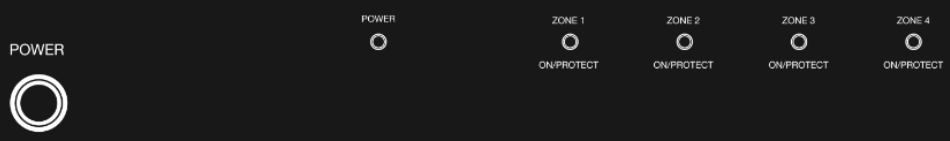
6x4 **Multizone Home Audio Controller**

and Amplifier Kit

User's Manual



6x4 Multizone Home Audio Controller

14524

CONTENTS

SAFETY WARNINGS AND GUIDELINES

- This device is intended for indoor use only.
- Do not expose this device to water or moisture of any kind. Do not place drinks or other containers with moisture on or near the device. If moisture does get in or on the device, immediately unplug it from the power outlet and allow it to fully dry before reapplying power.
- Do not touch the device, the power cord, or any other connected cables with wet hands.
- Do not expose this device to excessively high temperatures. Do not place it in, on, or near heat sources, such as a fireplace, stove, radiator, etc. Do not leave it in direct sunlight.
- This device ventilates excessive heat through the slots and openings in the case. Do not block or cover these openings. Ensure that the device is in an open area where it can get sufficient airflow to keep from overheating.
- Do not place or install this device in an area where it can be exposed to excessive amounts of dust, humidity, oil, smoke, or combustible vapors.
- Prior to operation, check the unit and power cord for physical damage. Do not use if physical damage has occurred.
- Take care to prevent damage to the power cord. Do not allow it to become crimped, pinched, walked on, or become tangled with other cords. Ensure that the power cord does not present a tripping hazard.
- Before plugging the unit into a power outlet, ensure that the outlet provides the same type and level of power required by the device.
- This device uses a grounded power cord and requires a ground connection for safe operation. Ensure that the power source has a proper ground connection. Do not modify the plug or use a "cheater" plug to bypass the ground connection.
- Ensure that power is turned off and disconnected before making any electrical connections.

- Disconnect the unit from the power source when replacing the fuse. Replace the fuse only with the same type.
- Unplug this device from the power source when not in use.
- Never unplug the unit by pulling on the power cord. Always grasp the connector head or adapter body.
- Remove the batteries from the controller if it will go unused for a lengthy period of time.
- Clean using a soft, dry cloth only. Do not use chemical cleaners, solvents, or detergents. For stubborn deposits, moisten the cloth with warm water.
- This device has no user serviceable parts. Do not attempt to open, service, or modify this device.

INTRODUCTION

Thank you for purchasing this Multizone Home Audio Controller and Amplifier Kit!

This device is a full function audio system, which combines the functions of a preamplifier, a full 6x4 audio matrix, and four 70 watt power amplifiers for driving speakers in up to four separate zones. Additionally, up to three multizone amplifiers, including the 10761 6x6 50-watt model, can be combined to provide full signal switching and amplification to up to 16 different speaker zones!

For best results, please read and understand this manual thoroughly before installation, paying particular attention to the safety warnings and guidelines. Keep this manual in a safe place for future reference.

FEATURES

- Two pairs of analog stereo RCA inputs
- One analog 3.5mm TRS stereo input
- One combination analog 3.5mm TRS/digital optical Mini Toslink® stereo input
- Two RJ45 digital inputs for use with audio source devices, such as the model 13358 Multizone Source Keypad
- Four separate stereo 70-watts per channel into 4-ohms audio amplifiers
- Each amplifier can be bridged to produce 140-watts into an 8-ohm load
- Can be expanded with up to two additional 6x4 or 6x6 multizone controllers
- PA override feature to broadcast to all zones
- 12-volt triggers for each zone
- Includes IR remote control and four remote keypad controllers
- Includes rack mount ears for installation into a standard 19" equipment rack

PACKAGE CONTENTS

After receiving the product, please inventory the contents to ensure you have all the proper parts, as listed below.

1x 6x4 multizone home audio controller/amplifier

4x Keypad controllers

1x Keypad in-wall hub connection plate

1x Infrared remote control

1x Expansion ribbon cable

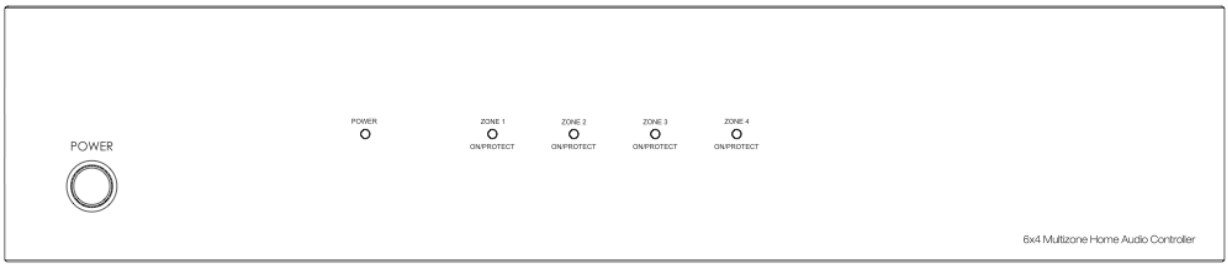
1x Rack mounting kit

1x AC power cord (IEC 60320 C13 to NEMA 5-15)

1x User's manual

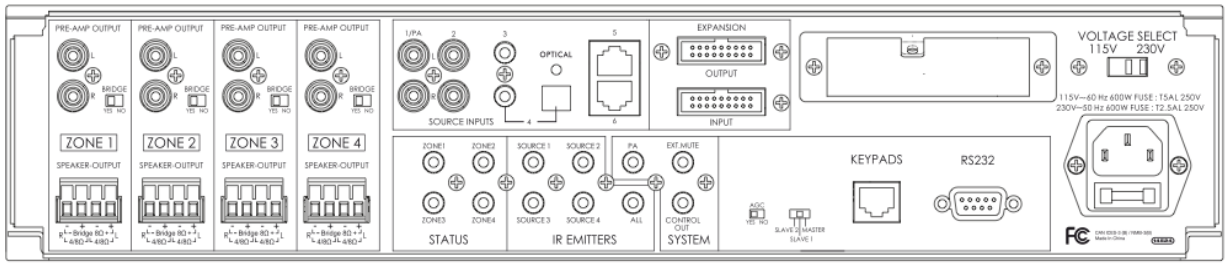
PRODUCT OVERVIEW

Front Panel



1. **Power Button:** Depress the power button to turn the controller/amplifier on or off. Note that when the controller is powered on, each individual zone will remain in standby until its keypad is activated.
2. **Power LED Indicator:** This LED is off when the controller is powered off and illuminates red when power is applied.
3. **Zone Status LED Indicators:** These multicolor LEDs illuminate blue whenever the individual zone keypad is activated. If the amplifier is driven into distortion, the audio signal will cut off and the LED will change color to red, indicating that you should immediately reduce the volume level using the zone keypad.

Rear Panel



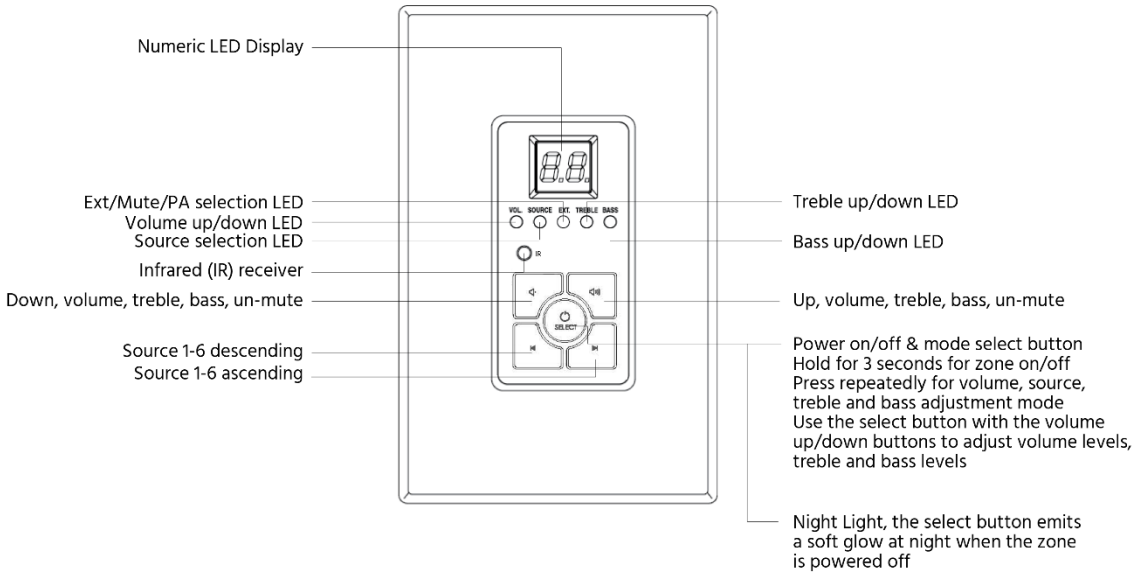
4. **Preamp Outputs:** Each of these four stereo pairs of RCA jacks is used to connect to a dedicated power amplifier, instead of using the built-in amplifier.
5. **Bridge Switch:** Each of these slide switches is used to switch the zone between Stereo and Bridged Mono mode. In Stereo mode you can connect 4-ohm or 8-ohm speakers, but in Bridged Mono mode you can only connect an 8-ohm load.

6. **Speaker Output:** Each of these removable Euroblock terminal blocks is used to connect a pair of speakers in Stereo mode or a single speaker in Bridged Mono mode.
7. **Source Input 1:** This analog stereo RCA pair is used to connect to the line level output of an audio device, such as a CD player. When a 12VDC trigger signal is detected on the *System PA* input, the audio on this input is broadcast to all zones.
8. **Source Input 2:** This analog stereo RCA pair is used to connect to the line level output of an audio device, such as a CD player.
9. **Source Input 3:** This analog stereo 3.5mm TRS jack is used to connect to the line level output of an audio device, such as a CD player, or the headphone output of a mobile device.
10. **Source Input 4:** This 3.5mm TRS jack can be used as an analog stereo audio input or as a digital optical S/PDIF (Mini Toslink®) input. Instead of requiring a physical switch to change modes, the controller will automatically detect the type of signal and adjust itself accordingly.
11. **Source Inputs 5 and 6:** Each of these RJ45 Ethernet jacks is used to connect to a digital audio source, such as the model 13358 Multizone Source Keypad, using Cat5e or Cat6 cables.
12. **Zone Status:** Each of these 3.5mm TS jacks provides a constant 12VDC signal output whenever the corresponding zone is active. This 12-volt signal can be used as a trigger for motorized devices, such as projector screens, curtains, lights, etc.
13. **IR Emitters:** Each of these 3.5mm TS jacks is used to connect to an infrared emitter, which can repeat an IR control signal sent from a remote keypad to control each source device. The IR repeater function supports single-band IR signals only (those in the 38kHz range). The ALL jack repeats the IR control signals for all source devices to a single IR emitter.
14. **System PA:** This 3.5mm TS jack is used to connect to a 12VDC trigger source. When a signal is present on this input, the audio from Source Input 1 is broadcast to all zones.

15. **System Mute In:** This 3.5mm TS jack is used to connect to a 12VDC trigger source. When a signal is present on this input, the audio output is muted for all zones.
16. **System Control Out:** Similar to the Zone Status jacks, this 3.5mm TS jack provides a constant 12VDC signal output whenever any zone is active. This 12-volt signal can be used as a trigger for motorized devices, such as projector screens, curtains, lights, etc.
17. **Expansion Input and Output:** These two ribbon cable connectors are used to connect to up to two additional 6x4 (14524) or 6x6 (10761) controllers to create up to 16 distinct zones. Use the included ribbon cable to connect the output of one controller to the input of the second. A third Controller can then be connected to the output of the second.
18. **AGC Switch:** This slide switch controls whether Automatic Gain Control is active or not. The automatic gain ensures that all the inputs are at the same overall volume level.
19. **Master/Slave Switch:** This slide switch determines the functional assignment of this particular controller in a multi-controller setup. Up to three controllers can be connected, one of which must be designated the Master, with the other two being Slave 1 and Slave 2.
20. **Keypads Jack:** This RJ45 Ethernet jack is used to connect the controller to the Keypad In-wall Hub Connection Plate, which in turn connects to each individual wall plate keypad. Use Cat5e or Cat6 Ethernet cable wired to the TIA/EIA-T568B standard. Ethernet cables are not included.
21. **RS232 Port:** This DB9 (DE9) female port is used to connect to a PC to provide automated control of the system. A full reference to the RS232 codes needed to control the system can be found in the *RS232 Serial Control* section of this manual.
22. **Voltage Select Switch:** This slide switch sets the base input voltage to 115V or 230V. The plastic cover must be removed before the switch position can be changed, which ensures that the voltage switch cannot be accidentally set to the wrong position. Make sure the voltage selector switch is set to the correct voltage range before plugging the unit into a power outlet. The fuse should be replaced with the appropriate type and size whenever the input voltage level is changed.

23. **AC Power Input Socket/Fuse Holder:** This combination power socket and fuse holder uses the familiar IEC 60320 C14 style and connects using a power cord with a C13 plug. The fuse is a 250V, 600 watt T5AL type for 115V use and a T2.5AL type for 230V use. Always change the fuse whenever the input voltage is changed.

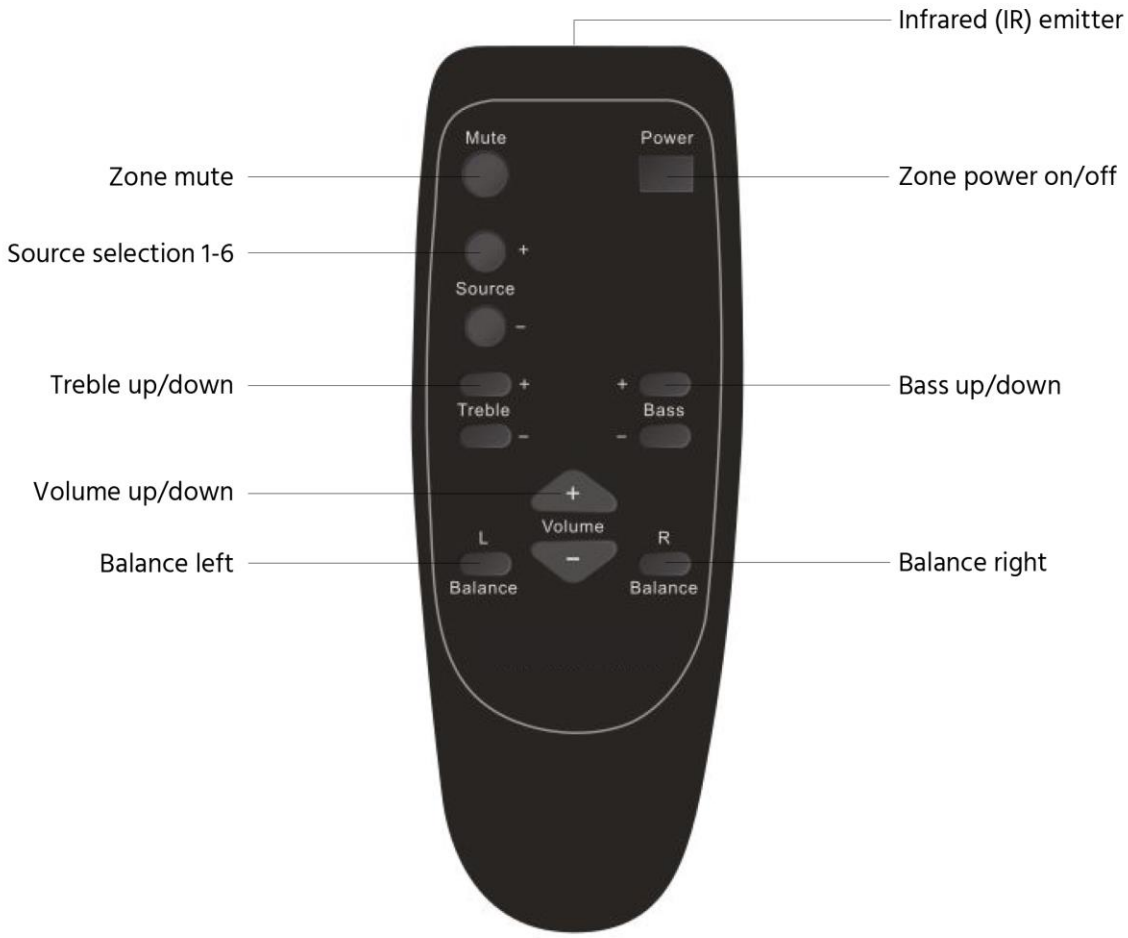
Keypad Controllers



24. **LED Display:** The digital LED display shows the number of the source device, as well as the volume, treble, and bass levels.
25. **Vol. LED:** When illuminated, this LED indicates that the Numeric LED is displaying the volume level. Use the **Up** and **Down** buttons to increase and decrease the volume level.
26. **Source LED:** When illuminated, this LED indicates that the Numeric LED is displaying the source selection.
27. **Ext. LED:** When illuminated, this LED indicates that the Mute function is enabled or that a PA broadcast is in progress.

28. **Treble Mode LED:** When illuminated, this LED indicates that the Numeric LED is displaying the treble level. Use the **Up** and **Down** buttons to increase and decrease the treble level.
29. **Bass Mode LED:** When illuminated, this LED indicates that the Numeric LED is displaying the bass level. Use the **Up** and **Down** buttons to increase and decrease the bass level.
30. **Infrared (IR) Receiver:** The IR "eye" receives the infrared remote control signals. Signals sent from the included remote control are used to control the wallplate keypad, while signals from other remote controls are sent back to the Master Controller, which distributes the signals to the source device via an external IR emitter (not included).
31. **Up Button:** Use this button to increase the volume, treble, or bass levels, depending on which mode is selected. If the zone is muted, pressing this button will unmute it.
32. **Down Button:** Use this button to decrease the volume, treble, or bass levels, depending on which mode is selected. If the zone is muted, pressing this button will unmute it.
33. **Previous Source Button:** Use this button to cycle backwards through the list of available sources. For example, if source 4 is currently selected, pressing this button will change to source 3.
34. **Next Source Button:** Use this button to cycle forward through the list of available sources. For example, if source 4 is currently selected, pressing this button will change to source 1.
35. **Select/Power Button:** Press and hold this button for about 3 seconds to turn the zone on or off. When the zone is on, pressing the button will cycle through the available adjustment modes.

IR Remote Control



36. **IR Emitter:** When using the remote control, the IR emitter should be pointed at the IR receiver on the Keypad Controller.
37. **Mute Button:** Press this button to mute/unmute the zone.
38. **Power Button:** Press this button power the zone on or off.
39. **Source Buttons:** Press the **+** button to cycle forwards through the available source devices and press the **-** button to cycle backwards through the available source devices.
40. **Treble Buttons:** Press the **+** button to increase the treble level and press the **-** button to decrease the treble level.

41. **Bass Button:** Press the **+** button to increase the bass level and press the **-** button to decrease the bass level.
42. **Volume Buttons:** Press the **+** button to increase the volume level and press the **-** button to decrease the volume level.
43. **Balance Left Button:** Press this button to move the stereo balance to the left.
44. **Balance Right Button:** Press this button to move the stereo balance to the right.

LOCATION PLANNING

Prior to installation you should make a detailed plan of exactly where you will install each component and how you will route the necessary Ethernet cables to connect everything together.

Determine where you will mount the Wallplate Keypad Controllers. Note that installation of the keypads requires the use of a single-gang, low-voltage mounting bracket (not included).

The Master Controller/Amplifier can be installed into a standard 19" equipment rack, using the attached rack mount ears, or can be set on a shelf. Ensure that there is sufficient room around all sides and that there is good airflow for cooling. Do not place other equipment on top of the controller and do not install it in an enclosed space, such as a cabinet or closet.

Of course, you will also need speakers for each zone. The built-in amplifiers in this unit are capable of producing 60 watts per channel into 8 ohm speakers or 70 watts per channel into 4 ohm speakers. Each amplifier can be individually bridged to produce 140 watts into a single 8 ohm speaker. Do not attempt to use 4 ohm speakers with bridged mode.

Note: Even the best speaker cable has some resistance, which increases with the length of the cable. The resistance of the cable must be added to the impedance of the speaker when considering the total load presented to the amplifier. We recommend the use of 8 ohm speakers for longer cable runs, because the resistance added by the cable would represent a smaller percentage of the total impedance and therefore would have a lesser impact on sound quality.

CABLE PREPARATION

You will need a variety of cables for this installation, the specifics of which vary depending on your installation choices. None of the cables or connectors mentioned in this section are included with the system.

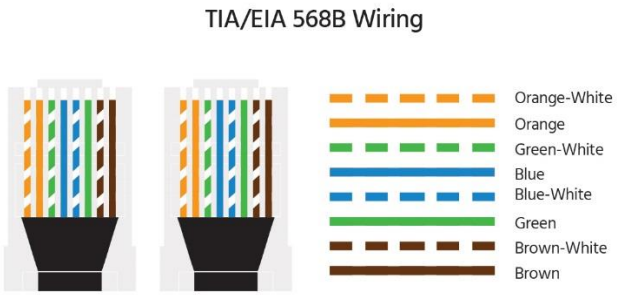
Important Safety Note! *If you plan on running any of these cables through the walls, through a connecting floor, or inside an air duct in commercial applications, they should be rated for In-Wall, Riser (between floors), or Plenum (air duct) use, respectively. For residential installations, an In-Wall rating is sufficient for all situations. Using unrated or improperly rated cables could accelerate the spread of any fire and could nullify insurance claims.*

Ethernet Cables

The Wallplate Keypad Controllers connect to the Master Controller/Amplifier using Cat5e or Cat6 Ethernet cables. The cables carry the low-voltage power needed for the keypad operation and illumination, as well as the specific signals used to control the system.

Depending on the distance of each keypad from the Master Controller, you may be able to use pre-made Ethernet cables. However, it is most likely that you will need to make custom cables of the appropriate length for each zone. Additionally, Ethernet cable is used to connect Inputs 5 and 6 on the Master Controller/Amplifier to digital audio source devices, such as the model 13358 Multizone Source Keypad.

Each Ethernet cable should be wired to the TIA/EIA-568B standard, which is the standard by which almost all currently available, pre-made Ethernet cables are constructed. The following diagram shows the proper wiring for 568B connections:



It is a good idea to use a dedicated RJ45 cable tester to verify the proper operation of each Ethernet cable prior to installation, especially if you are building the cables yourself and especially if the cables will be routed through the walls, even if using pre-made cables. A cable tester can save a lot of time and frustration in troubleshooting any connectivity issues discovered during installation.

Speaker Wires

You will need speaker wire to connect each speaker in each zone to the Master Controller/Amplifier. The size (AWG) of wire you choose depends on the distance from the amplifier to the speaker(s), the speaker impedance, and the physical limits of the terminals at each end.

Other than saving a few pennies of cost or grams of weight per foot, there is no reason to use anything other than the thickest wire possible. The Master Controller/Amplifier uses Euroblock Terminal connectors, which can accept up to 14 AWG wire, so it is recommended to use 14 AWG speaker wire. If the speaker terminals cannot accept 14 AWG wire, you can use a banana or pin plug to connect the wire to the speaker terminal.

Whatever speaker wire you get, make sure that it has marks to identify one conductor from another. Most speaker wire uses a colored stripe to identify one of the conductors. The identified conductor is usually used for the positive (+/red) connection and the other for the negative (-/black) side.

Note: When cutting speaker wire, ensure that the length of each stereo pair is the same. This ensures that the overall impedance of each channel is identical. If there is any excess speaker wire, it should not be coiled, as it could create an antenna to receive stray radio signals. Instead, snake the excess wire back and forth.

RCA Cables

If there is a significant distance from the Master Controller/Amplifier to a given speaker zone, it might be better to use an external power amplifier to power the speakers in that zone. If this is the case, you will need stereo RCA cables to connect from the preamp outputs to the inputs of the external amp.

While long line-level or preamplifier level RCA cables are less susceptible to interference over long distances, it is recommended to use RCA cables manufactured using shielded RG6 or RG59 cable.

In addition to the preamp connections, you will need a stereo RCA cable to connect up to two source devices to the Master Controller/Amplifier's source inputs. In most cases these will be relatively short connections, so it is not necessary to use RG-based cables.

3.5mm TRS Cables

Inputs 3 and 4 can accept analog stereo audio signals from a three-conductor 3.5mm TRS audio cable. You can use premade 3.5mm audio cables or can make them yourself using three conductor cable and 3.5mm TRS plugs.

Mini Toslink® Cable

In addition to analog stereo audio signals, Input 4 can also accept digital optical audio (S/PDIF) signals from a fiber optical Mini Toslink cable. Premade Mini Toslink cables are available in a variety of lengths.

Trigger Cables

This system includes several trigger inputs and outputs. The trigger outputs can be connected to the trigger inputs of responsive devices, such as projection screens, lighting systems, curtain motors, etc. The trigger inputs allow the Master Controller to respond to external trigger events, such as a PA or mute signal.

The trigger signal consists of a low-current 12 VDC signal applied to the input, which is carried between systems with a two-conductor cable that terminates in a 3.5mm TS plug. You can user premade TS cables or can make them yourself using 2-conductor wire and 3.5mm TS plugs.

Note that you can also use 3-conductor 3.5mm TRS cables instead of TS cables.

RS232 Serial Cable

If you will be using the RS232 external control option, you will need to have an RS232 serial cable to connect your PC to the Master Controller/Amplifier. The specific wiring needs of this cable are determined by your specific setup. You will need a male DB9 (DE9) plug on the end that connects to the Master Controller/Amplifier.

See the *RS232 Serial Control* section for more information about the control codes used by the system.

IR Emitters

This system has the ability to repeat IR signals from each speaker zone to control the source devices. To carry the IR signal from the Master Controller/Amplifier to the actual source device requires the use of IR emitters (not included). The IR emitters connect to the Master Controller via a 3.5mm TS plug. If the emitters are not long enough, you can use standard 3.5mm TS or TRS extension cables to increase their lengths.

The IR repeater function supports single-band IR signals only (those in the 38KHz range).

INSTALLATION

Note: Before making any connections, ensure that all equipment is powered off and unplugged to prevent the possibility of personal injury or equipment damage due to electrical shock.

Test Installation

Before drilling any holes and before running any cables through walls, it is highly recommended to perform a test installation first. The test installation should consist of a complete connection of all speakers, wallplates, source devices, etc., so that full functionality can be verified prior to making permanent or difficult installation actions.

Ideally, you should route cables from the master location to the intended location of each zone, connect speakers and wallplate keypads in each zone, and perform full functionality testing using the keypads, the system's remote control, and any remote controls for connected source devices.

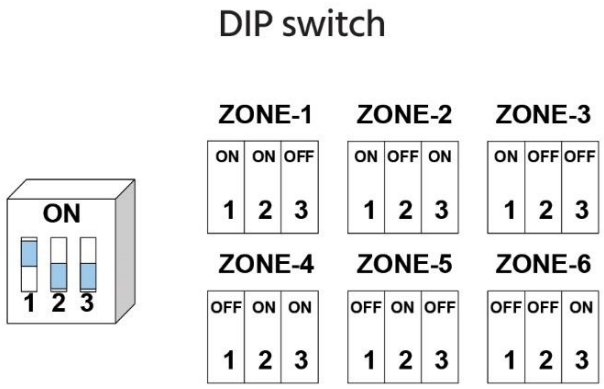
Connecting Multiple Multizone Controllers

If you will be using multiple multizone controllers, you will need to connect them together using the ribbon cable supplied with each unit.

1. Decide which device will be the Master device. Slide the **Master/Slave** switch on this unit to the **Master** position.
2. Plug one end of the included ribbon cable into the **Expansion Output** port on the back of the Master device. Plug the other end into the **Expansion Input** port on the back of the first slave device.
3. Slide the **Master/Slave** switch on the first slave device to the **Slave 1** position.
4. If connecting a third controller, plug one end of the included ribbon cable into the **Expansion Output** port on the back of the first slave device. Plug the other end into the **Expansion Input** port on the back of the second slave device.
5. Slide the **Master/Slave** switch on the second slave device to the **Slave 2** position.

Connecting the Wallplate Keypad Controllers

1. Set the three DIP switches on each Keypad Controller to one of the four identification patterns listed below. Each Keypad Controller connected to the same Master Controller/Amplifier must have a unique identification. Note that the identification is localized to each Master Controller/Amplifier device. If multiple Master Controllers are in use, each one will have its own set of keypads with the same identification numbers as keypads on another Master Controller.



2. Connect one end of an Ethernet cable to the RJ45 port on the front of the Keypad In-Wall Hub Connection Plate. Connect the other end to the **Keypads** port on the back of the Master Controller/Amplifier.
3. Repeat step 2 for each other Master Controller/Keypad In-Wall Hub Connection Plate set in the system.
4. Connect one end of an Ethernet cable to the RJ45 port on the back of one of the Keypad Controllers. Connect the other end to one of the RJ45 ports on the back of the Keypad In-Wall Hub Connection Plate. It does not matter which port is connected because the DIP switches are used to identify each Keypad Controller.
5. Repeat step 4 for each other Keypad Controller in the system.

Connecting External Amplifiers

If you are using an external amplifier for one or more zones, perform steps 1-4 below for each external amplifier in the system.

1. Plug one end of a stereo RCA cable into the input jacks on the back of the external amplifier. Plug the other end into the appropriately numbered **Preamp Output** on the back of the Master Controller/Amplifier.
2. Connect one end of a speaker wire to the positive and negative terminals on the left channel speaker. Connect the other end to the positive and negative left channel speaker out terminals on the external amplifier. Ensure that the polarity is properly maintained at each end.
3. Connect the right channel speaker in the same way you connected the left channel in step 2 above.
4. Visually inspect each connection to ensure that there are no stray strands of wire sticking out of any of the connections. If there are, fix the connection before proceeding.

Connecting the Speaker Wires

For each zone that will be powered using the built-in amplifiers in the Master Controller, perform steps 1-6 below.

1. Pull on the Euroblock terminal block on the back of the Master Controller/Amplifier to detach it from the device.
2. Strip about 1/4" of insulation from the ends of each conductor on the speaker wires for this zone. Twist the wire tightly so that there are no stray strands.
3. Carefully insert the positive and negative conductors on each speaker wire into the appropriate sockets in the Euroblock terminal. Tighten the screws on the terminal block until there is a good, solid mechanical and electrical connection.
4. Connect the other ends of each speaker wire to the positive and negative terminals on each of the two speakers. Pay close attention to the polarity to ensure that it is maintained at each end.

5. Visually inspect each connection to ensure that there are no stray strands of wire sticking out of any of the connections. If there are, fix the connection before proceeding.
6. Plug the Euroblock terminal block into the back of the Master Controller/Amplifier unit.

Connecting Analog RCA Source Devices

For each analog source device attached to the Master Controller/Amplifier(s) using the RCA inputs, plug one end of a stereo RCA cable into the **Source Input** jacks on the back of the Master Controller/Amplifier. Plug the other end into the output jacks of the source device.

Connecting Analog 3.5mm Source Device

For each analog source device attached to the Master Controller/Amplifier(s) using the 3.5mm TRS inputs, plug one end of a 3.5mm TRS stereo audio into the **Source Input** jack on the back of the Master Controller/Amplifier. Plug the other end into the output jack of the source device.

Connecting a Digital Optical (S/PDIF) Source Device

You can connect a digital optical source device to Input 4 on the back of the Master Controller/Amplifier using a fiber optic cable with a Mini Toslink® connector. Plug one end of the Mini Toslink cable into **Source Input 4** on the back of the Master Controller/Amplifier, then plug the other end into the digital optical output of your audio source device.

Connecting a Digital Audio Source Device

You can connect digital audio source devices, such as the model 13358 Multizone Source Keypad, to Source Inputs 5 and 6. To make the connections, plug one end of an Ethernet cable into **Source Input 5 or 6** on the back of the Master Controller/Amplifier, then plug the other end into the output of the digital audio source device.

Connecting the Triggers

The Status and System Control Out jacks on the back of the Master Controller/Amplifier provide a constant 12VDC signal used to trigger other devices on or off, such as projection screens, curtains, lights, etc.

The four numbered **Status** jacks output a trigger signal whenever the associated zone is active. The **System Control Out** jack outputs a trigger signal whenever any of the zones are active.

Using a 3.5mm TS or TRS audio cable, plug one end into the trigger input on your other device, then plug the other end into the appropriate output jack on the Master Controller/Amplifier. This is a very low current signal, so length is not an issue.

Connecting IR Emitters

Each Wallplate Keypad Controller has an IR receiver "eye", which can receive and process signals from the system's own remote control. Additionally, it can receive and repeat the signals from other remote controls. An IR emitter is used to transmit the repeated IR signal to the IR receiver "eye" on the source device.

Each numbered IR emitter jack corresponds to a specific source device. When an IR remote control is used in a particular zone, the system determines which source device is selected for that zone and sends the IR signal out to that specific device's IR emitter.

In addition to the specific IR signaling to individual source devices, the ALL jack repeats all IR signals received, regardless of the zone or the selected source device. With the ALL output, you can use a single IR emitter to process the signals for all devices, so long as they are within range and have clear line-of-sight to the IR emitter.

To install an IR emitter, simply insert the 3.5mm plug for the emitter into the appropriate **IR Emitter** jack. Position the emitter bulb so that it is within range and has a clear line-of-sight to the source device(s). If the emitter cord is not long enough, you can use any 3.5mm TS or TRS extension cable to extend its reach.

Connecting a Computer Using RS232

You can connect as computer to the Master Controller/Amplifier using a cable with a DB9 (DE9) serial connector. The specific construction and configuration of your RS232 cable is dependent on the equipment you will be using to control the system.

Connecting Power

1. Using the included AC power cable, plug the C13 end into the C14 panel connector on the back of the Master Controller/Amplifier. Plug the other end into a nearby AC power outlet.
2. Plug in each other device in the system (source devices, external amplifiers, etc.) into nearby AC power outlets.
3. Power on each device.

Test Operation

At this point the system should be complete, though not yet in its final location. Verify system operation in each zone as follows:

1. Activate each source device so that audio material is playing. Use audio material that will make it easy to identify each source device by sound alone.
2. Press and hold the **Select/Power** button on the keypad for about 3 seconds to activate the zone.
3. If there is a trigger event associated with this zone, verify that it does what it is supposed to do when the zone is activated.

4. Using the **Next Source** button on the Keypad Controller, cycle forwards through all available sources, verifying that the correct audio material is being played and that the quality of sound is correct.
5. Using the **Previous Source** button on the Keypad Controller, cycle backwards through all available sources, verifying that the correct audio material is being played and that the quality of sound is correct.
6. Press the **Select/Power** button on the Keypad Controller until the Volume mode LED is illuminated. Using the **Up** and **Down** buttons, verify that you can increase and decrease the volume level.
7. Press the **Select/Power** button on the Keypad Controller until the Treble mode LED is illuminated. Using the **Up** and **Down** buttons, verify that you can increase and decrease the treble level.
8. Press the **Select/Power** button on the Keypad Controller until the Bass mode LED is illuminated. Using the **Up** and **Down** buttons, verify that you can increase and decrease the bass level.
9. Press the **Mute** button on the remote control to verify that the audio mutes properly.
10. Press the **Source +** button on the remote control repeatedly to cycle forwards through all available source devices.
11. Press the **Source -** button on the remote control repeatedly to cycle backwards through all available source devices.
12. Press the **Treble +** and **-** buttons on the remote control to verify that you can adjust the treble level up and down.
13. Press the **Bass +** and **-** buttons on the remote control to verify that you can adjust the bass level up and down.
14. Press the **Volume +** and **-** buttons on the remote control to verify that you can adjust the volume level up and down.
15. Press the **Balance Left** and **Balance Right** buttons on the remote control to verify that you can adjust the balance between the left and right channels.

16. Press the **Power** button on the remote control to verify that it can turn the zone on and off.
17. If you are using the IR repeater functions, use your device's remote control to verify that it can be effectively controlled from the remote location.

Final Installation

Once you have verified the proper operation of all aspects of the system, it is time to take it all apart and perform the permanent installation.

1. Power off and unplug all equipment.
2. Remove all connecting wires and cables and route them in their permanent locations.
3. Reattach all equipment in accordance with the steps listed above.
4. For each zone, perform a complete test of full operation as described in the *Test Operation* section above.

Congratulations! You have completed the installation and can now enjoy music or other audio material throughout your home!

RS232 SERIAL CONTROL

All keypad and remote control operations can be performed by a computer connected to the Master Controller/Amplifier using an RS232 connection. The communications standard uses:

Baud Rate: 9600, 8, N, 1

DB9 Connector Pinout Tx, Rx, GND

'CR': Carriage Return (0x0D)

No case capitalization/lowercase

Control order structure <xxPPuu'CR' Reply control order frame >

For xxPPuu'CR':

xx: stands for control object code

10: All Zones of Main unit 1.

20: All Zones of Main unit 2.

30: All Zones of Main unit 3.

11: Zone1 of Main unit 1.

12: Zone2 of Main unit 1.

13: Zone3 of Main unit 1.

PP: Stands for control action code.

PR: Power control

PR00: Power off

PR01: Power on

MU: Mute control

MU00: Mute off

MU01: Mute on

DT: Do Not Disturb control

DT00: DT control off

DT01: DT control on

VO: Volume control

VO (00-38): Volume control

TR: Treble control

TR (00-14): Treble control

BS: Bass control

BS (00-14): Bass control

BL: Balance control

BL (00-20): Balance control

CH: Source Channel control

CH (01-06): Source control

Inquiry command structure (1) ?xx'CR'

xx: stands for control object code

10: All Zones of Main unit 1.

20: All Zones of Main unit 2.

30: All Zones of Main unit 3.

11: Zone1 of Main unit 1

12: Zone2 of Main unit 1

13: Zone3 of Main unit 1

21: Zone1 of Main unit 2

22: Zone2 of Main unit 2

23: Zone3 of Main unit 2

Reply command: > xxaabbccddeeffgghhiijj'CR'

aa: PA control status

bb: Power control status ([5]:Backup Zone Power Status only on zone)

cc: Mute control status

dd: DT control status

ee: Volume control status

ff: Treble control status

gg: Bass control status

hh: Balance control status

ii: Source control status

jj: keypad connecting status

(00: disconnect 01: connected)

Inquiry command structure (2) ?xxPP'CR'

xx: stands for control object code

10: All Zones of Main unit 1.

20: All Zones of Main unit 2.

30: All Zones of Main unit 3.

11: Zone1 of Main unit 1

12: Zone2 of Main unit 1

13: Zone3 of Main unit 1

14: Zone4 of Main unit 1

PP: Stands for control action code.

PA: PA control

PR: Power control

MU: Mute control

DT: DT control

VO: Volume control

TR: Treble control

BS: Bass control

BL: Balance control

CH: Source control

LS: keypad connecting status

Reply command: >xxPPuu'CR'

Key in 1<********'CR' change Source 1 Name display; ********needs to be 8 valid ASCII codes

Key in 2<********'CR' change Source 2 Name display

Key in 3<********'CR' change Source 3 Name display

Key in 4<********'CR' change Source 4 Name display

Key in 5<********'CR' change Source 5 Name display

Key in 6<********'CR' change Source 6 Name display

Key in M<********'CR' change the name display on keypad when turned on.

Key in <9600'CR' change RS232 speed rate to 9600

Key in <19200'CR' change RS232 speed rate to 19200

Key in <38400'CR' change RS232 speed rate to 38400

Key in <57600'CR' change RS232 speed rate to 57600

Key in <115200'CR' change RS232 speed rate to 115200

Key in <230400'CR' change RS232 speed rate to 230400

The baud speed rate returns to 9600 when the Master Controller/Amplifier is disconnected from its power source.

ee: Volume control status

ff: Treble control status

gg: Bass control status

hh: Balance control status

ii: Source control status

jj: keypad connect status

(00: disconnect 01: connected)

Inquiry command structure (2) ?xxPP'CR'

xx: stands for control object code

10: All Zone of Main unit 1.

20: All Zone of Main unit 2.

30 : All Zone of Main unit 3.

11 : Zone1 of Main unit 1

12 : Zone2 of Main unit 1

13 : Zone3 of Main unit 1

14 : Zone4 of Main unit 1

PP: Stands for control action code.

PA: PA control

PR: Power control

MU: Mute control

DT: DT control

VO: Volume control

TR: Treble control

BS: Bass control

BL: Balance control

CH: Source control

LS: keypad connecting status

Reply command: >xxPPuu'CR' ;********needs to be 8 ASCII codes.

Key in 1<********'CR' change Source 1 Name display on the keypad when the keypad is turned on.

Key in 2<********'CR' change Source 2 Name display on the keypad when the keypad is turned on.

Key in 3<********'CR' change Source 3 Name display on the keypad when the keypad is turned on.

Key in 4<********'CR' change Source 4 Name display on the keypad when the keypad is turned on.

Key in 5<********'CR' change Source 5 Name display on the keypad when the keypad is turned on.

Key in 6<********'CR' change Source 6 Name display on the keypad when the keypad is turned on.

Key in M<********'CR' change the name in the display on the keypad when the keypad is turned on.

Key in <9600'CR' change RS232 speed rate to 9600

Key in <19200'CR' change RS232 speed rate to 19200

Key in <38400'CR' change RS232 speed rate to 38400

Key in <57600'CR' change RS232 speed rate to 57600

Key in <115200'CR' change RS232 speed rate to 115200

Key in <230400'CR' change RS232 speed rate to 230400

SPECIFICATIONS

Model	14524
Inputs	2x analog stereo RCA, 1x analog stereo 3.5mm TRS, 1x combination analog stereo 3.5mm/digital optical (S/PDIF) Mini Toslink, 2x RJ45
Outputs	4x speaker out, 4x pre-amplifier out
Output Power (per zone)	60 watts x 2 channels into 8 ohms, or 70 watts x 2 channels into 4 ohms, or 140 watts x 1 channel into 8 ohms
THD	< 0.1%
Signal-to-Noise Ratio	> 90dB A-weighted
Frequency Response	20Hz to 20kHz ±1 dB at 1 watt output into 8 ohms
Input Sensitivity	600mV for 80 watts @ 1kHz into 4 ohms on one zone, 700mV for 50 watts @ 1kHz into 8 ohms on one zone
Input Impedance	> 10 kilohms line input
Trigger Inputs/Outputs	Each Zone In/Out. 12VDC 100mA
Bridge Mode	Select Stereo or Bridge mode per zone 8 ohms only
Speaker Connectors	Detachable Euroblock speaker terminals support up to 14 AWG wire
Input Power	110-120 VAC, 60Hz, 600 watts max; 220-230 VAC, 50Hz, 600 watts max
Fuse Rating	110-120 VAC: T5AL 250V 220-230 VAC: T2.5AL 250V
Dimensions	16.8" x 3.5" x 16.1" (42.7 x 8.8 x 41.0 cm)
Shipping Weight	19.0 lbs. (8.6kg)

REGULATORY COMPLIANCE

Notice for FCC

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

Modifying the equipment without authorization may result in the equipment no longer complying with FCC requirements for Class B digital devices. In that event, your right to use the equipment may be limited by FCC regulations, and you may be required to correct any interference to radio or television communications at your own expense.

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

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

Notice for Industry Canada

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

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

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