

EAW®

Redline™

OWNER'S MANUAL



REDLINE™

Congratulations on the purchase of your Redline system.

The Redline series of products is the result of industry-leading innovation in acoustical and mechanical engineering, executed with meticulous craftsmanship.

Please read these instructions to get the maximum performance from your new loudspeaker system.

IMPORTANT SAFETY INSTRUCTIONS - READ THIS FIRST

Safety Instructions

Read and heed all warnings and safety instructions in this manual before using this product. Failure to follow these precautions may result in damage, injury, or death.

- 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 amplifier 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 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 Caster Pallets and accessories specified by the manufacturer, or sold with the apparatus. When a Caster Pallet is used, use caution when moving the 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, does not operate normally, or has been dropped.
- 15) **DO NOT ATTEMPT TO OPEN THE AMPLIFIER ITSELF; IT IS NOT USER-SERVICEABLE.**
 - i. **WARNING:** The loudspeaker is supplied with an AC mains power cable. Depending on the voltage model ordered, this cable is configured with the most common ac mains connector for that voltage. If the connector is not compatible with the local ac mains receptacle, employ a licensed electrician to re-configure the cable with the proper connector. Ensure that ac power supply has a properly grounded safety ground. Failure to follow this warning could cause equipment damage, injury, or death.

CONSIGNES DE SÉCURITÉ - À LIRE EN PREMIER

Instructions Relative à la Sécurité

Lisez et respectez toutes les consignes de sécurité et les mises en garde fournies dans le manuel des enceintes EAW avant d'utiliser ce produit. Le non-respect de ces consignes et mises en garde peut entraîner des dommages aux équipements et des accidents aux personnes pouvant être fatals.

ATTENTION: L'enceinte est fournie avec un cordon secteur. Selon la tension du modèle commandé, ce câble est fourni avec la fiche la plus communément utilisée avec cette tension. Si la fiche n'est pas compatible avec les prises secteur de votre région, faites appel à un électricien agréé pour modifier le cordon secteur en fonction du format local. Vérifiez que la fiche secteur dispose d'une mise à la terre. Le non-respect de la mise à la terre peut entraîner des dommages aux équipements et des accidents aux personnes pouvant être fatals.

PRECAUZIONI DI SICUREZZA - DA LEGGERE PER PRIMO

Norme di Sicurezza

Prima di procedere con l'utilizzo del prodotto, leggere e rispettare ogni avvertenza e norma di sicurezza riportata nel "Manuale EAW Loudspeaker". Il mancato rispetto di ogni precauzione può causare danni all'apparecchiatura, nonché infortuni alle persone o la morte.

ATTENZIONE: Il diffusore è completo di cavo d'alimentazione ac fornito in dotazione. In base la voltaggio del modello di diffusore acquistato, il cavo è configurato con il connettore ac più adeguato. Nel caso in cui il connettore non sia compatibile con le prese di corrente adottate nell'area d'impiego, rivolgersi ad un elettricista qualificato per ri-configurare il cavo con il

connettore più appropriato. Assicurarsi che la presa di corrente sia adeguatamente collegata a terra. Il mancato rispetto di tali norme può causare danni all'apparecchiatura, nonché infortuni alle persone o la morte.

PRECAUCIONES DE SEGURIDAD - LEA EST O PRIMERO

Instrucciones de Seguridad

Lea y observe todos los avisos e instrucciones de seguridad que aparecen en el "Manual de altavoces EAW" adjunto antes de usar este aparato. El no observar esta precaución puede dar lugar a averías en el aparato, daños en las personas o incluso la muerte.

PRECAUCION: El altavoz viene de fábrica con un cable de corriente. Dependiendo del voltaje que use el modelo solicitado, este cable estará configurado con el enchufe más habitual para ese tipo de corriente. Si ese enchufe no es compatible con su salida de corriente, contacte con un electricista profesional para que cambie el enchufe del cable por el tipo adecuado. Asegúrese de que la salida de corriente tenga una conexión a tierra adecuada. El no observar esta advertencia puede dar lugar a averías en el aparato, daños en las personas o incluso la muerte.

SICHERHEITSHINWEISE - LESEN SIE DIESEN ABSCHNITT ZUERST

Sicherheitsanweisungen

Lesen und beachten Sie alle Warnungen und Sicherheitsanweisungen der mitgelieferten "EAW Lautsprecher Bedienungsanleitung" vor der Benutzung des Produkts. Nichtbeachtung dieser Hinweise können möglicherweise zu Schäden am Equipment oder zu Verletzungen bzw. zum Tod von Personen führen.

WARNUNG: Der Lautsprecher wird mit einem Netzkabel geliefert. Abhängig von der jeweiligen Netzspannung wird das Kabel mit dem für die jeweilige Netzspannung gängigsten Netzstecker ausgeliefert. Sollte der Netzstecker nicht in Ihre Netzsteckdose passen, dann lassen Sie von einem zugelassenen Elektrobetrieb einen passenden Netzstecker montieren. Stellen Sie sicher, dass der Schutzkontakt der Netzsteckdose einen guten Kontakt zur Erde hat. Nichtbeachtung dieser Hinweise können möglicherweise zu Schäden am Equipment oder zu Verletzungen bzw. zum Tod von Personen führen.

FCC Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules (pending). These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CAUTION: Changes or modifications not expressly approved by LOUD Technologies® could void the user's authority to operate the equipment.

Correct Disposal of this Product

This symbol indicates that this product should not be disposed of with your household waste, according to the WEEE Directive (2002/96/EC) and your national law. This product should be handed over to an authorized collection site for recycling waste electrical and electronic equipment (WEEE). Improper handling of this type of waste could have a possible negative impact on the environment and human health due to potentially hazardous substances that are generally associated with WEEE. At the same time, your cooperation in the correct disposal of this product will contribute to the effective usage of natural resources. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, waste authority, or your household waste disposal service.



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Redline™ System Overview

Redline is the newest powered point-source loudspeaker from EAW. Drawing from EAW's deep legacy as a manufacturer of high-end touring loudspeakers, Redline is designed specifically for the professional audio user in corporate AV, rental & staging, and installation. Every feature is optimized to make these users' lives easier.

The Redline family consists of three models – a 12" two-way, 15" two-way and 18" subwoofer. All three models incorporate a complete amplifier and processing module, including over 1,250 watts of Class-D Power-Factor-Corrected bi-amplified power (1,000 watts for the subwoofer). Our 12" and 15" mains feature EAW's signature Focusing™ for a pristine impulse response, and all Redline models incorporate EAW's new DynO™ dynamic optimization algorithms to maintain this fidelity at even the highest output levels.

RL12 and RL15 mains each include three pre-defined, pre-tuned voicings for mains, monitor and mains with sub configurations. Each of these mains features a symmetrical enclosure and swappable amplifier module to easily form mirror-image monitor pairs. RL18S subwoofers feature a push-button cardioid function that allows you to create perfect cancellation behind the stack with two loudspeakers (one rotated). All Redline models feature 18-gauge steel grilles, hyper-black EAW logos and EAW's signature RoadCoat™ finish shared with many other EAW touring products such as Microwedges and Adaptive Systems.

In short – Redline gives professional users what they need most: rapid setup, spectacular sound with little fuss, application flexibility, and long-term reliability, all wrapped in styling that radiates professionalism.

Unpacking

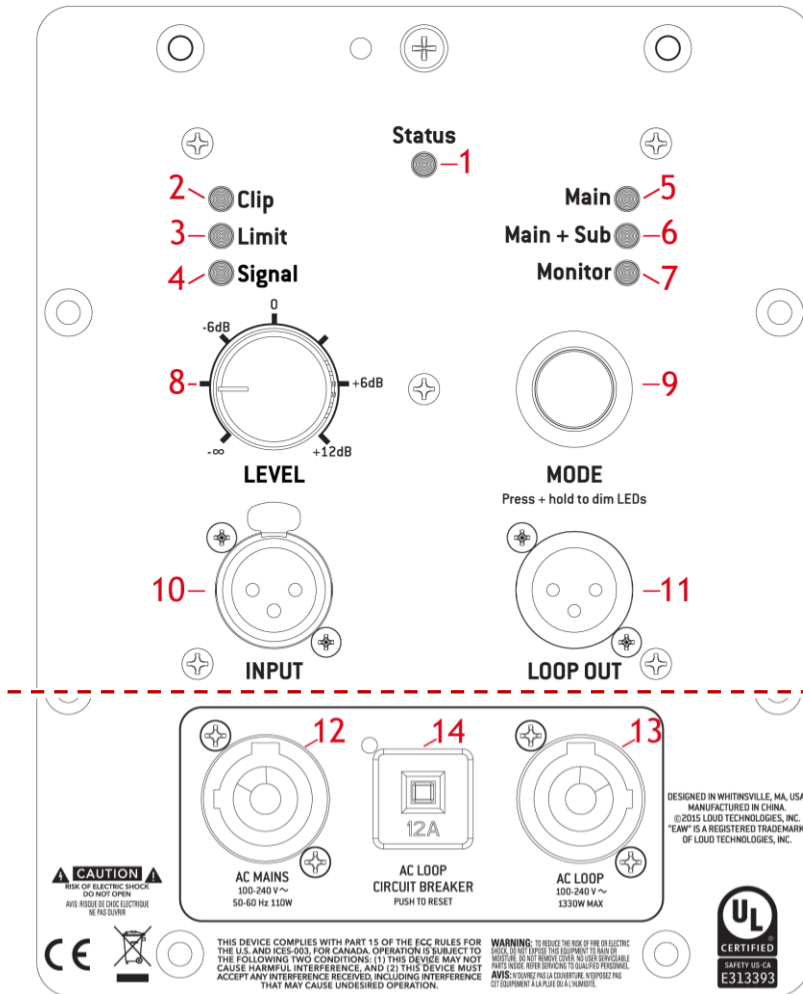
You should have visually inspected the outside of the shipping carton and noted any damage on the shipping bill you signed. After unpacking, if you find concealed damage to the loudspeaker, save the packing materials for the carrier's inspection, notify the carrier immediately and file a shipping damage claim. Although EAW will help in any way possible, *it is always the responsibility of the receiving party to file any shipping damage claim.* The carrier will help prepare and file this claim.

Contents

Qty	Item
1	Redline Series Product
1	Power Cable(dependent on products' AC mains voltage) 115 V - Neutrik® powerCON® to Nema 15R plug 230 V - Neutrik® powerCON® to male Schuko plug
1	Redline Series Owner's Manual (this document)
1	Warranty Card

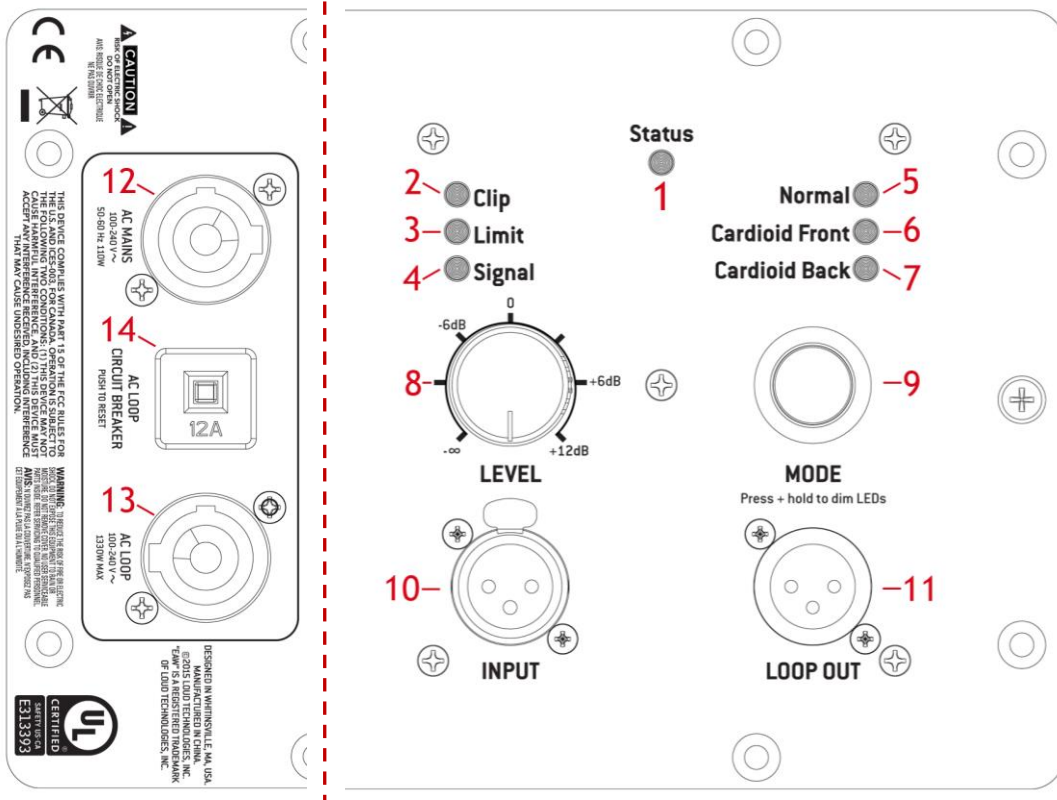
Functionality and Operation

RL12/RL15 Rear Input Panel Connectors and Controls



- | | | |
|----|---|---|
| 1 | Status LED | Indicator for normal and fault status |
| 2 | Clip Indicator | Indicator for input signal clipping |
| 3 | Limit Indicator | Indicator for limiting of output signal |
| 4 | Signal Presence Indicator | Indicator for signal presence |
| 5 | 'Main' voicing selection indicator | Indicates Main voicing is selected |
| 6 | 'Main + Sub' voicing selection indicator | Indicates Main+ Sub voicing is selected |
| 7 | 'Monitor' voicing selection indicator | Indicates Monitor voicing is selected |
| 8 | Input level attenuator | Controls the input signal level |
| 9 | Mode selection button | Selects between different voicings |
| 10 | XLR input | Connect Analog input signals |
| 11 | XLR Loop Through | Loop input signal to additional RL products, or other devices |
| 12 | AC Mains Input | Connect to AC mains supply as labeled |
| 13 | AC Mains Loop Through | Loop AC Mains for up to (4) additional RL products. |
| 14 | AC Loop Circuit Breaker | User Resettable, 12A(115 V), 6A(230V) |

RL18S Subwoofer Rear Input Panel Connectors and Control



1	Status LED	Indicator for normal and fault status
2	Clip Indicator	Indicator for input signal clipping
3	Limit Indicator	Indicator for limiting of output signal
4	Signal Presence Indicator	Indicator for signal presence
5	'Normal' voicing selection indicator	Indicates Normal voicing is selected
6	'Cardioid' voicing selection indicator	Indicates Cardioid Front voicing is selected
7	'Cardioid Back' voicing selection indicator	Indicates Cardioid Back voicing is selected
8	Input level attenuator	Controls the input level
9	Mode selection button	Selects between different voicings
10	XLR input	Connect Analog input signals
11	XLR Loop Through	Loop input signal to additional RL products, or other devices
12	AC Mains Input	Connect to AC mains supply as labeled
13	AC Mains Loop Through	Loop AC Mains for up to (4) additional RL products.
14	AC Loop Circuit Breaker	User Resettable, 12A(115 V), 6A(230V)

Audio Connections

Analog Audio

Connect the output from your line-level signal source to the XLR-3F INPUT connector on the rear panel. This is an electronically balanced input. Users must provide their own XLR cables. The two XLR-type connectors on the rear of each Redline series product, one female and one male, are designed for professional audio signal levels, nominally 0 dBu (= 0.775 V). Normally, use the female XLR as the signal input. Use the male XLR as a loop-thru output to connect the same signal input to additional Redline products.

The wiring convention is as follows:

- Pin 1: Shield
- Pin 2: +/Hot
- Pin 3: -/Cold



AC Mains Connection

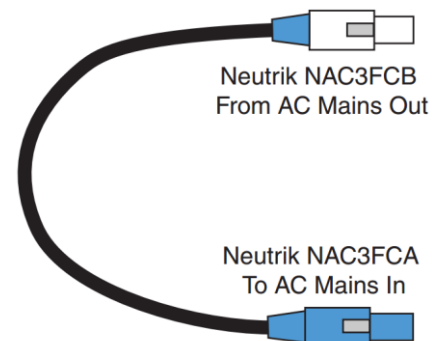
Connect the supplied AC mains cord to the Neutrik® powerCON® socket on the rear of the loudspeaker. Connect the other end to an AC mains supply receptacle, nominally 115 V 60 Hz or 230 V 50 Hz as labeled on the loudspeaker. If necessary, have a qualified electrician change the cable plug as required for compatibility with the local ac mains receptacle.

WARNING: Before connecting a Redline loudspeaker to the AC mains supply, completely turn down the input signal to the loudspeaker using the input level attenuator. If not, there could be excessive and possibly damaging sound levels from the loudspeaker when energized.

There is no power switch on the loudspeaker. When connected to the AC mains the loudspeaker will be fully operational, with the output level controlled by the signal source feeding the loudspeaker and level of the input attenuator.

Linking power

The Neutrik® powerCON® AC mains and AC loop connectors are wired in parallel to provide an AC mains inlet and outlet on each Redline product. The blue AC mains inlet mates with a Neutrik® powerCON® NACFC3A (supplied). The white AC mains outlet mates with a Neutrik® powerCON® NACFC3B. Therefore, to loop the AC mains from enclosure to enclosure, connect an AC mains jumper cable as shown (jumper is not included with Redline series products).



Up to four additional RL12 or RL15's can be looped in this fashion. Use an AC loop connector to daisy-chain AC mains power from one enclosure to another. The maximum, continuous load must not exceed 12A for the 115V version and 6A for the 230V version.

NOTE: The circuit breaker only protects the AC loop outlet, not the AC mains connector. If the continuous load connected to the AC loop outlet exceeds the rated load, the circuit breaker will trip. For this situation, reduce the connected load and then manually reset the circuit breaker.

Operating Indicators

Status

The **Status** LED is used to indicate the status of Redline series products, please refer to the chart below to determine the current operating status.

Fault Condition	Indication			User's Next Steps
	LED	Light length	Repeat Period	
All components working properly	Green LED	Solid Green LED		None
Amplifier is in protect mode	Red LED - flashing	short	fast	Change program material (ensures no DC in signal).
Impedance Fault (short, open)	Red LED - flashing	short	slow	Allow speaker to cool down then test drivers.
Excessive internal temperature	Red LED - flashing	long	slow	Reduce drive level and/or cool down speaker.
AC Input Voltage out of acceptable range	Red LED	Solid red LED.		Check AC power voltage.

Limit

The limiting parameters set in Redline Products are engineered to provide a high level of protection for the drivers while maximizing sonic performance and output. The **Limit** indicator in the rear input panel illuminates when limiting is occurring. If this is flashing occasionally, meaning no more than once every 3 seconds or so, then levels are probably OK, but at maximum. If this indicator is flashing more than once every 3 seconds or so, reduce the input signal level.

Clip

The **Clip** indicator on the rear panel illuminates if any of the Redline electronics are being driven into clipping. This includes the entire signal chain from the input stage through the DSP. Clipped signals can more easily damage drivers as they can raise the average signal level significantly with a spectrum that differs from the input signal. If the **Clip** indicator is flashing this indicates an

unacceptable overdrive in the system, reduce the input signal level or damage to the drivers is likely to occur.

CAUTION: Electronic limiters cannot provide absolute protection against driver failure. Thus, if limiting is occurring, it is a warning that excessive signal levels are being approached. It is NOT an indication that the loudspeaker is successfully protecting itself.

Operating Limits

While the processing for Redline series products includes robust driver and amplifier protection algorithms and circuits, it is ultimately the responsibility of the audio system operator to operate the loudspeakers within their capabilities. This is the only way to ensure that loudspeakers are not stressed beyond their limits to the point of damage or failure. Operation beyond their capabilities usually includes, but is not limited to, one or more of the following conditions:

- Severe amplifier clipping
- Noticeable distortion
- Mechanical noise (such as cones bottoming out)

The Redline products have both Limiter and signal indicators. It is recommended that the operator have a meter display calibrated to indicate the level where the Limiting and Clipping point are and thus be near to exceeding their capabilities

Adjusting the Output Level

Starting with the input level attenuator at $-\infty$ (all the way to the left), turn the input attenuator up until the desired volume is reached, but below the point where the CLIP and/or LIMITER ACTIVE lights illuminate.

CAUTION: If there is no sound, turn down the signal source's output level before investigating the problem. Do this to avoid excessive and possibly damaging sound levels from the loudspeaker.

CAUTION: Excessive clipping and limiting of the input signal should be avoided as it could result in damage to loudspeaker transducers.

LED Dim

For aesthetically sensitive situations where the LED indicators of the rear of Redline may be distracting, the LED light level can be reduced. To dim the LEDs, hold the 'Mode' button for 2 seconds. To restore the maximum LED brightness, repeat the same process, by holding down the 'Mode' button for two seconds. Note that for approximately one second after dimming or restoring the rear-panel LEDs, the voicing mode cannot be changed. This occurs because the LED state is being stored to non-volatile memory in order to persist through a power-cycle. This function has no effect on audio output.

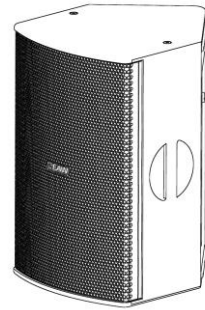
Onboard Processing/Voicing

Voicing Options - RL12, RL15

RL15 and RL12 feature three distinct voicings to accommodate a wide range of applications. To select voicings, simply press the 'Mode' button on the back panel until the desired voicing is illuminated.

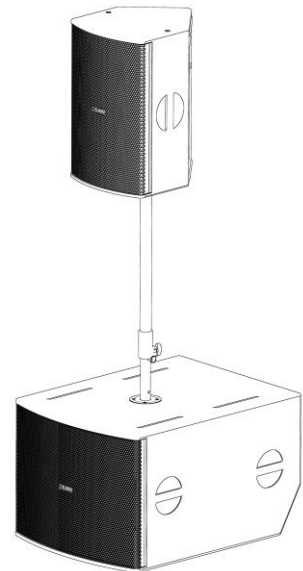
Main

Select the 'Main' voicing when using the RL12/15 without a subwoofer. The 'Main' voicing optimizes internal processing to maximize low frequency response for stand-alone full-range use.



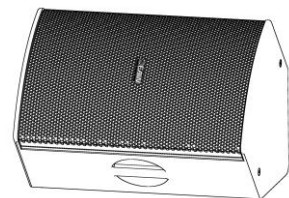
Main + Sub

Select the 'Main + Sub' voicing when using RL12/15 with the RL18S Subwoofer to create a three-way system. It optimizes overlap frequencies between the main and the sub to maximize overall output performance. This mode should also be used with pairing the RL12/15 with other companion subwoofers.



Monitor

Select the 'Monitor' voicing to optimize RL12/15 for use when placed on the ground horizontally. This voicing compensates for acoustical coupling with the ground, providing optimized performance when using RL12/15 as a stage monitor.



Voicing - RL18S

The RL18S subwoofer features three distinct voicings to accommodate a wide range of applications. To selection voicings, simply press the 'Mode' button until the desired voicing is illuminated. Normal mode provides maximum output performance. Cardioid mode provides low frequency cancellation behind an array of subwoofers and can reduce greatly unwanted low frequency energy from spilling onto a stage.

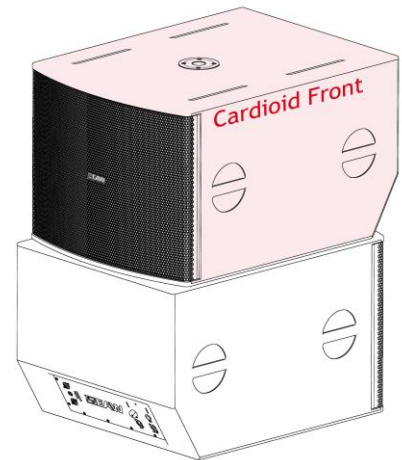
Normal

Select the 'Normal' voicing to optimize RL18S for standard operation when used alone, or with other RL18S subwoofers for maximum output performance.



Cardioid Front

When using 2 or more RL18S subwoofers in a cardioid configuration, select the 'Cardioid Front' for the RL18S which is oriented towards the intended coverage area (see the "Cardioid Configurations" section in this manual for more information on valid arrangements).



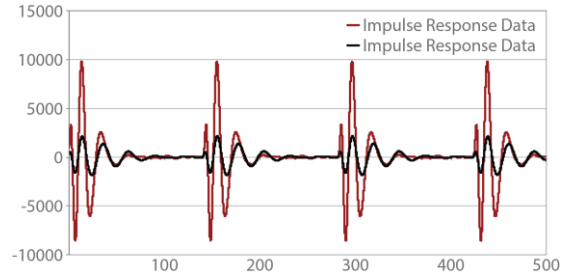
Cardioid Back

When using 2 or more RL18S subwoofers in a cardioid configuration, select the 'Cardioid Back' for the RL18S which is oriented away the intended coverage area. (See the "Cardioid Configurations" section in this manual for more information on valid arrangements)



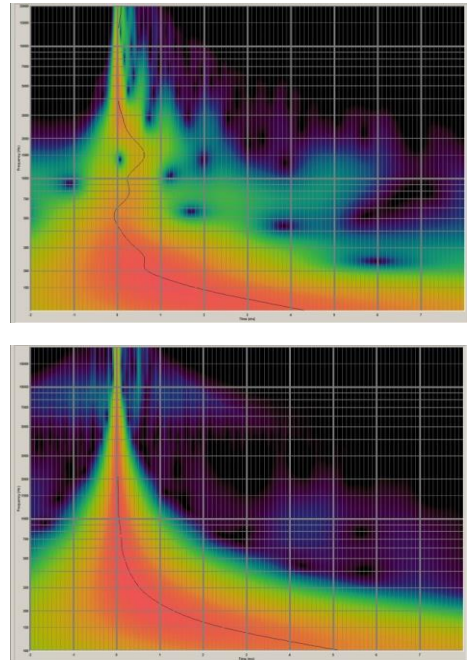
DynO™

DynO™ is a revolutionary processing technique that allows EAW Engineers to maximize output from a given amplifier – transducer combination. As opposed to conventional limiting which simply views amplifier output and driver power handling in aggregate (i.e. a driver can handle 100 watts or an amplifier can produce 500 watts), the DynO process involves much more detail and complexity. By studying the headroom of all electronic and acoustical devices frequency by frequency and utilizing frequency-dependent limiting algorithms in combination with more traditional band-pass limiting, a system's broadband headroom can be maximize regardless of the input signal spectrum.



EAW Focusing™

Even in well-designed professional loudspeakers, inherent sonic flaws such as phase plug reflections, horn resonances and cone resonances can cause undesirable audible artifacts. Implemented through advanced digital signal processing, EAW Focusing™ generates complex filters that correct these imperfections and improve the transient response of a loudspeaker. This is accomplished by isolating linear, time invariant and spatially consistent anomalies in a loudspeaker's response and eliminating them through advanced processing. The result is a high output, controlled loudspeaker that provides a pristine transient response equal to that of a direct radiating studio monitor.

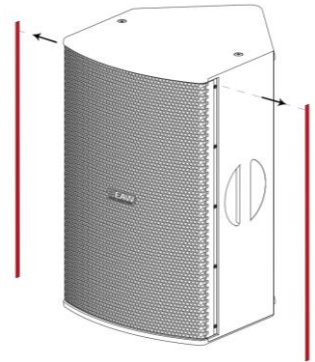


Redline Application Configurations

Removing the Red Strip

The red strip alongside the Redline products is adhered magnetically and can be removed as needed for aesthetically critical situations.

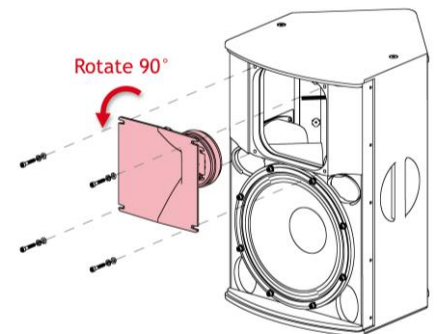
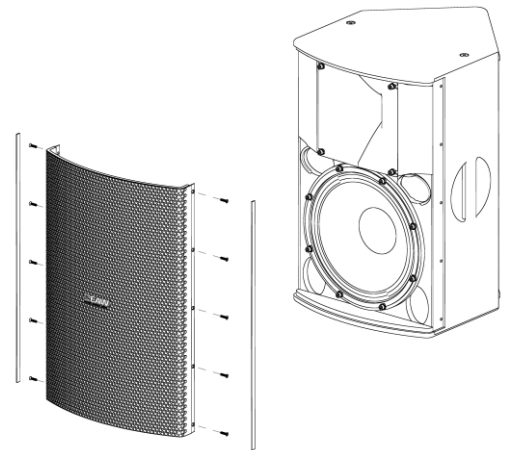
To remove the red strip, carefully peel back the magnetic strip. Place the red strip in a safe location so that it can be re-applied in for future applications.



Rotating the horn

RL12 and RL15 feature a user rotatable horn, providing exceptional application flexibility and the ability to maintain the 90° x 60° coverage pattern when the speaker is mounted horizontally. To rotate the horn, please follow the steps outlined below.

1. Remove the red strip to access the retaining screws securing the grill in place.
2. Remove the 10 retaining screws securing the grill in place using a standard Philips head screwdriver.
3. Remove the HF horn/driver assembly by unscrewing their retaining screws using a 3/16" hex key.
4. Carefully lift the HF horn/driver assembly from the baffle
5. Rotate the HF horn/driver assembly 90 degrees.*
6. Replace the HF horn/driver assembly back into the enclosure and re-fasten the retaining screws
7. Replace the grille and re-fasten the retaining screws.

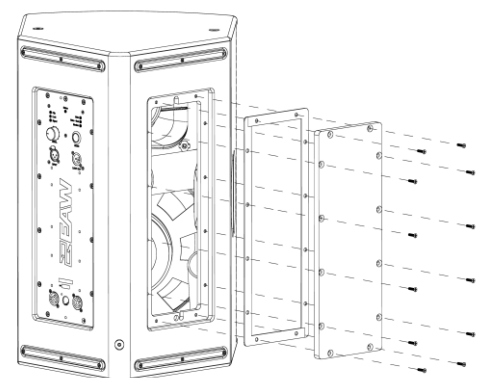
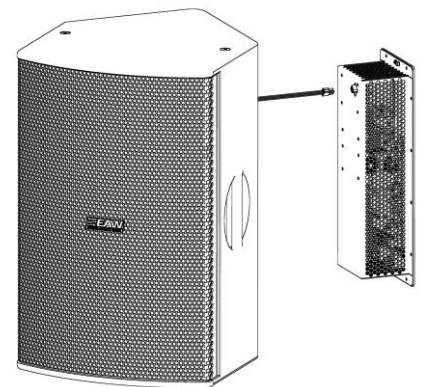
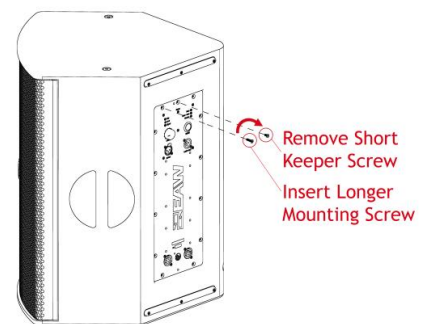
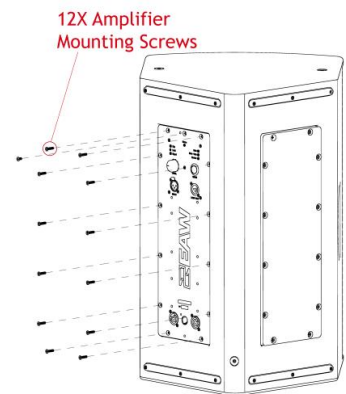


* The orientation of the horn can be determined by the orientation of the horn throat opening. When the opening is in the vertical orientation, the horn is in the default 90° x 60° configuration. If the opening is horizontal, the horn is in the 60° horizontal x 90° vertical orientation.

Creating Symmetrical Monitor Angles (Swapping Amplifier Modules)

Redline RL12 and RL15 products feature the ability to switch the amplifier to the opposite side of the enclosure to create symmetrical monitor angles for mirror image pairs. To move an amplifier to the opposite side of the loudspeaker

1. Disconnect the unit from AC supply and disconnect all analog audio cabling.
2. Remove the 12 mounting screws using a standard Phillips head screwdriver. Notice the top center screw indicated in the diagram, this is not a mounting screw, but a jacking screw location.
3. After removing the 12 screws, insert one of the standard longer screws into the jacking screw location. This will help free the amplifier from the loudspeaker cabinet.
4. Turn the mounting screw clockwise, pushing against the loudspeaker and forcing the amplifier's corner out. If the amplifier remains fixed to the gasket it may be necessary to use a flat head screwdriver to free the amplifier from the loudspeaker.
5. Once free, carefully lift the amplifier from the loudspeaker and disconnect the electrical leads at the coupling. Set the amplifier module aside.
6. Follow the procedure above for the blank amplifier panel on the opposite side of the loudspeaker.
7. Connect the electrical leads to the amplifier module.
8. Secure the amplifier by re-installing and tightening the 12 mounting screws.
9. Secure the blank panel by re-installing and tightening the 12 mounting screws remembering to reinsert the shorter jacking screw in the top center position.



Application Notes

Flying Redline from threaded mounting points

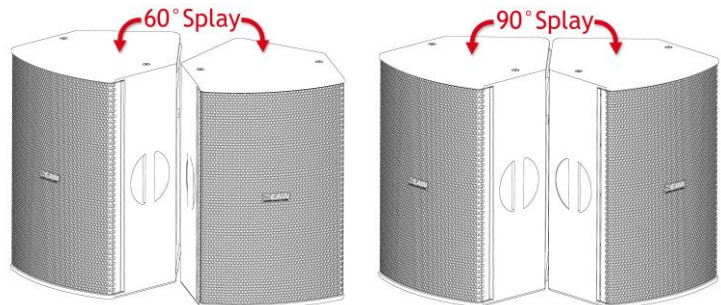
Redline attachment points are designed to accept M8 hardware. Always use a minimum of two points to suspend any loudspeaker. See section on “Rigging” later in this manual for more information.

Arraying RL12 and RL15

Redline loudspeakers can be arrayed in various ways. However, arraying loudspeakers requires special consideration for the overall array’s mounting angle, projection pattern, rigging/mounting method, and for system tuning adjustments. These issues can be significantly more complex than when the loudspeakers are used individually. The recommendations in this section may not be suitable for particular applications or for the desired sonic results. For assistance in configuring Redline in an array, contact EAW’s Application Support Group.

Vertical Array

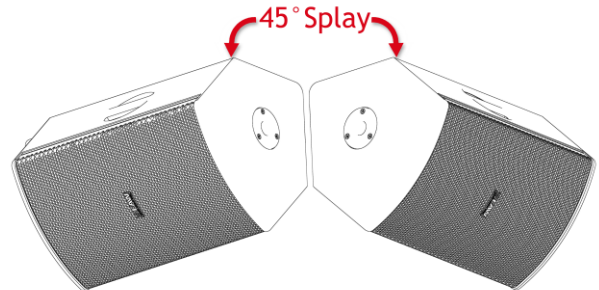
1. Non-Rotated Horn (90° horizontal coverage): Use a 90° splay between enclosure sides.
2. Rotated Horn (60° horizontal coverage): Use a 60° splay between enclosure sides.



If a different splay angle is needed for proper coverage, we suggest spacing the cabinets several feet apart, creating an exploded array to reduce comb filtering at critical frequencies.

Horizontal Array

1. Rotated Horn (90° horizontal coverage): Orient the enclosures so the LF drivers are adjacent (i.e. enclosure bottom to bottom).
2. Use a 45° splay between the enclosure bottoms.



As with vertical arrays, if a different splay angle is needed for proper coverage, we suggest spacing the cabinets several feet apart, creating an exploded array to reduce comb filtering at critical frequencies.

Recommended Accessories

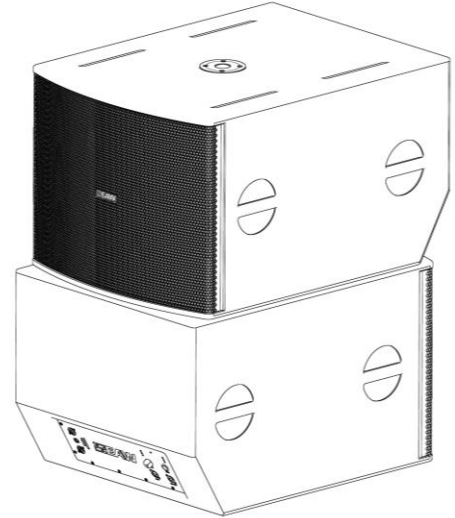
For a list of recommended accessories, please see the ‘Redline Accessory Guide’ document, available at www.eaw.com

RL18S Standard Cardioid Configurations

The RL18S features push-button cardioid functionality, allowing two or more RL18S subwoofers to be used together in a cardioid configuration. Cardioid functionality is possible in a number of different physical configurations, demonstrated below. These configurations can be scaled by adding equal numbers of front, and back facing subwoofers to achieve cardioid patterns with additional SPL output capabilities.

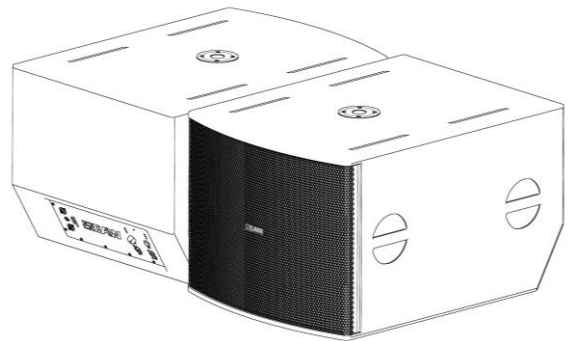
Two RL18S Stacked Horizontal

Two RL18S subwoofers can be stacked, one on top of another to achieve a cardioid coverage pattern. The subwoofer facing towards the audience should be set to 'Cardioid Front' with the other subwoofer set to 'Cardioid Back'.



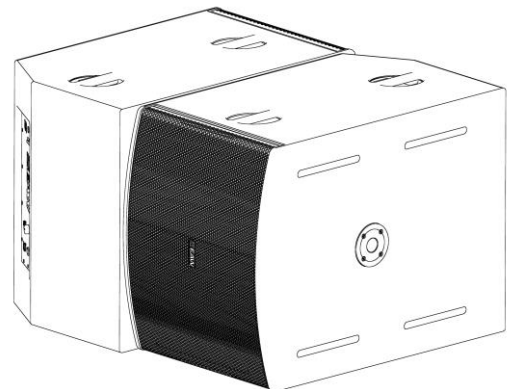
Two RL18S Side-by-Side Horizontal

Two RL18S can be placed side-by-side to achieve cardioid coverage pattern. The subwoofer facing towards the audience should be set to 'Cardioid Front' with the other subwoofer set to 'Cardioid Back'.



Two RL18S Side-by-Side Vertical

Two RL18S can be placed side-by-side to achieve cardioid coverage pattern. The subwoofer facing towards the audience should be set to 'Cardioid Front' with the other subwoofer set to 'Cardioid Back'.



Other Cardioid Configurations

It may be beneficial for the user to employ variants on the standard cardioid configurations in the form of unequal front/rear-facing subwoofers and/or relative front/back subwoofer gain adjustments. This allows the user to further tailor output and rejection levels to suit the needs of their application.

Three RL18S – In situations where space permits three RL18S to be assembled in one array, a cardioid configuration is still possible. Because the amount of forward- and rear-facing enclosures are no longer even, however, a gain offset must be applied to the rear facing subwoofer to maintain the same nominal rejection level as with the two-subwoofer configurations.

Maximum Rejection – The included cardioid presets are tailored to provide the optimal balance of rejection and forward output. In this way, an array of two RL18S subwoofers can provide significant rear rejection while sacrificing only 1.5 dB of forward gain as compared to two RL18S in an omnidirectional configuration (both facing forward, on the default preset). The included preset is also optimized to provide rejection at distances of approximately 10 feet from the stack.

However, the user may desire greater amounts of rejection at distances closer to the array, at the expense of forward output. This can be easily accomplished by simply reducing the amount of gain on the rear-facing subwoofer as follows:

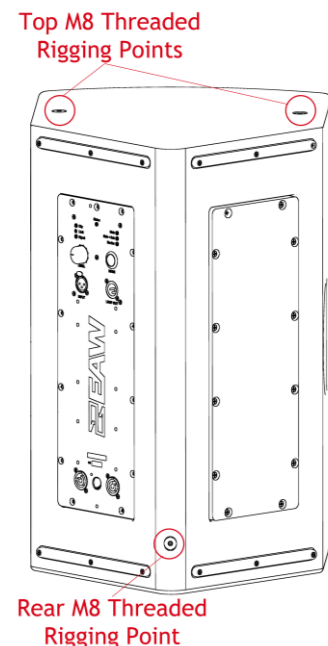
Rear Attenuation*	Rejection Distance	Forward Reduction	Rear Gain Setting
12 – 18 dB	10 ft/ 3 m	-1.5 dB	0 dB (unity)
	1 ft / .3m	-6 dB	-6 dB (first line below 0)

* Rear rejection measurement at “Rejection Distance”, averaged across operating range. Rear attenuation is heavily dependent upon acoustical environment and exact results may vary.

Rigging

Redline RL12 and RL15 are intended to be suspended via integral rigging points, or ground-stacked. Redline RL18S is intended to be ground-stacked only. It is the user’s responsibility to determine the viability and safety for alternate methods and implement them accordingly.

NOTE: At a minimum, any suspended Redline loudspeaker must be flown from the two top M8 rigging points. The third point on the rear of the enclosure may be used to increase the down-tilt. Always observe load de-rating when applying loads with lateral components to eyebolts. Use hoist rings where necessary. **NEVER SUSPEND ONE REDLINE ENCLOSURE FROM ANOTHER – ALL FLOWN REDLINE ENCLOSURES MUST BE SUPPORTED INDEPENDENTLY.**



Warnings

WARNING: Mounting or overhead suspension of any heavy load can result in serious injury and equipment damage. This work should be done by qualified persons following safe rigging practices in accordance with all applicable safety and construction standards. Such persons must determine the required load ratings and design factors. They must determine the mounting or suspension method that meets static, dynamic, shock, and any other load requirements. All such work must be done in accordance with and in compliance with all federal, state, and local regulations governing such work.

WARNING: If there is any question about the integrity or capability of any part to perform its intended function when used to suspend or mount a loudspeaker, immediately remove it from service for repair or replacement.

WARNING: Do not under any circumstances use a loudspeaker's handles to support the weight of the loudspeaker except for their intended use: hand carrying. The handles are not rated to support the load of the loudspeaker for temporary or permanent installation.

WARNING: Rigging loudspeakers is an extremely serious matter with potentially lethal consequences should anything go wrong. It is of vital importance that this task is done by persons qualified to do so and who have a full understanding of all factors involved, with safety as the number one priority. Only persons with the knowledge of and experience with proper hardware and safe rigging techniques should attempt to suspend or mount loudspeaker systems overhead. For all questions involving loudspeaker rigging, consult a licensed, qualified professional Engineer or Professional Rigger. All rigging work must be done in accordance with and in compliance with all applicable regulations governing such work.

Reference Material

For detailed information about rigging, the following publications are recommended:

"Entertainment Rigging: A Practical Guide for Riggers, Designers, and Managers"

By Harry Donovan; Harry M. Donovan, 2002

"An Introduction to Rigging in the Entertainment Industry"

By Chris Higgs; Entertainment Technology Press, June 2002

"Rigging for Entertainment: Regulations and Practice"

By Chris Higgs; Entertainment Technology Press, April 2003

Firmware Update Procedure

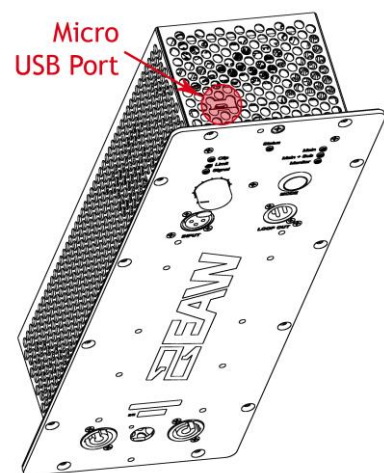
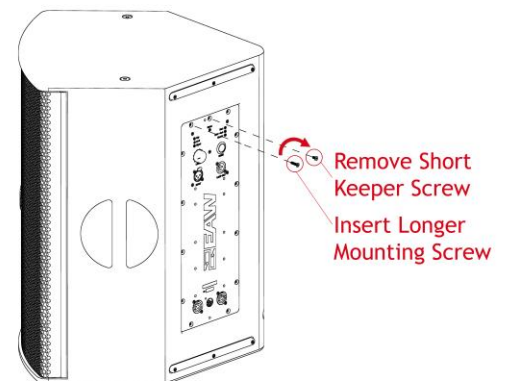
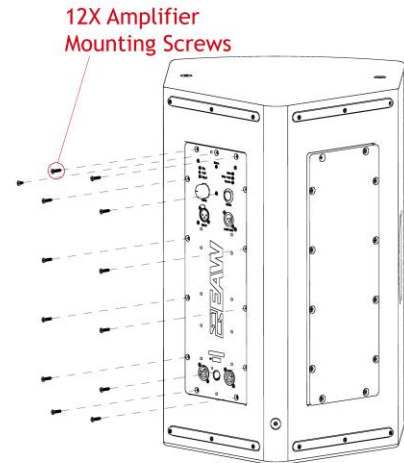
Redline series products are equipped with user upgradable firmware to accommodate future voicing and DSP updates. To update the firmware, please follow the instructions below.

Firmware Update on RL12/RL15

1. Disconnect the unit from AC supply and disconnect all analog audio cabling.
2. Remove the 12 mounting screws using a standard Phillips head screwdriver. Notice the top center screw indicated in the diagram, this is not a mounting screw, but a jacking screw location.
3. If the amplifier remains fixed to the loudspeaker after removing the 12 mounting screws, it is because the amplifier to loudspeaker gasket is binding them together. To free them, use the center jacking location to free the amplifier from the loudspeaker.
4. To do so replace the keeper screw from the center location with one of the mounting screws already removed.
5. Turn the mounting screw clockwise, pushing against the loudspeaker and forcing the amplifier's corner out. If the amplifier remains fixed to the gasket it may be necessary to jack another corner away from the loudspeaker.
6. Once free, carefully lift the amplifier from the loudspeaker and disconnect the electrical leads at the coupling. Set the amplifier module aside.
7. Locate the Micro USB input port at the top of the amplifier and connect the user supplied micro cable to the amplifier.
8. Connect AC power to the amplifier module and follow the firmware update quick start guide.

WARNING: Once AC power is applied to the amplifier module, avoid direct contact with the protective cage surround the amplifier.

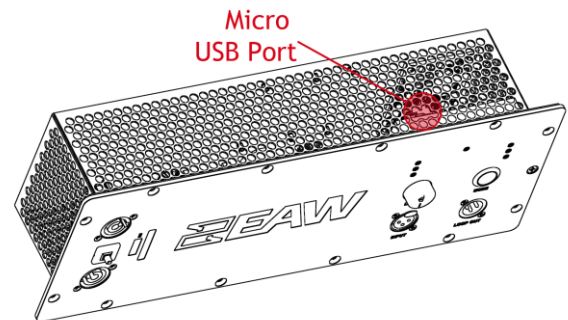
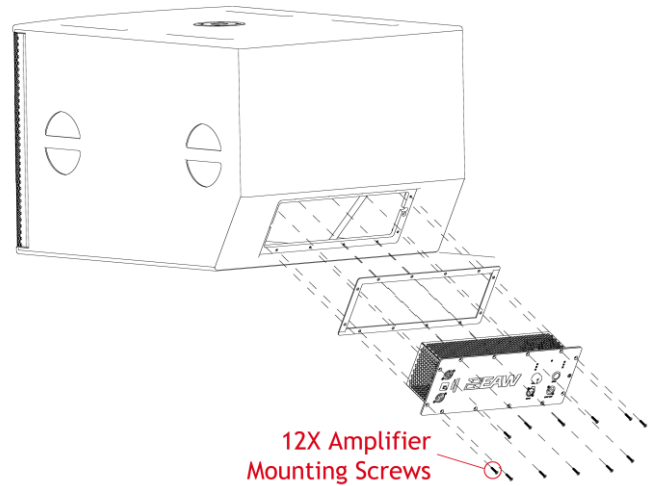
9. When the firmware update is complete, disconnect AC power from the amplifier, disconnect the USB cable, then re-secure the amplifier module to the loudspeaker.



Firmware Update - RL18S

The firmware update and amplifier removal procedure for the RL18S is identical to that of the RL12/15, with the exception of the Micro USB port, which is located on the side of the amplifier, rather than the top.

1. Disconnect the unit from AC supply and disconnect all analog audio cabling.
2. Remove the 12 mounting screws using a standard Phillips head screwdriver. Notice the top center screw indicated in the diagram, this is not a mounting screw, but a jacking screw location.
3. If the amplifier remains fixed to the loudspeaker after removing the 12 mounting screws, it is because the amplifier to loudspeaker gasket is binding them together. To free them, use the top center jacking location to free the amplifier from the loudspeaker.
4. To do so replace the keeper screw from the center location with one of the mounting screws already removed
5. Turn the mounting screw clockwise, pushing against the loudspeaker and forcing the amplifier's corner out. If the amplifier remains fixed to the gasket it may be necessary to jack another corner away from the loudspeaker.



6. Once free, carefully lift the amplifier from the loudspeaker and disconnect the electrical leads at the coupling. Set the amplifier module aside.
7. Locate the Micro USB input port at the side of the amplifier and connect the user supplied micro cable to the amplifier.
8. Connect AC power to the amplifier module and follow the firmware update quick start guide.

WARNING: Once AC power is applied to the amplifier module, avoid direct contact with the protective cage surround the amplifier.

9. When the firmware update is complete, disconnect AC power from the amplifier, disconnect the USB cable, and then re-secure the amplifier module to the loudspeaker.

Basic Field Troubleshooting and Repair

Loudspeaker difficulties usually fall into one of the following categories. The causes for each problem are listed in the most likely order of probability.

No Sound or Low Output

1. Loudspeaker cables or connectors are miswired or faulty: Check all cabling. Refer to these instructions for correct loudspeaker cable connections. The best way to check a suspect cable is to swap it with a known good cable. Read the loudspeaker's input panel to verify correct cable connections.
2. Electronic equipment is not turned on or level controls are not adjusted properly: Make sure that all equipment in the signal path is powered up and that all controls are set to appropriate levels for normal operation.
3. Loudspeaker is not working: Connect the signal cable to a known good loudspeaker leaving all equipment set to the same levels. If the problem disappears, the loudspeaker is probably not working. Contact EAW Service for appropriate troubleshooting.

Distorted Sound

1. The input to the internal amplifier is clipping: The input signal level is exceeding the limits of your system and should be reduced in level.
2. Other electronic equipment is clipping: Ensure that no equipment in the signal chain is being overdriven. For example: input(s) or summing bus in the mixing console, equalizers, etc.
3. Driver(s) not working properly: Contact EAW Service for appropriate troubleshooting.

Partial Sound (Some Frequency Bands Missing)

1. Incorrect EQ settings in the electronic equipment: Ensure all EQ settings and filters on the mixing console or preamplifier and on other equipment are set for normal operation. Ensure level controls on electronic crossovers and associated amplifiers are correctly set and that all cables and connections for such equipment are working properly.
2. Incorrect processor configuration: Make sure the processor configuration is correct for the loudspeaker and its intended mode of operation. This includes settings made using software for powered loudspeakers.
3. Incorrect mode settings on the loudspeaker input panel. Ensure mode settings are correct for the application.
4. Driver(s) not working properly: Contact EAW Service for appropriate troubleshooting.

Rigging Problems

Because of the potential serious consequences and liabilities due to faulty rigging, contact the EAW Service Department to determine the appropriate service solution for any problems with the rigging hardware integral to the enclosure or EAW rigging accessories.

Enclosure and Integral Hardware

Enclosure problems, such as loose hardware, faulty joints, or other structural problems, will usually be heard as distinct buzzes, rattles, or other unwanted noises. To test for enclosure problems, use a sine wave signal manually swept on the loudspeaker. The input level should be varied, because certain problems can be level as well as frequency specific. It may be possible to field-repair some enclosure problems.

Cosmetics

While the paint finish and the wood used for the enclosures is of high quality and durability, scuffs, marks, and other blemishes may appear from normal handling. For paint touchup, use good quality latex paint. For a more permanent and cosmetically correct appearance, contact the EAW Service Department for the paint specifications or to purchase small quantities for touch-up. For cosmetically damaged wood, use common woodworking methods and materials as appropriate for the damage.

Driver Service

A faulty driver will usually cause readily audible distortions or other unwanted noises. In other cases, they may stop functioning. Use your ears and test signals or other sound source to determine which one is at fault. The drivers can be field serviced by replacing the entire driver or having the driver repaired (such as diaphragm replacement) by a qualified service technician.

1. Access the drivers by removing the front grille.
2. Remove the LF driver or HF horn/driver assembly by unscrewing their retaining screws.
3. Lift the LF driver or HF horn/driver assembly from the baffle.
4. Disconnect the signal cable from the driver.
5. To reinstall or replace the LF driver and/or the HF horn/driver assembly, reverse the above steps. Make sure that LF drivers are connected with the blue+ and black- signal wires and that HF drivers are connected with the red+ and black- signal wires.

IMPORTANT: When reconnecting the signal wires to the driver, connect the colored wire to the plus (+) terminal and the black wire to the (-) minus terminal.

Powered Loudspeaker Electronics

Some faults with the electronics will normally be indicated by the 'Status' indicator on the loudspeaker input panel and are described in the section labeled 'Operating Indicators'. Others should clearly be indicated by an outright malfunction in the sound output. Such malfunctions can include:

1. No or very low sound output
2. Highly distorted sound
3. Poor frequency response, such as the loss of low or high frequencies
4. Intermittent sound
5. Excessive electronic noise

In the case of malfunctioning electronics, contact the EAW Service Department for troubleshooting and repair instructions.

Internal Electronics and Wiring

Faulty electronics are serviced by replacing the entire amplifier module. A replacement module consists of the power amplifiers, DSP board, power supply, connectors and indicators, all pre-mounted on the amplifier panel. See 'Swapping Amplifier Modules' above for amplifier replacement instructions.

Electrical Warnings

AC MAINS SUPPLY

WARNING: Read all instruction and cautionary notes concerning electrical power in the EAW Loudspeaker Owner's Manual.

Translations

ALIMENTATION SECTEUR

ATTENTION: Lisez toutes les instructions et notes de sécurité sur l'alimentation secteur, dans le mode d'emploi de l'enceinte EAW.

ALIMENTAZIONE AC

ATTENZIONE: Leggere tutte le istruzioni e le avvertenze riguardanti l'alimentazione elettrica, incluse nel Manuale EAW Loudspeaker.

FUENTE DE ALIMENTACIÓN

PRECAUCION: Lea todas las instrucciones y advertencias relativas a la corriente eléctrica que aparecen en el manual de altavoces EAW.

NETZSTROMVERSORGUNG

WARNUNG: Lesen Sie alle Anweisungen und Sicherheitshinweise bezüglich der Netzspannung in der EAW Lautsprecher Bedienungsanleitung.

AC Mains Cable

The AC mains cables supplied with the Redline products mate with the Neutrik® powerCON® AC MAINS jack on the loudspeaker.

WARNING: Ensure that AC power supply has a properly grounded safety ground. Failure to follow this warning could cause equipment damage, injury, or death.

Translations

Cordon secteur

ATTENTION : Il se peut que le format de la fiche secteur ne corresponde pas à celui de votre situation géographique. Dans ce cas, faites appel à un électricien agréé pour qu'il remplace la fiche par une autre du bon format. Respectez les normes électriques de câblage locales.

ATTENTION: Assurez-vous que la ligne secteur dispose d'une terre. Le non-respect de cette précaution peut entraîner des dommages aux équipements et des accidents aux personnes pouvant être fatals.

Cavo d'alimentazione AC

CAUTELA: Il connettore del cavo d'alimentazione AC fornito in dotazione potrebbe non essere adeguato per le prese di corrente impiegate nell'area in cui il diffusore viene utilizzato. In questo caso, contattare un elettricista qualificato per sostituire la presa di corrente con una dotata di connessione adeguata. Per il cablaggio, occorre seguire la codifica corretta utilizzata nell'area d'utilizzo.

ATTENZIONE: Assicurarsi che la presa d'alimentazione sia correttamente collegata a terra. Il mancato rispetto di tali avvertenze potrebbe causare danni all'apparecchiatura, nonché infortuni alle persone o la morte.

Cable de alimentación

PRECAUCION: El enchufe que viene en el cable de alimentación incluido puede que no encaje en las salidas de corriente de su zona. Si ocurre esto, contacte con un electricista profesional para que sustituya el enchufe problemático y lo cambie por uno adecuado para la salida de corriente. Compruebe que se sigan todas las normativas de seguridad aplicables.

PRECAUCION: Asegúrese que la fuente de alimentación tenga una conexión a tierra correcta. El no cumplir con esta advertencia puede dar lugar a daños en el equipo, en las personas que lo manejen o incluso la muerte.

Netzkabel

VORSICHT: Das mitgelieferte Netzkabel besitzt möglicherweise einen Netzstecker, der nicht in Ihre Steckdose passt. In diesem Fall können Sie sich von einem zugelassenen Elektrobetrieb einen passenden Netzstecker unter Berücksichtigung der jeweils gültigen Vorschriften montieren lassen.

WARNUNG: Stellen Sie sicher, dass der Schutzleiter der Netzsteckdose eine gute Verbindung zur Erde hat. Nichtbeachtung dieses Hinweises kann zu Schäden am Equipment, zu Verletzungen oder zum Tod führen.

Operating Temperature

The operating temperature range is 32° F to 113° F / 0°C to 45° C.

NOTE: When in operation and under load, maintain at least 6 in. of clearance below and 36 in. of clearance behind all fan inlets and outlets.

Service, Inspection & Maintenance

General Service

All components in the Redline systems are designed to withstand the most rigorous and demanding environments. Through regular operation it may still be necessary to replace acoustical, electronic and mechanical components. The section below offers guidelines for user-serviceable parts. If you have any questions about replacing components in Redline series products, **please contact EAW Service immediately and before performing the replacement.**

CAUTION: These servicing instructions are for use by qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

Rigging Service

Because of the potential serious consequences and liabilities due to faulty rigging, contact EAW to determine the appropriate service solution for any rigging hardware concerns.

Routine Maintenance

DO NOT ATTEMPT TO OPEN, REPAIR OR SERVICE THE POWER PLANT; IT IS NOT USER-SERVICEABLE.

Internal Electronics and Wiring

The Redline Amplifier Module is not user-serviceable and must be sent to EAW for repair. In the unlikely event of a failure of any amplifier or processing components, simply remove and replace the entire Amplifier Module with a spare.

DO NOT ATTEMPT TO OPEN, REPAIR OR SERVICE THE AMPLIFIER MODULE.

Contacting EAW

We have attempted to make this manual as thorough as possible. However, feel free to contact us with any further questions or comments for topics not covered.

Operating Questions

EAW Applications Support Group
Tel 508-234-6158
Tel 800-992-5013 (USA only)
Fax 508-234-6479
e-mail asg@eaw.com

Service Information

EAW® Service Department
Shipping
One Main Street Building 9
Whitinsville, MA 01588 USA
Tel 508-234-6158 x3
Tel 800-992-6158 x3 (USA only)
Fax 508-234-3776
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General

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