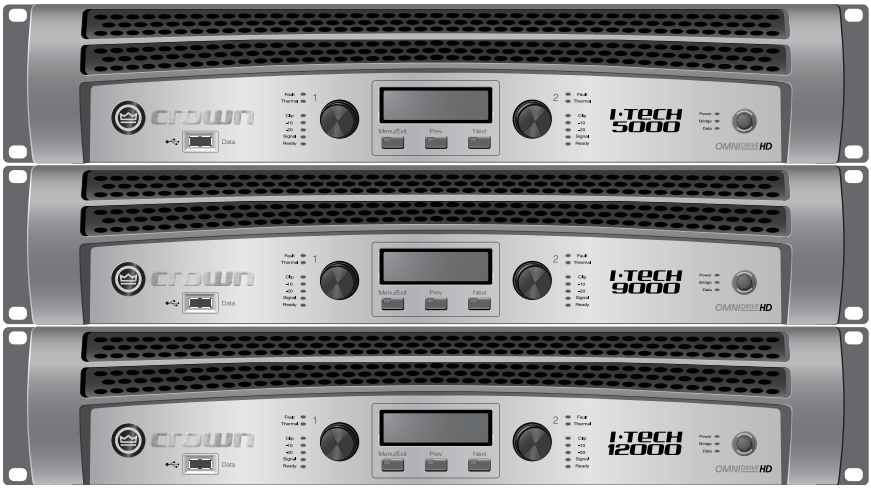
I-Tech HD Series Operation Manual

Models: I-T5000 HD, I-T9000 HD, I-T2000 HD



Obtaining Other Language Versions: To obtain information in another language about the use of this product, please contact your local Crown Distributor. If you need assistance locating your local distributor, please contact Crown at 574-294-8000.

This manual does not include all of the details of design, production, or variations of the equipment. Nor does it cover every possible situation which may arise during installation, operation or maintenance.

The information provided in this manual was deemed accurate as of the publication date. However, updates to this information may have occurred. To obtain the latest version of this manual, please visit the Crown website at www.crownaudio.com.

Some models may be exported under the name Amcron®

5009241 - 11/11

Important Safety Instructions

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.

12. Use only with a cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. Use the mains plug to disconnect the apparatus from the mains.
16. WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE.

17. DO NOT EXPOSE THIS EQUIPMENT TO DRIPPING OR SPLASHING AND ENSURE THAT NO OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, ARE PLACED ON THE EQUIPMENT.
18. THE MAINS PLUG OF THE POWER SUPPLY CORD SHALL REMAIN READILY OPERABLE.

TO PREVENT ELECTRIC SHOCK DO NOT REMOVE TOP OR BOTTOM COVERS. NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

TO COMPLETELY DISCONNECT THIS EQUIPMENT FROM THE AC MAINS, DISCONNECT THE POWER SUPPLY CORD PLUG FROM THE AC RECEPTACLE. THE MAINS PLUG OF THE POWER SUPPLY CORD SHALL REMAIN READILY OPERABLE.

WATCH FOR THESE SYMBOLS:

The lightning bolt triangle is used to alert the user to the risk of electric shock.

The exclamation point triangle is used to alert the user to important operating or maintenance instructions.

IMPORTANT

XLS Series amplifiers require Class 2 output wiring.

MAGNETIC FIELD

CAUTION! Do not locate sensitive high-gain equipment such as preamplifiers or tape decks directly above or below the unit. Because this amplifier has a high power density, it has a strong magnetic field which can induce hum into unshielded devices that are located nearby. The field is strongest just above and below the unit.

If an equipment rack is used, we recommend locating the amplifier(s) in the bottom of the rack and the preamplifier or other sensitive equipment at the top.

FCC COMPLIANCE NOTICE

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

CAUTION: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

DECLARATION OF CONFORMITY

Issued By: Harman International.
1718 W. Mishawaka Rd.
Elkhart, IN 46517 U.S.A.

FOR COMPLIANCE QUESTIONS ONLY: Sue Whitfield
574-294-8289
Sue.Whitfield@harman.com

European Representative's Name and Address:
David J. Budge
10 Harvest Close
Yateley
GU46 6YS
United Kingdom

Equipment Type: Commercial Audio Power Amplifiers
Family Name: I-Tech HD
Model Names: I-T5000 HD, I-T9000 HD, I-T12000 HD

EMC Standards:

EN 55103-1:1997 Electromagnetic Compatibility – Product Family Standard for Audio, Video, Audio-Visual and Entertainment Lighting Control Apparatus for Professional Use, Part 1: Emissions

EN 55103-1:1997 Magnetic Field Emissions-Annex A @ 10 cm and 1 M

EN 61000-3-2:2005 & Amd 1: 2008 Limits for Harmonic Current Emissions (equipment input current ≤16A per phase)

EN 61000-3-3:1998 Limitation of Voltage Fluctuations and Flicker in Low-Voltage Supply Systems Rated Current ≤16A

EN 55022:2006 Limits and Methods of Measurement of Radio Disturbance Characteristics of ITE: Radiated, Class B Limits; Conducted, Class B

EN 55103-2:1997 Electromagnetic Compatibility – Product Family Standard for Audio, Video, Audio-Visual and Entertainment Lighting Control Apparatus for Professional Use, Part 2: Immunity

EN 61000-4-2:2001 Electrostatic Discharge Immunity (Environment E2-Criteria B, 4k V Contact, 8k V Air Discharge)

EN 61000-4-3:2006 Radiated, Radio-Frequency, Electromagnetic Immunity (Environment E2, Criteria A)

EN 61000-4-4:2007 Electrical Fast Transient/Burst Immunity (Criteria B)

EN 61000-4-5:2006 Surge Immunity (Criteria B)

EN 61000-4-6:2006 Immunity to Conducted Disturbances Induced by Radio-Frequency Fields (Criteria A)

EN 61000-4-11:2001 Voltage Dips, Short Interruptions and Voltage Variation

Safety Standard:

IEC 60065: 2001: 7Ed & Amd 1: 2005 Safety Requirements - Audio Video and Similar Electronic Apparatus

I certify that the product identified above conforms to the requirements of the EMC Council Directive 89/336/EEC as amended by 92/31/EEC, and the Low Voltage Directive 73/23/EES as amended by 93/68/EEC.

Signed

Terry Davenport
Director of Manufacturing

Date of Issue: November 1, 2008

Due to line current harmonics, we recommend that you contact your supply authority before connection.

Get Started

Welcome

This is the Crown® I-Tech HD Series offers amazing power, light weight and ease of use for touring sound applications. Unlike other amplifiers, it includes onboard high-definition DSP, an LCD control screen, and a built-in network connection.

Modern power amplifiers are sophisticated pieces of engineering capable of producing extremely high power levels. They must be treated with respect and correctly installed if they are to provide the many years of reliable service for which they were designed.

In addition, I-Tech Series amplifiers include a number of features which require some explanation before they can be used to their maximum advantage.

Please take the time to study this manual so that you can obtain the best possible service from your amplifier.

Features

1. Global Power Supply with PFC (Power Factor Correction) works anywhere in the world.
2. High power density, up to 8000 watts in a 2U chassis.
3. Highest output voltage in the industry (200V peak) provides clean transient peaks.
4. 3rd-generation patented Class I (BCA®) circuitry couples power efficiently to the load and provides low AC current draw.
5. Onboard high-definition DSP with 24-bit, 192 kHz Cirrus Logic SHARC A/D and D/A converters. Advanced IIR filters and linear-phase FIR filters.
6. Pushbutton presets simplify setup. Custom presets for various loudspeakers can be downloaded.
7. AES/EBU digital audio input.
8. EtherCon® Ethernet connector for HiQnet™ control or CobraNet digital audio transport. This "Single Plug" connection allows HiQnet protocol and CobraNet digital audio through the same CAT 5 cable.
9. Analog and digital thru connectors.
10. LCD Control Screen is used to adjust the amplifier's attenuation and muting, configure the amp, set up and view error monitoring, and recall DSP presets to reconfigure the amp for various applications.
11. Comprehensive array of indicators provide accurate diagnostics: Power, Data, along with Ready, Signal, Clip, Thermal and Fault for each channel.
12. AC mains indicator in power switch glows green when AC power is present.
13. Front-panel USB connector accepts a USB drive to transfer presets from the drive to the amplifier DSP, and vice versa.
14. Light weight due to aluminum chassis, special internal construction and switching power supply.
15. Thermal management controller and two discrete thermal zones with variable-speed fans, forced-air cooling.
16. Advanced protection circuitry guards against: shorted outputs, DC, mismatched loads, general overheating, under/over voltage, high-frequency overloads and internal faults.
17. Three-Year, No-Fault, Fully Transferable Warranty completely protects your investment and guarantees its specifications.

Setup

Unpack and Install Your Amplifier

When Please unpack and inspect your amplifier for any damage that may have occurred during transit. If damage is found, notify the transportation company immediately. Only you can initiate a claim for shipping damage. Crown will be happy to help as needed. Save the shipping carton as evidence of damage for the shipper's inspection.

We also recommend that you save all packing materials so you will have them if you ever need to transport the unit. **Never ship the unit without the factory pack.**

YOU WILL NEED (not supplied):

1. Input wiring cables
2. Output wiring cables
3. Ethernet cables
4. Rack for mounting amplifier (or a stable surface for stacking)

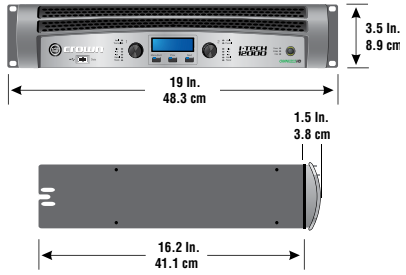
WARNING: Before you start to set up your amplifier, make sure you read and observe the Important Safety Instructions found at the beginning of this manual.

CAUTION: Before you begin, make sure your amplifier is disconnected from the power source, with the power switch in the "off" position and all level controls turned completely down (counterclockwise).

Use a standard 19-inch (48.3 cm) equipment rack (EIA RS-310B).

You may also stack amps without using a cabinet.

NOTE: When transporting, amplifiers should be supported at both front and back.



Magnetic Field

CAUTION! Do not locate sensitive high-gain equipment such as preamplifiers or tape decks directly above or below the unit. Because this amplifier has a high power density, it has a strong magnetic field which can induce hum into unshielded devices that are located nearby. The field is strongest on the right side and right bottom of the amplifier (facing the amplifier).

If an equipment rack is used, we recommend locating sensitive equipment at least 20 cm (8 inches) away from the amplifier.

When using an equipment rack, mount units directly on top of each other. Close any open spaces in rack with blank panels. DO NOT block front or rear air vents. The side walls of the rack should be a minimum of two inches (5.1 cm) away from the amplifier sides, and the back of the rack should be a minimum of four inches (10.2 cm) from the amplifier back panel.

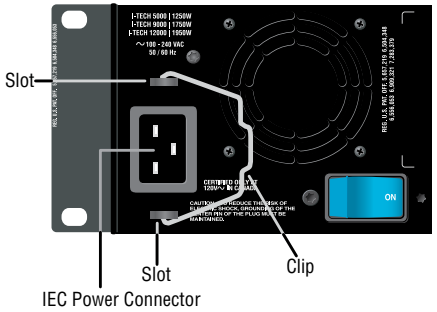
Connecting to AC Mains

WARNING: The third (ground) prong of the supplied AC power cord connector is a required safety feature. Do not attempt to disable this ground connection by using an adapter or other methods.

Amplifiers don't create energy. The AC mains voltage and current must be sufficient to deliver the power you expect. You must operate your amplifier from an AC mains power source with not more than a 10% variation above or a 15% variation below the amplifier's specified line voltage range and within the specified frequency requirements (indicated on the amplifier's back panel label). If you are unsure of the output voltage of your AC mains, please consult your electrician.

Packed with your I-Tech amplifier is a clip that retains the power cord so it can't pull out accidentally.

1. Locate the clip in a bag in the I-Tech packing carton.
2. Locate the IEC power connector on the back of the amplifier. Above and below that connector are two slots. Stretch the ends of the clip and insert them into the slots.
3. Plug the power cord all the way into the amplifier IEC power connector.
4. Pull the clip to the left and snap it onto the power cord.



Wire Inputs and Outputs

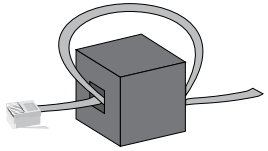
Wiring basics

- Always use shielded wire for input wiring. The higher the density of the shield (the outer conductor) the better. Spiral wrapped shield is not recommended.
- When using unbalanced lines keep the cables as short as possible. Avoid lengths greater than 10 feet (3 meters).
- Do not run the audio input cables together with the high-level wiring such as loudspeaker wires or AC cords. (This lessens the chance of hum and noise being induced into the input cables.)
- Turn the entire sound system off before changing any connections. Crown is not liable for damage incurred when any transducer or component is over driven.

THE CHANNEL 2 INPUT IS IGNORED by default in Bridge Mono mode. It can be summed using the input source selector and used instead of Channel 1.

For additional information on audio input wiring please refer to the Crown Amplifier Application Guide available online at www.crownaudio.com. It contains helpful information on preventing unwanted subsonic frequencies, radio frequency interference, ground loops, and feedback oscillation.

When using network connections, pass the CAT 5 cable five times through a ferrite core, available from Crown Audio Inc. This is to ensure compliance with emission regulations.



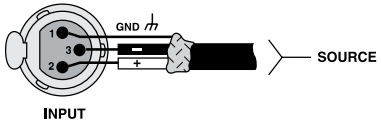
Choose Input Wire and Connectors

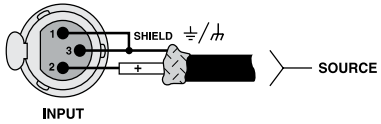
Crown recommends using pre-built or professionally wired, balanced line (two-conductor plus shield), 22-24 gauge cables and connectors. Use 3-pin male XLR connectors.

Unbalanced line may also be used but may result in noise over long cable runs.

The image below on the left shows connector pin assignments for balanced analog wiring or AES/EBU digital wiring. The use of standard analog cable with AES/EBU will result in diminished performance. For best results, 110 ohm shielded twisted-pair cable for AES/EBU signals is highly recommended. The image below on the right shows connector pin assignments for unbalanced analog wiring.

NOTE: Custom wiring should only be performed by qualified personnel.





Choose Output Wire and Connectors

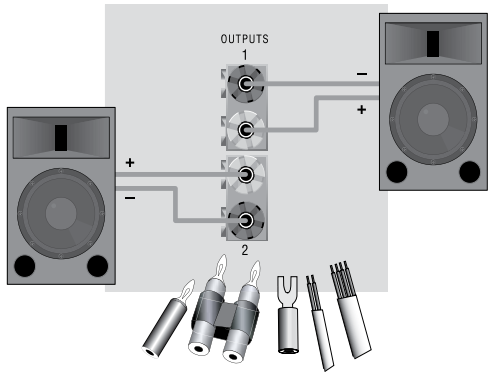
Crown recommends using pre-built or professionally wired, high-quality, two- or four-conductor, heavy gauge speaker wire and connectors. Use Class 2 output wiring. You may use a 4-pole Speakon® connector or banana plugs, spade lugs, or bare wire for your output connectors. To prevent the possibility of short circuits, wrap or otherwise insulate exposed loudspeaker cable connectors.

CAUTION – SHOCK HAZARD: Potentially lethal voltages exist at the output connectors when the amplifier is turned on and is passing a signal.

Using the guidelines below, select the appropriate size of wire based on the distance from amplifier to speaker.

Distance	Wire Size
up to 25 ft.	16 AWG
26-40 ft.	14 AWG
41-60 ft.	12 AWG
61-100 ft.	10 AWG
101-150 ft.	8 AWG
151-250 ft.	6 AWG

CAUTION: Never use shielded cable for output wiring.



Stereo Mode Wiring

Typical input and output wiring is shown in image below.

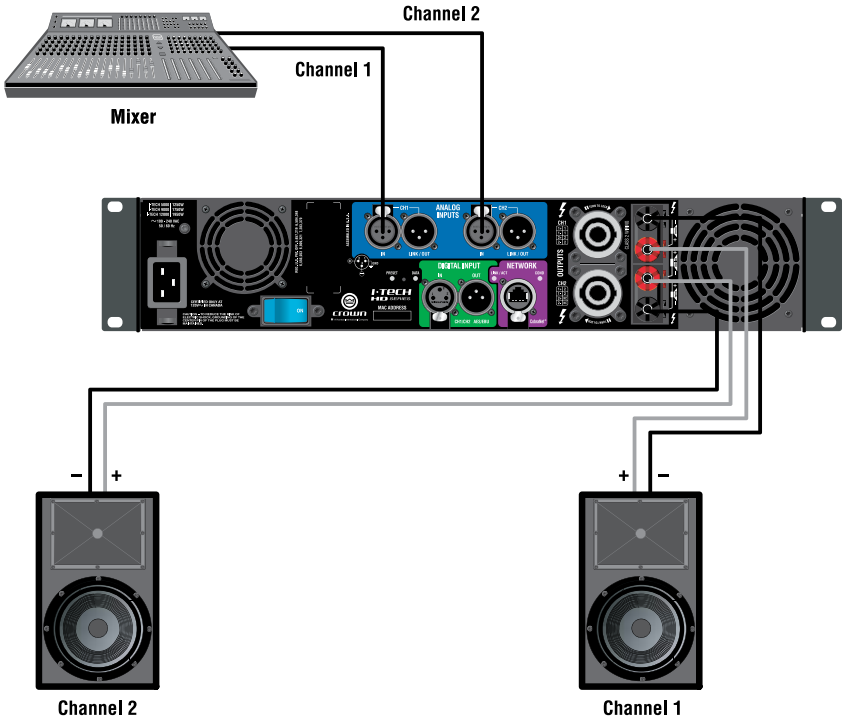
IMPORTANT: Turn off the amplifier and unplug its power cord.

INPUTS: Choose one of these options:

- Connect analog input wiring for both channels.
- Connect an AES/EBU digital signal to the AES/EBU connector.

OUTPUTS: Maintain proper polarity (+/–) on output connectors. Use Class 2 output wiring.

The image below shows how to wire stereo speakers to the binding posts. Connect Channel 1 loudspeaker's positive (+) lead to Channel 1 positive (red) terminal of amp; repeat for negative (–). Repeat Channel 2 wiring as for Channel 1.



To wire stereo speakers to the Speakon® connectors, use one of these methods:

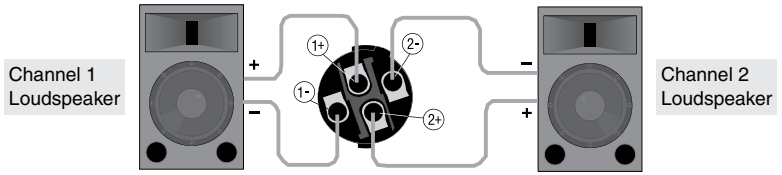
Method 1: Wire one Speakon® cable connector to two speakers. Insert the Speakon® cable connector into the amplifier's top Speakon® connector.

Method 2: Plug the Channel 1 speaker into the Channel 1 (top) Speakon® connector, and plug the Channel 2 speaker into the Channel 2 (bottom) Speakon® connector.

Method 1

Stereo Wiring Method 1: Use Top Speakon® Only

PIN	1+	1–	2+	2–
CH	1+	1–	2+	2–



Method 2

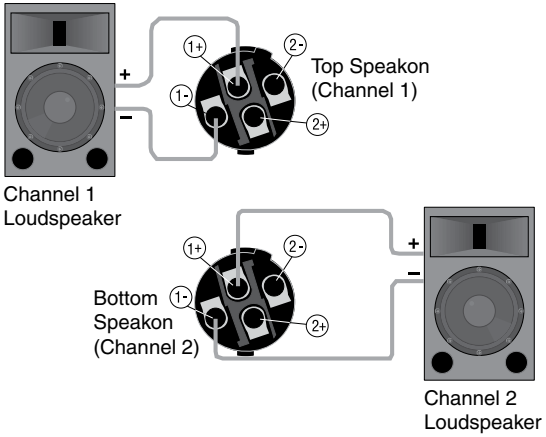
Stereo Wiring Method 2: Use Both Speakon®s

Top Speakon

PIN	1+	1–
CH	1+	1–

Bottom Speakon

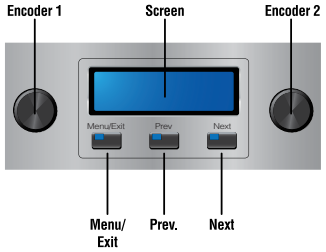
PIN	1+	1–
CH	2+	2–



Bridge-Mono Mode

Overview: Turn on the amp, enable Bridge-Mono mode using the LCD Control Screen, turn off the amp, wire it, and turn it back on.

1. Be sure that no cables are connected to the amplifier. Turn on the front-panel power switch. The LCD Control Screen will light up.



NOTE: In Bridge-Mono mode, the Channel 1 Level control sets the level; the Channel-2 Level control is defeated. All Channel-2 objects and controls are hidden and disabled.

2. Under the LCD Control Screen, press the **Menu/Exit** button. Press the **Next** button until you see OUTPUT MODE on the screen. If N/A is displayed, OUTPUT MODE is locked via software. If LOCKOUT is displayed, all the LCD screens are locked via software.

   Press an Encoder knob to select BRIDGE MONO. Press the knob again to confirm your choice. Press Menu/Exit. Turn down both level controls (Encoders) until you reach maximum attenuation.

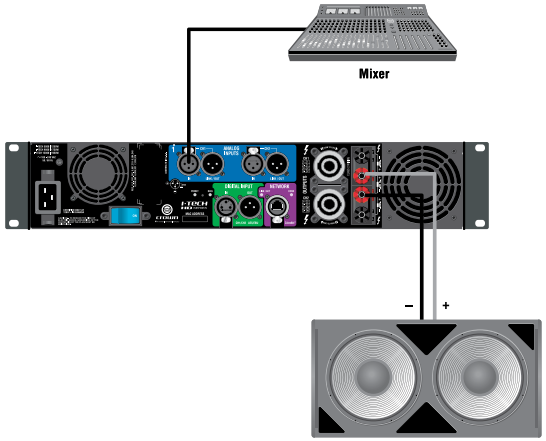
3. **IMPORTANT: Turn off the amplifier and unplug its power cord.**

INPUTS: There are three ways to connect an input signal to the amplifier:

- Connect an analog signal source to the Channel-1 amplifier input.
- Connect an AES/EBU digital signal source to the Digital Input IN connector.

NOTE: Crown provides a reference of wiring pin assignments for commonly used connector types in the Crown *Amplifier Application Guide* available at www.crownaudio.com.

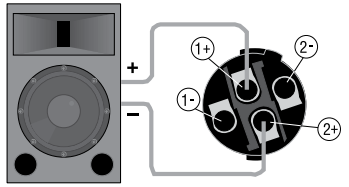
OUTPUTS: Use Class 2 output wiring. There are two ways to wire the amplifier output connectors for Bridge-Mono mode:



1. Wire the speaker across the red binding post of each channel. Do not use the black binding posts when operating in Bridge-Mono mode.
2. Wire the speaker only to the top Speakon® connector as shown in the table below.

Top Speakon® Wiring for Bridge-Mono

PIN	1+	2+
SPKR	+	–



Operation

Protecting Your Speakers

It's wise to avoid clipping the amplifier signal. Not only does clipping sound bad, it can damage high-frequency drivers. To prevent clipping, use System Architect software's Level Max suite to enable or display the peak voltage limiter and average power limiter in your amplifier's built-in DSP. That way, no matter how strong a signal your mixer produces, the amplifier output will not clip. Set the limiter threshold so that mixer signals above 0 dB or 0 VU on the mixer meters do not quite drive the amplifier into clipping.

Also, avoid sending strong subsonic signals to the amplifier. High-level, low-frequency signals from breath pops or dropped microphones can blow out drivers. To prevent subsonic signals, use one of these methods:

- Insert a highpass filter between mixer output and amplifier input (or between mixer and limiter).
- Use the I-Tech's onboard DSP to set up a highpass filters.
- Switch in highpass filters at your mixer. Set the filter to as high a frequency as possible that does not affect your program. For example, try 35 Hz for music and 75 Hz for speech. On each mixer input channel, set the filter frequency just below the lowest fundamental frequency of that channel's instrument.

Startup Procedure

When first turning on your amplifier, follow the procedures in the Quick-Start Guide on page 4 (stereo) or page 5 (bridge-mono).

If you ever need to make any wiring or installation changes, don't forget to disconnect the power cord.

For help with determining your system's optimum gain structure (signal levels) please refer to the Crown *Amplifier Application Guide*, available online at www.crownaudio.com.

Precautions

Your amplifier is protected from internal and external faults, but you should still take the following precautions for optimum performance and safety:

1. Before use, your amplifier first must be configured for proper operation, including input and output wiring hookup. Improper wiring can result in serious operating difficulties. For information on wiring and configuration, please consult the Setup section of this manual or, for advanced setup techniques, consult Crown's *Amplifier Application Guide* available online at www.crownaudio.com.
2. Use care when making connections, selecting signal sources and controlling the output level. The load you save may be your own!
3. Do not short the ground lead of an output cable to the input signal ground. This may form a ground loop and cause oscillations.
4. **WARNING: Never connect the output to a power supply, battery or power main. Electrical shock may result.**

5. Tampering with the circuitry, or making unauthorized circuit changes may be hazardous and invalidates all agency listings.
6. Do not operate the amplifier with the red Clip LEDs constantly flashing.
7. Do not overdrive the mixer, which will cause clipped signal to be sent to the amplifier. Such signals will be reproduced with extreme accuracy, and loudspeaker damage may result.
8. Do not operate the amplifier with less than the rated load impedance. Due to the amplifier's output protection, such a configuration may result in premature clipping and speaker damage.
9. **CAUTION – SHOCK HAZARD: Potentially lethal voltages exist at the output connectors when the amplifier is turned on and is passing a signal.**

Remember: Crown is not liable for damage that results from overdriving other system components.

Front Panel Features

Indicators:

Fault Indicator: Red LED, one per channel, flashes when the amplifier output channel has stopped operating. Usually this means that the amplifier must be serviced.

Thermal Indicator: Red LED, one per channel, illuminates when the channel has shut down due to thermal stress or overload.

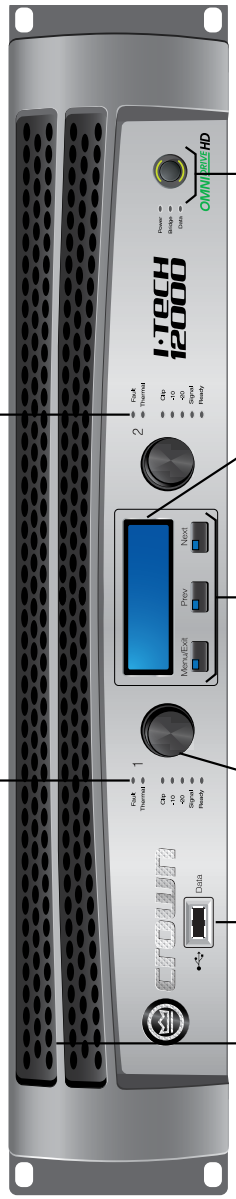
Clip Indicator: Red LED, one per channel, illuminates whenn the channel's output signal reaches the onset of audible clipping. The Clip indicator also will illuminate during Thermal Level Control (TLC) limiting. The Clip Indicator can be turned of during Blackout mode.

-10 dB Indicator: amplifier output is 10 dB below clipping.

-20 dB Indicator: amplifier output is 20 dB below clipping.

Signal Indicator: selected input signal is abouve -40 dBu.

Ready Indicator: Green LED, one per channel, illuminates when the channel is initialized and ready to produce audio output. Indicator is off when the channel is set to standby mode via System Architect or in Blackout mode.



Cooling Vents:
Front-to-rear forced airflow through foam dust filter.

USB 2.0 Connector:
Accepts a USB drive to transfer presets from the drive to the amplifier DSP, and vice versa.

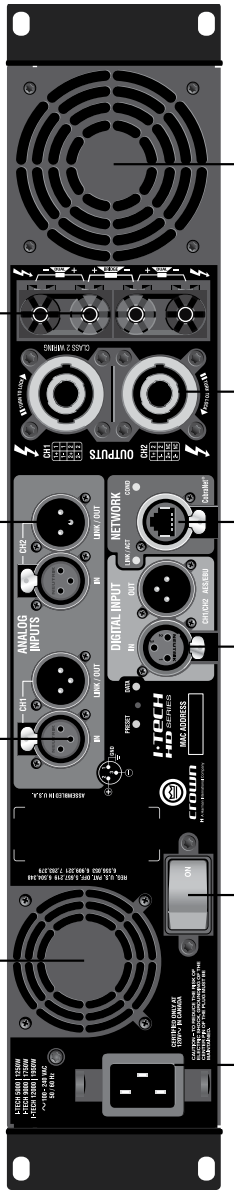
Gain (Level) Controls:
Two black rotary level controls, one for each channel.

Sel/Prev/Next Buttons:
Three buttons located underneath the LCD screen used to access menu items and front panel lockout.

LCD Screen:
Backlit liquid crystal display shows enabled presets and speaker processing.

Power Button & Indicator:
Push-on/push-off switch glows green when AC power is present at the power cord and the amplifier circuit breaker is in the "on" position.

Back Panel Features



Balanced Analog XLR Loop-Through Outputs:
Two 3-pin male XLR output connectors are provided (one per channel). The signal at these connectors is paralleled with the Input signal for feeding the input signal to other amplifiers.

Binding Post Output Jacks:
One pair per channel of high-current, 60A color-coded binding posts. Accepts banana plugs,wire of spade lugs.

Balanced Analog XLR Inputs:
Provide front to back forced airflow for cooling.

Fans:
Provide front to back forced airflow for cooling.

Network Connector:
This EtherCon® Ethernet connector is for networking.
Warning: Only connect to networks that remain inside the building.

Fans:
Provide front to back forced airflow for cooling.

4-Pole Speakon® Output Connectors:
These two connectors accept 2-pole or 4-pole Speakon connectors. The channel 1 connector is wired for both channels so it can be used for bridge-mode wiring or stereo wiring of two speakers to a single Speakon.

AES/EBU Digital Input:
This 3-pin female XLR connector accepts a digital signal in the AES/EBU format.

AC Power Connector

Reset Switch/ Circuit Breaker

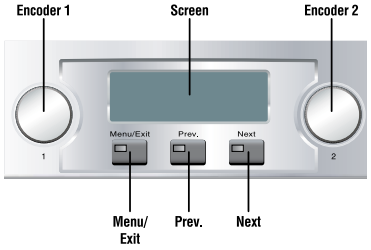
Advanced Operation

Navigating the LCD Control Screen

Introduction

The LCD Control Screen and its controls let you configure the amplifier and access many features that before were available only through a remote computer. Also, you can recall DSP presets via the front panel. (Some DSP parameters cannot be adjusted with the LCD Control Screen. That is done in System Architect.)

This image shows the parts of the LCD Control Screen. Its functions are described below. NOTE: Listed functions can also be controlled in System Architect.



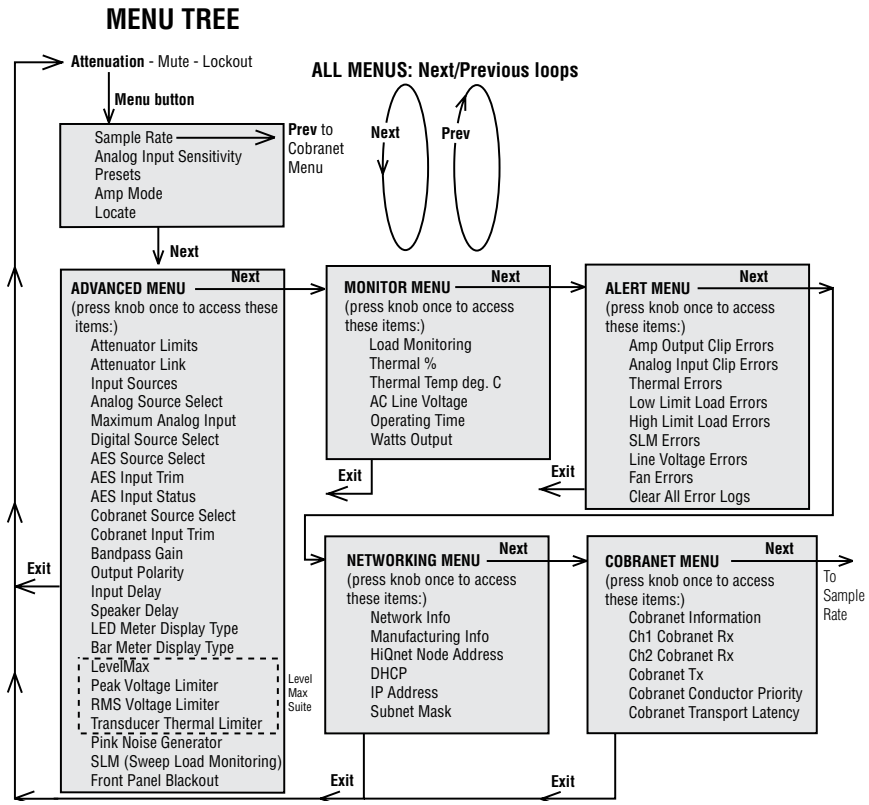
Here's how to access the various menus and settings in the LCD control screen:

Starting from the Attenuation screen, press **Menu/Exit** to go to the Sample Rate screen.

- Press **Next** to go to the next item in the menu.
- Press **Prev** to go to the previous item in the menu.
- Turn or press either **Encoder** knob to change the value of the displayed parameter.
- When you see a menu screen, push the knob once to see the items in that menu. Or press **Next** to go to the next menu.
- Press **Menu/Exit** to leave the menu and return to the Attenuation screen at any time.

Some menu items require confirmation: after you request a change, the display might say "Press and hold." To confirm a change, press and hold an **Encoder** knob. If you don't want the change to occur during a confirmation, turn the knob or wait five seconds.

The entire front panel or just selected screens can be locked out or set to read only status using System Architect software. Locked-out screens will either say "Lockout" or the individual parameter will say "N/A". If a change is attempted the screen will say "Changes Disabled".



Sweep Load Monitoring is not available in early I-Tech HD models.

Presets

Introduction

Your I-Tech HD amplifier has a wide variety of onboard Digital Signal Processing (DSP). Some applications for this DSP are speaker configuration (setting the drive levels, frequency bands, delays and limiting for your particular speakers), EQ, filtering, compression, and much more. Those functions are described in Section 4.6. System Architect software lets you adjust the DSP settings, such as filter slope, compression ratio, EQ frequency bands, and so on.

A **preset** is a group of DSP settings that configure the amp for a specific application. For example, you might use one preset that optimizes the amp's DSP for a JBL Vertec Line Array. You might use another preset that sets up the DSP for a stereo pair of loudspeakers of your choice. You can choose any of 50 presets with the LCD Control Screen.

Preset 1 is the factory default preset and cannot be overwritten. It sets up the amplifier for stereo operation with no DSP.

The I-Tech HD amplifier works with two types of presets:

1. **User presets.** Using System Architect, you can create your own custom DSP presets, label them, and send them to the I-Tech HD amplifier. The amp stores those presets in firmware. You can recall those presets from the LCD Control Screen.
2. **Downloadable presets.** Crown and JBL engineers have designed presets that are optimized for various JBL loudspeakers, such as Vertec Line Arrays. You can download presets from the I-Tech pages in the Crown website www.crownaudio.com. Then in the software, or with a USB drive, send the preset files to the I-Tech HD amplifier, where you can recall them from the LCD Control Screen.

We will describe each type of preset in detail.

User Presets

User presets are DSP presets that you set up. This is the basic procedure:

1. Adjust the DSP settings as desired in the System Architect software (not with the LCD Control Screen).
2. Save this group of settings as preset. Give it a label.
3. Download the preset to the I-Tech HD amplifier. See the software Help file for details. As soon as you save the setting as a preset, it is sent to the amplifier. Another option, described on the next page, is to transfer the preset file using a USB drive.
4. Select that preset from the LCD Control Screen. The preset will automatically set the DSP parameters as you set them up in the control software.

Setting some parameters of the DSP in the I-Tech HD amplifier is done using the control software, not by the amplifier's LCD Control Screen. For example, if you want to set filter Q, compression ratio, or graphic EQ, you would do so within the System Architect software.

5. When you want to recall the preset, select it from the Preset screen in the LCD display. The preset will automatically set the DSP parameters as you set them up in the control software.

Downloadable Presets

Crown and JBL engineers have designed I-Tech HD DSP presets that are optimized for various JBL loudspeakers, such as Vertec Line Arrays. To use them, follow this procedure in System Architect:

1. Go to the I-Tech pages at www.crownaudio.com.
2. Select Downloads.
3. Click on the file of your choice. It will download to your computer.
4. In System Architect, see the Help file on Presets for details on downloading the preset to an I-Tech HD amplifier.Basically, you will open and engage a data frame. The file will overwrite the preset you designate. Another option, described on the next page, is to transfer the preset file using a USB drive.
5. Recall the preset from the LCD Control Screen. Then your amp will be configured to work with the specified loudspeaker model.

Digital Audio Options (AES/EBU)

Digital audio inputs allow you to keep the amplifier input signals in the digital domain. Keeping the input signal digital reduces the number of Digital-to-Analog and Analog-to-Digital conversions. This provides better sound quality and reduces pickup of electrical interference.

The AES/EBU connector provides the most widely accepted format. Connect an AES/EBU signal to the AES/EBU connector on the rear panel. If the amplifier's low-voltage power supply is lost for any reason, the AES input signal goes directly to the AES output. The amplifier has a digital buffer converter so it will adapt to any AES sample rate between 32 and 96kHz that is sent to it.

Networking the Amplifier

If you need help understanding network concepts, please see Appendix A on Network and CobraNet Basics. Please check the System Architect help file for directions on how to use its networking configuration tools.

An I-Tech HD amplifier may be used in an existing I-Tech network and can use existing I-Tech device or venue files.

You can make the following settings via the front panel or by using the Network Troubleshooter:

HiQnet node address

DHCP off/on

IP address

Subnet mask

Network Troubleshooter

The network troubleshooter can assist you in setting up your HiQnet network for the first time. Using the troubleshooter, you can address your components and be informed of addressing and other errors in the system. Please note that this wizard is designed to work with devices that are on the same physical network segment as the computer it is running on. It will not work through a router.

Select Network Card

The first page of the wizard lists all the network adapters currently in the computer. If you have more than one adapter, you can scroll through the list and see the **IP Address** assigned to each card.

If you have a card with an IP address of 0.0.0.0, it typically means one of several things:

1. The card is disabled.
2. The card is not connected to a network.
3. The card is setup to obtain its address from a DHCP server, and no DHCP server is available.

Select the card that is connected to the HiQnet system and click the **Next** button. The Wizard will walk you through the rest of the process. Please see the System Architect online help for more information.

Software-Controllable Onboard DSP

Crown's latest-generation Digital Signal Processing is built into the I-Tech HD amplifier. Its 24-bit/96kHz converters offer extremely low noise and extended dynamic range. When you use an I-Tech HD amp, the loudspeaker processors, crossovers, limiters and delays are in the onboard DSP – so you don't need those rack-mounted devices. This drastically cuts setup time, commissioning, rack space and costs.

The I-Tech HD's DSP can be monitored and controlled with a computer running System Architect software, and connected to the amplifier Network Connector by a network Category 5 cable.

Some applications for this DSP are:

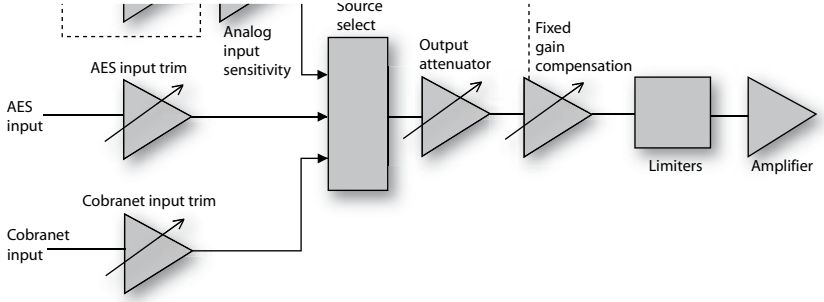
- Set up signal flow
- Optimize system gain structure
- Set up speaker configurations (set the drive levels, frequency bands, delays and limiting for your particular speakers)
- Set up EQ, filtering, compression, and much more.

Fixed-Gain mode in the I-Tech HD

Fixed-gain mode makes any I-Tech HD model have the same gain, regardless of output power.

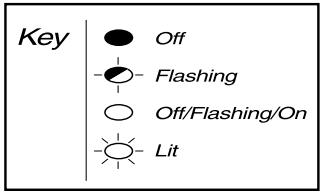
To do that, fixed-gain mode sets the **Analog Input Sensitivity** to 0 dB gain, then adjusts the **Fixed Gain Compensation** fader, and the **Maximum Analog Input**, to achieve 26 or 32 dB of gain (if the Maximum Analog Input is set Low), or to achieve 32 or 38 dB of gain (if the Maximum Analog Input is set High), no matter what model the amplifier is.

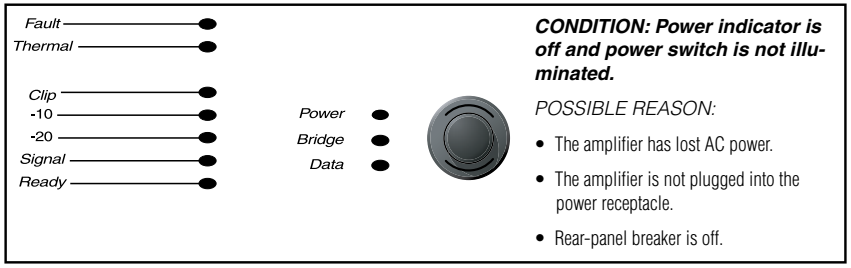
However, In fixed-gain mode, the input trims (Analog, AES, CobraNet) can still be adjusted.



Troubleshooting

"Off/Flashing/On" means that the LED can be off, or flashing, or on.

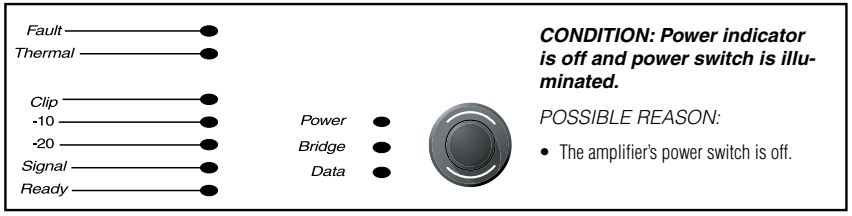




CONDITION: Power indicator is off and power switch is not illuminated.

POSSIBLE REASON:

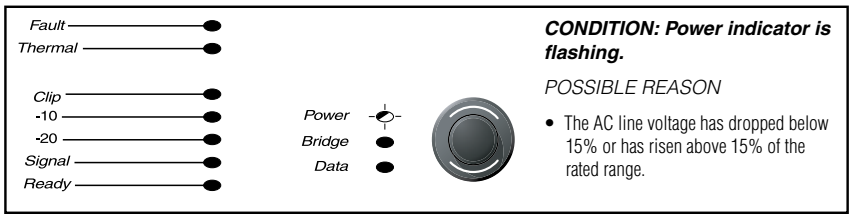
- The amplifier has lost AC power.
- The amplifier is not plugged into the power receptacle.
- Rear-panel breaker is off.



CONDITION: Power indicator is off and power switch is illuminated.

POSSIBLE REASON:

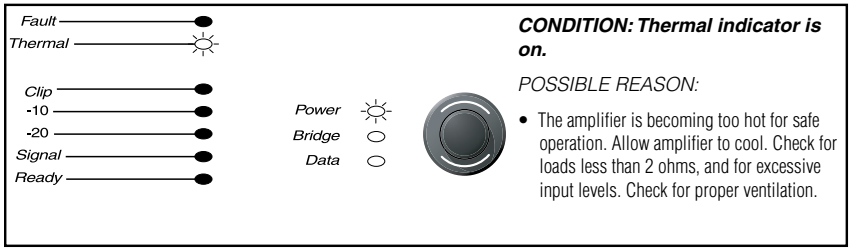
- The amplifier's power switch is off.



CONDITION: Power indicator is flashing.

POSSIBLE REASON

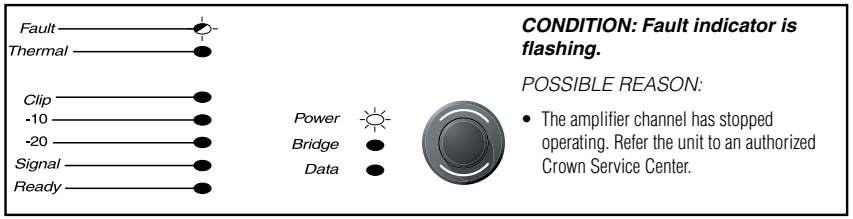
- The AC line voltage has dropped below 15% or has risen above 15% of the rated range.



CONDITION: Thermal indicator is on.

POSSIBLE REASON:

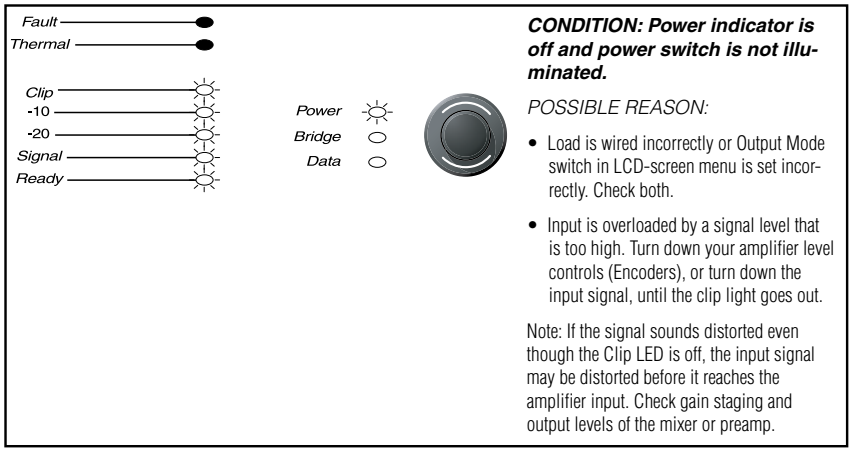
- The amplifier is becoming too hot for safe operation. Allow amplifier to cool. Check for loads less than 2 ohms, and for excessive input levels. Check for proper ventilation.



CONDITION: Fault indicator is flashing.

POSSIBLE REASON:

- The amplifier channel has stopped operating. Refer the unit to an authorized Crown Service Center.

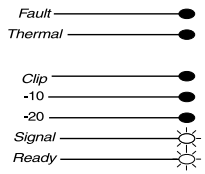


CONDITION: Power indicator is off and power switch is not illuminated.

POSSIBLE REASON:

- Load is wired incorrectly or Output Mode switch in LCD-screen menu is set incorrectly. Check both.
- Input is overloaded by a signal level that is too high. Turn down your amplifier level controls (Encoders), or turn down the input signal, until the clip light goes out.

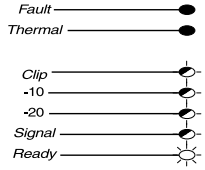
Note: If the signal sounds distorted even though the Clip LED is off, the input signal may be distorted before it reaches the amplifier input. Check gain staging and output levels of the mixer or preamp.



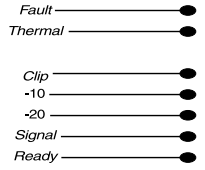
CONDITION: No sound, even though the amp has power. Power LED is on without flashing and the amp is receiving an input signal. Signal indicator is on or flashing.

POSSIBLE REASON

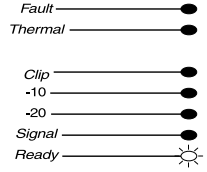
- Speakers not connected.
- Open circuit due to speaker failure.



- There is a short on the amplifier output. First disconnect your speakers from the affected channel(s) one by one to determine if one of the loads is shorted.



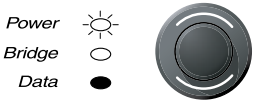
- Ready LED is off. Channel has been set to standby mode via the software.
- Amplifier is in blackout mode. Press or turn an Encoder to reactivate the LCD display.



CONDITION: No input signal. Signal indicator is not flashing even though audio is applied, and the channel is ready.

POSSIBLE REASON

- Input signal level is very low.
- Another source is selected or routed.

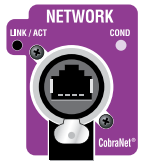


CONDITION: Data indicator not flashing, even though host computer software is active.

POSSIBLE REASON:

- Cable between computer and amplifier is broken or not connected.

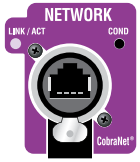
Note: Data indicator flashes only when the amplifier is polled for data, or is polled to see whether it is online.



CONDITION: Yellow LINK ACTIVITY indicator in Ethernet connector does not illuminate or flash.

POSSIBLE REASON:

- Ethernet link is broken.



CONDITION: COND indicator is off.

POSSIBLE REASON:

- There is only one conductor allowed per network system. This indicator is lit only when the amplifier is the conductor.
- Amplifier is in blackout mode. Press or turn an Encoder to reactivate the LCD display.

CONDITION: Computer does not communicate with the network devices.

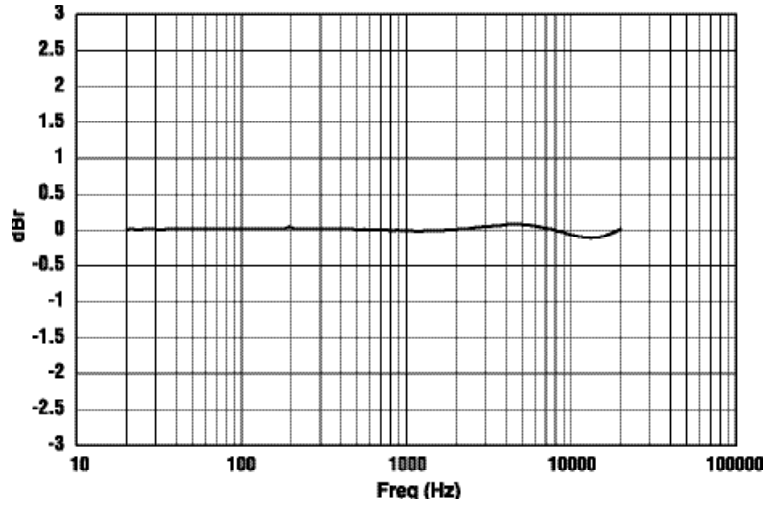
POSSIBLE REASON:

- Incorrect wiring. See Section 3.5 letter O on network wiring.
- IP Addressing is not done correctly. Use the Network Troubleshooting Wizard in System Architect.

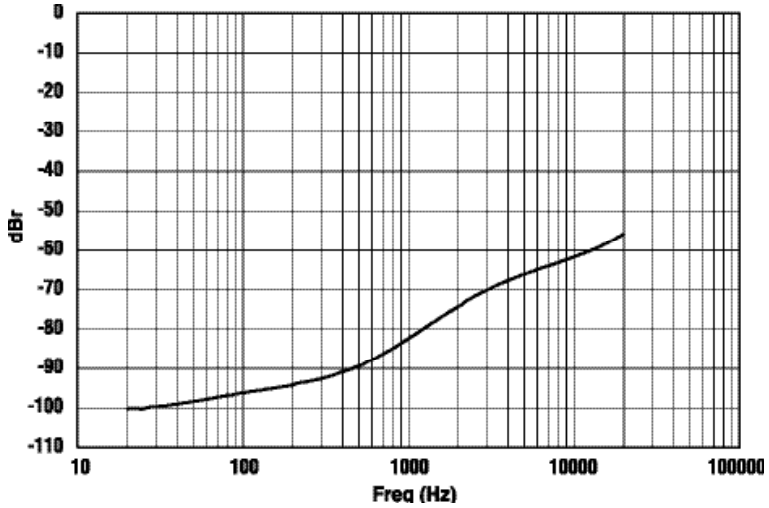
Minimum Guaranteed Power	I-T5000HD	I-T9000HD	I-T12000HD
20 Hz - 20 kHz with 0.35% THD			
Stereo, 2 ohms (per ch.)	1800W	2500W	3500W
Stereo, 4 ohms (per ch.)	2000W	3000W	4000W
Stereo, 8 ohms (per ch.)	1250W	1500W	2100W
Bridge mono, 4 ohms	3600W	5000W	7000W
Bridge mono, 8 ohms	4000W	6000W	8000W
Performance	**I-T5000HD**	**I-T9000HD**	**I-T12000HD**
Input Sensitivity (volts RMS) for rated output	Adjustable in 0.1V steps from 1.28V to 8V	Adjustable in 0.1V steps from 1.28V to 8V	Adjustable in 0.1V steps from 1.28V to 8V
Voltage Gain for full rated power at 8 ohms	37.1 dB to 22.2 dB	37.9 dB to 23.0 dB	40.1 dB to 24.5 dB
Frequency Response (at 1 watt, 20Hz - 20 kHz)	± 0.25 dB	± 0.25 dB	± 0.25 dB
Signal to Noise Ratio below rated full-bandwidth power, A-weighted	> 108 dB	> 108 dB	> 108 dB
Total Harmonic Distortion (THD) at full rated power at 1 kHz	< 0.1%	< 0.1%	< 0.1%
Intermodulation Distortion (IMD) 60 Hz and 7 kHz at 4:1, from full rated output to –35 dB	< 0.35%	< 0.35%	< 0.35%
Maximum Input Level	+15 dBu or +21 dBu, depending on setting of maximum input level	+15 dBu or +21 dBu, depending on setting of maximum input level	+15 dBu or +21 dBu, depending on setting of maximum input level
Latency	1.16 mS at 48 kHz, 529 µS at 96 kHz	1.16 mS at 48 kHz, 529 µS at 96 kHz	1.16 mS at 48 kHz, 529 µS at 96 kHz
A/D, D/A Converters	24-bit 96 kHz Cirrus Logic	24-bit 96 kHz Cirrus Logic	24-bit 96 kHz Cirrus Logic
Digital Input	AES/EBU, 24-bit, 32-96 kHz. Onboard sample rate converter.	AES/EBU, 24-bit, 32-96 kHz. Onboard sample rate converter.	AES/EBU, 24-bit, 32-96 kHz. Onboard sample rate converter.
Network	Onboard HiQnet and TCP/IQ, compatible with standard 100Mb Ethernet hardware	Onboard HiQnet and TCP/IQ, compatible with standard 100Mb Ethernet hardware	Onboard HiQnet and TCP/IQ, compatible with standard 100Mb Ethernet hardware
DSP	24-bit conversion with 32-bit, floating-point DSP processing	24-bit conversion with 32-bit, floating-point DSP processing	24-bit conversion with 32-bit, floating-point DSP processing
Attenuators	Speed-sensitive rotary encoders, 0.5 dB steps, range 0 to –100 dB.	Speed-sensitive rotary encoders, 0.5 dB steps, range 0 to –100 dB	Speed-sensitive rotary encoders, 0.5 dB steps, range 0 to –100 dB

Performance	I-T5000HD	I-T9000HD	I-T12000HD
Damping Factor (8 ohms): 20 Hz to 100 Hz	> 5000	> 5000	> 5000
Crosstalk (below rated power, 20 Hz to 1 kHz)	> 80 dB	> 80 dB	> 80 dB
Common Mode Rejection (CMR) (20 Hz to 1 kHz)	> 55 dB, typically > 70 dB	> 55 dB, typically > 70 dB	> 55 dB, typically > 70 dB
DC Output Offset (Shorted input)	< ± 3 mV	< ± 3 mV	< ± 3 mV
Input Impedance (nominal)	20 kilohms balanced, 10 kilohms unbalanced	20 kilohms balanced, 10 kilohms unbalanced	20 kilohms balanced, 10 kilohms unbalanced
Load Impedance (Note: Safe with all types of loads)			
Stereo	1-2-4-8-16 ohms	1-2-4-8-16 ohms	1-2-4-8-16 ohms
Bridge Mono	2-4-8 ohms	2-4-8 ohms	2-4-8 ohms
Required AC Mains	Universal AC input, 100-240VAC (±15%), 50/60 Hz. Max. AC mains voltage 277VAC.	Universal AC input, 100-240VAC (±15%), 50/60 Hz. Max. AC mains voltage 277VAC.	Universal AC input, 100-240VAC (±15%), 50/60 Hz. Max. AC mains voltage 277VAC.
AC Line Connector	USA, UK, European, Australia, India	USA, UK, European, Australia, India	USA, UK, European, Australia, India
Construction	**I-T5000HD**	**I-T9000HD**	**I-T12000HD**
Ventilation	Flow-through ventilation from front to back	Flow-through ventilation from front to back	Flow-through ventilation from front to back
Cooling	Dual-zone, microprocessor controlled, continuously variable speed fans	Dual-zone, microprocessor controlled, continuously variable speed fans	Dual-zone, microprocessor controlled, continuously variable speed fans
Dimensions	EIA Standard 19-inch rack mount width (EIA RS-310B), 3.5-inch (8.9-cm) height, 16.2-inch (41.1-cm) depth behind front mounting surface	EIA Standard 19-inch rack mount width (EIA RS-310B), 3.5-inch (8.9-cm) height, 16.2-inch (41.1-cm) depth behind front mounting surface	EIA Standard 19-inch rack mount width (EIA RS-310B), 3.5-inch (8.9-cm) height, 16.2-inch (41.1-cm) depth behind front mounting surface
Weight			
Net	28 pounds (12.7 kg)	28 pounds (12.7 kg)	28 pounds (12.7 kg)
Shipping	36 pounds (16.3 kg)	36 pounds (16.3 kg)	36 pounds (16.3 kg)

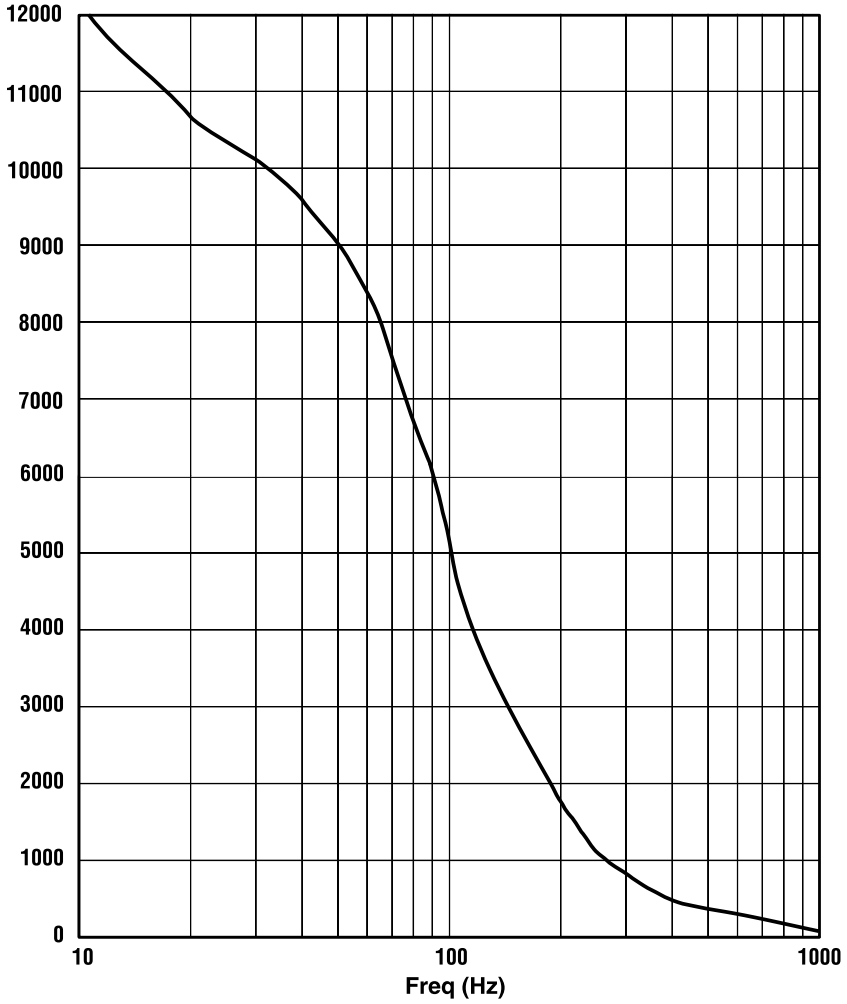
Charts



Typical Frequency Response (1W)



Typical Crosstalk vs. Frequency



Typical Damping Factor vs. Frequency

I-Tech 5000HD AC Current Draw and Thermal Dissipation:

Pink noise 12dB crest factor, bandwidth limited 22Hz to 22kHz.
Typical line impedance used.
Data based on both channels driven.

I-T5000HD										
		120VAC		208VAC		230VAC			Thermal Dissipation	
	Load	Line Current 120VAC	Watts Out Per 1A Amp Line Current	Line Current 208VAC	Watts Out Per 1A Amp Line Current	Line Current 230VAC	Watts Out Per 1A Amp Line Current	Watts Dissipated	Btu/hr	kcal/hr
Idle (sleep mode)		0.8		0.95		0.9		53	182	157
Idle (awake)		1.6		1.4		1.3		172	587	505
1/8th Power Pink Noise Typical of program material just at clip.	8 Ohms/Ch. 16 Ohms Bridge	5.3	59.6	3.4	94.6	3.1	102.6	305	1040	262
	4 Ohms/Ch. 8 Ohms Bridge	7.8	64.9	4.7	106.9	4.4	116.3	414	1413	356
	2 Ohms/Ch. 4 Ohms Bridge	8.0	58.1	4.8	96.1	4.4	106.0	476	1625	410
1/3rd Power Pink Noise Typical of program material with severe clipping.	8 Ohms/Ch. 16 Ohms Bridge	10.9	77.1	6.6	126.2	6.0	139.9	437	1491	376
	4 Ohms/Ch. 8 Ohms Bridge	17.8	77.0	10.5	129.1	9.5	142.1	711	2426	612
	2 Ohms/Ch. 4 Ohms Bridge	17.7	70.3	10.7	115.3	9.4	128.7	824	2814	709

I-Tech 9000HD AC Current Draw and Thermal Dissipation:

Pink noise 12dB crest factor, bandwidth limited 22Hz to 22kHz.
Typical line impedance used.
Data based on both channels driven.

I-T9000HD										
		120VAC		208VAC		230VAC			Thermal Dissipation	
	Load	Line Current 120VAC	Watts Out Per 1A Amp Line Current	Line Current 208VAC	Watts Out Per 1A Amp Line Current	Line Current 230VAC	Watts Out Per 1A Amp Line Current	Watts Dissipated	Btu/hr	kcal/hr
Idle (sleep mode)		1.0		1.0		0.95		60	205	177
Idle (awake)		2.1		1.7		1.6		225	767	660
1/8th Power Pink Noise Typical of program material just at clip.	8 Ohms/Ch. 16 Ohms Bridge	6.6	57.6	4.2	91.2	3.8	99.8	392	1338	337
	4 Ohms/Ch. 8 Ohms Bridge	11.6	65.7	7.0	108.8	6.3	120.4	593	2024	510
	2 Ohms/Ch. 4 Ohms Bridge	11.5	55.9	6.8	96.5	6.2	105.3	695	2373	598
1/3rd Power Pink Noise Typical of program material with severe clipping.	8 Ohms/Ch. 16 Ohms Bridge	13.6	74.4	8.1	125.3	7.4	137.2	579	1977	498
	4 Ohms/Ch. 8 Ohms Bridge	27.6	73.9	16.0	127.2	14.3	141.0	1149	3921	988
	2 Ohms/Ch. 4 Ohms Bridge	25.0	67.0	14.9	113.5	13.6	124.3	1223	4173	1052

I-Tech 12000HD AC Current Draw and Thermal Dissipation:

Pink noise 12dB crest factor, bandwidth limited 22Hz to 22kHz.
Typical line impedance used.
Data based on both channels driven.

I-T12000HD												
		120VAC		208VAC		230VAC			Thermal Dissipation		
	Load	Line Current 120VAC	Watts Out Per 1A Amp Line Current	Line Current 208VAC	Watts Out Per 1A Amp Line Current	Line Current 230VAC	Watts Out Per 1A Amp Line Current	Watts Dissapited	Btu/hr	kcal/hr
Idle (sleep mode)		0.9		1.1		1.0		62	212	183
Idle (awake)		2.0		1.8		1.6		213	726	625
1/8th Power Pink Noise Typical of program material just at clip.	8 Ohms/Ch. 16 Ohms Bridge	8.3	63.6	5.1	103.3	4.7	111.8	441	1504	379
	4 Ohms/Ch. 8 Ohms Bridge	14.6	68.8	8.7	115.2	8.0	124.5	701	2394	603
	2 Ohms/Ch. 4 Ohms Bridge	14.2	62.9	8.2	106.1	7.7	113.6	764	2607	657
1/3rd Power Pink Noise Typical of program material with severe clipping.	8 Ohms/Ch. 16 Ohms Bridge	18.1	77.4	11.0	128.3	9.9	142.0	715	2439	615
	4 Ohms/Ch. 8 Ohms Bridge	35.1	76.3	20.8	128.6	18.7	144.2	1370	4677	1179
	2 Ohms/Ch. 4 Ohms Bridge	33.9	69.2	19.9	118.0	17.9	131.1	1589	5425	1368

Advanced Featured

Protection System

Your Crown amplifier provides extensive protection and diagnostic capabilities, including thermal level control, fault indicators, high-pass filtering, DC protect, AC under/over voltage protection, inrush limiting, and variable-speed fans with tachometer feedback. Microprocessor monitors fans, and signals an error via System Architect if fans are not operating.

Thermal Level Control (TLC)

If the amplifier becomes too hot for safe operation, the TLC will engage the input compressor and the clip LED will illuminate. By compressing the input, the amplifier will not generate as much heat and will have a chance to cool down. The degree of compression is proportional to the amount of overheating. This feature allows the show to go on, rather than having the amplifier shut down, and only occurs in extreme situations.

Circuit Breaker

If the current draw of the amplifier exceeds safe limits, this breaker automatically disconnects the power supply from the AC mains.

Global Switching Power Supply with PFC

Thanks to its global power supply, the I-Tech amplifier works anywhere in the world. There's no need to reset an AC mains voltage switch, and no need to order a special model. The amp will work and meet all specs on 100V - 240VAC, 50/60 Hz.

Crown's Switching Power Supply minimizes the amplifier's weight.

Typical non-switching power supplies require large, heavy transformers in order to produce the required power at the output stage. These transformers must be large to operate at 50 to 60 Hz (standard AC supplied by the power company).

By contrast, switching power supplies can operate with a much smaller (and lighter) transformer because they first convert the AC up to a much higher frequency, thereby reducing waste.

Power Factor Correction (PFC) controls how your amplifier draws current from the AC mains. Instead of drawing high-magnitude current spikes that reduce the capacity of your power distro (and couple noise into other system components), PFC draws a smooth and quiet current waveform that is in phase with the mains voltage waveform. PFC allows you to reduce the size and weight of your power distribution and improve the performance of your signal processors.

Color-Coded Overlay

The labels on the rear panel are color coded to group similar functions under common colors.

Setting Sensitivity for Best Gain Staging

Optimized system gain structure maximizes signal to noise within the system. Adjusting your amplifier to fit within an optimized system gain structure is accomplished by properly setting both the sensitivity and attenuation controls within the amplifier. I-Tech amplifiers offer 149 sensitivity and gain settings allowing very fine adjustment of the amplifier's gain and voltage sensitivity. The Appendix section of the I-Tech Application guide (online at www.crownaudio.com) provides charts with sensitivity in volts and gain in dB for each sensitivity/gain setting.

With other amplifiers, it is often necessary to apply attenuation in order to achieve the desired sound pressure level. Large amounts of attenuation are not necessary with I-Tech amplifiers and can, in fact, degrade performance. The attenuation adjustment should only be used for small (3 dB) or temporary adjustments in amplifier gain. Instead, set the sensitivity/gain of your I-Tech amplifier so that you can achieve the desired output with the attenuators at or near 0 dB.

Example: Suppose that you are using an I-T9000HD with the sensitivity/gain set at 1.4V/37.1 dB. After optimizing the gain structure of the rest of your system you find that attenuating the amplifier by 10 dB produces the desired loudness. The same output level, with improved signal-to-noise ratio and headroom, can be achieved by using 0 dB of attenuation and by setting the amplifier sensitivity/gain to 5.81V/27.0 dB (37 dB – 10 dB = 27 dB).

Note: as indicated in the online appendix, the list of possible sensitivity settings is different for each position of the max input setting. If, while adjusting sensitivity/gain in your amplifier, you do not find the setting you need, try changing the status of the max input setting and search again.

Service

Crown amplifiers are quality units that rarely require servicing. Before returning your unit for service, please contact Crown Technical Support to verify the need for servicing.

This unit has very sophisticated circuitry which should only be serviced by a fully trained technician. This is one reason why each unit bears the following label:

CAUTION: To prevent electric shock, do not remove covers. No user serviceable parts inside. Refer servicing to a qualified technician.

Complete the Crown Audio Factory Service Information form, in the back of this manual, when returning a Crown product to the factory or authorized service center. The form must be included with your product inside the box or in a packing slip envelope securely attached to the outside of the shipping carton. Do not send this form separately.

Warranty is only valid within the country in which the product was purchased.

International and Canada Service

Service may be obtained from an authorized service center. (Contact your local Crown/Amcron representative or our office for a list of authorized service centers.) To obtain service, simply present the bill of sale as proof of purchase along with the defective unit to an authorized service center. They will handle the necessary paperwork and repair.

Remember to transport your unit in the original factory pack.

US Service

Service may be obtained in one of two ways: from an authorized service center or from the factory. You may choose either. It is important that you have your copy of the bill of sale as your proof of purchase.

Service at a US Service Center

This method usually saves the most time and effort. Simply present your bill of sale along with the defective unit to an authorized service center to obtain service. They will handle the necessary paperwork and repair. Remember to transport the unit in the original factory pack. A list of authorized service centers in your area can be obtained from Crown Factory Service, or online from
http://www.crownaudio.com/support/servcent.htm.

Factory Service

Crown accepts no responsibility for non-serviceable product that is sent to us for factory repair. It is the owner's responsibility to ensure that their product is serviceable prior to sending it to the factory. Serviceable product list is available at
http://crownweb.crownintl.com/crownrma/.
For more information, please contact us direct.

A Service Return Authorization (SRA) is required for product being sent to the factory for repair. An SRA can be completed online at www.crownaudio.com/support/factserv.htm. If you do not have access to the web, please call Crown's Customer Service at 574.294.8200 or 800.342.6939 extension 8205.

For warranty service, we will pay for ground shipping both ways in the United States. Contact Crown Customer Service to obtain prepaid shipping labels prior to sending the unit.

Or, if you prefer, you may prepay the cost of shipping, and Crown will reimburse you. Send copies of the shipping receipts to Crown to receive reimbursement. Your repaired unit will be returned via UPS ground. Please contact us if other arrangements are required.

Factory Service Shipping Instructions:

1. Service Return Authorization (SRA) is required for product being sent to the factory for service. Please complete the SRA by going to www.crownaudio.com/support/factserv.htm. If you do not have access to our website, call 1.800.342.6939, extension 8205 and we'll create the SRA for you.
2. See packing instructions that follow.
3. Ship product to:
   CROWN AUDIO FACTORY SERVICE
   1718 W MISHAWKA RD.
   ELKHART, IN 46517
4. Use a bold black marker and write the SRA number on three sides of the box.
5. Record the SRA number for future reference. The SRA number can be used to check the repair status.

Packing Instructions

Important: These instructions must be followed. If they are not followed, Crown Audio, Inc. assumes no responsibility for damaged goods and/or accessories that are sent with your unit.

1. Fill out and include the Crown Audio Factory Service Information sheet in the back of this manual.
2. Do not ship any accessories (manuals, cords, hardware, etc.) with your unit. These items are not needed to service your product. We will not be responsibility for these items.
3. When shipping your Crown product, it is important that it has adequate protection. We recommend you use the original pack material when returning the product for repair. If you do not have the original box, please call Crown at 800.342.6939 or 574.294.8210 and order new pack material. See instructions for "foam-in-place" shipping pack. (Do not ship your unit in a wood or metal cabinet.)
4. If you provide your own shipping pack, the minimum recommended requirements for materials are as follows:

a. 275 P.S.I. burst test, Double-Wall carton that allows for 2-inch solid Styrofoam on all six sides of unit or 3 inches of plastic bubble wrap on all six sides of unit.

b. Securely seal the package with an adequate carton sealing tape.

c. Do not use light boxes or "peanuts". Damage caused by poor packaging will not be covered under warranty.

Using your 'foam-in-place' shipping pack

Note: The foam-in-place packing is molded so that there is only one correct position for your product.

1. Open carton and lift center cushion leaving both end-cushions in place.
2. Carefully place your product with the product's front panel facing the same direction as arrows indicate.
3. Reset center cushion down over top of product's chassis. The foam-in-place packing was molded to accommodate different chassis depth sizes. If your product's chassis does not completely fill the foam-in-place cavity, you may use a soft but solid packing material (such as paper or bubble wrap) behind the chassis.
4. Enclose the completed Crown Audio Factory Service Information form (or securely attach it to the outside of carton) and re-seal the shipping pack with a sturdy carton sealing tape.

Estimate Approval

Approval of estimate must be given within 30 days after being notified by Crown Audio Inc. Units still in the possession of Crown after 30 days of the estimate will become the property of Crown Audio Inc.

Payment of Non-Warranty Repairs

Payment on out-of-waranty repairs must be received within 30 days of the repair date. Units unclaimed after 30 days become the property of Crown Audio Inc.

If you have any questions, please contact Crown Factory Service.

Crown Factory Service
1718 W. Mishawaka Rd.,
Elkhart, Indiana 46517 U.S.A.

Telephone:
574.294.8200
800.342.6939 (North America,
Puerto Rico, and Virgin Islands only)

Facsimile:
574.294.8301 (Technical Support)
574.294.8124 (Factory Service)

Internet:
http://www.crownaudio.com

Warranty — UNITED STATES & CANADA

SUMMARY OF WARRANTY
Crown International, 1718 West Mishawaka Road, Elkhart, Indiana 46517-4095 U.S.A. warrants to you, the ORIGINAL PURCHASER and ANY SUBSEQUENT OWNER of each NEW Crown product, for a period of five (5) years from the date of purchase by the original purchaser (the "warranty period") that the new Crown product is free of defects in materials and workmanship. We further warrant the new Crown product regardless of the reason for failure, except as excluded in this Warranty.

Warranty is only valid within the country in which the product was purchased.

ITEMS EXCLUDED FROM THIS CROWN WARRANTY
This Crown Warranty is in effect only for failure of a new Crown product which occurred within the Warranty Period. It does not cover any product which has been damaged because of any intentional misuse, accident, negligence, or loss which is covered under any of your insurance contracts. This Crown Warranty also does not extend to the new Crown product if the serial number has been defaced, altered, or removed.

WHAT THE WARRANTOR WILL DO
We will remedy any defect, regardless of the reason for failure (except as excluded), by repair, replacement, or refund. We may not elect refund unless you agree, or unless we are unable to provide replacement, and repair is not practical or cannot be timely made. If a refund is elected, then you must make the defective or malfunctioning product available to us free and clear of all liens or other encumbrances. The refund will be equal to the actual purchase price, not including interest, insurance, closing costs, and other finance charges less a reasonable depreciation on the product from the date of original purchase. Warranty work can only be performed at our authorized service centers or at the factory. Warranty work for some products can only be performed at our factory. We will remedy the defect and ship the product from the service center or our factory within a reasonable time after receipt of the defective product at our authorized service center or our factory. All expenses in remedying the defect, including surface shipping costs in the United States, will be borne by us. (You must bear the expense of shipping the product between any foreign country and the port of entry in the United States including the return shipment, and all taxes, duties, and other customs fees for such foreign shipments.)

HOW TO OBTAIN WARRANTY SERVICE
You must notify us of your need for warranty service within the warranty period. All components must be shipped in a factory pack, which, if needed, may be obtained from us free of charge. Corrective action will be taken within a reasonable time of the date of receipt of the defective product by us or our authorized service center. If the repairs made by us or our authorized service center are not satisfactory, notify us or our authorized service center immediately.

DISCLAIMER OF CONSEQUENTIAL AND INCIDENTAL DAMAGES
YOU ARE NOT ENTITLED TO RECOVER FROM US ANY INCIDENTAL DAMAGES RESULTING FROM ANY DEFECT IN THE NEW CROWN PRODUCT. THIS INCLUDES ANY DAMAGE TO ANOTHER PRODUCT OR PRODUCTS RESULTING FROM SUCH A DEFECT. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATIONS OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

WARRANTY ALTERATIONS
No person has the authority to enlarge, amend, or modify this Crown Warranty. This Crown Warranty is not extended by the length of time which you are deprived of the use of the new Crown product. Repairs and replacement parts provided under the terms of this Crown Warranty shall carry only the unexpired portion of this Crown Warranty.

DESIGN CHANGES
We reserve the right to change the design of any product from time to time without notice and with no obligation to make corresponding changes in products previously manufactured.

LEGAL REMEDIES OF PURCHASER
THIS CROWN WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE. No action to enforce this Crown Warranty shall be commenced after expiration of the warranty period.

THIS STATEMENT OF WARRANTY SUPERSEDES ANY OTHERS CONTAINED IN THIS MANUAL FOR CROWN PRODUCTS. 5/11

Warranty — WORLDWIDE EXCEPT USA & CANADA

SUMMARY OF WARRANTY
Crown International, 1718 West Mishawaka Road, Elkhart, Indiana 46517-4095 U.S.A. warrants to you, the ORIGINAL PURCHASER and ANY SUBSEQUENT OWNER of each NEW Crown1 product, for a period of five (5) years from the date of purchase by the original purchaser (the "warranty period") that the new Crown product is free of defects in materials and workmanship, and we further warrant the new Crown product regardless of the reason for failure, except as excluded in this Warranty.

Warranty is only valid within the country in which the product is purchased.

Note: If your unit bears the name "Amcron," please substitute it for the name "Crown" in this warranty.

ITEMS EXCLUDED FROM THIS CROWNWARRANTY
This Crown Warranty is in effect only for failure of a new Crown product which occurred within the Warranty Period. It does not cover any product which has been damaged because of any intentional misuse, accident, negligence, or loss which is covered under any of your insurance contracts. This Crown Warranty also does not extend to the new Crown product if the serial number has been defaced, altered, or removed.

WHAT THE WARRANTOR WILL DO
We will remedy any defect, regardless of the reason for failure (except as excluded), by repair, replacement, or refund. We may not elect refund unless you agree, or unless we are unable to provide replacement, and repair is not practical or cannot be timely made. If a refund is elected, then you must make the defective or malfunctioning product available to us free and clear of all liens or other encumbrances. The refund will be equal to the actual purchase price, not including interest, insurance, closing costs, and other finance charges less a reasonable depreciation on the product from the date of original purchase. Warranty work can only be performed at our authorized service centers. We will remedy the defect and ship the product from the service center within a reasonable time after receipt of the defective product at our authorized service center.

HOW TO OBTAIN WARRANTY SERVICE
You must notify your local Crown importer of your need for warranty service within the warranty period. All components must be shipped in the original box. Corrective action will be taken within a reasonable time of the date of receipt of the defective product by our authorized service center. If the repairs made by our authorized service center are not satisfactory, notify our authorized service center immediately.

DISCLAIMER OF CONSEQUENTIAL AND INCIDENTAL DAMAGES
YOU ARE NOT ENTITLED TO RECOVER FROM US ANY INCIDENTAL DAMAGES RESULTING FROM ANY DEFECT IN THE NEW CROWN PRODUCT. THIS INCLUDES ANY DAMAGE TO ANOTHER PRODUCT OR PRODUCTS RESULTING FROM SUCH A DEFECT.

WARRANTY ALTERATIONS
No person has the authority to enlarge, amend, or modify this Crown Warranty. This Crown Warranty is not extended by the length of time which you are deprived of the use of the new Crown product. Repairs and replacement parts provided under the terms of this Crown Warranty shall carry only the unexpired portion of this Crown Warranty.

DESIGN CHANGES
We reserve the right to change the design of any product from time to time without notice and with no obligation to make corresponding changes in products previously manufactured.

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THIS STATEMENT OF WARRANTY SUPERSEDES ANY OTHERS CONTAINED IN THIS MANUAL FOR CROWN PRODUCTS. 5/11


crown®
by HARMAN