S1616A

Multi-Zone Controller Amplifier

Single Chassis & Dual Chassis Mode

INSTALLATION MANUAL

ELAN®

Preface

Purpose of this Manual

This manual provides design information, step-by-step installation instructions and connection examples, along with basic user information for installation and ongoing use of the S1616A Multi-Zone Controller Amplifier. This manual is written for the installer of this equipment.

This manual only covers the S1616A when used in **Multi-Zone Mode**. For installation instructions for using the S1616A in **Amplifier Mode** please download the S1616A Amplifier Mode Installation manual at www.elanhomesystems.com/dealer.

Organization

The following information is contained in this manual:

Safety Information	Provides a comprehensive list of safety practices and procedures allowing for the safe installation and operation of the ELAN Home Systems S1616A Multi-Zone Controller Amplifier.
S1616A Introduction	Provides an introduction to ELAN Home Systems S1616A Multi-Zone Controller Amplifier, along with system features to include Front and Rear panel controls, indicators and connections, along with a short description of each.
S1616A Design	Provides information that will allow you to positively implement the S1616A's features in your installations.
S1616A Connections	Provides a description of the S1616A Multi-Zone Controller Amplifier system connections and direct connections from the S1616A to other components.
Troubleshooting	Provides troubleshooting tables to help fix common problems that may be encountered when installing the S1616A Multi-Zone Controller Amplifier.
Specifications	Provides equipment specifications for the S1616A Multi-Zone Controller Amplifier.
Appendix A	Programming with Configurator.

Important Safety Instructions

1. Read these instructions.

2. Keep these instructions.

3. Heed all warnings.

4. Follow all instructions.

5. Do not use this apparatus near water.

6. Clean only with a dry cloth.

7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.

8. Do not install near any heat sources such as radiators, heat registers, stoves or other apparatus (including amplifiers) that produce heat.

9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or 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.

10. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles and the point where they exit from the apparatus.

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

12. 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.

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

14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

15. Do not expose this apparatus to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the apparatus.

16. To completely disconnect this apparatus from the AC Mains, disconnect the power supply cord plug from the AC receptacle.

17. The power supply cord (sometimes referred to as the "Mains Plug") is used as the disconnect device and shall remain accessible and operable at all times.

18. Do not expose batteries to excessive heat such as sunshine, fire or the like.

19. Open flame sources, such as lighted candles, should NOT be placed on the apparatus.

WARNING: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

FCC Required Text:

NOTE: 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.

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

Table of Contents

Items in Package:

- S1616A Power Amplifier
- Rack Mount Brackets
- Power Cord
- Safety Flyer

Chapter 1: Introduction

The S1616A is the culmination of twenty-three years of ELAN experience in the design and perfection of multi-source/multi-zone controllers and amplifiers. Incorporating the features and reliability that has made ELAN a firmly established manufacturer of multi-room A/V products, the S1616A is ELAN's most powerful and flexible multi-source/multi-zone controller to date. The S1616A is an integrated controller and amplifier whose inputs and outputs may be flexibly configured in either stereo or mono. Used in Single Chassis configuration the S1616A allows for 8 stereo inputs or 16 mono inputs or for combinations of stereo/mono as the project requires. Alternatively, the S1616A may be used in Dual Chassis configuration that provides sixteen stereo inputs and sixteen stereo outputs per Dual Chassis pair. In Single Chassis mode up to sixteen S1616A units can be linked for a total of 128 stereo outputs or 256 mono outputs. In Dual Chassis mode eight pairs of S1616A units can be linked together providing 128 stereo outputs. The S1616A is a dedicated g! system device and requires an HC series controller for configuration and operation.

This unit has been designed with ultimate flexibility in mind. Allowing operation from all g! interfaces, including iPad and iPhone, and being ultimately expandable the S1616A is the perfect solution for mid to large audio and control systems. Multiple control methods combine with expandability to offer the perfect solution for larger audio/video and automation control systems.

The ELAN Story

Located in Carlsbad, CA USA, ELAN is a part of The AVC Group, a collection of integration-centric brands. ELAN has designed innovative multi-room audio/video systems since 1989. ELAN systems were the first to integrate music, intercom and TV distribution features that used the homeowner's stereos, televisions and telephones to create the whole-house entertainment experience. These systems allow people to move from room to room, controlling centrally located equipment with ease.

ELAN's product line includes:

- Power Amplifiers
- Multi-Zone Pre-Amps
- Intelligent Keypads
- In-Wall LCD Color Touch Panels
- Film Interactive Touchpads
- Hand Held Remote Controls
- In-Wall and In-Ceiling Speakers
- System Controllers
- Volume Controls
- Telephone-Based Intercom Controllers
- Video Switchers
- Satellite Radios
- Accessories for Home Systems Installation
- Outdoor Speakers

S1616A Features

- Two "Chassis Mode" Configurations
  - Single Chassis – 8 stereo inputs, 16 mono inputs or combinations thereof
  - Dual Chassis – 16 Stereo inputs
- Amplifier Mode Operation
  - The S1616A can act as a high quality amplifier (see Amplifier Mode manual)
- Flexible Input Configuration
  - Single Chassis
    - 8 Stereo Inputs
    - 16 Mono Inputs
    - Any combination of Stereo/Mono i.e. 6 stereo + 4 mono for 10 source inputs
    - SPDIF input (2) usable in single unit systems
  - Dual Chassis
    - 16 stereo inputs
  - Buffered loop outputs
  - Input level matching
- 64 Zones
  - Bass/Treble/Loudness settings by zone
  - Page, Doorbell, DND, WHM & Zone Group settings
  - Sub-Zoning
- Flexible Output Configuration
  - Single Chassis
    - 16 outputs individually configured to
      - Left
      - Right
      - Mono
    - High/Low pass per output
      - Adjustable crossover points
    - Level adjustment
    - Expandable to 16 units for 256 outputs
  - Dual Chassis
    - 16 stereo pair outputs
    - High/Low pass per output
      - Adjustable crossover points
    - Level adjustment
    - Expandable to 8 pairs of units for 128 stereo outputs
- House Scenes allow memorization of power/input/level settings to be stored and recalled quickly
- Zone Groups allow common areas to be grouped & un-grouped with ease
- Signal Sensing for all sources usable for automation and Event Maps
- Class D Digital Amplification
  - 50 watts (8 ohms) per output
  - 75 watts (4 ohms) per output
- Automatic Clipping Eliminator (ACE)
  - Monitors output to eliminate clipping
- Automatic Volume Reduction (AVR)
  - Monitors output to eliminate overdriving
- Intelligent Load Monitoring
  - Detects load faults and shuts down only the affected channel pairs thereby protecting speakers, wiring and the S1616A
- Rack Mount brackets included
- cTUVus, CE, C-Tick certified

S1616A Front Panel Indicators

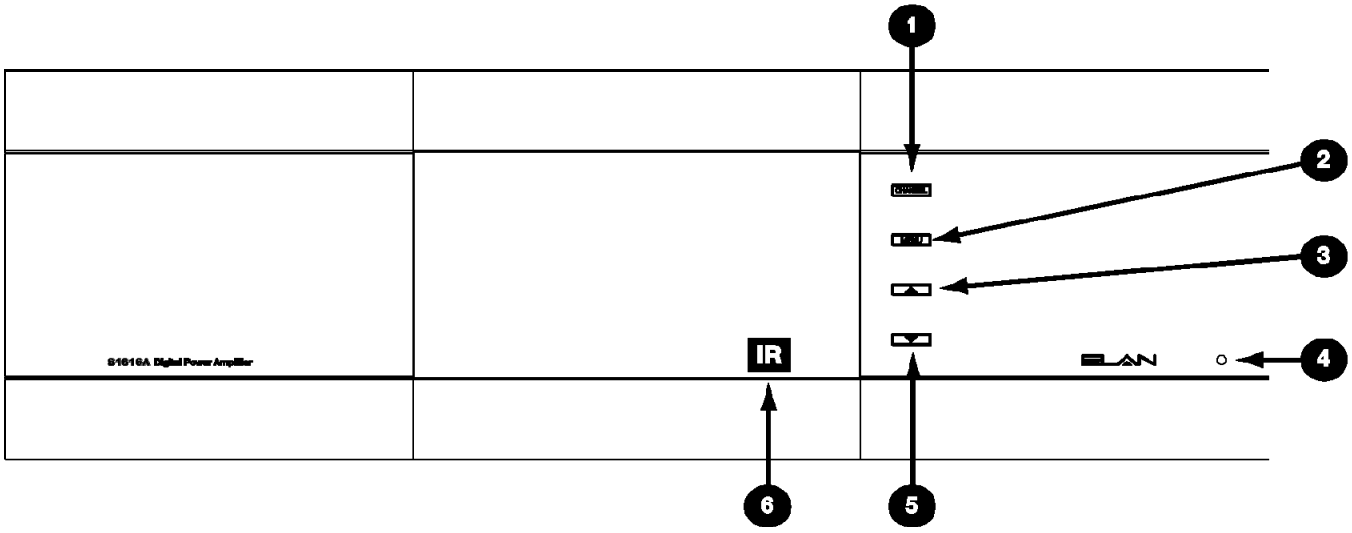

Figure 1-1**: **S1616A Front Panel Controls and Display

Item	Function
1	Channel Button Cycles through information pertaining to each of the 16 audio channels
2	Menu Button Cycles through various advanced setup features
3	Up Arrow Button Increments selected menu item
4	Power Indicator Illuminates when AC power is present and the power switch is on.
5	Down Arrow Button Decrements selected menu item
6	IR Receive Indicator Used in Amplifier Mode only

S1616A Rear Panel Connections

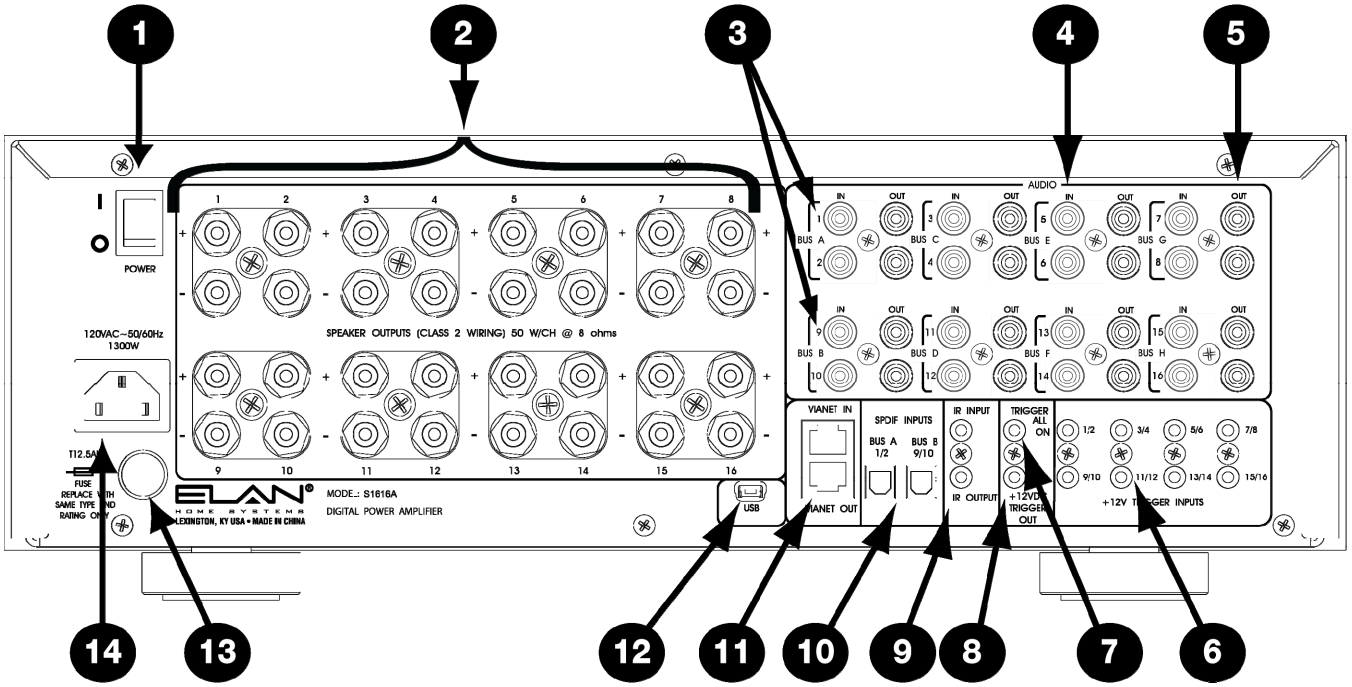

Figure 1-2

Item	Function	Item	Function
1	Power Switch Unit master power switch	8	12V Trigger Out Used only in Amplifier Mode – see Manual
2	Speaker Outputs Channels 1-16, Five Way Binding Posts	9	IR Input & Output Used only in Amplifier Mode – see Manual
3	Bus Inputs, A-B Used only in Amplifier Mode – see Manual	10	Digital Audio Inputs Replaces inputs 1/2 and 9/10 when used
4	Line Level Inputs Inputs 1-16	11	VIA!NET Input & Output VIA!NET In/Out
5	Line Level Audio Loop Outputs Used for sharing audio sources between units	12	USB Mini B Port For in-field firmware updates
6	12V Trigger Inputs Used only in Amplifier Mode – see Manual	13	Fuse Holder Replace only with ***T12.5AL250V***
7	Trigger All On Used only in Amplifier Mode – see Manual	14	Power Cable Connector IEC type C14

Note: All 3.5mm connectors are mono (two conductors)

Chapter 2: System Design and Applications

Introduction

The first step to a good design is to map the system. It is advisable to mark up a copy of the house floor plan with speaker, touchpad, touchscreen, volume control, and equipment locations etc. Make sure that all locations are decided upon before pre-wiring commences so that all necessary wiring and installation hardware is in place. This unit will be interfacing with other components such as amplifiers, source components, communications controllers, serial controllers, and user interfaces, so it is essential that ALL system components are accounted for prior to the pre-wire stage.

Secondly, make a detailed list of all components. Include source equipment, touchpads, touchscreens, volume controls, amplifiers, communications gear and the S1616A itself. Be sure to include necessary electrical boxes, structured wiring enclosures, telephone lines, rough-in brackets, patch cords, power supplies, etc.

Design

The S1616A is a very flexible controller and as such many design opportunities exist. Understanding the capabilities of the S1616A is critical. What follows are design definitions that will help you maximize the capabilities of the S1616A in your installations.

Amplifier Mode

Information about Amplifier Mode is available in the S1616A Amplifier Mode Instruction Manual available at www.elanhomesystems/dealer.

Multi-Zone Operation

When used as a multi-zone controller amplifier the S1616A has two chassis options – Single Chassis or Dual Chassis. These distinctions apply primarily to how the inputs are configured. Additional S1616As (referred to as Units in this manual) will share identical input configurations as the first chassis.

Single Chassis Mode

The Single Chassis system provides 8 stereo inputs or 16 mono inputs or any combination in between. *Figure 2-1* shows the input configuration options for a Single Chassis installation. Whether an input is stereo or mono, the S1616A automatically adapts it to the stereo and mono outputs.

Single Chassis Mono/Stereo	
Mono Inputs	Stereo Inputs
0	8
1/2	7
3/4	6
5/6	5
7/8	4
9/10	3
11/12	2
13/14	1
15/16	0

Figure 2-1

In systems configured for use with a C2 communication controller input pair 15/16 is automatically set to mono and input 16 is used for the C2. In this configuration a maximum of seven stereo sources and one mono source are allowed. *Figure 2-2* indicates how to connect seven stereo sources and one mono source along with a C2.

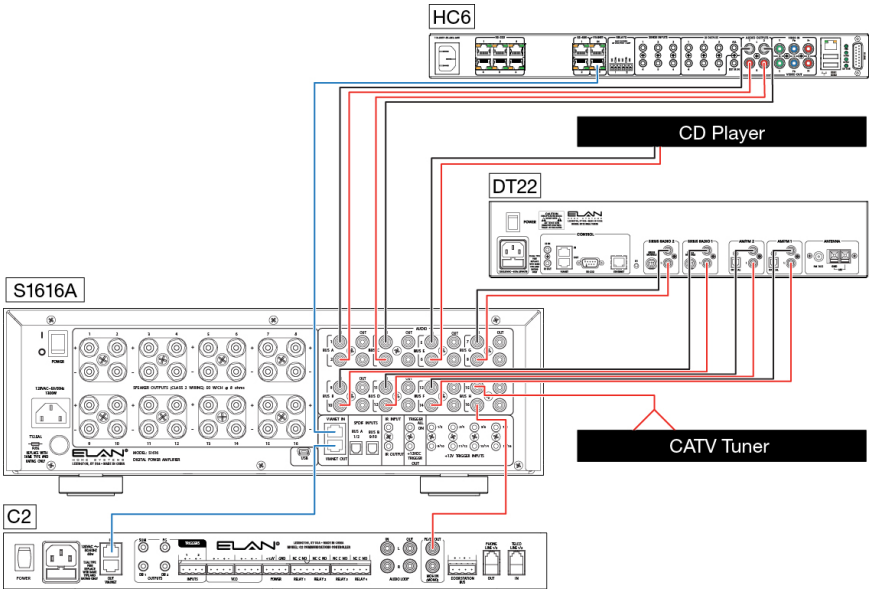

Figure 2-2

Dual Chassis Mode

A Dual Chassis system uses one chassis for the left channels and one chassis for the right channels. This configuration is always a 16 stereo input system. Expanding the outputs of this mode requires two additional units. Up to 8 pairs of S1616As may be used in a system.

The C2 communications controller connects to input 16 in a Dual Chassis system and requires a Y cable or use of the loop out from the first to the second chassis. See *Figure 2-3*.

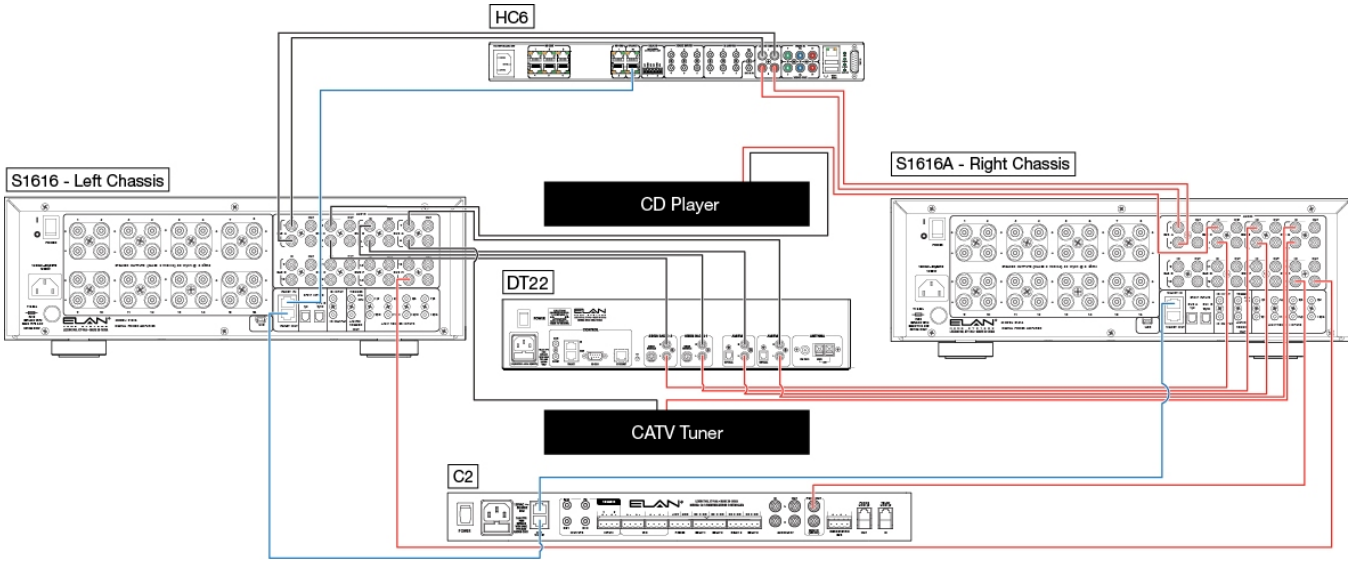

Figure 2-3

Inputs

Level Matching

In both Single Chassis and Dual Chassis modes each source allows Level Matching for a professional result. Input levels are individually adjustable in the configuration utility (see Appendix A).

Digital Inputs

Two optical digital inputs are available for use in Single Chassis systems that have only one unit. Utilizing the left optical input overrides analog inputs 1 & 2. Utilizing the right optical input overrides analog inputs 9 & 10.

Optical inputs are disabled in multiple unit Single Chassis installations and in all Dual Chassis installations.

Signal Sensing

All audio inputs feature a built-in signal sensor that may be used to trigger g! events. Please refer to the g! Configurator manual for information on using triggers.

Zones

A zone is an area that has independent access to sources. The S1616A is unique in that it separates zones from outputs. Both Single Chassis and Dual Chassis are configurable for up to 64 zones. A system designed with only 4 zones could still utilize all 16 outputs.

Below is an example of a 4 zone 16 output system *(Figure 2-4)*. In this example the zones are the Master Bedroom, Living Room, Dining Room and Patio. The Master Bedroom is equipped with architectural left/right speakers, the Dining Room utilizes a pair of stereo speakers, the Living Room uses two pair of stereo speakers, and the Patio has extensive summed mono outdoor speakers, including two outdoor subwoofers utilizing the S1616A's electronic crossover.

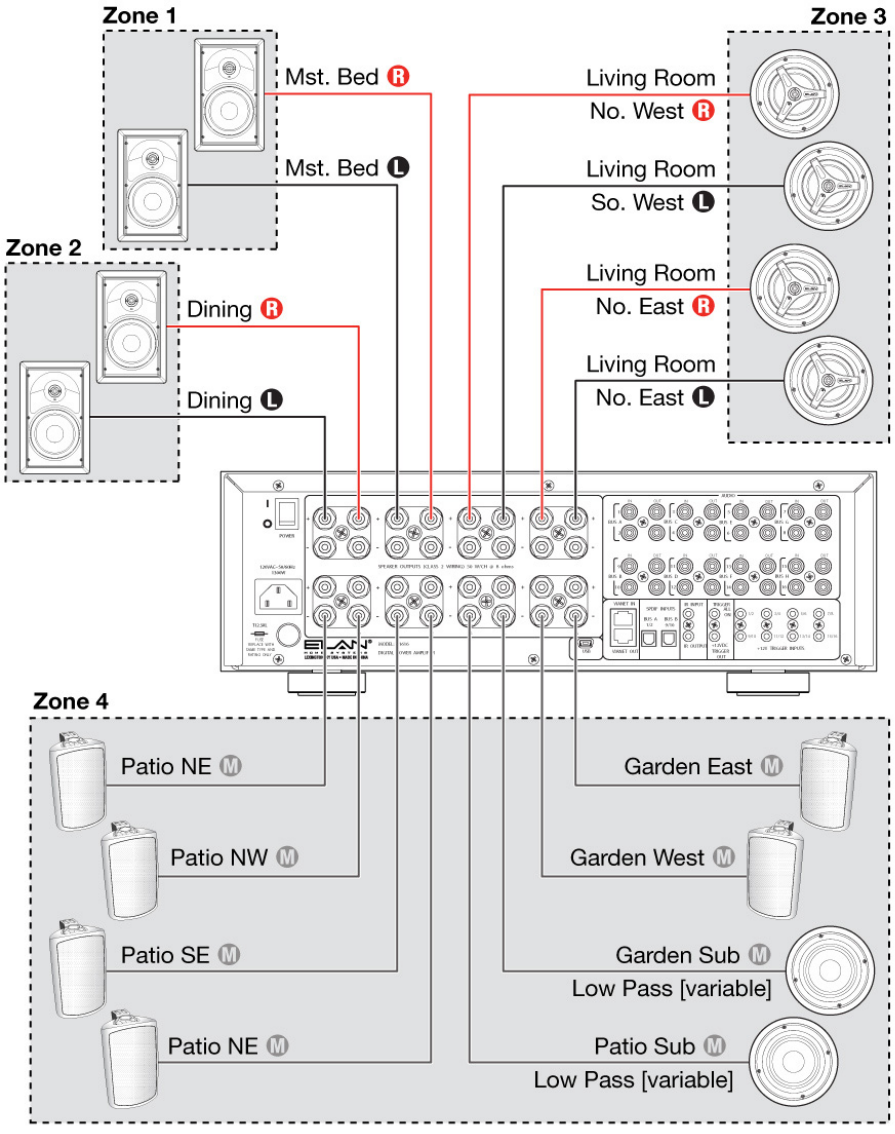

Figure 2-4

Sub Zones

Sub zones start life as a zone, but are attached to another zone in the Configurator. A sub zone shares source selection, power status and zone grouping attributes with the master zone but has independent volume control. An example of this would be a master bedroom and sitting area. The master bedroom is the master zone and the sitting area is the sub zone. Either area can select the source or turn the system on/off but each area has independent volume control from any of the g! interfaces.

Zone Configuration

Each zone has multiple settings that are set in the Configurator (see Appendix A):

- Zone Name – This is the name that shows up on the systems user interfaces
- Sub Zone – Attaches source selection and power status to another zone
- Whole House Music – Include/exclude zone from whole house music mode
- Zone Group – Groups (none/1-8) the zone with other zones
- Maximum Volume – Limits volume output
- Turn On Max Volume – Limits the turn on volume
- Turn On Minimum Volume – Establishes minimum volume at turn on
- Bass – Establishes bass level (set to *X* level or last) at zone turn on
- Treble – Establishes treble level (set to *X* level or last) at zone turn on
- Loudness – Establishes loudness contour status (engage/disengage) at zone turn on
- Do Not Disturb – Establishes DND status (on/off/last) at zone turn on
- C2 Status – Allows/disallows paging and doorbell in the zone
- C2 Volume – Establishes page and doorbell level

Outputs

The S1616A has only amplified outputs. Should your installation require more amplifier power than the S1616A's 50WPC @ 8Ω and 75WPC @ 4Ω power output you can use one of any number of speaker level to line level converters on the market to convert the amplified output to a useable line level. The S1616A, like all digital amplifiers, utilizes a floating ground system on its outputs and is not compatible with any converter designed for common ground. You can check the converter by putting a meter on the negative (–) input terminals of the converter and testing for continuity. If the meter shows no continuity then the converter is suitable for use with the S1616A. Never use a line level converter with common ground inputs as it will damage the S1616A. You may use a suitable speaker level to line level converter and a speaker simultaneously on the same output.

A fixed level line out may be created by setting the Turn on Max Volume to a level, say 71, and the Turn on Minimum Volume to one digit less, 70 in this case. The actual numbers will vary depending on the converter you use. It is currently not possible to disable the zone volume control so we recommend that the fixed output zone be configured as a Sub Zone to another zone and the fixed output zone not be shown on any user interfaces. Changing the source in the Master Zone will change the source on the fixed output sub zone while the volume control will have no effect.

Single Chassis

A Single Chassis system has 16 individual outputs. Additional outputs may be added to the installation by adding additional S1616A units. The maximum number of S1616A units in a Single Chassis system is 16, which provides for up to 256 outputs. Each output may be configured as Left, Right, or Mono and assigned to any zone. See *Figures 2-5, 2-6, 2-7, 2-8* or the S1616A Designer's Guide for output configuration examples.

Output Settings

- Name – For convenience each output may be given a name to keep track of what is connected
- Zone – Assigns output to a zone
- Type – Defines the output as Left channel, Right Channel or Mono
- Output Level – Allows output matching for zones with multiple speakers
- Filter – High or Low or No filter
- Crossover – Sets the crossover frequency for the filter

Dual Chassis

In a Dual Chassis system both the outputs on the left and the right chassis are matched. This means that output 1 of the left chassis is always connected to the same zone as output 1 of the right chassis. Outputs are expanded in pairs of units and a total of 8 pairs of S1616A units may be used on one installation providing 128 stereo outputs.

Output Settings

- Name – For convenience each output may be given a text name
- Zone – Assigns output to a zone
- Output Level – Allows output matching for zones with multiple speakers
- Filter – High or Low or No filter
- Crossover – Sets the crossover frequency for the filter

Triggers

The 12 volt zone triggers (Trigger Inputs & Trigger All On) and the Trigger Out on the rear of the S1616A are only used when the Amplifier Mode is utilized and are not available for Multi-Zone installations.

IR Control

The IR control input/output is only used when the Amplifier Mode is active and is not available for g! installations. IR control of source components is accomplished with the Home Controller IR outputs.

Applications

Single Chassis configurations – below are a few examples of S1616A systems to help you fit your customer's applications. Additional examples can be found in the S1616A Designer's Guide available from your ELAN representative or on the ELAN dealer website.

Figure 2-5 shows a typical 8 stereo input with 8 stereo output installation.

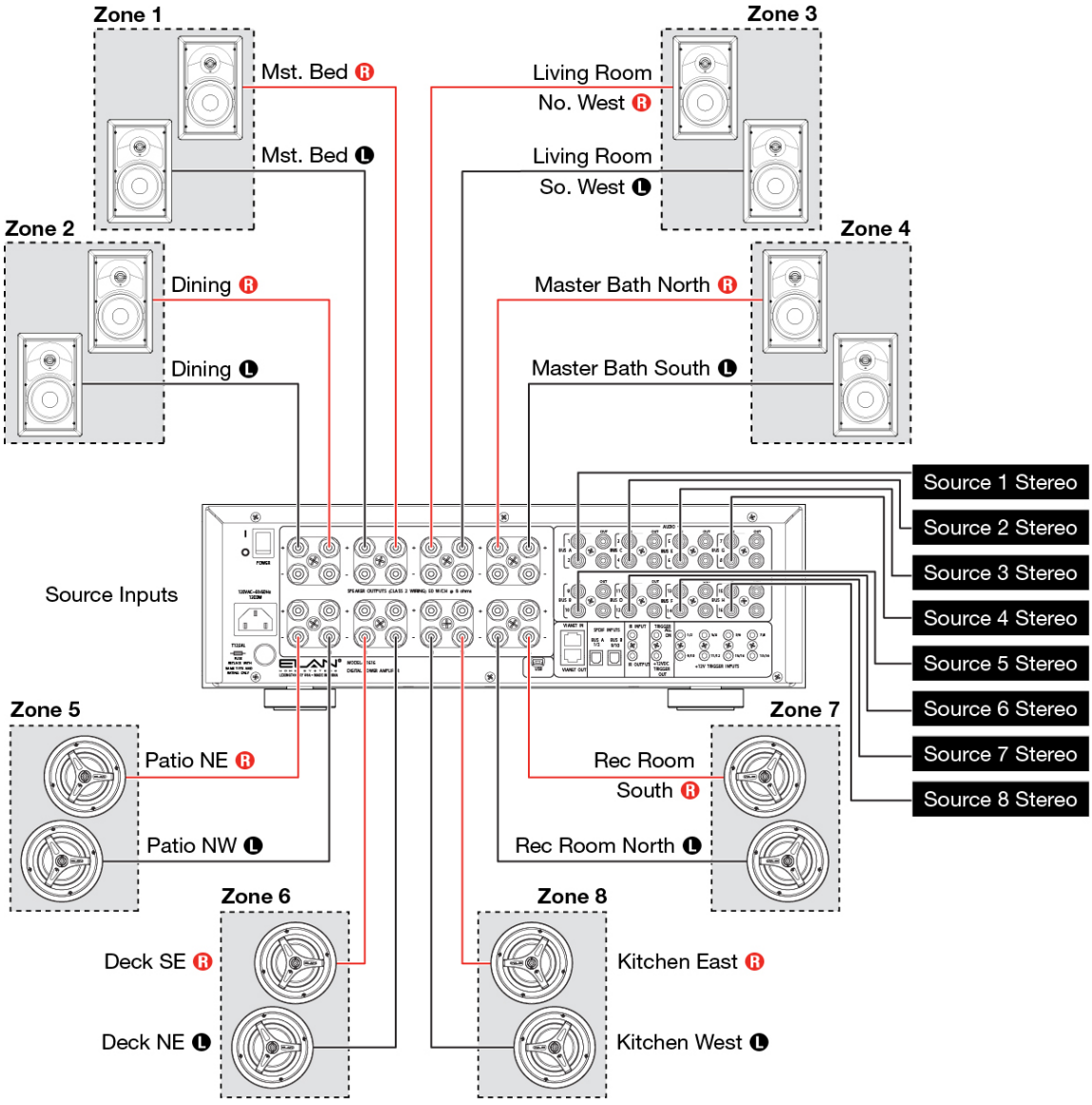

Figure 2-5

Figure 2-6 shows a system that has a passive in-ceiling subwoofer in the master bedroom along with left and right speakers, a single mono speaker (not a two channel) in the master bathroom, and stereo speakers in the rest of the house. An ELAN C2 is connected and allows doorbell and paging throughout the house.

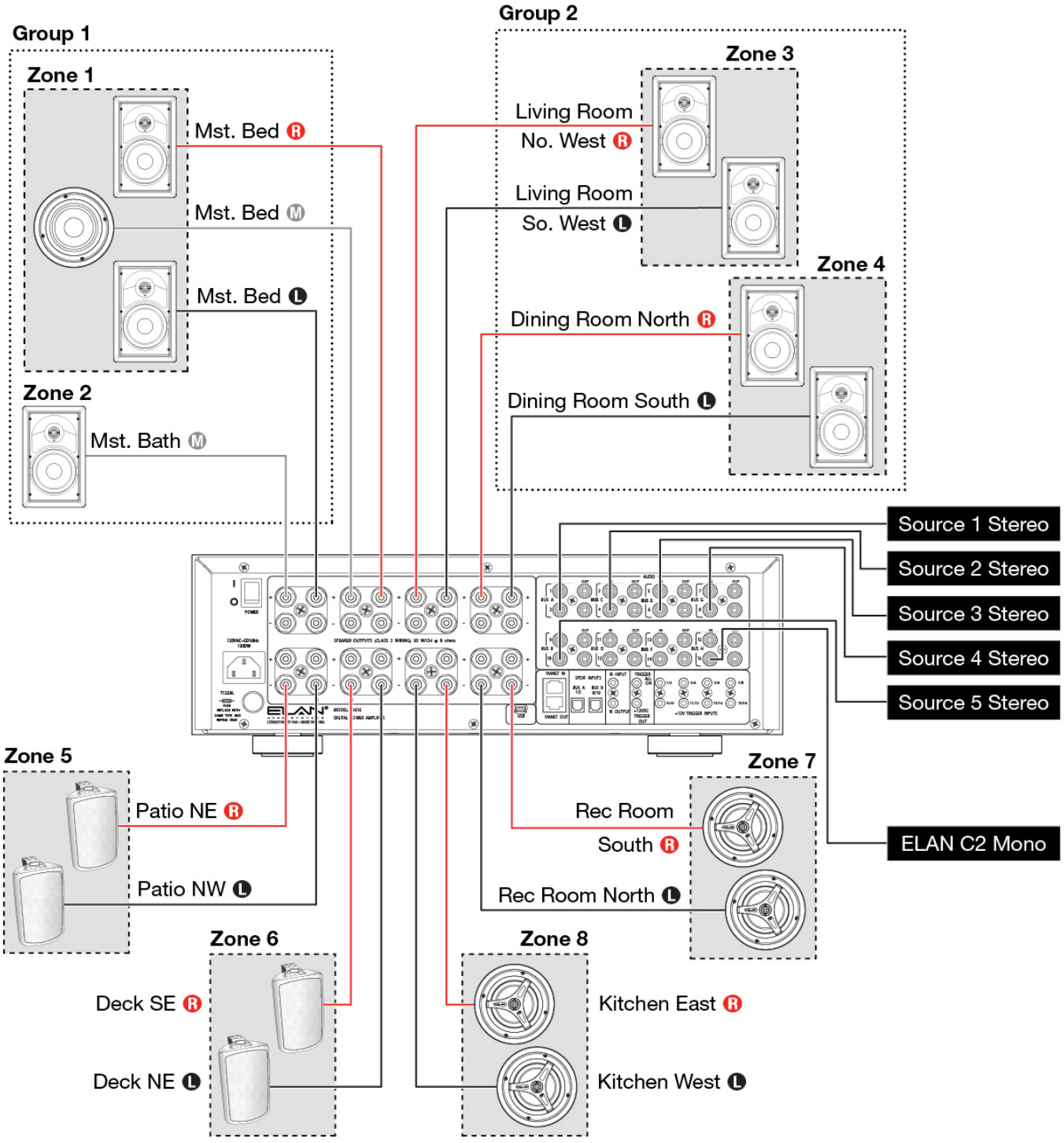

Figure 2-6

Figure 2-7 is a seven stereo, one mono system with an ELAN C2 controller. The system has 6 stereo pairs of speakers and 4 areas with single mono speakers. Three groups allow the Master Suite, Exterior and Entertaining areas to be easily linked through any g! interface.

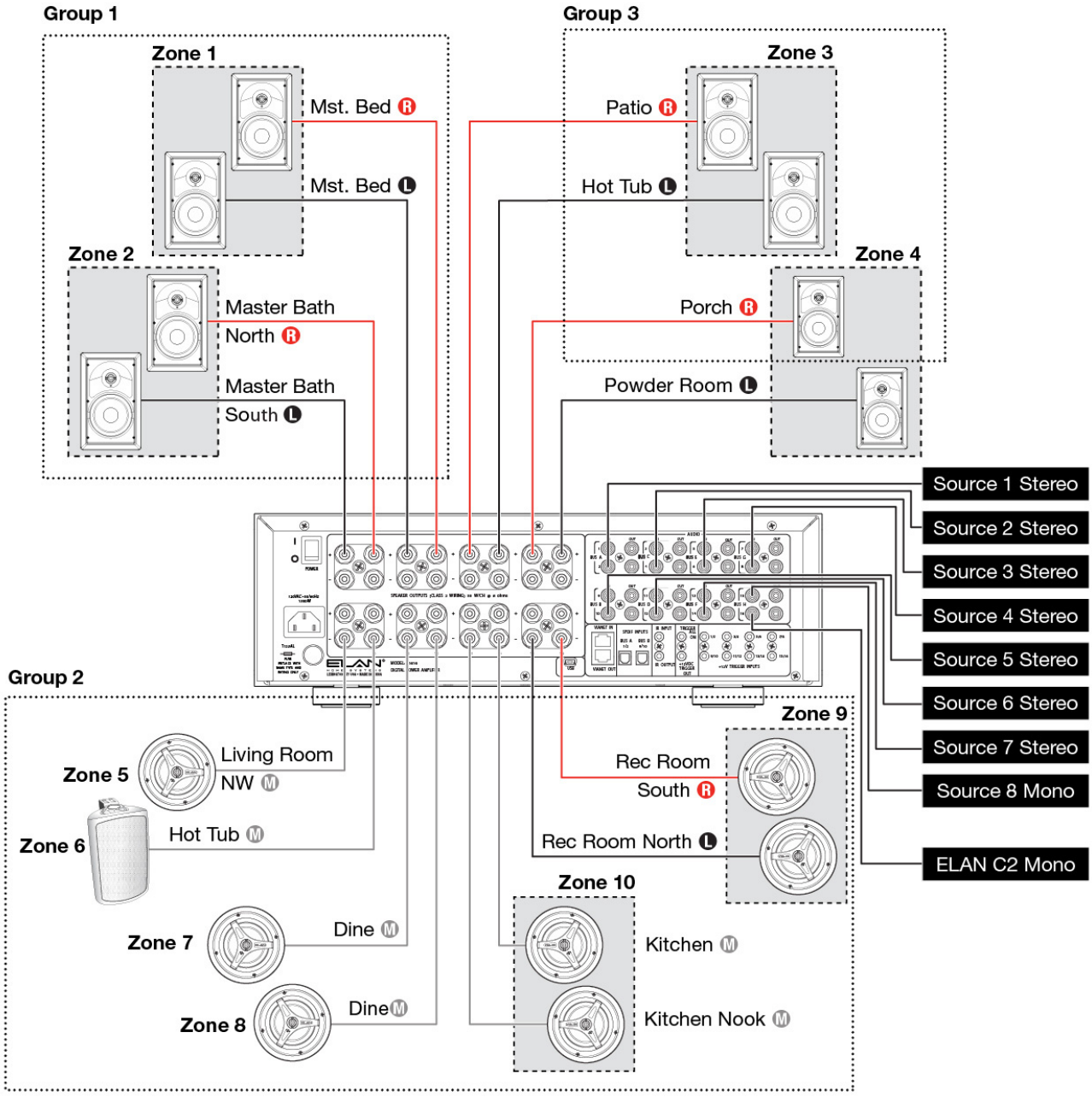

Figure 2-7

Figure 2-8 is a sports bar with 8 TV tuners as mono sources and 16 speakers throughout the establishment. The use of zones for each speaker provide the ability to adjust the volume in each area while the S1616A's grouping feature allows simple source selection for all contiguous areas. Any zone can choose any TV tuner, and the whole system can easily be controlled from a VL10 or even an HR2.

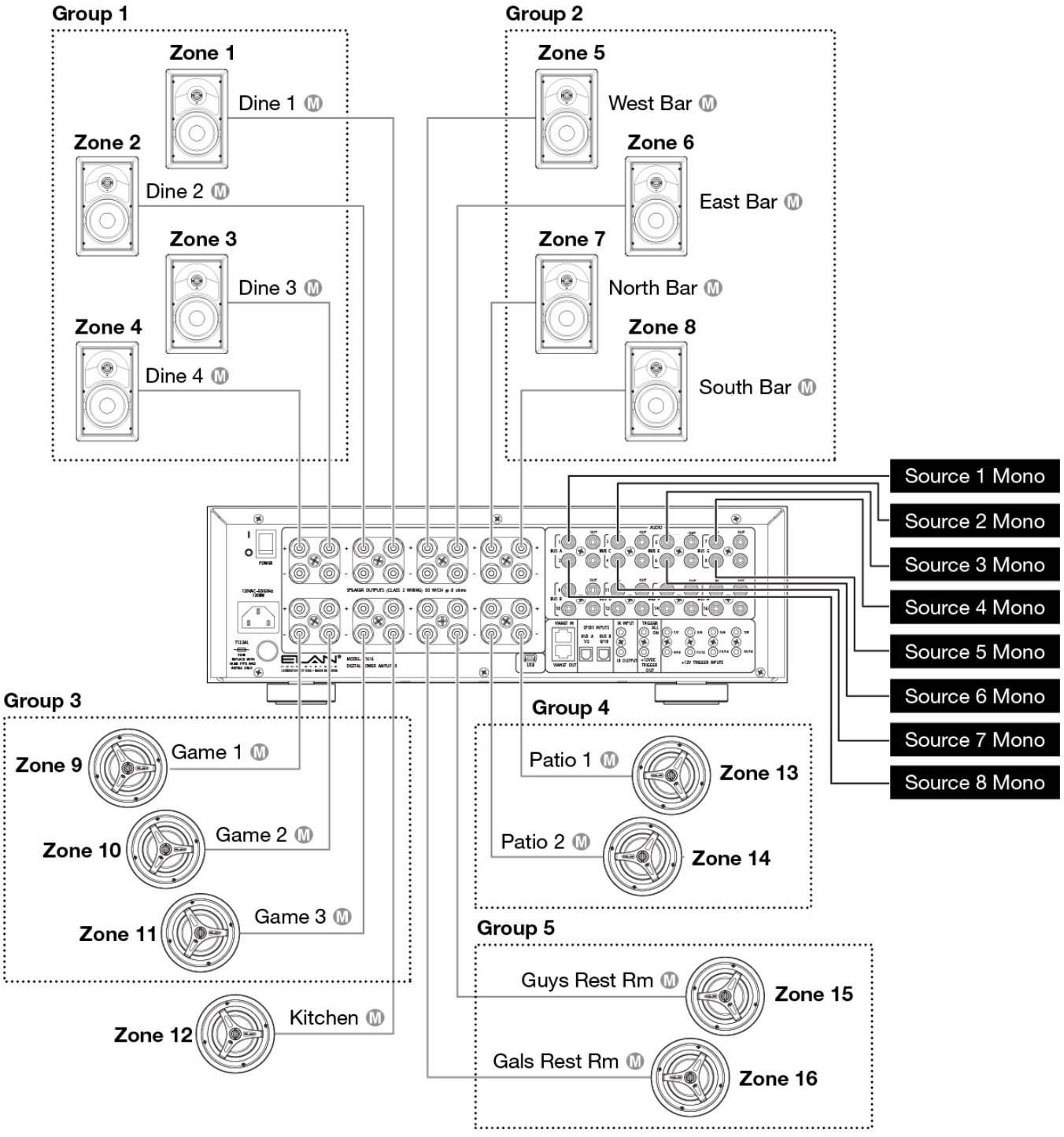

Figure 2-8

Dual Chassis Configurations

Dual Chassis offers more source inputs, but all inputs are stereo. Outputs are also always stereo, with the lower number unit (i.e. 1 of units 1 and 2) being the left channel and the higher number (i.e. 2 of units 1 and 2) being the right. *Figure 2-9* shows a 16 input, 16 output configuration. The loop outputs are used to expand the system to 32 or more outputs. The C2, when used, always connects to input 16. It must be connected to both units either by looping from one unit to the other or by using a Y cable.

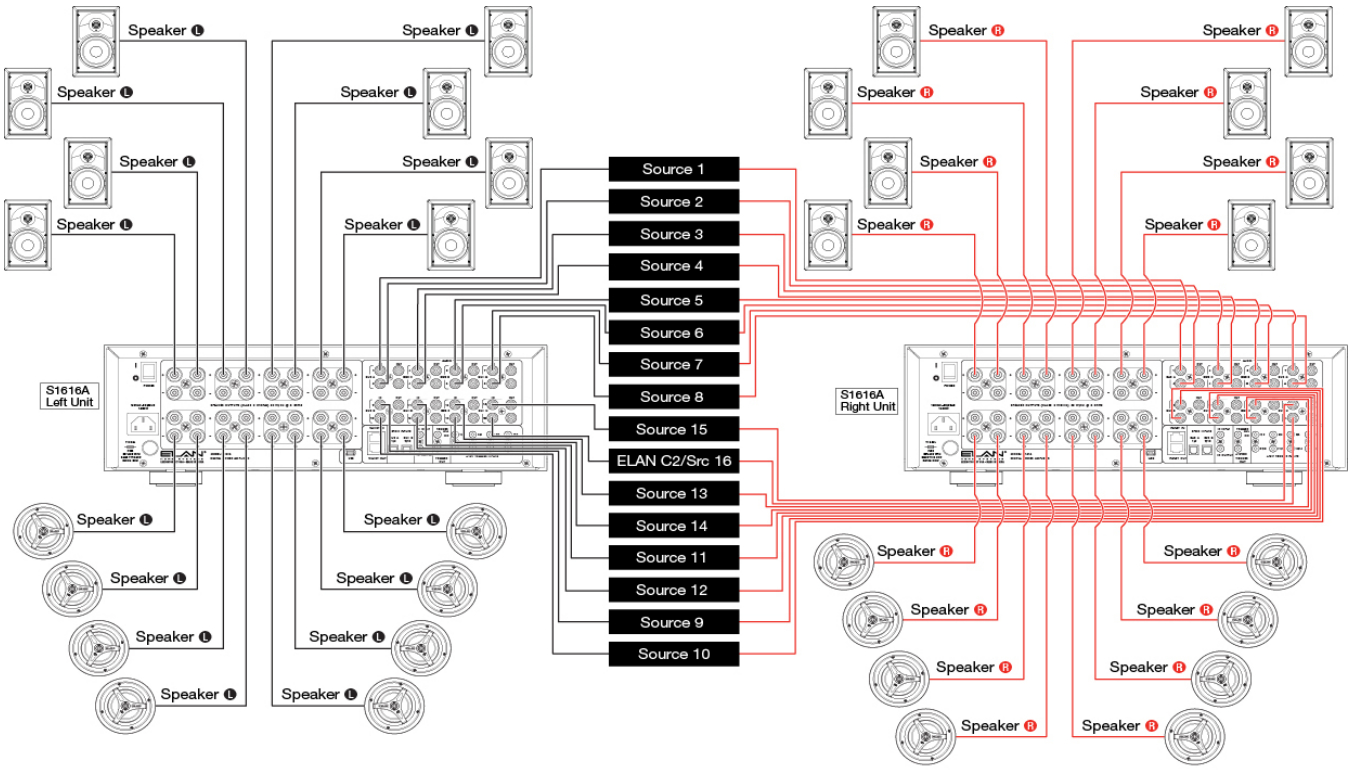

Figure 2-9

Chapter 3: Unit Addressing

All configurations, with the exception of setting the unit address, are accomplished using the g! Configurator. See Appendix A for configuration instructions.

The S1616A requires firmware version 2.0.1.1 or later, which must be loaded into the chassis using the Elan Firmware Updater. The current version of the firmware may be checked by powering the unit up and observing the bottom line of the S1616A's LCD display. See *Figure 3-1*.

Figure 3-1

Updating The Firmware

Using the ELAN Firmware Updater or g! Tools connect your laptop to the S1616A with a mini-USB cable to the USB connector on the rear panel of the S1616A. See *Figure 3-2.* Please refer to the instructions for ELAN Firmware Updater for how to operate the software. Select the "S1616A Multi-Zone" firmware and upload. When the firmware update is complete disconnect the USB cable. The S1616A will automatically re-boot and display the new firmware version.

S1616A

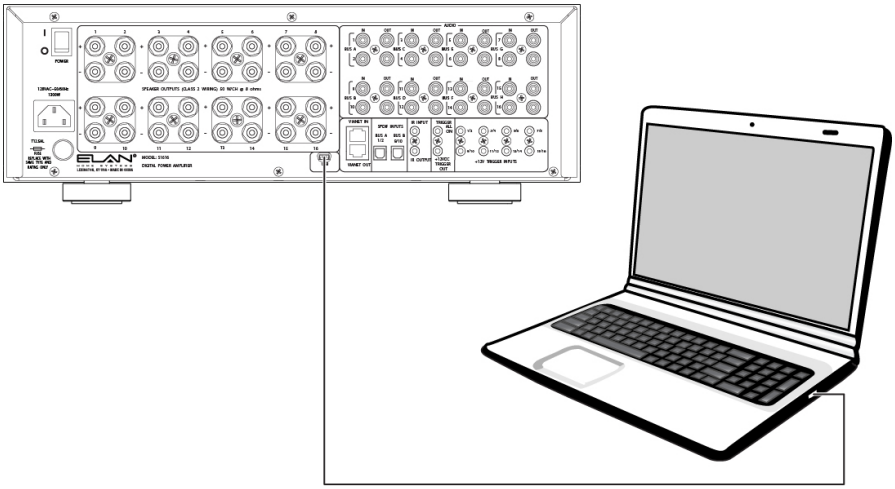

Figure 3-2

Setting the Unit ID

Each S1616A in your system must have a unique Unit ID from 1 to 16 on Single Chassis systems and Dual Chassis systems. The default Unit ID is 1. The Unit ID must be set prior to Configurator programming. If your installation is a Single Chassis configuration and you have a only one S1616A you can skip this step. In Dual Chassis mode installations Configurator assumes that the odd numbered units are used for the LEFT channel and even numbered units are used for the RIGHT channel.

Setting of the Unit ID is accomplished with the S1616A's front panel LCD display along with the MENU, /\, and \/ buttons.

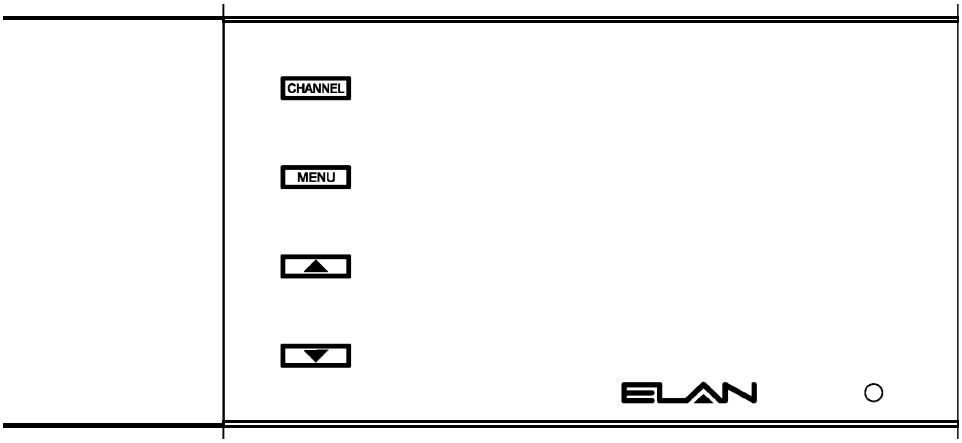

Figure 3-3
Front Panel Controls

To set the Unit ID press and hold MENU for approximately 10 seconds.

The display will change to the following once you are in the setup menu *(Figure 3-4)*:

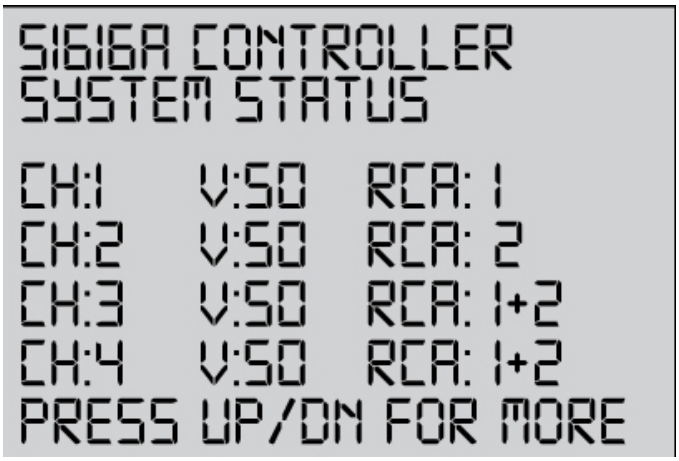

Figure 3-4

Pressing MENU 4 more times brings you to the Unit ID screen *(Figure 3-5)*.

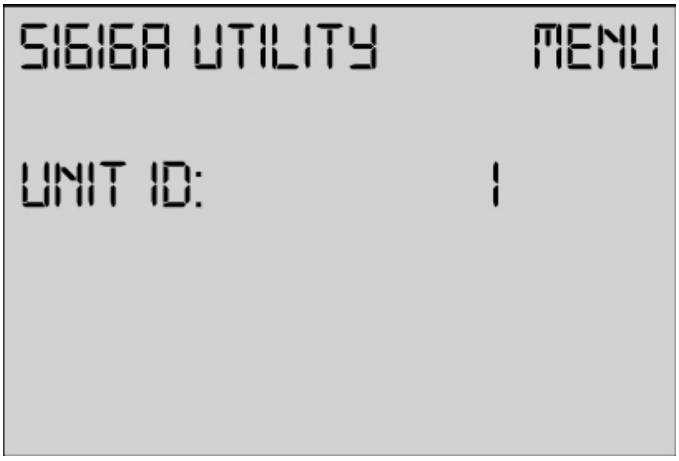

Figure 3-5

Use the Λ and V buttons to change the ID. Set IDs sequentially for Dual Chassis systems. Use odd IDs for left and even IDs for right. Press the Channel button to reboot to the new Unit ID *(Figure 3-6)*.

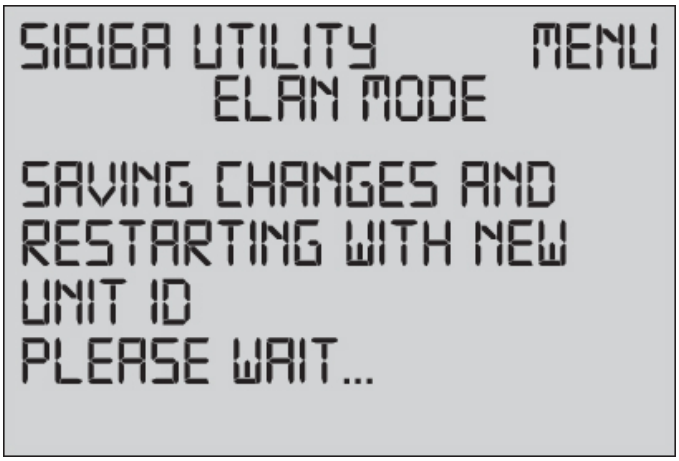

Figure 3-6

The S1616A will re-boot with the new address. To change the address again repeat the above steps.

Chapter 4: Connections

The S1616A has many rear panel connections so it is important to label cables with their destination or source correctly. The Configurator can print out your input and output connections to aid in hookup. See Appendix A for more information.

Use high quality line level RCA connector type cables for source connections to ensure the lowest possible noise and best sound performance.

For most applications, use 16AWG 2 conductor speaker cable. For wiring runs longer than 80 feet, it is recommended to use 14AWG 2 conductor speaker cable. The S1616A's high quality, gold plated 5-way binding posts will accommodate speaker cabling sizes up to 12AWG. Attaching banana plugs will enable the connection of larger cable sizes.

Line Level Audio Inputs

Connect line level input audio by inserting RCA cables into the audio input connectors.

Optical Digital Audio Inputs

The optical digital inputs may be used only on a Single Chassis system with only a single unit. Multiple unit installations and all Dual Chassis systems utilize the analog inputs exclusively. When utilized the optical inputs override analog inputs 1/2 and 9/10 *(Figure 4-1)*.

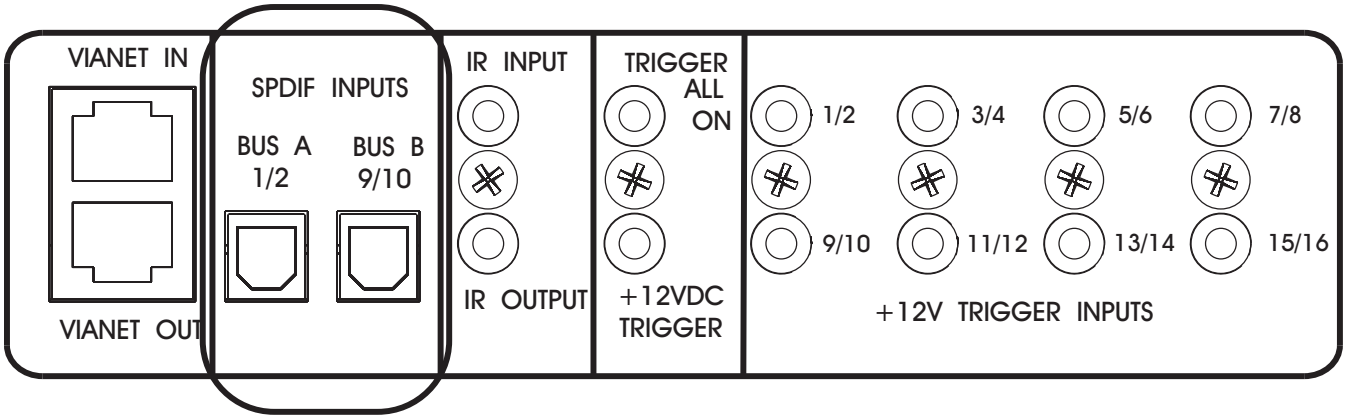

Figure 4-1

Loop Outputs

Loop audio outputs enable connection of additional amplifiers to allow further system expansion *(Figure 4-2)*. Audio input 1 is buffered and routed out the audio output 1 connector, input 2 to output 2 and so forth. Digital audio inputs do not “loop out” of the S1616A. If multiple units are to be used you must use the analog inputs.

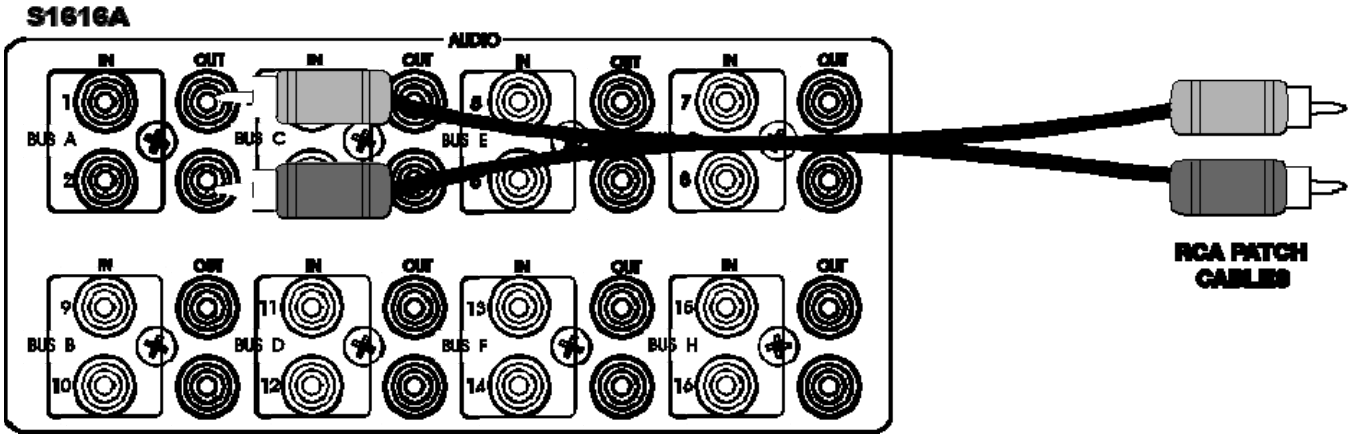

Figure 4-2

VIA!NET LOOP INPUT/OUTPUT Connections

An RJ-45 VIA!NET Data Bus Loop is provided for g! HC series controller connection. Before the multi-zone controller amplifier will operate it must be set with an appropriate and unique Unit ID. See "Setting Unit ID" on page 20.

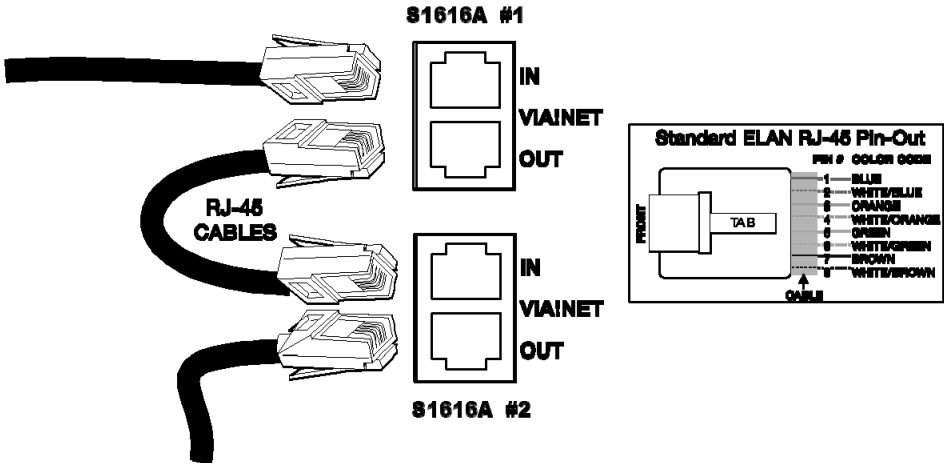

Figure 4-3

USB Connector

Used to update and configure the S1616A firmware.

Note: A Standard USB-A to USB-Mini-B cable must be utilized for firmware updates and is not included with the S1616A *(Figure 4-4)*.

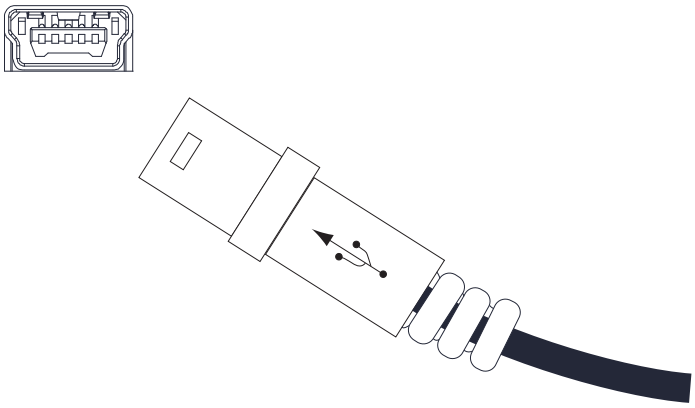

Figure 4-4

AC Power Connector

A removable IEC compatible AC Power cord is included for connecting the AC Power Connector to 120VAC power *(Figure 4-5)*.

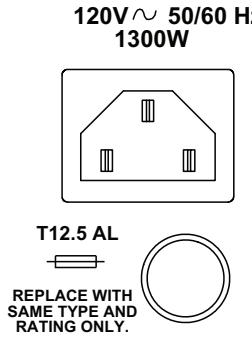

Figure 4-5

Speaker Binding Post

The S1616A is equipped with gold plated, 5-way speaker binding posts. This will allow for five methods of speaker wire termination; bare wire, spade lug, pin, single banana and dual banana plug. Label all speaker wires with their destination to ensure easy configuration. To attach speaker wires use the following method *(Figure 4-6)*:

1. Carefully split the speaker wire insulation at least two inches.
2. Strip 1/2 inch of the insulation from the speaker wire conductor exposing the bare wire.
3. Twist the wire strands of each conductor, if using banana plugs, attach wire to banana plug observing polarity.
4. If using banana plug; insert plug ends into binding post observing correct polarity. If using the bare wire method; loosen red and black binding post caps and insert the bare wire through the hole in the post. Tighten the knob until the wire is securely clamped.
5. Note that the S1616A utilizes a floating ground on all outputs and is not compatible with common grounded devices like transformers, and some volume controls. If there is any question about the device you are connecting's configuration use a test meter and check for continuity between the negative terminals. If there is continuity the device is wired for common ground and will damage the S1616A if connected.

CAUTION! Speaker Wire connections must be made with the amplifier OFF

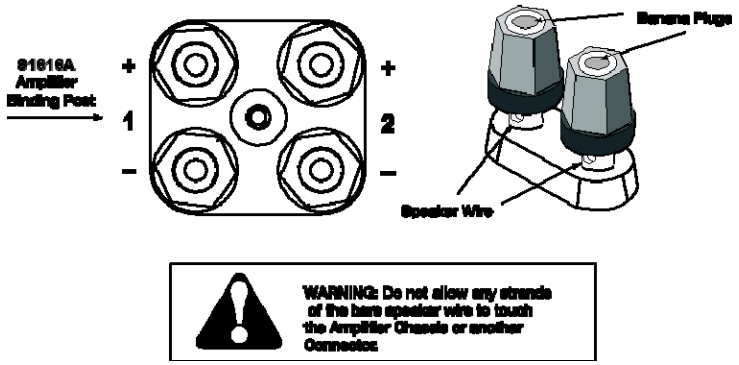

Figure 4-6
Speaker Binding Posts

Rack Mounting

Use the included rack mount brackets to mount your S1616A in industry standard equipment racks. Be sure to leave at least one rack space above and below the S1616A for heat dissipation. Attach the rack mount brackets onto the S1616A chassis from the front as shown in *Figure 4-7*.

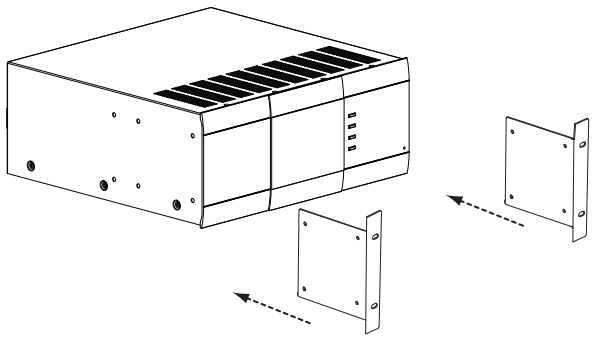

Figure 4-7

Ensure that the brackets are flush with the front of the unit. Install each of the eight screws (included) through the side mounting flanges into the holes in the sides of the unit as shown in *Figure 4-8*. Hand tighten screws! Over-tightening could cause damage to the S1616A chassis.

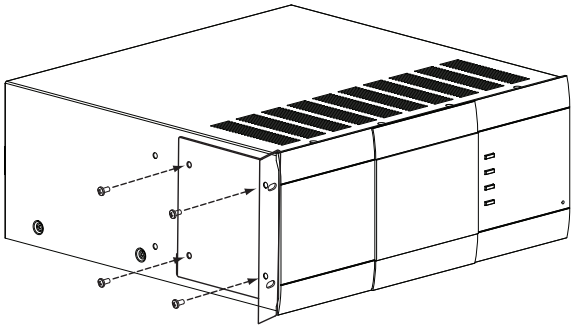

Figure 4-8

Once the brackets are securely mounted, install the entire assembly into a standard 19" equipment rack from the front using four rack screws (not included). Three rack spaces will be used. See *Figure 4-9*.

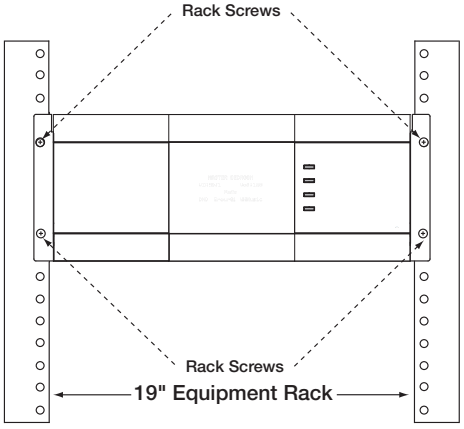

Figure 4-9

Chapter 5: Troubleshooting

General

Symptom	*Possible Cause*	*Solution*
Amplifier will not power up.	1. Power switch is OFF	1. Turn switch ON. Switch is on the back of the unit.
	2. Circuit breaker tripped	2. Set circuit breaker. The S1616A draws 12 amps of AC current. Ensure that combined current draw of all devices on circuit does not exceed the circuit's capacity.
	3. Power cord is disconnected	3. Fix connections.

Audio

Symptom	*Possible Cause*	*Solution*
No audio out on one or more channels.	1. Loose/bad speaker cable connection	1. Check cable ends at binding posts and speaker terminals.
	2. Break/short in speaker cable	2. Check continuity of each speaker cable using multi-meter. If short or open is indicated, check wiring for proper connections.
	3. Speaker is defective	3. Swap with known good speaker.
	4. RCA patch cable defective	4. Swap with known good patch cable.
	5. Source not sending audio	5. Verify source is powered up and playing. Check any tape monitor settings on A/V Receiver.
	6. Amplifier is overheating due to inadequate ventilation or prolonged operation at clipping levels	6. (a) Turn the amplifier off and allow the internal circuits to cool. (b) Ensure that the amplifier has proper ventilation. Add cooling fan if necessary. (c) Lower the volume level controls for that channel pair.
	7. Output not configured properly	7. Check output settings in Configurator.
	8. Source is connected to wrong input	8. Fix connections.
	9. Channel is in fault protection	9. Check the front panel. If one or more channels are in fault the /\ and \/ buttons can be used to reset. If it continues to fault see Solution 2.
	10. Incorrect communications device	10. Select correct communications device.

Audio (Continued)

Symptom	*Possible Cause*	*Solution*
Audio hum	1. Ground potential difference between source components (ground loop)	1. (a) Test AC outlet using ground tester. (b) Reverse the AC plug of components with non-polarized ends plugged into the same outlet strip as amp.
	2. Faulty/damaged cables	2. Check source equipment cables for damage and faulty connections.
	3. Faulty wiring	3. (a) Make sure volume controls are not hooked up backwards. (b) Check for shorts in wiring (see item 2 in "No audio…").
Distorted audio at normal volume levels	1. Input gain set too high	1. Reduce gain to the channel in question.
	2. Defective/incompatible speaker	2. (a) Check for physical damage to speaker. (b) Ensure speakers have appropriate power rating for amplifier. (c) Ensure speakers have at least 4 Ohm impedance. This amp is compatible with speakers with 4-8 Ohm impedance or greater.
	3. Volume control wired incorrectly	3. Check for proper input/output connections at volume control. Verify that the input comes from amplifier and the output goes to speakers.
	4. Volume control Impedance Match settings incorrect	4. Verify/correct Impedance Match settings.
Audio is unclear; bass response low	Speakers are out of phase	Verify that **+** of amplifier goes to **+** of speaker and **–** of amplifier goes to **–** of speaker on ALL speaker leads.
Incorrect source playing on speakers	1. Source connected to wrong input of amplifier or A/V Controller	1. Verify/correct input connections.
	2. Speakers connected to incorrect speaker outputs	2. Verify/correct speaker connections.

IR/VIA!NET Control

Symptom	***Possible Cause***	***Solution***
Home Controller is not communicating with S1616A	1. Incorrect firmware 2. Improper VIA!NET wiring 3. Unit ID does not match Configurator	1. Update firmware to Rev. 2.0.1.1 or later (see page 19). 2. Correct VIA!NET connections (see page 23). 3. Set Unit ID to correct address (see page 19).

Specifications

Audio Section	
Output Power (RMS)	75WPC @ 4 Ohms, 50WPC @ 8 Ohms, all channels driven
Frequency Response	20Hz to 20kHz ±1.5 dB @ 8 Ohms
Full Power Bandwidth	10Hz to 25kHz
Signal to Noise	> 102 dB (A-weighted)
Channel Separation	> -70dB (channel to channel @ 1kHz)
Total Harmonic Distortion	< .04%
Intermodulation Distortion	< 0.1%
Input Impedance	49k Ohms
Connectors	
Input/Loop Output	RCA Stereo
Speaker Output	Gold Plated 5 Way Binding Post
Power	
AC Power Requirements	120 VAC, 50-60 Hz – 1300W
Current Draw	12A @ 120 VAC
Standby Power Saving Mode	21W
Triggers	
Remote Trigger Input	5 to 24 Volts AC/DC
Loop Output Trigger	+12VDC @ 100 mA
Dimensions w/Feet (3U w/o Feet)	
In.	17 W x 5 7/8 H x 17 D
mm	432 W x 149 H x 432 D
Weight (Unit)	
lbs.	47.6
kg	21.6
Weight (Shipping)	
lbs.	54.0
kg	24.5

Appendix A: Configurator

For Single Chassis and Dual Chassis Mode configurations programming is done using g! Configurator. Core Module release 5.4 or greater is required to integrate the S1616A systems.

For Amplifier Mode S1616A's please see the Amplifier Mode programming instructions in the Amplifier Mode Instruction Manual. It's available at www.elanhomesystems/dealer.

These instructions assume that the proper firmware has been installed and the Unit IDs have been set in each S1616A. If these steps have not been completed please see page 19 and complete these steps prior to programming with Configurator.

The configuration of the S1616A is similar to other zone controllers in g!, but adds several new screens to handle the source and zone configurations available in the S1616A.

The configuration MUST be uploaded for any changes to take effect. You will be warned when navigating away from the controller if you have made changes and have not uploaded them. Changes are not lost if you choose not to "Write", but they will not work until you do.

Step 1: Create a Chassis

The S1616A uses the VIA!NET communications device so an additional device does not need to be added.

On the Media Tab right click "Audio Zone Controllers" and select "Add New Audio Zone Controller".

Name your new device and select either ELAN S1616A (Dual Chassis Mode) or ELAN S1616A (Single Chassis Mode) and press OK. See *Figure A-1*.

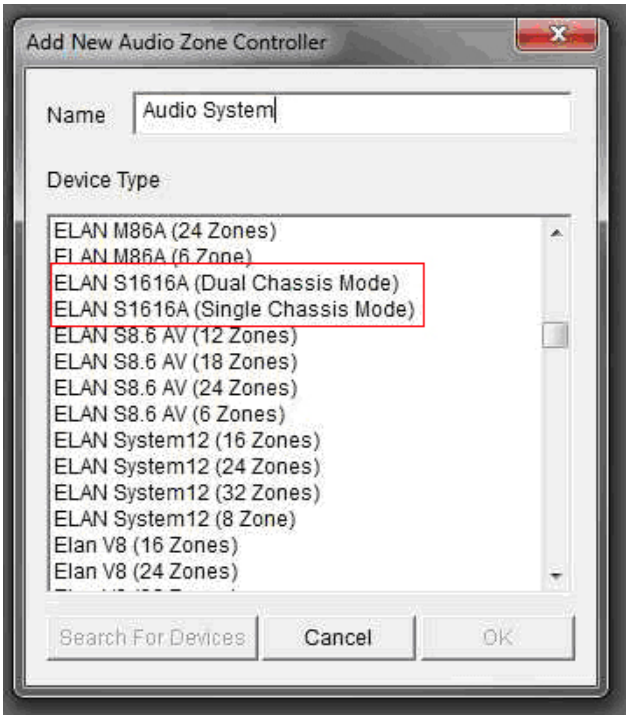

Figure A-1

Select the newly added S1616A, and configure the basic parameters in the properties window as shown below in *Figure A-2*:

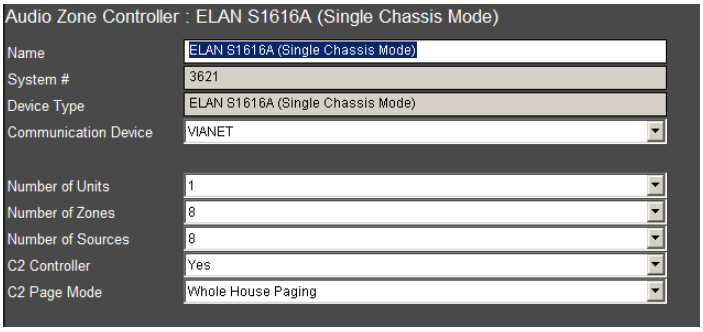

Figure A-2

Select VIA!NET for the Communication Device.

Specify the number of units. This is the total number of S1616A chassis' in the installation.

Specify the number of zones. Up to 64 unique zones are available.

Specify the number of sources (Single Chassis only). Up to 16 sources are available.

Specify if there is a C2 controller.

Specify the C2 Page Mode if applicable.

Step 2: Setup Source Inputs

Open the Sources node on the ELAN S1616A, and then configure each source one at a time as this allows you to set all source parameters without changing screens. This is shown below in *Figure A-3*:

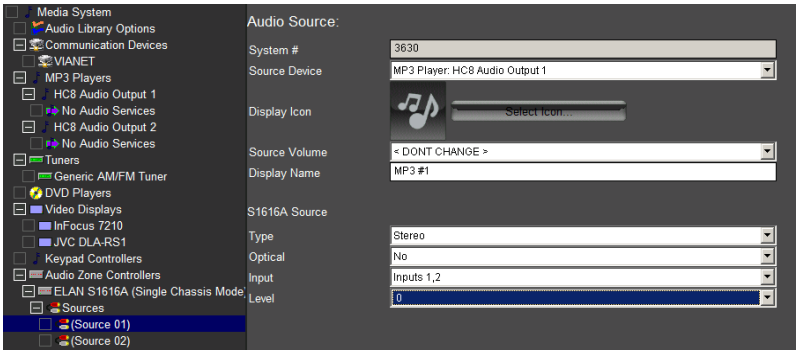

Figure A-3

You are required to select "Apply" before leaving the current source after making a change.

Set the source device.

Select an icon for the source.

Adjust the Source Volume if necessary. This setting is used primarily for variable output level MP3 players, such as the Squeezebox and the HC Audio.

Change the display name (the name that appears on the user interfaces).

Select the type of source (stereo or mono). In a Dual Chassis system all sources are stereo.

Select if you are going to use an optical input (yes/no). Optical inputs are only available for stereo sources on single unit systems. Two optical inputs are available and automatically disable analog inputs 1/2 for the left optical input and 9/10 for the right one.

Single Chassis – Select which input the source is connected to. All stereo sources occupy an odd/even group (i.e. 1/2, 3/4, etc.). Selecting an input for mono leaves its mate as a mono input as well (i.e. select 5 as a mono input and 6 becomes a mono input as well).

Dual Chassis – Source 1 is automatically assigned to Input 1, Source 2 to Input 2, and so on. Input 16 is used for the C2 connection if enabled.

Select a level adjustment to match the relative level of this source with other sources. This is usually done via a listen test.

Step 3: Setup Zones

Open the Zones node on the ELAN S1616A device, and then configure each zone one at a time. This is shown below in *Figure A-4*:

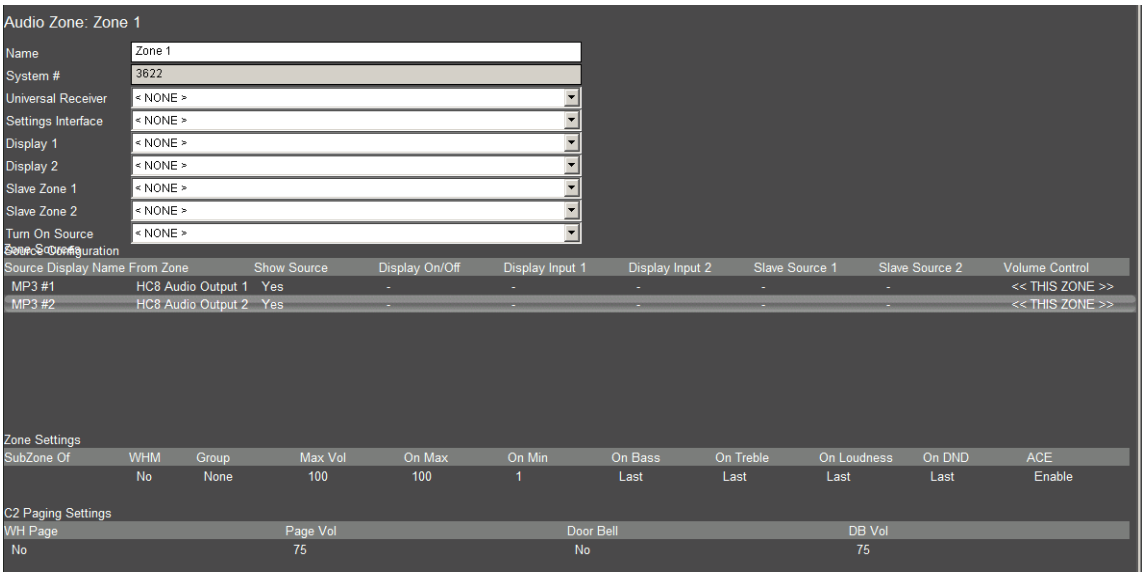

Figure A-4

Zone Configuration – you are required to click Apply when switching to another zone after making a change.

Name the zone. This is the name that will show up on the user interfaces.

Select an IR (universal) receiver if applicable.

Select the settings interface. To create a settings interface for this zone right click the zone in the tree and select “Create Settings Page for this Zone”. Select <NONE> to deactivate.

Select the display(s).

Assign video Slave Zones.

Select a turn on source for the zone.

Source Configuration – In the table right click on an item to change its setting.

Right click the Display Name or From Zone to adjust the order the sources will show on the user interfaces.

Choose to show the source in the zone or not (Show Source).

Choose to turn the displays on or off and change to a specific input when the source is selected (Display On/Off) (Display 1 Input) (Display 2 Input).

Volume Control – Refer to Programming Local Systems in the Configurator Reference Guide for examples of how this control is used.

Zone Settings – Also a table based configuration – use right click to change settings.

Select Master Zone if applicable (Sub Zone Of). Attaches this zone to the selected zone for source and power settings while retaining independent volume control & mute. Sub Zones acquire the WHM and Zone Group attributes of the master zone.

Include or exclude from Whole House Music (WHM) mode.

Attach to a Zone Group (Group). Used to create groups within the project that can be quickly connected together for source and power. Each zone retains independent volume and mute control.

Set Maximum Volume for the zone.

Set the Turn On Max Volume (On Max). Will lower zone volume to this level if turned off louder.

Set the Turn On Min (On Min). Raises the turn on volume to this level if turned off lower. Can be used to create a fixed output by setting to a higher level.

Set the Bass level at turn on (On Bass). Last or [Level].

Set the Treble level at turn on (On Treble). Last or [Level].

Set the Loudness at turn on (On Loudness). Last/On/Off.

Set Do Not Disturb on turn on (On DND). Last/On/Off.

C2 Paging Settings – shows up only if C2 is selected in Step 1.

Include the zone in Whole House (WH) Page.

Set the paging volume for WH Page.

Include in Door Bell announcement.

Set the Door Bell (DB) Volume.

Fixed Zone Outputs - See the instructions at the end of this appendix to create fixed output level zones.

Step 4: Setup Outputs

Open the Outputs node on the S1616A, and then configure outputs as shown below in *Figure A-5*:

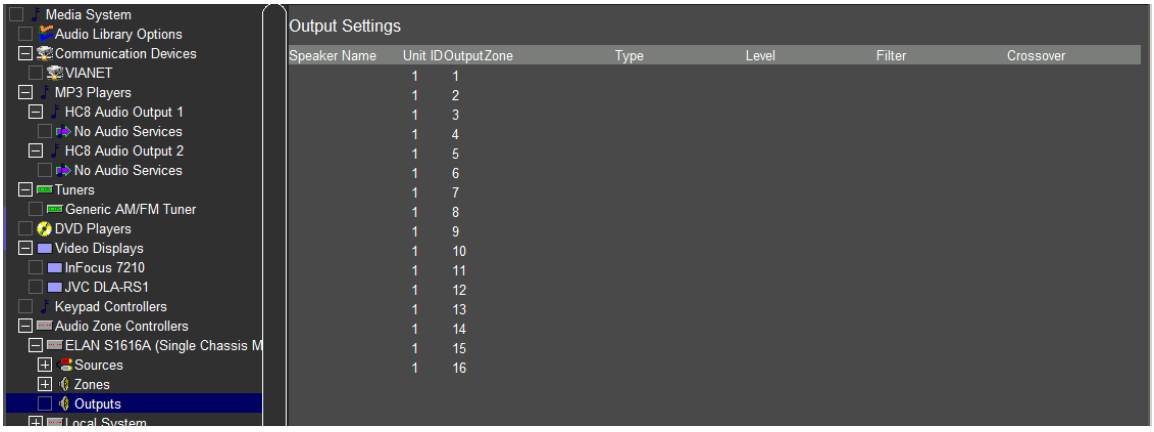

Figure A-5

The outputs are listed on the page according to the Unit ID and the Output Zone: these fields cannot be changed, and the sort order cannot be changed.

Set the Speaker Name if desired. This is not used on any interface but may aid in troubleshooting.

Set the output type (Type) to Mono, Left, Right or None – Single Chassis mode only.

Set the output level (Level): 0 to –6 dB in 1dB steps. One speaker in each zone will be the Master – you can change which speaker is Master. Adjusts the output level compared to the Zone Master.

Set the output filter (Filter) – None/High Pass/Low Pass.

If the filter is set, then set the filter crossover frequency (Crossover) – 20 Hz to 180 Hz in 20 Hz steps.

Step 5: Programming the S1616A and Printing

Once the S1616A has been configured, the Configurator is used to program the S1616A. Select the S1616A in the Audio Zone Controllers items to access the buttons for programming and printing. *Figure A-6* shows the buttons at the bottom:

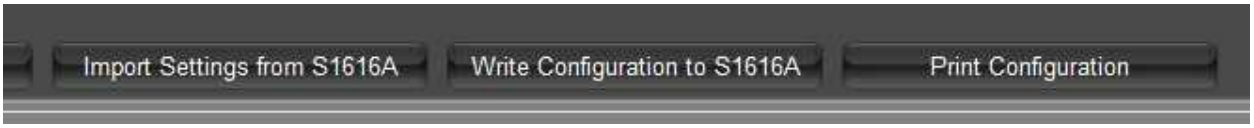

Figure A-6

Click **Write Configuration to S1616A** to write the configuration down to the S1616A. This must be done before any changes made will take effect.

NOTE: Writing to the system erases House Scene memories.

Click **Print Configuration** to print out the zone settings, as shown in *Figure A-7*:

S1616A Configuration

ELAN S1616A (Single Chassis Mode)
January 13, 2012 15:04:25

Input Configuration

Source Name	Input(s)
MP3 #1	1L, 2R
MP3 #2	3L, 4R
Source 03	
Source 04	
Source 05	
Source 06	
Source 07	
Source 08	
Source 09	
Source 10	
Source 11	
Source 12	
Source 13	
Source 14	16

Output Configuration

Zone Name	Speaker Name	Chassis	Output
Not Assigned	Zone 1 Left	1	1
Not Assigned	Zone 1 Right	1	2
Not Assigned	Zone 2 Left	1	3
Not Assigned	Zone 2 Right	1	4
Not Assigned		1	5
Not Assigned		1	6
Not Assigned		1	7
Not Assigned		1	8
Not Assigned		1	9
Not Assigned		1	10
Not Assigned		1	11
Not Assigned		1	12
Not Assigned		1	13
Not Assigned		1	14
Not Assigned		1	15
Not Assigned		1	16

Figure A-7

Importing Configurations from an S1616A

It is possible to import the current configuration from the S1616A's previously programmed. Importing overwrites the current configuration and importing does not include any of the names that were entered (i.e. speaker, source, and zone names).

Select the S1616A zone controller and note at the bottom of the configuration screen the buttons shown in *Figure A-8*:

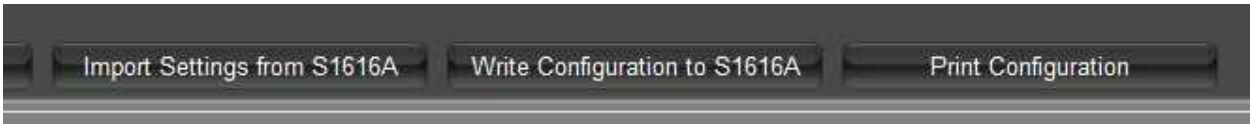

Figure A-8

Check to verify that you have the correct Single Chassis or Dual Chassis mode. Correct if necessary. The number of Units in the installation and the units in Configurator must match prior to importing. Check the Number of Units setting and verify that they match (see *Figure A-9*).

Figure A-9

Click **Import Settings from S1616A** and confirm your desire to import and overwrite the current configuration and Configurator will read the data from the attached unit(s) and populate the configuration accordingly.

Notes on House Modes and Groups

The S1616A supports two different groups: the Whole House Mode (WHM) group and a collection of up to 8 Zone Groups. This section provides details to explain group support.

Each zone can be a member of the Whole House Music (WHM) group and a member of one of the 8 individual Zone Groups. When WHM or a Zone Group is enabled a source change in any zone in the group changes all zones in the group to that source. It is possible for multiple Zone Groups to be active at the same time – e.g., First Floor Group on and Second Floor Group on.

WHM is system wide. Individual Zone Groups cannot be active while WHM is active.

WHM and Zone Groups are activated via the Settings Page. For each zone the Settings Page can have buttons for WHM On, Group On, and WHM/Groups Off, when appropriate. Buttons for each are automatically generated with you create a settings page. If the zone is not configured for WHM or Group mode, then the corresponding buttons will appear in the disabled state. Alternatively, you can remove any of these buttons on a zone by zone basis.

The following sections describe the behavior when the WHM and Groups are activated. Keep in mind that you must first turn on a zone and select a source, before you can engage WHM or enable a Group. Pressing the WHM or Group On buttons when no source is active has no effect.

When the **Group On** button is pressed for a zone:

The Group the zone is a member of is enabled. All zones in the Group turn on to the source that is active in the zone that turned on the Group. If WHM was enabled, it is now disabled. Any zones that were in the WHM group, but are not in the new group, continue to play what they were playing. While a Group is enabled a source change in any zone in the group will change all zones in the group to the same source.

When the **Whole House Mode On** button is pressed for a zone behavior is similar to above:

WHM mode is enabled. All zones in the WHM group turn on to the source that is active in the zone that turned on WHM. All zone Groups are disabled. If a zone was part of a previously active group, but not part of the whole house mode, it continues to play what is was playing. While WHM is enabled a source change in any zone in the WHM group will change all zones in the WHM group to the same source.

When the **Whole House Music Off** or **Group Off** button is pressed:

The active Group that the zone is a member of is disabled. There is no change to any zones. They continue to play what they are playing. When WHM mode and the zone's Group are both disabled a change in source selection is local to the zone.

If WHM mode is active, and any zone in WHM is turned **Off** (using the zone off button, not the WHM/Group Off button) all zones in WHM are also turned off and WHM is disabled, so that turning back on that same zone does not turn on other zones or re-enable WHM.

If a Zone Group is active, and any zone in that group is turned **OFF** all zones in that group are also turned off and that group is disabled, so that turning back on that same zone does not turn on other zones or re-enable the group. Other groups currently active are not impacted.

UI controls in g! to manage the groups are typically placed on a settings page for the desired zones. The g! Configurator provides a group control that has four buttons: one to turn the Zone Group On, one to turn the Zone Group Off, WHM On, and WHM Off. As with other zone controllers, right-click the zone, and select Add Settings Page for Zone to create a settings page for any desired zone in the S1616A.

Fixed Output Zones

There are two ways to create a fixed output zone – using a Generic Single Zone Controller and using a Dummy Zone. The Generic Single Zone Controller method takes more time but is cleaner for the end user.

Generic Single Zone Controller Method

Configure a zone in the S1616A with all of the source, WHM, Group, C2 and output level attributes you desire in the fixed zone. Name it something like “Dining Fixed Out”.

Create a Settings Page for the “Fixed Out” zone

It will look something like this when you are done (*Figure A-10*).

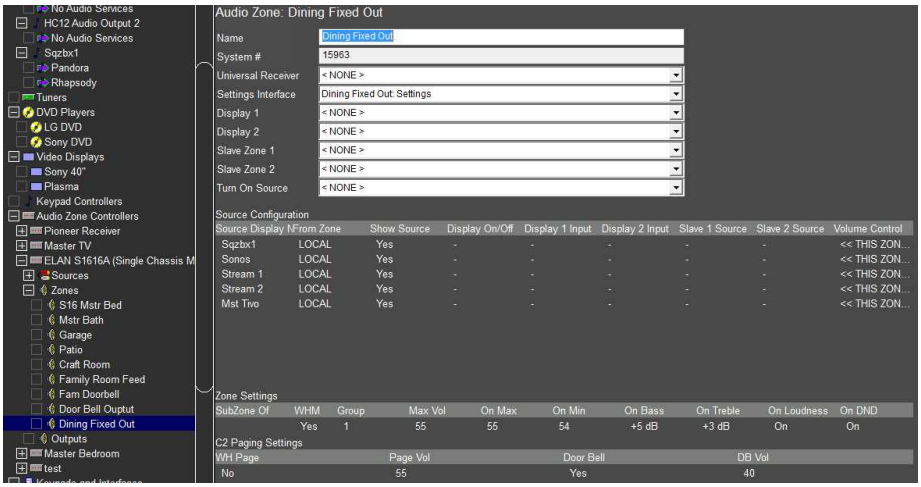

Figure A-10

Attach the outputs to this zone in the Output tree as you normally would.

Create a Generic Single Zone Controller and name it something like “Dining Interface”

Under the “Interface” controller set On/Off Control Type to Discrete and Volume Control to NO

It should look something like this: (*Figure A-11*)

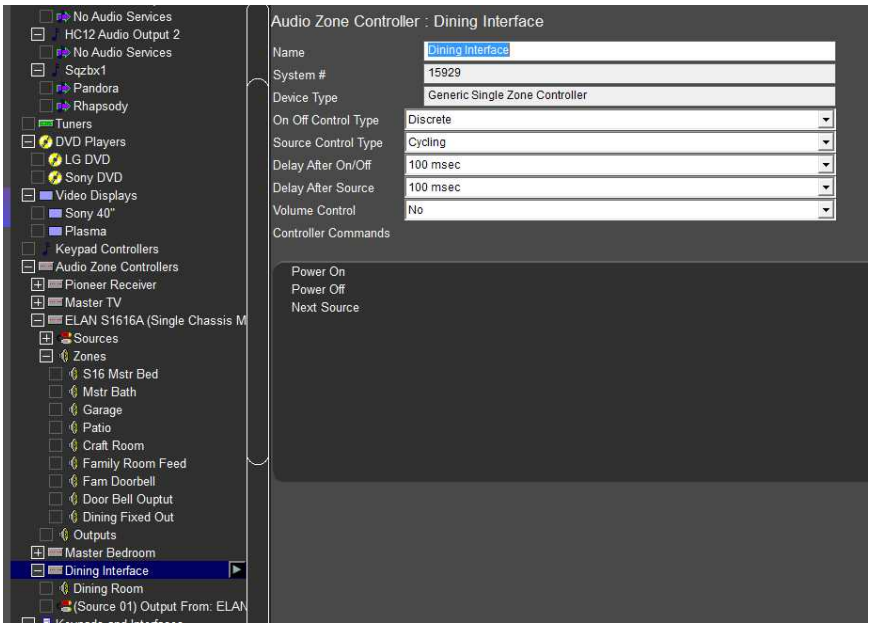

Figure A-11

Right click Power Off and add a command to turn off the S1616A "Fixed Out" zone (*Figure A-12*):

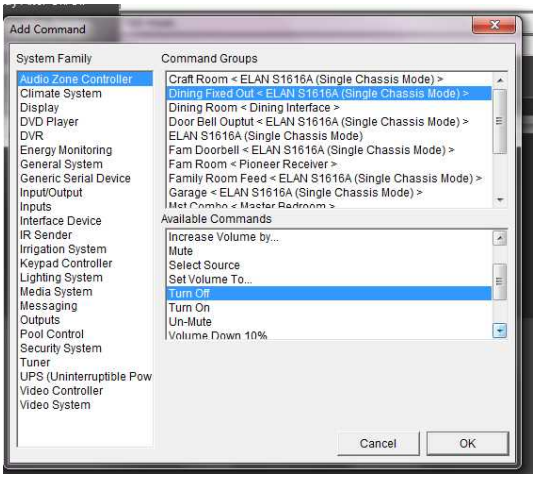

Figure A-12

Select (Source 01) of your Dining Interface controller and select the Source Device to be the Output From <S1616A Name>:Zone Dining Fixed Out and hit Apply. (*see Figure A-13*)

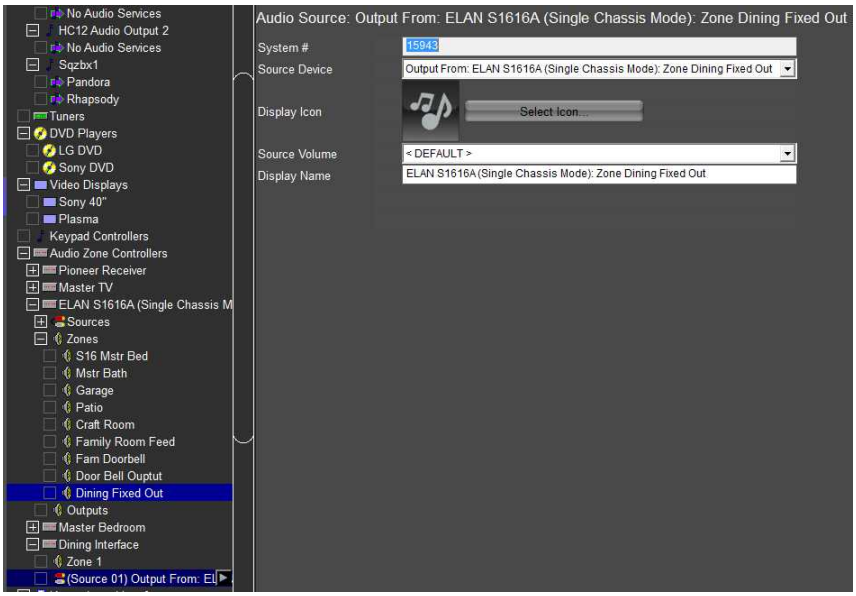

Figure A-13

Now select Zone 1 of the Dining Interface and change the name to the name that you want to show up in the user interfaces and change the Settings Interface to the Dining Fixed Out Settings and set the sources you wish to show and in what order and hit Apply (*see Figure A-14*).

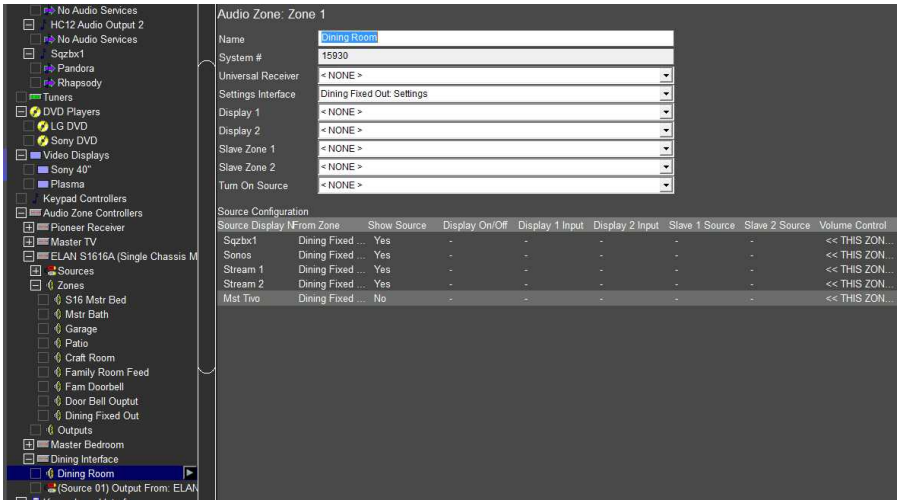

Figure A-14

Finally, adjust your Interfaces to show the Dining Room zone as applicable and hide the Dining Fixed Out on all interfaces (*see Figure A-15*).

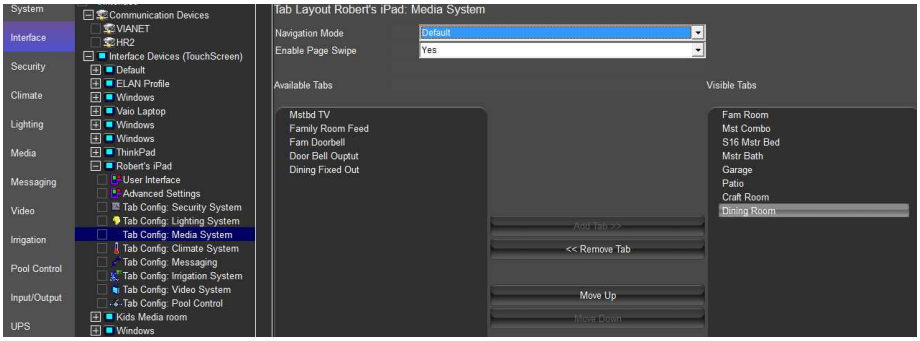

Figure A-16

Dummy Zone Method

When you create your Zone Controller set it up for one more zone than you actually have.

Configure the first zone in the S1616A with the bass, treble, loudness and output level attributes you desire in the fixed zone. WHM and Grouping settings will not matter. Name it something like "Dining Fixed Out". It will look like something like this when you are done (see Figure A-17).

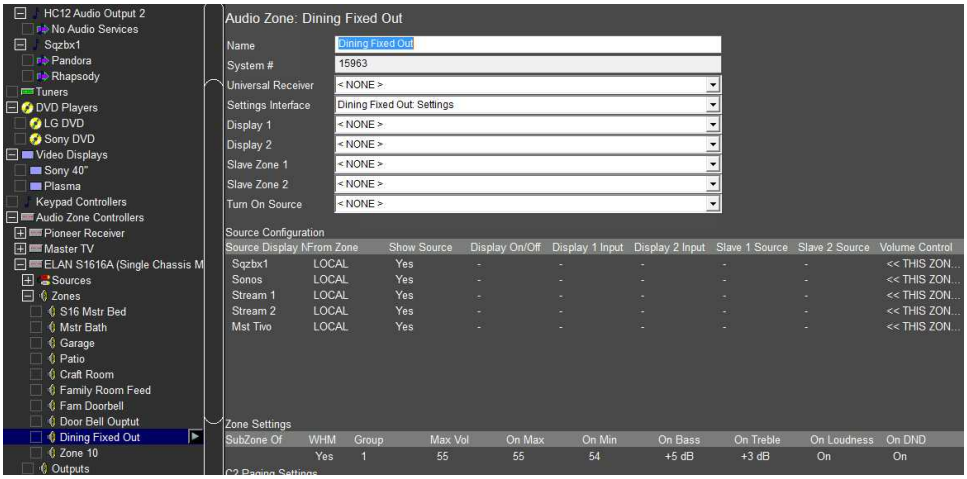

Figure A-17

Attach the outputs to this zone in the Outputs tree as you normally would.

Select another zone that will be the visible "dummy" zone and name it with the name you wish to be visible in the user interfaces.

Set the WHM, Group, and C2 attributes you wish. Volume levels will not matter.

Go back to the Fixed Output zone and make it a SubZone Of the "dummy" zone.

On the Interfaces tab remove the Fixed Output zone from all interfaces using the "dummy" zone as the control interface for all UI's.

The volume control and mute for the "dummy" zone will look like they work but will have no effect.

Notes on Event Map Commands

The S1616A includes the following **Events** in the Audio Zone Controller System Family:

"Chassis Selection" indicates features available by selecting the Zone Controller;

"Zone Selection" indicates features available by selecting a specific zone;

(note that "N" refers to the particular zone number/name).

- Chassis Selection
    - S1616A: All Zones Turned Off
    - S1616A: One or More Zones Turned On
- Zone Selection
    - Zone N: Source Selected… (select Source)
    - Zone N: Source Unselected…(select Source)
    - Zone N: Zone Source Changed
    - Zone N: Zone Turned Off
    - Zone N: Zone Turned On

The S1616A includes the following **Events** in the Inputs System Family:

- Audio Detect Source N: Input Turned Off
- Audio Detect Source N: Input Turned On

The S1616A includes the following **Conditions** in the Audio Zone Controller System Family:

- Chassis Selection
    - S1616A: Any Zone is On… (select TRUE/FALSE)
- Zone Selection
    - Zone N: Zone is On… (select TRUE/FALSE)

The S1616A includes the following **Conditions** in the Inputs System Family:

- Audio Detect Source N: Input is On… (select TRUE/FALSE)

The S1616A includes the following **Commands** in the Audio Zone Controller System Family:

- Chassis Selection
    - S1616A: Do Global Command… (select from:)
        - All Zones Off
        - Whole House Music On

        - Whole House Music Off
        - Group N Off
        - House Scene N Save
        - House Scene N Restore
        - Doorbell On
        - Doorbell Off
- Zone Selection
    - Zone N: All Clients Jump To Tab… (select tab)
    - Zone N: Decrease Volume by… (select)
    - Zone N: Do Zone Command…
        - Group N: On
        - DND ON/OFF
    - Zone N: Increase Volume by… (select)
    - Zone N: Mute
    - Zone N: Select Source… (select source)
    - Zone N: Set Volume To… (select)
    - Zone N: Turn Off
    - Zone N: Turn On
    - Zone N: Un-Mute
    - Zone N: Volume Down 5%, 10%
- Zone N: Volume Up 5%, 10%

Limited Warranty

ELAN HOME SYSTEMS L.L.C. ("ELAN") warrants the S1616A Multi-Zone Controller Amplifier to be free from defects in materials and workmanship for the period of two years (2 years) from date of purchase. If within the applicable warranty period above purchaser discovers that such item was not as warranted above and promptly notifies ELAN in writing, ELAN shall repair or replace the item at the company's option. This warranty shall not apply (a) to equipment not manufactured by ELAN, (b) to equipment which shall have been installed by other than an ELAN authorized installer, (c) to installed equipment which is not installed to ELAN's specifications, (d) to equipment which shall have been repaired or altered by others than ELAN, (e) to equipment which shall have been subjected to negligence, accident, or damage by circumstances beyond ELAN's control, including, but not limited to, lightning, flood, electrical surge, tornado, earthquake, or other catastrophic events beyond ELAN's control, or to improper operation, maintenance or storage, or to other than normal use of service. With respect to equipment sold by, but not manufactured by ELAN, the warranty obligations of ELAN shall in all respects conform to the warranty actually extended to ELAN by its supplier. The foregoing warranties do not cover reimbursement for labor, transportation, removal, installation or other expenses which may be incurred in connection with repair or replacement.

Except as may be expressly provided and authorized in writing by ELAN, ELAN shall not be subject to any other obligations or liabilities whatsoever with respect to equipment manufactured by ELAN or services rendered by ELAN.

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To ensure that consumers obtain quality pre-sale and after-sale support and service, ELAN Home Systems products are sold exclusively through authorized dealers. ELAN products are not sold online. The warranties on ELAN products are NOT VALID if the products have been purchased from an unauthorized dealer or an online E-tailer. To determine if your ELAN reseller is authorized, please contact ELAN Home Systems at 760-710-0990.

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