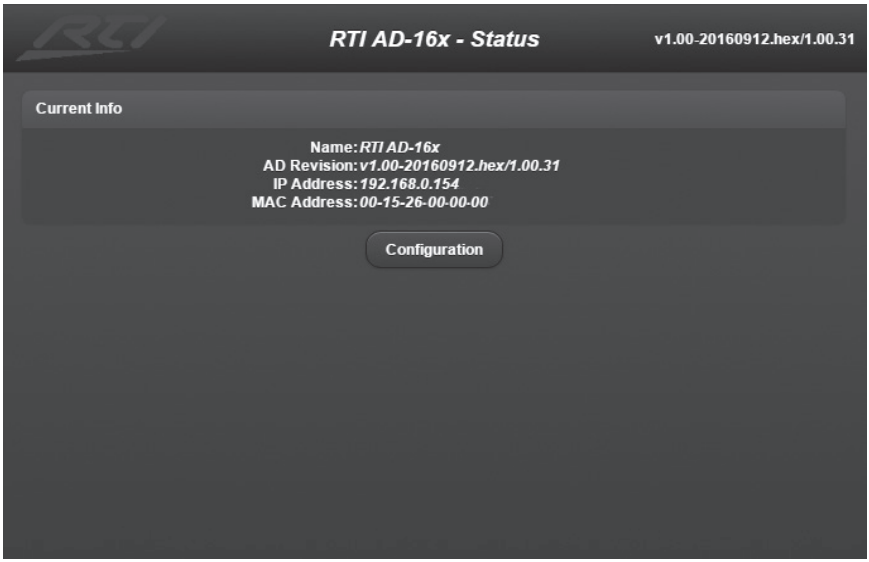
- The AD-16x icon will display the IP address it is using. Open a web browser on your PC, tablet or smartphone and type the IP address into the browser address bar.

  Example: http://192.168.0.15

CHAPTER 3 | INSTALLATION AND OPERATION

WEB INTERFACE - STATUS PAGE

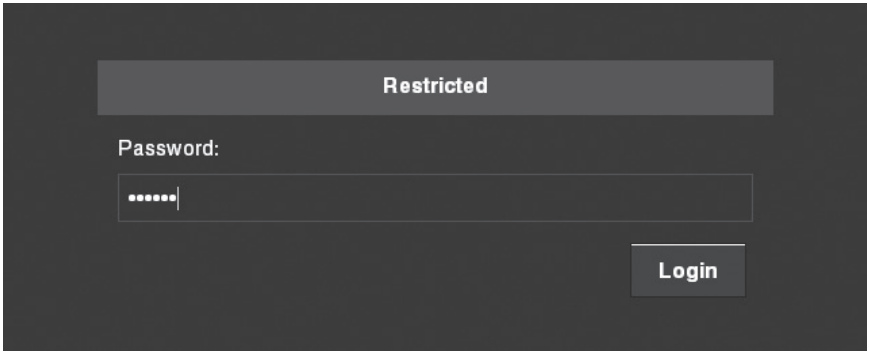
After entering the IP address into the web browser and hitting enter, the Status Page will be the first page displayed. The information includes the AD-16x name, firmware version, IP address and MAC address.



WEB INTERFACE - LOGIN

To configure the AD-16x settings, click on the "Configuration" button to login.

NOTE: The default password is: rti



CHAPTER 3 | INSTALLATION AND OPERATION

WEB INTERFACE - NETWORK CONFIGURATION PAGE

Upon logging into the web interface the Network Configuration page will be displayed. You can also reach this page by clicking the "Network" tab at the bottom of the web interface.

IP ADDRESS CONFIGURATION

IMPORTANT NOTES:

- Setting a static IP address is NOT necessary and is discouraged. The RTI two-way driver uses the UPNP name of the AD-16x to find it on the network so a static IP is unnecessary.
- Setting a static IP address and clicking "Update Settings" will cause the web interface to no longer be displayed in your web browser. Enter the new static IP address into your web browser address bar to access the web interface again.

To set the static IP address:

1. Select **Address Type** (set to DHCP by default): click this button and select "Static IP" from the drop down list.
2. Enter **Static IP Address**: Enter the static IP address.
3. Enter **Subnet Mask**: Enter the network subnet used by the AD-16x and RTI XP processor.
4. Enter **Default Gateway:** Enter the IP address of the network gateway.
5. Click on the "Update Settings" button to save these settings.

NOTE: To manually reset the AD-16x to DHCP

If the wrong IP address scheme is used during the static IP setup process, the AD-16x will not be accessible via the network. If this happens, the AD-16x web interface will not be available to make corrections and control via IP will not be possible.

To correct this, the AD-16x will need to be manually set back to DHCP using an RS-232 string so that it may rejoin the network, and allow the web interface to be used again.

Steps to reset IP Address Type to DHCP:

1. Connect a serial cable between your RTI control processor (or PC) and the AD-16x. (See "RS-232 CONTROL OF AD-16x" for cable requirements).
2. Send this RS-232 string followed by a carriage return: **^rti dhcp**
   - NOTE: There is a **space** between the "i" and the "d".
   - The string with carriage return using Integration Designer is: **^rti dhcp\r**
3. Follow the steps in the "ACCESSING THE WEB INTERFACE" section to gain access to the web interface again.

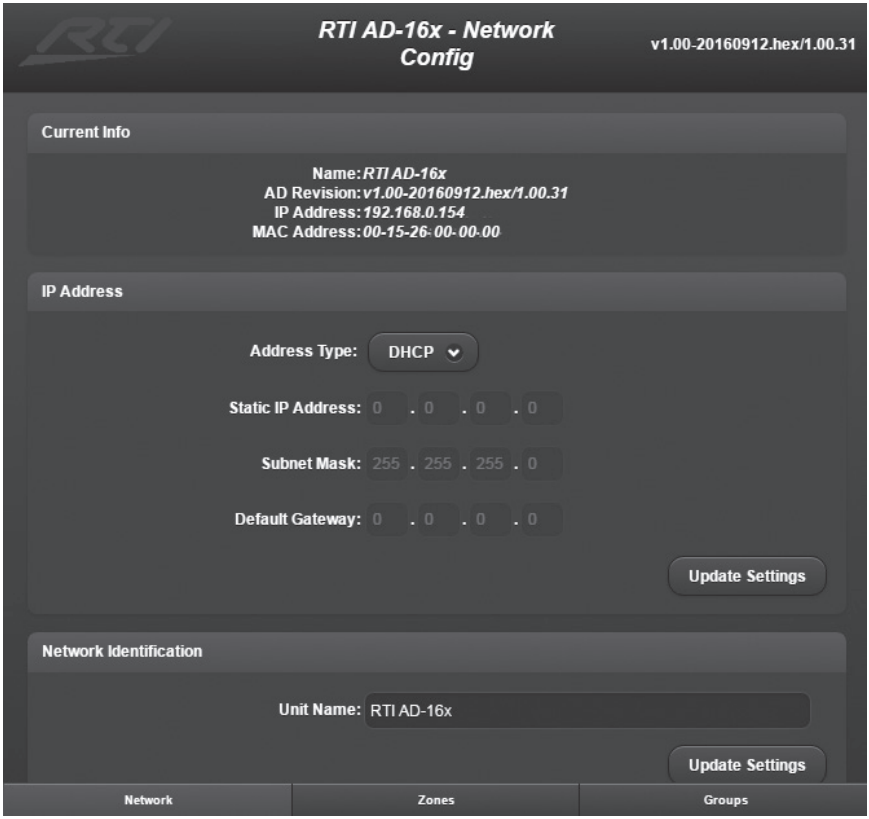
NETWORK IDENTIFICATION

This section allows you to change the name of the device as it shows up on the network and list of UPNP devices.

1. Unit Name: Enter a new AD-16x name
2. Click on the "Update Settings" button to save these settings.

CHAPTER 3 | INSTALLATION AND OPERATION

WEB INTERFACE - NETWORK PAGE



CHAPTER 3 | INSTALLATION AND OPERATION

WEB INTERFACE - ZONES PAGE

The Zones page of the web interface is used during AD-16x setup, allowing you to adjust the source, power, mute, volume and the assigned group using a device with a web browser such as a PC, tablet or smartphone.

View this page by clicking the "Zones" tab at the bottom of the web interface.

ZONE CONFIGURATION

Click the "+" to the left of the zone name that wish to configure.

OPTIONS:

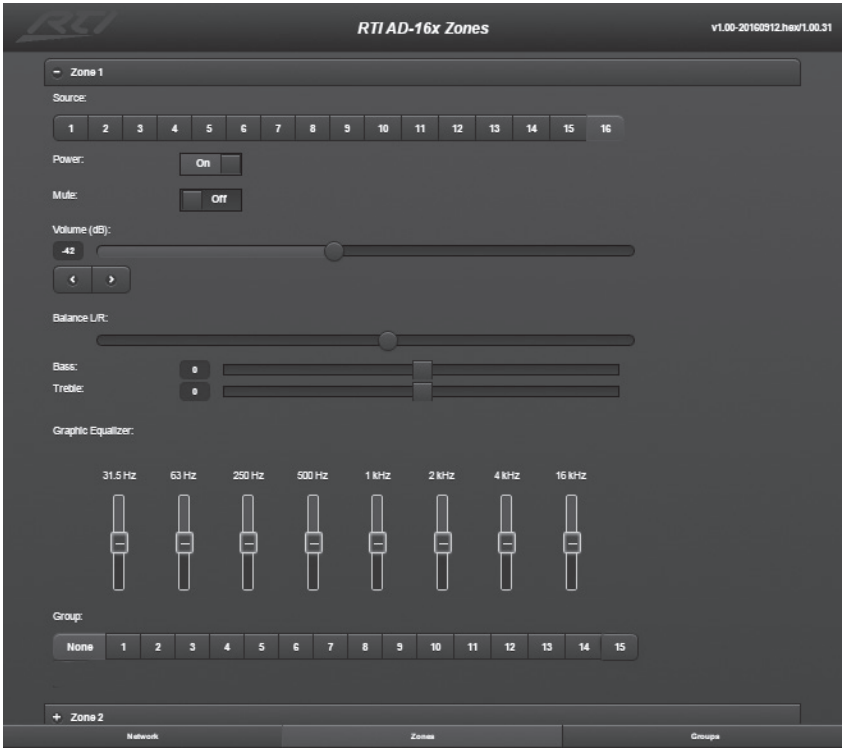
- **Sources:** Select the audio input source for this zone.
- **Power**: Click on this button to power the zone on and off.
- **Mute**: Click on this button to mute and unmute the zone.
- **Volume:** To adjust the volume level, use the raise and lower buttons or click on the volume slider bar to jump to a level.

CAUTION: Clicking on the volume level bar will cause the volume to JUMP to that level. Be cautious where you click the volume slider bar to avoid inadvertantly raising the volume to a high level.

- **Balance L/R:** To adjust the left and right output balance level, drag the adjustment button to the desired level or click on the slider bar to jump to a level.
- **Bass:** To adjust the bass level, drag the adjustment button to the desired level or click on the slider bar to jump to a level.
- **Treble:** To adjust the treble level, drag the adjustment button to the desired level or click on the slider bar to jump to a level.
- **Graphic Equalizer:** Current audio frequency levels are displayed on the slider bars. To adjust the level of each frequency, drag the adjustment button to the desired level or click on the slider bar to jump to a level.
- **Group:** Select the group that this zone will be a member of, or select "None". Grouped zones will be controlled together, allowing volume levels to be adjusted simultaneously in multiple zones.
  NOTE: Zones can only be a member of one group.

CHAPTER 3 | INSTALLATION AND OPERATION

WEB INTERFACE - ZONES PAGE



WEB INTERFACE - GROUPS PAGE

The Groups page of the web interface is used during AD-16x setup, allowing you to adjust power, mute and volume of each group from a device with a web browser such as a PC, tablet or smartphone.

View this page by clicking the "Groups" tab at the bottom of the web interface.

GROUPS CONFIGURATION

Grouped zones will be controlled together, allowing volume levels to be adjusted simultaneously in multiple zones, such as in an adjoining kitchen/family room. The group names are followed by the zones that are members of that group.

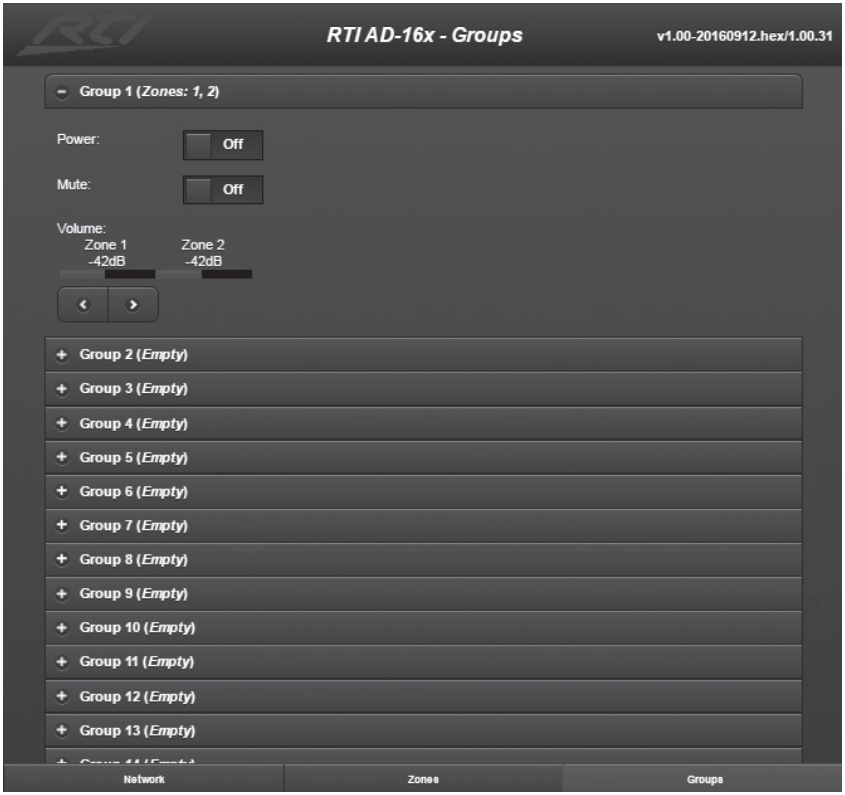
Click the "+" to the left of the group name that wish to configure.

- **Power**: Click on this button to power the grouped zones on and off.
- **Mute**: Click on this button to mute and unmute the grouped zones.
- **Volume:** To adjust the volume level of a group, use the raise and lower buttons.

  NOTES:

  - Volume will raise until the maximum limit is reached in any zone in the group. At that point the other zones in the group will stop raising the volume level.
  - Volume will lower until the minimum limit is reached in any zone in the group. At that point the other zones in the group will stop lowering the volume level.

WEB INTERFACE - GROUPS PAGE



CHAPTER 4 | SPECIFICATIONS

GENERAL

Power Supply	100VAC ~ 240VAC, 50~60Hz Switching Power Supply, 20W
Mounting	Rack mount or free standing
Dimensions (W x H x D)	16.9” (430mm) x 5.3” (133mm) x 14.5” (369mm)
Weight	14.5lb (6.6kg)
Operational Temperature	32°F - 104°F (0°C – 40°C)
Humidity	5% to 95% Non-Condensing
Heat Output	68 BTU/hr
Warranty	Three Years (Parts & Labor)

CONTROL & CONNECTIONS

Output Zones	Sixteen zones of stereo L/R, 16 RCA jack pairs (switchable between fixed or variable)
Audio Source Inputs (Local)	Sixteen, 16 RCA jack pairs
Audio Source Inputs (Remote)	Eight, RJ-45 jacks
Loop Outputs	Sixteen, 16 RCA jack pairs
Control Input (CTRL IN)	One, 3.5mm jack, compatible with industry standard IR repeaters and receivers
Control Output (CTRL OUT)	One, 3.5mm jack, compatible with industry standard IR repeaters and receivers
Remote Source IR Inputs	Nine, Eight discrete, One universal (All), 3.5mm jacks
Mute Input	One, 3.5mm jack Phone Input Sensitivity: AC25V-AC100V 20Hz Doorbell Sensitivity: AC/DC 3-12VDC
Trigger Output (Status Jack)	One, 12VDC, 15mA max
+12VDC Voltage Output	One, 12VDC, 500mA max
Serial (RS-232) Port	One, Bi-directional DB-9
Ethernet Port	One, 10/100Base-T, RJ45 Connection
Unit ID Numbers	1-8, Set using 3 switches

All specifications subject to change without notice.

CHAPTER 4 | SPECIFICATIONS

AUDIO

Total Harmonic Distortion	<0.03%
S/N Rating	92dB (@ mute +1) , 100dB(@ mute)
Frequency Response	20Hz ~ 20khZ +/- 0.5 dB
Input Overload	2.1V
Input Impedance	22K ohms
Channel Separation @1KHz	>60dB
Crosstalk Between Sources @1KHz	>90dB
Crosstalk Between Zones @ 1KHz	90dB
THD+ Noise	<0.03%
Treble Control @10KHz	8.5dB +/- 0.5 dB
Bass Control Range @100Hz	8.5dB +/- 0.5 dB
Equalizer Bands (8)	32Hz, 64Hz, 256Hz, 512Hz, 1024Hz, 2048Hz, 4096Hz, 16380Hz

All specifications subject to change without notice.

CHAPTER 5 | TROUBLESHOOTING

If you are having problems with your AD-16x Audio Distribution System, please read the information below before contacting technical support.

If you continue to have problems, see Chapter 6 for more information on contacting RTI technical support.

AD-16x DOES NOT FUNCTION PROPERLY

Symptom: No sound.
Possible Causes:
- AC power unplugged > Check AC cable and outlet.
- Main power switch not on > Is main power light on?
- Outlet has no power > Verify outlet has power.
- Blown fuse > Check main fuse.
- Mute jack > Is mute jack in active mode?

Symptom: No sound from individual zones.
Possible Causes:
- Faulty wiring > Verify all wiring.
- Zone output not on > Are zone output light(s) on?

Symptom: No sound via remote source wallplate.
Possible Causes:
- Faulty wiring > Verify all wiring & terminations.
- Verify source output > Make sure source has audio output.

Symptom: No IR control via remote source wallplate.
Possible Causes:
- Faulty wiring > Verify all wiring & terminations.
- IR signal level > Adjust IR signal going into AD-16x.
- IR emitter > Verify IR emitter is working.
- IR emitter placement > Verify emitter is properly placed.

Symptom: No IR control of AD-16x.
Possible Causes:
- Faulty wiring > Jack is 1/8” mono, tip = IR+, ring=Gnd.
- IR signal level > Adjust IR signal going into AD-16x.
- CTRL IN > Verify connection is to CTRL IN

CHAPTER 5 | TROUBLESHOOTING

Symptom: No RS-232 control of AD-16x.
Possible Causes:

- Faulty wiring > Check RS-232 pinout.
- Incorrect string > Verify string from manual.
- No carriage return > String requires carriage return.

Symptom: Distortion when using RSP-1.

Possible Causes:

- IR output on the RTI control processor > Reduce IR output from RTI control processor.

CHAPTER 6 | SERVICE AND SUPPORT

For news about the latest updates, new product information, and new accessories, please visit our web site at:

www.rticontrol.com

CONTACTING RTI

For general info, you can contact RTI at:

Tel. (952) 253-3100
info@rticontrol.com

RTI TECHNICAL SUPPORT

At RTI, customer service and satisfaction is an utmost priority. If you are encountering any problems or have a question about your RTI product, please contact RTI Technical Support for assistance.

RTI provides technical support by telephone or e-mail. For the highest quality service, please have the following information ready, or provide it in your e-mail.

- Your Name
- Company Name
- Telephone Number
- E-mail Address
- Product model and serial number (if applicable)

If you are having a problem with hardware, please note the equipment in your system, a description of the problem, and any troubleshooting you have already tried.

If you are having a problem with software, please note what version you have installed, the operating system on your PC, a description of the problem, and any troubleshooting you have already tried.

If you are calling about a software or programming question or problem, please be at you computer when you place your call. This will considerably speed up the troubleshooting process.

For technical support or assistance with your AD-16x, software, or accessories, contact RTI at:

(952) 253-3137
support@rticontrol.com
www.rticontrol.com

For questions regarding service or repair of your AD-16x, contact RTI at:

(952) 253-3136
custserv@rticontrol.com
www.rticontrol.com

Please do not return products to RTI without return authorization.

CHAPTER 6 | SERVICE AND SUPPORT

Shipment of AD-16x for Service

RTI will pay all labor and material expenses for all repairs covered by this product's warranty. If necessary repairs are not covered by warranty, or if a unit is examined which is not in need of repair, you may be charged for the repairs or examination.

If it is necessary to ship the AD-16x for service:

- Please pack it securely (we suggest that it be insured).
- Please include accessories such as power cords or manuals.

You must pay any shipping charges incurred in getting your AD-16x to RTI. RTI will pay reasonable return shipping charges via a carrier of our choice to any destination within the United States if the repairs are covered under warranty.

A copy of the original dated sales receipt must be provided whenever warranty service is required. You will need this receipt to establish the date of purchase.

INDEX

Contents 7
Description 10
  AD-16x Front Panel 11
  AD-16x Rear Panel 12
  RSP-1 14
  PDM-1 15
Disclaimer 6
Features 10
Federal Communications Commission Notice 3
Installation/Operation 16
  Connection Options 17
  Connections Diagram 24
  Control (IR/RS-232) 22
  Mounting/Power 16
Important Notes 8
Limited Warranty 6
Product Contents 9
Safety Suggestions 4
Service and Support 38
Specifications 34
Troubleshooting 36
Welcome 8

NOTES

It's Under Control®

Remote Technologies Incorporated
5775 12th Avenue East, Suite 180
Shakopee, MN 55379
Tel: 952-253-3100
www.rticontrol.com

© 2022 Remote Technologies Inc. All rights reserved. Printed in Taiwan.