

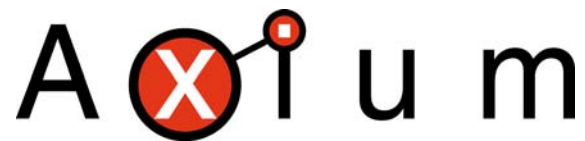
INSTALLATION & OPERATION MANUAL

AX250i



Two Zone:

Two Stereo Pre-Amplifiers & Amplifiers
With RS232, Keypad & IR Control



Total In Home Connectivity

Congratulations!

You have purchased one of the most advanced, dedicated multi-room amplifiers on the market. The AX250i like other Axiom products is designed to maximize control, simplify functionality, & expedite installation. Axiom products are built to the highest standards of quality and reliability.

To view Axiom's product line of Multizone Amplifiers, controllers, & accessories please visit the Website at www.axium.co.nz You may also download the latest control software.

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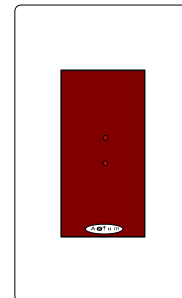
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INTRODUCTION

The AX250I Multizone amplifier combined with Axium Controllers, and/or a Home automation system enables you to individually adjust the Power status, volume and audio source in up to two rooms, and On status in a further two rooms. There are many advanced control features that may be accessed via the RS232 interface, some of which are monitoring of any controlled parameter, maximum volume limit setting, zone tracking - See the features section of the manual. A utility program called AMPCTRL is available from the Axium website, this gives users complete access, and control of all Axium networked components, and even provides the ability to schedule events from your personal computer. Axium Multizone amplifiers may be interconnected via the expansion bus, providing up to 32 zones of control, and vastly simplifying installation cabling.

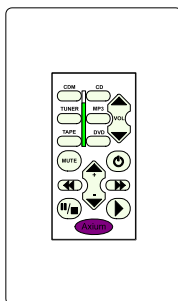


Multizone Amplifier

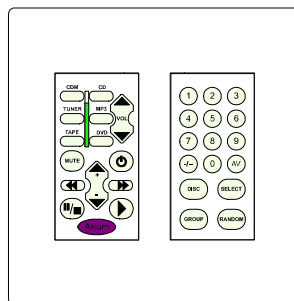


IRX receiver

**Integrate Controllers freely throughout the system.
Decide what control best suits each room.**



KRX – keypad



KDX – Keypad



PRX – Remote

FEATURES

- **Two Zone with two speaker switched outputs**
Two pre-amplifiers and amplifiers, each with two speaker switched outputs. Speaker A & B outputs are Zone 1, Speaker C & D outputs are Zone 2.
- **Remote controlled via Infra-red and Wired IR**
The front panel is equipped with an IR receiver, so the AX250i may receive IR directly from a PRX remote control, or other learning remote. The wired IR is decoded directly by the AX250i (IR is not re-emitted out of the front panel)
- **RS232 Control**
Full control and monitoring is available via RS232 of any Axiom multizone amplifier or KRX keypad. Only one RS232 connection is necessary to an Axiom amplifier stack.
- **Audio Inputs**
Four stereo inputs (CD, Tape, Tuner, & Aux) and one mono Input. (Utility)
- **Amplifier Power and Protection**
50 Watts RMS into 8 ohms, capable of driving into 4 ohms. The amplifiers are protected against short term output shorts, and high ambient temperatures.
Care should be taken to ensure adequate ventilation – see “installation guide”
- **Amplifier ON Status - “Amp-On”**
Each Speaker output has front panel On status indication, and 12VDC outputs on the rear panel connector. *The output’s are protected against shorts and back EMF voltage surges which may occur if powering a relay.*
- **Summed Amp-On**
A “Summed Amp-On” 12VDC output is provided on the rear panel connector. This is typically used to switch the Audio source component’s AC power.
If any amplifier Zone or Speaker output in an Axiom amplifier stack is ON, then this output will be 12VDC. *The output is protected against shorts and back EMF voltage surges which may occur if powering a relay.*
- **Power failure Restoration**
After an AC power outage the AX250i restores it’s settings to the pre-interrupted state. All internal settings are stored in non-volatile memory.
- **Direct wiring Keypads & IR receivers**
An IR input is provided on the rear panel connector, this is separately buffered both to the IR output jack, and to the Axiom expansion Bus (Axiom amplifier stack)
- **Pre-amplifier output**
The Zone 1 line level post fader output is provided on the rear panel
Typical applications are: Active sub-woofers & for connecting to higher-powered amplifier.
- **Source select output**
The Zone 1 line level (pre-fader) source select output is provided on the rear panel.
Typical applications are slave amplifier driven passive volume controlled speaker networks.

- **Axium Bus**
Axium Bus provides inter amplifier & Keypad control and monitoring. The Bus is protected from shorts to both 0V and +12VDC.
- **Bass, Treble, Balance, and Loudness controls**
Bass, Treble, and Balance controls may be accessed via the front panel or RS232. The loudness control - which is a low frequency boost whose level is dependent on volume – is controlled via the AMPCTRL set up utility (RS232)
- **Expansion Bus**
Data, IR, Amp-On & Audio Sources are interconnected via the expansion bus to other Axium amplifiers, thus simplifying the Axium amplifier stack wiring. The expansion bus uses the simple 20-way ribbon cable connector system
- **32 Zones**
32 zones of control is available. On the AX250i each Zone must be different, however in a multiple amplifier stack same Zone amplifiers are possible – they simply mimic every parameter.
- **Zone Tracking**
A Zone may be programmed to track one other Zone. When Zone tracking is selected, the source selection is tied together, but Standby, Mute, and volume control are independent. This is useful for closely coupled audio areas where it is advantageous to have different volume control but the same source.
- **Maximum volume limiting**
A volume limit may be set on any Zone, typically this is to prevent reckless use of the system, or prevent destruction of speakers when powered by a slave amplifier.
- **Global IR commands**
There is a range of Global IR commands available for turning All amplifiers either On, Off, or selecting various audio sources. There are also Force and Release Preset commands that invoke a user programmed Amplifier preset.
- **Global Preset**
One Preset may be programmed for every Zone, wherein any controlled parameter may be set. A Preset may be invoked either by the Preset IR command, RS232, or by a contact closure at the panels “preset input utility” connector on the rear panel. When a preset is invoked all Zones go to their programmed preset state. Upon release from the preset the amplifier Zone returns to it’s previous state. A typical application is phone paging.
- **Firmware upgradeable**
The AX250i’s microcontroller may be updated with the latest operational firmware via the RS232 port and a boot-loader program. The ability to enhance the functionality of installed Axium product’s provides a degree of future proofing, and flexibility.
- **Toroidal transformer power supply**
An impressive toroidal transformer ensures stable power supply performance and minimal magnetic field interference.
- **Restore factory defaults**
Remove AC power, push and hold down Function & Tuner Keys and reconnect AC power. The Amplifier will be reset to factory defaults, and memory cleared.

INSTALLATION GUIDE

UNPACKING

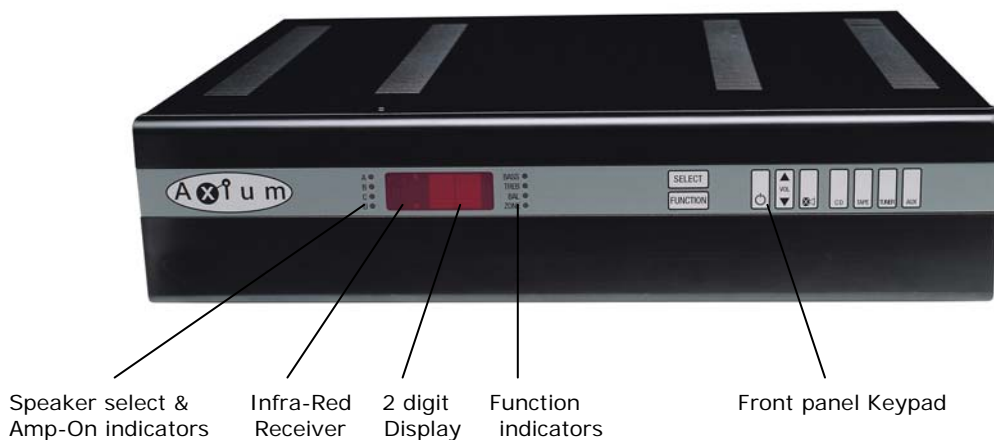
Immediately upon receiving your AX250i inspect the carton for evidence of mishandling during shipment. Then carefully unpack the unit and inspect for damage.

Please save the shipping carton and all inner packing materials in the event that the AX250i needs to be shipped for service or moved to a new location. Should you discover that the AX250i has been damaged during shipping please contact your dealer immediately.

PRECAUTIONS

- 1) Never expose the unit to moisture
- 2) Avoid restricting the airflow around the AX250i. Good airflow is necessary to help ensure proper operation. Not only should you provide enough free space around the unit, but also ensure that air can flow freely and escape from the amplifier surroundings. Failure to do so may cause intermittent channel cutout and reduced life expectancy.
- 3) Under no circumstances should the speaker output terminals of the unit be short circuited, or connected to another output.
- 4) Never plug the RS232 cable into the unit while power is connected.
- 5) Never short the 10 way controller connector terminals. These should all be connected before the AX250i is powered.
- 6) Avoid installing the AX250i in positions where the front panel is exposed to direct sun light. This may intermittently slow down the response of the unit to commands.
- 7) Never connect more than four controllers to the unit's 12Vdc-power supply terminals. The supply is internally poly-fused (self-resetting) and will open circuit.
- 8) Never connect the AX250i's +12Vdc power supply to an external power supply or other Axium amplifier's +12Vdc output.

FRONT PANEL OPERATION



SELECT

The SELECT button toggles the amplifier zone/speaker for which the front panel keypad is addressing. This is indicated by the Green Zone select LED' (A, B, C & D) It is also used as an 'enter key' when setting the amplifier zone.

FUNCTION

The FUNCTION button toggles between BASS, TREBLE, BALANCE & ZONE. Once a function is selected (corresponding LED FUNCTION indicator) the parameter may be edited using the VOL UP & DOWN buttons. For example to adjust the BASS settings on zone 1, make sure that the Speaker A or B indicator LED is lit (green) and the Zone is ON. Press the FUNCTION button until the BASS indicator LED is illuminated. You can then increase or decrease the BASS by pressing the VOL UP (increase) or DOWN (decrease). The FUNCTION level/value is indicated on the 2-digit display. The Zone is selectable between 0 – 31 and must be set in memory by pressing the SELECT button. FUNCTION mode is terminated after 4 seconds of inactivity or by toggling past the last FUNCTION (ZONE).

STANDBY

Standby toggles the selected speaker output ON or OFF. Amp-On indicators (RED LED's) provide standby status.

VOL UP & DOWN

VOL UP & DOWN control the selected Zone's volume in 2.5db steps. If the zone is muted, then pushing either VOL Up or DOWN will un-mute the amplifier.

MUTE

The MUTE button toggles the selected Zone's muting. The 2-digit display flashes while muted.

CD

Selects the CD input source

TAPE

Selects the TAPE input source

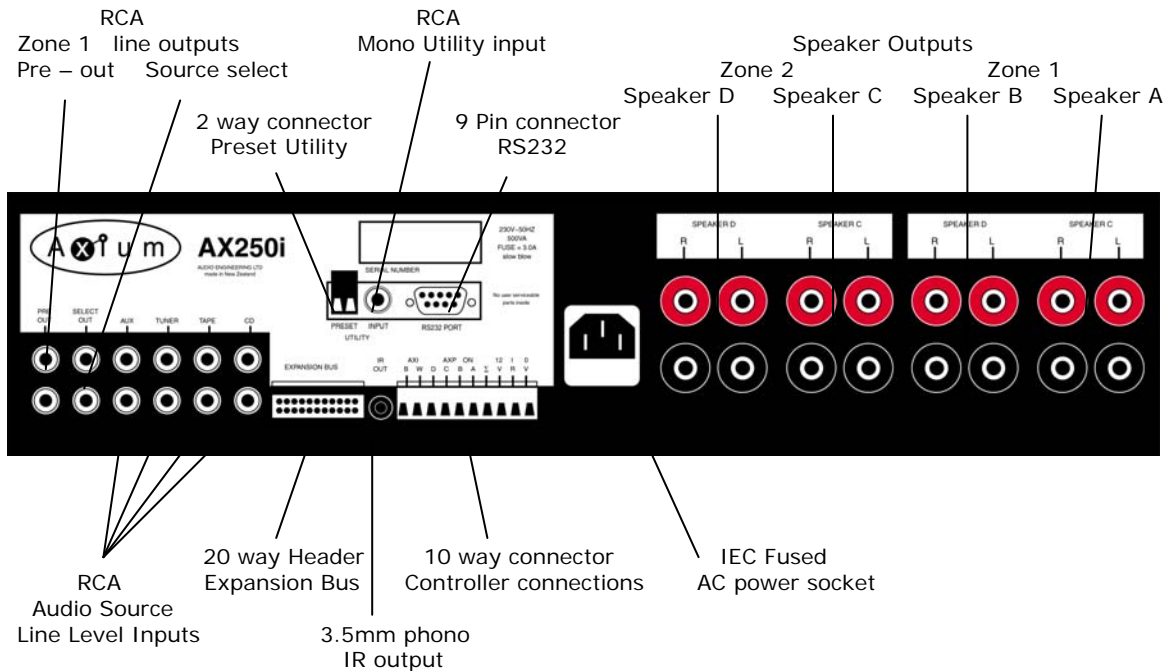
TUNER

Selects the TUNER input source

AUX

Selects the AUX input source

REAR PANEL CONNECTIONS



Audio Source Inputs

CD, TAPE, TUNER, AUX & Utility are common to all zones.

The utility input is mono and connects to both left and right channels. Typical applications are paging, or where a mono source is required (AM radio)

Line Outputs

SOURCE SELECT is the Zone 1 pre-fader output - independent of the volume control.

A typical application for this output is where speakers have volume pads installed and a slave amplifier is required to operate the network at full power.

PRE-OUT is the Zone 1 post fader output – Output level is dependant on the volume control.

The output is muted when Zone 1 is muted.

PRE-OUT may be used to drive a high power Slave amplifier or Active Sub-Woofer.

IR Out

A 3.5mm phono socket provides direct connection for IR emitters. The output is individually buffered and current limited, this ensures that a damaged emitter does not short out the IR system.

Expansion Bus

Axium amplifiers may be connected together via a 20 way IDC ribbon cable connection.

This simplifies the Audio source component connections. – CD, TAPE, TUNER, AUX & Utility are connected to only one Axium amplifier!

The summed Amp-On output, Axium Bus, and buffered IR input are linked through the Bus.

Axium Bus is a 2 wire serial communication interface which provides inter-amplifier and controller monitoring and control.

RS232 Port

The RS232 Asynchronous serial port provides data acquisition and control of Axium networks by a Home Automation System, or personal computer. Only one RS232 connection is necessary when interfacing with an Axium network.

The lead must be 'Null modem' : 9 pin female 'D' connectors at both ends (pin connections 2 and 3 swapped at one end)

See appendix1: RS232 protocol for more information.

PRESET Utility

A voltage free contact closure forces all Axium amplifiers (Zones) into their PRESET mode.

Open circuiting the terminals restores the amplifiers to their previous states.

10 way Terminal Block

0V	0V connection to Axium controllers and accessories.
IR	Infra-Red input from Axium controllers.
12V	Self-resetting Poly fused +12Vdc power supply for Axium controllers and accessories. The maximum number of controllers is four. If this is exceeded it is likely that the internal fuse may trigger open circuit.
Σ	The logical 'OR' of the Amp-On outputs. If any speaker output is ON, then Σ is On (12V). This is used to switch power sockets for connecting AC power to Audio source components. i.e. CD players, Tuners etc.
Amp-ON A	If Speaker A (Zone 1) is ON then output will be +12V. Current limited (25mA)
Amp-On B	If Speaker B (Zone 1) is ON then output will be +12V. Current limited (25mA)
Amp-On C	If Speaker C (Zone 2) is ON then output will be +12V. Current limited (25mA)
Amp-On D	If Speaker D (Zone 2) is ON then output will be +12V. Current limited (25mA)
AXI – W	Axium Bus (Clock) for connecting to Keypad controllers
AXI – B	Axium Bus (Data) for connecting to keypad controllers.

IEC Fused AC Power Socket

An IEC AC power socket provides the possibility of international power connectivity.

The operating voltage may be changed internally to 110VAC.

Fuse = 1.6Amp Slow blow, size =20mm. Replace only with same rated fuse!

Speaker Outputs

Speaker A, B, C & D outputs are BANANA sockets.

If both A & B are used then the maximum load on each output is 8 ohms. (4 ohms min/amp)

If both C & D are used then the maximum load on each output is 8 ohms. (4 ohms min/amp)

The BLACK outputs are all common.

The RED outputs must never be connected together. It is not possible to operate the amplifiers in parallel or "Bridge Tied Load".

SPECIFICATIONS

Audio Performance

Preamplifier:

Input impedance (all inputs)	= 180Kohms
Frequency response	= 20Hz – 20KHz
Signal-Noise ratio (relative to 1V @1KHz)	= >90db
Channel separation	= >90db
Max pre-out before clipping	= 2.3V RMS
Max input level (Tone control defeated)	= 2.0V RMS
THD (Vin = 1V; Gain = 0db)	= < 0.05%
Bass control range	= ± 12db
Treble control range	= ± 12db
Balance control range	= ± 19db
Loudness boost (Gain < -50db)	= +6db @ 40Hz
Volume control range	= -86db - 0db (2.5db steps)
Mute attenuation	= 100db

Amplifier:

Output power -8 ohm load	= 50W RMS
Output power – 4 ohm load	= 75W RMS
Slew Rate	= 10V/μs
THD (8ohm load, 1KHz @ 5Watt)	= <0.01%

IR range

9 m @ 30degrees off horizontal axis.

Dimensions

Width = 435mm (17")
Height = 112mm (4-2/5")
Depth = 340mm (13-2/5")

Weight

7.8Kg (17-1/16 lbs)

Certification

This device complies with AS/NZS 1053, Edition 5, 1999

APPENDIX 1: RS232 PROTOCOL

Baud Rate = **9600**

Command Structure: **<command><zone><data>line feed.**

Characters are all **ASCII**.

Command

Command	Description
01	Standby
02	Mute
03	Source Selection
04	Volume
05	Bass
06	Treble
07	Balance
09	Send All parameters
0B	Cause key press on Keypad
0C	Amplifier features
0D	Volume Limit
0E	Preset Call
0F	Track Zone
10	Unsupported IR command received
60 – 6F	User defined IR commands, no data byte
70 – 7F	User defined IR commands, one data byte

Zone

Axiom amplifiers and keypads are encoded with up to 32 zones (**00 – 31**)

All amplifier zones may be addressed by sending the **FF** characters

Data

Command	Content
Standby	00 – Standby A OFF 01 – Standby A ON 02 – Standby B OFF 03 – Standby B ON
Mute	00 – Mute 01 – Un-mute
Source Selection	00 – Select CD 01 – Select Tape 02 – Select Tuner 03 – Select Auxilliary 04 – Select Mono utility input
Volume	00 – A0 range
Bass	F4 – 0C (-12db - +12db)
Treble	F4 – 0C (-12db - +12db)
Balance	EC – 14 (Left –20db – Right –20db)
Amplifier features	00 – Loudness enabled 01 – Loudness disabled
Volume Limit	00 – A0 range
Preset	00 – Standard mode 11 – Force Preset
Track Zone	00 – 31 zone to be tracked FF – for no zone tracking

Notes:

- Commands are used as notifications. If an amplifier is switched ON, it will notify the other devices on the Axiom Bus by sending the Standby command (01). Any amplifiers with the same zone will take the notification as a command and also switch ON.
- When a command is sent to an amplifier it will first be transmitted on the Axiom bus and then returned to the PC (Home automation system). If an error occurs an error will be returned instead of the original command. The PC (Home automation system) needs to ignore its command when it is returned.
- Standby B commands are ignored by AX450i amplifiers.
- A Standby A or B ON command implies that the amplifier is not muted, if the amplifier was previously OFF. A Mute command must follow the Standby command if it is muted.
- The 'Track zone' command tells the zone specified to follow the source selection of the "Zone to be tracked". This does not imply that the "Zone to be tracked" will also track the Zone amplifier. It is normal that the program setting up the zone tracking will send two commands, one to get Zone X to Track Zone Y, and another to get Zone Y to track Zone X.

Example strings:

010801 : Standby A ON command for Zone 8
 060002 : +2db Treble setting on Zone 0
 033102 : Tuner source selection on Zone 31
 0B0311 : Volume down continuous push on Zone 3 keypad

Keypad key codes

An Axiom Keypad may be directed to emit its learnt IR commands via RS232 control.

This is achieved by sending a 'Cause key press on Keypad' command, followed by the zone, and the Keypad key code (data).

The Keypad key code is encoded with IR string repeats. (See table below)

To terminate a continuously repeating 'Key press', command a **00** keypad key code must be sent.

Continuous	REPEATS							KEY
	1	2	3	4	5	6	7	
00	xx	xx	xx	xx	xx	xx	xx	Stops repeating the current key
01	21	41	61	81	A1	C1	E1	Aux
02	22	42	62	82	A2	C2	E2	Tuner
03	23	43	63	83	A3	C3	E3	CD Bank
04	24	44	64	84	A4	C4	E4	CD
05	25	45	65	85	A5	C5	E5	Vol Up
06	26	46	66	86	A6	C6	E6	Ch Up (2)
07	27	47	67	87	A7	C7	E7	Random (1)
08	28	48	68	88	A8	C8	E8	Play
09	29	49	69	89	A9	C9	E9	Power
0A	2A	4A	6A	8A	AA	CA	EA	+ Track skip (0)
0B	2B	4B	6B	8B	AB	CB	EB	- Track skip (9)
0C	2C	4C	6C	8C	AC	CC	EC	Disc skip
0D	2D	4D	6D	8D	AD	CD	ED	Mute
0E	2E	4E	6E	8E	AE	CE	EE	Fast Forward (8)
0F	2F	4F	6E	8F	AF	CF	EF	Rewind (7)
10	30	50	70	90	B0	D0	F0	Pause (6)
11	31	51	71	91	B1	D1	F1	Vol Down
12	32	52	72	92	B2	D2	F2	Ch Down (5)
13	33	53	73	93	B3	D3	F3	Band (4)
14	34	54	74	94	B4	D4	F4	Stop (3)

APPENDIX 2: AMPCTRL PROGRAM

Overview:

AMPCTRL is an Axium amplifier setup utility program.

Full control, and tracking of any Axium amplifier zone if provided.

The program also has a scheduler. A wake up alarm clock is a typical function for the scheduler

Multiple amplifier setups may be programmed and scheduled to run either periodically or as single events.

A keypad Macro may also be programmed as part of the Schedule.

An Axium Keypad (connected to an amplifier) may be controlled, causing the keypad to emit it's learnt IR strings. Thus Audio Source (CD, Tuner etc) control may be achieved via the AMPCTRL program.

The Keypads programming file may be imported from AxiumIR (Keypad and Remote control program) providing button ID's.

For a full AMPCTRL users guide please visit the Axium Website: www.axium.co.nz

System requirements: Win95/98 or Win2000 PC with Com port

