



DIAMOND

HEX SERIES AMPLIFIERS

MULTI-CHANNELS
HX400.2/HX480.4/HX600.4/HX1200.5D



Owners Manual

ABOUT THE DIAMOND AUDIO EXPERIENCE

Congratulations, you have just purchased one of the finest mobile audio products on the market. Diamond Audio products represent the latest advances in electrical and acoustical technologies in sound reproduction for your vehicle. Diamond Audio products are designed, developed, and engineered in the USA using the latest innovative materials and components to provide the finest sound reproduction possible. Every Diamond Audio product has been verified and tested to ensure the best sounding and most reliable product on the market, if installed properly. Diamond Audio products will provide many years of the ultimate listening experience.

Please note that prolonged exposure to sound pressure levels in excess of 100dB can cause permanent hearing loss. Using Diamond Audio products can exceed that level so please exercise restraint in its operation in order to preserve your ability to enjoy its high fidelity sound for many years to come.

Diamond Audio recommends our products be professionally installed by an authorized Diamond Audio dealer to achieve the best possible system recommendation and installation. This will ensure a true Diamond Audio listening experience and sound you would expect from Diamond Audio products. With proper validation, using a Diamond Audio Retailer for installation, your newly purchased amplifier, Diamond Audio will extend the product warranty from one year to Two Years!!

Go ahead, Hear the Music

FEATURES

- Anodized Extruded Aluminum Heat Sink Provides Superior Thermal Performance
- 4-Layer PCB Board with Balanced Differential Inputs
- Full Range Class D IR Chipset
- "SNAP" Capacitors used Throughout the Circuit
- Audiophile Grade High Tolerance Components
- Spring Steel FET Clips Provide a Cleaner Board Design
- Illuminated Logo / Fully Concealed Mounting
- Output Clip Indicators for Precise Set Up
- Fine Tuned Fully Variable Crossovers and Phase Control
- Top Mounted Controls for Convenient Amplifier Adjustment

POWER RATINGS

	HX400.2	HX480.4	HX600.4	HX1200.5D
TOTAL RMS POWER	400 W RMS	480 W RMS	600 W RMS	1200 W RMS
RMS Power (4 Ω)	200 W X 2	120 W X 4	160 W X 4	100 W X 4/480 X 1
RMS Power (2 Ω)	350 W X 2	185 W X 4	250 W X 4	150 W X 4/800 X 1
Bridged (mono 4 Ω)	700 X 1	370 X 2	500 X 2	480 W X 1 (sub output)
Bridged (mono 2 Ω)	N/A	N/A	N/A	800 W X 1 (sub output)
Bridged (stereo 4 Ω)	N/A	370 W X 2	500 W X 2	300 W X 2 (4Ω)/800 X 1 (2 Ω)

WARNING: Prolonged exposure to sound pressure levels in excess of 100dB can cause permanent hearing loss. Diamond Audio amplifiers can exceed that level so please exercise restraint when listening and enjoying your new amplifier.

GENERAL PRECAUTIONS

- This unit is designed for negative ground 12V DC operation only.
- Total system impedance must NOT be less than 2ohms, stereo configuration, or 2 ohm mono on HX1200.5D sub channel
- Avoid installing the unit where:
 - It would be subject to high temperatures, such as from direct sunlight or hot air from the heater.
 - It would be exposed to rain or moisture.
 - It would be subject to dust or dirt.
- Do not cover the unit with carpet or wires.
- Do not use the unit with a weak auto battery. Optimum performance depends on a normal battery supply voltage.
- For safety reasons, keep the volume of your car audio system moderate while driving your vehicle so that you can still hear normal traffic sounds outside your car.
- There is NO speaker level input connector, you can cut RCA's and solder the wires and connect directly thru low level input(RCA)

MOUNTING PRECAUTIONS

Although Diamond Audio amplifiers incorporate heat sinks and protection circuits, mounting the amplifier in a tight space without any air movement can still damage internal circuitry over time. Choose a location that provides adequate ventilation around the amplifier. For easy system set-up, mount the amplifier so the side panel controls will be accessible after installation. To increase thermal run times on low impedance loads, an additional fan is recommended, remember any moving air across the amplifier will reduce heat.

In addition, observe the following precautions:

1. Using a felt pen mark the mounting hole locations.
2. Mounting the amplifier on carpet will significantly reduce air flow, resulting in reduced thermal run times.
3. Mount the amplifier on a solid surface. Avoid mounting to sub woofer enclosures or areas prone to vibration. Do not install the amplifier on plastic or other combustible materials.
4. Prior to mounting the amplifier, make sure not to cut or drill into the fuel tank, fuel lines, brake lines (under chassis) or electrical wiring.

WIRING PRECAUTIONS

1. Before installation, make sure the source unit power switch is in the OFF position.
2. Disconnect the negative (-) lead of the battery before making any power connections.
3. When making connections, be sure that each one is clean and secure. Insulate all of your connections. Failure to do so may damage your equipment.
4. A secure clean ground connection is critical to the performance of your amplifier. Connect the ground directly to the car chassis to minimize resistance and avoid any noise problems.
5. Add an external fuse on the amplifier's positive (+) power lead and connect it as close as possible to the vehicle's (+) battery terminal. Use a rating that equals the total current consumption at full output of all amplifiers in the system. This external fuse will protect the vehicle from short circuits that can cause a fire.

VEHICLE ELECTRICAL SYSTEM

Amplifiers (regardless of brand name) will put a load on the vehicles battery and charging system. Diamond Audio recommends checking your alternator and battery condition prior to installation to ensure that the electrical system has enough capacity to handle the increased load of your stereo system. Original equipment electrical systems, which are in good condition, should be able to handle the extra load of any Diamond Audio amplifier without problems, ALTHOUGH battery and alternator life can be reduced depending on your individual listening habits. To maximize the performance of your amplifier, we suggest the use of a power stiffening capacitor (1 Farad per 1,000W)

WARNING:

Avoid running power wires near the low level input cables, antenna, power leads, sensitive equipment or harnesses. The power wires carry substantial current and could radiate noise into the audio system through the audio cables.

1. Plan the wire routing as described in the "Importance of Pre-Planning" section. Keep RCA cables close together but isolated from the amplifier's power cables and any high power auto accessories, especially electric motors. This is done to prevent coupling the noise from radiated electrical fields into the audio signal. When feeding the wires through the firewall or any metal barrier, protect them with plastic or rubber grommets to prevent short circuits. Leave the wires long at this point to adjust for a precise fit at a later time.

2. Prepare the power wire for attachment to the amplifier by stripping 5/8 inch (15.9mm) of insulation from the end of the wire. Insert the bare wire into the B+ terminal And tighten the set screw to secure the cable in place.

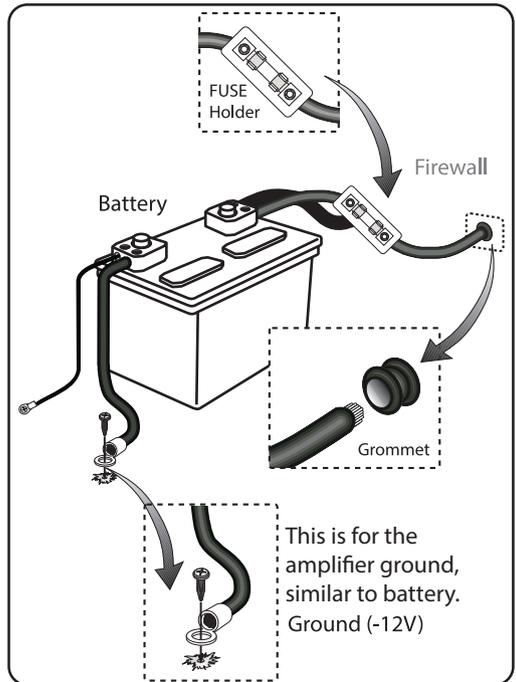
WARNING:

The B+ cable **MUST** be fused 18" or less from the vehicle's positive battery post. Choose a location to install a waterproof fuseholder under the hood and ensure connections are water tight. If you do not use the appropriate fuseholder, the connection will eventually suffer corrosion from moisture and heat.

3. Trim the power cable within 18 inches (45.7mm) of the positive battery post and splice in a in-line fuse holder. DO NOT install the fuse at this time.

4. Strip 1/2 inch (12.7mm) from the battery end of the power cable. Crimp and solder a large ring terminal to the cable. Connect the ring terminal to the positive (+) battery post.

FUSE WIRE DIAGRAM

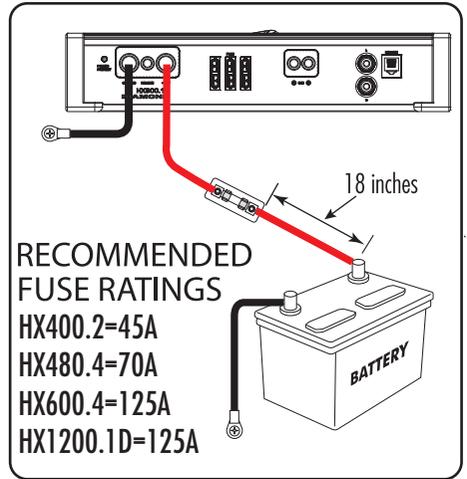


5. Prepare the ground wire for attachment to the amplifier by stripping 5/8" of insulation from the end of the wire. Always use a wire of the same gauge as the power connection, never smaller. Insert the bare wire into the GND terminal and tighten the set screw to secure the cable in place. Prepare the chassis ground by scraping any paint from the metal surface and thoroughly clean the area of all dirt and grease. Strip the other end of the wire, crimp and solder a ring connector. Fasten the cable to the chassis using a non-anodized screw with a star washer and a nut.

WARNING: It is important to upgrade the ground connection between the negative (-) battery post and the vehicle body or chassis to achieve optimum electrical performance.

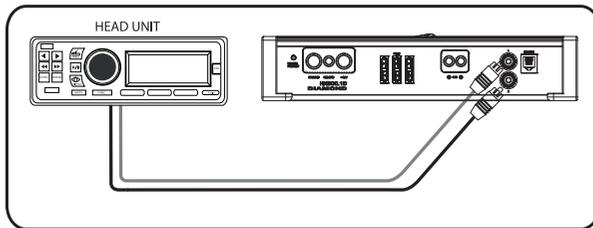
6. Prepare the REM turn-on wire for attachment to the amplifier by stripping 5/8 inch (15.9mm) of insulation from the end of the wire. Insert the bare wire into the REM terminal and tighten the set screw to secure the wire in place. Connect the other end of the REM wire to a switched 12 volt positive source. The switched voltage is usually taken from the source unit's remote amp turn on lead. If the source unit does not have this output available, the recommended solution is to wire to an accessory terminal in the car's fuse block using a relay to isolate the amplifier from the vehicles accessory circuit. This however will turn the amplifier on and off with the ignition key, regardless of whether the car stereo is on or off.

FUSE CONNECTION DIAGRAM



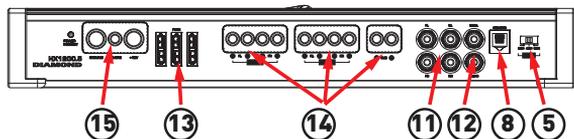
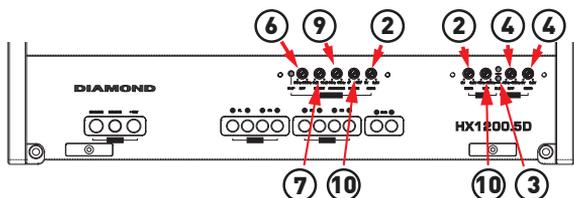
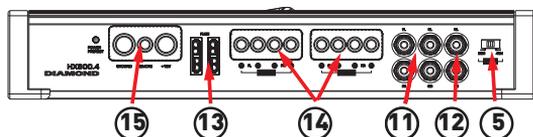
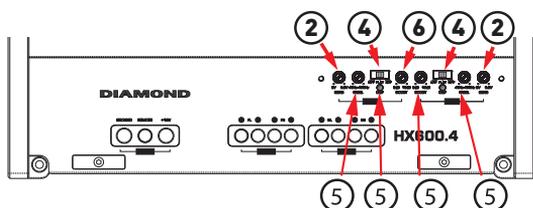
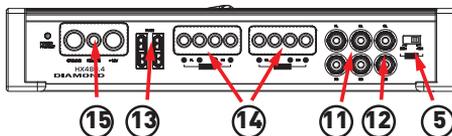
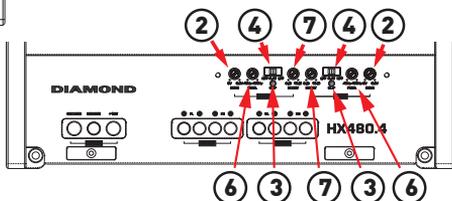
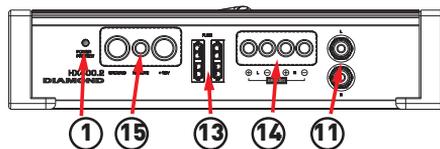
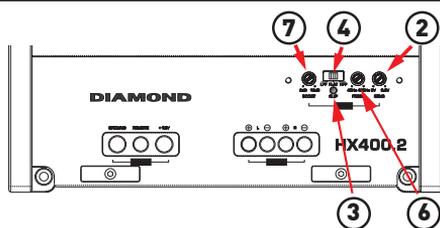
7. Securely mount the amplifier to the vehicle or amp rack. Be careful not to mount the amplifier on cardboard or plastic panels. Doing so may enable the screws to pull out from the panel due to road vibration or sudden vehicle stops.
8. Connect from source signal by connecting the RCA audio cables to the input jacks at the amplifier.

RCA CONNECTION DIAGRAM



9. Connect the car speakers. Speakers impedance should never be less than 2 Ohms stereo, 4 Ohms bridged (HX1200.5D sub channel is stable into 2 ohms). For most applications 18 gauge wire is adequate for the speaker leads. For leads in excess of ten feet, 16 gauge wire is recommended. Strip the speaker wires 1/2" (12.7mm) and insert into the speaker terminal block, then tighten the set screw to secure into place. When wiring the speakers, pay careful attention to the polarity of the terminals on the speakers and make certain they correspond to the polarity on the amplifier. DO NOT chassis ground any of the speaker leads as unstable operation or damage to the amplifier and/or speaker may result.

INSTALLATION

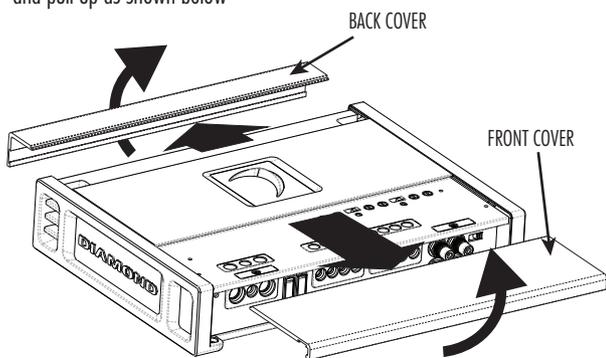


INSTALLATION

- ① Power/OverLoad Protection System LED's** - These lights indicate when the amplifier is powered up normally and when there is a protection fault. The "OPS" LED is illuminated when there is a problem with your amplifier. Please contact your authorized Diamond Audio dealer or call our technical support.
- ② Level Adjustment(Input Gain)** - This control matches the preamp stage of the Diamond Audio amplifier to your source unit. This is NOT a volume control. The range is between approximately 200mV (0.2V) to 5V.
- ③ Clipping Indicator LED's** - These lights indicate when the amplifier is "clipping" (going into distortion) This could be caused by over driving the input section and/or setting the input "gain" control to high. Remember that GAIN is NOT power output.
- ④ Crossover Selection Switch** - This switch allows you to select the crossover. Use High Pass for midrange or high frequency speakers. Use Low Pass for subwoofers. In the FLAT position, neither crossover adjustment knob has an affect and all speakers will receive the full frequency range.
- ⑤ Input Configuration** - This switch parallels the input circuit if you are using a single stereo pair of outputs from your headunit or from an auxiliary device (like a Smartphone, etc). The 5 channel model (HX1200.5D) is set up to accept 2/4/and 5 channels of input.
- ⑥ Frequency Adjustment** - Use this adjustment to select the crossover point. Remember that you must select the High Pass position (HPF) Low Pass (LPF) or Full Range (FULL) from the Crossover Selection Switch first. The range of adjustment is limited between 40-400 Hz, for BOTH HPF and LPF (and 30-300 Hz LPF on HX1200.5D sub channel). Full Range is no filter, all pass frequency.
- ⑦ Bass Boost**- This control adds 0 to +18dB of boost at 45Hz. Be cautious when adding boost to some subwoofer systems as they may not be able to handle the additional low frequency boost. In the 0dB position, no bass boost is added.
- ⑧ Remote Level Control** - This port is for the remote level control (included with HX1200.5D). The control is intended to allow the user to control the level of gain up to the maximum adjustment level set on the amplifier. The control does not add additional boost, it only attenuates the setting that is fixed at the amplifier's control panel.
- ⑨ Sub-Sonic Adjustment** - This control allows you to remove the unwanted sub-sonic frequencies below the tuning frequency of a ported enclosure. This helps to protect the woofer from over excursion.
- ⑩ Variable Phase** - This control gives the installer a unique feature that allows the variable adjustment of phase (0 to 180 degrees) to compensate for subwoofer placement. Allowing the subwoofer to sound like it's placed in the front of the vehicle instead of the trunk.
- ⑪ Line Input(RCA)** - The RCA jacks allow for a normal Left and Right channel signal input. Simply connect to the source unit using RCA type audio cables, keeping them away from power wiring wherever possible to reduce risk of noise.
- ⑫ Line Out (RCA)**- This output allows for easy connection of signal into multiple amplifiers without the use of "Y-adaptors" (Only available on HX480.4/HX600.4)
- ⑬ Power Fuses** - Standard automotive type ATC/ATO fuses are used on Diamond Audio amplifiers. Always replace with the correct fuse size. Never insert fuses of higher values. Doing so will void the warranty of your Diamond Audio amplifier. Also include a main fuse at the connection to the vehicle battery within 18 inches of the positive battery post. It is also important to upgrade the connection between the negative battery post and the chassis of the vehicle. This greatly reduces possibilities of weak electrical "links" in the circuit.
- ⑭ Speaker Output Terminals** - Connect your speakers to these terminals. Stereo connections are connected as labeled. Bridged connections use the LEFT + and RIGHT - as the two connections. The 4 and 5 channel amplifiers will perform into 2 Ohm stereo loads or 4 Ohm bridged loads. HX1200.5D has a sub output that is designed for 2 ohm loads This will run 2 ohms mono, BUT NOT 1 ohm mono!
- ⑮ Power Input Connections** - These connections are for input power, chassis ground, and remote turn-on. Use a minimum of 8 gauge wiring for power and ground connections, 4 Gauge is recommended. Be sure any wiring that passes through metal (like firewalls) has a grommet!

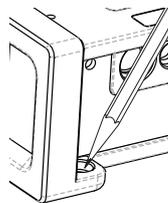
MOUNTING

All Diamond Audio HEX amplifiers are designed with hidden mounting . To accomplish this the front and rear aluminum covers are magnetically attached for easy access. To start the installation/mounting process simply remove the back panel by pushing towards the rear and pulling up at the same time. The front process is similar but push/pull towards the front and pull up as shown below

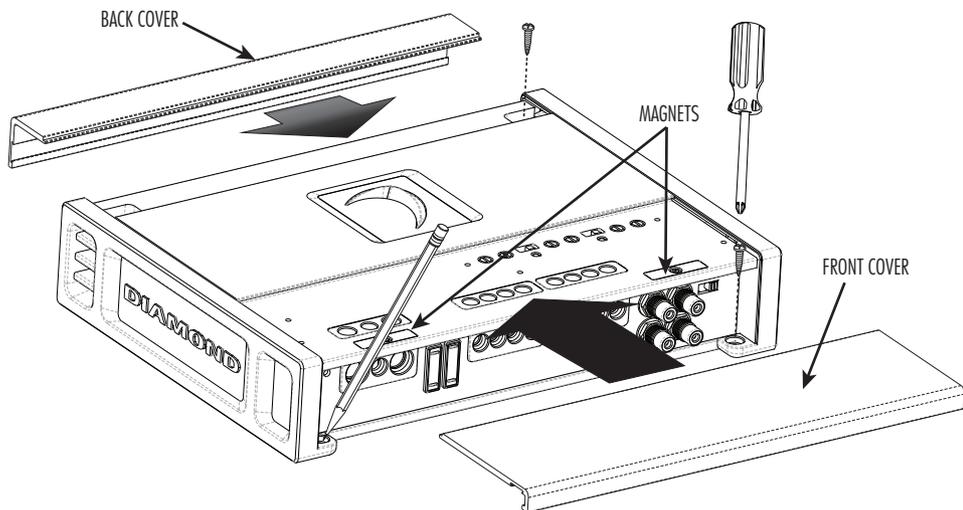


Mark Amplifier Mounting Holes:

Once the covers are removed, use a pencil and mark the mounting locations. Both front and rear. Once marked, drill $1/8''$ holes for the included mounting screws. (see below)



Once the amplifier(s) is mounted input signal cables and speaker/power wires are connected, adjust the input levels and crossover settings (according to page 9) After all the settings are done, THEN put the front and rear cosmetic covers back on. As shown below.



NOTE: These covers are both a friction fit as well as magnetic. There is a small "lip" on the front cover that clamps the front cover on tightly. Sometimes it can be somewhat hard to remove. Be careful, but forceful.

SET UP

Placing the x-over switch in the FULL position sets the amplifier to Full Range. This setting allows ALL frequencies to pass to the speakers. Placing the switch in the HPF or LPF position activates the 12dB crossover. When the switch is set to HPF(High-Pass) or LPF (Low-Pass) the crossover adjustable is from 50-250 Hz (40-250 LPF on DE900.5D).

Placing the switch in the HPF position sets the amplifier to the High Pass Filter mode, enabling frequencies above the cutoff point to pass. For a full range speaker system begin tuning with the frequency set between 50Hz and 80Hz.

Placing the switch in the LPF position sets the amplifier to the Low Pass Filter mode, enabling frequencies below the cutoff point to pass. For a subwoofer system begin tuning with the frequency set between 60Hz and 100Hz.

To adjust the gain setting, turn the amplifier gains all the way down (counterclockwise). If using a remote level control plug the level control into the amplifier and turn it to the "MAX" position. Next turn the source unit volume up to almost full volume (usually about 2/3rds of the way up) or until the output starts to distort on an oscilloscope. This will be NEARLY full volume on most source units, perhaps one or two "clicks" down from maximum volume. Next, increase the amplifier gain setting until adequate volume is achieved, or until distortion is audible and then turn it down a bit until the distortion is inaudible.

NOTE:

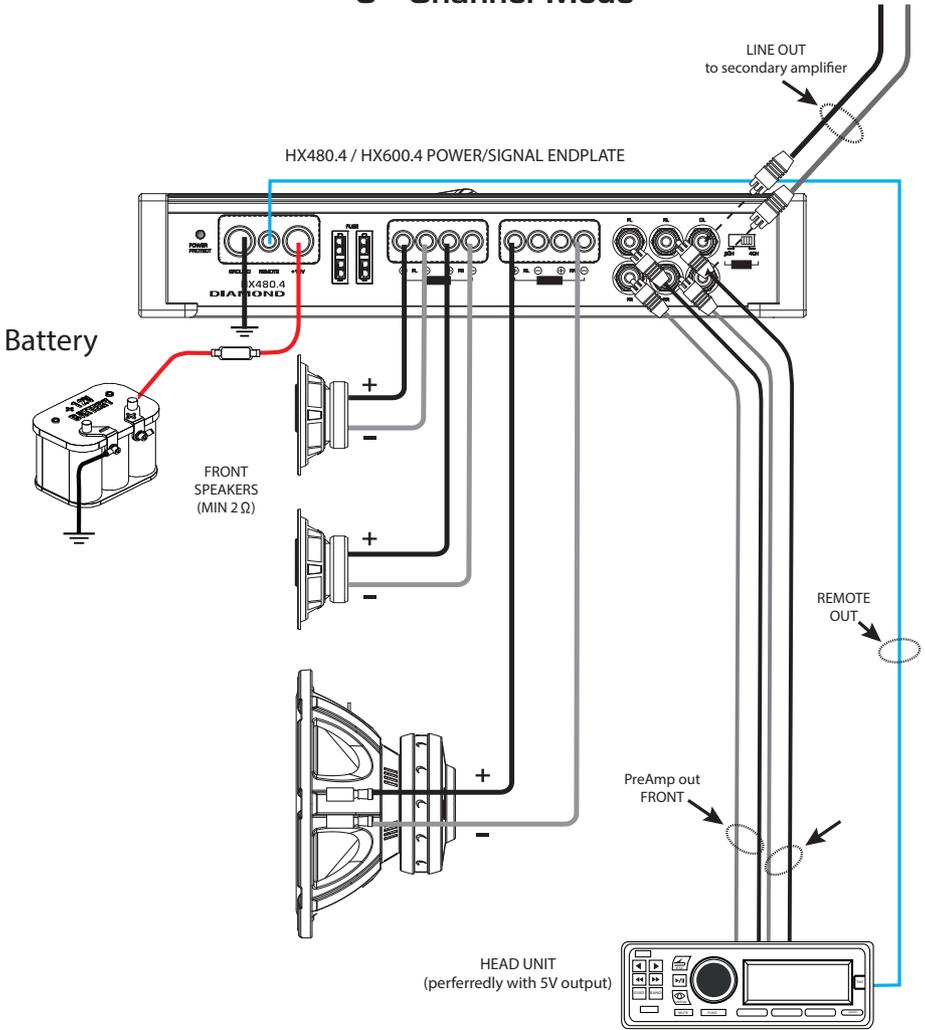
Ideal signal to noise and dynamic range are achieved with the gain at minimum (5V setting). Most users find adequate gain and volume is achieved at less than halfway in the adjustment range. Avoid setting the amplifier gain very high as noise and distortion will increase significantly. For a more in depth level setting (gain adjustment procedure), visit the Diamond Audio website.

The HPF or LPF crossover adjustment can now be fine tuned. If you are using the amplifier in a HPF configuration and would like the system to be a little bit louder you can increase the HP Filter frequency and reset the "Gain" of the amplifier. Raising the HPF frequency up to high however will cause a loss of mid range and bass. If you are using the amplifier in a LPF filter configuration and you hear voice or vocals coming from your subwoofer system you can turn the LPF filter frequency down (lower).

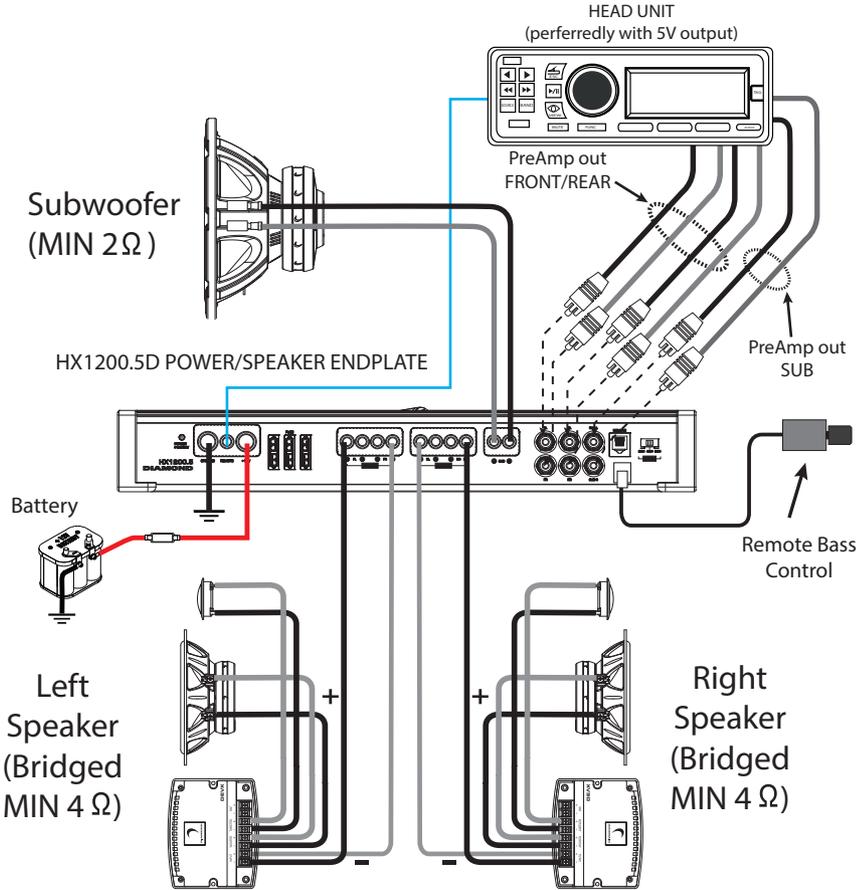
After setting the input gain adjustment and crossover, you may choose to add a small amount of "Bass EQ" in the low frequency region. Remember that the Bass EQ feature will not fix a poorly designed subwoofer enclosure or subwoofers that didn't sound good to begin with. Tuning below 32Hz (on your sub enclosure) is a BAD idea! Lower is NOT always better!!

1. Make sure any bass EQ or low frequency equalization from the source unit is set to OFF or FLAT.
2. While playing the same musical selections used during the gain setting process, slowly increase the level of the Bass EQ. You should be able to notice a obvious change between 0 and +18dB. If you do not notice much difference, then it will not serve any benefit to increase the boost further.
3. If the boost has audible benefits without adding appreciable distortion, find a level that suits your taste. Remember: it's much easier to construct the right subwoofer enclosure for your listening preferences than relying on a bass boost control to do the job!

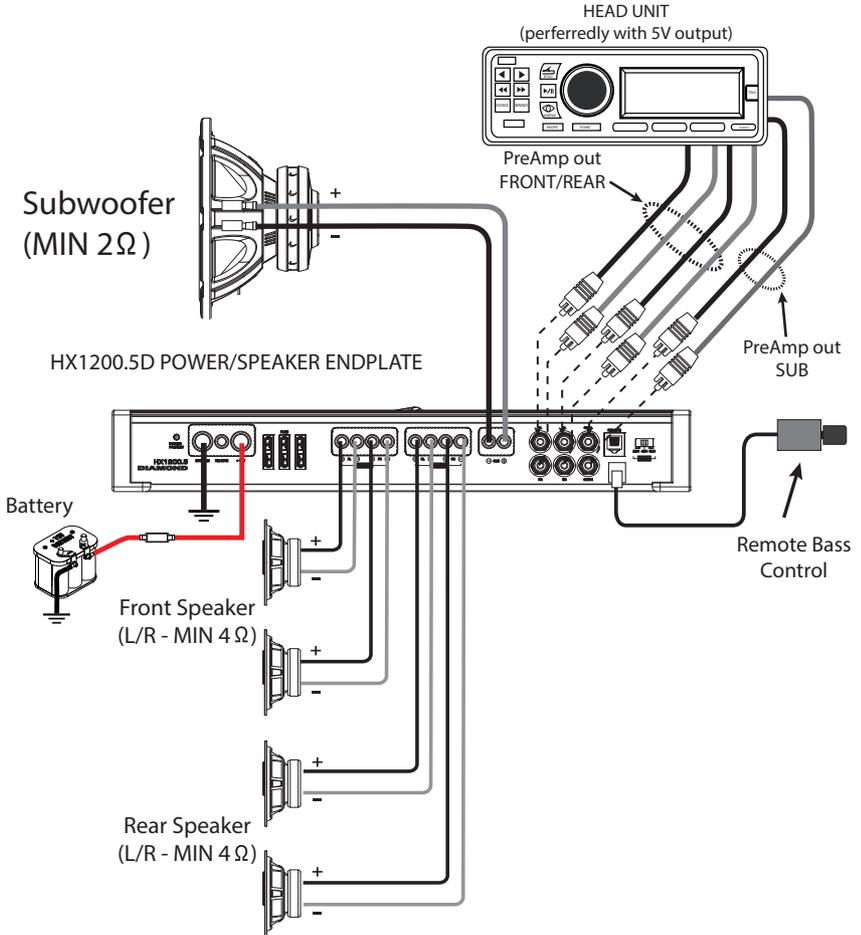
HX480.4/HX600.4 3 - Channel Mode



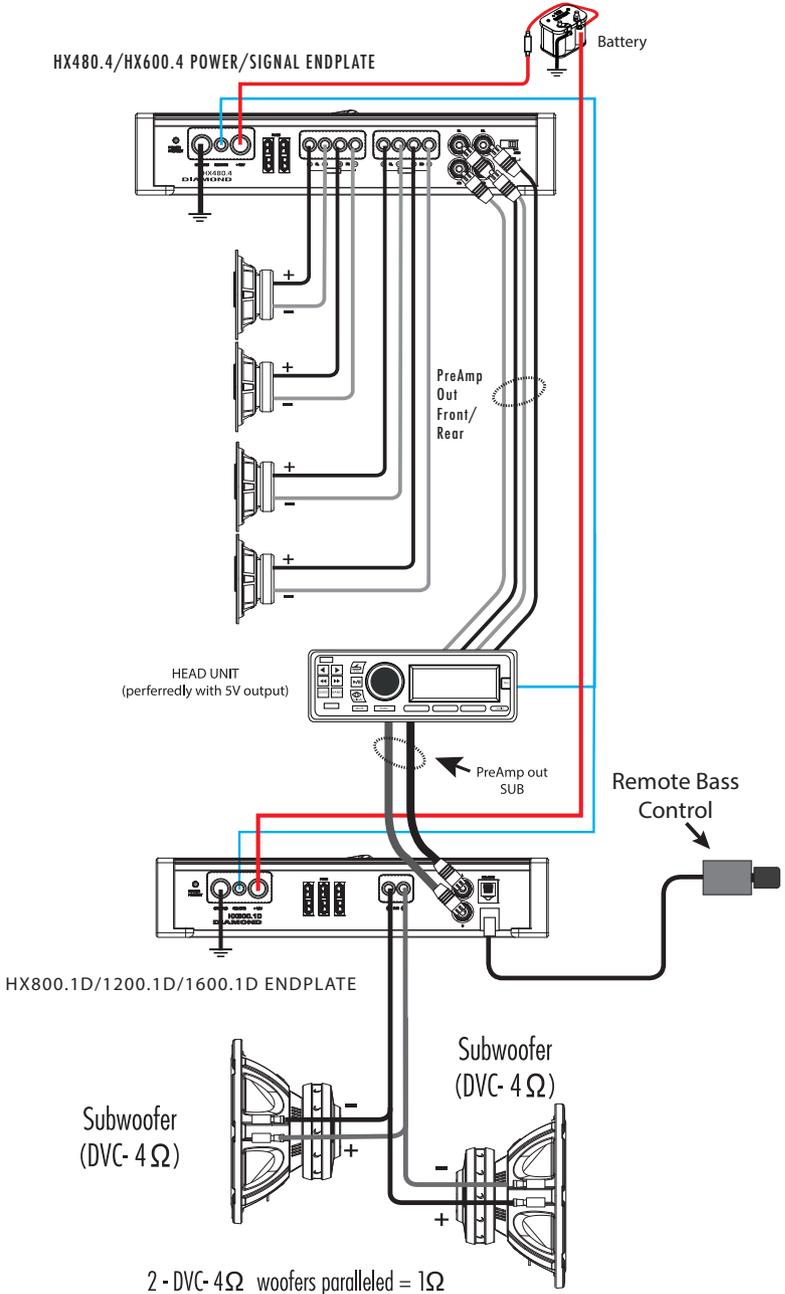
HX1200.5D 3 - Channel System Setup Front (4 channels bridged MONO/stereo)/Subwoofer



HX1200.5D - Typical 5 Channel System Setup One (1) Amplifier - Front/Rear/Sub



DIAMOND HEX COMPLETE 5-CHANNEL SYSTEM
HX480.4/HX600.4 (4-CH) & HX800.1D/1200.1D/1600.1D (1-CH)



PRODUCT SPECIFICATIONS

RMS Power Rating	HX400.2	HX480.4	HX600.4	HX1200.5D
RMS Power (4 Ω)	200 W X 2	120 W X 4	160 W X 4	100 W X 4 / 480 X 1
RMS Power (2 Ω)	350 W X 2	185 W X 4	250 W X 4	150 W X 4 / 800 X 1
Bridged (mono 4 Ω)	700 W X 1	370 W X 2	500 W X 2	480 W X 1 (sub output)
Bridged (mono 2 Ω)	N/A	N/A	N/A	800 W X 1 (sub output)
Bridged (stereo 4 Ω)	N/A	370 W X 2	500 W X 2	300 W X 2 (4 Ω) / 800 X 1 (2 Ω)
Type				
Topology	Full Range Class D			
Power Supply				
Power Supply	Full PWM	Full PWM	Full PWM	Full PWM
Power Supply Threshold	10.0VDC - 17.0VDC	10.0VDC - 17.0VDC	10.0VDC - 17.0VDC	10.0VDC - 17.0VDC
Idle Current	(0.7A)	(0.7A)	(0.7A)	(0.7A)
Distortion				
THD 4 (1KHz @4Ω)	0.06%	0.06%	0.06%	0.06%
S/N Ratio (A weighted @1W)	-80dBA	-80dBA	-80dBA	-80dBA
S/N Ratio (A weighted @ FP)	-95dBA	-95dBA	-95dBA	-95dBA
Input Sensitivity				
Low Input Level	200mV - 5.0V	200mV - 5.0V	200mV - 5.0V	200mV - 5.0V
High Input Level	N/A	N/A	N/A	N/A
Input Impedance				
Low Input Level	20 KΩ	20 KΩ	20 KΩ	20 KΩ
High Input Level	N/A	N/A	N/A	N/A
Output Stage				
Output Impedance	0.011 Ω	0.011 Ω	0.011 Ω	0.0297 Ω
Damping Factor (50Hz @ 4Ω)	>250	>250	>250	>250
Bandwidth (-3dB)	10Hz-35KHz	10Hz-35KHz	10Hz-35KHz	10Hz-35KHz
Crossover (-24 dB/Oct)				Crossover (-12/24 dB/Oct)
Variable High-Pass	40Hz - 400Hz	40Hz - 400Hz	40Hz - 400Hz	40Hz - 400Hz (-12dB Ch 1/2/3/4)
Variable Low-Pass	40Hz - 400Hz	40Hz - 400Hz	40Hz - 400Hz	30Hz - 300Hz (-12dB Ch 5)
Variable Sub-Sonic	N/A	N/A	N/A	10-55Hz@18dB
Fuse Ratings				
ATC	25A X 2	25A X 2	25A X 2	40A X 2
Dimensions				
LxWxH (inches)	8.75" x 6.8" x 2"	9.92" x 7.67" x 2"	11.9" x 7.67" x 2"	14.25" x 7.67" x 2"
LxWxH (mm)	222 x 195 x 51.5	252 x 195 x 51.5	302 x 195 x 51.5	362 x 195 x 51.5

LIMITED WARRANTY STATEMENT

Diamond Audio Technologies (DAT), a division of CV & DA Holdings Incorporated, warrants this product to be free from defects in material and workmanship for a period of one (1) year from the original date of purchase, provided it was purchased from an authorized DAT retailer within the United States. Product warranty period starts at the date of purchase or one year past the manufacture date whichever is first. However, upon purchase and completion of the on-line registration and installation by an authorized DAT dealer your warranty period will be extended to two (2) years. This warranty extension offer will only be recognized upon completion of the on-line registration of your product within thirty (30) days of the date of purchase.

THIS WARRANTY IS NOT TRANSFERABLE AND APPLIES ONLY TO THE ORIGINAL PURCHASER OF THIS PRODUCT IN ITS ORIGINAL INSTALLATION. Original purchaser must reside in the United States and be able to provide proof of purchase and installation with the sales receipt and completion of online registration from the authorized DAT retailer that sold and installed the product.

Should a manufacturing defect occur during above said warranty period, DAT will replace or repair the defective product with a product of the same or equivalent value and performance, at DAT's discretion.

Damage or failure caused by any of the following is not covered under this warranty policy: negligence, improper use, abuse, product modification, unauthorized repair attempts, accident, acts of God, misrepresentations by DAT retailers, and improper/inadequate packaging during return shipping.

Warranty is void if serial numbers have been removed, altered or defaced.

HOW TO OBTAIN WARRANTY SERVICE

In the event a DAT product should require service, you should visit the authorized DAT retailer you purchased the product from and they can expedite your claim. All claims must fall into the guidelines listed above and be accompanied by a copy of the original sales and installation receipt from that authorized DAT retailer.

Product returned for warranty service must be freight-prepaid, properly packaged and clearly marked with the Return Authorization (RA) number issued by DAT. Any product returned to DAT that is improperly packaged, does not have a RA number clearly marked on the package, or never received a RA number may be refused upon delivery. DAT does not assume responsibility for lost or misdirected product.

Repair or replacement under this warranty is the exclusive remedy of the consumer. DAT shall not be liable for any incidental or consequential damages for breach of any expressed or implied warranty on this product. Some states do not allow the exclusion or limitation of incidental or consequential damages, or allow limitations on how long an implied warranty lasts, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights that may vary from state to state.

Customers outside the United States should contact their local sales office to obtain information on pricing, exchange unit availability, instructions, service and warranty/non-warranty replacement or repair.

Diamond Audio Technologies

1225 E.7th ST

LOS ANGELES, CA 90021

Tel: 213-261-4161

Fax: 213-947-4767

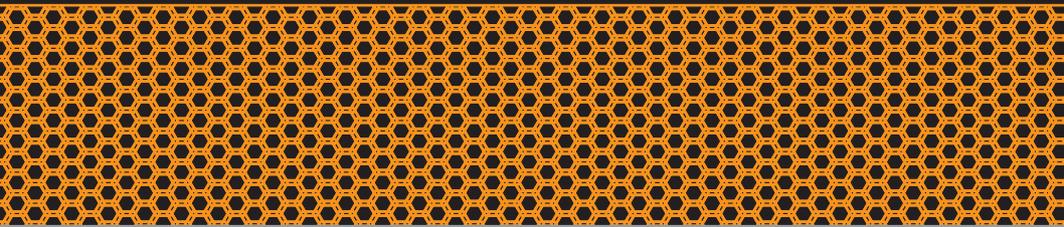
Web: diamondaudio.com

Service/Tech Support:

213-261-4161

Tech Support Email

techsupport@diamondaudio.com



DIAMOND

1225 E. 7th Street
Los Angeles, CA. 90021

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www.DiamondAudio.com