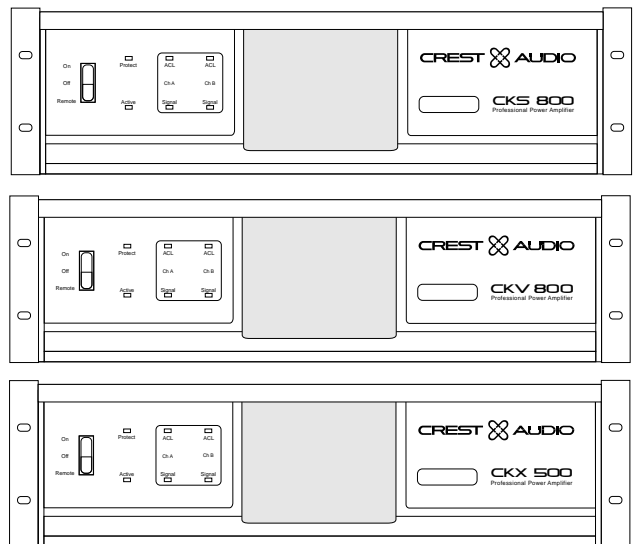




POWER PROCESSING
AMPLIFIERS



OWNER'S MANUAL

Important Precautions



This symbol is used to alert the operator to follow important operating procedures and precautions detailed in documentation.



This symbol is used to warn operators that uninsulated "dangerous voltages" are present within the equipment enclosure that may pose a risk of electric shock.

- 1. Save the carton and packing material even if the equipment has arrived in good condition.** Should you ever need to ship the unit, use only the original factory packing.
- 2. Read all documentation before operating your equipment.** Retain all documentation for future reference.
- 3. Follow all instructions** printed on unit chassis for proper operation.
- 4. Do not spill water or other liquids into or on the unit,** or operate the unit while standing in liquid.
- 5. Make sure power outlets conform to the power requirements** listed on the back of the unit.
- 6. Do not use the unit if the electrical power cord is frayed or broken.** The power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords and plugs, convenience receptacles, and the point where they exit from the appliance.
- 7. Always operate the unit with the AC ground wire connected** to the electrical system ground. Precautions should be taken so that the means of grounding of a piece of equipment is not defeated.
- 8. Mains voltage must be correct and the same as that printed on the rear of the unit.** Damage caused by connection to improper AC voltage is not covered by any warranty.
- 9. Have gain controls on amplifiers turned down during power-up** to prevent speaker damage if there are high signal levels at the inputs.
- 10. Power down & disconnect units from mains voltage before making connections.**
- 11. Never hold a power switch in the "ON" position if it won't stay there itself!**
- 12. Do not use the unit near stoves, heat registers, radiators, or other heat producing devices.**
- 13. Do not block fan intake or exhaust ports.** Do not operate equipment on a surface or in an environment which may impede the normal flow of air around the unit, such as a bed, rug, weathersheet, carpet, or completely enclosed rack. If the unit is used in an extremely dusty or smoky environment, the unit should be periodically "blown free" of foreign matter.
- 14. Do not remove the cover.** Removing the cover will expose you to potentially dangerous voltages. There are no user serviceable parts inside.
- 15. Connecting amplifier outputs to oscilloscopes or other test equipment** while the amplifier is in bridged mode may damage both the amplifier and test equipment!
- 16. Do not drive the inputs with a signal level greater than that required to drive equipment to full output.**
- 17. Do not connect the inputs / outputs of amplifiers or consoles to any other voltage source,** such as a battery, mains source, or power supply, regardless of whether the amplifier or console is turned on or off.
- 18. Do not run the output of any amplifier channel back into another channel's input. Do not parallel- or series-connect an amplifier output with any other amplifier output.** Crest Audio is not responsible for damage to loudspeakers for any reason.
- 19. Do not ground any + ("hot") terminal. Never connect a + ("hot") output to ground or to another + ("hot") output!**
- 20. Non-use periods.** The power cord of equipment should be unplugged from the outlet when left unused for a long period of time.
- 21. Service Information** Equipment should be serviced by qualified service personnel when:
 - A.** The power supply cord or the plug has been damaged;
 - B.** Objects have fallen, or liquid has been spilled into the equipment;
 - C.** The equipment has been exposed to rain;
 - D.** The equipment does not appear to operate normally, or exhibits a marked change in performance;
 - E.** The equipment has been dropped, or the enclosure damaged.
- 22. To obtain service,** contact your nearest Crest Audio Service Center, Distributor, Dealer, or Crest Audio at 201.909.8700 (USA).

Power Amplifier Owner's Manual

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Introduction.

Congratulations on your purchase of a Crest Audio CK family of Power Processing amplifiers. Please read this manual carefully (especially the the "Important Precautions" section located inside the front cover) as it contains information vital to the safe operation of the amplifier. Also, please fill out and return the enclosed product registration card.

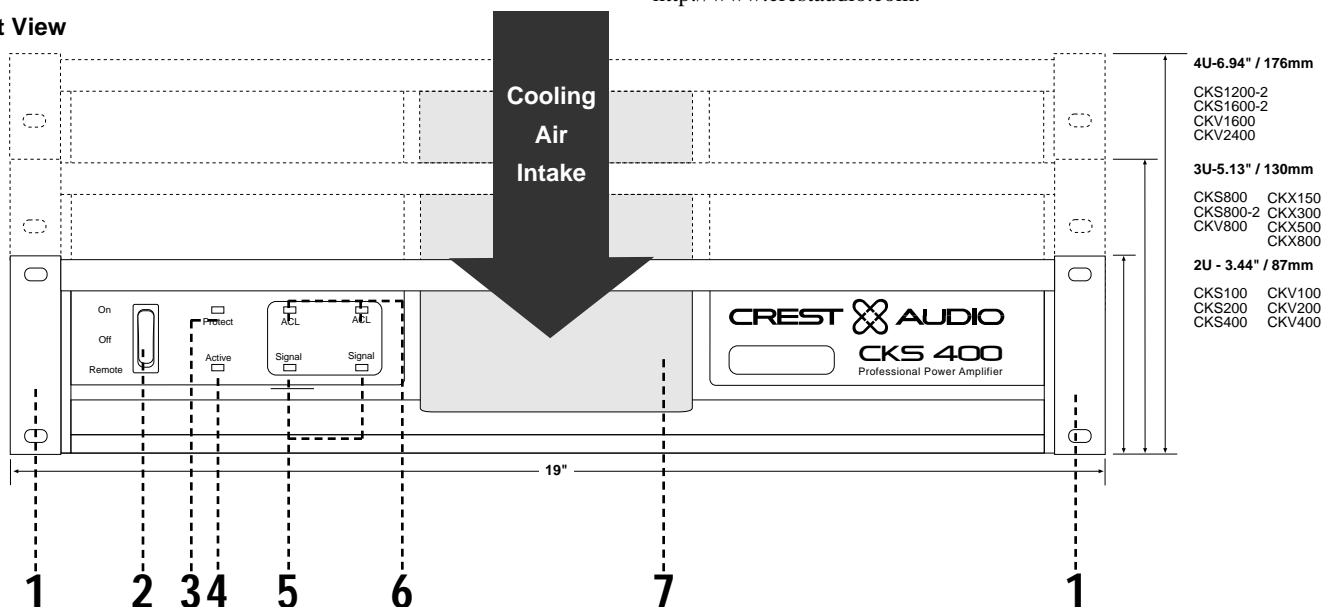
The CK Power Processing amplifiers represent new levels of value and flexibility never before offered to the contracting market. CKS Series models are specially designed to drive low impedance speaker loads - down to two ohms with "-2" models,. CKV Series models feature a unique proprietary front end circuit to provide directly coupled 70.7 volt outputs, eliminating the need for step-up transformers. CKX Series models feature transformer-isolated outputs for 100V operation (50V optional). Together, these amplifiers cover almost every conceivable installed or distributed sound power requirement.

By combining legendary Crest performance with three unique plug-in module bays located on the rear panel, these amplifiers can become very sophisticated audio processors. The CK family is everything that you expect from Crest Audio. They are ruggedly built from high quality components, intelligently laid out, and possess comprehensive protection features.

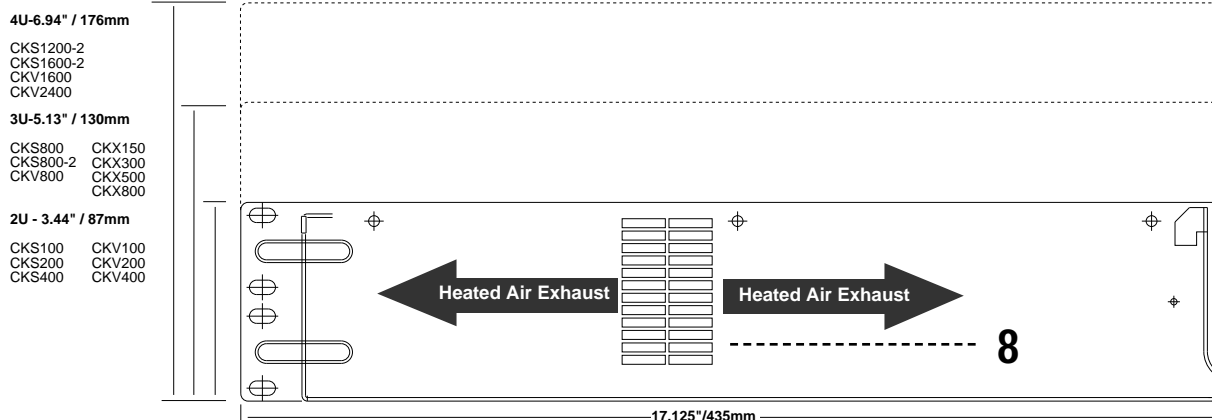
After-sale support is considered paramount at Crest Audio. For any assistance in the set-up or operation of this product please call Crest Audio's Customer Service department or your local Crest Audio representative. Should you have any problems at all, or suggestions that may help us improve our products or service, please contact us. We encourage your participation in Crest's future. (See back cover for contact info).

Crest Audio may also be contacted on the World Wide Web at: <http://www.crestaudio.com>.

Front View



Side View



Unpacking.

Upon unpacking, inspect the amplifier. If you find any damage, notify your supplier immediately. Only the consignee may institute a claim with the carrier for damage incurred during shipping. Be sure to save the carton and all packing materials. Should you ever need to ship the unit back to Crest Audio, one of its offices, service centers, or the supplier, use only the original factory packing. If the shipping carton is unavailable, contact Crest to obtain a replacement.

Amplifier Quick Set-Up.

Crest Audio CK Power Processing amplifiers are configured to a standard set-up at the factory. They are functional and ready to use 'out of the box'. All controls and input/output connections are clearly labeled. Units are shipped standard with modules as follows:

Input Bay: CC-IPB Module.

Network Bay: CC-BLK (Blank) Module.

Power/Output Bay: CC-STL Module.

To set the amplifier up for basic usage:

1. Rack mount the amplifier in the location where it is to be used, remembering to allow for adequate access and cooling space. For more information, see the sections on *Installation*, *Mounting*, and *Cooling Requirements*.
2. Make input connections to the input barrier strips on the Input Module. Be sure to make the correct connections for stereo, parallel, or bridged mono configuration. See the sections on *Mode Configuration* and *Input Module Connections and Controls* for more information.
3. Connect speakers to the output barrier strips on the Power/Output Module. Be sure to make the correct output connections for stereo, parallel or bridged mono configuration. See the section on *Power/Output Module Connections* for more information.
4. Make power connections, allowing for proper current draw. See the section on *Connecting Power/Circuit Size Requirements* for more information.
5. Turn the front panel three-position AC switch to 'on', and bring up the rear panel gain attenuators to the desired levels.

Installation and Mounting.

CK Power Processing amplifiers are 2, 3 & 4-rack space units of 17 1/8" (437mm) depth that mount in a standard 19-inch rack. On all amplifiers except 4-rack space units, four front panel mounting holes are provided. (4-rack space units have eight front panel mounting holes). Rear mounting ears are also provided on all amplifiers for additional support, which is essential in non-permanent installations like mobile or touring sound systems, but recommended for permanent installations as well. (Distance from the back of the front rack ear to the center of the rear mounting ear holes is 16 5/8" / 422mm) Because of the cables and connectors on the rear panel, a right-angle or offset screwdriver or hex key will make it easier to fasten the rear mounting ears to the rails. Dimension drawings are included on page 4.

Front Panel.

1. Rack Mounting Ears.

Two to four mounting holes are provided on each front mounting ear.

2. Three-position AC Power Switch.

A three-position switch is on the front panel. With the switch pushed towards the upper position the amplifier is On. The middle position is Off and the lower position is marked Remote. When switched to Remote, the amplifier must be activated by the sequential turn on/turn off (STO) circuit. (CK amplifiers are shipped with the CC-STL Power/Output module standard, which permits STO. If NexSys compatible modules are used, STO can also be performed under NexSys computer control.) When a voltage of +8 to +18V DC is applied to the rear-mounted STO terminal and the "In" terminal is connected to the "Com" terminal, the amplifier will turn on. When no voltage is present or the In-Com connection is opened, the amplifier will switch off. Other CK Power Processing amplifiers can be "daisy-chained" together and will turn on at 200ms intervals. See the section on *Sequential Turn-On/Turn-Off* for more information about STO.

3. Protect LED.

If the amplifier is in Protect mode, the output relay will open, and this LED will light.

4. Active LED.

The Active LED indicates the amplifier is turned on.

5. Signal LED.

Each channel has a Signal LED, which comes on gradually, first dim, and then brighter as the signal level increases.

6. ACL LED.

Each channel has an ACL (Active Clip Limiting) LED. This LED comes on at the clipping point, and indicates that ACL is engaged. See the section on *TourClass Protection* for more information.

7. Fan Grill & Filter.

A high-efficiency DC fan (with continuously variable speed) mounted behind the fan filter & fan intake grill draws cooling air into the amplifier. Do not block this intake! The fan operates only when the amplifier heatsinks require cooling. Fan filters are easy to remove and must regularly be cleaned to ensure optimum performance.

Side Panels.

8. Exhaust Ports.

Heated air exits through the exhaust ports, located on the sides of the amplifier chassis. Do not block these ports when rack-mounting the amplifier. See *Side View*.

Rear Panel.

Module Bays & Modules.

The rear panel of CK Power Processing amplifiers provides three bays (Input, Network and Output/Power) configured to accept interchangeable plug-in modules. Your amplifier may have been factory-configured with some of the optional modules. In this case, info on the relevant modules will be enclosed in the amplifier box, or in a separate binder. If all required information is not included, please call Crest Audio's Customer Service department or your local Crest Audio representative.

About CC Modules and NC Modules.

CC modules fit into the Power/Output or Input module bays in the rear panel of CK Power Processing amplifiers. These "basic" analog modules are non-programmable and non-NexSys® compatible; only the STO function can be controlled (through hardwiring).

NC Modules can be controlled, programmed and/or monitored. They fit into the rear panel of the amplifiers. NC Input Modules can be controlled and/or programmed over the NexSys network or via the N-Coder (Hand-Held) or N-Coder/PC software. (NexSys is Crest Audio's hardware and software package that offers network connection of Crest Audio amplifiers and associated devices.). NC Input and NC Output/Power Modules are NexSys-compatible. Using NexSys with the appropriate NC Network Module, NC Input and Output/Power Modules can be controlled, programmed and/or monitored remotely. NexSys also offers a number of diagnostic facilities. On the NC Input Modules, the individual channel attenuators offer manual level adjustment and removable knobs for additional security. Except for the STO feature, NC Modules are "tamper-proof" in that there are no user-accessible setup controls.

9. Circuit Breaker.

A re-settable, protective AC circuit breaker is located at the upper left of the amplifier rear panel. Two and three rack space amplifiers have a push-type breaker fitted, while four rack space units have a throw-switch style breaker. If the breaker has tripped, push it back in (or, in the case of four rack space units, flip the breaker up) to return the amplifier to operating condition. If the breaker trips repeatedly, the amplifier needs servicing.

10. IEC Power Connector with removable Power Cord or Captive Power Cord.

On two rack space amplifiers, a standard IEC power connector is located at the lower left corner of the amplifier rear panel. An AC mains cord having an appropriate AC plug for the intended operating voltage is included. Three and four rack space units have a captive power cord.

11. Power/Output Bay.

All Power/Output modules (CC-STL module is shipped standard) provide a ground lift jumper, barrier strip output connectors, and connections for sequential turn-on /off (STO) activation.

A barrier strip is provided for connection of loudspeakers with bare wire or spade lug connectors. A signal ground lift jumper permits the audio ground to be lifted from the chassis ground. *For more information see the sections on Signal Ground Lift Jumper, Module Removal, and Sequential Turn-On/Turn-Off.*

12. Network Bay.

The CC-BLK (blank panel) comes standard with all amplifiers. *See the section on Replacing or Installing a Network Module for more information.*

13. Input Bay.

CK Power Processing amplifiers come standard with a CC-IPB Input module. Barrier strip input connectors and individual channel rotary attenuators are provided. All Input modules have an internal voltage gain/input sensitivity jumper that is factory-set for X40 gain. *See the sections on Input module Connections and Removing or Replacing an Input module for more information.*

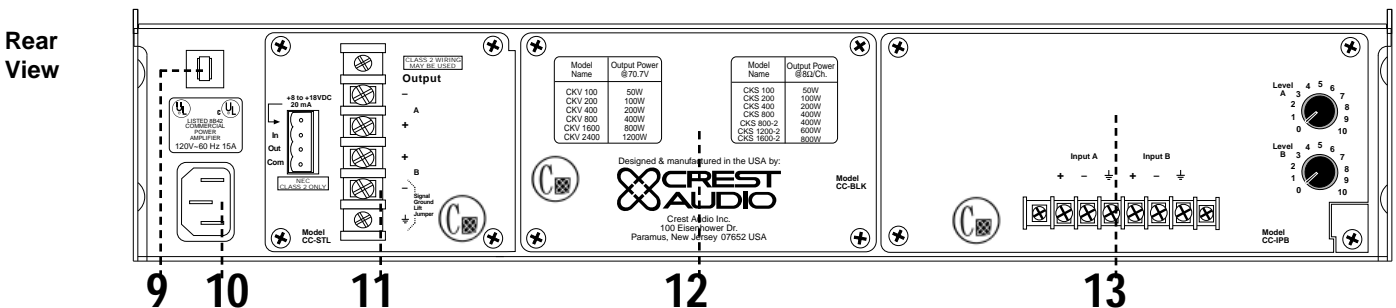
Operation.

Connecting Power/Circuit Size Requirements.

CK Power Processing amplifier power requirements are rated at "idle", 1/8th power ("typical" music conditions), 1/3rd power, and maximum rated power. The maximum power current draw rating is limited by the amplifier's circuit breaker. Consult the specifications at the end of this manual for the current that each amplifier will demand. AC mains voltage must be the same as that indicated on the rear of the amplifier. Damage caused by connecting the amplifier to improper AC voltage is not covered by any warranty. *Note: Always turn off and disconnect the amplifier from the mains voltage before making audio connections. If possible, as an extra precaution, have the attenuators turned down during power-up.*

Cooling Requirements.

CK Power Processing amplifiers use a forced-air cooling system to maintain a low, even operating temperature. Drawn by a continuously-variable-speed fan mounted behind the front panel, air enters through the front grill and courses through the cooling fins of the heat sink, (which dissipates power transistor heat), before exiting through the side panel ports. The fan will remain inactive until operating temperature rises above 45° C. Make sure that there is enough space around the front of the amplifier to allow air to enter, and around the sides to allow the heated air to exit. (See page 4 for intake and exhaust locations. *Note: If the amplifier is rack-mounted, do not use doors or covers on the front or rear without pressurizing the rack. Whatever type of rack you are using, make sure that heated air can escape freely, and that there is no resistance to the intake of cool air through the front grill. Intake and exhaust air must flow without resistance. Ensure that fan filters are regularly cleaned and periodically replaced. (No tools are required for filter removal).*



PowerSave.

All CK Power Processing amplifiers come standard with PowerSave circuitry. This effectively reduces current draw and thermal emissions to a minimum when the amplifier is at idle. PowerSave operates by cutting off the bias current to the output stage after signal absence is sensed at the input. Once signal is present, PowerSave instantly restores the bias current after the first positive-going waveform. Current draw specifications while PowerSave is active are included in specifications under "Idle Current Draw."

Thermal Emissions.

System cooling needs must be considered before installation, and the system installer/designer should specify appropriate countermeasures, such as ventilation, air conditioning, etc. Refer to the specifications appendix at the back of this manual for specific thermal emissions figures.

Mode Configuration.

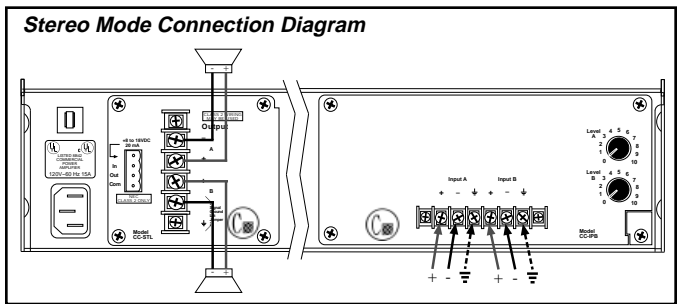
CK Power Processing amplifiers are configured standard for two channel (stereo) operation. They can, however, be wired to operate in bridged mono mode (a single Mono input amplified to the combined power of both channels and made available as a single Mono output) or parallel mode (where a single Mono input signal is fed to both channels).

Two Channel (Stereo) Mode.

In the factory configured, standard two channel (stereo) mode, both channels operate independently, individual input attenuators controlling their respective levels. Signal at Channel A's input produces output at Channel A's output, while signal at Channel B's input produces output at Channel B's output. (Recommended minimum nominal load impedance for stereo operation of CKS Series amplifiers is 4 ohms per channel; 2 ohms per channel for models CKS 800-2, 1200-2, and 1600-2. CKV and CKX Series amplifiers are specifically designed for use with distributed or constant voltage systems. See appendix E for information on recommended distributed line impedance.). Connect loudspeakers to the barrier strip output connectors for channels A and B. Connections are shown in the diagram below.

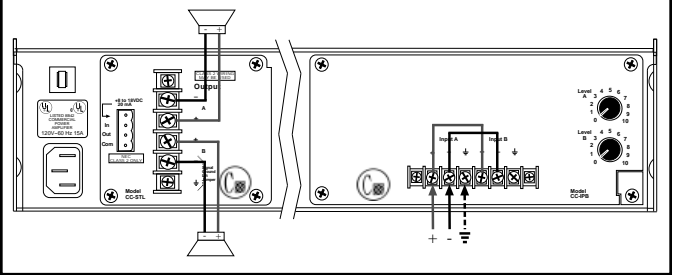
Parallel Mode.

To send the same signal to both channels, connect the input signal to Channel A via the Input Barrier Strip. Run jumpers from the positive and negative terminals of Channel A's Input Barrier Strip to the respective terminals of Channel B's. Both channels then share Channel A's input signal, but will operate independently. Speakers are connected as in Stereo Mode.



Regardless of operating mode, NEVER connect amplifier outputs together!

Parallel Mode Diagram



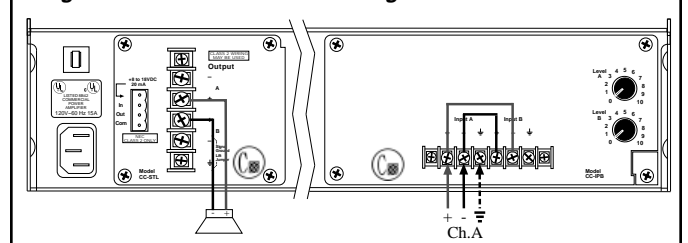
Bridged Mono Mode - CKS Series Power Amplifiers.

Bridged Mono Mode straps both amplifier channels together, making a very powerful single channel amplifier. One channel "pushes" and the other "pulls" equally, effectively quadrupling the power over that of either channel alone. Signal is connected to the input barrier strip as shown in the drawing below, with one jumper connecting the positive (+) terminal of Input A to the negative (-) terminal of Input B, and another jumper connecting the negative (-) terminal of Input A to the positive (+) terminal of Input B. Both channel attenuators (A&B) are used to control signal level, and both must at the same level, preferably at 0dB attenuation. The speakers are connected only to the designated "+" output terminals as shown below.

Note: Use extreme caution when operating in bridged mono mode. Never ground either side of the speaker cable when the amplifier is in bridged mono mode; both sides are "hot." If an output patch panel is used, all connections must be isolated from each other and from the panel. For CKS Series amplifiers, the recommended minimum nominal load impedance in bridged mono mode is 8 ohms, the equivalent to driving both channels at 4 ohms. [For models CKS 800-2, 1200-2 and 1600-2, the recommended minimum nominal load impedance in the bridged mono mode is 4 ohms, equivalent to driving both channels at 2 ohms].

Note: Driving loads of less than the recommended minimums will activate the IGM circuitry, resulting in a loss of power, and may also cause a thermal protect condition.

Bridged Mono Mode Connection Diagram.



Bridged Mono Mode - CKV & CKX Series.



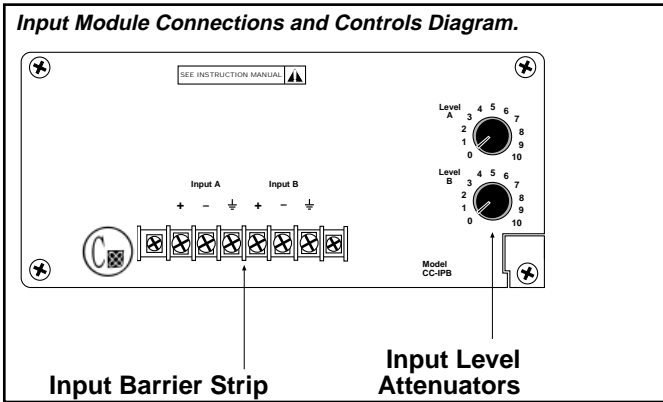
CKV and CKX Series amplifiers can also be wired for Bridged Mono mode operation.

However, bridging these models is usually undesirable, as the resultant output will be approximately 140V (CKV) or 200V (CKX)! There are, however, specific applications for this configuration. Contact Crest Audio Customer Service for more information if required.

Input Bay.

Input Module Connections and Controls.

Input barrier strips have a 0.325" (8.3mm) center and 0.270" (6.9mm) lug space. For connecting to the input barrier strips, a wire gauge between 14 AWG (2.5mm²) & 24 AWG (0.25mm²), and spade lugs (Panduit Part No. PNF 18-6LF-C or equivalent) are recommended.



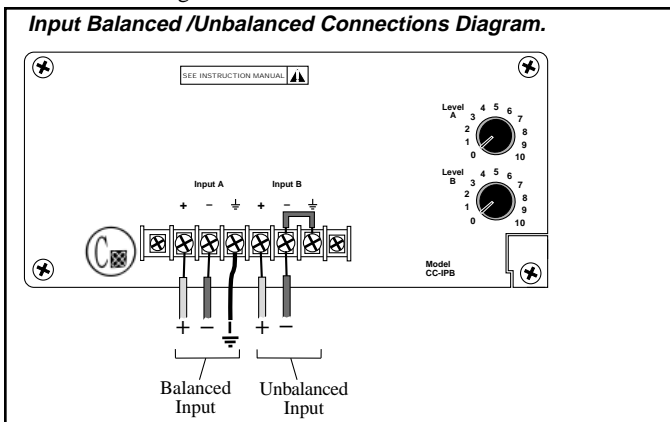
Removable Attenuator Knobs.

The attenuator knobs can be removed and replaced with blanking plugs. These plugs are shipped with the amplifier. The procedure for attenuator knob removal is as follows:

1. With an X-Acto or similar knife, pop off the grey key cap of the attenuator knob. This will reveal the inside nut.
2. Using a needle nose pliers or appropriate size nut driver, loosen the inside nut.
3. Slide the attenuator knob off the shaft.
4. Insert a regular screwdriver in the slotted end of the shaft, and adjust attenuation to desired level.
5. Blanking plugs may now be inserted in the attenuator holes.

Unbalanced Sources.

For use with an unbalanced source, tie the inverting (minus) input to ground by installing a jumper across the appropriate barrier strip terminals. If the inverting input is left floating, a 6 dB loss in gain will result. See the diagram below.



Input Module Jumpers.

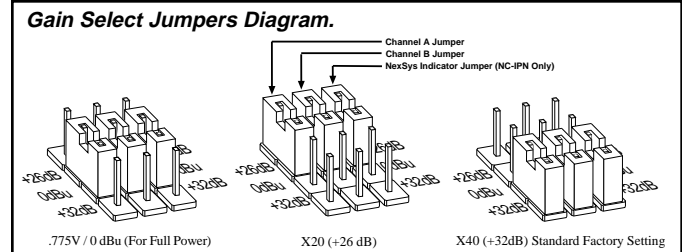
Gain Select Jumpers.

Input modules have user-settable jumpers to configure Input Gain/Sensitivity. These internal jumpers (two for CC-IPB, three for

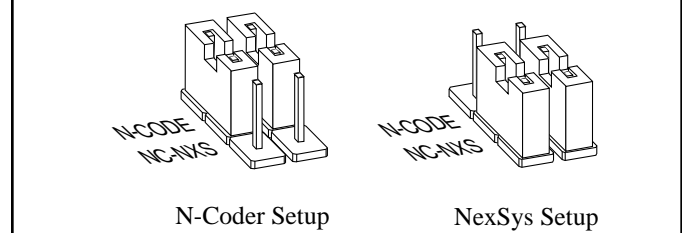
all input NC modules), labeled "W1 W2 W3", are used to set the overall gain of the amplifier. The 3 positions allow the amplifier to be set for constant gain of X20 (26 dB), X40 (32 dB), OR constant sensitivity for full output (.775V) at 0 dBu input. The standard factory setting is for X40 (32dB). (Refer to the specifications for more gain/sensitivity information). The diagram below shows the location of these jumpers. All jumpers must be set to the same position as indicated in the drawing below. To change jumper settings, the Input module must first be removed from the amplifier chassis. This operation is covered in the section "Module Removal/Replacement".

N-Coder Setup Jumpers.

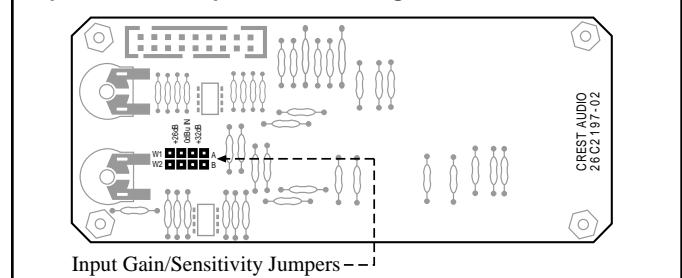
All NC Modules have internal jumpers used to set the module for operation with NexSys or N-Coder. These jumpers are labeled "W4 W5" on the Input module circuit board. The "NC-NXS" jumper position allows operation with NexSys, while the "NCODE" jumper position permits the Input module to be programmed through N-Coder or N-Coder/PC software when the amplifier is off. *Note: Factory setting is the 'NexSys' position. If NexSys, N-Coder, or N-Coder/PC software is not being used, jumper position will have no effect upon the operation of the amplifier.*



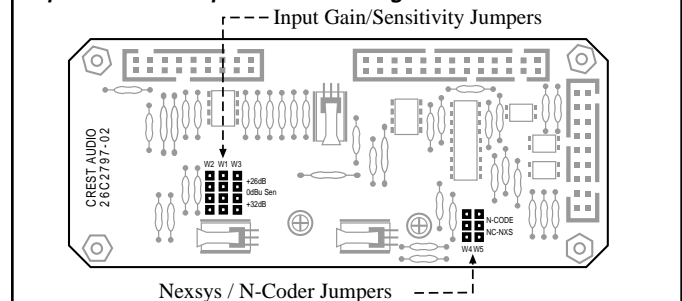
N-Coder/NexSys Setup Jumpers Diagram.



Input Module Jumpers Location Diagram - CC-IPB.



Input Module Jumpers Location Diagram - NC-IPN shown.

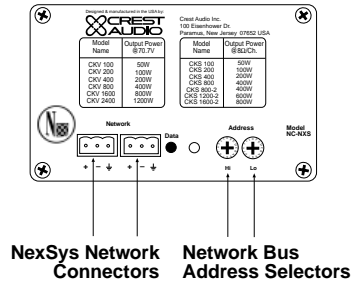


Network Bay.

Network Module Controls/Connections.

CK Power Processing amplifiers come standard with a blanking panel fixed over the Network bay. When a Network module is installed in this bay, network connection is made via a pair of three-pin connectors. They are wired in parallel, and form a loop-through connection. (Mates for these connectors are shipped with the Network module.) Network bus addressing is accomplished through use of the Hi and Lo Address dials. Refer to module documentation for exact connection and control information.

Network Bay Controls/Connections Diagram.



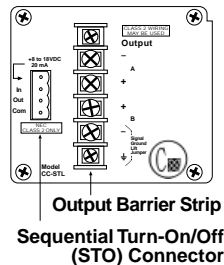
Power/Output Bay.

Power/Output Module Connections.

Speakers are connected using the Output Barrier Strip connectors. Spade lugs, ring tongues or bare wire may be connected to the output barrier strip elements. Spade Lug measurements for Output barrier strip are as follows: .44" (11mm) screw spacing, .32" (8mm) lug space. For output spade lugs, Panduit Part No. PNF 14-8LF-C (or equivalent) is recommended. (Consult the wire gauge charts in this manual for speaker wiring recommendations.) Make sure the amplifier is turned off before you change any output connections or jumpers. Also ensure that the load impedance being connected is not less than the amplifier's ability to drive it.

On the standard CC-STL Power/Output module, a four-pin Sequential Turn-On/Turn-Off (STO) connector is supplied. A mating connector is shipped with the amplifier. For more information on STO, see the section on Sequential Turn-On/Off.

Power/Output Module Connections Diagram.



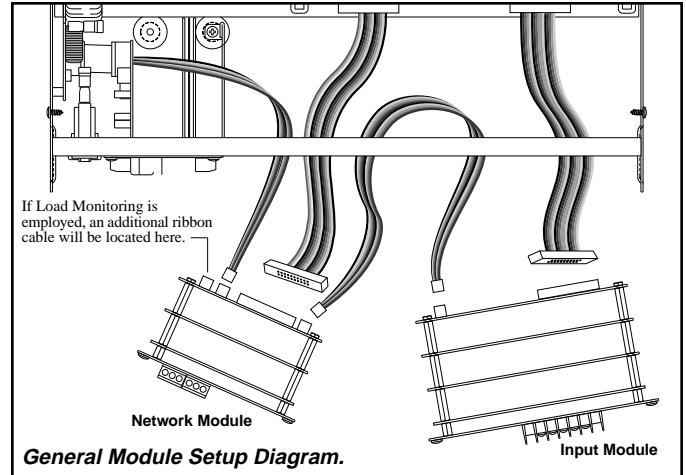
Module Removal.



Removable modules contain static-sensitive devices; handle modules at static-safe work stations!

Situations Requiring Module Removal

Only jumper setting changes or module upgrades require modules to be removed from the amplifier. Contact Crest Audio Customer Service for full details on module removal. The 'General Module Setup' diagram indicates the general setup of the rear panel module/bay configuration.



Amplifier is shown with the top cut away for clarity only. Dangerous voltages exist inside, and only a Crest Audio-certified service technician should remove top cover!

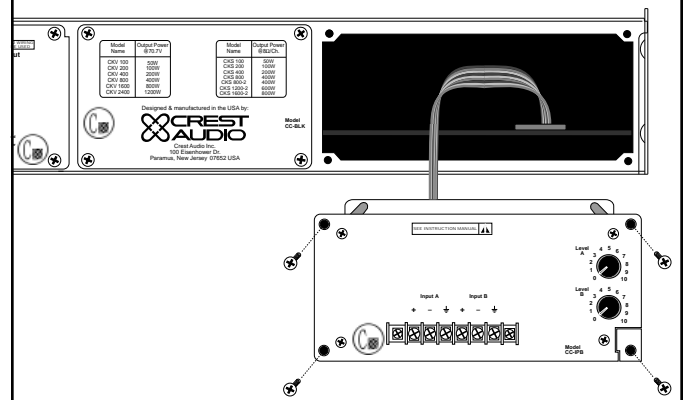


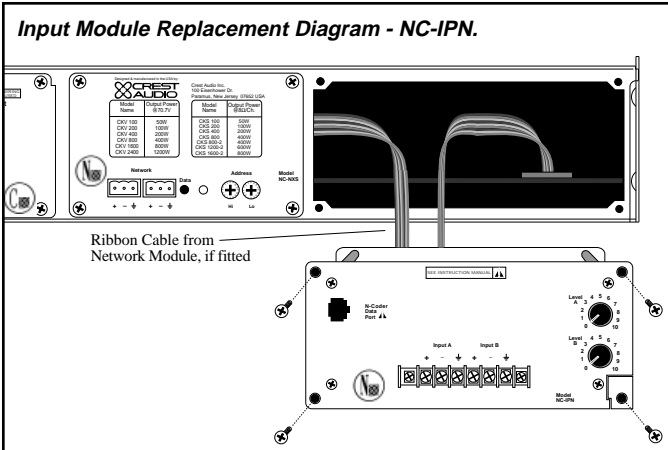
The amplifier must be switched off and the mains plug removed from the supply before module removal operation is undertaken.

Removing or Replacing an Input Module.

The amplifier must be switched off and unplugged from the mains supply before this operation is undertaken. Remove the four #8 3/8" Phillips pan head sheet metal screws that secure the module to the chassis. The module is connected electrically to the amplifier via multi-pin ribbon cables. Unplugging the module from the ribbon cable connectors frees the module for removal. To insert the same or another module, simply reverse this procedure, making sure that any ribbon cable connectors are properly and securely seated. *Note: The amplifier must not be operated without an Input module in place.*

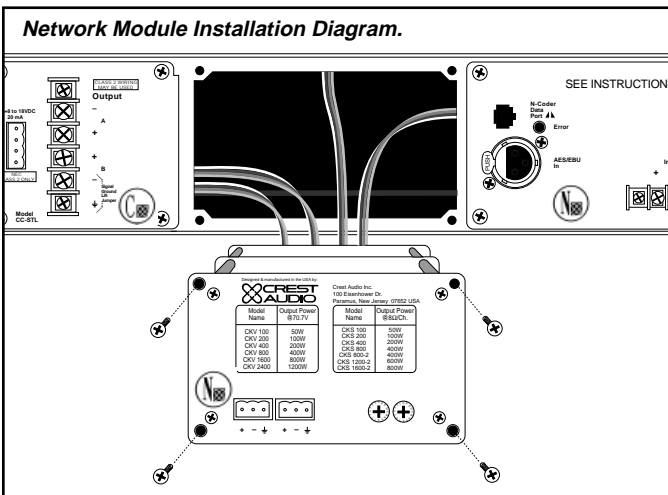
Input Module Removal Diagram - CC-IPB.





Replacing or Installing a Network Module.

The amplifier must be switched off and unplugged from the AC mains supply before this operation is undertaken. Four Phillips head screws secure the module to the chassis. The module is connected electrically to the amplifier via multi-pin ribbon cables. Unplugging the module from the ribbon cable connectors frees the module for removal. To insert the same or another module, simply reverse this procedure. *Note: Standard CK Power Processing amplifiers come with a blank panel installed in the Network bay. The amplifier must not be operated without a Network module or blank panel in place.*



IMPORTANT:

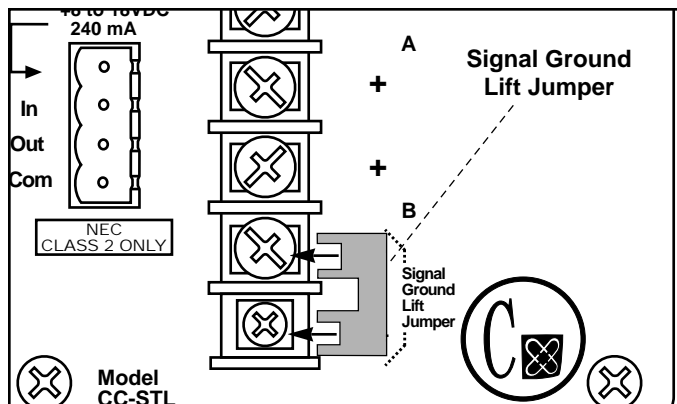
THE POWER/OUTPUT MODULE IS NOT REMOVABLE. DO NOT ATTEMPT TO REPLACE OR REMOVE A POWER/OUTPUT MODULE !

This module can only be serviced by a Crest Audio-certified service technician. Please consult your dealer or Crest Audio representative for assistance. User-inflicted damage to this module will invalidate your warranty.

Signal Ground Lift Jumper.

Whenever possible, the signal source equipment should share the same AC ground as the amplifier(s). In some cases, however, particularly if an amplifier is being installed in an existing system, this may result in a ground loop. If this happens, remove the factory-installed ground lift jumper from the output barrier strip (located on the Power/Output module), which electrically connects the signal ground to the chassis/AC ground. If the jumper is removed, the signal ground is lifted and is clamped to $\pm 0.6V$. Don't remove the jumper if the amplifier and the signal source equipment are not on the same AC ground!

In a properly designed system (for safety and to minimize noise), the amplifier should receive its ground from the AC line cord. The shield on a balanced input line should be grounded at one end only (usually the sending end), and it must never be relied on to supply AC ground to the amplifier.



TourClass® Protection Features.

Every model in the CK Power Processing incorporates TourClass protection features. Derived from Crest's extensive experience with the world's largest sound rental companies, the TourClass group of circuits sets new standards in load and amplifier protection.

ACL (Active Clip Limiting).

At the amplifier's full power, or clipping point, ACL will be activated. This is indicated by illumination of the Clip/ACL LED. The channel gain will automatically be reduced, guarding the loudspeakers against damaging high power and continuous square waves that would otherwise be produced. Situations that may activate ACL include: uncontrolled feedback, oscillations, or an improper equipment setting or malfunctions upstream from the amplifier. Normal program transients will not trigger ACL; only steady or excessive clipping will. ACL is virtually transparent in operation and full signal bandwidth is maintained. If NexSys control is installed, ACL operation is reported to NexSys.

IGM Impedance Sensing.

IGM (Instantaneous Gain Modulation) is an innovative circuit that allows the amplifier to operate safely into any load. When the amplifier sees a load that overstresses the output stage, the IGM circuit adjusts the channel gain to a safe level. Like ACL, the IGM circuit is inaudible in normal use. In addition, if extreme low impedance is encountered, the amplifier's output relay will open. If NexSys control is installed, IGM operation is reported to NexSys.

AutoRamp Protection.

AutoRamp operates every time the amplifier is turned on or is reactivated after a protect condition. This exclusive Crest feature gradually increases gain to the attenuator setting after the output relays close, avoiding unnecessary stress on the loudspeakers.

Thermal Protection.

If the heatsink temperature reaches an abnormally high temperature, the amplifier will protect itself by disconnecting speakers and shutting down until sufficiently cooled. During this time, the Protect LED will light. If the power transformer gets too hot, its thermal sensing circuit will disconnect both channel outputs. During this time, the Active LED will extinguish, the Protect LED will illuminate, and ACL LEDs will stay off, and the cooling fan will stay running. Once cool enough, the amplifier will resume operation automatically. If NexSys control is installed, thermal protect operation is reported to NexSys.

Short Circuit.

If an output is shorted, the IGM and thermal circuits will automatically protect the amplifier. The IGM circuit senses the short circuit as an extremely stressful load condition and attenuates the signal, protecting the channel's output transistors from overcurrent stress. If the short circuit remains, the load will be disconnected by the thermal protection circuitry.

DC Voltage Protection.

If an amplifier channel detects DC voltage at its output terminals, the output relay will immediately open to prevent loudspeaker damage. The Protect LEDs will light. If NexSys control is installed, a DC protect condition is reported to NexSys.

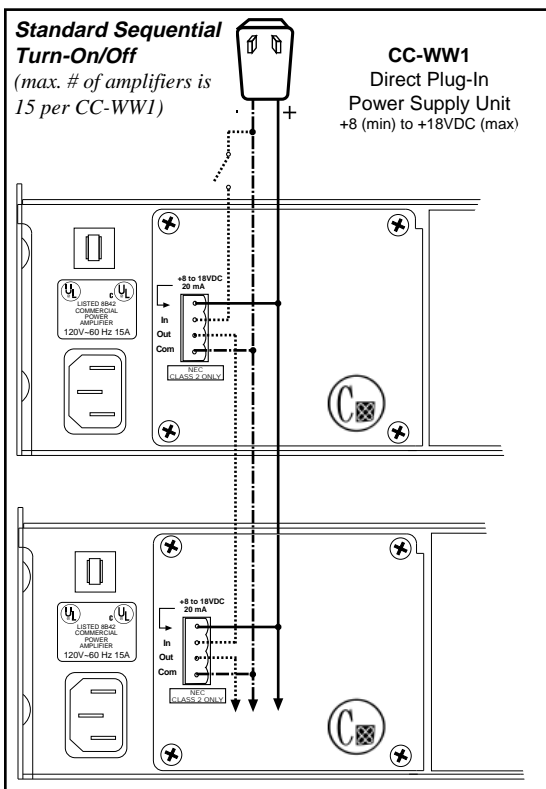
Sequential Turn-On/Turn-Off.

CK Power Processing amplifiers come standard with the CC-STL Sequential Turn-On/Turn-Off (STO) Output/Power module installed. If the amplifier front power switch is set to "remote" and a voltage of between +8 to +18 VDC is applied across the "Com" and "+8 to +18V" terminals, a closure between the "In" and "Com" terminals will turn the amplifier on. Additional amplifiers are added to the chain by looping from the "Out" terminal of one amplifier into the "In" terminal of the next amplifier.

Turn-on delay time between amplifiers fitted with basic modules (i.e., CC-STL) is approximately 100ms, turn-off delay time is 200ms. (When using NexSys-controlled Power/Output modules, these standard turn-on and turn-off delay times may be modified in the software). The number of CC-STL modules that an external DC supply will be able to power is dependent on the supply's voltage output and current capability. The external Direct Plug-In Power Supply Unit (CC-WW1, available from Crest Audio) supplies 9 volts at 300 milliamps and can power 15 CC-STL modules. If your configuration requires the STO control of more than 15 amplifiers, contact Crest Audio.

Standard Sequential Turn-On/Turn-Off Wiring.

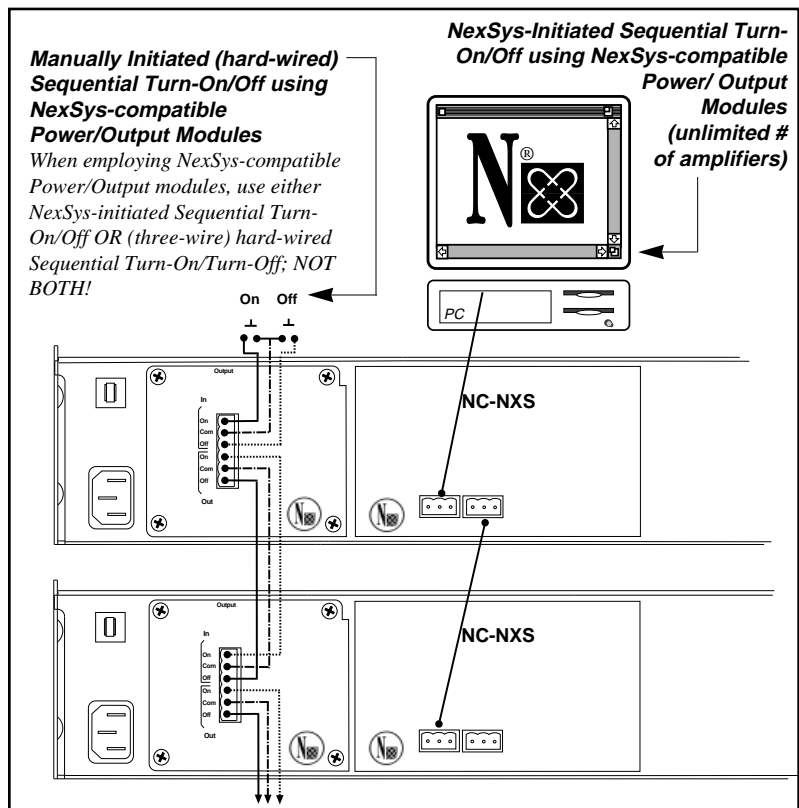
For CK Power Processing amplifier systems configured for basic non-NexSys applications, (CC-IPB with CC-STL) an external Direct Plug-In Power Supply Unit is needed to provide a nominal +8 to +18 Volts to each STL module. *Use only a two-wire power supply!* This power supply (part number CC-WW1) may be ordered from Crest Audio. (Note that module CC-SDC has an integral STO power supply, and does not require CC-WW1). The "Com" and "+8 to +18V" terminals on each CK Power Processing amplifier are bussed together in parallel and connected to the DC supply. The "Out" terminal of each CK amplifier is connected to the "In" terminal of the next CK amplifier in the turn-on sequence. The first amplifier in the chain requires an SPST closure between it's "In" terminal and "Com" terminal to initiate the power turn-on sequence and keep the amplifiers in the chain powered on.



Manual or NexSys-Compatible Sequential Turn-On/Turn-Off Wiring.

CK Power Processing amplifiers fitted with a NexSys-compatible NC Power/Output Module (NC-STI, NC-SAC, NC-SLM) may be powered up via NexSys OR with a manual switch closure. If NexSys is employed, the STO delay time is also software-controllable. *Note: when using NexSys control, hard-wiring for manual switch closure between amplifiers should be used cautiously. If the switch closure output is wired up, it WILL cause the next amp to switch, regardless of which source (hardware switch or NexSys STO command) has initiated the command.*

The modules (and the non-NexSys compatible CC-SIO) feature a 6-pin connector providing a 3-wire input from switch closures (or from a CK Power Processing amplifier) and an opto-isolated 3-wire output to another CK Power Processing amplifier. The 3-wire signals are: ON, OFF, and COM. To initiate either the ON or OFF function manually, simply provide a closure from the proper signal line to COM; after a time delay of approximately 200ms, the closure is echoed on the 3 isolated output signal pins to initiate the turn-on function in 'downstream' amplifiers. The on/off closures can be either momentary or constant contact.



Service Information. For service, contact your nearest Crest Audio Service Center, Distributor, Dealer, or any of the worldwide Crest Audio offices, or contact Crest Audio Inc. Customer Service directly at: TEL. 201.909.8700 (USA) Fax. 201.909.8744 (USA). For technical inquiries only, the Crest Audio Technical Services Dept. can be faxed at 201.587.0550 (USA). Crest Audio may also be contacted on the World Wide Web at: <http://www.crestaudio.com>.



Appendices

Appendix A - CKS Series Specifications.

	CKS100	CKS200	CKS400	CKS800	CKS800-2	CKS1200-2	CKS1600-2
8Ω Stereo Power, 20Hz-20kHz, 0.1% THD+N	50 Watts	100 Watts	200 Watts	400 Watts	400 Watts	600 Watts	700 Watts
8Ω Stereo Power, 1kHz, 0.01% THD+N	60 Watts	120 Watts	255 Watts	440 Watts	420 Watts*	620 Watts*	715 Watts*
4Ω Stereo Power, 20Hz-20kHz, 0.1% THD+N	75 Watts	150 Watts	300 Watts	600 Watts	600 Watts	900 Watts	1100 Watts
4Ω Stereo Power, 1kHz, 0.01% THD+N	90 Watts	175 Watts	320 Watts	670 Watts	670 Watts*	940 Watts*	1130 Watts*
2Ω Stereo Power, 20Hz-20kHz, 0.1% THD+N	N/A	N/A	N/A	N/A	800 Watts	1100 Watts	1100 Watts
2Ω Stereo Power, 1kHz, 0.1% THD+N	N/A	N/A	N/A	N/A	870 Watts	1130 Watts	1440 Watts
Max RMS Output Voltage (each channel)	22V	32V	45V	64V	64V	78V	90V
Peak Output Voltage (each channel)	31V	45V	64V	90V	64V	110V	127V
Frequency Response (+0 / -0.3dB, 1W/8Ω)	10Hz–20kHz, -3dB @ 148kHz						
Power Bandwidth (rated power at 4Ω, 1% THD+N)	10Hz–20kHz, +0/-0.2dB						
TourClass® Protection	ACL, IGM, AutoRamp, short circuit, DC voltage, turn-on/off transient, current inrush, and sub/ultrasonic input.						
THD+N (rated power at 4Ω, 1kHz)	<0.01%	<0.01%	<0.01%	<0.01%	<0.02%	<0.02%	<0.02%
SMPTE IMD (rated power at 8Ω, 60Hz & 7kHz)	<0.1%						
Damping Factor	300:1	300:1	300:1	400:1	400:1	400:1	400:1
Input CMRR (1kHz)	>60dB						
Input Sensitivity (rated power at 8Ω, @ X40 gain)	0.5V	0.707V	1.0V	1.41V	1.41V	1.732V	1.87V
Voltage Gain	X40 standard, X20 & 0.775V user-selectable						
Input Impedance (balanced, unbalanced)	>20kΩ, >10kΩ						
Hum and Noise (below rated power @ 4Ω)	105dB, A-weighted						
Crosstalk (below rated power @ 4Ω)	>60dB @ 1kHz						
Class	AB	AB	AB	AB	H	H	H
Input Connectors (per channel)	Rear-panel barrier strip input, 4-pin Phoenix sequential turn-on/off connector on standard CC-STL module						
Output Connectors (per channel)	Rear-panel barrier strip output						
Filter Storage	10,000 μF	22,000 μF	16,400 μF	24,000 μF	24,000 μF	27,500 μF	37,000 μF
Power Supply (factory configured)	100–240V, 50–60Hz						
Idle Current Draw (PowerSave active, 120V)	0.5A	0.6A	0.7A	0.7A	0.7A	1.3A	1.3A
1/8 Power Current Draw (typical music, 120V/4Ω)	1.65A	3.0A	5.8A	10A	4.2A	9.6A	10A
1/3 Power Current Draw (cont. music, 120V/4Ω)	2.32A	4.2A	8.6A	14.8A	12.1A	17.3A	22.6A
Max Current Draw (circuit brkr rating, 120V/4Ω)	3.5A	6.5A	12A	15A	20A	26A	30A
Thermal Emissions (1/8 Power, 4Ω)	612 BTU/hr	1100 BTU/hr	2120 BTU/hr	3584 BTU/hr	1210 BTU/hr	3164 BTU/hr	3154 BTU/hr
Thermal Emissions (1/3 Power, 4Ω)	780 BTU/hr	1380 BTU/hr	2820 BTU/hr	4700 BTU/hr	3600 BTU/hr	5040 BTU/hr	6525 BTU/hr
Cooling	Variable speed, front panel mounted fan, front-to-side airflow						
Controls	Three-position front panel On/Remote/Off switch, two rear panel channel attenuators, AC mains circuit breaker						
LED Indicators (per channel)	Signal, ACL (one per ch.) Protect, Active						
Construction	Steel Chassis, 16 gauge, double thickness in rack ear area.						
Dimensions (Height x Width x Depth)	3.5"x19.0"x17.13"	3.5"x19.0"x17.13"	3.5"x19.0"x17.13"	5.25"x19.0"x17.13"	5.25"x19.0"x17.13"	7.0"x19.0"x17.13"	7.0"x19.0"x17.13"
	89x483x435mm	89x483x435mm	89x483x435mm	133x483x435mm	133x483x435mm	178x483x435mm	178x483x435mm
Gross Weight	31.63 lbs. (14.36 kg)	34.44 lbs. (15.64 kg)	35.44 lbs. (16.09 kg)	58.20 lbs. (26.42 kg)	58.20 lbs. (26.42 kg)	78.65 lbs. (35.39 kg)	78.65 lbs. (35.39 kg)
Net Weight	26.63 lbs. (12.09 kg)	29.44 lbs. (13.37 kg)	30.44 lbs. (13.82 kg)	50.20 lbs. (22.80 kg)	50.20 lbs. (22.80 kg)	70.65 lbs. (32.08 kg)	70.65 lbs. (32.08 kg)
Warranty	5 Years (USA, Canada, United Kingdom, and many other countries)						

* 0.02% THD+N

Voltage Gain / Input Sensitivity Options		CKS100		CKS200		CKS400		CKS800		CKS800-2		CKS1200-2		CKS1200-2	
		Gain	Sens	Gain	Sens	Gain	Sens	Gain	Sens	Gain	Sens	Gain	Sens	Gain	Sens
Factory Standard ("+32dB")		X40	0.5V	X40	0.70V	X40	1.0V	X40	1.41V	X40	1.41V	X40	1.73V	X40	1.87V
Option 1 ("+26dB")		X20	1.0V	X20	1.41V	X20	2.0V	X20	2.82V	X20	2.82V	X20	3.46V	X20	3.74V
Option 2 ("0dBu")		X25.8	.775V	X36.5	.775V	X51.6	.775V	X73	.775V	X73	.775V	X89.4	.775V	X96.5	.775V

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Power figures are watts per channel, both channels driven

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Appendix B - CKV Series Specifications.

	CKV100	CKV200	CKV400	CKV800	CKV1600	CKV2400
Output Power, 70.7 Volt	50 Watts	100 Watts	200 Watts	400 Watts	800 Watts	1200 Watts
Max RMS Output Voltage (each channel)	92V					
Peak Output Voltage (each channel)	130V					
Frequency Response (+0 / -0.3dB, 1W/70.7V)	10Hz –20kHz, -3dB @ 148kHz					
Power Bandwidth (full power, 1% THD+N)	10Hz –20kHz, +0/-0.2dB					
TourClass® Protection	ACL, IGM, AutoRamp, short circuit, DC voltage, turn-on/off transient, current inrush, and sub/ultrasonic input.					
THD+N (rated power, 1kHz)	<0.1%					
SMPTE IMD (rated power, 60Hz & 7kHz)	<0.1%					
Input CMRR (1kHz)	> 60 dB					
Input Sensitivity (rated power)	1.75V @ X40 gain setting					
Voltage Gain	X40 standard, X20 & 0.775V user-selectable					
Input Impedance (balanced, unbalanced)	>20kΩ/>10kΩ					
Hum and Noise (below rated power)	105dB, A-weighted					
Crosstalk (below rated power)	>60dB @ 1kHz					
Class	AB	AB	AB	AB	H	H
Input Connectors (per channel)	Rear panel barrier strip input, 4-pin Phoenix sequential turn-on/off connector on standard CC-STL module					
Output Connectors (per channel)	Rear panel barrier strip output					
Filter Storage	3,900 µF	3,900 µF	7,800 µF	11,200 µF	37,000 µF	37,000 µF
Power Supply (factory configured)	100V–240V, 50–60Hz					
Idle Current Draw (PowerSave active, 120V)	0.5A	0.5A	0.6A	0.8A	1.3A	1.3A
1/8 Power Current Draw (typical music, 120V)	0.76A	2.2A	3.6A	7.0A	8.0A	10A
1/3 Power Current Draw (cont. music, 120V)	1.02A	2.83A	5.1A	10.1A	17.0A	23.0A
Max Current Draw (breaker rating, 120V)	2.5A	4.2A	7.0A	15A	30A	30A
Thermal Emissions (1/8 Power, 120V)	269 BTU/hr	816 BTU/hr	1304 BTU/hr	2540 BTU/hr	2600 BTU/hr	3100 BTU/hr
Thermal Emissions (1/3 Power, 120V)	304 BTU/hr	932 BTU/hr	1634 BTU/hr	3263 BTU/hr	5000 BTU/hr	6500 BTU/hr
Cooling	Variable speed, front panel mounted fan, front-to-side cooling					
Controls	Three-position front panel On/Remote/Off switch, two rear panel channel attenuators, AC mains circuit breaker					
LED Indicators (per channel)	Signal, ACL (one per ch.) Protect, Active					
Construction	Steel Chassis, 16 gauge, double thickness in rack ear area.					
Dimensions (Height x Width x Depth)	3.5"x19.0"x17.13" 89x483x435mm	3.5"x19.0"x17.13" 89x483x435mm	3.5"x19.0"x17.13" 89x483x435mm	5.25"x19.0"x17.13" 133x483x435mm	7.0"x19.0"x17.13" 178x483x435mm	7.0"x19.0"x17.13" 178x483x435mm
Net Weight	30.26 lbs. (13.74 kg)	32.20 lbs. (14.62 kg)	35.66 lbs. (16.19 kg)	58.20 lbs. (26.42 kg)	78.65 lbs. (35.39 kg)	78.65 lbs. (35.39 kg)
Gross Weight	25.26 lbs. (11.47 kg)	27.20 lbs. (12.35 kg)	30.66 lbs. (13.92 kg)	50.20 lbs. (22.80 kg)	70.65 lbs. (32.08 kg)	70.65 lbs. (32.08 kg)
Warranty	5 Years (USA, Canada, United Kingdom, and many other countries)					

Voltage Gain / Input Sensitivity Options		CKV100		CKV200		CKV400		CKV800		CKS1600-2		CKS2400-2	
		Gain	Sens	Gain	Sens	Gain	Sens	Gain	Sens	Gain	Sens	Gain	Sens
Factory Standard (**+32dB**)	X40	1.77V		X40	1.77V	X40	1.77V	X40	1.77V	X40	1.77V	X40	1.77V
Option 1 (**+26dB**)	X20	3.54V		X20	3.54V	X20	3.54V	X20	3.54V	X20	3.54V	X20	3.54V
Option 2 (**0dBu**)	X91	.775V		X91	.775V	X91	.775V	X91	.775V	X91	.775V	X91	.775V

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Power figures are watts per channel, both channels driven

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Appendix C - CKX Series Specifications.

	CKX150	CKX300	CKX500	CKX800
Output Power, 100 volt (50 or 70.7 volt option)				
40Hz–20kHz, 0.1% THD+N	75 Watts	150 Watts	250 Watts	400 Watts
Max RMS Output Voltage (each channel)			105V	
Peak Output Voltage (each channel)			150V	
Frequency Response (1W/100V)			38Hz–38kHz, +0/-3dB	
Power Bandwidth (rated power, 1% THD+N)			40Hz–16kHz, +0/-1dB	
TourClass® Protection	ACL, IGM, AutoRamp, short circuit, DC voltage, turn-on/off transient, current inrush, and sub/ultrasonic input.			
THD+N (rated power, 1kHz)			<0.1%	
SMPTE IMD (rated power, 60Hz & 7kHz)			<0.1%	
Input CMRR (1kHz)			>60dB	
Input Sensitivity (rated power)	.61V @ X40 gain setting	.87V @ X40 gain setting	1.1V @ X40 gain setting	1.41V @ X40 gain setting
Voltage Gain		X40 standard, X20 & 0.775V user-selectable		
Input Impedance (balanced, unbalanced)		>20kΩ, >10kΩ		
Hum and Noise (below rated power)		105dB, A-weighted		
Crosstalk (below rated power)		>60dB @ 1kHz		
Class	AB	AB	AB	AB
Input Connectors (per channel)	Rear-panel barrier strip input, 4-pin Phoenix sequential turn-on/off connector on standard CC-STL module			
Output Connectors (per channel)	Touch-proof rear-panel barrier strip output			
Filter Storage	20,000 µF	20,000 µF	34,000 µF	32,000 µF
Power Supply (factory configured)		100–240V, 50–60Hz		
Idle Current Draw (PowerSave active, 240V)	0.5A	0.25A	0.3A	0.4A
1/8 Power Current Draw (typical music, 240V)	0.57A	1.6A	2.2A	3.5A
1/3 Power Current Draw (cont. music, 240V)	.77A	2.1A	3.2A	5.2A
Max Current Draw (breaker rating, 240V)	1.88A	3.2A	4.4A	7.5A
Thermal Emissions (1/8 Power, 240V)	404BTU/hr	1220BTU/hr	1630BTU/hr	2540BTU/hr
Thermal Emissions (1/3 Power, 240V)	456BTU/hr	1400BTU/hr	2450BTU/hr	3263BTU/hr
Cooling	Variable speed, front panel mounted fan, front-to-side cooling			
Controls	Three-position front panel On/Remote/Off switch, two rear panel channel attenuators, AC mains circuit breaker			
LED Indicators (per channel)	Signal, ACL (one per ch.) Protect, Active			
Construction	Steel Chassis, 16 gauge, double thickness in rack ear area.			
Dimensions (Height x Width x Depth)	5.25"x19.0"x17.13"	5.25"x19.0"x17.13"	5.25"x19.0"x17.13"	5.25"x19.0"x17.13"
	133x483x435mm	133x483x435mm	133x483x435mm	133x483x435mm
Gross Weight	37 lbs. (16.82 kg)	40.0 lbs. (18.18 kg)	40.0 lbs. (18.18 kg)	65.0 lbs. (29.55 kg)
Net Weight	32 lbs. (14.55 kg)	35.0 lbs. (15.91 kg)	35.0 lbs. (15.91 kg)	57.0 lbs. (25.91 kg)

	CKX150	CKX300	CKX500	CKX800
Factory Standard ("+32dB")	Gain X40 Sens .61V	Gain X40 Sens .87V	Gain X40 Sens 1.1V	Gain X40 Sens 1.41V
Option 1 ("+26dB")	X20 1.22V	X20 1.74V	X20 2.2V	X20 2.82V
Option 2 ("0dBu")	X31.5 .775V	X44.9 .775V	X56.8 .775V	X73.0 .775V

Power figures are watts per channel, both channels driven

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Appendix D - Wire Gauge Charts

Stranded Cable Lgth. (ft.)	Wire Gauge (AWG)	Power Loss (8 ohm load)	Power Loss (4 ohm load)	Power Loss (2 ohm load)
5	18	0.81%	1.61%	3.2%
	16	0.51	1.02	2.0
	14	0.32	0.64	1.28
	12	0.20	0.40	0.80
	10	0.128	0.25	0.51
10	18	1.61%	3.2%	6.2%
	16	1.02	2.0	4.0
	14	0.64	1.28	2.5
	12	0.40	0.80	1.60
	10	0.25	0.51	1.01
40	18	6.2%	11.9%	22%
	16	4.0	7.7	14.6
	14	2.5	5.0	9.6
	12	1.60	3.2	6.2
	10	1.01	2.0	4.0
	8	0.60	1.20	2.4
80	18	11.9%	22%	37%
	16	7.7	14.6	26
	14	5.0	9.6	17.8
	12	3.2	6.2	11.8
	10	2.0	4.0	7.7
	8	1.20	2.4	4.7
Stranded Cable Lgth. (m)	Wire Gauge (mm ²)	Power Loss (8 ohm load)	Power Loss (4 ohm load)	Power Loss (2 ohm load)
2	0.3	2.9%	5.6%	10.8%
	0.5	1.74	3.4	6.7
	0.75	1.16	2.3	4.5
	1.5	0.58	1.16	2.3
	2.5	0.35	0.70	1.39
	4	0.22	0.44	0.87
5	0.5	4.3%	8.2%	15.5%
	0.75	2.9	5.6	10.8
	1.5	1.45	2.9	5.6
	2.5	0.87	1.74	3.4
	4	0.55	1.09	2.2
	6	0.37	0.73	1.45
10	0.5	8.24%	15.5%	28%
	0.75	5.6	10.8	19.9
	1.5	2.9	5.6	10.8
	2.5	1.74	2.9	6.7
	4	1.09	1.74	4.3
	6	0.73	1.09	2.9

Appendix E - Distributed / Constant Voltage Systems.

A distributed or constant voltage system, as shown in the figure below, uses loudspeaker step-down transformers for each speaker. The transformers are designed to deliver a specific power level into a specific load impedance when a specific voltage (the example here uses 70.7 volts) appears at the primary. A speaker transformer usually has taps on its primary, secondary, or both, so it can be used for several different power levels or speaker impedances.

Each speaker step-down transformer converts the low impedance of its loudspeaker to a relatively high impedance as seen by the distributed line. Consequently, loads can be added or subtracted to the distributed line with very little effect on the actual line voltage, hence the term "constant voltage."

The actual line load Z that the amplifier "sees" is determined by the formula

$$Z = V^2/P$$

where P is the sum of the loudspeaker power taps, compensated for transformer insertion loss;

$$(P = X [\text{xfrmr\#1}] * P [\text{speaker\#1}] + X [\text{xfrmr\#2}] * P [\text{speaker\#2}] + \dots),$$

and V is the distributed line voltage. So, for a 70.7 volt line,

$$Z = (70.7)^2 / P$$

$$Z = 5000 / P$$

For example, if the total power demanded by the speakers is 200 watts, then:

$$V^2/P = 25$$

The compensation factor for transformer insertion loss is:

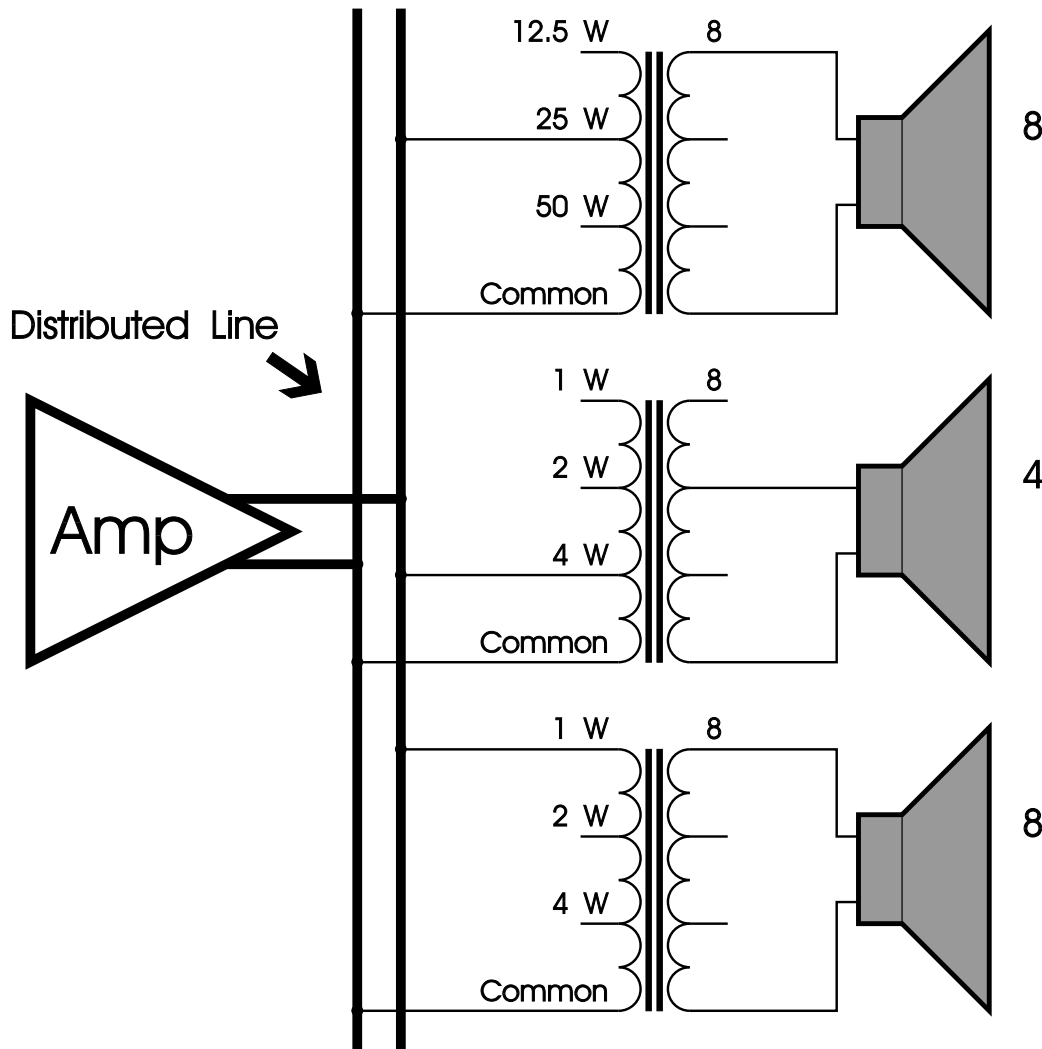
$$x = \text{power drawn from distributed line}$$

$$\text{power delivered to speaker} = 10 \text{ Insertion loss (in dB)} / 10$$

Therefore, a speaker transformer with an insertion loss of 1 dB, tapped at 4 watts, will actually demand 1.26 times 4 watts, or about 5 watts.

CKV Series amplifiers are specifically designed for use with distributed or constant voltage systems. Each CKV Series model can drive two distributed lines (one per channel) of the type for which they are configured, any number of tapped loudspeakers can be placed on a line as long as the total demanded power including insertion losses does not exceed the rated power of the model chosen.

If the impedance of a distributed line overly stresses the amplifier output stage, the amplifier's IGM protection circuits engage, reducing gain in order to protect the amplifier.





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