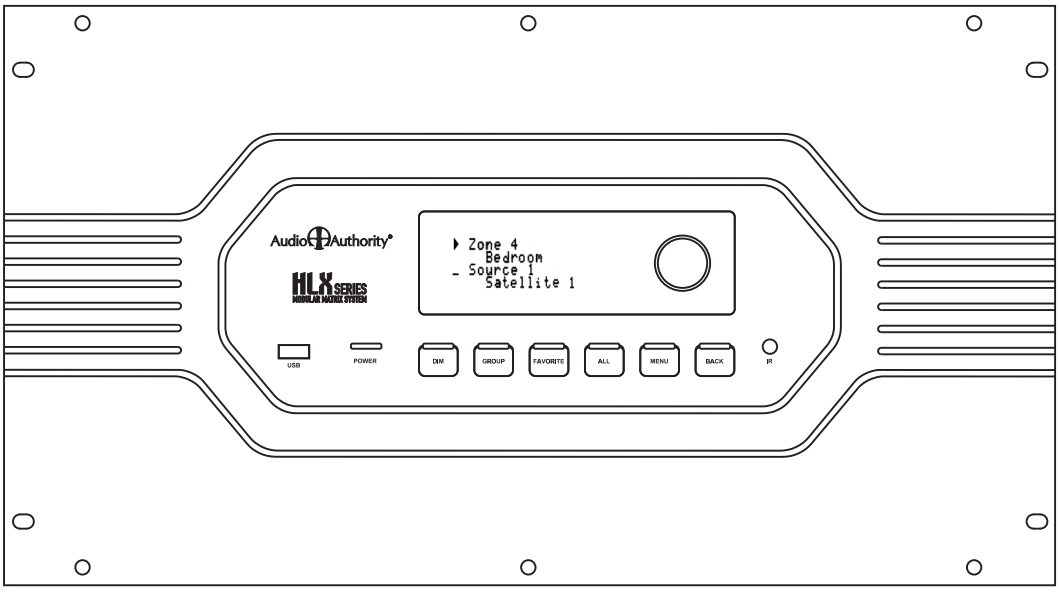
Installation and Operation

HLX SERIES
MODULAR MATRIX SYSTEM



Component Video/Audio Source Inputs
Dual Cat 5 Outputs to Zone Receivers

Audio Authority®

WARNING:

To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

The lightning flash within an equilateral triangle is intended to alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

The exclamation point symbol within the eight-sided shape alerts users to important operating and maintenance instructions in this booklet.

- Read these instructions.
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.
- This product must be installed by qualified personnel.
- Do not open the cover—there are no user-serviceable parts inside.
- Do not use this apparatus near water.
- Clean only with dry cloth.
- Do not block any ventilation openings. Install in accordance with the manufacturer’s instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- Do not defeat the safety purpose of the grouding-type plug. If the provided plug does not fit into an outlet, consult an electrician for replacement of the obsolete outlet.
- The power cord is used as a disconnect device; it shall remain readily operable. Do not prevent cord from being unplugged from apparatus.
- Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where it exits from the apparatus.
- Use only attachments/accessories specified by the manufacturer.
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- 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.

AVERTISSEMENT:

Pour réduire les risques d’incendie ou de choc électrique, ne pas exposer cet appareil à la pluie ni à l’humidité.

L’éclair terminé d’une flèche à l’intérieur d’un triangle indique à l’utilisateur la présence à l’intérieur de l’appareil d’une tension dangereuse non isolée ayant une amplitude suffisante pour provoquer une électrocution.

Le point d’exclamation à l’intérieur d’un triangle indique que des instructions de fonctionnement et d’entretien importantes sont detaillées dans les documents fournis avec l’appareil.

Le point d’exclamation à l’intérieur de l’octagone indique à l’utilisateur que des importantes instructions d’opération et d’entretien sont incluses dans ce document.

- Lire toutes les directives avant de mettre l’appareil en opération.
- Conserver les directives de sécurité and d’utilisation pour future consultation.
- Tenir compte des avertissements.
- Suivre les directives.
- Ce produit doit être installé par un personnel qualifié.
- Afin d’éviter tout risque d’électrocution, ne pas retirer le capot ou la couvercle. Aucune des pieces intérieures n’est réparable par l’utilisateur. Pour toute réparation, s’adresser à un technician d’entretien qualifié.
- Ne pas utiliser cet appareil près de l’eau.
- Nettoyer seulement avec un chiffon sec.
- Les ouvertures et fentes dans le chassis sont prevues pour la ventilations de l’appareil. Ces ouvertures ne doivent pas être bloquées. Installer conformement aux directives du manufacturier.
- L’appareil doit être situé loin de sources de chaleur telles que des radiateurs, des registres de chaleur, des forneaux, ou d’autres appareils produisant de la chaleur.
- Ne pas modifier le dispositif de securité de la fiche ayant une broche de mise à la terre. S’il est impossible d’insérer la fiche dans la prise de courant, contacter un électricien pour remplacer la prise de courant.
- Le cordon d’alimentation est utilisé comme un dispositif de déconnexion; Il doit rester aisément fonctionnel. Ne pas prevenir le cordon d’alimentation de démonter de l’appareil.
- Les cordons d’alimentation devraient être disposés de façon à ce qu’on ne puisse pas marcher dessus ou qu’ils soient susceptibles d’etre coincés par des articles placés sur ou contre eux. Une attention particulière doit etre portée aux fiches, prises de courant, et aux points où ils sortent de l’appareil.
- Utiliser seulement les attachements et accessoires recommendés par le manufacturier.
- Débrancher l’appareil de la prise d’alimentation pendant un orage électrique ou une absence d’utilisation prolongée.
- Confier tout entretien à un personnel de service qualifié.
- Un service d’entretien est necéssaire quand l’appareil ne fonctionne pas normalement en suivant les consignes d’utilisation, quand le cordon d’alimentation ou sa fiche sont endommagés, quand des objets sont tombés dans l’appareil, quand du liquide y a étè renversé, ou quand l’appareil a étè exposé à la pluie ou à l’eau.

HLX SERIES
MODULAR MATRIX SYSTEM

Installation and Operation Manual

This document is consistent with HLX configurations that include Model 2114 and 2248 cards, with features in firmware version 1.0

Contents

Audio Authority®
Lexington, Kentucky
www.audioauthority.com
800-322-8346

Intertek

Introducing HLX

The HLX Series of modular matrix systems is designed to be easy to control, expand, and customize for a wide range of audio/video applications. It features multiple control interfaces, a flexible number of video and audio inputs/outputs, and an ultra-wide bandwidth bus which enables large matrix systems with no loss in signal quality. The HLX Series offers IR, RS-232 and Ethernet control. Dual Cat 5 output cards feature pathways for IR control signals originating in the zones.

General HLX Features

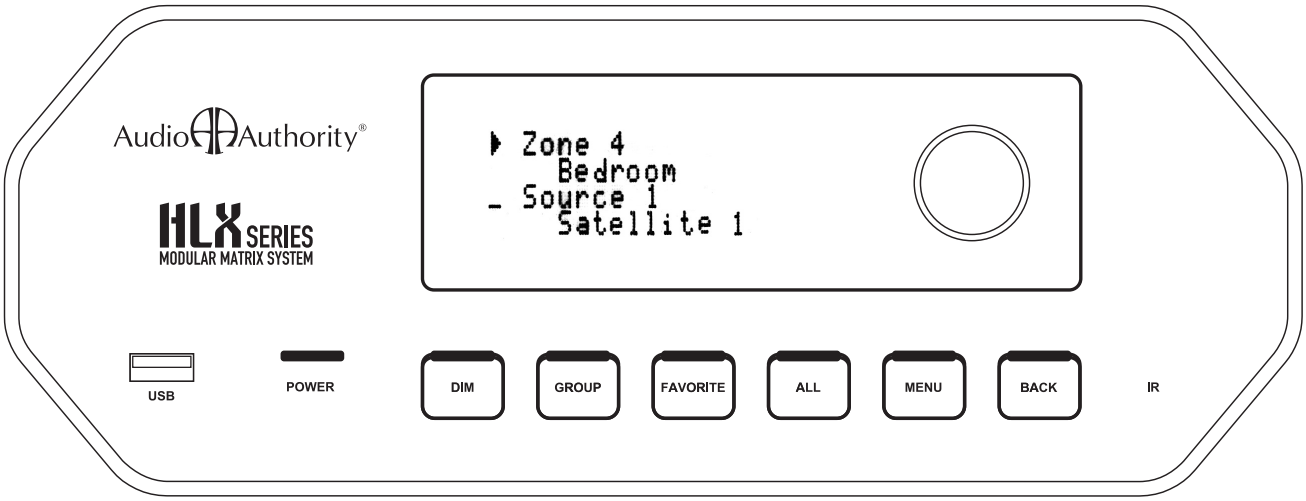
- From 4 to 12 audio/video sources
- From 8 to 32 A/V zone outputs (depending on sources)
- Compatible with Ethernet, RS-232 serial, front panel IR, rear panel IR control signal input
- Durable, easy to clean touch-sensitive front panel
- Supports component video, analog audio, digital audio and IR
- Supports HD video resolutions up to 1080p*
- Cross-converts** digital audio – digital coax and optical inputs are converted and output in both formats simultaneously
- Breakaway switching allows selecting audio and video sources independently
- Modular card cage design for maximum flexibility
- Heavy duty, rack mountable, all metal construction
- Designed and built in Lexington, KY, USA

Benefits for the Installer

- Permanent viewing restrictions on any number of zone/source combinations
- Locking front panel controls can prevent tampering
- Delivers component video up to 1080p*, digital and analog audio*** to zone receivers over Cat 5e/6 cables
- Cat 5 bus includes power for the zone receiver and an IR pathway for control signals from each zone***
- Optimize picture quality at each zone location with our Exclusive Active Gain Equalization (AGE) technology
- Five different Cat 5 receiver styles are available***
- LAN control via telnet using commands
- IR codes available for use with control systems including Control 4, Logitech Harmony, and URC.
- Unique IR signal routing allows discrete control of multiple sources of the same brand from different zones
- Efficient setup via downloadable PC application
- Requires no external power supply

Benefits for the User

- Compatible with most control interface systems
- Any viewer can restrict other zones from viewing and/or controlling his or her source (expires after 5 hours)
- Content in each zone can be monitored and controlled from the HLX panel interface



* Many sources do not support 1080p output on component video; they may offer 1080p only on copy protected, digital video outputs. Similarly, some TVs are not capable of displaying 1080p, even if they accept 1080p signals.

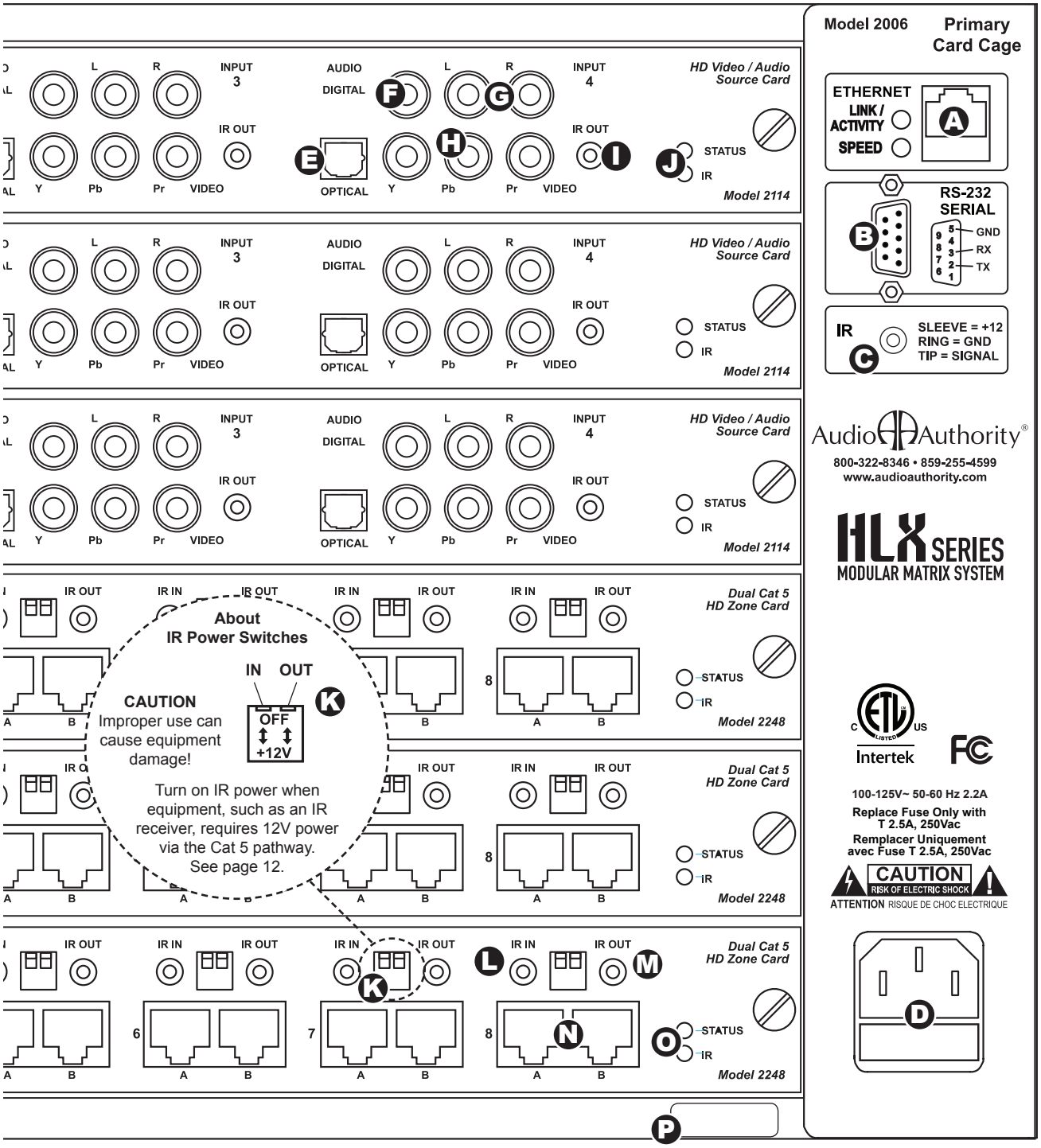
** Digital audio inputs are not converted to analog outputs, or vice versa.

*** Analog audio and IR pathways are only available using 2248 zone cards with dual Cat 5 receivers. IR must be wired separately when used in a Single Cat 5 receiver zone (see page 18 for details).

Panel Descriptions

Shown below is a Model 2006 card cage at full capacity.

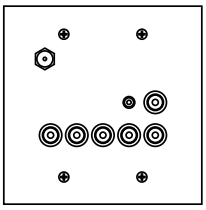
A Ethernet communication port
B RS-232 serial communication port
C IR input via 3.5mm for controlling HLX only
D AC power port and fuse
E Optical digital audio input (Source 4)
F Coaxial digital audio input
G Left and right analog audio input
H Component video YPbPr (do not use for composite video)
I IR output for Source 4
J Source card status light (green) and IR activity light (yellow)
K 12 V power switches for IR pathways (see page 12)
L IR input jack for sending IR commands to the HLX and sources
M IR output jack for sending or receiving zone IR via the Cat 5 pathway
N Zone 8 Cat 5 outputs A and B
O Zone card status light (green) and IR activity light (yellow)
P Chassis serial number



HLX System Design

The basic HLX Series components covered in this manual include the Model 2006 card cage, AV source cards and AV zone cards, as described below. For information about expansion card cage, and other source and zone cards, refer to the item's separate manual.

Cat 5 zone cards require Audio Authority zone receivers. Three Dual Cat 5 styles are available, and two single Cat 5 styles. See page 18 for complete information about zone receiver features.



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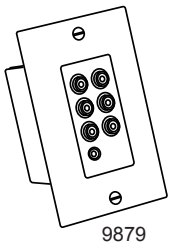

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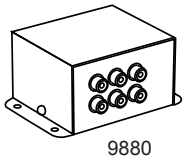

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Card Cage Features

The front panel includes the display, IR receiver, keys and knob, plus a USB port. The rear panel includes six slots for signal switching cards, a specially designed, robust internal power supply. The power supply module also provides the location for the control interface connections.

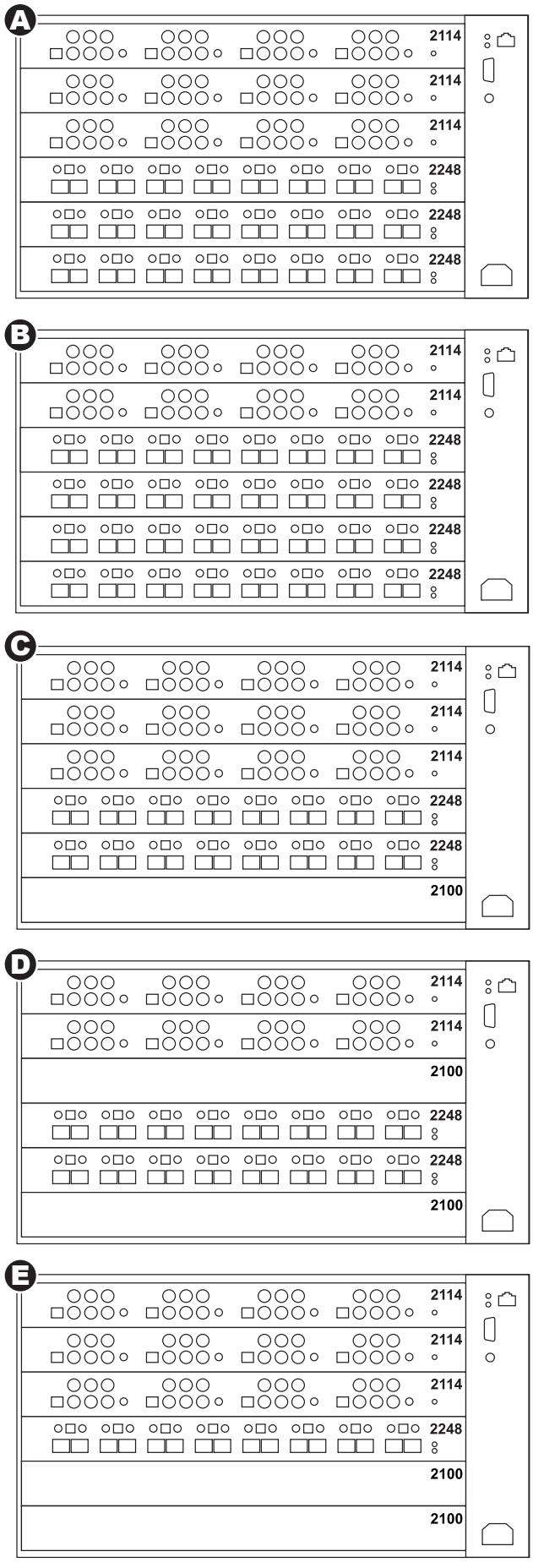
Matrix Switching Cards

Note: other types of source and zone cards are in development; visit www.audioauthority.com for details.

- 2114 Source Cards – component video, stereo analog audio, digital coaxial audio, digital optical audio, and IR out jacks. Four sources per card.
- 2248 Zone Cards – Dual Cat 5 outputs for zone receivers carrying component video, stereo analog audio, digital coaxial audio, digital optical audio, and IR signals. IR injection jacks for incoming and outgoing control signals. Eight zones per card.
- 2100 Blank Panel – Covers unused card slots.

Example Configurations

Configurations including 12x24 (A), 8x32 (B), 12x16 (C), and 8x16 (D), and 12x8 (E) are shown at the right. Example B represents the maximum number of zones using the Model 2006 card cage. Example A (Model HLX-12C-24D) and example D (Model HLX-8C-16D) are standard configurations available for purchase at www.audioauthority.com. Call Audio Authority for details on other configurations, and visit www.audioauthority.com to learn about new cards and card cages as HLX Series development proceeds.



Installation

1. Read this entire instruction manual.
2. Confirm that nothing is missing from your shipping carton (see below).
3. Activate your warranty and receive future update notifications by registering your purchase on our website: www.audioauthority.com/register.
4. Write the serial number (see product rear panel) inside the back cover of this manual.
5. Connect associated equipment (sources, TVs, etc.)
6. Connect the HLX to a suitable power outlet and test.
7. Perform desired setup operations via RS-232 or Ethernet if desired (see Appendix A).

Carton Contents

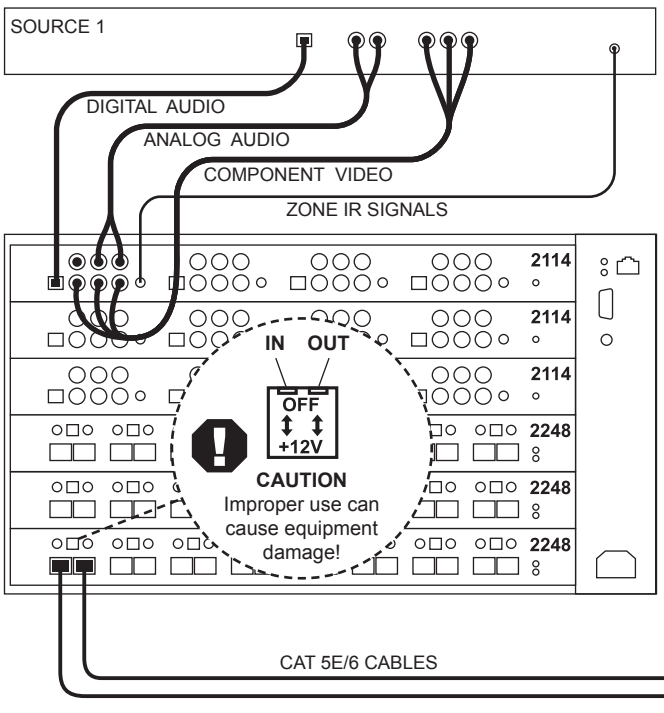
1. Model 2006 card cage with installed cards
2. Power cord
3. User manual

Other Items Required for Installation

- Audio Authority Cat 5 Zone Receivers
- Cat 5e/6 UTP cable
- Professional Category 5e/6 cable tester*
- Patch cables (Ethernet, RCA, and/or optical)
- Coaxial cable and RCA terminations for zone outputs
- Infrared receivers

Suggested Accessories

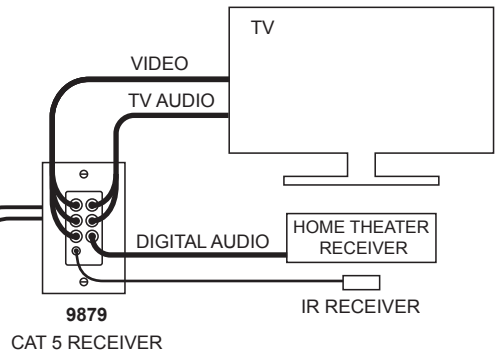
- Model 1360 Down-converter: converts component video to composite or S-Video for legacy TVs.
- Model 1362 Up-converter/scaler: converts composite or S-video signals to component video for legacy video sources.
- Model 1366 Video Converter: converts YPbPr to RGBHV or VGA to YPbPr for incompatible video sources or projectors and video displays.



Example System 1

In this 12x24 Dual Cat 5 HLX configuration, the installer uses the Cat 5 pathway to send IR signals from the zone to the sources. See page 9 for alternative IR connection options.

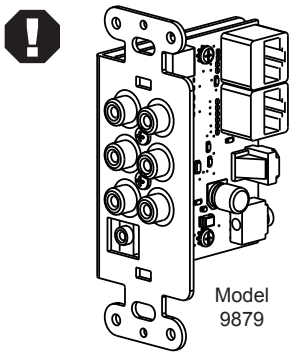
In each video zone the installer can choose to use stereo audio for TV sound and/or digital audio for surround sound via a home theater receiver.



* It is strongly recommended to test both factory made and site fabricated cables with a professional tester; balanced line pairing order is crucial for optimal picture quality. Continuity testing of the cable lines does not insure noise free performance.

Hardware Installation

The HLX system is designed to be mounted in a standard 19-inch equipment rack. Secure the card cage to the rails with all four screws (supplied). If your system includes an expansion card cage (Model 2014) install it first, then carefully seat the main HLX card cage onto the multi-pin connector and fasten it to the rack. Check that each pre-installed card is properly seated and secured in the card cage.

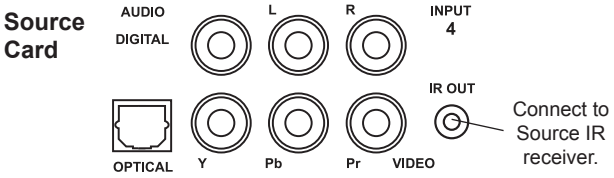


CAUTION!

Do not apply system power until cables are tested and A and B connections have been verified.

Wiring Sources and Initial Testing

Component Video Source Card – Model 2114
Connect high quality component video cables (YPbPr), analog audio (L/R) and either digital coaxial audio or digital optical audio (one form of digital audio ONLY) to each source input. If both analog and digital audio signals are desired in a zone, both digital AND anlalog audio inputs must be connected from the source to the HLX source card.

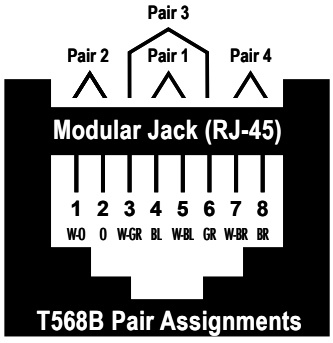


Source Card IR Outputs

IR outputs on source cards relay IR data from the zones to the source device. Connect IR emitters or blasters from the IR output jacks on each source card to each source device. Place the blaster directly over the IR receiver on the front panel, or, if available, connect a patch cord to the IR input on the rear panel.

Terminating Cat 5e and Cat 6

1. Install RJ-45 plugs using EIA-568B pairing (pins 1-2, 3-6, 4-5, 7-8).
2. Check each cable with a ***professional network cable tester*** before plugging it into the zone card, *even when using pre-made cables*. Continuity testing is not adequate! The twisted pairs must be properly matched for balanced line transmission.

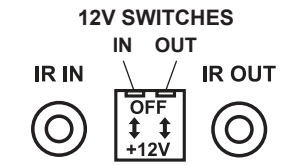


Wiring Dual Cat 5 Zones

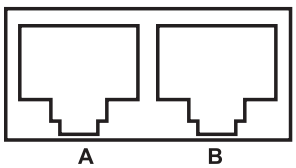
- **Zone Card – Model 2248** Carefully mark two Cat 5e/6 cables as cable A and B and pull them to the receiver location. It is imperative that the A and B cables are correctly connected to the zone receiver and the zone card; swapping cables can result in permanent damage to the receiver.
- **Zone Receiver – Model 9879** Carefully connect the cables marked A and B to the appropriate Cat 5 jacks on the zone receiver. Set the cable length compensation rotary switch based on the length of the cables (0 for 0-99 feet, 1 for 100-199 feet, etc). Connect high quality component video, analog audio, and digital coaxial audio cables to the zone receiver. Finally, connect an IR receiver to the front or back of the zone receiver.
- IR Input and Output jacks – The two 3.5mm jacks for each zone card output are used for special control signals. The IN jack sends signals to the HLX and to sources via the source card IR jacks. The OUT jack sends OR recieves signals via the Cat 5 zone pathway.
- Zone IR 12V Power – Do not turn on (down position) the 12V switch unless compatible equipment requires 12V power. See the example diagram on page 12 for details.

Dual Cat 5 Zone Card IR Switches

Enable 12V for a zone that includes a compatible IR receiver.



CAUTION
Improper use can cause equipment damage!



Control Options

Centralized serial Ethernet control systems provide the most robust and complete HLX control, however, comprehensive IR controllers and zone IR control are good alternatives for most day to day activities.

Ethernet or RS-232 Serial Control

System controllers and PCs can send all setup and control commands via the RS-232 serial port and receive feedback.

- Important: observe the correct pinout for controlling the HLX via RS-232 cable
- Serial control is capable of performing all commands
- See page 19 for details on using serial commands

IR Control Options

The HLX can be controlled through IR commands issued at each zone, or via the IR inputs at the head end (see example systems below). Either use an IR remote with a receiver connected to the IR jack on the zone receiver, or program an RF controller or other control system with HLX IR commands and connect its outputs to the IR input jacks on the 2248 zone card. (12 volt switches should be OFF, in the up position.)

Choosing a Control Interface

Most commands are available on Ethernet, IR and RS-232, but there are differences as shown below.

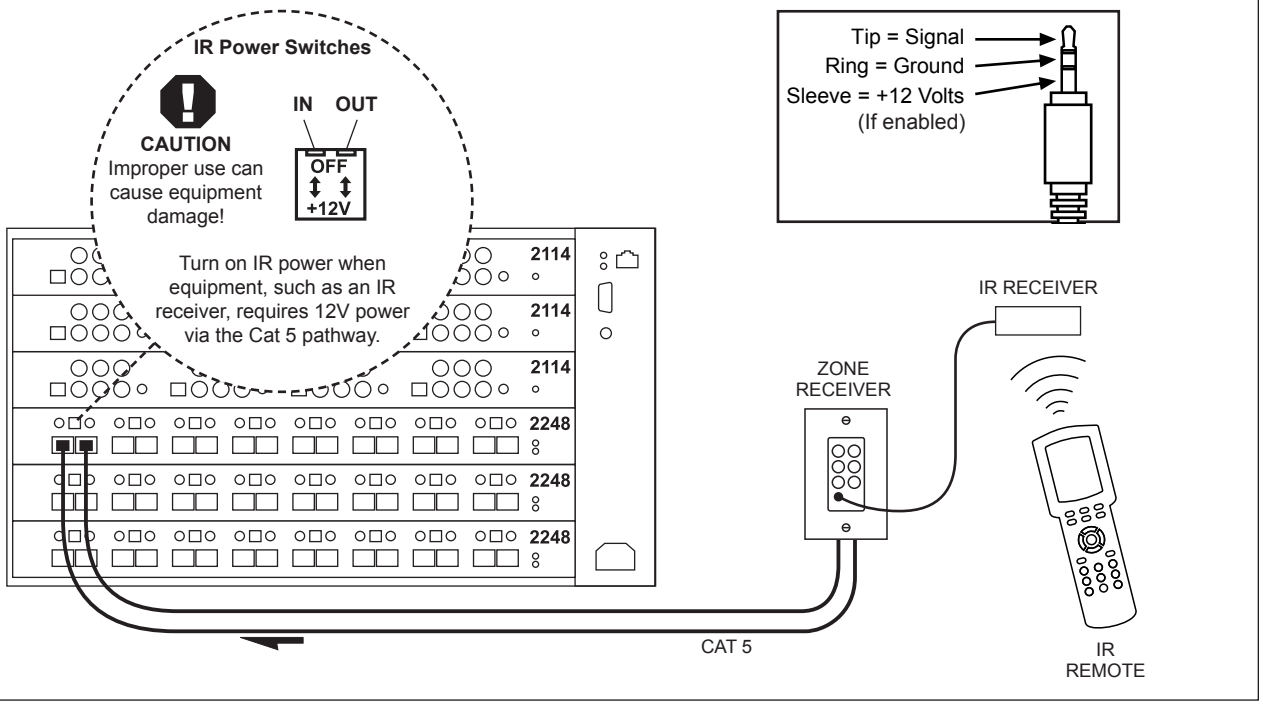
	RS-232	Ethernet	Front Panel IR	Zone IR	Panel Controls
A/V signal switching	✔	✔	✔	✔	✔
Favorites switching	✔	✔	✔	✔	✔
Groups switching	✔	✔	✔	✔	✔
Dimming	✔	✔	✔	-	✔
Breakaway switching	✔	✔	✔	✔	-
Lockout (restrict)	✔	✔	✔	✔	-
Disable front panel IR	✔	✔	✔	-	✔
Lock IR	✔	✔	-	-	✔
Lock front panel keys	✔	✔	-	-	✔
Change Ethernet settings	✔	(a)	-	-	-
Update firmware (b)	-	-	-	-	✔

(a) If an automatic IP protocol is used to obtain an IP address, the only direct way to obtain the new IP address is to query the HLX Ethernet settings using RS-232, or use front panel controls.

(b) All firmware updates must be performed via USB.

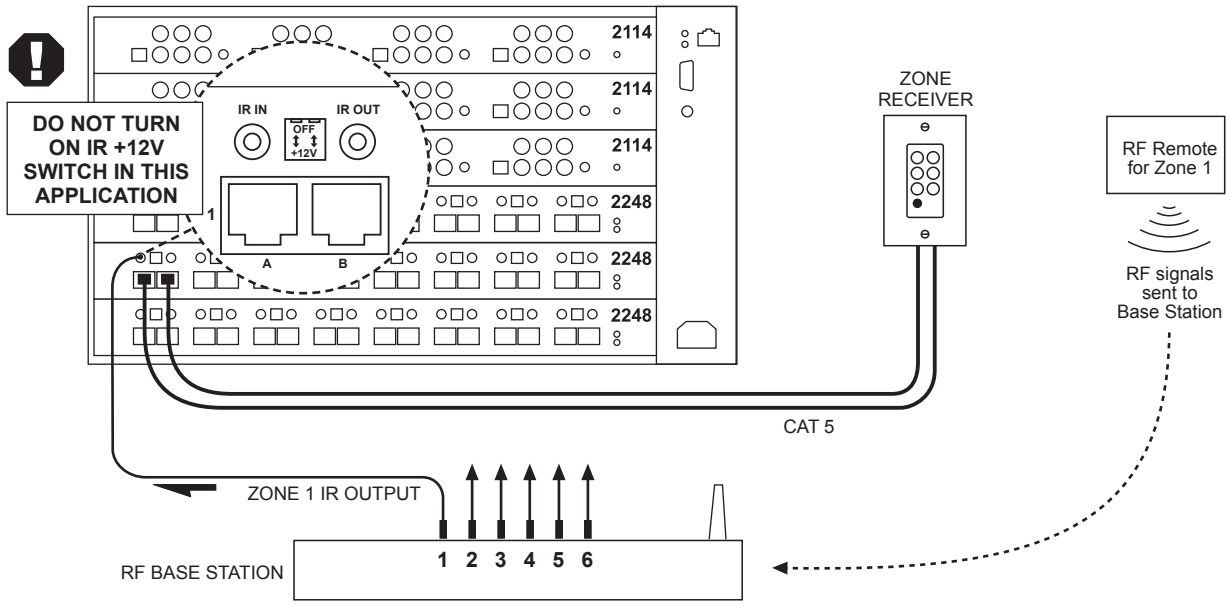
IR Control from Zones

An IR receiver connected to a zone receiver IR jack can be powered via connecting block in the zone, or powered with 12 volts from the HLX. To enable HLX power, move the OUT dip switch to the *down* position to power a compatible IR receiver in the zone. CAUTION: Can cause damage if used with incompatible IR equipment. Check voltage and pinout.



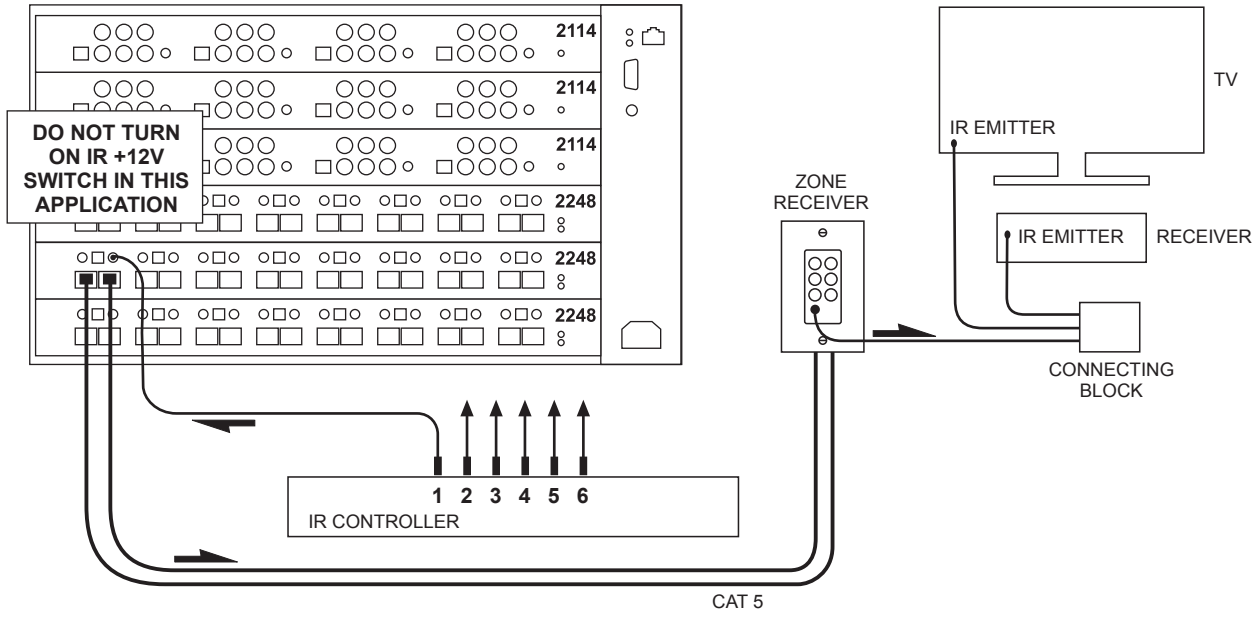
RF Base Station (or Wired Keypad System)

The IR IN jack on HLX zone cards allows controllers at the head end to mimic sending commands from the zones.



IR Control to Zones

An IR controller connected to the HLX IR OUT jack can send IR to the zone. The , or powered with 12 volts from the HLX. To enable HLX power, move the OUT dip switch to the *down* position to power a compatible IR receiver in the zone. CAUTION: Can cause damage if used with incompatible IR equipment. Check voltage and pinout.



Comprehensive IR Control System

The HLX can be used right out of the box; no setup is necessary. Comprehensive IR controllers can use the complete HLX IR code set, along with the codes of the sources. HLX volume controls are not included in this code

1. Patch the IR signal directly to the IR input port on the rear panel using a standard 3.5mm cable or, place a stick-on emitter or blaster from the infrared system on the HLX front panel optical IR receiver.
2. If the HLX IR codes are available from your remote control company, download and/or activate those files.
3. A HEX file can be downloaded from the Audio Authority website: www.audioauthority.com/page/software.

Logitech Harmony remote controls can access the HLX IR codes in the Harmony database here: Amplifier>Audio/Video Switch>Audio Authority>HLX.

Zone IR Control

1. Set up a programmable remote (URC, RTI, Logitech, etc.) with HLX remote control codes.
2. Connect an IR receiver to the HLX system either by running the IR receiver cable directly to the input of a 2248 Zone Card, or connect the IR receiver to the zone receiver IR jack.
3. For operation tips, see the zone IR explanation in the operation section below.

Operation

HLX Front Panel Controls

Front panel control is peformed via touch sensitive keys and a selector knob.

- The default screen is the zone/source switching screen. Scroll zones using the knob, press the knob to choose a zone, then scroll and select a source.
- To perform multiple switching operations, use GROUP, FAVORITE and ALL keys (some setup required).
- Touch MENU to access settings and scroll to a desired item and press the knob to enter.
- Press the BACK key to exit.

Zone IR Operation

HLX "Buttons" for Remote Control Systems
When programming a remote control system, the following functions are available for operational controls:

- Source Buttons: 12 discrete buttons cause the source connected to the zone to be switched, given the current configuration (sources that do not exist or that are restricted in some way cannot be selected).
- Audio/Video Buttons: breakaway switching is possible by first pressing the audio or video button and then a discrete source button; only the audio or video signal is switched.
- Lock Access: remove other zones viewing the source selected and temporarily restrict other zones from selecting the source.
- Lock Control: temporarily restrict other zones from passing IR to the selected source device.
- Unlock: cancel all temporary restrictions placed by the activating zone.
- Digits: the 0-9 digits on the remote can be used to enter group or favorite numbers.
- Favorites: activates a predetermined combination of zone/source selections; requires a number to be entered on the 0-9 digits (1-10) before pressing the favorite button for activation.
- Groups: sets a predetermined list of zones to the specified source video, audio or both. This command requires one to press the desired group number, group button, audio or video modifiers, and finally the source button.

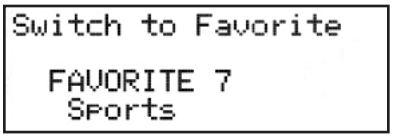
IR Operation Example

Current Configuration:
- 8 source inputs (1-8)
- 8 zone outputs (1-8) on a Model 2248 output card
- No restrictions in place
- IR receiver connected to the HLX zone 1 IR input
- Favorite 7 is defined as: "zones 1-8 switch to source 2"
- Group 1 contains zones 1-4

Example Sequence of Commands

1. [SOURCE1] – zone 1 is connected to source 1
2. [VIDEO][SOURCE2] – switch zone 1 to view source 2 but remain listening to source 1
3. [LOCK ACCESS] – temporarily restrict zones 2-8 from viewing source 2, the currently viewed source in zone 1. Breakaway is canceled for zone 1 and zone 1 is forced to view and listen to source 2, the source that it was viewing when the restriction was activated.

4. [SOURCE1] – switch zone 1 back to watching/listening to source 1. The temporary restriction is canceled by switching away from the restricted source.
5. [LOCK CONTROL] – temporarily restrict zones 2-8 from passing IR control to source 1. For example, source 1 may be connected to a DVD player. Zones 2-8 would be unable to use DVD player IR remote commands to enter commands such as stop, pause, skip, etc.
6. [UNLOCK] – removes the temporary restriction of controlling source 1.
7. [VOLUME UP] – has no effect on output cards that do not have physical analog outputs; adjusts the volume on an output card that has physical analog audio outputs
8. [7][FAVORITE] – all zones 1-8 switch to source 2



9. [1][GROUP][VIDEO][SOURCE4] – zones 1-4 are switched to watching source 4 video, but remain listening to the audio connected to the previous selection (source 2)

Using Restrictions

The HLX system can be set up to deny certain zones access to certain sources. These “restrictions” can be either permanent (until reprogrammed) or temporary (active until they are cancelled or expire).

Temporary Source Restrictions
This feature allows a viewer in one zone to view* content privately; no other zone is able to view the source while the temporary restriction is in place. When activated, this restriction removes other zones currently viewing the source. Temporary restrictions automatically expire after five hours; alternatively they are canceled by switching away from the restricted source or explicitly issuing an unlock command.

When a zone is removed from a newly restricted source, it is automatically switched to the next available source.

Example of Temporary Restriction

- Zone 1 and zone 2 are viewing source 7.
- Zone 2 applies a temporary viewing restriction to source 7.
- Zone 1 is switched to source 8 (presuming there is no restriction in place that will prevent that action).

If there is a restriction in place that prevents switching to a zone, the next zone is attempted.

If a zone only has access to a single source, and that source becomes restricted, the zone deactivates (black screen).

Placing and cancelling temporary restrictions have other limitations based on the control interface and will be described in their respective sections.

Temporary Control Restrictions (IR)
A Control Restriction prevents other zones from controlling* the selected source through the HLX integrated IR control pathway. Other zones may still view the source. Temporary restrictions expire after five hours, or by switching away from the restricted source or issuing an unlock command.

Permanent Source Restrictions
When a zone is permanently restricted from viewing a source, it may not select or view that source under any circumstances. Temporary source restrictions supplement permanent restrictions, and may add further restrictions to the available sources that a zone may access. Permanent source restrictions can be applied or removed only through serial or Ethernet commands, or by using the HLX configuration utility on a PC.

* “View,” In the context of restrictions, means to select, watch and/or listen to a given source. The term “control” means to send IR commands through the HLX IR pathway to control a source (e.g. change channels, stop, play, etc.).

Serial and Ethernet Control Setup

Serial Control

Serial commands can be used at any time via RS-232 or Ethernet to change the HLX settings. See page 19 for a complete list of commands.

Default RS-232 Port Settings

Transfer Rate	9600 bps
Data Bits	8
Stop Bits	1
Parity	None
Flow Control or Data Flow	None
Character type	ASCII
Interface connector	DB-9
DB-9 Electrical rating	Pins 2 and 3, ±15 VDC
DB-9 Pin-out	Pin 2, Tx
	Pin 3, Rx
	Pin 5, Ground
	Shell, Ground

- All serial commands require opening and closing brackets “[ ]” but do not require any periods, spaces, or commas.
- Commands can be in any order: [RPZ1] = [R, Z1, P]
- Enter a line feed and carriage return after each command.
- ASCII codes not specified are ignored (i.e. control codes, unused alphanumeric characters, etc.).

Setup for Ethernet Control

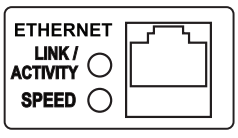
Consult your network administrator if you are unfamiliar with setting up a network connection.

HLX commands (see page 19 for a complete list) can be issued using an Ethernet connection and a telnet program. There are two LED indicators located next to the Ethernet port N on the rear panel that will help in identifying connection issues:

- Link - The Link LED is steadily lit if a connection is detected and flashes when activity is present.
- Speed - The Speed LED is off for 10 base T, and on for 100 base T.

Using the Ethernet Port

Use a telnet client or terminal program on a Mac or PC to send and receive commands through the Ethernet port on the HLX. Connect a PC directly to the Ethernet port using a crossover cable, or alternatively use a standard Ethernet hub or switch and standard patch cables. Once connected to a PC or network, by default the HLX attempts to obtain an IP address automatically using DHCP. To use static settings, see below.



Using DHCP

DHCP is enabled on the HLX by default. If DHCP is enabled on your network, simply connect the HLX to the network with an existing DHCP server to obtain all necessary settings.

Static Addressing (Connected to a PC)

- The HLX must be given an IP address which will not conflict with the PC. Go to the network settings (which are found in control panel -> network -> local connection properties of a PC running Windows XP).
- Change the TCP/IP protocol properties, and set the IP address, gateway, and subnet mask, if they are not already set. This can be arbitrarily done on a direct connection, but a good choice for the settings would be IP address of 192.168.0.1, subnet mask of 255.255.255.0, and an empty default gateway. Once these values have been set, use serial commands to set the network settings of the HLX in a similar manner, but use a different IP address than that of the computer (for example, 192.168.0.2).

Static Addressing (Through a Network)

- The HLX must be set to the same settings as the PC except for the IP address, which must be one available on the network. To determine this in Windows, use the DOS prompt (Start->Run->cmd) commands ipconfig and ping. Ipconfig will list the PC’s settings, and ping will allow you to test addresses to make sure that nothing else on the network has that address.
- Once connectivity is established, a telnet program such as Hyper Terminal, Teraterm, PuTTY etc, must be used to connect to the device. Enter the IP address of the HLX and leave the default port (23) to connect. Once connected, standard serial commands (listed in Appendix A) can be issued in an identical manner to serial control.

Troubleshooting

IR Interference

There are many sources of possible IR interference including LCD/Plasma screens, fluorescent lights, or space heaters. IR receivers are unable to operate properly in the presence of significant interference.

1. Eliminate source of interference and use Plasma-proof and/or LCD-proof IR receivers
2. Experiment with relocating the IR receiver
3. Check for IR interference using the IR diagnostics

IR Compatibility

The HLX only works with 12 volt, three-wire receivers (example, Xantech 291 Series).

IR Connectivity Problems

1. Use a professional cable tester and re-terminate bad cable ends using EIA-568B color code.
2. IR receivers require power and may receive it from a connecting block or from a Zone card itself depending on the configuration. Contact support.

Note: native HLX IR commands sent from zone IR ports are not passed to any of the HLX IR output jacks.

Does not repeat commands from a certain IR remote

- Some IR remotes cannot be processed by the HLX.
- IR output not properly connected to external IR system – call Audio Authority Technical Support.

Does not respond to RS-232

- HLX commands not properly stored or programmed in remote control system.
- Wrong type of RS-232 cable – See specifications for proper cable pin-out on page 13.
- Incorrect settings in software – See page 13.

No Video or IR control after adding cage expander

- Incompatible firmware versions – update to latest firmware (see www.audioauthority.com).
- Improperly seated connector – check connection for bent pins and re-seat.

Blinking Status Light on Source/Zone Card

When an unrecoverable condition has occurred on a particular card, it flashes an indicator code consisting of a set of pulses and then a short delay.

Three Blinks = Video Type Error

Four Blinks = Rail Voltage Failure

Five Blinks = Flash Memory Error

Rail Voltage Failure (four blinks)

The card has determined that the voltage powering the card is insufficient for proper operation.

All cards in one cage Rail Voltage Failure

1. Power off the system.
2. Make sure an AC power cord is connected to the card cage.
3. Power on the system.
4. If the problem persists, contact support.

Single Card Rail Voltage Failure

1. Remove power from the system.
2. Disconnect all cables from the card.
3. Confirm that power is connected correctly to the cage in which the card is installed.
4. Apply power to the system.
5. If the error is gone, it may be possible that a connected device is drawing too much power due to some kind of failure. If the error is still present, contact support.
6. Remove power from the system.
7. Connect one set of cables (for instance, one pair of dual Cat 5 cables).
8. Confirm proper operation; repeat until the problem component is found.

Flash Memory Error (five blinks)

There is a problem reading or writing to the flash memory present on the card. Contact Technical Support.

No Video or Audio

Cat 5 Connected Zone

1. Confirm that the Cat 5 cables used in the system have been tested with a cable tester and re-terminate using EIA-568B color code.
2. Damaged Cat 5 port – try moving Cat 5 cables to a different port to localize the problem.
3. Damaged Cat 5 receiver – swap with a known good receiver and connect to a known good output card port.

Component Connected Zone

1. Check that the cables are properly connected (Y = green, Pb = blue, Pr = red) and that only one digital audio connection (either coaxial or optical) is connected to a source card.
2. Damaged port – try moving the cables to another port and check operation.

Updating HLX Firmware

The latest firmware is available to download to your PC from www.audioauthority.com/page/software.

Two separate update processes are used for HLX firmware: Card Update and System update. These updates are performed from one firmware file (FILENAME.SMM).

Updating Zone and Source Cards

1. Place the USB drive containing the latest operating system data into the HLX USB port.
2. Touch MENU. The setup menu appears. Scroll and choose “Update Firmware”.
3. Scroll to the latest operating system (e.g. 052710.SMM). Press the knob.
4. The screen displays “Downloading…” for two or three minutes, then “Completed”. Cycle power and the HLX is ready for operation.

Updating System Firmware

To update system firmware, insert a USB drive containing the firmware file (FILENAME.SMM) and cycle power. Click the knob as soon as the LCD screen lights up. Select the firmware update. The firmware takes several moments to update. Do not interrupt this process by cycling power or removing the USB drive.

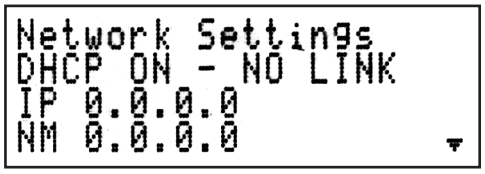
Diagnostics and Settings

IR Diagnostics

The IR diagnostic report contains timing information about detected IR signals. The IR diagnostic report can be sent to a PC via serial port or Ethernet, or can be saved to a connected USB flash drive.

Network Settings

This diagnostic displays Ethernet settings. These settings are also accessible via serial commands.

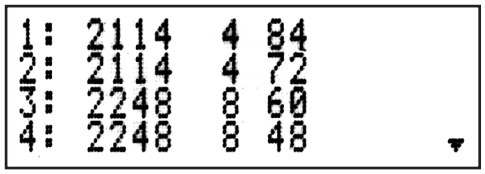


Firmware Versions

This diagnostic displays the current firmware and secondary bootloader versions present on all system components.

Card Diagnostic

This screen shows information about each source card and zone card in the HLX system:



SLOT MODEL CAPACITY ADDRESS

HLX System Design Rules

Note: Call Audio Authority Technical Support when performing any in-field upgrades.

Audio Authority can help you choose the correct source and zone cards for your application, or you can use our website to configure a system.

Card Placement Rules

Systems are pre-assembled at the factory, but for field updates, observe the following rules. Slide each card into the HLX card cage and secure using the provided screws.

1. The first card slot must have a source card installed.
2. Slot 2 may have a source card installed or may be left empty. Do not install a zone card in slot 2.
3. Slot 3 accepts either a source or zone card.
5. Slots 4, 5, and 6 accept zone cards only*.
6. Sources and zones are numbered sequentially, left to right, starting with the top card in the card cage.
7. Adding cards to an existing system requires inserting the card at the bottom of the respective stack; a source card should be added after the last source card in the system, shifting zone cards down if necessary. Zone cards should be added in the next available slot, below the existing zone cards.

Source Cards

Source cards must be placed into the top two or three slots. Do not leave vacant slots between source cards.

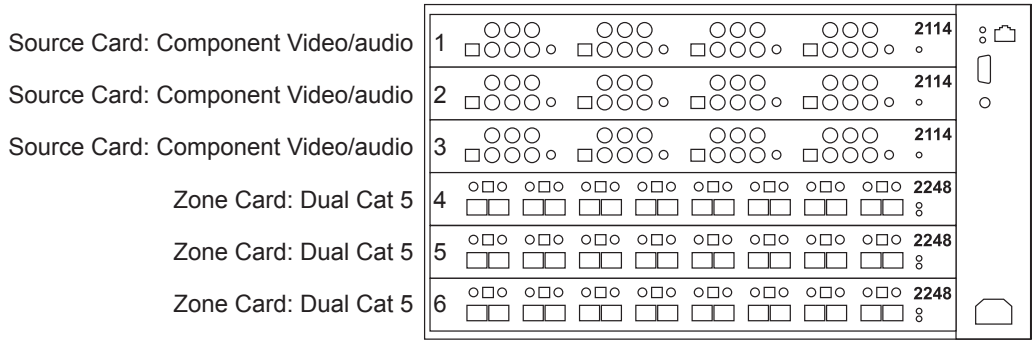
- Slot 1 – Source Card 1, Source 1-4
- Slot 2 – Source Card 2, Source 5-8
- Slot 3 – Source Card 3, Source 9-12

Zone Cards

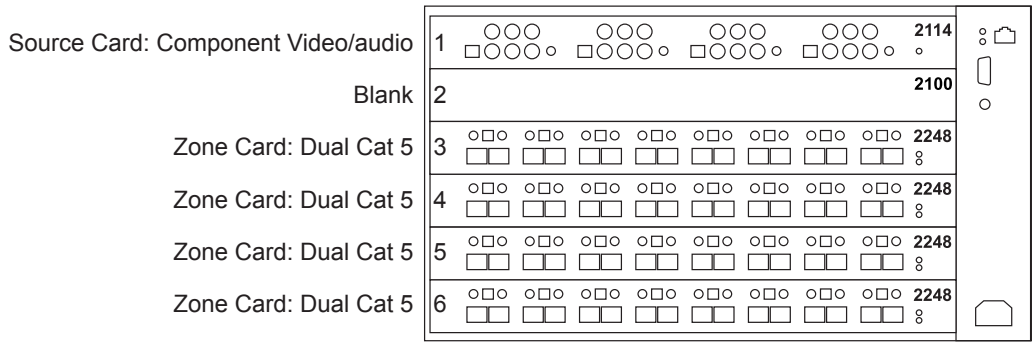
Zone cards must be installed in valid zone card slots, but are not required to be installed contiguously. The zones will be numbered in order, based on the card location in the card cage, however.

- Slot 3 – Zone Card 1, zones 1-8
- Slot 4 – Zone Card
- Slot 5+ – Zone Card

Example HLX configuration for 12 sources and 24 zones.



Example HLX configuration for 4 sources and 32 zones. Slot 2 cannot be used for zones.

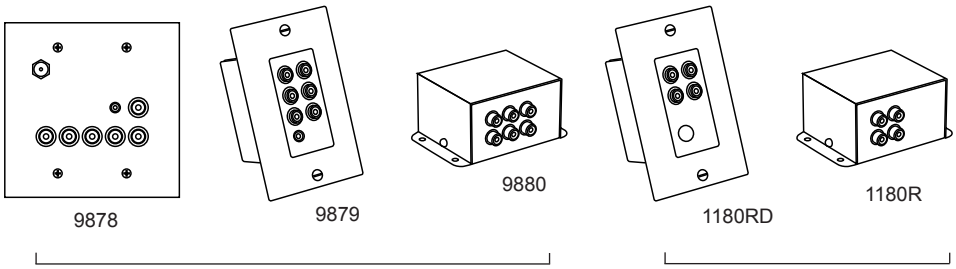


Zone Receivers

- Model 9878 • dual-gang wallplate receiver, stainless steel, shallow mounting depth with antenna pass-through jack
- Model 9879 • single-gang wallplate, Decora style with front and rear facing IR inputs
- Model 9880 • surface mount receiver, can be mounted on any surface
- Model 1180RD • single-gang, single Cat 5 wallplate, Decora style (does not have analog audio or IR)
- Model 1180R • surface mount receiver (does not have analog audio or IR), can be mounted on any surface

Cat 5 Zone Receiver Features

Features	9878	9879	9880	1180R	1180RD
Component Video	Yes	Yes	Yes	Yes	Yes
Digital Audio	Yes	Yes	Yes	Yes	Yes
Analog Audio	Yes	Yes	Yes	-	-
IR	Yes	Yes	Yes	-	-
Cat 5	Dual	Dual	Dual	Single	Single
Source Card	2248	2248	2248	2238	2238



Dual or Single Cat 5 Receivers

It may be desirable to use single Cat 5 receiver with a dual Cat 5 card. Use the Model 1110 adapter.

1110

Specifications

Agency Approvals	FCC, ETL
Power Input Connector	IEC C14
Power Voltage/Polarity	100-125VAC 50-60Hz
Maximum Input Current	1.4A (Model 2004) 2.2A (Models 2006 and 2014)
Power Cord	801-163 appliance cord w/ground
Heat Output	200 BTU/hr max

Audio Parameters	
Analog/Digital	Digital/Analog
Digital Input/Output Type	Optical+Coaxial In/Coax Out
Input Impedance	75 ohms/50K ohms
Min Load Impedance	75 ohms/10K ohms
Multi-channel Digital	Yes
Frequency Response	10-50KHz
S/N Ratio	70dB
THD+Noise	0.05%
Crosstalk	-60dB

Video Parameters	
Signal Type	Component (Y Pb Pr)
Video Formats (analog)	Component Video, 480i - 1080p
Video Formats (digital)	n/a
Input/Output Impedance	75 ohms
Input Ground Isolation	No
Gain	1
Gain Accuracy	2%
3dB Bandwidth	100MHz
Input Coupling	AC
S/N Ratio	70dB
Max Gain/Equalization	40dB equalization

HLX Commands

- Commands that pertain to audio cards are specified in a separate user manual.
- The @ symbol represents up to 16 characters.
- All switching is assumed to be audio/video unless specified.

Zone/Source Switching

Description	***Command Structure***	***Example Commands***	***Example Output***	***Result***
Switch a zone output to a source input	[CO###I##]	[CO1I2]	(CO1I2)	Zone output 1 is connected to source input 2.
Query an output zone	[QO###]	[QO8]	(CO8I4) (NO8"Master Bedroom") (RCO8)	Returns all information pertaining to zone 8. In this case, the name of the zone is MASTER BEDROOM, currently connected to source input 4, and IR control is restricted.
Switch a zone output to a source audio input (breakaway switching)	[CO###AI##]	[CO5AI6]	(CO5AI6)	Audio for zone output 5 is connected to source input 6.
Switch a zone output to a source video input (breakaway switching)	[CO###VI##]	[CO5VI7]	(CO5VI7)	Video for zone output 5 is connected to source input 7.
Turn on zone tracking	[TRO###O##]	[TRO2O8]	(TRO2O8)	Pairs zones 2 and 8. Useful when an audio zone should always switch with a video zone.
Turn off zone tracking	[TRO###]	[TRO2]	(TRO2)	Breaks the pairing of zone 2 with zone 8.
Switch all zones to a single input source	[CXI##]	[CXI4]	(CXI4)	All zone outputs are connected to source input 4.
Switch all zones to a single audio input	[CXAI##]	[CXAI4]	(CXAI4)	All zone outputs are connected to source audio input 4.
Switch all zones to a single video input	[CXVI##]	[CXVI4]	(CXVI4)	All zone outputs are connected to source video input 4.
Switch to a favorite zone/source configuration	[CF##]	[CF3]	(CF3)	All zones that are a member of favorite 3 will be set to the predefined source connections.
Switch a group of zones to the specified source	[CG##I##]	[CG1I3]	(CG1I3)	All zones that are a member of group 1 are switched to source 3.
Name an output zone	[NO###"@"]	[NO3"Den"]	(NO3"Den")	Zone 3 is named "Den".
Name an input source	[NI##"@"]	[NI3"HD Satellite"]	(NI3"HD Satellite")	Source 3 is named "HD Satellite".
Restrict (IR) control of the source connected to a particular zone (Temporary - expires after 300 minutes)	[RCO###]	[RCO8]	(RCO8)	Other zones are prevented from sending IR to source connected to zone 8. Expires after 300 minutes.
Restrict viewing of a source to one zone (Temporary - expires after 300 minutes)	[RTO###]	[RTO9]	(RTO9)	Only zone 9 may view the source connected to it for 300 minutes, until zone 9 switches to a different source, or until the restriction is cancelled.
Cancel temporary restrictions on the source connected to a particular zone	[AO###]	[AO3]	(AO3)	All zones may view or send IR signals to the source connected to zone 3.
Restrict a particular zone from viewing a source (Permanent)	[RPO###I##]	[RPO4I9]	(RPO4I9)	Prevent zone 4 from viewing source input 9.
Cancel a permanent zone / source restriction	[AO###I##]	[AO4I9]	(AO4I9)	Allow zone 4 to view source 9.

Favorites

Connect a favorite	[CF##]	[CF3]	(CF3)	Favorite 3 is now connected.
Add a zone/source combination to a favorite	[F##AO##I##]	[F1AO3I2]	(F1AO3I2)	Add the zone 3, source 2 combination to favorite 1.
Add an audio only zone/source combination to a favorite	[F##AO###AI##]	[F2AO9AI8]	(F2AO9AI8)	Add the zone 9, source 2 audio only combination to favorite 2.
Add a video only zone/source combination to a favorite	[F##AO###VI##]	[F2AO9VI5]	(F2AO9VI5)	Add the zone 9, source 2 video only combination to favorite 2.
Query favorite	[QF##]	[QF10]	(F1AO1I3) (F1AO3I4) (NF1"Favorite 1 Name") (QF10)	Query favorite membership and settings. See the favorite adding and naming commands for how to read the results.
Remove a zone/source combination from a favorite	[F##RO###]	[F1RO3]	(F1RO3)	Remove zone 3 from favorite 1.
Name a favorite	[NF##"@"]	[NF1"Gameday"]	(NF1"Gameday")	Favorite 1 is named "Gameday"
Erase all favorite memberships	[FAR]	[FAR]	(FAR)	All favorites now have no zone members.

Groups

Query a group	[QG##]	[QG10]	(QG10) (NG10"Empty Group")	Group 10 has no members and is named "Empty Group".
Add a zone to a group	[G##AO###]	[G1AO3]	(G1AO3)	Zone 3 is now a member of group 1.
Switch all zones in a group to a source	[CG##I##]	[CG2I4]	(CG2I4)	All zones in group 2 switch to source input 4.
Switch all audio for the zones in a group to a source input	[CG##AI##]	[CG3AI7]	(CG3AI7)	Group 3 switch audio to source 7.
Switch all video for the zones in a group to a source input	[CG##VI##]	[CG3VI5]	(CG3VI7)	Group 3 switch video to source 5.
Remove a zone from a group	[G##RO###]	[G1RO3]	(G1RO3)	Zone 3 is removed from group 1.
Name a group	[NG##"@"]	[NG1"Bedrooms"]	(NG1"Bedrooms")	Group 1 is named "Bedrooms"
Erase all group memberships	[GAR]	[GAR]	(GAR)	All groups now have no zone members.

Network Settings Adjustment

Query current network (Ethernet) settings	[QE]	[QE]	(DHCP1) (IP0.0.0.0) (NM0.0.0.0) (GW0.0.0.0) (MAC00-00-5E-A8- 00-D3)	DHCP status, IP address, subnet mask, gateway, and MAC address are displayed by this command.
Enable or disable dynamic host configuration protocol (DHCP)	[DHCP#]	[DHCP1] [DHCP0]	(DHCP1) (DHCP0)	DHCP is enabled (1) or disabled (0). It is not possible to statically set address while DHCP is on.
Define the static IP address	[IP###.###.###.###]	[IP192.168.0.212]	(IP192.168.0.212)	Set the IP address to the specified value.
Define the default gateway	[GW###.###.###.###]	[GW192.168.0.2]	(GW192.168.0.2)	Set the default gateway for accessing computers outside of the subnet.
Define the subnet mask	[NM###.###.###.###]	[NM255.255.255.0]	(NM255.255.255.0)	Set the subnet mask, which determines the computers that can be accessed without traveling through the gateway.

Serial Settings Adjustment

Set the serial baud rate	[SB#]	[SB0] [SB1] [SB2]	(SB0) (SB1) (SB2)	Baud rate is set to 9600 (0), 19200 (1), or 115200 (2).

Front Panel Interface Adjustment

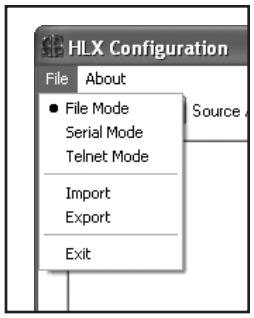
Query front panel interface lockout	[QFPL]	[QFPL]	(FPL0) (QFPL)	Returns whether the front panel interface is locked out (1) or unlocked (0).
Enable or disable front panel interface lockout	[FPL#]	[FPL0] [FPL1]	(FPL0) (FPL1)	Front panel interface is locked out (1) or unlocked (0).
Query front panel IR lockout	[QIRL]	[QIRL]	(IRL0) (QIRL)	Returns whether the front panel IR is disabled (1) or enabled (0).
Enable or disable front panel IR lockout	[IRL#]	[IRL1] [IRL0]	(IRL1) (IRL0)	Lock out front panel IR (1) or allow it to operate (0).
Set VFD backlight and LED dimming level	[SD#]	[SD1]	(SD1)	The VFD and LED brightness level is set (0-3 are valid levels).

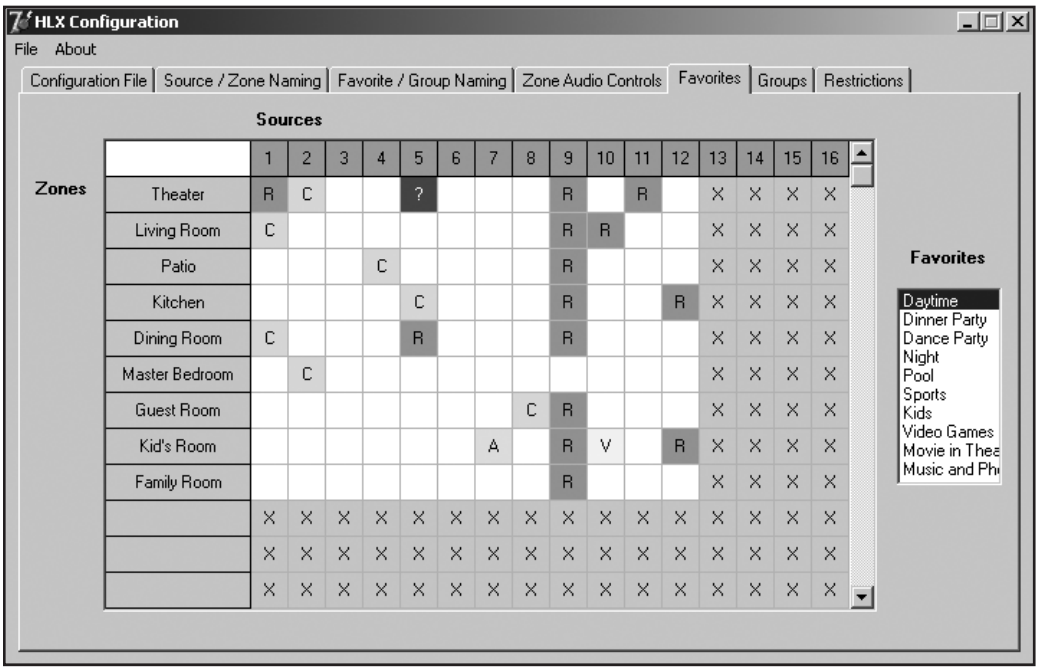
Configuration Utilities

Query the current configuration	[QX]	[QX]	(SC100) (SD4) (SBL100) (SLED100) (DHCP1) …	All configuration information is displayed.
Backup current configuration	[QXSB]	[QXSB]	[SC100] [SD4] [SBL100] [SLED100] [DHCP1] …	All configuration information is displayed in square brackets. This data can be resent to the HLX to restore settings.
Load the configuration from memory	[LOAD]	[LOAD]	(LOAD)	Loads the configuration stored in onboard memory.
Reset the configuration to factory defaults	[RESET]	[RESET]	(RESET)	Loads the factory default settings for every option.
Save the current configuration to memory	[SAVE]	[SAVE]	(SAVE)	Saves the current configuration settings immediately. There is a 30 second timer which automatically saves the settings during normal operation.

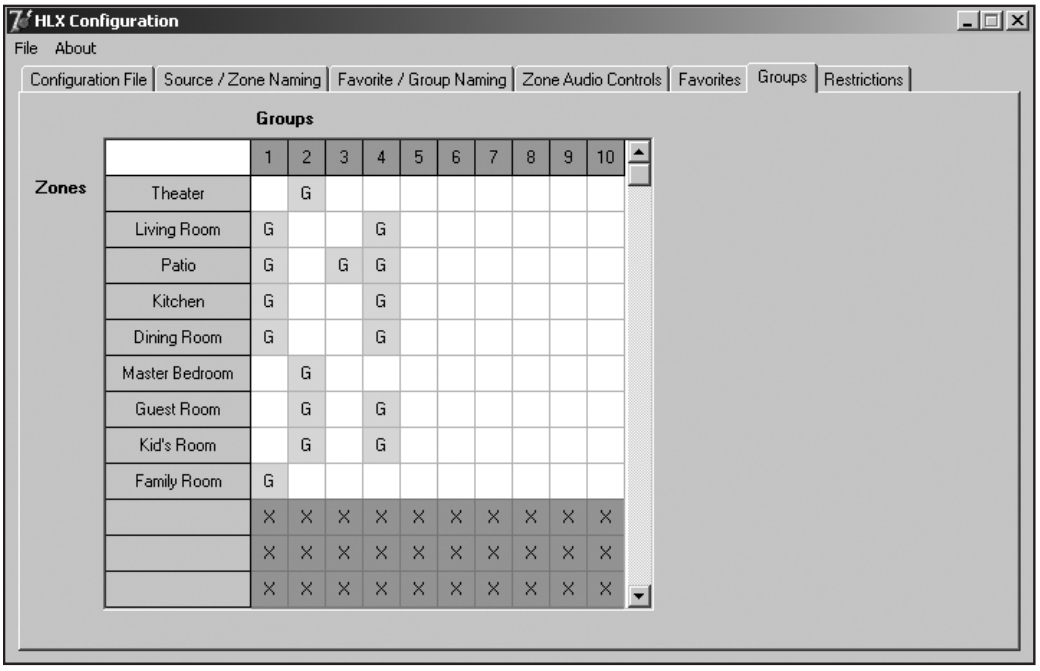
Using the PC Configuration Utility

The HLX Configuration Utility allows easy setup and configuration of HLX components. It is not a real-time control utility. It may be used to set up groups and favorites, define restrictions, and name sources and zones. The HLX Configuration Utility may be operated directly by serial connection, through Ethernet or in “file mode”. See page 14 for serial and Ethernet connection details. In file mode, the utility saves a script file (CONFIG.HLX) to a USB drive that can be loaded via the HLX USB port. A copy of the file can be stored as a backup in a safe location. Download the PC Configuration Utility from www.audioauthority.com/page/software.





Favorites may be defined with sychronized audio and video, or breakaway switching. The favorites screen also shows permanent restrictions for reference.



Add or remove a zone from a group by double clicking. Any zone can belong to one or multiple groups.

Suggested Configuration Steps

1. Choose a mode: file mode, serial mode, or Ethernet.
2. Import an HLX configuration. This defines the number and type of source inputs and zone outputs in the system, and shows the fields already populated.
3. Name the Sources and Zones.
4. Name favorites and groups, then define favorites by double clicking in the square representing the zone/source combination.
5. Adjust audio controls in each zone. (This option requires an audio zone card still in development.)
6. Define restrictions by double clicking in the square representing the zone/source combination.
7. Export the configuration to the HLX.
8. Using file mode, save to a drive for backup.

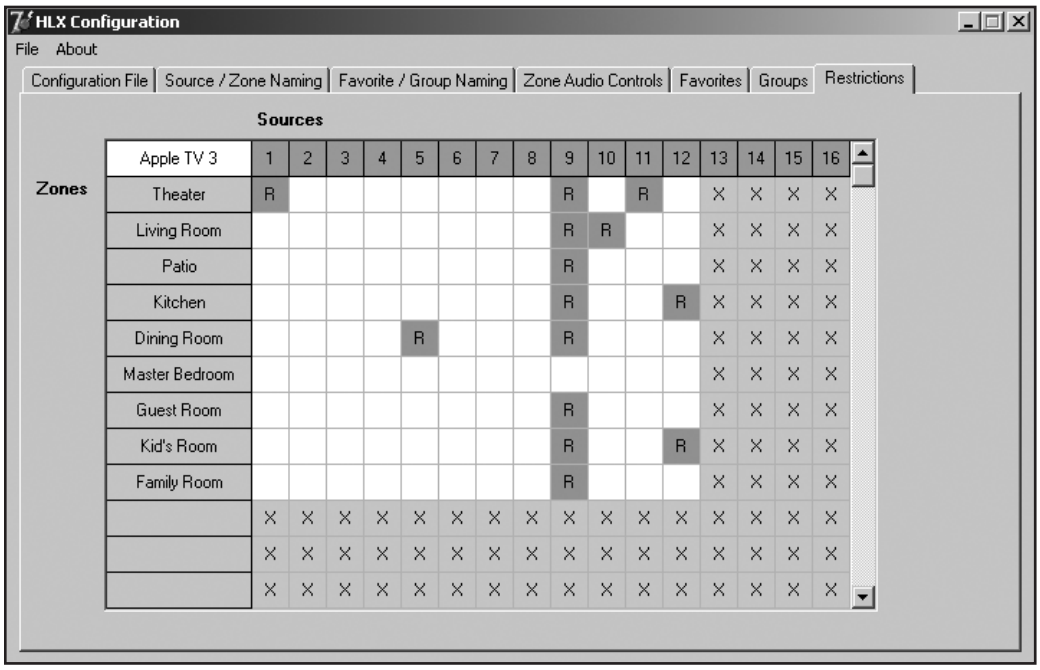
Import/Load File
Opens an exported or previously created config file on the computer

Export File
In file mode, Export File sends file to USB drive. In serial or Ethernet mode, it sends configuration commands directly to the connected HLX system. The utility is able to export configuration file data or human-readable configuration data to USB, Serial, or Ethernet.

Groups
Zones can be added to a group by checking a box by each zone that should be included. Zones can be included in more than one group

Favorites
A Favorite is a “scene preset” that assigns a particular source to each zone.

Restrictions
Each zone/source combination can be restricted or allowed by double-clicking its box next to the desired zone. This restriction is permanent, and cannot be reversed except through serial/Ethernet or by using this utility. Note: configuration files are not password protected.



Limited Warranty

If this product fails due to defects in materials or workmanship within one year from the date of the original sale to the end-user, Audio Authority guarantees that we will replace the defective product at no cost. Freight charges for the replacement unit will be paid by Audio Authority (Ground service only). A copy of the invoice from an Authorized Reseller showing the item number and date of purchase (proof-of-purchase) must be submitted with the defective unit to constitute a valid in-warranty claim.

Units that fail after the warranty period has expired may be returned to the factory for repair at a nominal charge, if not damaged beyond the point of repair. All freight charges for out-of-warranty returns for repair are the responsibility of the customer. Units returned for repair must have a Customer Return Authorization Number assigned by the factory.

This is a limited warranty and is not applicable for products which, in our opinion, have been damaged, altered, abused, misused, or improperly installed. Audio Authority makes no other warranties either expressed or implied, including limitation warranties as to merchantability or fitness for a particular purpose. Additionally, there are no allowances or credits available for service work or installation performed in the field by the end user.

HLX Chassis Serial Number _____

Date of Purchase / Installation _____

Custom Installer _____

Telephone Number _____

Sources

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

7 _____

8 _____

9 _____

10 _____

11 _____

12 _____

Zones

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

7 _____

8 _____

9 _____

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