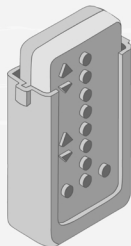


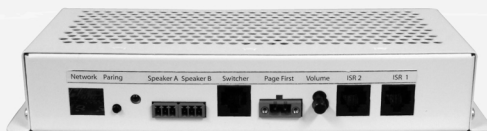
Classroom Audio System



Wireless Selector
(Shown in wall mount)



AV Switcher



Amplifier



REDMIKE



Video
Converter

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SECTION 1:

OVERVIEW

SYSTEM OVERVIEW

CAT AV is truly the media hub of the classroom supporting speech reinforcement, full range multimedia sound, and video switching and control. The unique wireless control that can be mounted anywhere in the classroom and moved as often as necessary as there are no wires to install or move. You can locate it on your teaching wall or you can take with you for control anywhere in the room. Up to four infrared wireless REDMIKE Volume control microphones provide clear distribution of the teachers voice across the entire classroom.

The AV switcher allows up to four audio and video inputs (two VGA and two composite). The switcher directs the selected AV input and sends the Audio via CAT-5 cable to the system amplifier. It also directs the selected video signal to the Video Converter module where it is converted back to its appropriate video connector and signal type to connect with the classroom projector.

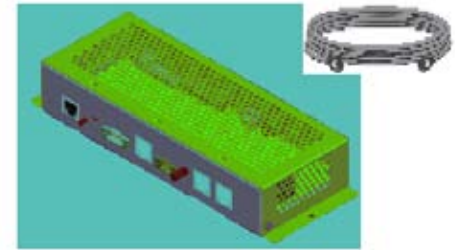
Designed for the classroom, CAT AV is fast and simple to install. Three CAT-5 twisted pair cables carry audio and video signals, control signals and power between all system modules and plenum rated speaker wire carries the amplified audio to the ceiling speaker(s).

This user guide includes all of the information necessary for installation, set up and operation of the CAT AV system. Call Lightspeed Technologies, Inc. at 800-732-8999 with any questions regarding this system.

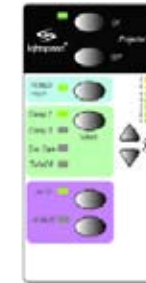
SYSTEM COMPONENTS AND UNPACKING

The standard configuration of the CAT AV will contain:

Amplifier and Cable



Wireless Selector with Wall Mount



I/O Switcher and Cable



System Power Supply



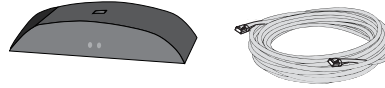
SYSTEM COMPONENTS AND UNPACKING

CONT'D

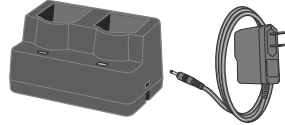
Video Converter with Cables



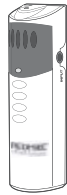
iR Receiver and Cable



Charging Cradle and Power Supply

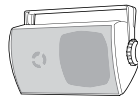


REDMIKE VC Classroom Microphone



SPEAKERS

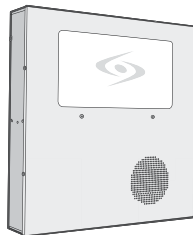
Optional WMQ (x 4)



Optional DRQ (x 4)



MCQ (x 1)



SYSTEM COMPONENTS AND UNPACKING

CONT'D

Standard Accessories

AC-CAVWC	Wireless Control Panel
AV-CAVSW	I/O Switcher
AV-VCON	Video converter
AMP-CAV	Amplifier
PS-24V-2.5A	Power Supply
RX-ISR	Integrated Sensor Receiver
RMV	REDMIKE Volume Control, Lavalier cord, rechargeable AA batteries
CA-CAT5e50	CAT-5e cable (50 ft)
BA-NH2A27	Lightspeed AA rechargeable sensing battery
BC-RMCC	REDMIKE VC cradle charger
PS-5V-1.0	Cradle charger power supply
AC-WCPWM	WCP Wall Mount
CA-35IRE	iR emitter to 3.5mm jack
CA-VGA-1.5	18 inch VGA Cable
CA-RCA-1.5	18 inch RCA Cable
SPK-MCQ	Ceiling Multimedia Speaker
CA-PLSPK50	Plenum speaker cable (50 ft)
	Velcro strip 2 inch
AC-ENC	System Enclosure
AC-MNCAV	User Manual
SPEAKERS	Contact Lightspeed at 800.732.8999 for speaker info

FEATURES

WIRELESS CONTROL

CAT AV's wireless RF selector gives maximum flexibility for the teacher. It can be mounted to a wall or carried to give control anywhere in the classroom.

AUDIO INPUTS

CAT AV Switcher can select between four multimedia audio inputs (associated with the video inputs).

MICROPHONE INPUTS

Up to four infrared microphone transmitters can be used for the wireless transmission of the teacher's voice. Each microphone has its own volume control or the wireless control panel can be used to set microphone output level.

VIDEO INPUTS

CAT AV Switcher can select between four inputs (two VGA and two composite).

ALD AUDIO OUTPUT

CAT AV outputs a mixed audio output (both multimedia audio and voice) through the ALD output jack located on the Switcher front panel. The output includes an independent volume control. This audio output can be used for connection to a recording or listening device.

TWISTED PAIR OUTPUTS

CAT AV switcher outputs Audio to the Amplifier and Video to the Video Converter modules through two RJ-45 connectors. Audio and video signals can be transmitted via CAT-5 cable up to 100 ft away.

CHECK AUDIO OUTPUT TO SPEAKERS

16 W per channel (32 W total) output for 1 to 4 speakers

PAGEFIRST

CAT AV connects to the classroom paging system using an optional paging sensor. When a page is sensed, it mutes all audio output from the CAT AV System during the page. Audio is returned to its normal levels when the page is complete.

AUTO PROJECTOR SHUTDOWN

To save energy and maximize projector bulb life, CAT AV will turn the projector off at a predetermined interval after all audio inputs have stopped. Time can be set in 30 minute intervals from 0 minutes to 3 hours.

EQUALIZER & TONE CONTROLS

Classroom acoustics are different from room to room. To provide the highest speech intelligibility and natural sounding multimedia, provision for digital adjustment is provided for during initial system set up.

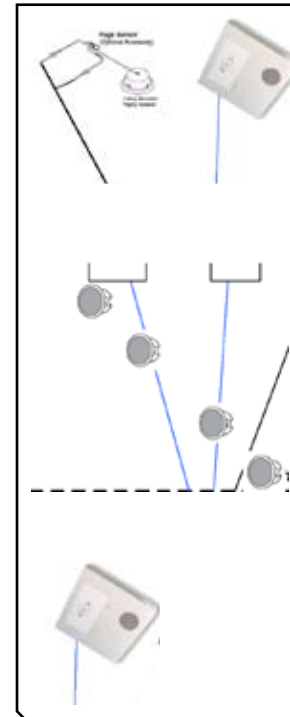
IR LEARN MODE

CAT AV learns from your projectors remote control. IR control codes are learned directly from the projector's remote control. Codes: Projector On & OFF, Input connection (VGA or Video), and Video Mute.

APPLICATIONS DIAGRAM

THIS IS A ROUGH SKETCH OF A DIAGRAM THAT IS BEING DESIGNED

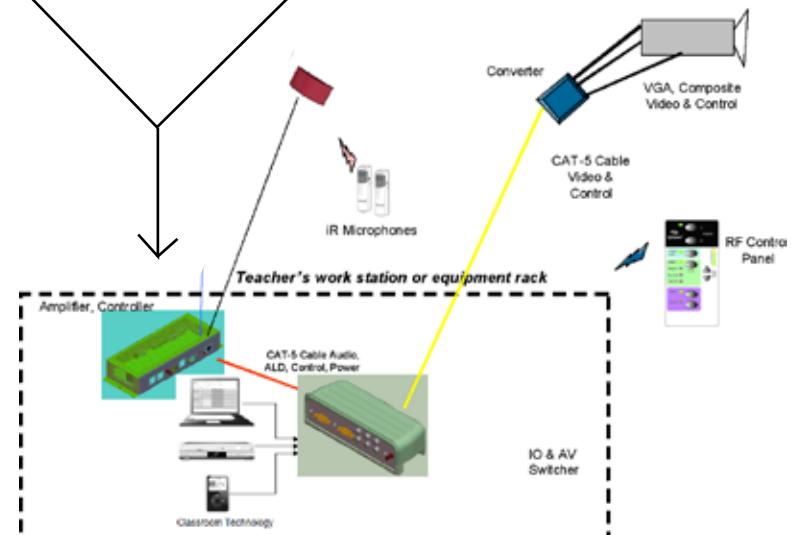
Here are three example diagrams of application setups.



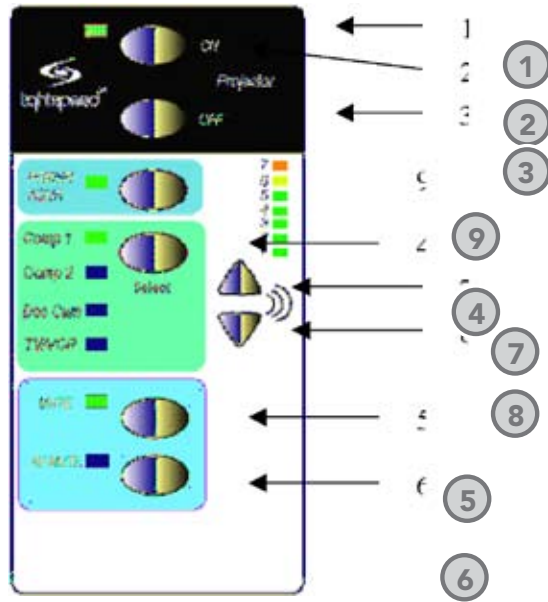
1) CAT AV System with Optional Page First Sensor Connection

2) CAT AV System with four ceiling or wall speakers

3) CAT AV System basic interconnection using MCQ multimedia ceiling speaker



WIRELESS SELECTOR CONTROLS



1. CAT AV SYSTEM POWER SWITCH/POWER INDICATOR:

This switch is used to turn the system power ON and OFF. When POWER is ON, the POWER light will glow green.

2. PROJECTOR POWER ON/PROJECTOR POWER INDICATOR:

Pushbutton sends IR code to the projector to turn its power ON. When Power is ON, the projector power light will glow green.

3. PROJECTOR POWER OFF:

Pushbutton sends an IR code to the projector to turn its power OFF. When Power is OFF, the projector power ON light will be OFF.

NOTE: Some projectors will turn off with a single push of the OFF button. Other projectors require two pushes.

4. AV INPUT SOURCE SELECT AND SOURCE INDICATORS:

Pushbutton selects the audio and video input source as Follows:

- A. VGA input 1
- B. VGA input 2
- C. Composite Video input 1
- D. Composite Video input 2

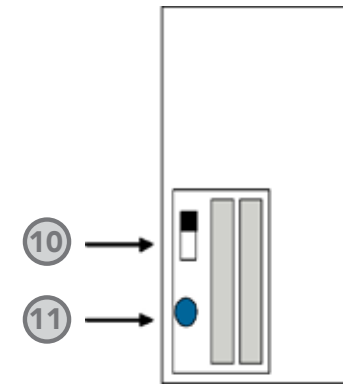
NOTE: AV input labels for lights A, B, C, and D can be customized to match the AV sources connected to the corresponding AV input on the Switcher module.

The light will glow green when the corresponding AV source is selected.

5. MICROPHONE MUTE/MUTE INDICATOR:

Pushbutton mutes all audio except the teacher's microphone. When Mute is pushed, the Mute light will glow green.

WIRELESS SELECTOR CONTROLS CONT'D



Rear Panel

6. AV MUTE/AV MUTE INDICATOR:

Pushbutton blanks the video being displayed and mutes its associated audio. When AV Mute is on, the AV mute light will glow green.

7. VOLUME UP: Pushing the volume up button causes the selected source volume to increment by 1 db.

8. VOLUME DOWN: Pushing the volume down button causes the selected source volume to decrement by 1 db.

9. VOLUME LEVEL LIGHTS:

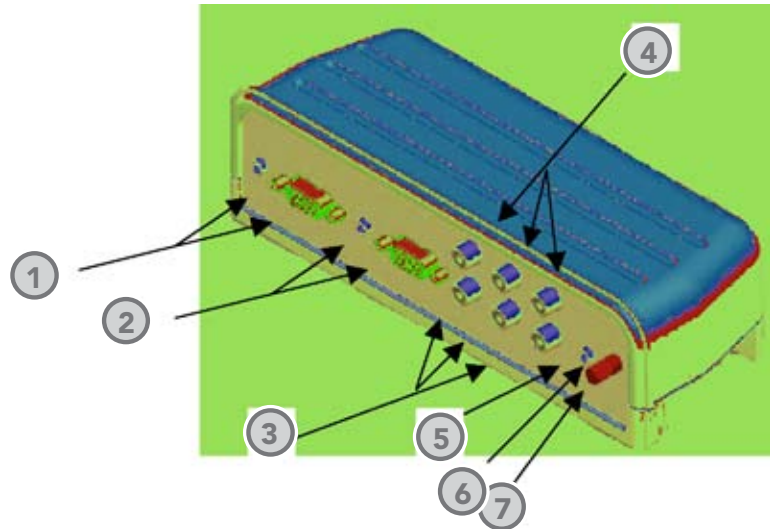
Indicates the relative volume level for the source selected. Three pushes of the Volume UP pushbutton will increment to the next higher light to glow green.

Likewise, three pushes of the Volume DOWN pushbutton will decrement to the next lower light to glow green. Volume levels are saved in memory so will return to the previously set level when the AV source is selected again.

10. MODE SWITCH: Selects between normal operation and set-up mode. In set-up mode the front panel switches take on new meaning. See Set-Up Section of this document for information.

11. PAIRING BUTTON: Synchronizes the Wireless Selector to the system for exclusive operation.

I/O SWITCHER FRONT PANEL CONNECTORS AND CONTROLS



- 1. VGA VIDEO WITH AUDIO 1:**
A 15 pin VGA Video connector and 3.5 mm Audio connector input for source 1.
- 2. VGA VIDEO WITH AUDIO 2:** A 15 pin VGA Video connector and 3.5 mm Audio connector input for source 2.
- 3. COMPOSITE VIDEO WITH LEFT AND RIGHT AUDIO 1:** Yellow RCA connector for Composite Video with Red RCA connector for Right Audio and White RCA connector for Left Audio.
- 4. COMPOSITE VIDEO WITH LEFT AND RIGHT AUDIO 2:** Yellow RCA connector for Composite Video with Red RCA connector for Right Audio and White RCA connector for Left Audio.

- 5. POWER LIGHT:** Glows green when power is received from the Amplifier module
- 6. ALD AUDIO OUTPUT:** 3.5 mm stereo jack sends audio signal to external equipment such as a recorder or an assistive listening device like Lightspeeds LES-370 Personal FM System.
- 7. ALD VOLUME CONTROL:** Adjusts the Audio signal level output through the ALD Audio Output connector.

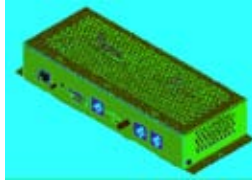
I/O SWITCHER BOTTOM PANEL CONNECTORS

“(Picture of bottom side of the switcher showing connectors)”

Need image – there’s not one in the Word File.

- 1. AUDIO OUTPUT/ALD AUDIO INPUT JACK:** RJ-45 connector for carrying audio signals to the Amplifier and ALD Audio signals back from the Amplifier. Power for the Switcher is also carried on the connecting CAT-5e cable.
- 2. VIDEO OUTPUT JACK:** RJ-45 connector for carrying video signals to the Video Converter module. The connecting CAT-5e cable also carries power for the Video Converter module and projector control signals.

AMPLIFIER CONTROLS & CONNECTIONS



- 1. SYSTEM PAIRING BUTTON:** Pushbutton used to synchronize the Wireless Selector to the system controller.
- 2. IR LEARN WINDOW:** Receives the IR control codes from the projector remote control. When in the set up mode, the volume up or down button on the wireless selector is pushed followed by the corresponding button on the projector remote control.
- 3. FOR INTERNAL USE ONLY.**
- 4. AUDIO INPUT:** An RJ-45 connector to receive audio signals from the Switcher. A CAT-5 cable carries audio signals from the switcher to the amplifier and mixed audio and power signals back to the Switcher.

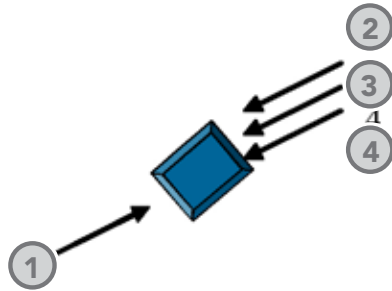
- 5. PAGEFIRST INPUT CONNECTOR:** A phoenix connector connects the system to the classroom paging speaker. When a page is received, the system audio is muted. The system returns to its previous level when the page is finished.
- 6. PAGEFIRST SENSITIVITY ADJUST:** Adjusts the sensitivity of the page first to duct system audio for a page but not for noise riding on the paging circuit.
- 7. ISR INPUT 1 CONNECTOR:** An RJ-45 connector for connecting the amplifier to a group frequency Integrated Sensor Receiver using a CAT-5 cable. The CAT-5 cable carries power to the ISR and Channel A and B microphone audio back to the amplifier.

AMPLIFIER CONTROLS & CONNECTIONS

CONT'D

- 8. POWER ON LED:** This light glows red when system power is turned ON.
- 9. ISR INPUT 2 CONNECTOR:** An RJ-45 connector for connecting the amplifier to a group 2 frequency Integrated Sensor Receiver using a CAT-5 cable. The CAT-5 cable carries power to the ISR and Group 2 – Channel A and B microphone audio back to the amplifier.
- 10. SYSTEM POWER ON/OFF PUSHBUTTON:** System power is turned ON or OFF with this pushbutton. (System power can also be turned ON/OFF directly from the Wireless Selector.)
- 11. WIRELESS SELECTOR ANTENNA**
- 12. SPEAKER OUTPUT 1:** A phoenix connector outputting audio signal to a speaker. Plenum rated speaker wire is used to connect this output to a system speaker.
- 13. SPEAKER OUTPUT 2:** A phoenix connector outputting audio signal to a speaker. Plenum rated speaker wire is used to connect this output to a system speaker.
- 14. SYSTEM POWER INPUT CONNECTOR:** 24V 2.5 amp power connector to an external power supply.

VIDEO CONVERTER CONNECTORS



1. VIDEO INPUT CONNECTOR:

An RJ-45 connector for accepting video signals from the Switcher. A CAT-5 cable is used to carry VGA video, Composite video, power, and IR control signals from the Switcher to the Video Converter.

2. COMPOSITE VIDEO OUTPUT CONNECTOR:

An RCA connector outputs composite video to be carried to the projector composite video input.

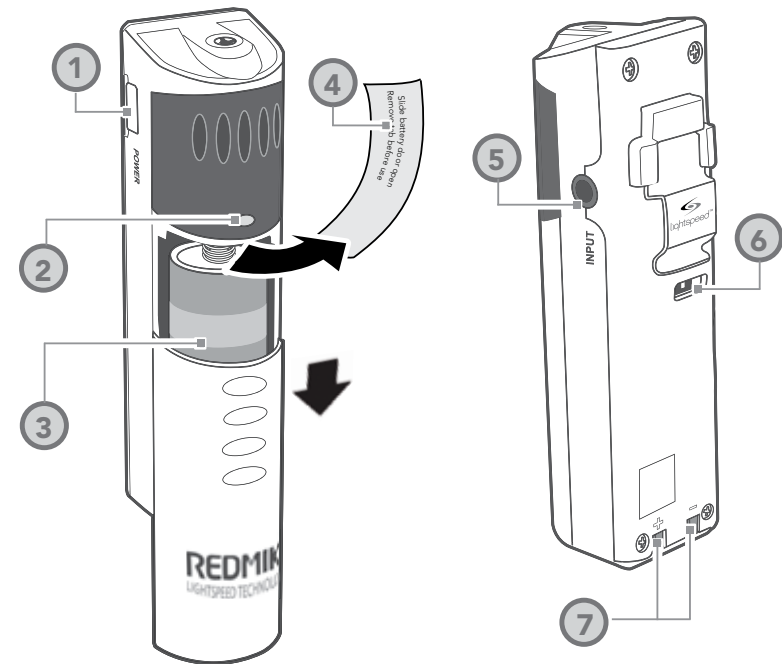
3. VGA VIDEO OUTPUT CONNECTOR:

A 15-pin Dsub (female) connector outputs VGA video signals to be carried to the projector VGA input on the projector.

4. IR CONTROL SIGNAL OUTPUT CONNECTOR:

A 3.5 mm (female) connector output for connecting an IR Emitter. Electrical control codes are then converted by the IR Emitter to infrared light for pick-up by the IR receiver port on the projector.

REDMIKE VC CONTROLS & CONNECTIONS



1. POWER BUTTON: Press this button to turn the REDMIKE VC ON, press again to turn it OFF (mute).

2. POWER/LOW BATTERY INDICATOR: A BLUE light indicates the REDMIKE VC is on and fully charged. A RED light indicates a charge is needed.

3. BATTERY COMPARTMENT: To access the battery compartment, slide the door downward. The battery should only be replaced by a Lightspeed AA rechargeable sensing battery (part # BA-NH2A27).

4. YELLOW PROTECTIVE TAB: Slide the battery compartment door open to remove this disposable protective tab before use. NOTE: do not attempt to remove the tab without first opening the compartment door, as

it may tear, leaving fragments.

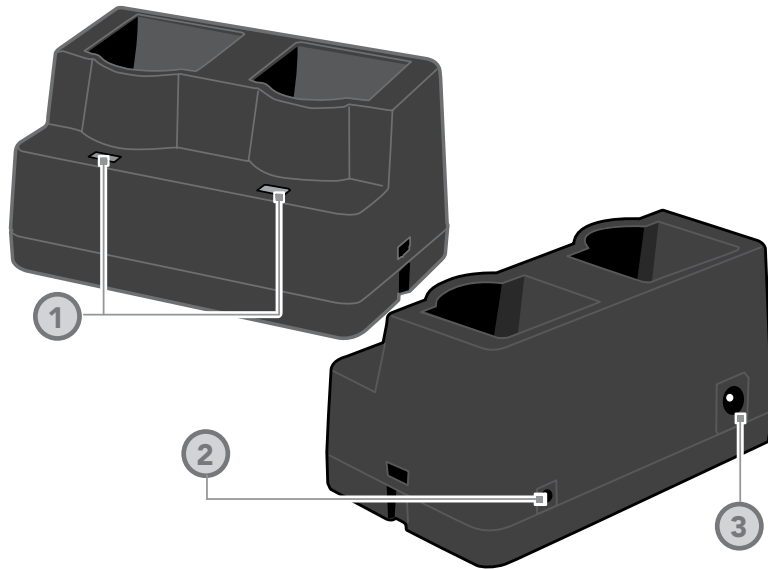
5. AUDIO/MICROPHONE INPUT: Use this input to plug in a laptop, MP3 player or other audio source to wirelessly transmit audio to be played through the system. Alternatively, an external microphone can be connected.

6. CHANNEL SELECT SWITCH (CH A/B): This switch allows for selection between Channel A or B. If you are using a single microphone, we recommend using Channel A.

7. VOLUME CONTROLS (UP – DOWN)

8. CHARGER CONTACTS (+ -): These contacts interface with the charging tabs in the BC-RMCC cradle charger for daily charging. Simply place the REDMIKE VC in the charger.

CRADLE CHARGER CONTROLS AND CONNECTIONS

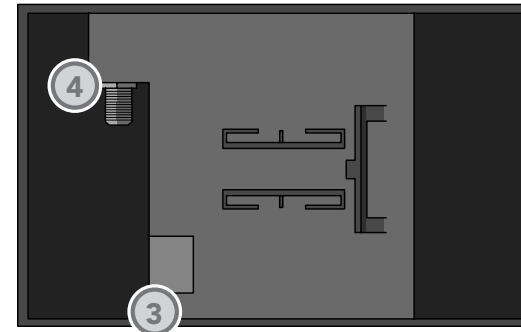
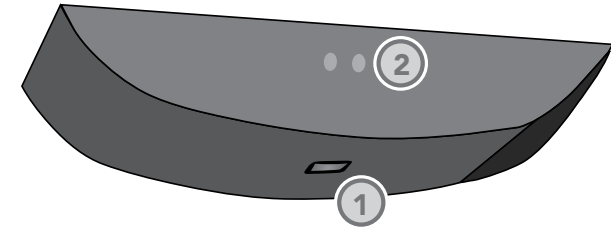


1. CHARGE INDICATORS: The light glows RED while the REDMIKE VC is charging. When fully charged, the light will glow GREEN. A blinking RED light indicates that no battery is sensed, (REDMIKE VC Yellow Protective Tab may not have been completely removed—see page 5, item 4.) A blinking Green LED means a non- Lightspeed battery has been installed (possibly an alkaline battery).

2. DC POWER PORT: Connect the DC power cord here.

3. OPTIONAL CHARGING PORT: Plug the charging cord for the optional LT-71 or the REDMIKE Share microphones here.

INFRARED SENSOR/RECEIVER (ISR) CONNECTIONS



1. POWER INDICATOR: This light will glow blue when the ISR is receiving power from the CAT AV. (There is a blue light in the center of logo on the front side – add image of this).

2. A/B IR INDICATORS: These lights glow when the corresponding microphone (set to channel A or B) is turned on and transmitting. A steady light indicates a strong signal.

3. SENSOR OUT: Connect the Cat 5 sensor cable to this connection to send audio from the microphones to the CAT AV amplifier.

4. IR EXPANSION: Connect up to three passive IR sensors (IR-SR70F) to this connection for larger classrooms. For more than one additional sensor a 3-way coax splitter is required (HS3).

SECTION 2:

INSTALLATION

IMPORTANT SAFETY INSTRUCTIONS

1. **Instructional Literature**—All safety and operation instructions should be read before this Lightspeed product is operated. The safety and operating instructions should be kept for future reference. All operating and other instructions should be followed.
2. **Heed Warnings**—All warnings on this Lightspeed product and in these instructions should be followed.
3. **Water, Heat and Moisture**—This Lightspeed product should not be used near water. Care should be taken so that objects do not fall onto and liquids are not spilled into the Lightspeed product. This Lightspeed product should be situated away from heat sources such as radiators, etc.
4. **Power**—This Lightspeed product should be connected to a power supply only of the type described in the operation instructions or as marked on this Lightspeed product. Power supply cords should be routed so that they are not likely to be walked upon or pinched by items placed upon or against them. Do not use this polarized plug with an extension cord, receptacle or other outlet unless the blades can be fully inserted to prevent blade exposure.
5. **Damage Requiring Service**—This Lightspeed product should be serviced only by qualified service personnel. The user should not attempt to service this Lightspeed product. Keep all original packaging for easy transport if repair or return is necessary.
 - Read these instructions. Keep them in a location where you have easy access to them.
 - Heed all warnings and follow all instructions
 - Do not use this product near water.
 - Clean only with a 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 products apparatus (including amplifiers) that produce heat.
 - 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 are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
 - Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

IMPORTANT SAFETY INSTRUCTIONS CONT'D

- Only use attachments/accessories specified by the manufacturer.
- Unplug this product 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.

PRE-INSTALLATION

The CAT AVfour System has been thoroughly tested as a complete system prior to shipment. Factory default settings have been pre-set into the system. To make installation as easy as possible, perform the following two steps before installing the Amplifier module.

1. Synchronize the Wireless Control to the system.
2. Perform the IR Learn function to learn the IR codes from the projector remote control.

Note: Step 2. only needs to be performed on the first classroom installation of a series of classrooms containing the same make and model of projector. After the first classroom, the wireless control can be used to copy set-up information to each remaining system.

Pre-Install Procedure

1. Find the Amplifier module and its power supply.
2. Plug the DC power plug into the power receptacle on the Amplifier.
3. Plug the AC power plug into an appropriate wall outlet.
4. Turn the system power ON by pushing the system power button on the wireless control. The power LED on the Amplifier will light.
5. Remove the battery door from the back of the wireless control
6. Push the pairing button located in the wireless control battery compartment followed closely by the pairing button on the Amplifier.
7. Turn the system power OFF and remove the power connections to the Amplifier module.

SYSTEM INSTALLATION OVERVIEW

System Components can be installed in a variety of locations as shown in the following chart.

	I/O Switcher	Amplifier	Video Converter	Control Panel	Integrated Sensor/ Receiver	Speakers
WALL						
On Wall, In Enclosure	X	X				
On Wall, No Enclosure	X	X		X		
In Wall	X					
CABINET						
On Cabinet	X	X				
In Cabinet	X	X				
CEILING						
Above /In Ceiling		X				X
On Ceiling Grid					X	
PROJECTOR						
On Projector			X			

ON/IN WALL (NO ENCLOSURE)

1. Install System Wall Plates & I/O Switcher

- Label both ends of all cables
- Mark (with painters tape) location of CAT AVfour Modules
- Install the mud rings or electrical boxes
- Pull cables

CABLE LABELING

Cable Type	Qty	How to Label
CAT-5, 50 ft	3	1) Audio 2) Video 3) ISR
CA-PLSPK, 50 ft	1	1) Speaker Wire
CAT-5, 12-24 in *	1-2	1) Audio 2) ISR
CA-PLSPK, 12-24in *	1	1) Speaker Wire

*Optional (depends on type of installation)

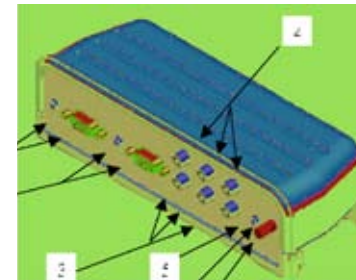
ON/IN WALL (NO ENCLOSURE) CONT'D

For on the wall installation

- Mark mounting screw/wall-anchor locations & drill holes for the switcher (the switcher module installs over the 1-gang wall box)
- Connect the CAT-5 cables labeled Audio and Video and connect them to the appropriately labeled connectors on the switcher
- Install the I/O –Switcher on the pre-installed screws.

For in wall installation

- Install the 4-gang mud ring or electrical box
- Pull the CAT-5 cables marked Audio and Video
- Connect the cables to the Audio and Video outputs on the Switcher
- Install the wall décor plate on the Switcher Module using the screws provided
- Install the wall décor plate to the installed mud ring or electrical box.



ON/IN WALL (NO ENCLOSURE) CONT'D

2. Install the Amplifier Module and Video Converter

Install Amplifier on the wall by the switcher

- Mark the screw/wall-anchor locations for the Amplifier
- Mark (with painters tape) location of CAT AVfour Amplifier Module
- Mount the Amplifier Module on the wall
- Install two 1-gang mud rings or electrical boxes
- Pull cables
- Install one wall décor plate with three RJ-45 connectors and One wall décor plate with two sets of two binding posts
- Connect the Audio Input jack on the Amplifier to the wall décor plate connector marked Audio using a short CAT-5 cable labeled Audio
- Connect the ISR 1 jack on the Amplifier to the wall décor plate connector marked ISR 1 using a short CAT-5 cable labeled ISR 1
- Connect the speaker wire between the Phoenix connector on the Amplifier and the binding post connections on the wall décor plate labeled Speaker 1
- Connect the power supply to the power input jack on the Amplifier.
- Run the power cord to the nearest wall outlet

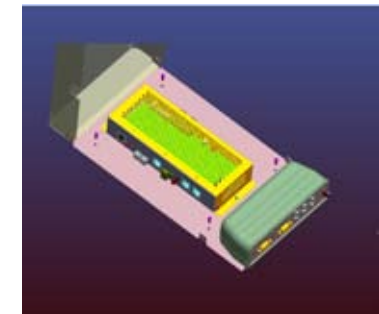
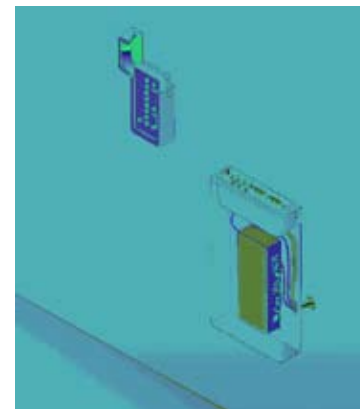
Install Video Converter at the Projector

- Install the 18" VGA, 18" RCA, and 3.5 mm to IR Emitter cables to the Video Converter
- Install the CAT-5 cable labeled Video to the video converter
- Connect the 18" VGA and 18" RCA cables to the source inputs on the projector.
- Locate the IR Control window on the projector and stick the IR Emitter next to the window.
- Using the 2" Velcro strip, stick one side on a flat spot on top of the projector and the other to the bottom of the Video Converter. Velcro the video converter to the top of the projector.

ON WALL IN EQUIPMENT ENCLOSURE

1. Install System Wall Plates & I/O Switcher

- Label both ends of all cables (see page 22)
- Mark (with painters tape) location of CAT AVfour Modules
- Install the mud rings or electrical boxes
- Pull cables
- Use the short (12") CAT-5 cable labeled Audio to connect the switcher Audio output jack to the audio input jack on the Amplifier
- Pull the two 50' CAT-5 cables labeled ISR and Video into the bottom of the wall box and connect the ISR cable to the connector labeled ISR 1 and the Video cable to the Switcher Video output connector.
- Pull the 50' Speaker wire(s) through the hole in the bottom of the wall box and wire to the phoenix connector for SPEAKER 1 (also Speaker 2 is installing 4 speakers)
- Connect the power supply to the power input jack on the Amplifier.
- Run the power cord to the nearest wall outlet
- Screw the wall box to the wall over the mud ring.
- Install the Switcher module in the wall box and close the lid. Secure the wall box lid with the two screws provided.



SWITCHER ON WALL & AMPLIFIER IN ENCLOSURE ABOVE CEILING

1. Install System Wall Plates & I/O Switcher

- Label both ends of all cables (see page 22)
- Mark (with painters tape) location of CAT AVfour's Switcher Modules
- Install the 4-gang mud ring or electrical box
- Pull the CAT-5 cables marked Audio and Video
- Connect the cables to the Audio and Video outputs on the Switcher
- Install the wall décor plate on the Switcher Module using the screws provided
- Install the wall décor plate to the installed mud ring or electrical box.

2. Install the Amplifier Module and Video Converter

Install the Amplifier Module

- Prepare the equipment enclosure by assembling the front panel on the enclosure
- Carefully route the Audio cable so the equipment box with the amplifier can be set on the tile bridge for the projector.
- Install the Amplifier module in the equipment enclosure using the screws provided
- Connect the CAT-5 cable labeled Audio to the Audio input jack on the Amplifier
- Connect the ISR CAT-5 cable to the IRS 1 jack on the Amplifier
- Pull the 50' Speaker wire(s) through the hole in the side of the wall box and wire to the phoenix connector for SPEAKER 1 (also Speaker 2 is installing 4 speakers)
- Secure the equipment wall box lid with the two screws provided.

Install the Video ConverterModule

- Install the 18" VGA, 18" RCA, and 3.5 mm to IR Emitter cables to the Video Converter
- Install the CAT-5 cable labeled Video to the video converter
- Connect the 18" VGA and 18" RCA cables to the source inputs on the projector.
- Locate the IR Control window on the projector and stick the IR Emitter next to the window.
- Using the 2" Velcro strip, stick one side on a flat spot on top of the projector and the other to the bottom of the Video Converter. Velcro the video converter to the top of the projector.

SECTION 3:

SET-UP & USE

1. GETTING STARTED

To get started using the CAT AV two things need to happen:

1. The wireless selector needs to be synchronized with the system.
2. The system needs to learn the IR control codes for the classroom projector.

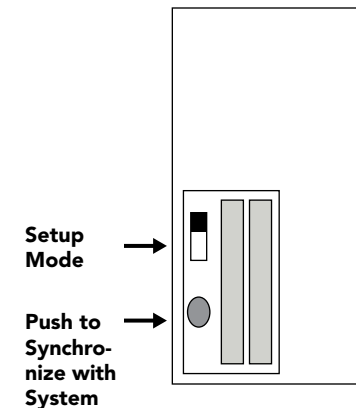
Lightspeed has preset the system with factory default values that should work for a majority of classrooms. Access to these default settings are made available to you through a series of setup procedures. All changes to factory settings are accomplished using the Wireless Sector. These procedures are detailed in the following paragraphs.

2. PAIRING THE WIRELESS SELECTOR TO THE SYSTEM

When installation is complete, the Wireless Selector needs to be synchronized with the system. This process is called "Pairing". Pair the Wireless Selector by:

1. Remove the battery compartment door
2. Find the push button along the left side of the battery compartment (see figure)
3. Push the pairing button located in the battery compartment. A green LED next to the button will light.
4. Find and push the pairing located on the Amplifier Module. Hold this pairing button in until the green LED in the battery compartment goes out (about 3 seconds).

The system and wireless selector are now paired.



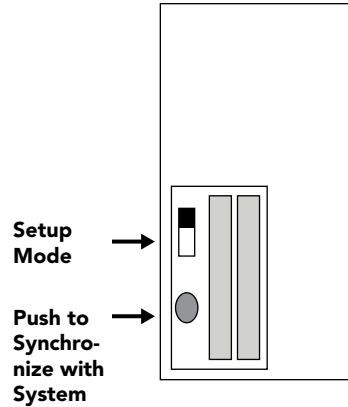
3. SETUP MODE

The wireless selector provides access to learn projector IR codes and change factory default settings. The set up functions are:

- Microphone Volume
- Equalizer Levels
- Tone Levels
- Auto Projector Shutdown Time
- IR Learn Mode
- Copy Setup, Return to Default settings, Un-pairing

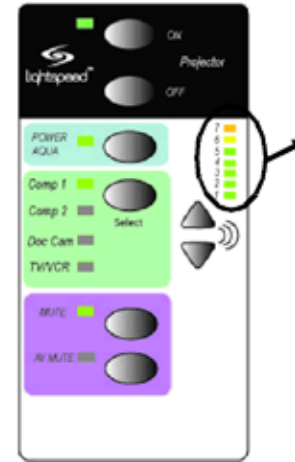
Entering Set Up Mode:

1. Remove the battery compartment door
2. Find the slide switch above the pairing button along the left side of the battery compartment (see figure)
3. Move the slide switch to its "UP" position. The green LED next to the projector ON button on the front panel will blink indicating the system is in the Set Up Mode.



4. SELECTING SET UP FUNCTION

Each of the set up functions is represented by an LED located on the wireless selector front panel as shown in the following figure.



Volume LED

- 7. Microphone volume
- 6 Equalizer level
- 5. Tone level
- 4. Auto power shutdown time
- 3. IR learn mode
- 2. Load and other options
- 1. (the bottom led is not used)

When first entering the setup mode, LED 7 will glow red indicating the Microphone volume setting function. The up and down arrow buttons will change the mode selection to the desired function. Enter the desired function by pushing the AV Mute button. To change to select another function, push the Mute button and use the up & down arrow buttons to select the new function.

5. MICROPHONE VOLUME SETTING

CAT AV can have up to 4 microphones. The volume for each of these microphones can be set using the following procedure:

Picture of LED 7 lit & location of AV Mute & Mute buttons

Picture of selector showing the new meaning of the select LEDs (group 1 channel A, group 1 channel B, group 2 channel A, group 2 channel B)

Procedure:

1. Enter Set Up Mode
2. Make sure LED 7 is glowing green
or:
 - a. Push the Microphone Mute button
 - b. Use the up & down arrow buttons until LED 7 lights
3. Push the Mute AV Source button.
The first green LED next to the Select button will light.
4. Look at the channel setting on the rear of the microphone to determine if it is set to channel A or channel B.
5. Use the Select button until the LED representing the channel setting of the microphone lights.
6. Use the up & down arrow buttons to increase or decrease the volume for this microphone.
7. Repeat steps 4 to 6 for each additional microphone.
8. Push the Microphone Mute button to leave this set up mode and select another function.

6. EQUALIZER LEVEL SETTING

The CAT AV uses a 4-band audio equalizer designed to optimize and fine-tune the microphone sound quality for the classroom. Below are some tips on proper system equalization:

The voice should be natural, very clear and without any audio feedback (ringing)

- Walk the room listening for the overall quality and any feedback that is present
- If there is a lot of audio feedback, it is likely the volume is too high. Ensure the volume is at the appropriate level, a second person is helpful to determine this.
- If feedback is still present with the audio set at the right level, make the following EQ adjustments:
 - High pitched ring: lower the 2K and/or 4K adjustment by _ down arrow button
 - Lower pitched ring: lower the 500 and/or 1K adjustment by _ down arrow button
- If you notice the sound is “muddy” or has too much bass:
 - Lower the 500 adjustment by _ down arrow button and/or
 - Raise the 2K or 4K adjustment by using the up arrow button
- Note: the EQ adjustments should be preset at “center (zero).” This is the nominal level and any adjustments (up or down) should be made from this level.

6. EQUALIZER LEVEL SETTING CONT'D

Procedure:

1. Enter Set Up Mode
2. Make sure LED 6 is glowing green or:
 - a. Push the Microphone Mute button
 - b. Use the up & down arrow buttons until LED 6 lights
3. Push the Mute AV Source button. The first green LED next to the Select button will light.
4. The frequency band is represented using the volume level LEDs. The center is zero. The band can be boosted by using the up arrow key to increase the setting or cut by using the down arrow key.
5. Use the Select button to move through the bands from low to high as shown in figure xx.
6. Repeat step 4 to adjust each frequency band.
7. Push the Microphone Mute button to leave this set up mode and select another function.

Picture of LED 6 lit & location of AV Mute & Mute buttons

Picture of selector showing the new meaning of the select LEDs (frequency 1: 500Hz, frequency 2: 1000Hz, frequency 3: 2000Hz, frequency 4: 4000Hz)

7. TONE CONTROL SETTING

The tone control is used to personalize the sound of music played through the CAT AV system. Using the tone control you can increase or decrease the base, mid frequency, or treble tone of the music. The result will be a full range natural sound for multimedia.

Procedure:

1. Enter Set Up Mode
2. Make sure LED 5 is glowing green or:
 - a. Push the Microphone Mute button
 - b. Use the up & down arrow buttons until LED 5 lights
3. Push the Mute AV Source button. The first green LED next to the Select button will light.
4. The frequency band is represented using the volume level LEDs. The center is zero. The band can be boosted by using the up arrow key to increase the setting or cut by using the down arrow key.
5. Use the Select button to move through the bands from low to high as shown in figure xx.
6. Repeat step 4 to adjust each frequency band.
7. Push the Microphone Mute button to leave this set up mode and select another function.

Picture of LED 5 lit & location of AV Mute & Mute buttons

Picture of selector showing the new meaning of the select LEDs (Bass: 500Hz range, Mid: 1000Hz range, Treble: 2000Hz range)

8. AUTO POWER DOWN TIME SETTING

Replacing projector bulbs is expensive. To save energy and increase projector bulb life, CAT AV will turn off the projector after a set elapsed time after the last audio is processed by the system. The elapsed time can be set in 30 minute increments from 30 minutes to 3 hours. A 30 second setting is provided for initial testing of the Auto Power Down Mode.

Procedure:

1. Enter Set Up Mode
2. Make sure LED 4 is glowing green or:
 - a. Push the Microphone Mute button
 - b. Use the up & down arrow buttons until LED 4 lights
3. Push the Mute AV Source button. The default time setting (2 hours) is shown on the Volume Level LEDs.
4. Use the up & down arrow buttons to increase or decrease the elapsed time setting.
5. Push the Microphone Mute button to leave this set up mode and select another function.

Picture of LED 4 lit & location of AV Mute & Mute buttons

Picture of selector showing the new meaning of the volume level LEDs (function disabled, 30, 60, 90, 120, 150, 180 minutes & 30 seconds)

9. IR LEARN MODE

1. Enter Set Up Mode
2. Make sure LED 3 is glowing green or:
 - a. Push the Microphone Mute button
 - b. Use the up & down arrow buttons until LED 3 lights
3. Push the Mute AV Source button. The first LED next to the Select button will light.
4. Learn projector ON Command: Push button 7 or 8 to set the system to listen for the IR command.
5. Hold the emitter of the projector remote control pointed at the IR Learn window on the Amplifier module
6. Push the power ON button on the projector remote control. The volume LEDs will blink when the command is received.
7. Push button the Select button. LED 2 by the Select button will light.
8. Learn projector OFF Command: Push button 7 or 8 to set the system to listen for the IR command.
9. Hold the emitter of the projector remote control pointed at the IR Learn window on the Amplifier module
10. Push the power OFF button on the projector remote control. The volume LEDs will blink when the command is received.
11. Push the Select button. LED 3 by the Select button will light.
12. Learn projector VGA Input Select Command: Push button 7 or 8 to set the system to listen for the IR command.
13. Hold the emitter of the projector remote control pointed at the IR Learn window on the Amplifier module

Pix of projector remote close to the Amplifier IR Learn Window

9. IR LEARN MODE CONT'D

14. Push the VGA (or computer) button on the projector remote control. The volume LEDs will blink when the command is received.
 15. Push the Select button. LED 4 by the Select button will light.
 16. Learn projector Composite Select Command: Push button 7 or 8 to set the system to listen for the IR command.
 17. Hold the emitter of the projector remote control pointed at the IR Learn window on the Amplifier module
 18. Push the Video button on the projector remote control. The volume LEDs will blink when the command is received.
 19. Push the Select button. LEDs 1 and 2 by the Select button will light.
 20. Learn projector AV Video Mute Command: Push button 7 or 8 to set the system to listen for the IR command.
 21. Hold the emitter of the projector remote control pointed at the IR Learn window on the Amplifier module
 22. Push the Video Mute button on the projector remote control. The volume LEDs will blink when the command is received.
 23. Push the Microphone Mute button to leave this set up mode and select another function.
- The projector IR codes have been learned and stored in the CAT AV. The Projectors remote control can now be stored away.

Need pictures to show steps.

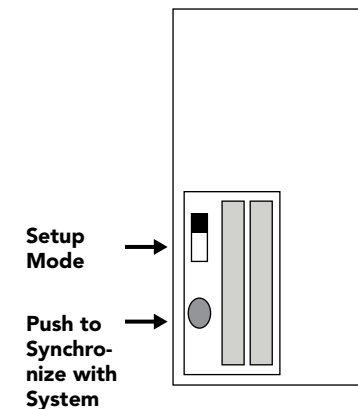
Which steps? What should pics be of?

10. SET-UP COPY MODE

To save valuable installation & setup time, CAT AV has a set-up copy mode. After completing set-up of the first CAT AV system, the set-up information can be downloaded into the wireless control then uploaded to new CAT AV systems as long as the projector in each classroom is the same model.

1. Enter the Set Up Mode
2. Make sure LED 2 is glowing green or:
 - a. Push the Mute button
 - b. Use the up & down arrow buttons until LED 2 lights
3. Push the Mute AV Source button. The first LED next to the Select button will light.
4. Push button the down arrow button to download the set-up information to the wireless selector
5. Go to the next classroom
6. Push the pairing button located in the battery compartment. A green LED next to the button will light.
7. Find and push the pairing located on the Amplifier Module of the new system. Hold this pairing button in until the green LED in the battery compartment goes out (about 3 seconds).
The system and wireless selector are now paired.
8. Push the up arrow button (7) on the wireless control. The set-up information from the first system is uploaded into the second system.
9. Repeat steps 5 through 8 for each new system to be set up.

Picture of Selector battery compartment and Amplifier Module pairing button location.



11. UN-PAIR WIRELESS SELECTOR MODE

Often the IT department will have an additional wireless selector to help troubleshoot a possible problem with a classroom system. (CAT AV can have up to 4 wireless selectors paired to the system at one time.) When the IT department has found and corrected the problem and returns to the IT department, their wireless selector should be unpaired to avoid any accidental system changes in the classroom they just left.

1. Enter the Set Up Mode
2. Make sure LED 2 is glowing green or:
 - a. Push the Mute button
 - b. Use the up & down arrow buttons until LED 2 lights
3. Push the Mute AV Source button. The first LED next to the Select button will light.
4. Push the Select button to light LED 2 next to the Select button
5. Push the up or down arrow button to un-pair the wireless selector. The system and wireless selector are now un-paired.

Picture of wireless select with LED 2 lit

Picture of buttons used on wireless selector

12. RESET TO FACTORY DEFAULT SETTINGS MODE

The CAT AV can be reset to its factory default settings using this procedure. If you are unsure if the setup is correct or not, this mode allows you to return to the beginning to start again. All setup functions are reset except learning the projector IR commands.

1. Enter the Set Up Mode
2. Make sure LED 2 is glowing green or:
 - a. Push the Mute button
 - b. Use the up & down arrow buttons until LED 2 lights
3. Push the Mute AV Source button. The first LED next to the Select button will light.
4. Push the Select button until LED 3 next to the Select button is lit.
5. Push the up or down arrow button to reset the system to factory default settings.

Picture of wireless select with LED 2 lit

Picture of buttons used on wireless selector

13. SET UP SUMMARY CHART

7. Microphone Volume	Group 1 Channel A	Select volume for each microphone channel
	Group 1 Channel B	
	Group 2 Channel A	
	Group 2 Channel B	
6. Equalizer	Freq. 1: 500 Hz	Select level for each frequency
	Freq. 2: 1000 Hz	TOP LED +10 db
	Freq. 3: 2000 Hz	LED +6, +8 db
	Freq. 4.: 4000 Hz	LED +2, +4 db
		CENTERLED 0 db
LED -2, -4 db		
LED -6, -8 db		
BOTTOM LED -10 db		
5. Tone	Bass: 500 Hz going down	Select level for each frequency.
	Midrange: centered at 1 kHz	Change in 2 dB steps
	Trevel: 2 kHz going up	
4. Auto Powerdown Time Select	There is nothing to select. The shutdown time is displayed on the volume LEDs.	Shutdown in 30 seconds
		Shutdown in 3 hours
		Shutdown in 2.5 hours
		Shutdown in 2 hours
		Shutdown in 1.5 hours
		Shutdown in 1 hour
		Shutdown in 30 minutes
		No LED lit – Auto Shutdown Disabled
3. IR Learn	1st LED lit – Power ON	Pressing either button 7 or 8 will cause the system to listen for the selected IR Comand coming in the sensor. The volume LEDs will flash when complete.
	2nd LED lit – Power OFF	
	3rd LED lit – VGA Select	
	4th LED lit – Composite Select	
	1st & 2nd LED lit – AV Mute	
2. Load Setup Options	1st LED lit – Up/Down load	Button 7 – remote to controller Button 8 – controller to remote
	2nd LED lit – Unpair this remote	Pressing button 7 or 8 will cause selected transaction to occur.
	3rd LED lit – Reset to factory defaults	
	4th LED lit – Clear remote EEPROM	

14. SPEAKER CONFIGURATION

When setting up a speaker configuration, the correct speaker impedance loading must be observed.

Multimedia Ceiling Speaker Installation

Tools and Equipment

- Straight edge
- Utility knife
- Screwdriver (small flathead)
- Drill

Included Components

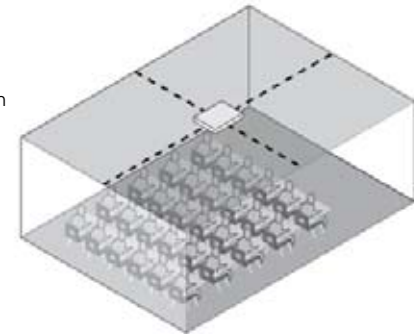
- (1) MCQ speaker assembly
- (1) Ceiling grid t-bar attachment
- (1) 50ft plenum rated speaker wire
- (1) 15ft safety wire
- (1) Eye screw (1/4" x 3 _")
- (4) Sheet metal screws (self-drilling)

Installation

STEP 1:

Selecting Speaker Mounting Location
One MCQ speaker will distribute sound throughout a classroom of up to 1200 square feet. The location of the speaker is critical to ensure this even sound distribution.

- Identify the center of the listening area of the classroom for optimum location (see figure 1).



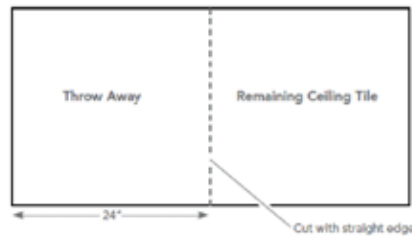
- Select the ceiling tile that is free from fixtures (lighting, HVAC, etc.) nearest to the center point.
- Remove the selected ceiling tile for speaker installation

14. SPEAKER CONFIGURATION CONT'D

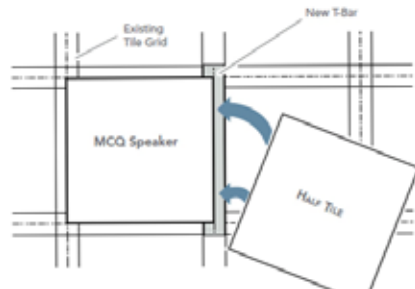
Step 2:

Installing the Speaker into the Ceiling Grid The dimensions of the MCQ speaker are 2' x 2' and is designed to lie onto any standard suspended ceiling tile grid.

- If the ceiling tile that was removed is 2' x 4', it needs to be cut in half to accommodate the MCQ speaker. If the ceiling tile that was removed is 2' x 2', no cutting of the tile is necessary, skip to Step 3.
- Set the ceiling tile on a flat work surface with the patterned side facing down.
- Using a straight edge, cut the 2' x 4' ceiling in half (see figure 2) leaving two 2' x 2' sections.



- Locate the 2' ceiling grid t-bar attachment. Locate the attachment slots in the existing ceiling grid and snap the new t-bar into place to create two 2' x 2' openings (see figure 3).
- Lift the MCQ speaker up and lay it into the desired 2' x 2' opening in the ceiling.

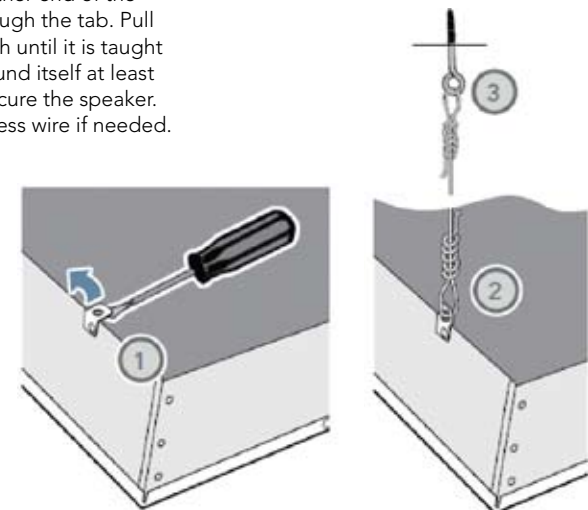
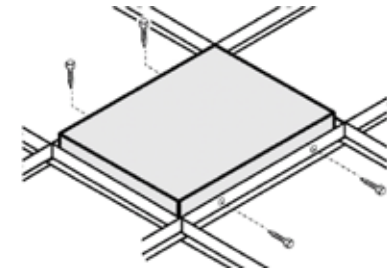


14. SPEAKER CONFIGURATION CONT'D

Step 3:

Securing the MCQ Speaker To comply with Building Codes, the MCQ speaker MUST be fastened to the ceiling grid and secured with a safety wire.

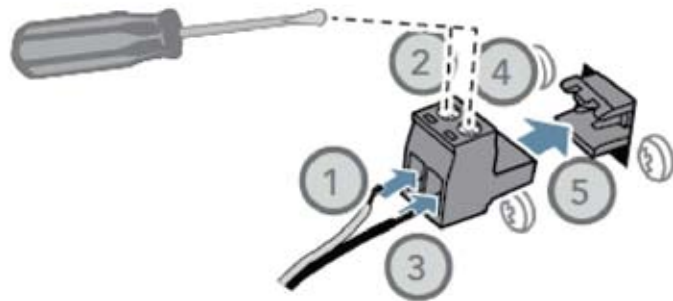
- Locate the four (4) self-drilling sheet metal screws.
- Utilizing existing holes on the vertical section of the ceiling grid, drill two screws per side on opposite sides of the MCQ.
- Locate the 15ft length of safety wire and the eye screw. The safety wire needs to be permanently attached to the solid structural ceiling above.
- Install the eye screw (or concrete anchors if necessary) into the structural ceiling.
- Loop one end of the safety wire through the eye screw (or anchor), then twist it around itself at least five times.
- Pull one of the tabs up on the MCQ (located in opposite corners) and loop the other end of the safety wire through the tab. Pull the wire through until it is taut and twist it around itself at least five times to secure the speaker. Cut off any excess wire if needed.



14. SPEAKER CONFIGURATION CONT'D

Step 4: Connecting and Routing Speaker Wire

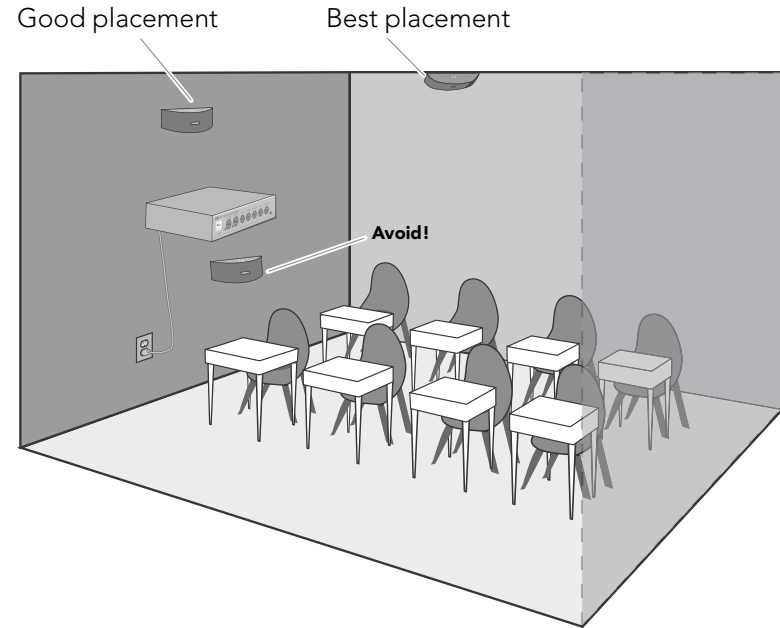
- a) Locate the 50-foot length of plenum rated wire included with the speaker and the green euro-block style connector.
- b) Connect one end of the speaker wire to the euro-block connector (see figure 6).
 - i. Insert the positive conductor (RED or WHITE in color) into the left side of the connector and use a screwdriver to tighten.
 - ii. Insert the negative conductor (BLACK) into the right side of the connector and tighten.
- c) Insert the euro-block connector into the jack on the back of the MCQ as shown in figure 6.
- d) Route the speaker wire above the ceiling tiles and back down to the receiver/amplifier. Wire should be secured and tied off overhead as required by local building codes. Wire raceway should be used on walls to properly conceal and protect the wire.



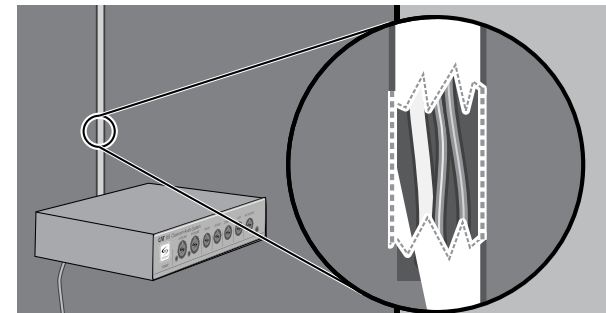
Step 5:
Return to installation section of the product manual to continue system installation.

15. IR SENSOR/RECEIVER (ISR) INSTALLATION

Next, find a suitable location for the ISR. Poor location will cause substandard performance of the CAT AV Classroom Audio System. The ISR should be as high as possible in the room – the ceiling is the best location, centered along the longest wall in the room. When possible, use a conduit to protect the wires (not included). Poor choices for placement are corners, on walls at heights lower than 7 feet (2 meters), or in places where the line of sight from the ISR to the receiver is or could be obstructed.



Conduit is Recommended

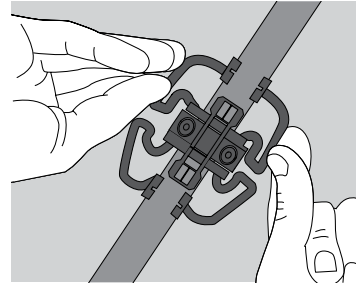


15. IR SENSOR/RECEIVER (ISR) INSTALLATION CONT'D

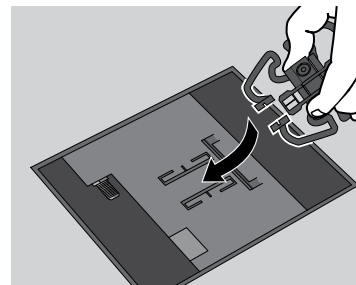
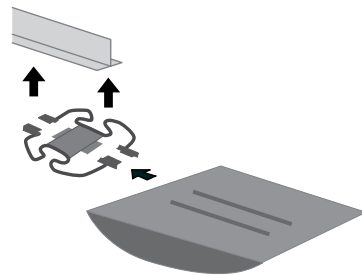
Once you find a suitable location for the ISR, follow these instructions to mount it. There are different instructions for mounting depending on if the ISR will be mounted to a suspended ceiling grid or secured to a wall / solid vertical surface.

Suspended Ceiling Mount

- Attach the bracket to the ceiling tile grid (t-bar).
 - Slide the tabs onto the outsides of the t-bar, starting with one corner.
 - Attach the second tab around the other side of the t-bar.
 - Repeat with the other side of the bracket so it is connected at all four points.
- Slide the ISR onto the bracket until it "clicks" into place.
 - Guide the mounting rails onto the bracket, oriented as pictured.
 - Once secure, the ISR locks into place.
 - To remove the ISR, press the release bar down and slide the ISR off the bracket. (We need to label the "release bar" on the ISR Image that shows "clip guide")
- Uncoil the Cat 5 sensor cable. Connect one end of the cable to the ISR. Secure wire overhead and route it back to the system.
- Connect the other end of the Cat 5 sensor cable into the SENSOR INPUT jack on the CAT AV amplifier.



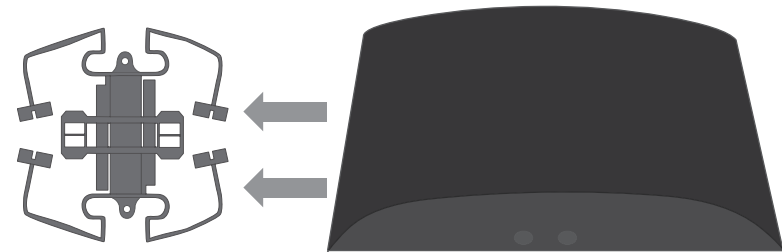
clip connects to t-bar on ceiling



15. IR SENSOR/RECEIVER (ISR) INSTALLATION CONT'D

Wall/Solid Ceiling Mount

- Screw the bracket to a place high on the wall or in the middle of the solid ceiling. Mount the bracket horizontally as shown above.
 - Guide the mounting rails onto the bracket, oriented as pictured.
 - Once secure, the ISR locks into place.
 - To remove the ISR, slide a ruler or screwdriver behind the ISR to press the release bar down and slide the ISR off the bracket
- Uncoil the Cat 5 sensor cable. Connect one end of the cable to the ISR. Route the wire back to the CAT AV amplifier, securing it along with way using surface raceway where possible.
- Slide the ISR onto the bracket until it "clicks" into place.
- Connect the other end of the Cat 5 sensor cable into the SENSOR INPUT jack on the CAT AV amplifier.



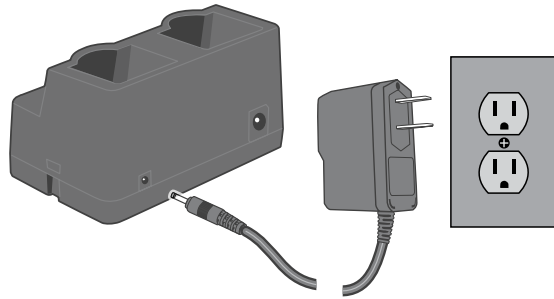
16. CHARGING THE REDMIKE VC

Before using, the REDMIKE VC should be charged. It will take 8-9 hours for the REDMIKE VC to obtain a full charge. A fully charged REDMIKE VC will last for over 7 hours of use. If microphones are used daily, they should be kept in the charging cradle – microphones can be left in a charging cradle constantly for up to 2 weeks without causing degradation to battery life. A red light on the charging cradle indicates the REDMIKE VC is charging. A green light indicates that charging is complete and a full charge has been reached. A blinking light indicates a charging or sensing error. See Troubleshooting section for more information.

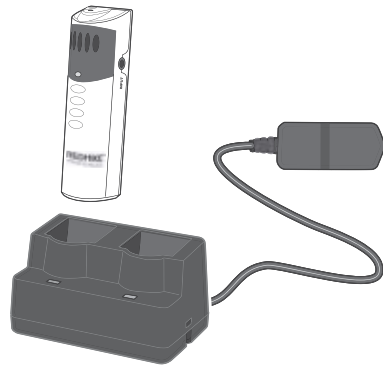
REDMIKE VC incorporates alkaline protection into the microphone design. Always use a Lightspeed rechargeable sensing battery. Replacement AA NiMH batteries may only be purchased through Lightspeed Technologies (part # BA-NH2A27).

Do not attempt to charge alkaline batteries. They can overheat and expand creating a significant hazard and damaging the microphone (this is not covered by warranty).

1. Plug power cord into the cradle charger and then plug the AC end into an electrical outlet.
2. Ensure that the REDMIKE VC is turned OFF.



3. Place the REDMIKE VC into the cradle. The LED on the cradle will glow RED indicating charging has started. When the REDMIKE VC is fully charged the LED on the cradle charger will change to GREEN.



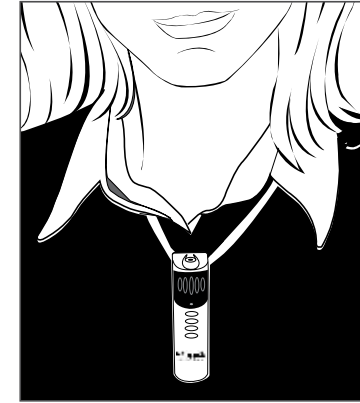
17. SETUP & OPERATION OF REDMIKE VC

Once the REDMIKE VC is charged, follow these steps to set it up for use.

1. Turn the CAT AV power on. The power LED on the amplifier will glow.
2. Remove the REDMIKE VC from the charging cradle and turn it on.
3. Slip the REDMIKE VC with lanyard around the neck and position the top of the microphone just below the collarbone. **NOTE:** Positioning of the REDMIKE VC is critical for proper volume adjustment.
NOTE: A nominal volume level must be set on the CAT 885 before adjusting controls on the REDMIKE VC.

The teacher can now use the controls on the REDMIKE VC to adjust the volume level from anywhere in the room. The microphone volume control has 4 steps up and 4 steps down from the mid point (9 levels total).

4. While speaking in a normal voice slowly increase the volume of the corresponding channel on the CAT AV until your voice is barely audible. Each REDMIKE VC has its channel pre-set to either A or B, as indicated on the back of the Mic.
5. Once initial volume level is set, walk around the room and listen for audio dropout and overall audio quality.
6. If a second REDMIKE VC was purchased, repeat steps 2-4.



SECTION 4:

TROUBLESHOOTING

COMMON PROBLEMS AND SOLUTIONS

Note Most problems are directly related to low battery power. Please run through the “Battery Check” items first. For remaining troubleshooting, use known good, fully-charged batteries.

ALL PROBLEMS: Most Problems are related to low battery power.

SOLUTION: Battery Check

- Confirm batteries are charged each night.
- Confirm proper batteries are used. The REDMIKE VC requires the Lightspeed BA-NH2A27 rechargeable sensing battery for proper charging. The LT-71 & HM-70 require NiMH AA rechargeable batteries.
- Make sure the microphones are turned off while charging so a full charge is attained. Full charge will last eight hours.
- Inspect the battery contacts. Clean and adjust if necessary.

PROBLEM: Hearing Static

SOLUTION: Follow these steps to eliminate static.

- Ensure sensor is in optimum location (refer to sensor placement in manual). A single sensor will cover a 1600 sq. ft. enclosed classroom.
- Ensure that no other REDMIKE VC/ LT71/ HM70 is operating on the same channel.

- If the optional iR media connection is in use, set the microphone to Channel A.

PROBLEM: Low Volume or Feedback

SOLUTION: Follow these steps to eliminate low volume or feedback.

- Ensure microphone is positioned appropriately, just below the collar bone.
- Check volume level on the amplifier. If the volume is too high, feedback will occur. Adjust accordingly.
- Adjust the volume level on the back of the REDMIKE VC.

PROBLEM: No Sound From Speaker

SOLUTION: Follow these steps to produce sound from speakers.

- Turn the CAT AV System on. Confirm that the POWER light located on the switcher front panel is on.
- Confirm that REDMIKE VC is turned on. There will be a BLUE LED on the microphone to indicate it is powered on.

TIPS TO OBTAIN OPTIMUM AUDIO PERFORMANCE

- Speak in a natural voice. A normal conversational speech level will provide an adequate signal. It is not necessary to increase the intensity of your voice—the audio system provides adequate amplification (approximately 5 – 10 dB) above ambient room noises.
- Avoid wearing jewelry that may rub or bump against the microphone.
- Turn the REDMIKE VC off during private conversations with a student, parent, or other classroom visitor. You can also cover the LED lens on top of the REDMIKE VC to block the signal.
- Recharge batteries each night. When recharged nightly, operating time (actual usage) for the transmitters will last through a typical school day.

If you review these instructions and still have questions, write down the serial number and model number of your system and call Lightspeed Technical Services at 800.732.8999, 5 a.m. – 5 p.m., PST.

SECTION 5:

WARRANTY & SPECIFICATIONS

FIVE-YEAR LIMITED WARRANTY


Lightspeed Infrared Audio Systems and optional accessories are warranted against malfunction due to defect in materials and workmanship for a period of five (5) years from date of purchase. System components will be repaired or replaced at

Lightspeed's option. Rechargeable batteries and connecting cables are guaranteed for one (1) year. Warranty does not extend to finish, appearance, or malfunctions due to abuse or misuse. Repairs performed by other than Lightspeed Technologies will void this warranty. For warranty service, including return shipping labels, please contact Lightspeed's Service Department at 800.732.8999 / service@lightspeed-tek.com.


1. Warranty on infrared microphones is FIVE (5) YEARS.
2. Warranty on Lightspeed rechargeable batteries, all external cables and wires provided by Lightspeed is one (1) year.
3. Prepaid shipping labels are provided by Lightspeed factory or an authorized warranty service center for warranty repairs.
4. Warranty does not extend to finish, appearance items, or malfunctions due to abuse or operation other than specified conditions, nor does it extend to incidental or consequential damages. Repair by other than Lightspeed or its authorized service agencies will void this guarantee. Information on authorized service agencies is available from Lightspeed Technologies, Inc.

Our Service Department (800.732.8999, 5 a.m. – 5 p.m., PST) will handle all your repair/replacement needs.

WARNINGS AND CERTIFICATIONS



CAUTION



RISK OF ELECTRIC SHOCK DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK DO NOT REMOVE COVER (OR BACK) NO USER-SERVICEABLE PARTS INSIDE REFER SERVICING TO QUALIFIED PERSONNEL



The lightning flash with arrowhead symbol 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 sufficient magnitude to constitute a risk of electric shock.



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.

CERTIFICATIONS



This product conforms with the essential requirements of the following European Union Directives: 89/336/EEC, 92/31/EEC, 93/68/EEC, and 2004/108/EC Electromagnetic Compatibility Directives.



Lightspeed Technologies launched a formal product recycle program in Europe that complies with the European Union Directive 2002/96/EC on Waste Electrical and Electronic Equipment ("WEEE Directive"). Please visit our website at www.Lightspeed-tek.com for more information.



This product is manufactured using lead-free processes and is free of other materials harmful to the environment. It conforms to the most stringent new European guidelines for consumer products (RoHS).

FCC STATEMENT

FCC Requirements per 15.19(a)(3) and (a)(4)

(3) All other devices shall bear the following statement in a conspicuous location on the device:

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. (4) Where a device is constructed in two or more sections connected by wires and marketed together, the statement specified under paragraph (a) of this section is required to be affixed only to the main control unit. (5) When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (a) of this section on it, the information required by this paragraph shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed. However, the FCC identifier or the unique identifier, as appropriate, must be displayed on the device. (b) Products subject to authorization under a Declaration of Conformity shall be labelled as follows: (1) The label shall be located in a conspicuous location on the device and shall contain the unique identification described in Sec. 2.1074 of this chapter and the following logo: (i) If the product is authorized based on testing of the product or system;

FCC Requirements per 15.21

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

SYSTEM SPECIFICATIONS

AUDIO VIDEO

Resolution	1920 x 1200 at 60Hz
Video Inputs	Four (4) Inputs (VGA 9-pin Dsub x2; Composite RCA x2)
Output (Switcher to Converter)	CAT-5e cable
Switcher Dimensions	
Video Converter Dimensions	

	Band	Range
6. Equalizer	Freq. 1: 500 Hz	Select level for each frequency.
	Freq. 2: 1000 Hz	TOP LED +10 db
	Freq. 3: 2000 Hz	LED +6, +8 db
	Freq. 4: 4000 Hz	LED +2, +4 db
		CENTER LED 0 db
		LED -2, -4 db
		LED -6, -8 db
		BOTTOM LED -10 db

	Band	Range
5. Tone	Bass: 500 Hz going down	Select level for each frequency. Change in 2 dB steps
	Midrange: centered at 1kHz	
	Trebel: 2kHz going up	

	Time to Shutdown
4. Auto Powerdown time select	Volume LEDs indicate:
	LED 7: Shutdown in 30 seconds
	LED 6: Shutdown in 3 hours
	LED 5: Shutdown in 2.5 hours
	LED 4: Shutdown in 2 hours
	LED 3: Shutdown in 1.5 hours
	LED 2: Shutdown in 1 hour
LED 1: Shutdown in 30 minutes	
	No LED lit – auto shutdown disabled

SYSTEM SPECIFICATIONS CONT'D

SWITCHER

Video	
Gain	Unity (as a system)
Bandwidth RGB	200 MHz (-3 dB) @ 50' (15 m) of cable
Composite video	100 MHz (-3 dB)
Differential phase error	Composite video: 0.25° at 3.58 MHz and 4.43 MHz
Differential gain error	Composite video: 0.15% at 3.58 MHz and 4.43 MHz
Crosstalk	-70 dB @ 5 MHz
Switching speed	1 ms (max.) from front panel, 1-2 s from remote panel
CMRR	-90 dB @ 100 Hz, -70 dB @ 10 MHz

Video input

Number/signal	Inputs 1 and 2: VGA-UXGA RGBHV, RGBS Inputs 3 and 4: composite video
Connectors	Inputs 1 and 2: 9-pin Dsub connectors Inputs 3 and 4: RCA connectors
Nominal level	1 Vp-p for composite video (including sync) 0.7 Vp-p for RGB
Minimum/maximum levels	Analog
RGB	0.3 V to 1.5 Vp-p with no offset
Composite video	0.4 V to 2.0 Vp-p with no offset
Impedance	75 ohms
Horizontal frequency	15 kHz to 145 kHz
Vertical frequency	30 Hz to 170 Hz
Return loss	Composite video: <-40 dB @ 5 MHz
DC offset (max. allowable)	1.0 V

Video output

Number/signal type	1 VGA-UXGA RGBHV, RGBS (follows input type) 1 composite video
Connectors	1 female RJ-45 connectors
Nominal level	1 Vp-p for composite video (including sync) 0.7 Vp-p for RGB
Minimum/maximum levels	
VGA	0.3 V to 1.5 Vp-p (follows input)
Composite video	0.4 V to 2.0 Vp-p (follows input)
Impedance	75 ohms
Return loss	<-40 dB @ 5 MHz
DC offset	
VGA	±5 mV, max., with input at 0 offset
Composite video	±20.5 mV with input at 0 offset

SYSTEM SPECIFICATIONS CONT'D

SWITCHER CONT'D

Sync	
Input type	RGBHV, RGBS (RGB input)
Output type	RGBHV, RGBS (RGB output, follows input)
Standards	NTSC 3.58, NTSC 4.43, PAL, SECAM (for composite video inputs and output)
Input level	2.0 V to 5.5 Vp-p

Output level	4.5 V to 5.5 Vp-p, unterminated
Input impedance	510 ohms
Output impedance	75 ohm
Max. propagation delay	40 ns (system only, not due to cable delay)
Max. rise/fall time	15 ns
Polarity	Positive or negative (follows input)

Audio input

Number/signal type	4 stereo
Connectors	2 female 3.5 mm jacks; 2 left and right female RCA

$$N 0 \text{ dBu} = 0.775 \text{ Vrms}, 0 \text{ dBV} = 1 \text{ Vrms}, 0 \text{ dBV} \approx 2 \text{ dBu}$$

AMPLIFIER

Audio	
Power Output	16 W/Channel (32 W Total)
Total Harmonic Distortion (THD)	<1% @ 10 W
Signal-to-Noise Ratio	>73 dB
Amplifier Frequency Response	40 Hz - 20 kHz
Audio Inputs (with volume controls)	Four (4) Inputs (Stereo RCA x 2; Stereo 3.5 mm x 2)
ALD Output (with volume control)	One 3.5 mm
Audio Input/output (Switcher to Amplifier)	CAT-5e cable
Dimensions	
Standard Carrier Frequencies (IR Sensor)	2.06/2.54 MHz
System Power	24V, 2.5A
Tone adjustment	
High	±10.5 dB @ 50 Hz
Mid	

SYSTEM SPECIFICATIONS CONT'D

Lo

AMPLIFIER CONT'D:**Infrared Audio Input — VoiceLift™ Receiver**

Number/signal type	2 mono, balanced (mic and aux)
Connectors	1 female RJ-45
Impedance	>10k ohms unbalanced/balanced, DC coupled
Nominal level	-10 dBV (316 mVrms)
Input gain/volume adjustment	-18 dB to +24 dB (default = 0 dB), adjustable independently from all other audio gain and volume controls via front panel or RS-232
Input level sensitivity	-10 dBV (316 mVrms) for maximum output before clipping when VoiceLift Receiver volume is set to 24)

Audio Output

Number/signal type	1 stereo/mono, balanced/unbalanced, fixed/variable
Connector	(1) 3.5 mm
Impedance	50 ohms unbalanced, 100 ohms balanced
Gain error	±0.8 dB channel to channel
Maximum level (600 ohms)	+8 dBu, balanced, at <0.1% THD+N

Audio Output — Power Amplifier

Number/signal type	(1) stereo or dual mono (default), 2 channels total
Connectors	(1) 5.0 mm captive screw connector, 4 pole
Impedance	2/4/8 ohms (single channel)2/4/8 ohms (stereo)
Amplifier type	Class D
Gain/volume adjustment	-10 dB to +10 dB (default = 0 dB), adjustable in 1 dB steps
Frequency response	20 Hz to 20 kHz, -1 dB/+3.5 dB @ 1 watt output, 8 ohm load
THD + Noise	0.2% @ 1 kHz at nominal level (1 watt, 8 ohm load)
S/N	>67 dB, 20 Hz to 20 kHz at maximum output (unweighted), 8 ohms (as a system with Extron PVT Series wallplates with 50' cables)

Continuous power output with a full load @ 20 Hz to 20 kHz, 1% THD

At 2, 4, or 8 ohms	25 watts (rms) per channel (1 watt tolerance)
Damping factor	>75 (8 ohm load)

Control**Video Converter**

SYSTEM SPECIFICATIONS CONT'D

AMPLIFIER CONT'D:**Video Input**

Number/signal type	1 VGA-UXGA RGBHV, RGBS (follows input type)
Connectors	1 composite video
Nominal level	1 Vp-p for composite video (including sync)0.7 Vp-p for RGB
Minimum/maximum levels	
VGA	0.3 V to 1.5 Vp-p (follows input)
Composite video	0.4 V to 2.0 Vp-p (follows input)
Impedance	75 ohms

GENERAL

External power supply	100 VAC to 240 VAC, 50-60 Hz, external; to 12 VDC, 5 A, regulated
Power input requirements	12 VDC, 5 A
Temperature/humidity	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing
Cooling	Convection, vents on sides
Mounting	
Rack mount	Yes, with optional 1U rack shelf
Furniture mount	Yes, with optional mini under-desk mounting kit
Pole mount	Yes, with optional pole mounting kit
Enclosure type	Metal
Enclosure dimensions	1.7" H x 8.7" W x 3.0" D (1U high, half rack wide)(approximately 4.3 cm H x 22.1 cm W x 7.6 cm D)
Product weight	2.5 lbs (1.1 kg), plus power supply (0.9 lbs [0.4 kg])
Shipping weight	5 lbs (2.3 kg)
Vibration	ISTA 1A in carton (International Safe Transit Association)
Regulatory compliance	
Safety	CE, c-UL, ULUL rated for use in plenum airspaces: meets UL 2043 for heat and smoke release, excluding the power supply; meets UL 60065 for safety.
EMI/EMC	CE, C-tick, FCC Class B, ICES, VCCI
Environmental	Complies with the appropriate requirements of RoHS, WEEE
MTBF	30,000 hours
Warranty	3 years parts and labor

N All nominal levels are at ±10%.

N Specifications are subject to change without notice.



LIGHTSPEED TECHNOLOGIES

11509 SW HERMAN ROAD / TUALATIN, OR 97062

TOLL FREE: 800.732.8999 / PHONE: 503.684.5538 / FAX: 503.684.3197

LIGHTSPEED-TEK.COM