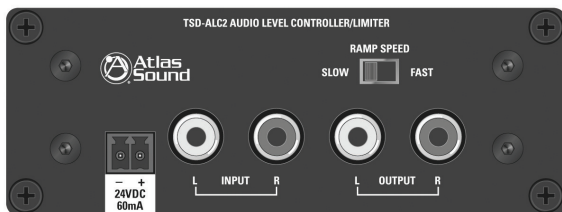
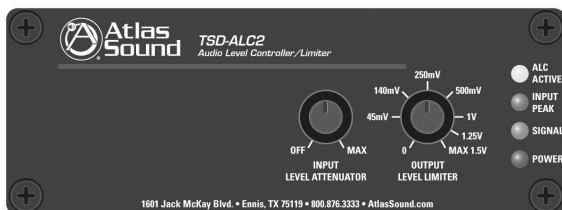




## TSD-ALC2 Audio Level Controller/Limiter





## **Description**

The Atlas Sound TSD-ALC2 is an automatic 2-channel audio level controller/limiter that allows designers and installers the ability to set predetermined maximum source levels. The TSD-ALC2 is great for installations with multiple program sources including satellite receivers, mp3 players, etc. that typically have vast output level irregularities. With the TSD-ALC2 inserted in line with these sources, the audience will not be distracted during high volume commercial breaks or when different inputs are selected. Retail stores, restaurants, sports bars, hotels, event centers, and other facilities can all benefit from improved sound when the TSD-ALC2 is integrated.

Features include stereo RCA input and output connectors, threshold level, ramp speed selection, and output gain adjustments. The TSD-ALC2 also works well when used in conjunction with Atlas Strategy Series Mixer Amplifiers. For level control and passive combining of stereo sources with Atlas amps, specify (1) AA-YSUM input cable in conjunction with (1) TSD-ALC2 for each source input.

The TSD-ALC2 is highly efficient and meets most energy standards as one 24V DC power supply (available separately) can power multiple Atlas Time Saving Devices.

The TSD-ALC2 is part of a full line of Atlas Sound Time Saving Devices. These compact (1.5" x 4" x 2.75") units are designed to solve some of the common audio system problems in the easiest and in the most efficient and cost-effective way. All models are made from high quality components and include removable individual I/O connectors for quick and precise wiring, separate ground terminals for all I/Os assuring secured connections, and removable level controls that can be replaced with tamper-proof security covers.

## **Features**

- Stereo Auto Level Control
- Unbalanced RCA Input and Output
- Threshold Level Adjustment
- Ramp Speed Selection
- Output Gain Control
- Security Covers Included for All Front Panel Controls
- Meets Most Energy Standards
- Compact Chassis Design

## **Audio Applications**

- Satellite Feeds
- iPod®
- CD Players
- MP3 Players

## **Installation**

- Restaurants
- Sports Bars
- Schools
- Residential
- Playback Systems
- House of Worship





## Understanding an Audio Auto Leveler

Variable audio levels between songs or TV programs and commercials can be very aggravating in a home or commercial environment. Because the audio content varies drastically, Auto Level Controllers (ALCs) require unique settings to maximize the audio auto level performance for the specific application. Most Audio Auto levelers on the market claim to seamless transition between sources or material, however no ALC can perfectly auto-level audio. No ALC has perfect seamless audio auto leveling. In fact, many bad designs that utilize old technologies or are incorrectly used have given ALCs a bad name. The TSD-ALC2 is designed with the latest technology and optimizes adjustments and settings for each unique installation.

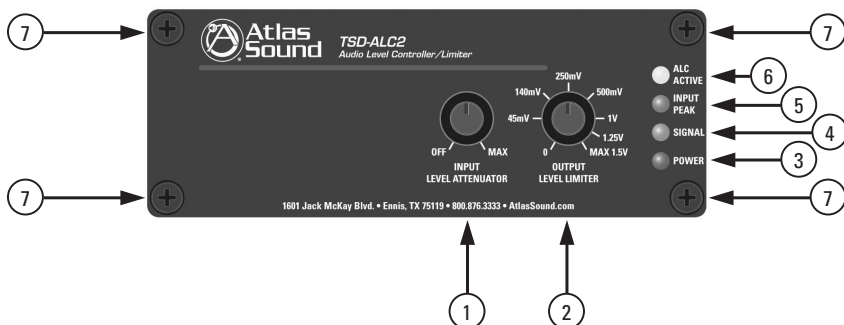
Determining a signal's sample rate is important for an ALC to detect when the source material audio level is actually changing or if it is just dynamic changes within the song. A fast reaction time is necessary to quickly adjust the level but if it is set too fast, an audible pumping effect will occur when music content with a lot of drums goes to a piano, for example. Too slow of a reaction time can also be annoying during transitions between tracks or to commercial breaks. Another issue ALCs must overcome is the level of variation between input signals. If it is too large, the compensation creates an abrupt level change that is noticeable to the listener. If the level adjustment is too small, the song or commercial can be well into its content before the level adjustment occurs. Either way, the overall listening experience is disrupted.

The TSD-ALC2 solves these signal level issues without the need to of a computer and measurement tools to tailor the settings to the job. The TSD-ALC2 uses 42 audio samples per measurement, averages out the signal levels, and makes an adjustment every 20 milliseconds if required. This has been determined as the ideal sample rate to detect the audio dynamic content and make adjustments in most applications. The TSD-ALC2 also allows you to select how much the level can be adjusted, at either 1dB or 2dB increments. The TSD-ALC2 also incorporates an adjustable hard limiter so the maximum level in an audio system cannot be overdriven. The Output Level Limiter can be adjusted from 100mv to 1.5V.

The TSD-ALC2 provides a smooth transition between music or audio source selections. Auto level changes depend on how drastic the level needs to be adjusted but, in most situations, auto leveling isn't noticeable and will greatly improve the listening experience. Secondly, the output limiter feature prevents users from turning up the gain too loud and damaging your speakers - an invaluable feature that alone makes the TSD-ALC2 worth adding to any system.



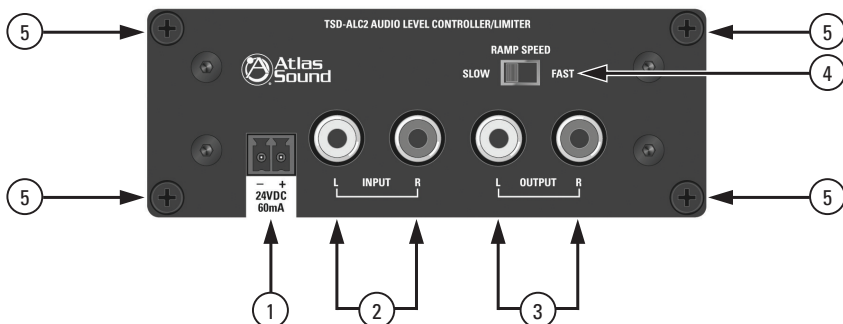
## Front Panel Description



1. **Input Level Attenuator** - Adjusts the level of the input signal applied to the ALC2. This only reduces the input signal and does not add signal gain. See the Setting the Level section on page 7. Turn counter-clockwise to decrease the signal. **Note:** The Input Level Control knob can be removed and replaced with a supplied security cover to prevent unauthorized adjustment.
2. **Output Level Limiter** - Sets the maximum output signal that will be available at the outputs. Turn clockwise to increase the signal level and counter-clockwise to decrease it. **Note:** The Output Level Control knob can be removed and replaced with a supplied security cover to prevent unauthorized adjustment.
3. **Power LED** - Illuminates Blue when 24VDC power is present.
4. **Signal LED** - Illuminates Green when the input signal strength reaches 25mV to verify a signal path.
5. **Input Peak LED** - Illuminates Red when the input signal reaches 3dBV below when signal clipping will occur. Occasional flashing is normal but if this indicator is continuously On, then reduce the input level using the Input Level Attenuator.
6. **ALC Active LED** - Illuminates Yellow when circuitry is working. **Note:** If this LED is not illuminated or flashing, the Auto Level Control circuitry is not functioning and either the output signal at the source or the input level control on the ALC2 must be increased. This LED will not illuminate until the input level is 100mV.
7. **Bracket Retainer Points** - Each TSD includes two mounting brackets for securing the TSD to a cabinet or wall. Remove screws and align the bracket with the panel hole before firmly tightening the screws.



### Rear Panel Description



The TSD-ALC2 features Stereo RCA inputs and outputs and a removable phoenix style power connector that has a 3.5mm pitch between pins.

1. **DC Power Input** - Each TSD that requires DC power comes with a 2 position connector for an external 24VDC power supply (sold separately). Because of the TSDs low power consumption, a single external power supply may power more than one TSD. Please refer to the specifications on current requirements in milliamps to match with the appropriate power supply. **Note:** It is acceptable to exceed the current requirements of the TSDs but NOT safe to use a power supply that is below the current requirement of the device.
2. **RCA Input** - Connect unbalanced line level sources to these inputs. The source connections must be mated properly to the input connector or signal loss and/or noise may be introduced.
3. **RCA Output** - Connect these unbalanced line level outputs to amplifiers or other devices. The output connections must be connected properly to the connectors or signal loss and/or noise may be introduced to other devices.
4. **Ramp Speed Switch** - Select the audio level rate of change to fit your Ramp Speed. This switch selects between 1dB (slow) or 2dB (fast) change in level per transition step.
5. **Cable Management Retainer Points** - Use the rear panel screws for connecting the included cable retainers. Each TSD comes with two cable retainers for simplified cable management.



## **Knob and Security Cover**

All front panel level controls feature a removable knob that can be replaced with included security covers to prevent potentiometer damage or unwanted changes.

- **Knob Installation** - Turn the potentiometer shaft fully counter-clockwise. Align the knob indicator to the lowest setting on the panel and the potentiometer shaft slot. Carefully press the knob onto the potentiometer shaft. Do not force or damage may occur to the potentiometer.
- **Security Cover Installation** - Remove the knob from the panel and insert the cover. Do not force or damage may occur to the potentiometer. Small pliers may be required to remove the knobs.

## **Mounting**

There are three ways to securely mount this TSD:

1. **Velcro™** - Each unit includes industrial-grade Velcro™ with adhesive backing to adhere to any flat surface.
2. **Brackets** - Each unit includes two mounting brackets to secure to a cabinet or wall.
3. **Rack Mount Panel** - The optional TSD-RMK rack mount panel supports up to four TSDs in a 1RU space.





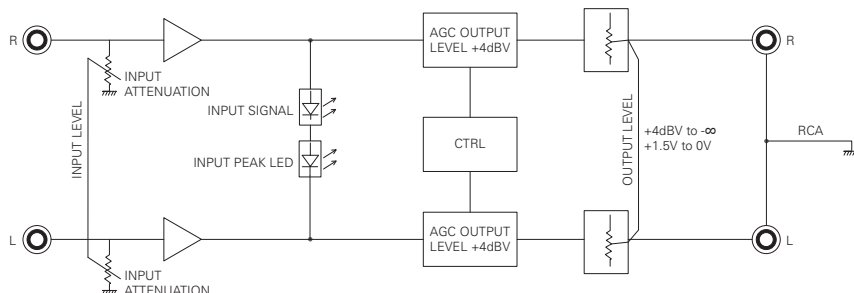
### Setting the Level

For optimization of the ALC2, it is important to understand that the set level should be the balance of input source signals from low input signal to strong input signal. The Auto Level Control circuit operates from a wide 50mV to 3V range of input voltages to accommodate iPods, CD players, computers, and satellite receivers with immense dynamic variation of music and commercial content. Follow these steps to calibrate the ALC to achieve optimal performance and review the Understanding an Audio Auto Leveler section on page 3.

1. Insert the ALC2 in line between audio source and the preamp or amplifier. **Note:** Turn the level controls on the amplifier to minimum or Off position.
2. Turn the Level Attenuator and the Output Level Limiter fully clockwise to Max positions.
3. Strong Input Signal Setup- If using a preamp or input source selector with more than one input source, setup the source with the loudest audio content and strongest signal first. Increase the input signal until the Signal LED is flashing and the Active LED is flashing steadily on the ALC. Once the Peak LED begins to flash, reduce the input signal until it stops. The Auto Level Control circuitry works best if the strongest input signal is just below the Peak threshold.
4. Low or Weak Signal Setup - After setting up the strongest input, select the content with the lowest input signal and check if the Active Limiter LED is flashing. If not, increase the input signal at the source or by using the Level Attenuator until the LED is flashing. The level setting is a balance between the strongest and weakest input signals.
5. Finally, set the output level to the amplifier. Choose a dynamic signal source for this set up and slowly increase the amplifier level control to the level desired in the audio system. If the level is too strong from the ALC2, turn the Output Level Limiter counter-clockwise to the level desired to match your amplifier gain and system listening level. Check the amplifier's Input Sensitivity specification and match the Output Limiter Level to it. For example, if the amplifier Input Sensitivity is 1V, the Output Limiter Level should be set at or below 1V to prevent clipping. Use the markings indicating the maximum output voltages on the Output Limiter Control to set your level so the maximum audio system level is fixed or limited.



## Block Diagram



## Specifications

Description	Two Channel Audio Level Controller/Limiter
Chassis Color	Black
Chassis Material	Aluminum

### Inputs

Type	Qty 2, Unbalanced
Connection	RCA Left and Right
Impedance	10K $\Omega$

### Outputs

Type	Qty 2, Unbalanced
Connection	RCA Left and Right
Impedance	150 $\Omega$ Unbalanced
Output Level	Adjustable from 0V to 1.5V, Hard Limit

### Controls

Input Level Attenuator	Qty 1, Removable Knob with Security Cover
Output Level Limiter	Qty 1, Removable Knob with Security Cover

### Indicators

Input Signal	Green, 25mV On Threshold
Input Peak	Red, -3dB Before Clip
ALC Active	Yellow, Onset of Input Level Reduction, 2.6V Threshold
Power	Blue







### Electrical

Frequency Response	20Hz - 20kHz ( $\pm 1$ dB)
Auto Level Threshold Range	25mV - 3V
THD	.5% @ 1kHz
Signal to Noise	80dBV
Output Level Limiter Range	0V - 1.5V
Sample Rate	42 per Adjustment
Delay Time	20ms Between Adjustment
Level Adjustment Increment	1dB or 2dB Selectable

### Mounting

Velcro™	Industrial-Grade, Included
Brackets	Qty 2, Included
TSD-RMK	Optional 1 RU Rack Mount Panel (Supports 4 TSD Units)
Cable Retainer	Qty 2, Included

### Power Requirements

Voltage	24VDC
Power Consumption	60mA
Power Consumption	1.4W
Dimensions	H 1.5" (39mm) x W 4" (101mm) x D 2.75" (70mm)
Weight	6oz, .165kg

### Accessories

TSD 24VDC Power Supplies  
TSD-RMK 1 RU Rack Panel

### Safety and Certifications

External Power Supply	cUL, CE, RoHS, TUV
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# Owner's Manual

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**Notes:**

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## **Limited Warranty**

All products manufactured by Atlas Sound are warranted to the original dealer/installer, industrial or commercial purchaser to be free from defects in material and workmanship and to be in compliance with our published specifications, if any. This warranty shall extend from the date of purchase for a period of three years on all Atlas Sound products, including SOUNDOLIER brand, and ATLAS SOUND brand products except as follows: one year on electronics and control systems; one year on replacement parts; and one year on Musician Series stands and related accessories. Additionally, fuses and lamps carry no warranty. Atlas Sound will solely at its discretion, replace at no charge or repair free of charge defective parts or products when the product has been applied and used in accordance with our published operation and installation instructions. We will not be responsible for defects caused by improper storage, misuse (including failure to provide reasonable and necessary maintenance), accident, abnormal atmospheres, water immersion, lightning discharge, or malfunctions when products have been modified or operated in excess of rated power, altered, serviced or installed in other than a workman like manner. The original sales invoice should be retained as evidence of purchase under the terms of this warranty. All warranty returns must comply with our returns policy set forth below. When products returned to Atlas Sound do not qualify for repair or replacement under our warranty, repairs may be performed at prevailing costs for material and labor unless there is included with the returned product(s) a written request for an estimate of repair costs before any nonwarranty work is performed. In the event of replacement or upon completion of repairs, return shipment will be made with the transportation charges collect.

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