



link500.4mini

500W RMS 4-Channel Amplifier

Owner's Manual



www.wavtech-usa.com

 WARNING	This symbol means important instructions. Failure to heed them can result in serious injury or death.
 CAUTION	This symbol means important instructions. Failure to heed them can result in injury or property damages.

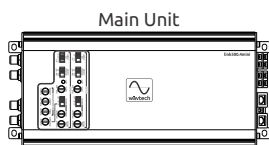
WARNING

- **DO NOT DRIVE WHILE DISTRACTED.** Any function that requires your prolonged attention should not be performed while driving. Always stop the vehicle in a safe location before performing any such function. Failure to do so may result in an accident.
- **KEEP THE VOLUME AT MODERATE LEVELS WHILE DRIVING.** Excess volume levels can obscure sounds such as emergency vehicle sirens or road warning signals and may result in an accident. Continuous exposure to high sound pressure levels may cause permanent hearing loss. Use common sense and practice safe sound.
- **FOR USE WITH 12V NEGATIVE GROUND VEHICLE APPLICATIONS ONLY.** Using this product other than in its designed application may result in fire, injury or product damage.
- **MAKE THE CORRECT WIRING CONNECTIONS AND USE PROPER FUSE PROTECTION.** Failure to connect wiring correctly with appropriate gauge and fuse protection may result in fire, injury or product damage. When replacing fuse(s), never exceed the specified rating. Ensure proper protection of all system power wiring and install an external fuse (not included) with specified rating for each amplifier connected with the +12V lead at the battery terminal.
- **DISCONNECT THE NEGATIVE BATTERY TERMINAL BEFORE INSTALLATION.** Failure to do so may result in fire, injury or damage to the unit.
- **DO NOT ALLOW CABLES TO BECOME ENTANGLED IN SURROUNDING OBJECTS.** Arrange wiring and cables to prevent obstructions when driving. Cables or wiring that obstruct or hang up on places such as steering wheel, brake pedals, etc. can be extremely hazardous.
- **DO NOT DAMAGE VEHICLE SYSTEMS OR WIRING WHEN DRILLING HOLES.** When drilling holes in the chassis for installation, take precautions so as not to contact, puncture or obstruct brake lines, fuel lines, fuel tanks, electrical wiring, etc. Failure to take such precautions may result in fire or an accident.
- **DO NOT UTILIZE OR CONNECT TO ANY PART OF VEHICLE SAFETY SYSTEMS.** Bolts, nuts or wires used in the brake, airbag, steering or any other safety-related systems or fuel tanks should NEVER be used for mounting, power or ground connections. Using such parts may disable control of the vehicle or result in fire.

CAUTION

- **STOP USE IMMEDIATELY IF A PROBLEM OCCURS.** Failure to do so may result in personal injury or damage to the product. Return it to your authorized Wävttech dealer.
- **HAVE AN EXPERT DO THE WIRING AND INSTALLATION.** This unit requires special technical skill and experience for wiring and installation. To insure safety and proper function, always contact the authorized dealer where you purchased the product to have it done professionally.
- **INSTALL THE UNIT SECURELY WITH SPECIFIED PARTS.** Be sure to use only the included parts and specified installation accessories (not included). Use of other than designated parts may damage this unit. Install the unit securely so that it will not come loose during a collision or sudden jolt.
- **ROUTE WIRING AWAY FROM SHARP EDGES AND MOVING PARTS.** Arrange cables and wiring away from sharp or pointed edges and avoid moving parts such as seat hinges or rails to prevent pinching or wear. Use loom protection where appropriate and always use a grommet for any wiring routed through metal.
- **NEVER RUN SYSTEM WIRING OUTSIDE OR UNDERNEATH THE VEHICLE.** All wiring must be routed, secured and protected inside the vehicle. Failure to do so may result in fire, injury or property damage.
- **INSTALL THE UNIT IN A DRY AND VENTILATED LOCATION.** Avoid mounting locations where the unit will likely be exposed to high moisture or heat without adequate ventilation. Moisture penetration or heat buildup may result in product failure. Always make sure the amplifier chassis temperature is safe before touching it.
- **REDUCE GAIN AND SOURCE VOLUME TO MINIMUM LEVELS FOR INITIAL SYSTEM TUNING.** Ensure amplifier power is off before connecting signal cables and follow proper system gain setting procedures. Failure to do so may result in damage to the amplifier and/or connected speakers.

Package Contents:



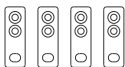
Spk Level
Input Terminals



Hex Wrenches



Mounting Tabs
(pre-attached)



Mounting Screws



Accessories Required for Installation (not included):

- RCA Cables or Signal Wire
- Power Supply & Speaker Wire
- In-line Fuse Holder w/60A Fuse
- Battery Ring Terminal
- Chassis Ground Terminal
- Wire Crimp Connectors
- Grommets & Loom

Introduction

Welcome to Wävtech, exceptional mobile audio products for audiophiles. Our products are engineered from the ground up to provide a truly remarkable listening experience with superior performance, sound quality and reliability. Built for the professional installer, our innovative features enable maximum application coverage with ultimate system flexibility. Whether retaining the factory receiver or utilizing an aftermarket source, our solutions are simply the best available for unlimited sound system upgrades.

Features:

- 4/3/2-Channel Bridgeable
- Differential Balanced Inputs
- Dual Input Range with Ideal Gain Structure
- Variable Gain Adjustments with Clip LEDs
- Variable -12dB/oct. HP/LP Filters
- Independent Input Channel Select
- 2-way Summing with +/-6dB Level Trim Adjust
- Parametric EQ & Subsonic Filter (CH3/4)
- Remote Level Control Ready (CH3/4)
- Auto Turn-On via DC-Offset and Audio Detect
- Stop-Start Vehicle Compatible
- OEM Load Detect System Compatible
- Active Rollback Thermal Management
- Panel Mount RCA Inputs with Bal/Unbal Select
- Locking Detachable Spk Level Input Terminals
- 4AWG Insert Power/Ground Terminals
- 12AWG Insert Speaker Output Terminals
- Compact Chassis w/Detachable Mounting Tabs

Input Panel Connections & Settings

1 Auto Turn-On Detect Jumpers:

By default, the amplifier is set to detect both DC-offset and audio signals for turning itself on/off automatically. These jumpers allow either turn-on mode to be defeated independently or to bypass both modes when a switched +12V trigger is available and connected to the remote turn-on (REM) terminal.

2 Load Jumpers: Each speaker level input channel has built-in loading to satisfy most OEM load detect systems. These internal loading circuits can be bypassed (OFF) for channels where no loading is required, such as when a speaker is still directly connected to the source.

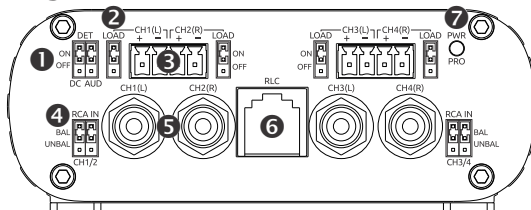
3 Speaker Level Input Terminals: For up to four channels of speaker level input connections to the source. When set to the 20V input range (default), audio signal from 1-20Vrms will produce up to full power output from maximum to minimum gain. For factory amplifiers with more than 20Vrms output signal or if volume range is not sufficient with gains set at minimum, select the 40V input range, which will reduce the input sensitivity by half for signals up to 40Vrms.

4 RCA Input Bal/Unbal Jumpers: These jumpers select the RCA input configuration between balanced (default) and unbalanced. Unbalanced connects the RCA shield to ground reference, which may be useful in eliminating noise under certain source or system conditions. Both jumpers (left/right) should be moved together if changed.

5 RCA Inputs: For up to four channels of RCA line level input connections to the source. When set to the 5V input range, audio signal from 0.2-5Vrms will produce up to full power output from maximum to minimum gain. For sources with more than 5Vrms output signal or if volume range is not sufficient with gains at minimum, select the 10V input range, which will reduce the input sensitivity by half for signals up to 10Vrms. Use quality interconnects to ensure stable connection and minimize the possibility for induced noise.

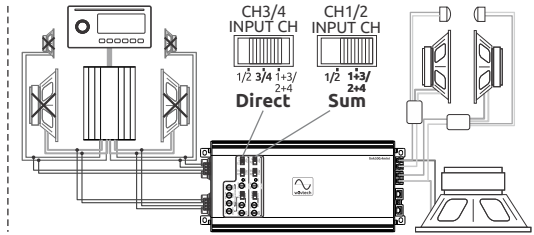
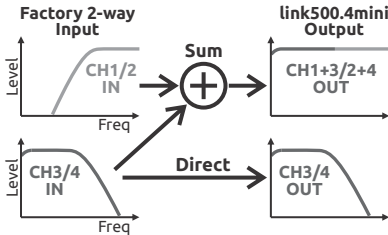
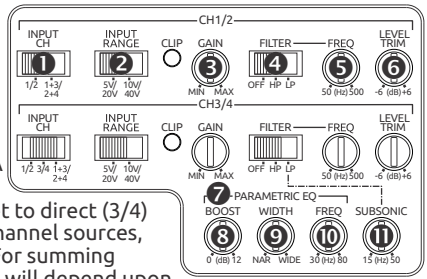
6 Remote Level Control Jack: This RJ45 jack is for connecting the optional linkRC to the main unit for remote adjustment of CH3/4 output volume from 0dB (max) to -30dB (min).

7 Power/Protect Indicator: This LED will illuminate green when the amplifier is powered on and operating normally. If a shutdown occurs due to a detected fault, the LED will turn red. Once the fault has been corrected or the condition has cleared, the amplifier will automatically recover, indicated by the LED changing back to green.



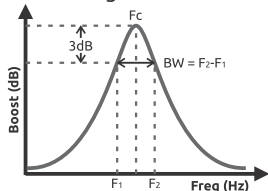
Top Panel Controls

1 Input Channel: These switches are for selecting which input channels feed each channel pair's pre-amp and output stages. CH1/2 can be set to direct (1/2) or sum (1+3/2+4), while CH3/4 can be set to copy (1/2), direct (3/4) or sum (1+3/2+4). For 2-channel sources, connect the source to CH1/2's RCA or speaker level inputs and set CH3/4's input select to copy (1/2), or use y-adapters/jumper wires and set to direct (3/4) to allow CH3/4's gain to be used separately. For 4-channel sources, set CH1/2 to direct (1/2) and CH3/4 to direct (3/4). For summing factory 2-way signals, there are several options that will depend upon the connected speaker system. Example: For a 3-channel system from a factory 2-way source, CH1/2 would be set to sum (1+3/2+4) for full-range output to the main speakers, while CH3/4 would be set to direct (3/4) to pass only the factory woofer signal to drive the subwoofer:



- 2 Input Sensitivity Range:** Two input sensitivity ranges are provided for each channel pair to optimize source volume range while minimizing the gain required to achieve full power output for best signal-to-noise. Choose the input range that will accommodate the source's maximum output signal voltage without excessive clipping, 5V or 10V for low level (RCA) inputs, and 20V or 40V for speaker level inputs.
- 3 Gain Adjustment with Clip LED:** Each channel pair has a variable gain with corresponding clipping indicator, where the clip LED will dimly illuminate just before the onset of clipping and become fully bright when the amplifier has reached full power output at clipping. When summing, these gain adjustments should be used for matching relative levels so that the combined signals sum as close to flat as possible or to the desired frequency response. Note that CH3/4's gain adjustment will be bypassed if its input select switch is set to copy (1/2).
- 4 Filter Mode:** This switch selects the filter mode as either a high-pass (HP) or low-pass (LP) crossover, and is bypassed when set to OFF (default). For smaller full-range or component speakers, select HP mode to filter out lower frequencies below the chosen cut-off frequency. For midbass speakers or subwoofers, use the low-pass (LP) setting to filter out unwanted higher frequencies above the chosen cut-off frequency.
- 5 Filter Frequency:** When either the HP or LP filter mode is activated, this variable adjustment sets the filter's cut-off frequency (F_s) from 50Hz to 500Hz with a slope of -12dB/oct. Use this adjustment to optimize speaker or subwoofer frequency response to what they can effectively reproduce while minimizing the chance of being over-driven at maximum volume.
- 6 Level Trim:** When summing, and after setting gains and crossovers for appropriate frequency response, these adjustments allow the power output of CH1/2 and CH3/4 to be increased or decreased independently by up to +/-6dB for final volume balance between them while preserving the summing ratio established by the gains. See the 3-channel system summing example in 1 above, where CH1/2's level trim would usually be reduced to achieve desired bass overlap from CH3/4 at full volume. Note that increasing level trim of channels already at maximum power output will require re-adjusting gains lower to avoid clipping.

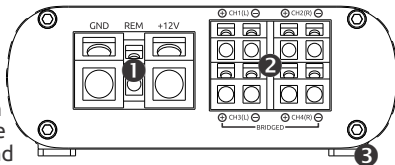
- 7 **Parametric EQ:** This section provides full adjustment over all parameters of a single EQ band, including boost, width and frequency. Unlike traditional bass boost, a parametric EQ provides the tuning flexibility required for differences between vehicles, subwoofers and enclosures.
- 8 **Boost:** This adjustment sets the amount of boost at the center frequency (F_c) of the parametric EQ band from 0dB up to +12dB. Note that adding boost may cause the output to clip or subwoofer to be over-driven. Readjust the gain, subsonic and low-pass filters as necessary to optimize bass response vs. maximum output and volume range.
- 9 **Width:** Also known as Q, width sets the bandwidth (BW) of the boost for the parametric EQ band. A wide setting will include more adjacent frequencies for a broad boost, while a narrow setting will only boost frequencies close to the chosen center frequency (F_c). The range of Q adjustment is 1.5 (wide) to 5 (narrow). To calculate the bandwidth between the -3dB points that are boosted by the EQ band, use the formula $BW = F_c/Q$.
- 10 **Frequency:** This adjustment allows the center frequency (F_c) of the parametric EQ band to be set between 30Hz and 80Hz. Note that boosted frequencies that overlap with the subsonic and low-pass filters will be attenuated.
- 11 **Subsonic Filter:** This adjustment sets the -3dB cut-off point (F_3) below which all frequencies are filtered out at up to -24dB/oct. Very low frequencies can waste amplifier power and damage subwoofers. This adjustment is especially important for ported enclosures to prevent over-excursion below the tuning frequency.



Power Supply & Output Panel Connections

1 Power Supply Terminal:

- **Ground (GND):** The ground terminal must be connected to a metal part of the vehicle with ground plane back to the main battery ground attachment point (a.k.a. chassis ground). This wire should be as short as possible, but no longer than 2ft (60cm), with minimum gauge of 8AWG. The ground wire should be terminated with a ground specific or ring terminal and securely bolted to the vehicle with star or lock washer and nut to prevent from coming loose. The chassis ground connection point should be scuffed to the bare metal.
- **Remote Turn-on (REM):** If the source unit has a remote output wire (+12V switched output), connect it to the REM terminal. If a remote lead is unavailable, the amplifier will automatically turn-on by detecting DC-offset or audio signal from the source. While auto turn-on works well in most applications, there may be some cases where a +12V trigger is preferable or necessary. Both detect functions are enabled by default, but can be individually defeated via the two jumpers located on the input panel.
- **Power (+12V):** The constant +12V power connection must be made at the vehicle's main battery, securely connected with a ring terminal and protected with an in-line fuse within 18in (45cm) from the positive battery terminal. The link500.4mini requires a 60A external in-line fuse (not included) and a minimum power wire gauge of 8AWG. Do not install the fuse until all other system connections have been made.

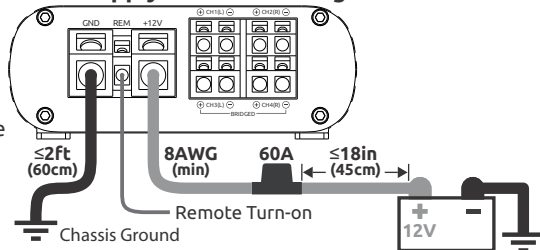


- 2 **Speaker Output Terminal:** Each (+) and (-) terminal pair per channel is for connecting the amplifier's output to speaker(s) or subwoofer(s). Make sure to observe correct polarity and total impedance per channel. The minimum nominal impedance is 2Ω per channel, or 4Ω for bridged connections.
- 3 **Mounting Tabs:** These mounting tabs are pre-attached and should be used to properly secure the amplifier with the included mounting screws to a solid mounting surface that is directly attached to the metal structure of the vehicle cabin. These tabs are removable if the unit can be safely secured by another method.

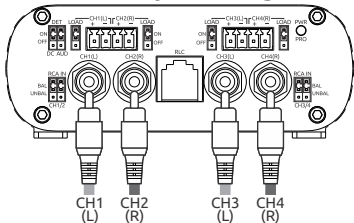
System Wiring

It is important to read this manual thoroughly before starting your installation and always plan accordingly. Before installing any Wävtech product, disconnect the negative (ground) wire from the vehicle's battery to avoid damage to the vehicle or yourself. Following all guidelines will ensure years of enjoyment with your Wävtech amplifier.

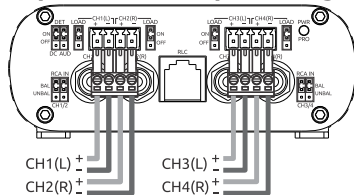
Power Supply Terminal Wiring:



RCA Input Wiring:



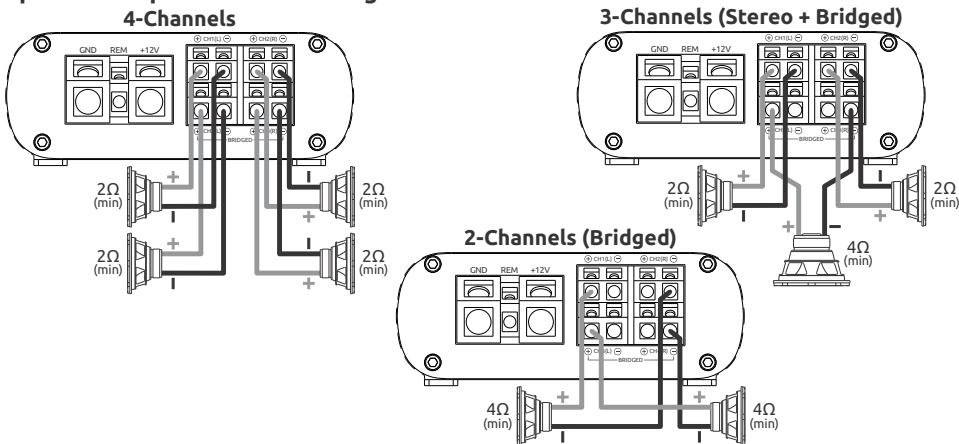
Speaker Level Input Wiring:



Notes:

- When using a 2-channel source for a 4ch or 3ch output configuration, connect it to CH1/2 inputs and set CH3/4's INPUT CH switch to copy (1/2). If separate gain control is desired for CH3/4, use RCA y-adapters or jumper wires to connect CH1/2 to CH3/4's inputs in parallel and set CH3/4's INPUT CH switch to direct (3/4).
- When using a 2-channel source for a bridged 2ch stereo output configuration, connect the source's left channel to both CH1 and CH2 inputs and the right channel to both CH3 and CH4 inputs using RCA y-adapters or jumper wires. Connect the bridged output from CH1/2 to the left speaker and CH3/4 to the right speaker as shown in the 2-Channels (Bridged) wiring diagram below.

Speaker Output Terminal Wiring:



Note: After checking all wiring and connections, make all initial settings and adjustments before turning on the amplifier to avoid damaging the connected speakers. Gains should always start at minimum with the appropriate input range selected for your aftermarket or OEM source's maximum output voltage. For smaller speakers, always activate the HP filter and set the cut-off frequency to protect them from being over-driven.

Specifications

link500.4mini

Power Output	14.4V, <1%THD+N	4Ω	75W RMS x 4
		2Ω	125W RMS x 4
		4Ω BTL	250W RMS x 2
S/N Ratio		1W, 1kHz, A-wtd	-78dBA
Frequency Response		Max Flat (+0/-1dB)	<10Hz to >28KHz
		Extended (+0/-3dB)	<10Hz to >43KHz
Input Impedance		RCA Input	20KΩ
		Spk Level Input	20KΩ / 20Ω
Input Channel Select		CH1/2	CH1/2, CH1+3/2+4
		CH3/4	CH1/2, CH3/4, CH1+3/2+4
Input Sensitivity	RCA Input	Low Range	200mV - 5V
		High Range	400mV - 10V
	Spk Level Input	Low Range	1V - 20V
		High Range	2V - 40V
Crossover	HPF / LPF	Slope	-12dB/oct.
		Frequency (F ₃)	50Hz - 500Hz
	Subsonic (CH3/4)	Slope	Up to -24dB/oct. @ 15Hz
		Frequency (F ₃)	15Hz - 50Hz
Level Trim		Boost/Cut	+/-6dB
Parametric EQ (CH3/4)		Boost	0dB to +12dB
		Width (Q)	1.5 - 5
		Frequency (F _c)	30Hz - 80Hz
Remote Level Control (w/optional linkRC)		Volume Range (CH3/4)	0dB to -30dB
Turn-On Threshold	Remote	via REM	2.6V
	DC-Offset	via Spk Input	2V
	Audio Signal	via RCA Input	<10mV/50mV (1kHz/100Hz)
		via Spk Input	<50mV/250mV (1kHz/100Hz)
Current Draw	Sleep Current		<2.5mA
	Idle Current		<1.3A
Fuse Rating	External (not included)		60A
Operational Voltage		Battery / DC Power Supply	
Protection	Thermal		Rollback / Auto-Recover
	Over-Voltage		Auto-Recover
	Under-Voltage		Auto-Recover
	Over-Current		Auto-Recover
	Short Circuit		Auto-Recover
Terminals	RCA Input		Panel Mount
	Speaker Level Input		16AWG, Insert/Plug
	Power Supply		4AWG, Insert
	Speaker Output		12AWG, Insert
Chassis Dimensions	HxWxL	w/o terminals, tabs	42 x 115 x 233mm
			1.65" x 4.53" x 9.17"
		incl. terminals, tabs	44 x 115 x 259mm
			1.73" x 4.53" x 10.2"

Note: All Specifications are subject to change without notice.

Warranty & Service Care

Wāvtech warrants this product to be free from defects in material and workmanship for a period of one (1) year when purchased from an authorized Wāvtech retailer within the United States. This warranty will be extended to a period of two (2) years when the installation is performed by an authorized Wāvtech retailer. A valid sales receipt is required to verify eligibility of purchase and installation.

This warranty is valid only to the original purchaser and is not transferrable to subsequent parties. This warranty is void if the product serial number has been altered or removed. Any applicable implied warranties are limited in duration to a period of express warranty as provided herein beginning with the date of the original purchase at retail, and no warranties, whether expressed or implied, shall apply to this product thereafter. Some states do not allow limitations on implied warranties, therefore these exclusions may not apply to you. This warranty gives you specific legal rights. You may also have other rights which vary from state to state.

If your product needs service, you should contact Wāvtech Customer Service to receive a Return Authorization (RA) Number. Any product received without an RA number will be returned to sender. Once your product is received and inspected by customer service, Wāvtech at its sole discretion, will repair or replace it with a new or remanufactured product at no charge. Damage caused by the following is not covered under warranty: accident, abuse, failure to follow instructions, misuse, modification, neglect, unauthorized repair or water damage. This warranty does not cover incidental or consequential damages. This warranty does not cover the cost of removing or reinstalling the product. Cosmetic damage and normal wear are not covered under warranty.

For Service within the United States:

Wāvtech Customer Service: (480) 454-7017
Monday – Friday, 8:30am to 5:00pm MST

Serial Number: _____
Installation Date: _____
Place of Purchase: _____

Important Notice for International Customers:

For products purchased outside the United States of America or its Territories, please contact your local distributor concerning specific procedures for your country's warranty policy. International purchases are not covered by Wāvtech, LLC.

Wāvtech[®]

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