It's Under Control®

AD-4x

Audio Distribution System

Installation and Operation Guide

AD-4x Audio Distribution System

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.rticorp.com/declaration

AD-4x Audio Distribution System

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.

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SAFETY SUGGESTIONS

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

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-4x Audio Distribution System needs service, please contact Remote Technologies Incorporated by telephone, fax or E-mail for return information. **Please do not return products to Remote Technologies Incorporated without return authorization**.

DISCLAIMER

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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.

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

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CHAPTER 1 | WELCOME

Thank you for using the AD-4x Audio Distribution System.

With four audio source inputs and four zone outputs, wherever you go - the music moves with you. An integrated 8-channel amplifier provides plenty of power, while zone independent volume and tone control brings the sound to life. When you combine the AD-4x with RTI central processors, remote controls, touchpanels, and keypads, this RTI Audio Distribution solution easily keeps pace with the rhythm of your life.

The AD-4x audio distribution system is designed to be a seamless extension of an RTI control system. The AD-4x provides the audio switching, amplification and distribution functions, while RTI central processors and user interfaces manage the audio source control, user input and status feedback. Information such as the selected source, volume level, and tone control settings are available for each zone. Depending on the source equipment used, more advanced information such as song playlists, cover art, and tuner RDS data may also be available. Of course with RTI control systems, audio is just the beginning. Imagine every aspect of your environment working in complete harmony – from audio and video to lighting, ambience, temperature and more. Such scenarios are only made possible from an audio distribution system backed by a professional grade control system. Thanks to the efficient engineering that defines the AD-4x, there is no reason to limit yourself to a system that was designed only for music – with RTI so much more is possible.

IMPORTANT NOTES

Please read these important notes about the AD-4x:

- The AD-4x should be placed in an area where it is around normal room temperature (between 60°F to 90°F).
- Avoid installing the AD-4x in a location with little or no air circulation.
- Avoid installing the AD-4x in a location where it can come in contact with direct sunlight.
- Do not let the AD-4x 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-4x to smoke, dust, or vibrations.
- Only use the power cord that is supplied with the AD-4x. Using the wrong type of power cord may result in damage.
- Do not disassemble the unit. Service of the AD-4x should be performed by authorized personnel only.
- This product is shipped from RTI with AC voltage set to 115 Volts. The voltage switch will have to be changed for certain international locations. Dealers should take the following critical step: **Set the red voltage switch on the bottom of the AD-4x to the proper voltage for your location (115V/230V).**

CHAPTER 1 | PRODUCT CONTENTS

Contents within the box include the following items:

- One (1) AD-4x Audio Distribution System
- One (1) AD-4x Faceplate
- Four (4) Four Position Phoenix Connectors
- One (1) Power Cord
- Two (2) Rack Mounting Ears with Screws
- One (1) Installation Guide

UNPACKING AND INSPECTION

After unpacking your new AD-4x Audio Distribution System, save all of the packing materials in case you ever have to ship the unit.

Thoroughly inspect the AD-4x 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.

IMPORTANT NOTICE FOR DEALERS/DISTRIBUTORS OUTSIDE THE UNITED STATES

This product is shipped from RTI with AC voltage set to 115 Volts. The voltage will have to be changed for certain international locations. Ensure that the red 115/230 AC Voltage Switch on the underside of the unit is properly set for your location.

*The red voltage switch should be left in the 115 Volt position if used within the United States.
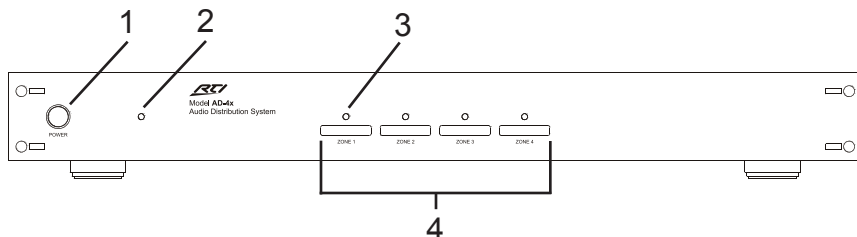
CHAPTER 2 | FEATURES AND DESCRIPTION

The AD-4x provides superior quality and reliability as well as these specific features:

- Four analog stereo audio outputs (either 4 ohm or 8 ohm speakers may be connected to the zone outputs - One 4 ohm minimum).
- Four analog audio source inputs.
- Cool Power® class-D amplifier provides twenty-five watts per channel.
- Amplifier offers thermal and short-circuit protection.
- Independent volume and tone control for all audio zones.
- Audio input trim adjustment on each source.
- Accessory wall plates (RSP-1) allow source equipment to be connected remotely with a Cat-5/6 cable.
- Pre-outputs in each zone allow external amplification for additional power or speakers in a zone.
- Built-in web interface provides output zone configuration and testing.
- Controlled via IP, RS-232 or Infrared.
- Optional phone and doorbell mute function.
- Zone power indicator LEDs.
- Compact, low-profile design is rack mountable (1U rack form factor) or free standing.

CHAPTER 2 | FEATURES AND DESCRIPTION

AD-4x FRONT PANEL

1. Power Switch
   Turns AD-4x power on or off.

2. Power LED
   A blue LED will be lit up when power is on and will be off when the power is off.

3. Zone Power LED
   A red LED indicates, when lit, that the corresponding zone is on.

4. Recessed Zone Label Holders
   A recessed rectangle for placement of a name label (not included) for each zone.

5. Local Source Inputs
   Stereo RCA inputs for audio from up to four independent audio sources. (Ex. Receiver, cable box, satellite radio etc).

6. Source Input Trim Adjustment
   The Trim Control dials are used to equalize signal levels of each input source to ensure that switching between inputs will result in the same output level.
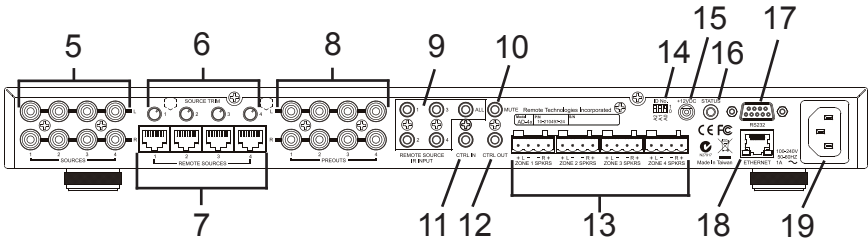
7. Remote Source Inputs
   RJ-45 jacks for connection of up to four RTI remote source wall plates (model RSP-1) for independent audio sources located remotely (iPod® dock, CD player, PC etc). RSP-1 wall plates are installed in locations where the audio source devices will be used (kitchen, office etc) and wired back to the AD-4x with Cat-5/6 cable. This provides a convenient audio signal path from the audio source to the AD-4x, in addition to IR control of the source from an RTI control system.

8. PREOUT Outputs
   Provides line level audio outputs for driving external amplifiers, such as the RTI CP-450 or CP-1650 amplifiers. The output level is variable and will ramp up and down with the corresponding AD-4x zone volume control.

CHAPTER 2 | FEATURES AND DESCRIPTION

AD-4x REAR PANEL

9. Remote Source IR Control Inputs
These 3.5mm mini-jack inputs are for connecting to an IR output port of an RTI control system for control of a remote audio source. The IR control is then delivered over the same Cat-5/6 cable that runs between the AD-4x and an RSP-1 RTI Remote Source wall plate (sold separately). There is a remote source IR control input for each of the four audio sources allowing for independent IR control of each device. There is also an input labeled "All" that will allow the delivery of IR to all connected sources at the same time.

10. Mute
This 3.5mm stereo mini-jack is for the connection of an RTI PDM-1 Phone/Doorbell Mute Module (sold separately). The PDM-1 mutes the AD-4x audio outputs when a phone/doorbell system sends a voltage to the PDM-1 which triggers a circuit closure that is sensed by the Mute input.

11. CTRL IN - Infrared Control Input
This 3.5mm mono mini-jack is for infrared control of the AD-4x 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 accessible only).
NOTE: Mini-jack is mono with tip = IR+, ring=Gnd

12. CTRL OUT - IR Pass through
This 3.5mm mono mini-jack allows IR to "pass through" from the CTRL IN port, for infrared control of additional AD-4x units from a control system.

13. Speaker Outputs
Four sets of removable stereo connectors for speakers in each zone. Either 4 ohm or 8 ohm speakers may be connected to the zone outputs.
NOTE: Connected speakers must have a 4 ohm minimum load or damage to the unit may occur.

14. ID Number
Installations can have up to 8 AD-4x units installed providing up to 32 output zones. To allow discrete IR control each unit is given a unique ID. Discrete IR code libraries are available for each unique ID. To set the ID for each AD-4x unit, refer to the ID assignment chart and adjust as necessary.

A2	A1	A0	ID No.
0	0	0	1
0	0	1	2
0	1	0	3
0	1	1	4
1	0	0	5
1	0	1	6
1	1	0	7
1	1	1	8

CHAPTER 2 | FEATURES AND DESCRIPTION

AD-4x REAR PANEL - CONTINUED

15. +12VDC

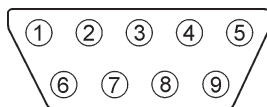This 3.5mm mono connection provides a constant +12VDC output (500mA max).

16. Status

This 3.5mm mono connection provides a +12VDC 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.

17. RS-232

DB-9 jack for RS-232 control of the AD-4x from a control system. See Chapter 3 Installation & Operation for RS-232 control details.
DB-9 Pinout

2	TXD	Transmit Data
3	RXD	Receive Data
5	GND	Ground

18. 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.

19. AC Power Socket and Fuse

Three-pin grounded socket to connect removable AC power cord with a T2AL 250V fuse.
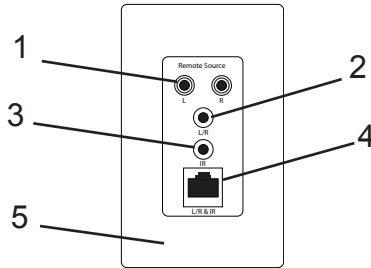
IMPORTANT POWER NOTICE

This product is shipped from RTI with AC voltage set to 115 Volts. The voltage switch will have to be changed for certain international locations. Dealers should take the following critical step.

- **Set the red voltage switch on the bottom of the AD-4x to the proper voltage for your location (115V/230V)**

- **The red voltage switch should be left in the 115 Volt position if used within the United States.**

CHAPTER 2 | FEATURES AND DESCRIPTION

RSP-1 REMOTE SOURCE PLATE* - FRONT

1. Audio Inputs - RCA
Two RCA input jacks for connection to the output (left and right) of the remote audio source (Internet music streamer, CD Player etc).

2. Audio Inputs - 3.5mm
One 3.5mm stereo mini jack for connection to the output of the remote audio source (iPod®, PC etc).

3. IR Output
One 3.5mm mono mini jack for connection of an IR emitter to control the remote source. IR control delivered from control system.

4. Audio Inputs and IR Output
This RJ-45 connection carries the left and right audio inputs from the remote source and the IR control output over Cat-5/6 cable.
Note: This would not normally be used.

5. Decora® faceplate (not included)
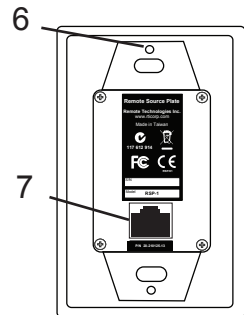Compatible with standard single-gang Decora® style faceplates.

RSP-1 REMOTE SOURCE PANEL - REAR

6. Mounting holes
Use screws to mount the RSP-1 in a standard single-gang electrical box.

7. Audio and IR control - RJ-45
This RJ-45 connection carries the left and right audio inputs from the remote source and the IR control output between the AD-4x and the remote source.
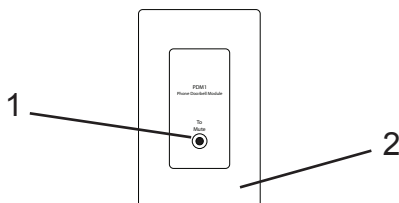
*Note: RSP-1 sold separately.

CHAPTER 2 | FEATURES AND DESCRIPTION

PDM-1 PHONE/DOORBELL MUTE PLATE* - FRONT
The back panel of the AD-4x has a 3.5mm stereo connector input labeled "Mute". This 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.
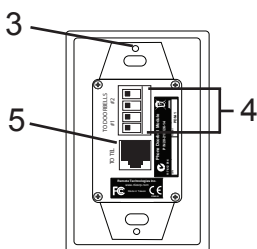

1. Phone - Doorbell Output - 3.5mm
   This 3.5mm stereo mini jack is for connecting to the "Mute" connection on the rear panel of the AD-4x. (See the AD-4x rear panel description)

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-4x system to mute.

*Note: PDM-1 sold separately.

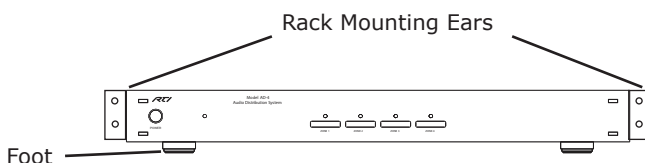# CHAPTER 3 | INSTALLATION AND OPERATION

FREE STANDING
The AD-4x ships with four removable feet that allow it to be placed on a flat surface. To maintain proper ventilation and cooling, do not install the AD-4x on a flat surface without the feet.

RACK MOUNT
The AD-4x can be mounted in a component rack as part of a comprehensive audio/video electronics system using the included rack mounting ears. Align the rack mounting ears with the screw holes located on the sides of the AD-4x near the front. Fasten the rack ears to the AD-4x 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 beneath the AD-4x if possible.

Rack Mounting Ears

Foot

CONNECTING THE 115VAC POWER CORD
The included AC power cord must be inserted into the AC input receptacle on the AD-4x. When the AC power cord is connected to a power source, press the Power button to turn the AD-4x on and off.

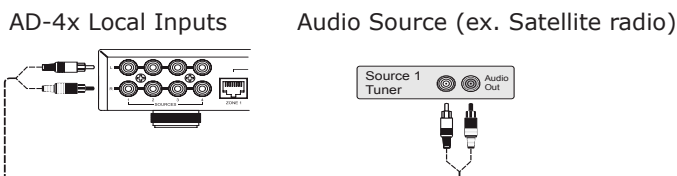**IMPORTANT NOTICE FOR INTERNATIONAL DEALERS/DISTRIBUTORS**
This product is shipped from RTI with AC voltage set to 115 Volts. The voltage will have to be changed for certain international locations. Ensure that the red 115/230 AC Voltage Switch on the underside of the unit is properly set for your location.
*The red voltage switch should be left in the 115 Volt position if used within the United States.

CONNECTING LOCAL AUDIO SOURCES
The AD-4x has four sets of RCA audio inputs for connecting up to four external source components. These four audio sources can be selected to play in up to four zones. Also, if users in more than one zone choose the same audio source, control of that source is shared between the zones.
• **Trim Control**: The Trim Control dials on the AD-4x 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).

AD-4x Local Inputs   Audio Source (ex. Satellite radio)

Source 1
Tuner

Audio
Out

CHAPTER 3 | INSTALLATION AND OPERATION

CONNECTING REMOTE AUDIO SOURCES
(See "Connecting Remote Audio Sources" diagram)
Audio sources that are located in other areas can have their audio signals
delivered back to the AD-4x and shared among all of the output zones.
NOTE: Local audio inputs (1-4) and remote audio inputs (1-4) are common,
limiting the AD-4x to four audio sources total. Any combination of local and
remote sources may be used, to a maximum of four. For example, do not plug
in a local audio source to local input 1 and remote audio source to the remote
input 1.

WIRING FOR REMOTE AUDIO SOURCES
Use standard Cat-5/6 cable between the RSP-1 Remote Source Plate and the
RJ-45 jacks on the rear of the AD-4x. Use either the stereo RCA jacks or the
3.5mm mini stereo jack for connecting to the output of the audio source.

NOTE: It is not possible to "Y" or split the audio signals from the RSP-1 to
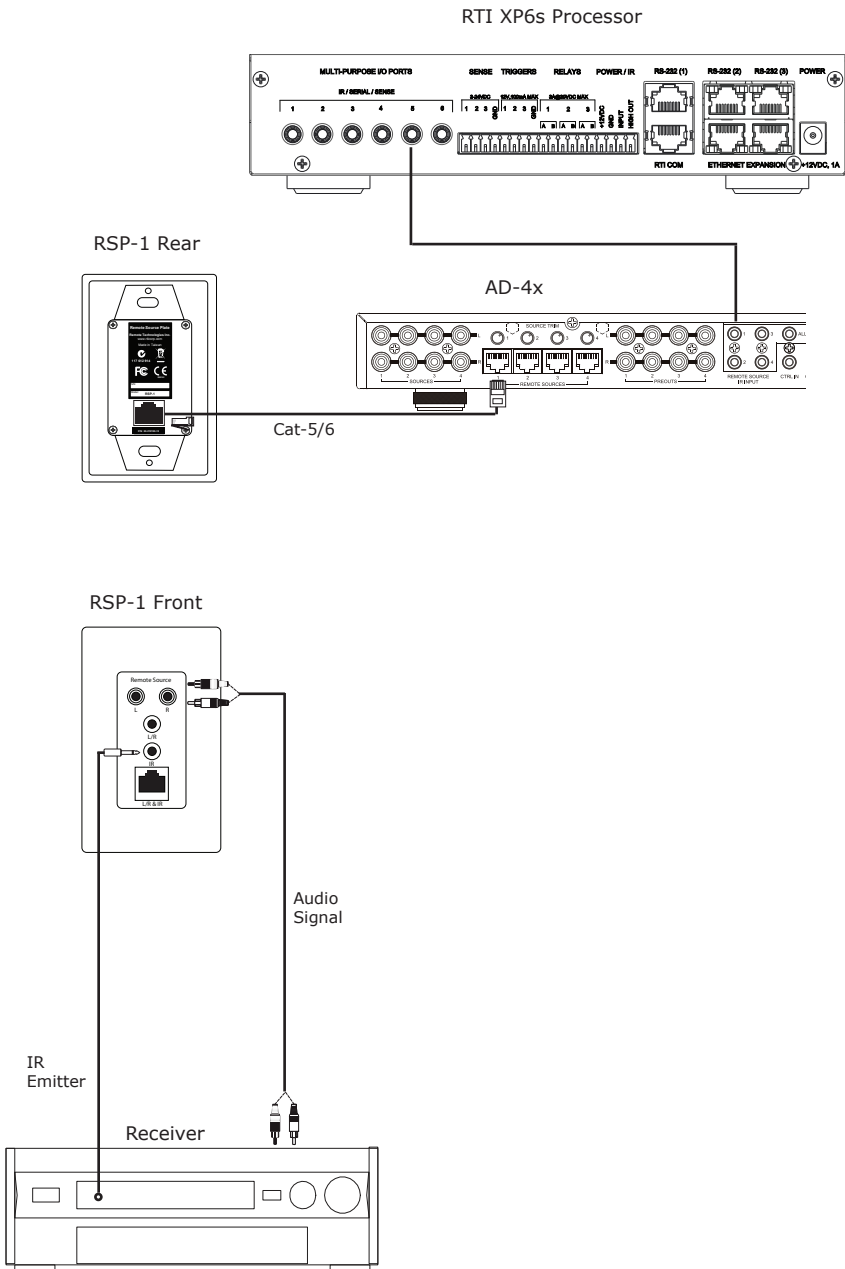multiple AD-4x units.
NOTE: The AD-4x can accommodate 500 total feet of Cat-5/6 cable for each
zone. For the most reliable operation, it is best that no single run of Cat-5/6
exceeds 250 feet. The correct wiring scheme for the Cat-5/6 cable is standard
EIA/TIA 568B. Properly terminating the Cat-5/6 cable is crucial for the
operation of the system.

CONTROLLING REMOTE AUDIO SOURCES
Remote audio sources can be controlled from their own front panel or via
infrared control delivered over the same Cat-5/6 cable wired to the RSP-1
Remote Source Panel that is used for the audio signal (see above). The IR
commands used to control the sources come from an RTI control system which
is wired to the IR inputs located on the rear of the AD-4x. Each remote source
has an individual IR input for independent control and commands sent to the
"All" input on the AD-4x will allow control of all remote sources if routing the IR
codes is not necessary.

CHAPTER 3 | INSTALLATION AND OPERATION

CONNECTING REMOTE AUDIO SOURCES

RTI XP6s Processor

RSP-1 Rear

AD-4x

Cat-5/6

RSP-1 Front

Audio
Signal

IR
Emitter

Receiver

CHAPTER 3 | INSTALLATION AND OPERATION
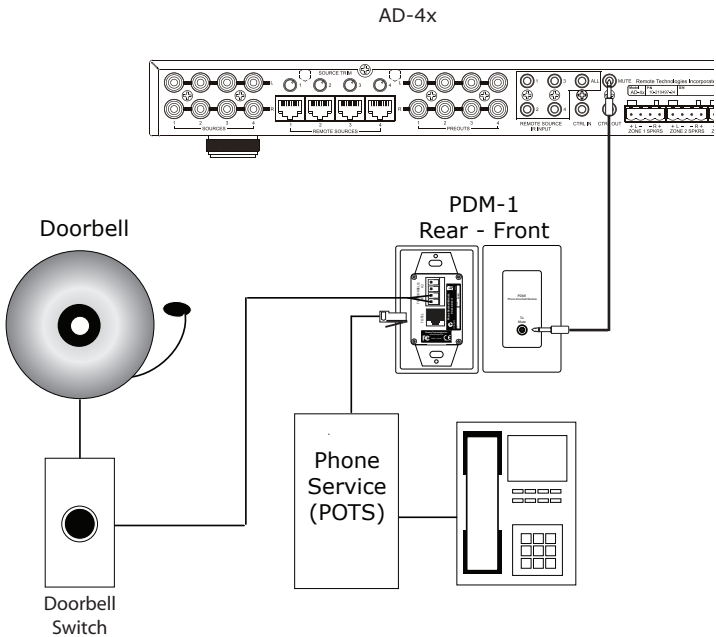
WIRING FOR MUTE INPUT
The back panel of the AD-4x has a 3.5mm non-shorting stereo connector input labeled "Mute". This is designed to be used with the PDM-1 Phone-Doorbell-Mute module. When the PDM-1 is connected, the system will temporarily mute when the phone or doorbell rings.

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 Paging
The ring voltage from a phone line will trigger the AD-4x system to mute.

AD-4x

PDM-1
Rear - Front

Doorbell

Phone
Service
(POTS)

Doorbell
Switch

CHAPTER 3 | INSTALLATION AND OPERATION

SPEAKER WIRE TERMINATION
Install the four supplied phoenix connectors into the audio zone outputs on the AD-4x. Connect the positive and negative wires for each audio channel output, keeping the proper orientation of positive and negative signal for each speaker connection. Typically, two-conductor speaker wire uses red to denote positive and black to denote negative. Some types of wire indicate positive with a line running through the insulation. Four-conductor wire can also be used. This has four separated wires in one outer jacket, making it possible to run a single speaker wire to a zone for its pair of speakers. This type of wire typically uses red and black for one speaker and white as positive and green as negative for the second speaker.
CAUTION: Do not short speaker wires together if they are connected to the AD-4x, as damage to the unit may result.

IR CONTROL OF AD-4x
A 3.5mm mono mini jack labelled CTRL IN, located on the rear of the AD-4x allows for hard-wired IR control from a control system. A library of infrared codes is available within the RTI Integration Designer programming software or on the RTI website (accessible to RTI dealers only). Installations can have up to 8 AD-4x units installed. To allow discrete IR control each unit is given a unique ID (see page 13). Discrete IR code libraries are available for each unique ID.

RS-232 CONTROL OF AD-4x
A DB-9 jack offers RS-232 control of the AD-4x 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.
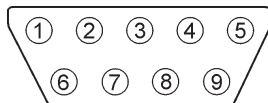
Connection Settings:
Baud rate: 9600
Data bits: 8
Parity: None
Stop bits: 1

DB-9 Jack Pinout:

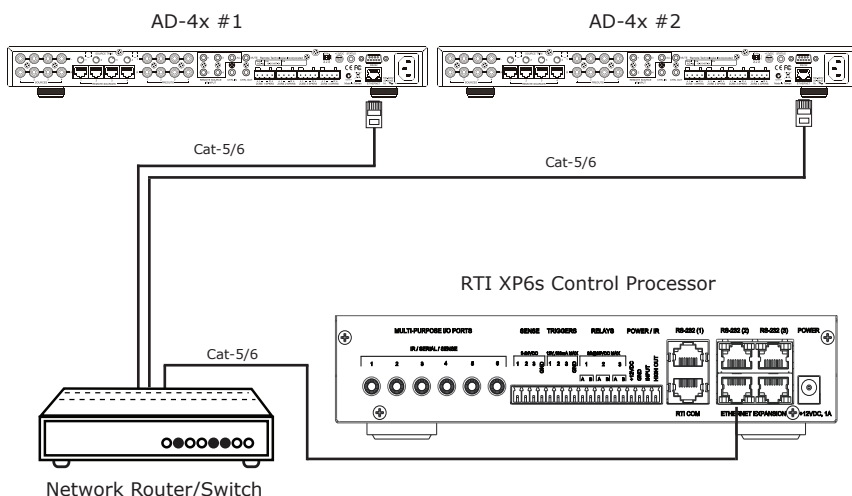|		
2	TXD	Transmit Data
3	RXD	Receive Data
5	GND	Ground

CHAPTER 3 | INSTALLATION AND OPERATION

IP CONTROL OF AD-4x UNITS - ETHERNET

The built-in Ethernet port allows convenient control of one or more AD-4x units (maximum 8) using IP via an Ethernet network (LAN) from an RTI XP processor. Configuration of the AD-4x networking is done through a web interface which is accessible through any web browser (See "CONFIGURING THE AD-4X 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-4x must be connected to the same Ethernet network (LAN).

AD-4x #1   AD-4x #2

Cat-5/6

Cat-5/6

RTI XP6s Control Processor

Cat-5/6

Network Router/Switch

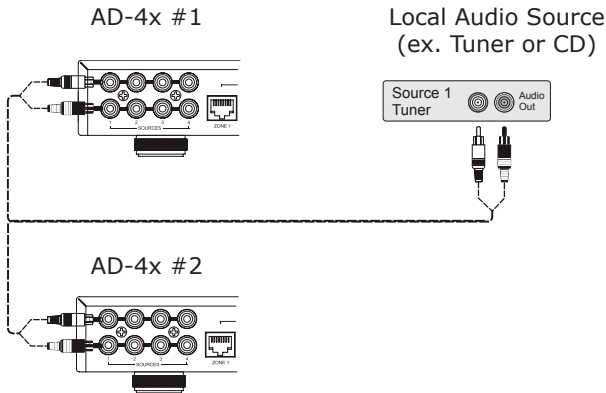## CHAPTER 3 | INSTALLATION AND OPERATION

EXPANDING TO EIGHT OUTPUT ZONES
It is possible to expand the number of output zones using two AD-4x Audio Distribution Systems together. This allows four local audio sources to be delivered to eight zones.
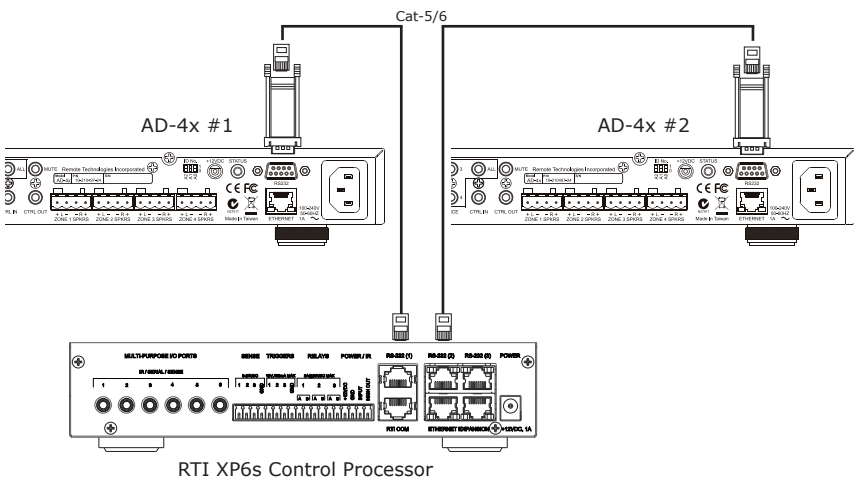
Local Source Cabling
A "Y" cable will need to be used to split the audio output of the local audio source and wired to the local audio source inputs on both AD-4x units.
NOTE: It is not possible to "Y" or split the audio signals from the RSP-1 to multiple AD-4x units, limiting their output to a maximum of four zones.

AD-4x #1   Local Audio Source (ex. Tuner or CD)
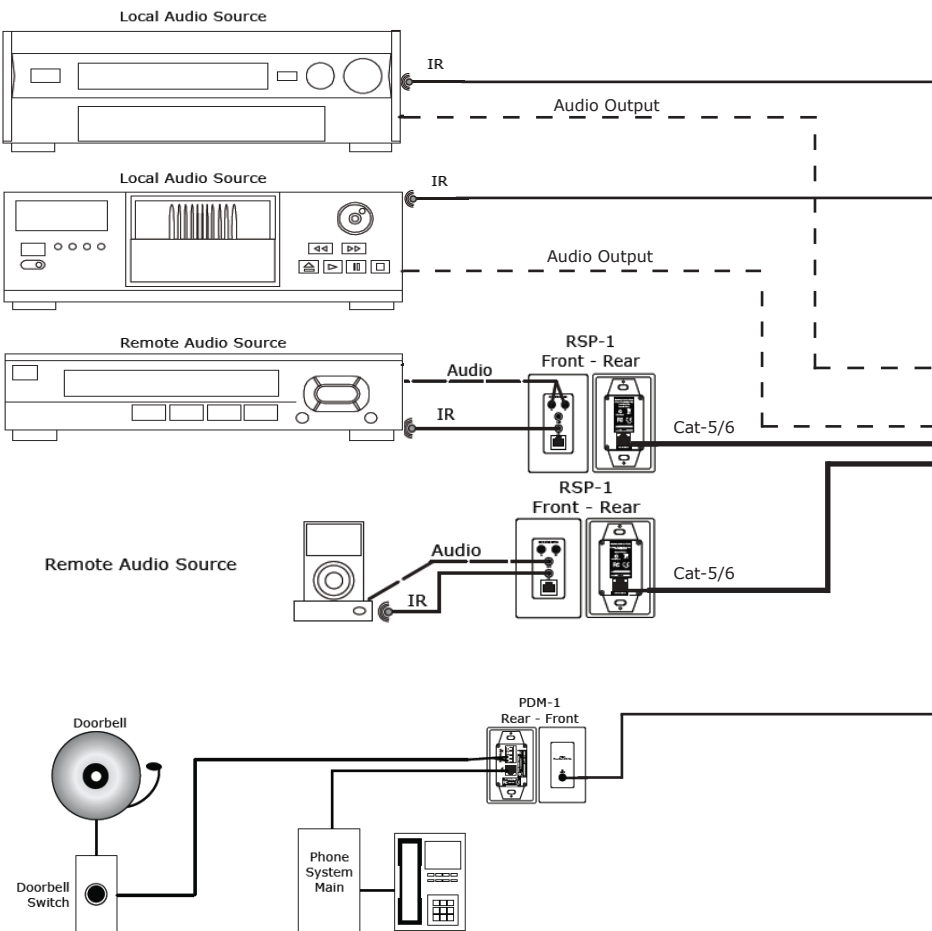
AD-4x #2
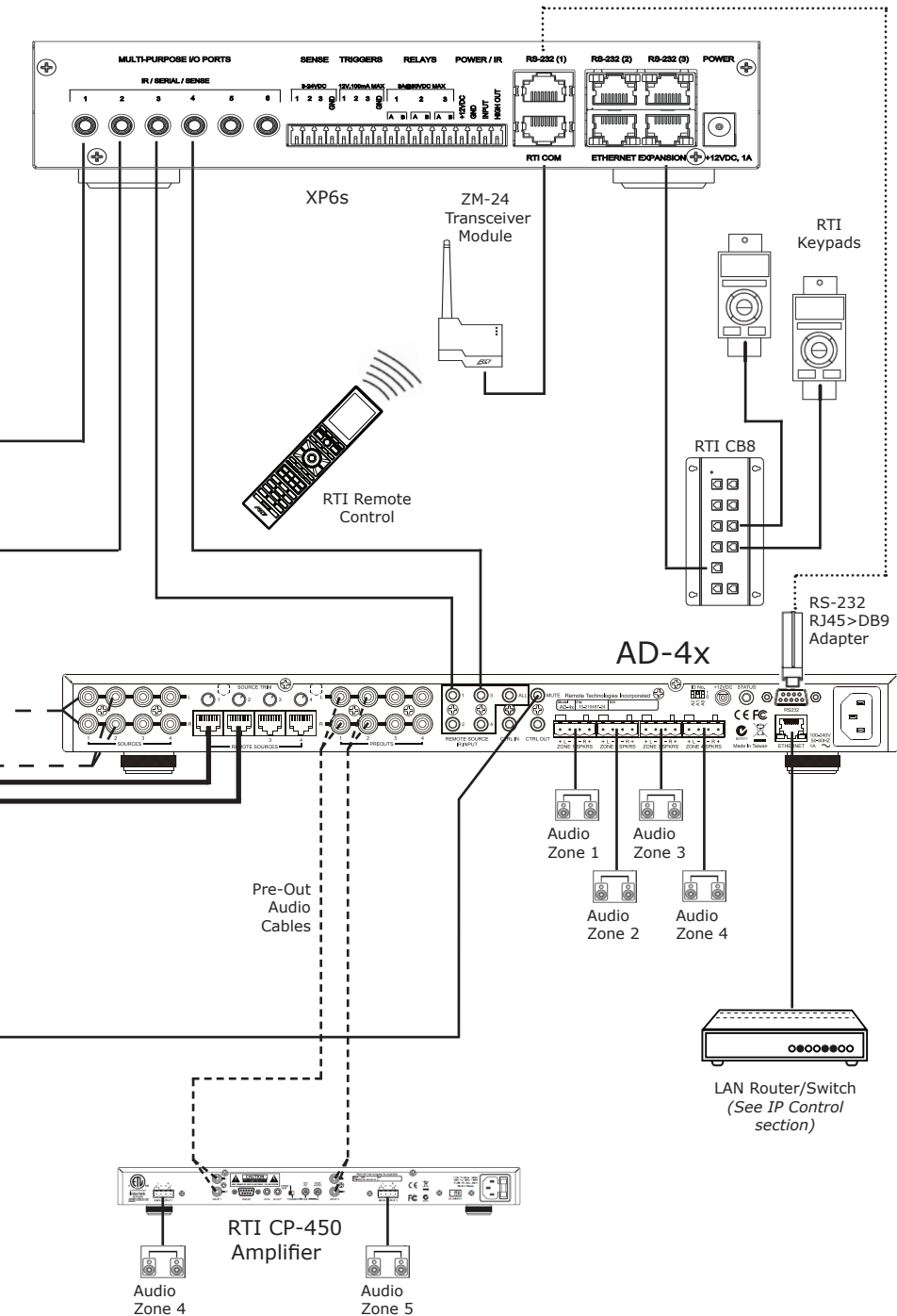
Controlling Multiple AD-4x's using RS-232
Each AD-4x will require an RS-232 connection to an RTI control processor. This will allow each AD-4x to be controlled separately, allowing for independent control in all eight output zones.

Cat-5/6

AD-4x #1   AD-4x #2

RTI XP6s Control Processor

AD-4x Audio Distribution System

CHAPTER 3 | INSTALLATION AND OPERATION

AD-4x CONNECTION DIAGRAM

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MULTI-PURPOSE I/O PORTS SENSE TRIGGERS RELAYS POWER / IR RS-232 (1) RS-232 (2) RS-232 (3) POWER

IR / SERIAL / SENSE

RTI COM ETHERNET EXPANSION +12VDC, 1A

XP6s

ZM-24
Transceiver
Module

RTI
Keypads

RTI Remote
Control

RTI CB8

RS-232
RJ45>DB9
Adapter

AD-4x

Audio
Zone 1

Audio
Zone 3

Audio
Zone 2

Audio
Zone 4

Pre-Out
Audio
Cables

LAN Router/Switch
*(See IP Control
section)*

RTI CP-450
Amplifier

Audio
Zone 4

Audio
Zone 5

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CONFIGURING THE AD-4X USING THE WEB INTERFACE

The AD-4x web interface is accessible via a standard web browser (Internet Explorer®, Firefox® , Safari® etc) on a PC, tablet or smartphone.

The web interface is used for:

• Configuring networking - IP address etc.

• Testing output zones - Each zone can have it's 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.

ADDING THE AD-4X TO THE ETHERNET NETWORK (LAN)

Wire the AD-4x 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-4x automatically and allow it to join the network.

• The AD-4x 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-4x 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".
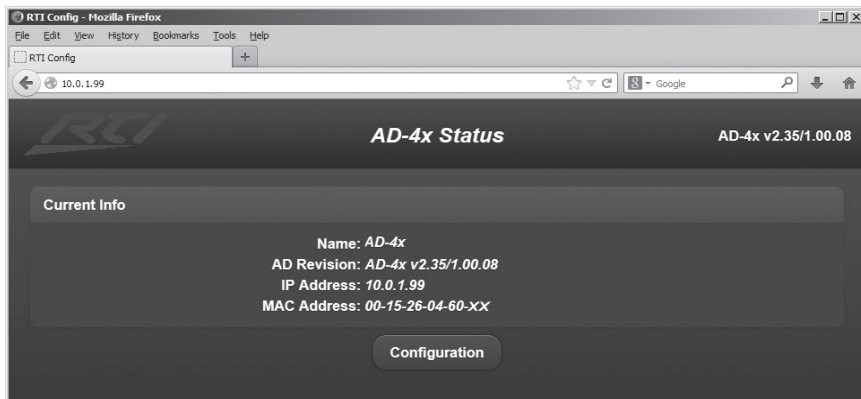• Find the AD-4x in the list of devices and double click on the icon to open the web interface.

OR

• The AD-4x 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.

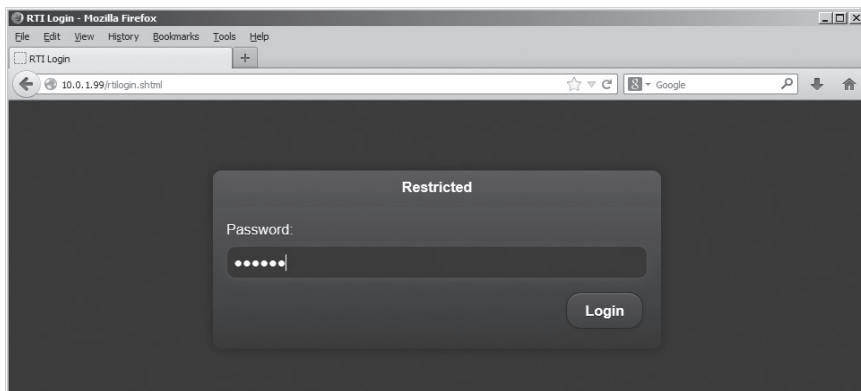   Example: http://192.168.0.15

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-4x name, firmware version, IP address and MAC address.

WEB INTERFACE - LOGIN

To configure the AD-4x settings, click on the "Configuration" button to login.

NOTE: The default password is: rti

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 "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-4x 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-4x 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-4x to DHCP

If the wrong IP address scheme is used during the static IP setup process, the AD-4x will not be accessible via the network. If this happens, the AD-4x web interface will not be available to make corrections and control via IP will not be possible.

To correct this, the AD-4x 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-4x. (See "RS-232 CONTROL OF AD-4x" for cable requirements).

2. Send this RS-232 string followed by a carriage return: **^rti dhcp**
   - 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-4x name

2. Click on the "Update Settings" button to save these settings.

WEB INTERFACE - NETWORK PAGE

WEB INTERFACE - ZONES PAGE

The Zones page of the web interface is used during AD-4x setup, allowing you to adjust the source, power, mute, volume and the assigned group from a device with a web browser such as a PC, tablet or smartphone.

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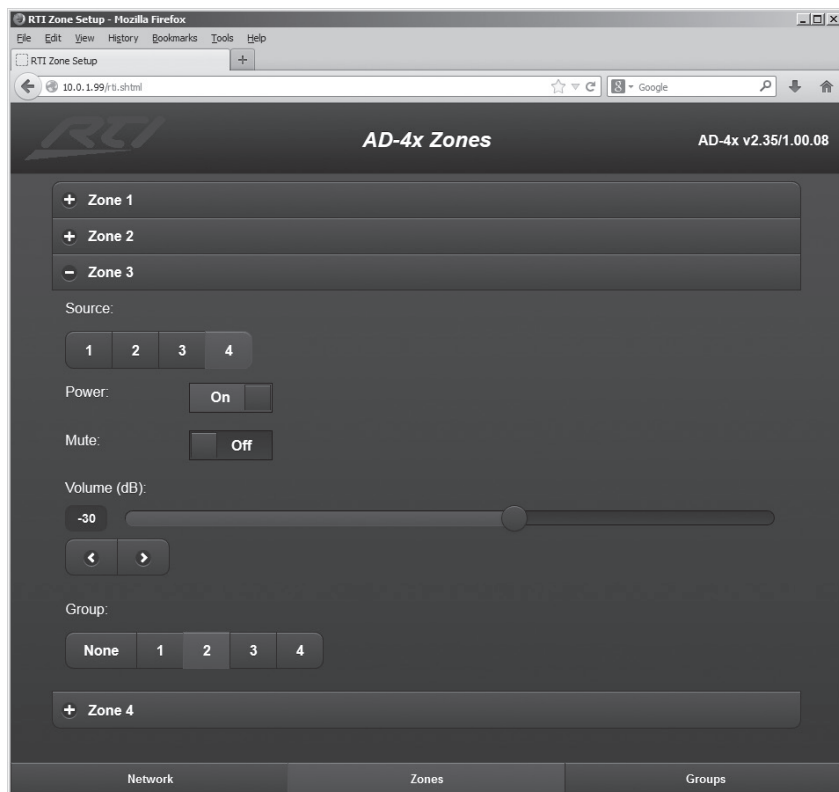
ZONE CONFIGURATION

Click the "+" next to the zone you wish to configure and test.

- **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 the zone on and off.
- **Volume:** Current volume level is displayed on volume slider bar. 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 VERY careful where you click to prevent accidently raising the volume to a high 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.

WEB INTERFACE - ZONES PAGE

In this example Zone 3 is configured:

- **Source:** 4 is selected
- **Power:** is ON
- **Mute:** is OFF
- **Volume:** set to -30dB
- **Group:** is a member of Group 2

WEB INTERFACE - GROUPS PAGE

The Groups page of the web interface is used during AD-4x 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 "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 each group.
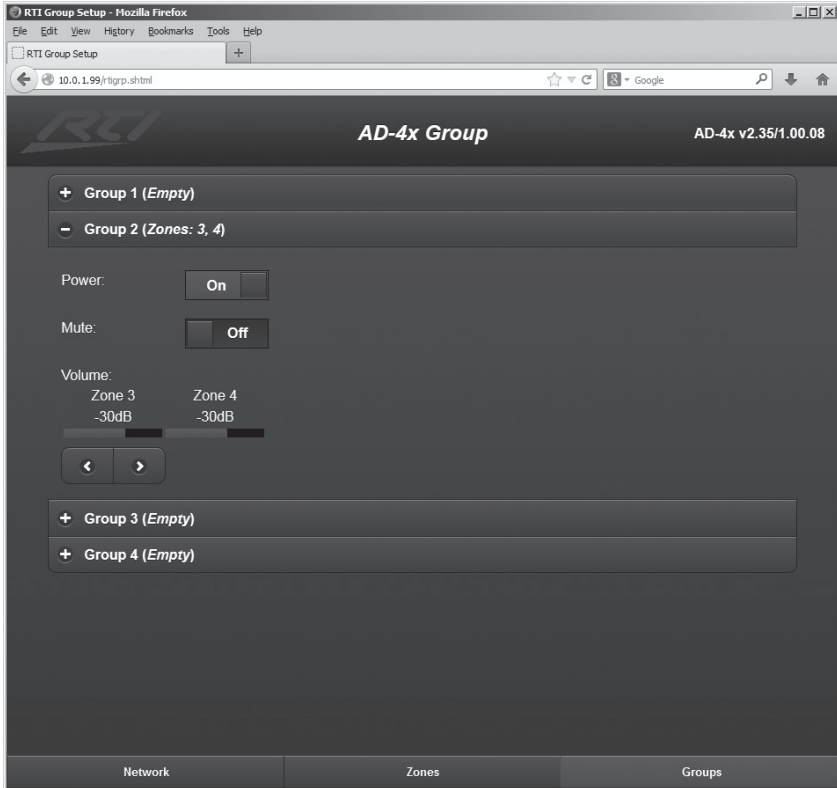
Click the "+" next to the group you wish to configure.

- **Power**: Click on this button to power the grouped zones on and off.
- **Mute**: Click on this button to mute the grouped zones on and off.
- **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	115 AC, 120W
Mounting	Rack mount or free standing
Dimensions (W x H x D)	16.9" (430mm) x 2.1" (53mm) x 13.3" (339mm)
Weight	11.0 lb. (5kg)
Warranty	Three Years (Parts & Labor)

CONTROL & CONNECTIONS

Total Output Zones	Four zones, two channels each (either 4 ohm or 8 ohm speakers may be connected to the zone outputs)
Pre-Outs	Four, RCA jack pairs
Audio Sources	Maximum four, local and remote combined.
Audio Source Inputs (Local)	Four, RCA jacks
Audio Source Inputs (Remote)	Four, RJ-45 jacks
Control Input	One, 3.5mm jack, compatible with industry standard IR repeaters and receivers
Remote Source IR Inputs	Five, 3.5mm jacks, compatible with industry standard IR emitters
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
Voltage Output	One, 12VDC, 500mA max
RS-232 Ports	One, Bi-directional DB-9
Ethernet Port	One, 10/100Base-T, RJ45 Connection
Unit ID Numbers	1-8, Set using 3 switches

CHAPTER 4 | SPECIFICATIONS

AUDIO

Total Output Zones	Four zones, two channels each
Rated Power / Channel	>20 Watts, 20Hz to 20KHz (RMS, 2 channels driven into 8 ohms)
Power / Channel	>25 Watts @ 1KHz (RMS, 2 channels driven into 8 ohms)
Total Harmonic Distortion @20W/8ohm	0.05%
Total Harmonic Distortion @1W/8ohm	<0.05%
S/N @ Rated power, IEC A-wtd, Source input shorted	92dB (mute +1)
Frequency Response 20Hz to 20KHz @ 1W/8ohms	1.5+/-0.5dB
Input Overload	2.5V
Input Impedance	>22K ohms
Channel Separation @1KHz	>60dB
Crosstalk Between Sources @ Rated Power /1KHz	>75dB
Crosstalk Between Zones @ Rated Power /1KHz	80dB
Treble Control @10KHz	10dB +/- 0.5dB
Bass Control Range @100Hz	10dB +/- 0.5dB

All specifications subject to change without notice.

CHAPTER 5 | TROUBLESHOOTING

If you are having problems with your AD-4x 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-4x 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-4x.
 - IR emitter > Verify IR emitter is working.
 - IR emitter placement > Verify emitter is properly placed.

Symptom: No IR control of AD-4x.
Possible Causes:
 - Faulty wiring > Jack is 1/8" mono, tip = IR+, ring=Gnd.
 - IR signal level > Adjust IR signal going into AD-4x.
 - CTRL IN > Verify connection is to CTRL IN

Symptom: No RS-232 control of AD-4x.
Possible Causes:
 - Faulty wiring > Check RS-232 pinout.
 - Incorrect string > Verify RS-232 string is correct.
 - 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.rticorp.com

CONTACTING RTI
For general info, you can contact RTI at:

Tel. (952) 253-3100
Fax (952) 253-3131
info@rticorp.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-4x, software, or accessories, contact RTI at:

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

For questions regarding service or repair of your AD-4x, contact RTI at:

(952) 253-3136
service@rticorp.com
www.rticorp.com

Please do not return products to RTI without return authorization.

CHAPTER 6 | SERVICE AND SUPPORT

Shipment of AD-4x 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-4x for service:

- Please pack it securely (we suggest that it be insured).
- Do not include accessories such as power cords or manuals unless instructed to do so.

You must pay any shipping charges incurred in getting your AD-4x 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.

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It's Under Control®

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