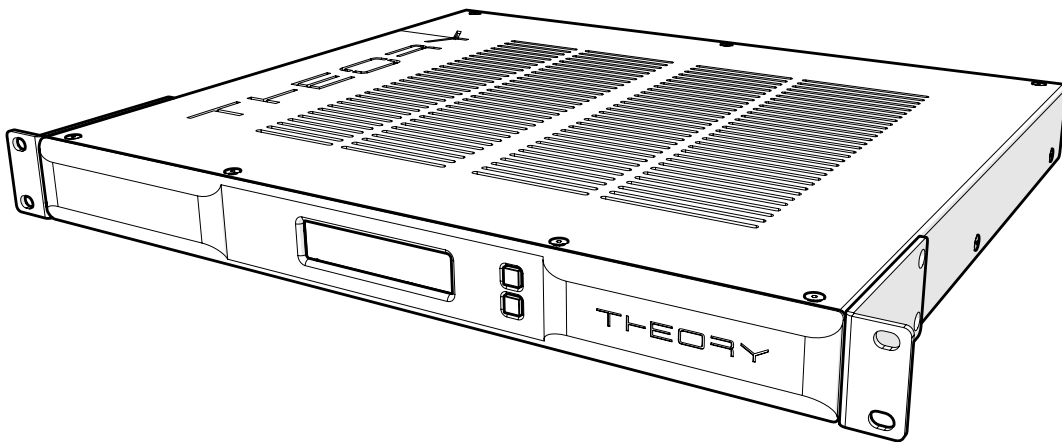


ALC-1809

AMPLIFIED LOUDSPEAKER CONTROLLER



ADVANCED INSTALLATION AND PROGRAMMING GUIDE

Rev B 210602

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IMPORTANT SAFETY INSTRUCTIONS

1. Read all instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. To prevent fire or shock, do not expose this equipment to moisture or water.
7. Clean only with a dry cloth.
8. Do not block any ventilation openings. Install in accordance with manufacturer's instructions.
9. Do not install near any heat sources such as radiators, heat registers, stoves or other apparatus (including other rack equipment) that produce heat.
10. Do not defeat the safety purpose of the grounding type plug. A grounding plug has two blades and a grounding prong. The wide blade and third prong are provided for your safety. If the provided plug does not fit your outlet, consult an electrician for the replacement of the obsolete outlet.
11. Protect power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and point where they exit the apparatus.
12. Use only attachments/accessories specified by THEORY AUDIO DESIGN, LLC.
13. Use only with hardware, brackets, stands, and components sold with the apparatus or supplied by THEORY AUDIO DESIGN, LLC.
14. Unplug the apparatus during lightning storms or when unused for long periods of time.
15. Refer all servicing to qualified service personnel. Servicing is required when the apparatus is 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.
16. To completely disconnect this apparatus from the AC Mains, disconnect the power supply cord from the AC receptacle.
17. The mains plug of the power supply cord shall remain readily operable.



The lightning flash with arrowhead symbol with 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 a triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.



CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE THE COVER, NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED PERSONNEL.



WARNING: TO PREVENT FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE EQUIPMENT TO RAIN OR MOISTURE.

WELCOME

The ALC-1809 Amplified Loudspeaker Controller (ALC) is the nucleus of all Theory audio systems and is responsible for all signal processing and power amplification for Theory loudspeakers and subwoofer systems. Every Theory audio system requires at least one Loudspeaker Controller.

WHAT IS AN “AMPLIFIED LOUDSPEAKER CONTROLLER”?

The ALC-1809 Amplified Loudspeaker Controller (ALC) is a multi-channel 96kHz/32-bit digital signal processor and multi-channel power ALC built into a single 1U chassis. The ALC is responsible for all signal conditioning and power amplification required to operate all Theory loudspeaker and subwoofer models.

The amplifier power and features of the ALC-1809 have been optimized to run Theory loudspeakers and subwoofers in commercial and residential audio installations, including distributed audio, surround sound and hi-fi/stereo.

TERMINOLOGY

This manual covers THEORY hardware and software features that span a couple generations and therefore certain terms are used interchangeably. “ALC”, “loudspeaker controller”, “amplified loudspeaker controller” and sometimes “amplifier” may be used within this manual to reference the THEORY multichannel amplified loudspeaker controllers.

POWER OUTPUT LIMITATIONS

SUBWOOFER CHANNELS 0-1-2

Channels 0-1-2 of the ALC-1809 are rated at 300W (into 4-ohms) and are intended to drive subwoofers and full range speakers. Note that Channel 0, while it is an independent amplifier channel capable of driving subwoofers, the signal driving it is always the same signal that is routed to the Channel 1 output. Channel 0 is in effect a “copy” of the Channel 1 signal.

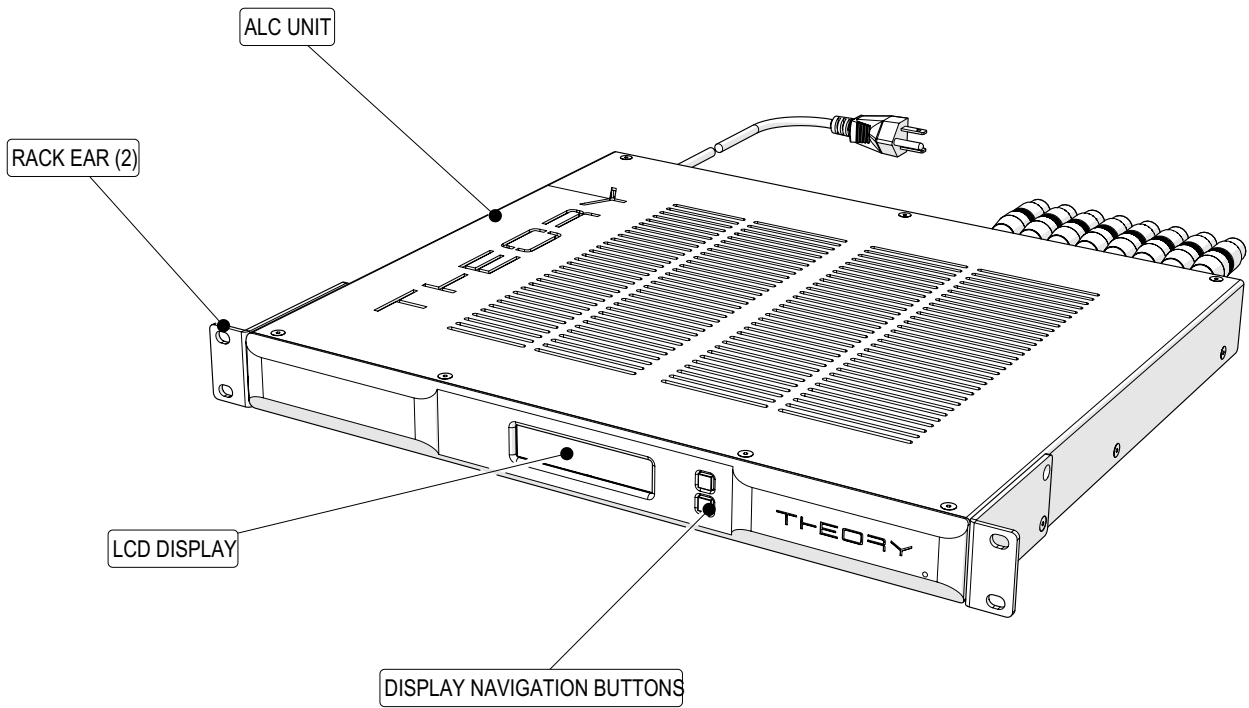
FULL RANGE CHANNELS 3-8

Channels 3-8 of the ALC-1809 are rated at 100W (into 4-ohms) and are intended to drive full range speakers **ONLY**. **Channels 3-8 cannot drive subwoofers. When bridged, channel pairs 3-8 can only drive 8-ohm loads. Do not connect bridged channels to 4-ohm loudspeaker loads.**

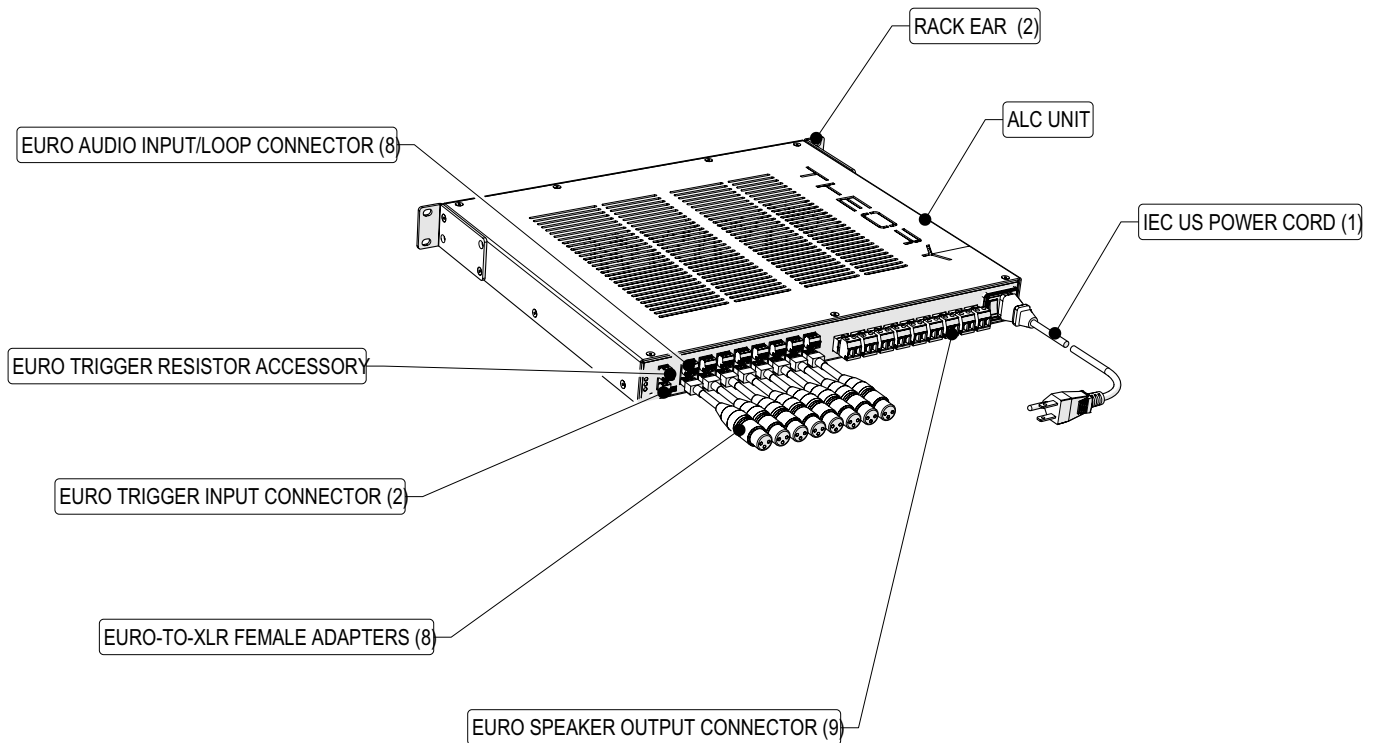


CAUTION: Do not connect subwoofers to speaker output channels 3-8, even when bridged. Channels 3-8 are rated for full-range, 8-ohm speakers only.

COMPONENTS AND ACCESSORIES (FRONT VIEW)

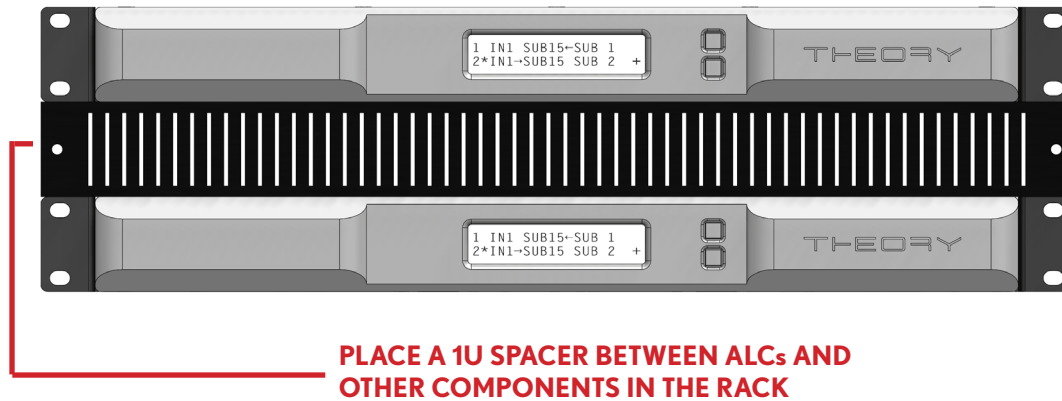


COMPONENTS AND ACCESSORIES (REAR VIEW)



INCLUDED ACCESSORIES:

- RACK EARS - 2 EACH
- EURO AUDIO INPUT/LOOP CONNECTOR - 8 EACH
- EURO TRIGGER INPUT CONNECTOR - 2 EACH
- EURO TRIGGER RESISTOR ACCESSORY - 1 EACH
- EURO-TO-XLR ADAPTER - 8 EACH
- EURO LOUDSPEAKER OUTPUT CONNECTOR - 9 EACH
- IEC US 20A POWER CORD - 1 EACH
- MINI USB CABLE - 1 EACH (NOT SHOWN)



THEORY ALCs WITH 1U RACK SPACER

SHELF MOUNTING

The ALC-1809 ships with small rubber feet attached to the chassis bottom panel allowing the unit to be placed on a shelf or table top when rack mounting is not desired.

RACK MOUNTING

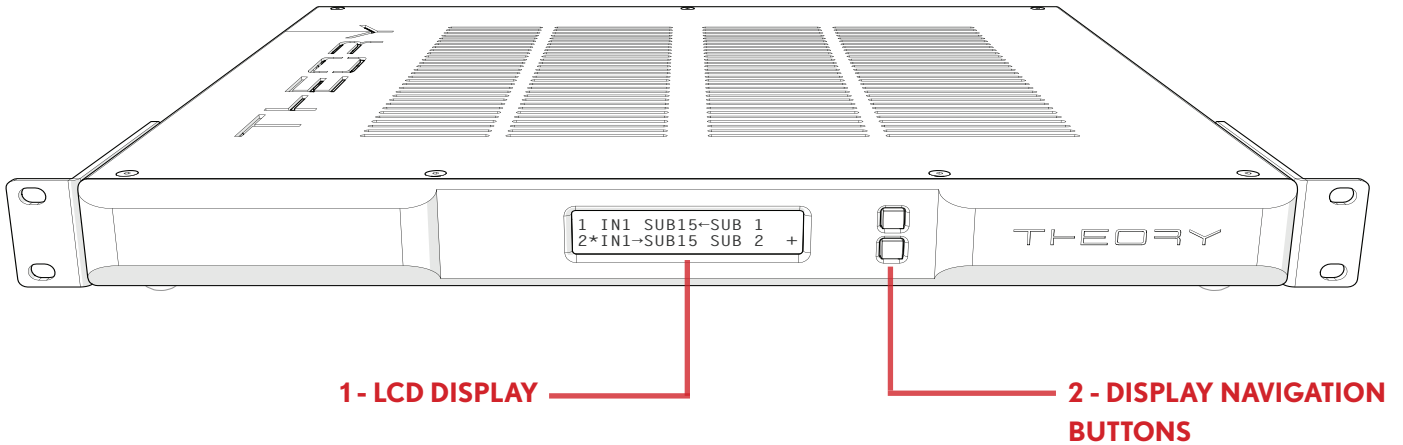
The ALC-1809 ships from the factory with rack mount ears and specific long screws in an accessory bag . The rack ears may be installed to the chassis using these long screws as shown above.

To keep the equipment and listening rooms as quiet as possible, the ALC-1809 does not have cooling fans and therefore relies on convection to remove waste heat from the chassis. The good news is, however, that the ALC-1809 is extremely efficient (> 80% efficiency). Still, with 1,800 watts per chassis, even with 80% efficiency it does generate a modest amount of heat, especially at idle. (Refer to the SPECIFICATIONS section for more information).

For this reason, it is recommended that you place a 1U spacer between the ALC-1809 chassis and any neighboring equipment, including other Theory and Pro Audio Technology ALCs, to insure adequate ventilation. During normal operation, the front panels of the ALC-1809 will become warm to the touch, but will not become hot.

To further minimize heat generated at idle, it is recommended that you take advantage of the STANDBY feature of the controller, and place it into STANDBY whenever not in use. This will keep power consumption and therefore waste heat to a minimum.

HARDWARE FEATURES



ALC FRONT PANEL

FRONT PANEL

1 - LCD DISPLAY

The display will illuminate and text will appear when the ALC main power is turned on. Once the ALC has completed its initialization process, the display will show details about the ALC configuration and programming.

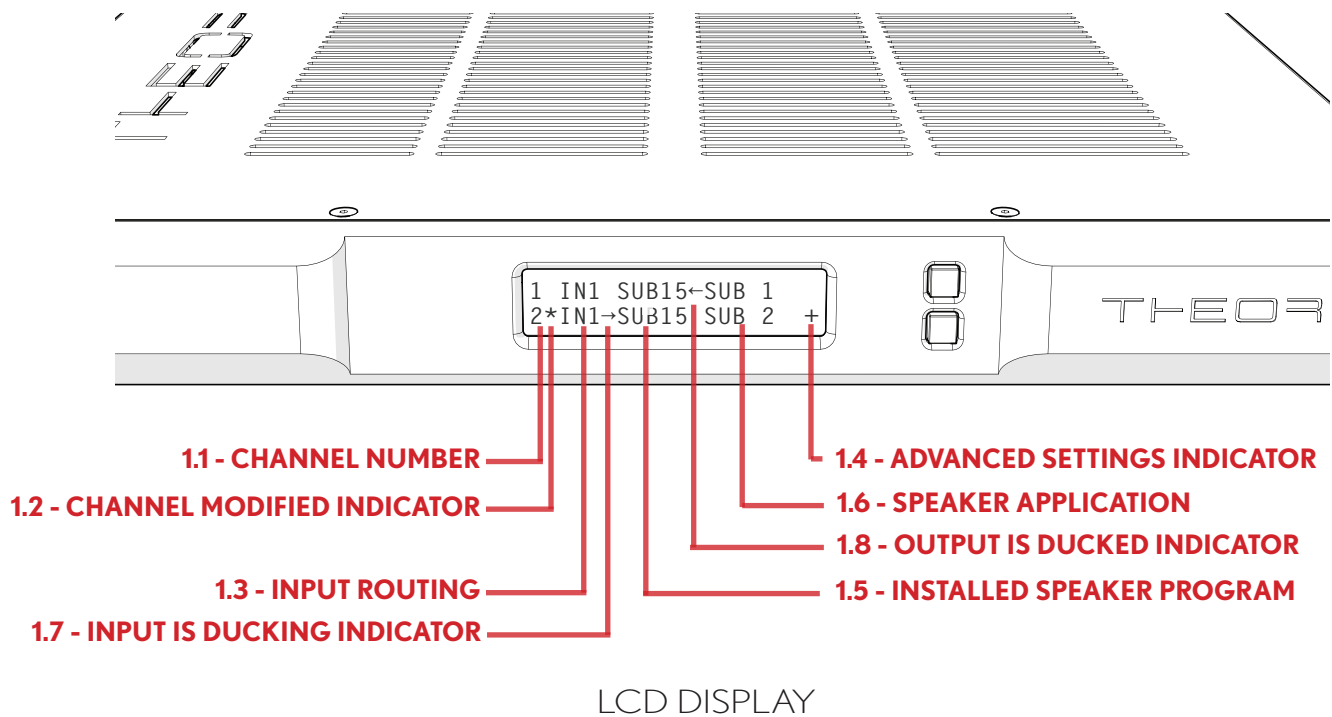
The text on each row of the display corresponds to an ALC channel. The channel number is indicated in the first column of text.

Each column of the LCD display indicates an important parameter of the ALC status and/or ALC programming. Column headings have intentionally been omitted from the chassis front panel to preserve a clean appearance. Please review the descriptions below to learn what information is shown in each column. After reviewing the information, deciphering the displayed text will be easy and intuitive.

When the ALC is placed into STANDBY mode, the display backlight will dim but the text will still be visible.

1.1 - CHANNEL NUMBER

The first column indicates the channel number. Two channels can be seen on the display at one time. The Display Navigation Buttons (see section 2) allow you to scroll up and down through the list of 8 channels



1.2 - CHANNEL MODIFIED INDICATOR

When a DSP setting has been modified on an ALC channel but the changes have not yet been saved to ALC memory, an asterisk will appear to the right of the channel number. Once the current settings have been saved to ALC memory, the asterisks will disappear. No asterisks on the front panel display indicates that settings in ALC memory are “in-sync” with the running DSP programming.

1.3 - INPUT ROUTING

The second display column indicates the analog input currently routed to the ALC output channel (as set up in SoundWizard™ or SoundTools™ control software, see “ALC Programming”). The source may be any one of the eight balanced audio input jacks on the ALC back panel or any of four possible summed-mono signals available in the ALC DSP engine.

From the factory, each output channel is by default routed to its corresponding unbalanced audio input jack. That is, Output 1 of the ALC is “listening” to Channel 1 balanced analog audio input. Output 2 is routed to the Channel 2 balanced analog audio input, and so on. Signal routing will be programmed automatically by the AUTOMATOR software.

1.4 - ADVANCED SETTINGS PRESENT INDICATOR

When advanced controls have been used on a particular channel, a plus sign, “+”, will appear in this column indicating that there are DSP settings in addition to those shown on the LCD running on the channel in question. These controls include channel delay, up to five total predefined compensation filters, bass steering, automatic ducking, and customized parametric EQ. To view these settings, connect the ALC to Theory SoundTools™ software.

1.5 - INSTALLED SPEAKER PROGRAM

Column three of the display indicates the speaker program that is installed for the channel. From the factory, the ALC is pre-programmed with no speaker program and this column will display "DISABLED".

1.6 - SPEAKER APPLICATION

Column four of the display indicates the application (where within a surround sound system configuration the speaker is used, for example) of the speaker connected to the output (e.g. "CENTER", "LEFT", "RIGHT", etc). In music applications such as distributed audio or hi-fi use this will read "MUSIC".

1.7 - INPUT IS DUCKING INDICATOR

If the input channel that corresponds to the row of the display is configured to duck any of the output channels, a right arrow, -> will appear here.

1.7 - OUTPUT IS BEING DUCKED INDICATOR

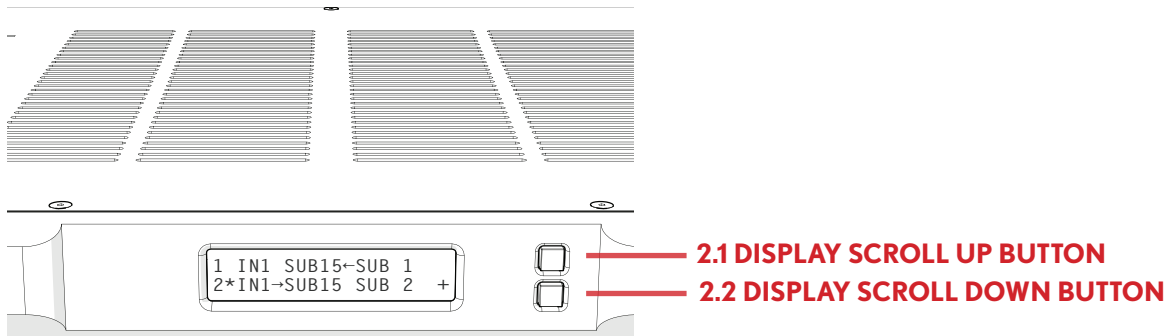
If the output channel that corresponds to the row of the display is configured to be ducked by any of the input channels, a left arrow, <-, will appear here.

2 - DISPLAY NAVIGATION BUTTONS

To the right of the LCD display on the ALC front panel are two square navigation buttons which allow you to control which two of the eight channels are displayed on the LCD screen. Think of the text shown in the display as a vertical list of channels with Channel 1 at the top and Channel 8 at the bottom.

2.1 - DISPLAY SCROLL UP BUTTON

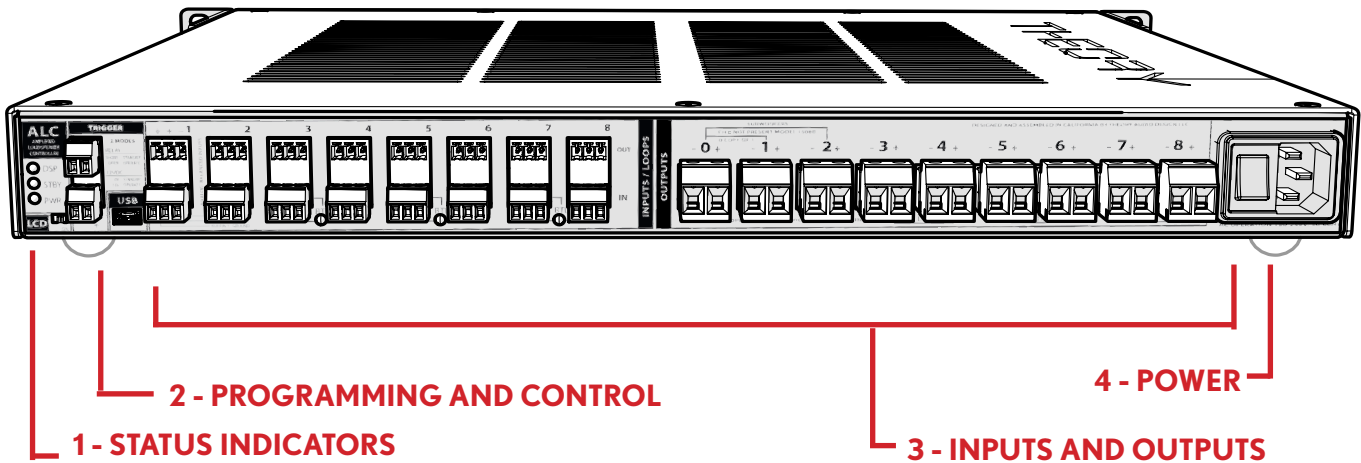
The display scroll up button will move the displayed channels two "higher" in the list. For example, if Channels 3 and 4 are currently displayed, press the scroll up button once to display Channels 1 and 2.



DISPLAY NAVIGATION BUTTONS

2.2 - DISPLAY SCROLL DOWN BUTTON

The display scroll down button will move the displayed channels two “lower” in the list. For example, if channels 3 and 4 are currently displayed, press the button once to display channels 5 and 6.



ALC REAR PANEL

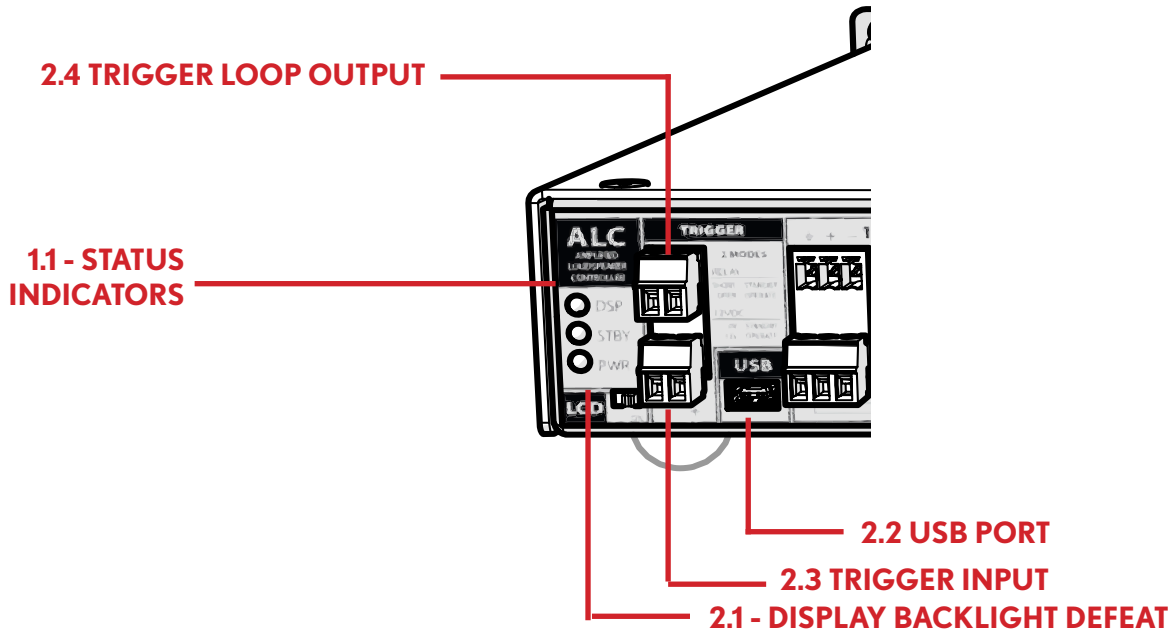
REAR PANEL

With the exception of the LCD display and display scroll buttons, all other features of the ALC-3316 can be found on the rear panel. The layout of the connectors and controls have been carefully designed to make connecting to and operating the ALC as easy as possible.

In addition to the usual input and output connectors, you will find a host of LED’s that indicate ALC operation which offer useful feedback during system setup and debugging.

The panel is divided into four main areas: ALC STATUS, PROGRAMMING AND CONTROL, INPUTS AND OUTPUTS, and POWER.

We’ll now take a look at the features within each area individually.



STATUS, PROGRAMMING AND CONTROL AREAS

1 - STATUS AREA

1.1 - ALC STATUS INDICATORS

- DSP ACTIVITY (RED)** - This LED will illuminate, solid or blinking, when communicating with the ALC via USB software control.
- STANDBY/PROTECT (YELLOW)** - This LED will illuminate when the ALC has been put into standby condition, or when the ALC has entered protection mode due to an operational fault.
- POWER (GREEN)** - This LED will illuminate when the ALC main power is on.

2 - PROGRAMMING AND CONTROL AREA

2.1- FRONT PANEL DISPLAY BACKLIGHT DEFEAT

Use this switch to defeat (turn-off) the ALC front panel LCD display backlight. It is recommended that once installation is complete, the front panel backlight be turned off with this switch to conserve power and preserve backlight life. This will defeat the backlight itself, but not the text displayed.

2.2 - USB PORT

Connect the ALC to your computer at this port using the supplied mini USB cable. Microsoft Windows 10 will discover the ALC unit and install the required drivers. When doing this for the first time, this process may take a few minutes. On subsequent connections, Windows will install the driver more quickly. Refer to "ALC Programming" section of this manual for more information. *As of this writing operating systems other than Windows are not supported.*

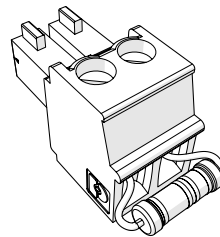
2.3 - 12V/CONTACT CLOSURE TRIGGER INPUT

The STANDBY/OPERATE TRIGGER will operate with applied DC voltage or with an open/short circuit. With the Main Power Switch in the ON position, connect a 12VDC trigger output, or contact closure relay to this jack using the supplied "Euro" or "Phoenix" connector.

When connecting to a control system relay/contact closure output, program the relay to close (short) the terminals to engage STANDBY; open the terminals for OPERATE.

When connecting to a DC trigger output, make sure to observe correct voltage polarity. Some third-party 12VDC trigger outputs have sufficiently high output impedance that the ALC trigger input cannot "sense" the attached device, so the ALC will not go into STANDBY. In this case, install the supplied 41k-ohm Trigger Resistor Accessory provided with the ALC unit in the trigger "LOOP" output position, leaving the 12V trigger output from your preamp connected to the trigger "INPUT". This resistor will pull the ALC into STANDBY; when the preamp 12VDC trigger outputs 12V, the ALC will awake and operate normally.

Failure to observe correct trigger polarity could result in damage to the ALC input or your component trigger



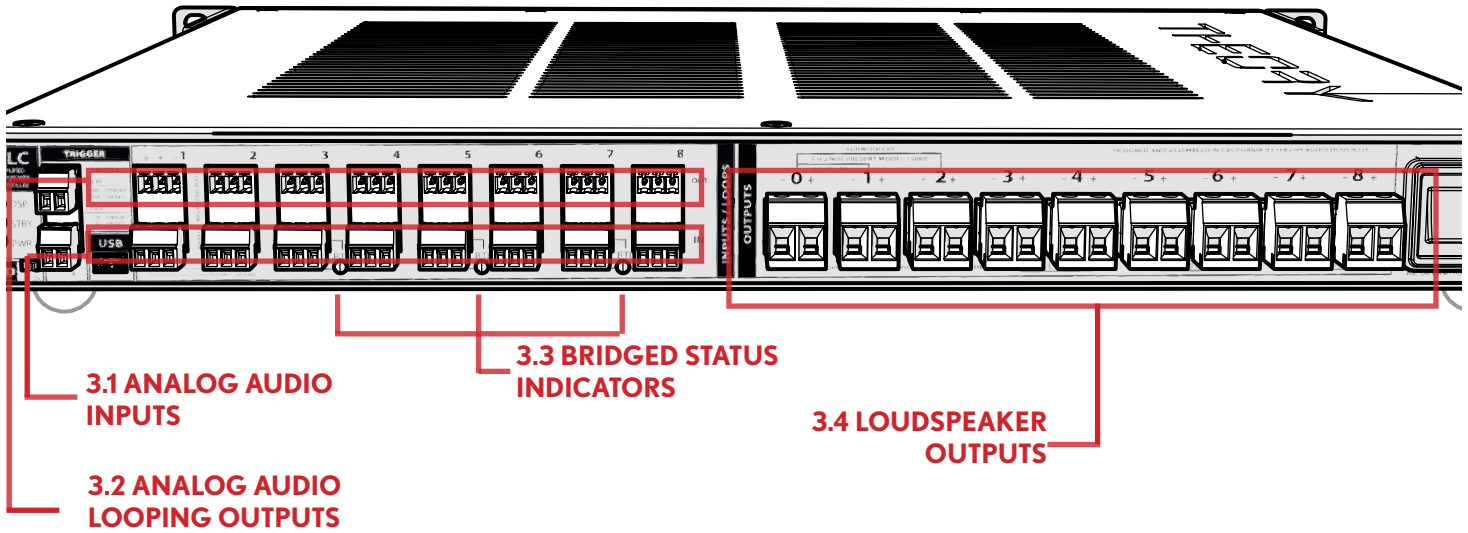
TRIGGER RESISTOR ACCESSORY

output.

0VDC will engage STANDBY mode; 5VDC up to 12VDC will cause the ALC to come out of STANDBY MODE and OPERATE.

2.4 - 12V/CONTACT CLOSURE LOOPING OUTPUT

Use this jack to "loop" the Trigger input signal to another ALC chassis using the supplied 2-position Euro connector block. When using a DC trigger input, make sure to observe correct polarity, or component damage may occur. If you need the supplied 41k-ohm resistor accessory to pull the ALC into standby with your 12V triggering device connected, install the LOOP wires together with the resistor into the Euro block plugged into "LOOP" output.



INPUT/OUTPUT AREA

3 - INPUT/OUTPUT AREA

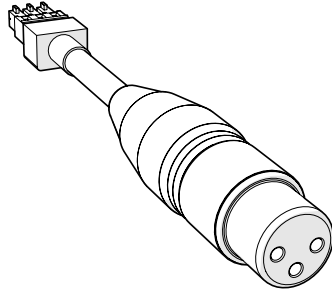
3.1 - BALANCED ANALOG AUDIO EURO BLOCK INPUTS

Connect these balanced analog audio inputs to the post-processed analog audio output from your surround sound processor or audio preamp.

To minimize the risk of unwanted ground plane noise, use of a earth-grounded preamp is highly recommended. Failure to connect to a properly grounded preamp/processor will likely result in unwanted ground noise that will enter the system and be heard from the loudspeakers.

The balanced input blocks have three terminals, from left to right: GROUND, HOT, COLD. These correspond to pins 1-2-3 of a standard XLR audio connector. Connect XLR pin 1 (GROUND) to the left-most terminal in the terminal block. Connect XLR pin 2 (HOT) to the middle terminal in the terminal block. Connect XLR pin 3 (COLD) to the right-most terminal in the terminal block.

Eight EURO-TO-XLR adapters are included with your ALC unit which convert the Euro connector to a standard audio XLR female jack. Plug the Euro end into a balanced analog input and a standard XLR audio cable can be used to connect the ALC to preamp/processor XLR outputs.



INCLUDED EURO-TO-XLR FEMALE ADAPTER (8 PIECES)

3.2 - BALANCED ANALOG AUDIO LOOPING OUTPUTS

Use these balanced analog audio outputs to “loop” the analog audio input signal to another ALC chassis.

3.3 BRIDGED or “BTL” STATUS INDICATORS

BRIDGED (BLUE)

This LED will illuminate when a pair of neighboring 100W channels has been “bridged” together (also called “BTL”) via software control. The result is a single 300W channel. The input for the lower number (odd number) channel should be used to drive the bridged channels.

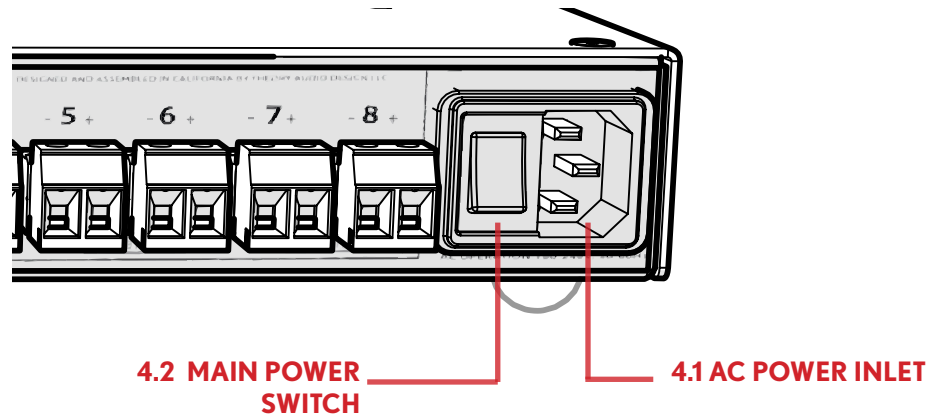
3.4 - LOUDSPEAKER OUTPUTS

Connect any Theory or Pro Audio Technology (PRO) passive loudspeaker system or bi or tri-amp speaker driver to these high-current Euro Block Connectors *making sure to observe correct polarity*. The terminal blocks will accept bare wire up to 10 gauge in size.

Note that on BRIDGED CHANNEL PAIRS, the connections should be made between the POSITIVE outputs of the bridged channels as indicated graphically on the ALC back panel. Make sure to connect the POSITIVE speaker conductor to the POSITIVE output of the ODD channel (lower channel connector) and the NEGATIVE speaker conductor to the POSITIVE output of the EVEN channel (higher channel connector).



CAUTION: ON CHANNELS OPERATING IN BRIDGED (“BRIDGED TIED LOAD”, OR “BTL”) MODE, BOTH LOUDSPEAKER OUTPUT POSTS ARE CONNECTED TO HOT SIGNALS. DO NOT CONNECT ANY SPEAKER OUTPUT POST TO GROUND OR TO EACH OTHER, OR ALC DAMAGE WILL RESULT.



CAUTION: NEVER CONNECT A LOUDSPEAKER OR SUBWOOFER ACROSS ALC OUTPUT CHANNELS 0, 1 OR 2 OR ANY CHANNELS 3-8 THAT HAVE NOT BEEN "BRIDGED" USING SOUNDTOOLS CONTROL SOFTWARE. ALC DAMAGE WILL RESULT.

4.1 - AC INLET



Main AC power inlet. Connect the mains power cable here. The ALC has a universal AC power supply and may be operated from 100-240VAC/50-60Hz.



WARNING: THIS ALC MUST BE CONNECTED TO AN AC OUTLET WITH PROTECTIVE EARTHING CONNECTION

4.2 - MAIN POWER SWITCH

Press the top side of the rocker switch to engage the ALC main electrical power. Press the bottom side of the rocker switch to disengage the power and turn the ALC off. If using 12VDC or relay trigger to control ALC operation, this switch should be left in the ON position.

ALC PROGRAMMING: THEORY AUTOMATOR™ SOFTWARE

1 SPEAKER LAYOUT

Front Speakers: 2 / Soundbar

Side Speakers: 0, 2, 4

Rear Speakers: 0, 2

Subwoofers: 0, 2, 3, 4

Top Speakers: 0, 2, 4

2 MODELS AND LOCATIONS

FRONT SPEAKERS | SIDE SPEAKERS | REAR SPEAKERS | SUBWOOFERS | TOP SPEAKERS

FRONT LEFT | CENTER | FRONT RIGHT

Theory Speaker Model: sb85 v1.2 | sb85 v1.2 | sb85 v1.2

Distance to Listening Chair: 12 Feet | 11 Feet | 12 Feet

Distance to Nearest Wall: On Wall | On Wall | On Wall

Distance to Nearest Corner: > 2 Feet | > 2 Feet | > 2 Feet

3 APPLY SETTINGS AND ACTIVATE

4 TRIM SUBWOOFERS LEVEL

5 SAVE TO CONTROLLER

LOUDSPEAKER CONTROLLERS

ROOM SIDE	ALC SERIAL NO.	ONLINE
LEFT	TF10032A20031331	<input checked="" type="checkbox"/>
RIGHT	TF10021A20081199	<input checked="" type="checkbox"/>

Left Side ALC: TF10032A20031331 | Right Side ALC: TF10021A20081199 | Wiring Table and Legend

SYSTEM LAYOUT: 9 . 4 . 4

PROGRAMMING OVERVIEW

During the programming process, you will communicate with the DSP Engine inside the Theory ALC (using Theory AUTOMATOR™ software which can be downloaded at www.theoryaudiodesign.com/downloads) to install loudspeaker programs and auxiliary filters that will be used during operation to process the audio for the connected loudspeakers within the system.

This process is accomplished with the ALC connected to a Microsoft Windows computer via the supplied mini USB cable. On one end there will be a standard USB connector ("Type A"), to be plugged into the PC, and on the other end there will be a mini USB connector ("Type B"), to be plugged into the Theory ALC.

LOUDSPEAKER CONTROLLER CONCEPTS TO KNOW

Your Theory Loudspeaker Controller is not just a multichannel amplifier, or even a multichannel amplifier with DSP. The Loudspeaker Controller, as its name implies, provides all signal conditioning, power limiting, signal filtering, signal mixing and routing required for your state-of-the-art Theory surround system to function optimally. **As such, never connect any Theory loudspeakers or subwoofers to third party amplifiers as poor performance and potentially loudspeaker damage could result.**

Even though the Theory AUTOMATOR™ quick start interface was designed to be bulletproof and will largely automate configuring your Theory surround system for you, there are certain concepts that will be good to know as you interact with and use your new sophisticated Loudspeaker Controller.

CONCEPT TO KNOW #1:

There are three places where the Theory ALC DSP program settings can exist: within ALC memory, within the ALC DSP chip itself, and within an (optional) backup file on your hard disk.

CONCEPT TO KNOW #2:

Theory AUTOMATOR™ software allows control of settings currently running the DSP chip and facilitates the writing of the settings to the ALC memory and computer backup.

The software does not have any role during the running of the settings themselves inside the DSP nor does it "store" any information within the software itself.

CONCEPT TO KNOW #3:

Each time a Theory ALC is powered-up, the DSP chip is initially "empty" - it does not remember any of the filter settings or programs.

At power-up, an on-board micro processor loads the DSP parameter settings *from on-board ALC memory*.

CONCEPT TO KNOW #4:

When AUTOMATOR™ software is communicating to a connected Theory ALC, any changes made to the controls within the software are loaded into the ALC DSP chip *in real time* and changes will be heard through the connected loudspeakers.

At this point, however, these settings exist only in the running DSP chip - *they are not yet stored in ALC memory, nor on your PC.*

CONCEPT TO KNOW #5:

In order for a Theory ALC to “remember” DSP settings when powered off and then powered up again, *your settings must be stored into the on-board flash memory so that they can be loaded by the microprocessor during the power-up “initialization” process.*

PROGRAMMING AND WIRING STEPS

The Theory AUTOMATOR™ software will make setting up and optimizing your surround sound system point-and-click simple. All that is required to complete setup and configuration of the ALC is a tape measure.

STEP 1 : GATHER MATERIALS

You will need speaker wire, balanced audio interconnect cables or 3-conductor interconnect wire, a Windows PC, the supplied mini USB cable and a tape measure. (It is assumed that the loudspeakers, soundbars and subwoofers are already installed into your listening space).

STEP 2 : CONNECT ALC(S) TO COMPUTER

With the computer powered-on and fully booted, but with the ALC(s) off, connect the ALC(s) to available USB port(s) on your Windows PC using the supplied USB to mini USB cable. Plug the standard USB connector into the PC port and the mini USB connector into the ALC USB port located on the ALC back panel (see "Hardware Features - Back Panel" for more information).

STEP 3 : POWER ON ALC(S)

Connecting to a PC for the first time - Internet Connection Required

If this is the first time you've connected a Theory ALC to your computer, Windows will need USB drivers to establish communication with it.

Power-on the Theory ALC.

Windows will "see" the Theory unit and attempt to install the required USB drivers. If the drivers are not available on your system, Windows will need access to the internet to find them. If an internet connection is available, Windows will find the drivers and install them automatically. This may take a few minutes. Be patient.

Once the drivers are installed, Windows will connect to the Theory unit and then show a brief message showing the Theory model and serial number just above your task pane on your screen. On subsequent connections, Windows will install the driver more quickly.

You can verify that it has discovered the ALC by inspecting the list of installed hardware. To do this, go to **Bluetooth & Other Devices** in Windows 10. This will display a dialog box showing icons that represent all hardware attached to your computer. The Theory ALC will show under the "Other Devices" heading. If installed, you will see the model and serial number of the Theory ALC (or ALCs).

Connecting to a PC - Subsequent Connections - No Internet Connection Required

Once the drivers have been loaded onto your system, Windows will discover and load the drivers to the chosen USB port quickly. Sometimes this happens so fast you will not see a message from Windows that your hardware is connected and ready for use, but you may hear a tone from the operating system indicating new hardware is installed.

Operating systems other than Windows 10 are not supported at this time.

STEP 4 : DOWNLOAD AND RUN AUTOMATOR™ SOFTWARE

Go to theoryaudiodesign.com/downloads to download and install AUTOMATOR™ setup software. Once installed and with the ALC(s) connected to the pc and powered on, run the software.

The software layout is easy to follow and is intended to be the Quick Start User Guide - you simply complete each of the **FIVE SECTIONS** within the software interface *in sequence* to fully configure your system.

Beginning with AUTOMATOR™ v2.0 (covered in this manual) the first time you program your ALC(s) a “wizard” will walk you through configuring the number of system ALC’s and speaker layout (**SECTION 1** of the software interface below).

SECTION 1 - SPEAKER LAYOUT

SECTION 2 - SPEAKER MODELS AND LOCATIONS

SECTION 3 - APPLY TO DSP BUTTON

SECTION 4 - SUBWOOFER TRIM CONTROL

SECTION 5 - SAVE BUTTON

RENDERING OF SYSTEM SHOWING SPEAKER MODELS AND LOCATIONS

SPEAKER LAYOUT NUMEROLOGY

WIRING GUIDE

ALC NAVIGATION TABS

ALC STATUS BAR

SHOW WIRING TABLE BUTTON

AUTOMATOR™ MAIN INTERFACE

Launch the software and complete each **SECTION 1 - 5** in sequence now using the Wizard and interface to guide you, or for more information on the process to complete each **SECTION**, see STEP 5 below.

NOTE: IF YOUR SYSTEM USES TWO LOUDSPEAKER CONTROLLERS (ALC)

If your system utilizes two loudspeaker controllers (ALCs), AUTOMATOR™ will utilize an ALC to power the speakers on each side of your room: right side and left side. This will optimize the use of the power modules within the units, make wiring your system easier and will enable bass management (redirection of low frequencies from small speakers to the subwoofers) of all channels. You can identify which of your two ALCs is RIGHT and which is LEFT via its unique serial number (found on the product label on the bottom surface of the ALC chassis). The serial numbers for the “LEFT” and “RIGHT” ALCs can be read from the ALC Status section in the lower right corner of the interface and also on the ALC Navigation tabs above the wiring guide.



NOTE: if your system utilizes two ALCs, to allow bass-management of all full-range loudspeakers in your system, *you must have at least two subwoofers, one connected to each ALC.*



“LEFT” ALC SERIAL NUMBER AND STATUS

“RIGHT” ALC SERIAL NUMBER AND STATUS

ALC NAVIGATION TAB - SELECT TO SHOW WIRING GUIDE FOR “LEFT” ALC

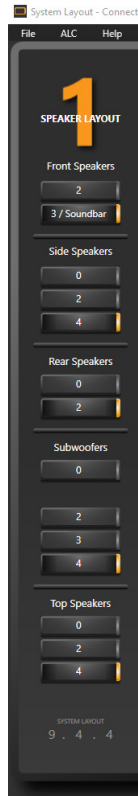
ALC NAVIGATION TAB - SELECT TO SHOW WIRING GUIDE FOR “RIGHT” ALC

AUTOMATOR™ MAIN INTERFACE - TWO ALCs

STEP 5 : COMPLETE AUTOMATOR™ SECTIONS 1 THRU 5 SHOWN IN THE AUTOMATOR™ INTERFACE TO CONFIGURE YOUR SYSTEM

5.1 - AUTOMATOR **SECTION 1** - SURROUND SPEAKER LAYOUT

The software needs to know your surround system speaker layout and how many ALCs your system uses.



Note: the first time you program your ALC(s) a Wizard will launch and walk you through completing section 1 before you enter the main interface. The wizard can be re-launched from within the program at any time from the "ALC" menu item.

AUTOMATOR SECTION 1 - SPEAKER LAYOUT

When you purchased your Theory surround system, you purchased a particular combination of loudspeakers and subwoofers that will comprise your system or speaker layout. The industry has adopted numerology to indicate these different surround sound system layouts in the format of:

X . X . X

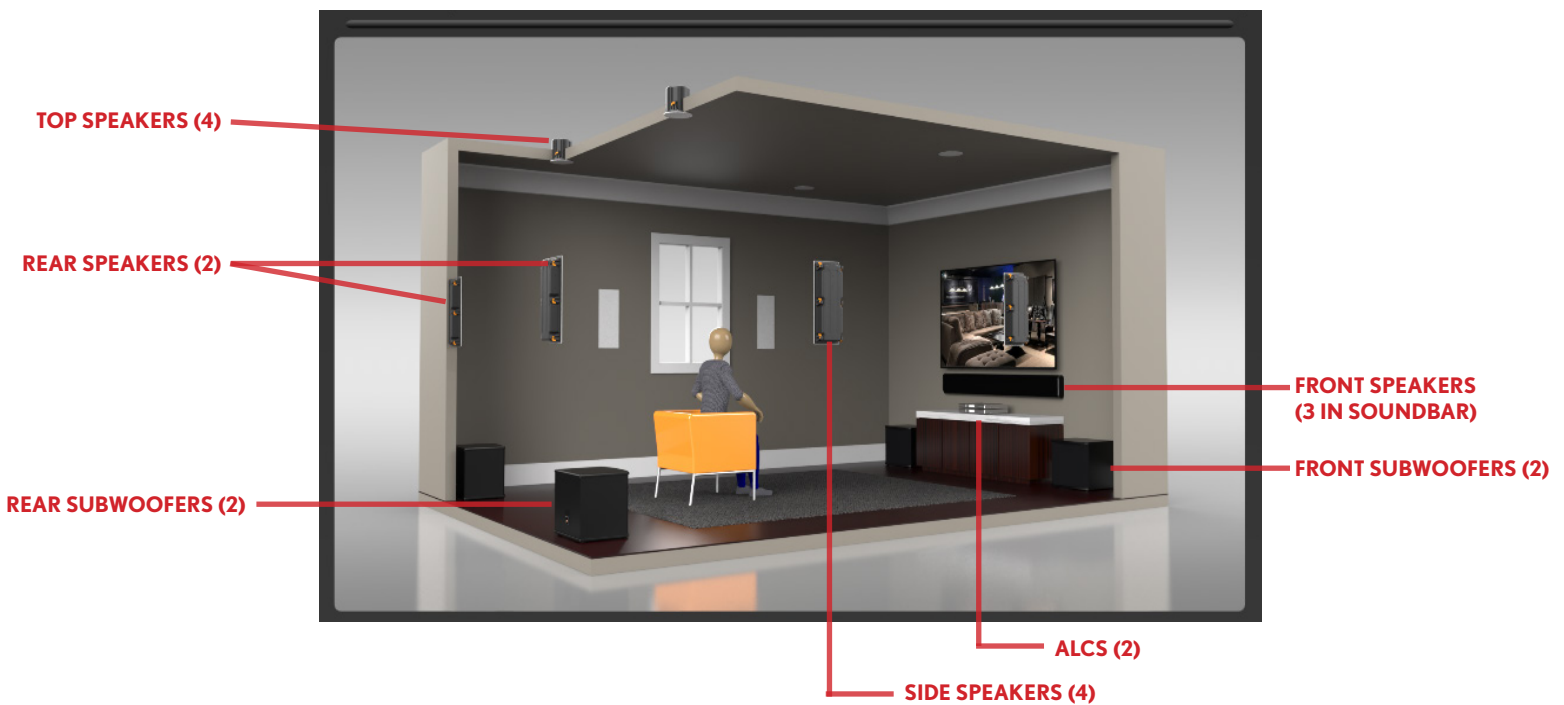
The first numeral in the three-numeral number indicates the quantity of full-range loudspeakers used in the horizontal plane (speakers placed in front of, to the side of and behind you). The second numeral in the number indicates the quantity of subwoofers in the system, and the third numeral indicates how many ceiling or "ATMOS" overhead speakers, sometimes called "tops" or "heights", are in the system.

For example, a simple system with a 3-channel soundbar with one subwoofer would be 3 . 1 . 0 - three speakers in the horizontal plane, one subwoofer and no Atmos speakers.

A more complex system with a 3-channel soundbar, two side speakers, two rear speakers and two subwoofers would be 7 . 2 . 0. Three fronts plus four surrounds (two on the side walls and two on the rear) equals seven speakers in the horizontal plane.

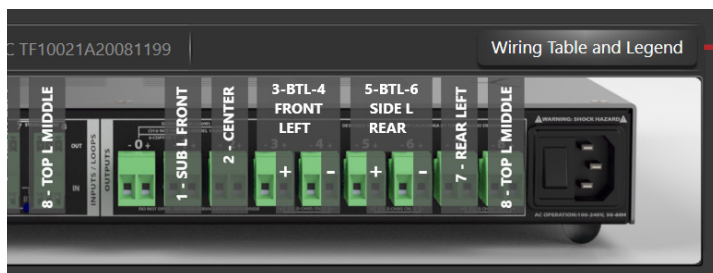
A small ATMOS system might have three loudspeakers on the front wall for Left, Center and Right, two subwoofers, with two surround speakers in the rear and two mounted overhead for ATMOS playback. That speaker layout would be referred to as 5.2.2. And so on.

Theory AUTOMATOR™ v2.0 allows the use of up to two ALC's for a total maximum of 17 loudspeakers - up to 9 . 4 . 4 (see image below). Many other combinations are possible.

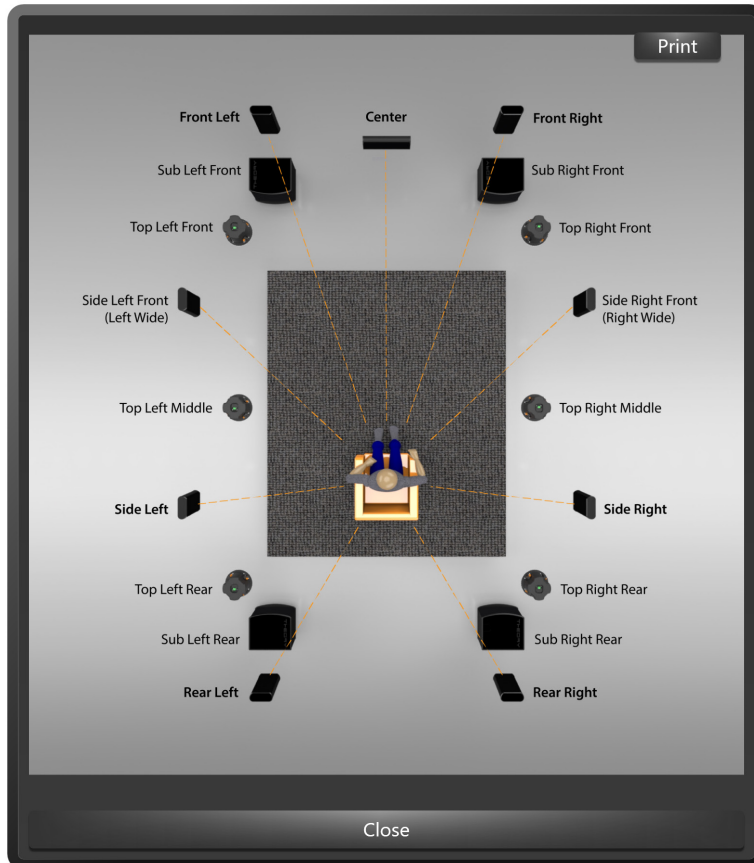


GRAPHIC REPRESENTATION OF A 9 . 4 . 4 SYSTEM FROM THE AUTOMATOR INTERFACE

Determine the layout of the system you purchased write it down for reference when completing **SECTION 1**.



WIRING TABLE BUTTON - PRESS TO ACCESS SYSTEM DIAGRAM SHOWING ALL POSSIBLE SPEAKER LOCATIONS



SYSTEM DIAGRAM FROM THE WIRING TABLE INTERFACE

A diagram showing all possible speaker locations with their names can be displayed from within the AUTOMATOR™ interface by selecting the “Wiring Table and Legend” button just above the Wiring Guide image at the bottom of the interface, then select the “Diagram” button at the top left corner of the Wiring Table window.

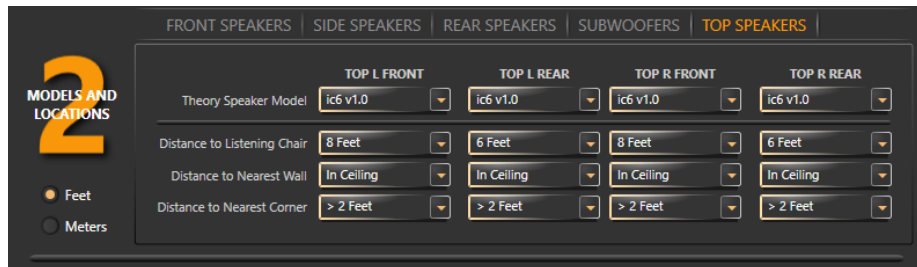
If you’re programming your ALC’s for the first time, a *Wizard* will appear and ask you simple questions about your system to complete **SECTION 1** before you enter the main interface. Simply answer each question then select “NEXT” to advance to the next question. Once you’ve answered all the questions, the *Wizard* will close and the main interface will appear with **SECTION 1** already completed.

If your ALC(s) have been previously programmed, the *Wizard* will not appear and you will be taken directly to the main interface, where you can modify the number of speakers in each location - Fronts, Sides, Rears, Subs and Tops - within your system freely in **SECTION 1** by selecting the buttons that correspond to the quantity of speakers you have of each type. Note that you need to make a selection for every speaker type before you can proceed to **SECTION 2**.

The main system graphic will update in real time to show you, visually, your speaker layout. Make sure that what is shown in the room rendering corresponds with the physical speaker and subwoofer layout of your system.

5.2 - AUTOMATOR™ SECTION 2 - LOUDSPEAKER MODELS AND LOCATIONS

The software now needs to know which loudspeaker and subwoofer models you purchased for each surround location and it needs to know where they are positioned with respect to your listening chair and room surfaces.



AUTOMATOR™ SECTION 2 - SPEAKER MODELS AND LOCATIONS

In **SECTION 2** of the interface, using the speaker navigation tabs, move through the speaker categories - Front, Side, Rear, Sub, Top - making selections for all fields: speaker model, distance to listening chair, distance to nearest room wall, distance to nearest room corner. If your system does not include speakers in a particular location, Tops for example, the tab will not appear in the interface. It's easiest if you move through the tabs from left-to-right making sure to make selections in all drop down list boxes. You have to make selections in every field before you can proceed to **SECTION 3**.

In addition to the speaker models, AUTOMATOR™ needs to know these three distances for each speaker or subwoofer in the system:

1. Distance from loudspeaker to your primary listening position
2. Distance from loudspeaker to the nearest room wall (often the speakers are "on" or "in" the wall)
3. Distance from loudspeaker to the nearest room interior corner

From this information, AUTOMATOR™ can calculate and adjust the individual loudspeaker levels, delays and room boundary gain compensation.

To obtain the distance data, use a tape measure or laser distance meter to measure from the speaker front surface (grille cloth or metal grille) to the object in question: chair, wall, corner. Make selections in the drop down lists that best represent the distance values of the speakers and subwoofers in your system.

Once all the data is entered, **SECTION 3** will become active, allowing AUTOMATOR to program your ALC.

But first we must wire up the system...

5.3 - WIRE SYSTEM AS SHOWN IN AUTOMATOR™ WIRING GUIDE IMAGE

Based on your Speaker Layout, AUTOMATOR™ shows you how to connect all the wires.

Once you've entered the surround layout, AUTOMATOR™ displays a wiring diagram showing how to connect the surround processor outputs and loudspeakers to the Loudspeaker Controller. If your system uses two ALCs, you can toggle between the RIGHT and LEFT ALC wiring guides, using the ALC Navigation Tabs just above the wiring guide image. Note that not all inputs and speaker outputs may be used depending upon your configuration.



AUTOMATOR™ WIRING GUIDE SHOWING OUTPUTS 3-4 AND 5-6 BRIDGED

The wiring information may also be viewed and printed in tabular format by pressing the “Wiring Table and Legend” button just above the right side of the wiring image. To print the table, select the “Print” button in upper right of the Wiring Table window.

PRESS TO DISPLAY DIAGRAM OF ALL SPEAKER LOCATIONS

ALC INPUT

SPEAKER LOCATION

Diagram
WIRING TABLE AND CHANNEL LEGEND
Print

LEFT ALC
RIGHT ALC

LEFT CONTROLLER

INPUT	CHANNEL NAME	- OUTPUT	+	BRIDGED
1	SUB LEFT FRONT	1-	1+	<input type="checkbox"/>
2	CENTER	2-	2+	<input type="checkbox"/>
3	FRONT LEFT	4+	3+	<input checked="" type="checkbox"/>
5	SIDE LEFT	6+	5+	<input checked="" type="checkbox"/>
7	REAR LEFT	7-	7+	<input type="checkbox"/>
8	TOP LEFT MIDDLE	8-	8+	<input type="checkbox"/>

Close

PRINT BUTTON - USE TO PRINT THE WIRING TABLE

INDICATES CHANNEL PAIRS BRIDGED TOGETHER (ALSO CALLED "BTL")

NOTE THAT FOR BRIDGED OUTPUTS, CONNECT THE SPEAKER TO THE POSITIVE TERMINALS ONLY ON EACH OF THE BRIDGED CHANNEL OUTPUTS

CONNECT SPEAKER POSITIVE TO THE POSITIVE OUTPUT OF THE ODD NUMBER (LOWER NUMBER) CHANNEL; SPEAKER NEGATIVE TO THE POSITIVE OUTPUT OF THE EVEN (HIGHER NUMBER) CHANNEL

SPEAKER OUTPUT POSITIVE CONNECTION

SPEAKER OUTPUT NEGATIVE CONNECTION

AUTOMATOR™ WIRING TABLE

Using the supplied Euro-to-XLR adapters, connect the surround processor balanced analog audio outputs (XLR style connectors) to the ALC inputs as indicated in the AUTOMATOR™ interface. Please note that your surround processor may use slightly different terminology for the different speaker locations. What we are calling “Side Right Front” may be called “Right Wide” for example. Additionally, the surround processor subwoofer outputs might be called “LFE” or sometimes “Subwoofer”. “Tops” can also be referred to as “Atmos” or “Heights”.

Using high quality speaker wire, 16 gauge or larger, connect the loudspeakers and subwoofers as indicated in the AUTOMATOR™ Wiring Guide interface. Note that flat profile (“zip cord” style) speaker wire will be easiest to use with the Theory soundbars and on-wall models when mounted to the wall as there is only 0.25” space between the back of the soundbar and the wall surface once mounted.

DOUBLE CHECK ALL WIRES.

Carefully double check all connections between the surround sound processor outputs and the ALC analog audio inputs. Open the Wiring Table and Legend window and print the tables for handy reference when inspecting the wiring of your ALC unit.

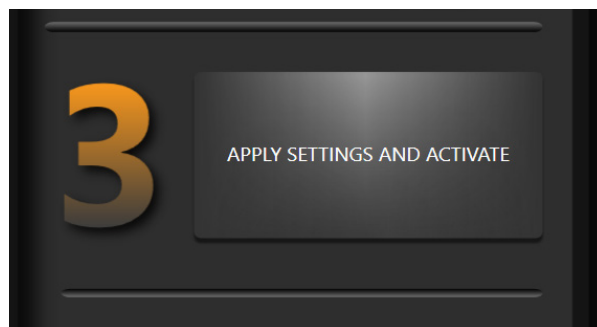
There are many connections to be made and mistakes are common. Diligence now will insure optimum performance and trouble-free operation from your Theory system.

Pay special attention to the wiring of speakers connected to bridged amplifier channels, as the connections need to be made across two amplifier outputs. Observing polarity here is particularly important. Please refer to the wiring guide image and wiring table and carefully check your work.

Carefully double check all speaker wires, paying special attention to subwoofer outputs. Connecting a subwoofer output to a full range speaker or soundbar will result in speaker damage.

5.5- AUTOMATOR™ SECTION 3 - ACTIVATE THE LOUDSPEAKER CONTROLLER

Once you have double and triple checked (!) all wiring, press the activate button to initialize and activate the loudspeaker controller. This will program the internal DSP with all system settings and allow audio to pass through the unit and allow you to carefully listen to the sound and evaluate the balance of the subwoofer(s).



AUTOMATOR™ SECTION 3 - APPLY SETTINGS AND ACTIVATE ALC

5.6 - AUTOMATOR **SECTION 4** - ADJUST OR “TRIM” SUBWOOFER LEVEL TO TASTE

The AUTOMATOR™ software will set the full range loudspeaker levels and all loudspeaker delays exactly right, but it can only approximate the ideal subwoofer level for your system for two reasons: one, subwoofer level at your listening position will be very dependent upon room interactions (standing waves) and two, subwoofer level is very subjective and personal; some people like the LFE (subwoofer) information well integrated and balanced to the full range sound, while other listeners like a little more “oomph” in the bottom end for thrilling, visceral impact.

For these reasons, AUTOMATOR™ gives you the opportunity to fine tune or “trim” the subwoofer output level to your taste. Press the “Trim Subwoofer Level” button to cause the Sub Level gain control to appear. While listening to familiar material, use the slider or type the desired value into the text box to adjust the level up or down from it’s current state.



AUTOMATOR™ **SECTION 4** - SUBWOOFER LEVEL ADJUSTMENT

Ideally, listen to program material with which you are very familiar. Listen to several different movies or music videos as LFE levels vary dramatically from disc to disc - setting the level based upon evaluation of a single cut is risky.

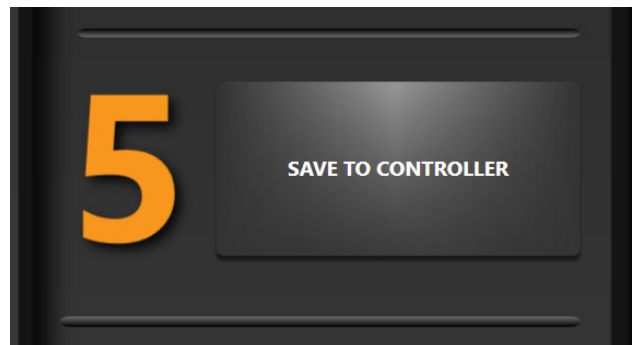
Once you're satisfied you have achieved the optimum level for all types of content, hit the "Close" button and proceed to all important **SECTION 5**.

5.7 - AUTOMATOR **SECTION 5** - SAVE ALL SETTING IN LOUDSPEAKER CONTROLLER

Once you've double and triple checked the wiring, verified speaker model designations and confirmed speaker distances, activated and optimized subwoofer output levels...

YOU MUST SAVE ALL SETTINGS IN THE LOUDSPEAKER CONTROLLER

Press the "SAVE TO CONTROLLER" button in **SECTION 5** to save all system settings into the ALC non-volatile memory. This process will take some time as the software is writing hundreds of parameters to the ALC memory. A dialog box will appear displaying information about the saving progress. Once saving is complete, the dialog box will disappear indicating save is complete and **SECTION 5** will turn gray again.



AUTOMATOR™ **SECTION 5** - SAVE ALL SETTINGS TO ALC

5.8 - MAKING CHANGES AFTER SAVING

If you need to make any changes to your system - further adjustment of subwoofer level, or to correct a distance value, or even to change speaker layout, for example - these changes can easily be made in **SECTIONS 1-2**. Once AUTOMATOR™ detects a change, **SECTION 3** will once again highlight. You will need to press "APPLY SETTINGS AND ACTIVATE" button again, to write the changes made to the DSP. Once you're satisfied with the changes, remember to SAVE using the "SAVE TO CONTROLLER" button in **SECTION 5**.

Steps for making changes after saving:

1. Make desired changes in **SECTION 1** (Speaker Layout) or **SECTION 2** (Speaker Models and Locations) or **SECTION 4** (Subwoofer Level).
2. In **SECTION 3**, press “APPLY SETTINGS AND ACTIVE” button to write the changes to the DSP to hear their effect.
3. Adjust subwoofer level in **SECTION 4** if required.
4. Save settings by pressing the “SAVE TO CONTROLLER” button in **SECTION 5**.

APPENDIX

APPENDIX A - SPECIFICATIONS

Description:	9-Channel Amplified Digital Loudspeaker Controller
Inputs:	8 x Balanced Analog Audio w Loop Outputs (1 mic/line level)
Outputs:	9 x Speaker Outputs 8 x Balanced Analog Audio Looping Outputs 12VDC/Contact Closure Trigger Loop Output
Trigger:	+12VDC or Contact Closure Trigger Input w Loop
Surround Formats:	3.1, 3.2, 3.3, 5.1, 5.2, 5.3, 7.1, 7.2, 5.2.2 ATMOS
Audio Operation:	96kHz/24-bit
On-Board DSP:	96kHz/32-bit
DSP Features:	Automatic Configuration of Surround System Settings Loudspeaker Processing For All Theory and PRO Models Input Trim Signal Routing Gain Delay (up to 75msec per channel) 160 Parametric EQ Filters (20 Per Channel) 8 x 8 Parametric Bass Management (Bass Steering) Mono Summing: 8 Stereo + 4 mono Signals Bass and Treble Controls Master Volume Clip Limiter Internal Sine and Pink Noise Sources

APPENDIX A - SPECIFICATIONS CONTINUED

Bandwidth: 5.5Hz-40.6kHz, -6dB

Frequency Response: 20Hz-20kHz, +/-0.2dB

Amplifier Powers: Channels 0-1-2: 300W, 4-ohms
Channels 3-8: 100W, 4-ohms, bridgeable to 300W*

Voltage Gain: 30dB

Input Sensitivity:

Channels 0-2: 1.1V

Channels 3-8: 660mV

Power Requirements:

Standby: 16W

Idle: 41W

(1/8 power, all ch. driven): 281W

Idle Noise (speaker program, typ., A-wt.):

Channels 0-2: -82dBV (0.00008V)

Channels 3-8: -80dBV (0.00010V)

Signal to Noise Ratio:

Channels 0-2: 108dB

Channels 3-8: 105dB

Distortion (1kHz, 1dB below max output): <0.02%

AC Operation: 100V-240VAC, 50-60Hz

Finish: Matte Bright Aluminum

Dimensions: 1.75" H x 17" W x 15" D
1.75" H x 19" W x 15" D w Rack Ears

Weight: 13 lbs.

***Bridged channels ok for sb speaker models only, not for subwoofer use.**

APPENDIX B - WARRANTY

Disclaimer : THEORY AUDIO DESIGN, LLC is not liable for any damage to loudspeakers or any other equipment that is caused by negligence or improper use or installation of this product, including damage caused by connecting Theory loudspeakers and subwoofers to third party amplifiers.

THEORY AUDIO DESIGN, LLC 3-Year Limited Warranty

THEORY AUDIO DESIGN, LLC guarantees its products to be free from defective materials and/or workmanship for a period of three (3) years from the date of sale, and will replace defective parts and repair malfunctioning products under this warranty when the defect occurs under normal installation and use - provided that the unit is returned to our factory or one of our authorized service centers via prepaid transportation with a copy of proof of purchase (sales receipt). This warranty provides that the examination of the return must indicate, in our judgement, a manufacturing defect. This warranty does not extend to any product which has been subject to misuse, neglect, accident, improper installation or where the date code has been removed or defaced. THEORY shall not be liable for incidental and/or consequential damages. The warranty gives you specific legal rights. This limited warranty is not transferable. Customer may have rights which vary from state to state.

In the event that this product was manufactured for export and sale outside of the United States or its territories, then this limited warranty does not apply. Removal of the serial number on this product, or purchase of this product from an unauthorized dealer will void this limited warranty.

Periodically this warranty is updated. To obtain the most recent version of THEORY'S warranty statement, please call +1-949-245-0505.

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CONTACT