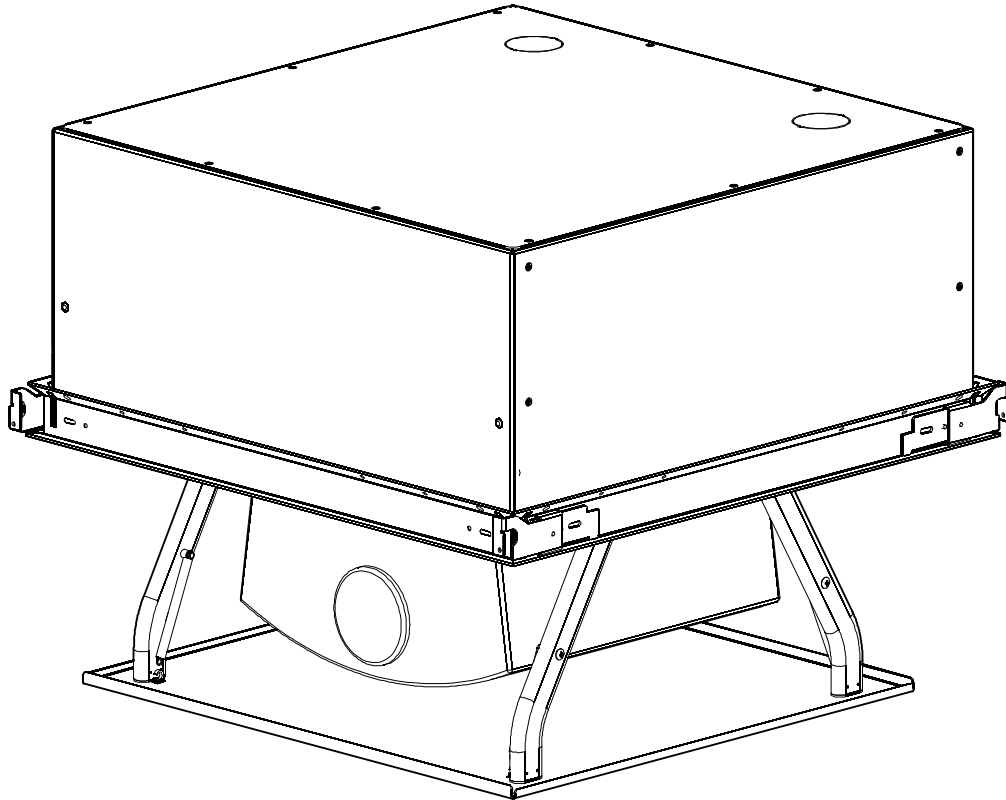


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# INSTALLATION INSTRUCTIONS

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## Suspended Ceiling Lift

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This device complies with part 15 of the FCC rules. Operation is subject to the following 2 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.

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

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment to an outlet on a circuit other than that to which the receiver is connected

Consult the dealer or an experienced radio/TV technician for help



Our Mounts. **Your Vision.**

# SL220

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## DISCLAIMER

Milestone AV Technologies, and its affiliated corporations and subsidiaries (collectively, "Milestone"), intend to make this manual accurate and complete. However, Milestone makes no claim that the information contained herein covers all details, conditions or variations, nor does it provide for every possible contingency in connection with the installation or use of this product. The information contained in this document is subject to change without notice or obligation of any kind. Milestone makes no representation of warranty, expressed or implied, regarding the information contained herein. Milestone assumes no responsibility for accuracy, completeness or sufficiency of the information contained in this document.

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## IMPORTANT SAFETY INSTRUCTIONS



**WARNING** alerts you to the possibility of serious injury or death if you do not follow the instructions.



**CAUTION** alerts you to the possibility of damage or destruction of equipment if you do not follow the corresponding instructions.



**WARNING:** FAILURE TO READ AND FOLLOW THE FOLLOWING INSTRUCTIONS CAN RESULT IN SERIOUS PERSONAL INJURY, DAMAGE TO EQUIPMENT OR VOIDING OF FACTORY WARRANTY. Read these instructions. Heed these instructions. Follow all instructions. It is the installer's responsibility to make sure all components are properly assembled and installed using the instructions provided.

When using an electrical mounting system, basic precautions should always be followed, including the following:

**READ ALL INSTRUCTIONS BEFORE USING THIS PRODUCT!!!!**



**DANGER:** TO REDUCE THE RISK OF ELECTRIC SHOCK:

1. Always turn off power at source before cleaning.
2. Clean only with dry cloth.



**CAUTION:** Changes or modifications to this unit not expressly approved by the manufacturer can void the units FCC compliance rating and make the unit illegal to operate.



**WARNING:** TO REDUCE THE RISK OF BURNS, FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS:

- Always turn off power at source before putting on or taking off parts.
- Use this mounting system only for its intended use as described in these instructions. Do NOT use attachments not recommended by the manufacturer.

- Never operate this mounting system if it has a damaged cord or plug. If it is not working properly during testing, return the mounting system to a service center for examination and repair.
- Keep the power cord away from heated surfaces.
- Never operate the mounting system with the air openings blocked. Keep the air openings free of lint, hair, and the like.
- Never drop or insert any object into any opening.
- Do not use outdoors unless marked for outdoor use.
- Do not use near water. Do not expose to dripping or splashing water. Do not place objects filled with liquids, such as vases, on this apparatus.
- Route cords and cables as shown in the installation instructions.
- To disconnect, turn all controls to the off position, then turn off power at source.
- Connection to the building wiring shall be done according to National Electrical Code ANSI/NFPA70 and the Canadian Electrical Codes, CSA C22.1 and CSA C22.2 and an appropriate listed disconnect device (e.g. circuit breaker or fuse) shall be incorporated in the building installation wiring.



**WARNING:** RISK OF ELECTRIC SHOCK!

Connect this mounting system to a properly grounded outlet only. See Grounding Instructions. 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 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.



**WARNING:** Failure to provide adequate structural strength for this component can result in serious personal injury or damage to equipment! It is the installer's responsibility to make sure the structure to which this component is attached can support five times the combined weight of all equipment. Reinforce the structure as required before installing the component.



**WARNING:** Exceeding the weight capacity can result in serious personal injury or damage to equipment! It is the installer's responsibility to make sure the weight of all components attached to the SL220 does not exceed 30 lbs (13.6 kg) [25 lbs (11.3 kg) if using a Listed RPA/RPM/RSA/RSM mount].



**WARNING:** RISK OF INJURY! Do not place video equipment such as televisions or computer monitors on the ceiling pan of the SL220.

**IMPORTANT ! :** Model SL220 is suitable for use in Other Environmental Air Space in Accordance with Section 300.22(C) of the National Electrical Code.

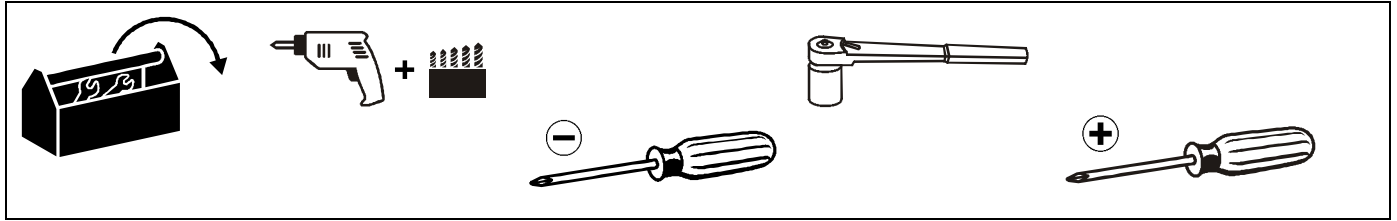
**NOTE:** This system has no user serviceable parts.

**--SAVE THESE INSTRUCTIONS--**

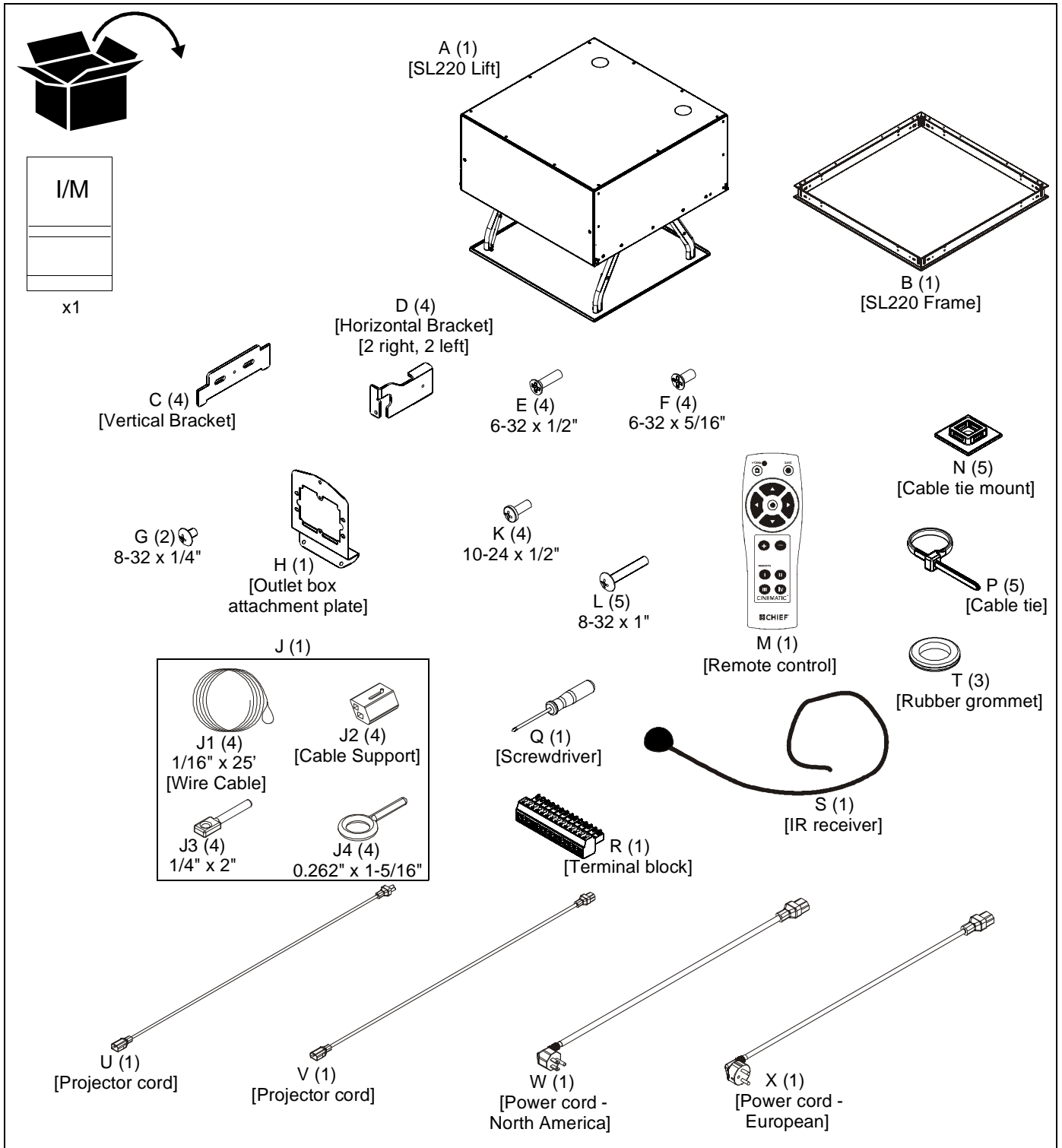
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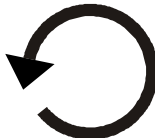

**TOOLS REQUIRED FOR INSTALLATION**



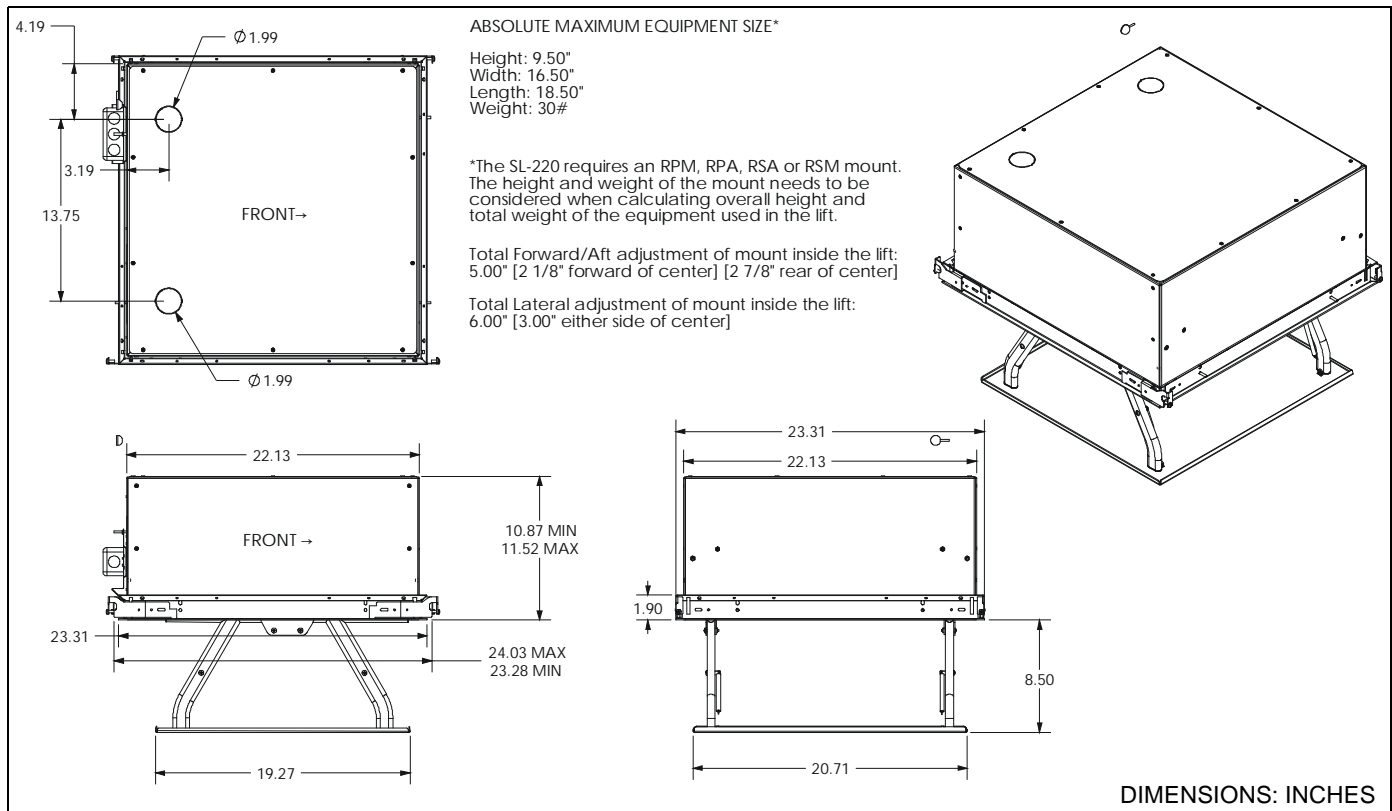
**PARTS**



**LEGEND**

	<b>Tighten Fastener</b>		<b>Phillips Screwdriver</b>
	Apretar elemento de fijación		Destornillador Phillips
	Befestigungsteil festziehen		Kreuzschlitzschraubendreher
	Apertar fixador		Chave de fendas Phillips
	Serrare il fissaggio		Cacciavite a stella
	Bevestiging vastdraaien		Kruiskopschroevendraaier
Serrez les fixations	Tournevis à pointe cruciforme		
	<b>Loosen Fastener</b>		<b>Adjust</b>
	Aflojar elemento de fijación		Ajustar
	Befestigungsteil lösen		Einstellen
	Desapertar fixador		Ajustar
	Allentare il fissaggio		Regolare
	Bevestiging losdraaien		Afstellen
Desserrez les fixations	Ajuster		

**DIMENSIONS**



## PREPARING FOR INSTALLATION

### Installation Requirements

The SL220 has been designed to be mounted recessed into a suspended ceiling consisting of 2' x 2' ceiling tiles and secured by a WireVice system.

### Electrical Rating

100-250VAC~, 50/60Hz, 960W

North America: 120VAC, 60Hz, 8A

**IMPORTANT !** : Installation and maintenance of this product must be completed by a qualified service technician.

### Preparing SL220 Framework

**NOTE:** Addition of the vertical bracket (C) is optional. The vertical bracket is used to allow vertical adjustment into the ceiling if a ceiling tile is attached to the bottom of the SL220.

1. OPTIONAL: Attach vertical brackets (C) to both sides (in each corner) of the SL220 frame (B) using a 06-32 x 5/16" Phillips flat head screw (F). (See Figure 1)
2. Attach horizontal bracket (D) over the vertical bracket (C) at each corner of the SL220 frame using a 06-32 x 1/2" Phillips flat head screw (E). (See Figure 1)

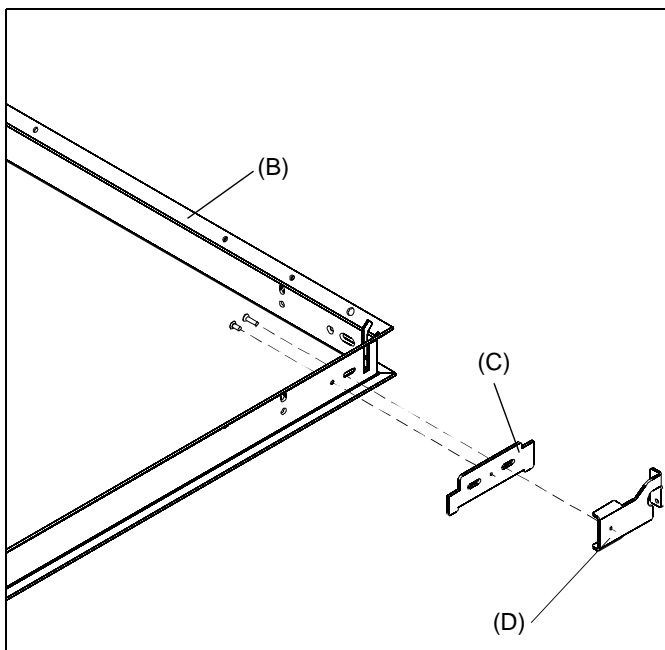


Figure 1

### Installing SL220 Framework

1. Remove one 2 ft x 2 ft tile from ceiling.
2. Insert SL220 frame (B) with attached brackets into the empty ceiling space. (See Figure 2)
3. Set SL220 frame over top of ceiling framework, hooking each horizontal bracket (D) onto the ceiling framework. (See Figure 3)
4. Secure SL220 frame (B) to ceiling framework using one 10-24 x 1/2" Phillips head screw (K) through each horizontal bracket (D) at each corner. (See Figure 3)

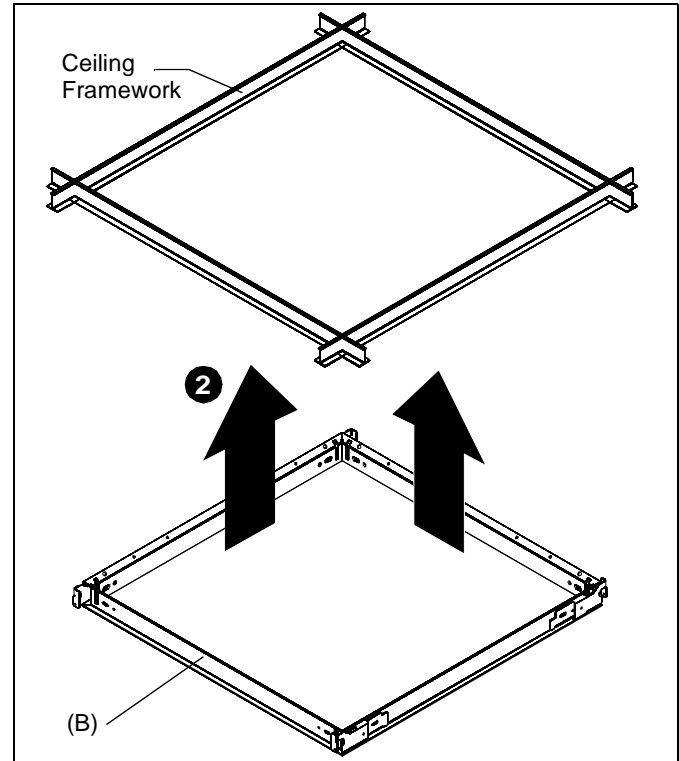


Figure 2

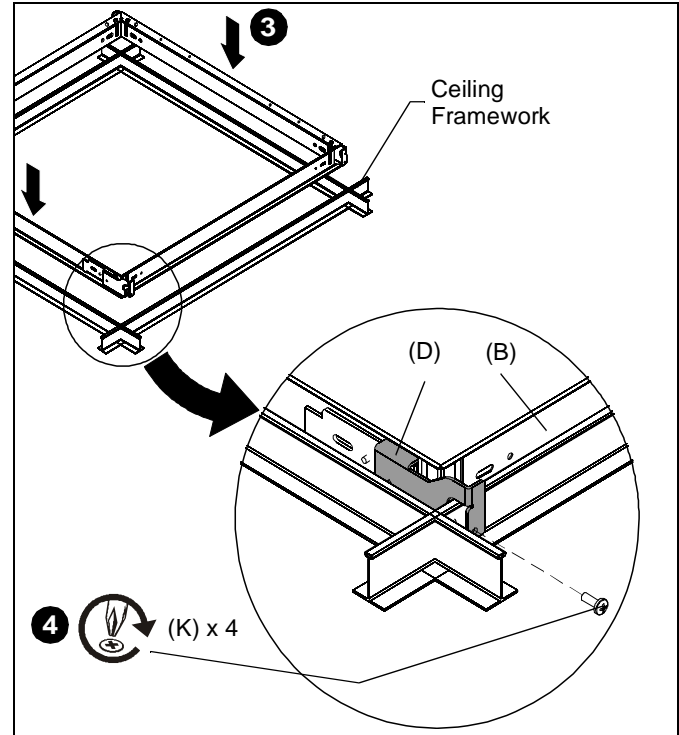


Figure 3

### Securing SL220 Frame to Ceiling Structure

1. Examine ceiling structure (concrete, steel truss, or wood) above SL220 frame (B) to identify four support cable anchor locations. Each location should be approximately 15° outside of support holes in SL220 frame (B). Mark locations with pencil. (See Figure 4).

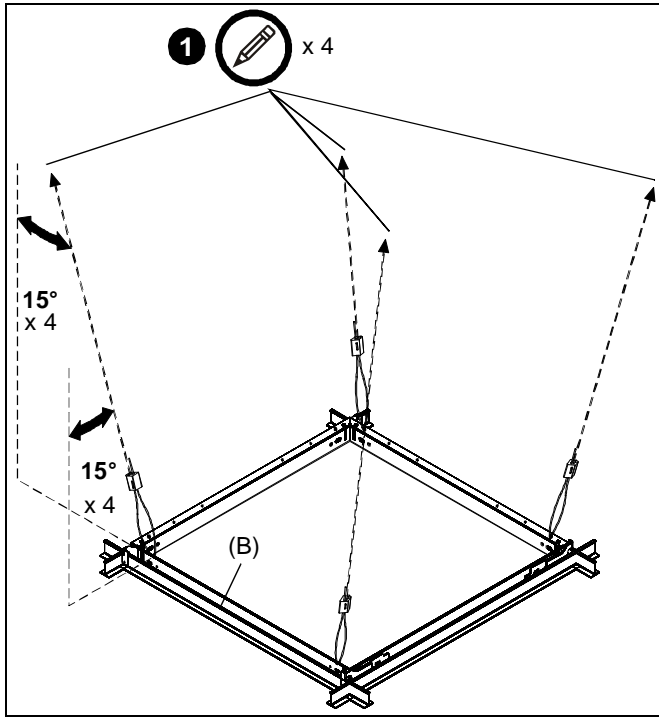


Figure 4

#### Solid Concrete Ceiling Structure



**WARNING:** Anchors must be installed into structurally sound solid concrete with a minimum thickness of 1.75" (44.5mm) or greater. Installation into hollow concrete block, mortar, or concrete that exhibits cracking, spalling, or other defects may result in failure of anchor and serious personal injury or damage to equipment!

1. Drill 1/4" diameter x 1-1/8" deep pilot hole at each marked cable anchor support location. Ensure hole is at least 2-1/2" from nearest concrete edge. Remove debris from hole. (See Figure 5)

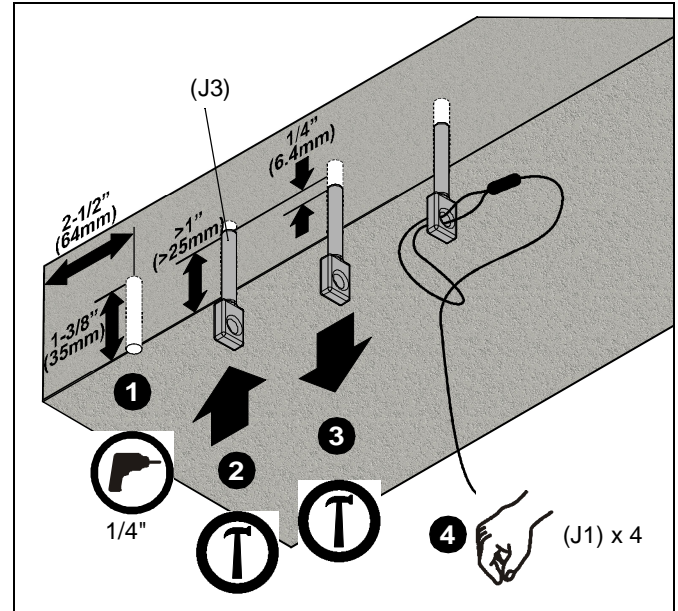


Figure 5

2. Tap anchor (J3) into each hole to a depth of at least 1". (See Figure 5)



**WARNING:** Failure to properly set anchor may result in failure of anchor and serious personal injury or damage to equipment!

3. Using claw portion of hammer, set each anchor (J3) by pulling it out of hole approximately 1/4". (See Figure 5)
4. Insert portion of manufactured loop on cable (J1) through hole in anchor (J3), and insert end of cable (J1) through loop. Repeat for 3 remaining support locations. (See Figure 5)

#### Steel Truss Ceiling Structure

1. Route end of cable (J1) over truss at marked cable anchor support location and then through cable loop. Repeat for 3 remaining support locations. (See Figure 6)

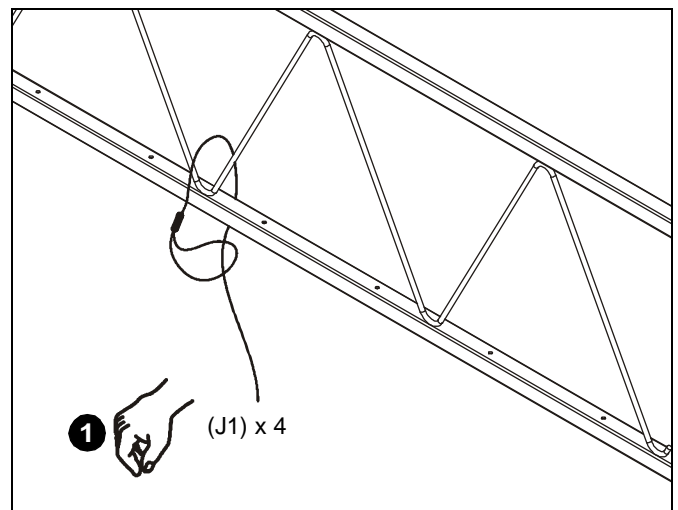
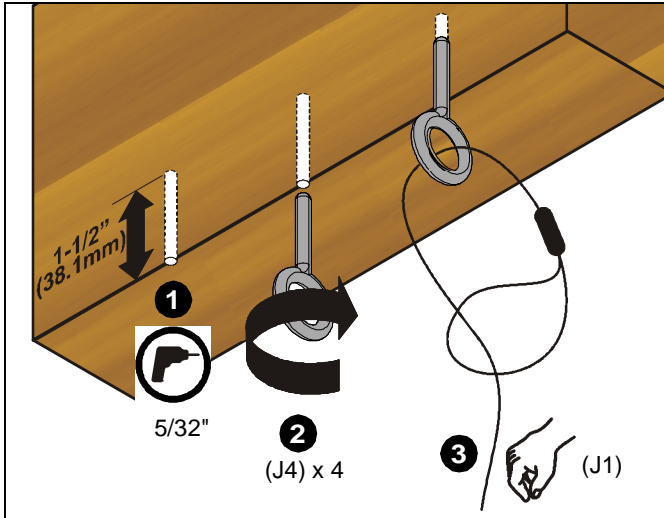


Figure 6

**Wood Ceiling Structure**

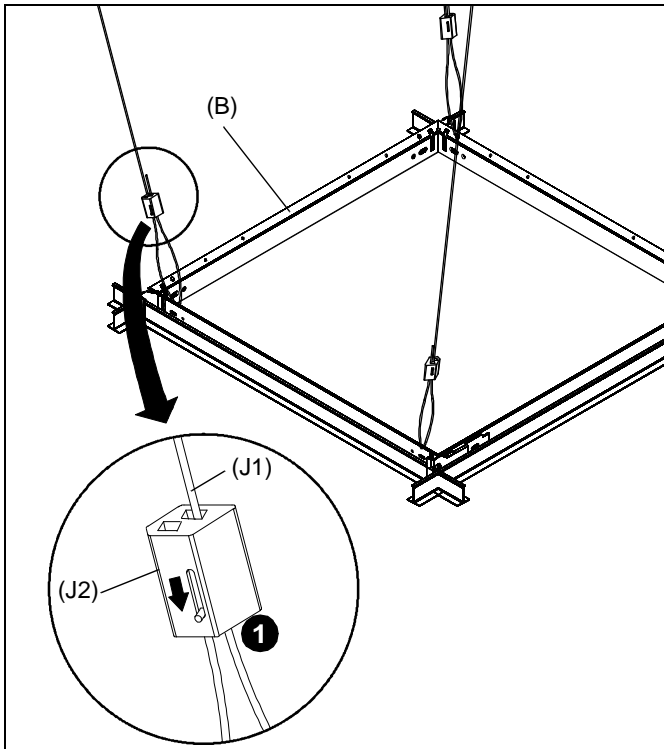
**WARNING:** Anchors must be installed into wood with a minimum thickness of 1-1/2" (38.1 mm) or greater.

1. Drill a 5/32" diameter x 1-1/2" deep pilot hole at each marked cable anchor support location. Ensure hole is at least 5/8" from nearest wood edge. Remove debris from hole. (See Figure 7)



**Figure 7**

2. Fully thread eye lag (J4) into each hole. (See Figure 7)
3. Route end of cable (J1) through eye lag (J4) and then through cable loop. Repeat for 3 remaining support locations. (See Figure 7)



**Figure 8**

**Installing Cable to SL220 Frame**

**CAUTION:** Failure to properly tension cables (J1) may result in damage to ceiling tile framework.

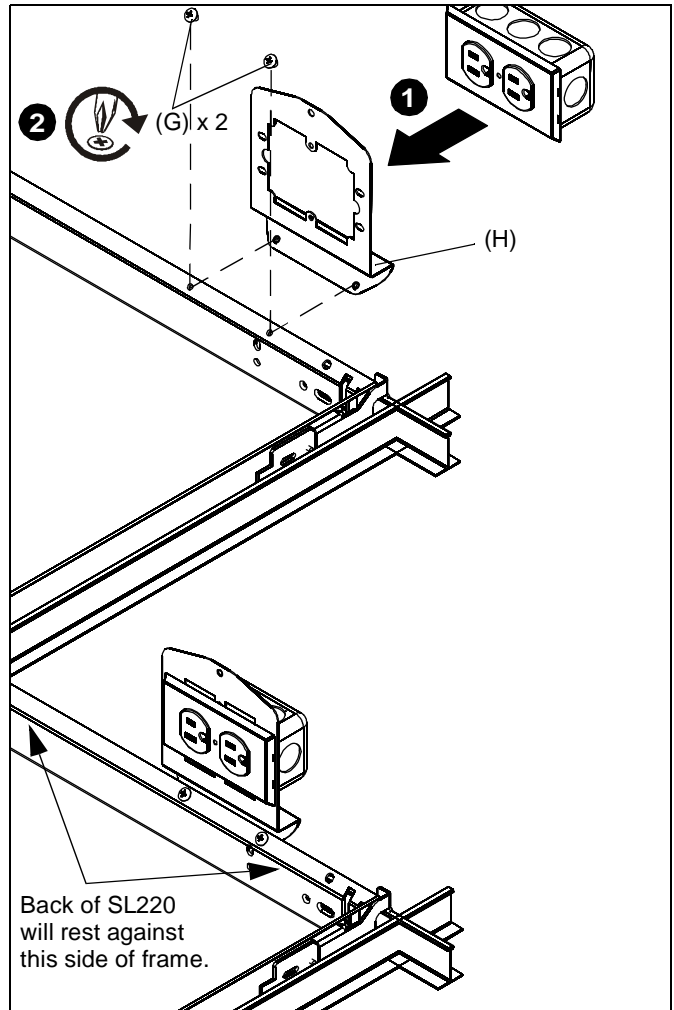
1. Thread each cable (J1) completely through cable lock (J2), corresponding hole in corner of SL220 frame (B), and completely through opposite side of cable lock (J2) (See Figure 8).
2. Adjust cable tension until SL220 frame (B) is supported *entirely* and *evenly* by all four support cables, but not so tight as to distort ceiling tile framework.

**CAUTION:** Cable lock (J2) will allow cable to enter from only one direction per side, indicated by arrows on lock. Depress spring loaded pins on cable lock (J2) to release cable tension.

**Installing Junction Box and Outlet**

1. Install Listed electrical box (not included) to outlet box attachment plate (H).
2. Install the plate (H) with attached electrical box onto the SL220 frame (B) using two 8-32 x 1/4" Phillips screws (G). (See Figure 9)

**IMPORTANT ! :** The junction box must be installed onto the back of the frame (i.e. the side of the frame against the back of the SL220).



**Figure 9**





**WARNING:** IMPROPER INSTALLATION CAN LEAD TO LIFT FALLING CAUSING SEVERE PERSONAL INJURY OR DAMAGE TO EQUIPMENT! It is the installers responsibility to make certain the structure to which the lift is being mounted is capable of supporting five times the weight of the lift and all attached equipment. Reinforce the structure as required before installing the lift.

**NOTE:** The following instructions assume a suitable mounting structure and surface exists prior to installation and all power and signal wires and cables have been properly installed.

**Electrical Rating**

100-250VAC~, 50/60Hz, 960W  
 North America: 120VAC, 60Hz, 8A

**IMPORTANT ! :** This product must be grounded. If it should malfunction or break down, grounding provides a path of least resistance for electric current to reduce the risk of electric shock.

**Grounding Instructions**

This product must be connected to a grounded metal, permanent wiring system, and must be properly installed and grounded in accordance with the National Electric Code, ANSI/NFPA, and Canadian Electrical Code, Part 1.

This product is suitable for use in Other Environmental Air Spaces in Accordance with Section 300.22(C) of the National Electrical Code.



**WARNING:** RISK OF ELECTROCUTION! All electrical wiring required for installation should be installed by a qualified electrician.

**IMPORTANT ! :** The appropriate outlet being installed must be the grounding type and properly grounded in accordance with the National Electric Code, ANSI/NFPA, and Canadian Electrical Code, Part 1.

3. Wire outlet into junction box in accordance with the National Electric Code, ANSI/NFPA, and Canadian Electrical Code, Part 1.

**PREPARING THE SL220**

Carefully inspect the SL220 for any shipping damage. If any damage is apparent, do NOT continue with the installation. Instead, contact Chief for further instructions.

**Removing Ceiling Pan**

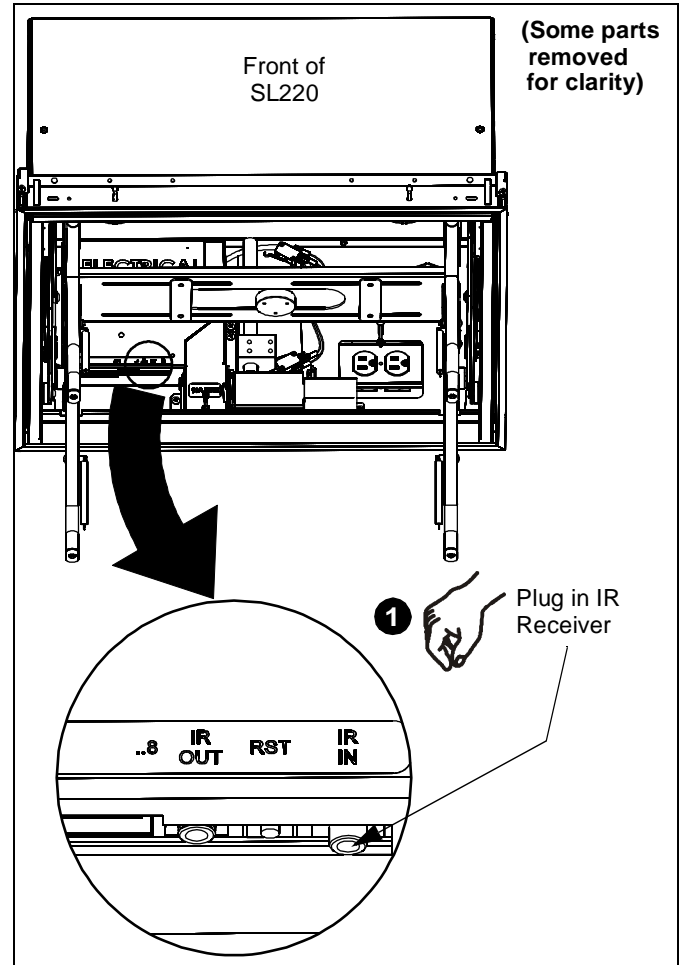
1. Place SL220 upside down on clean surface.
- NOTE:** The SL220 is shipped with the ceiling pan disconnected, but in place.
2. Remove ceiling pan and set aside.

**Installing IR Sensor and Power Cord**

The IR sensor placement is crucial to proper operation of the SL220.

1. Plug IR sensor (S) into control box. (See Figure 10)

**NOTE:** The final location of the sensor won't be made until after the SL220 is installed into the ceiling.



**Figure 10**

**IMPORTANT !** : Select power cord (W or X) suitable for location. If neither of those cords are suitable for your location, use a power cord that has an attachment plug on one end that meets IEC-60320 and on the other end is appropriate for use with the grounded main outlet.

2. Plug power cord into IEC inlet on rear panel inside SL220. (See Figure 11)

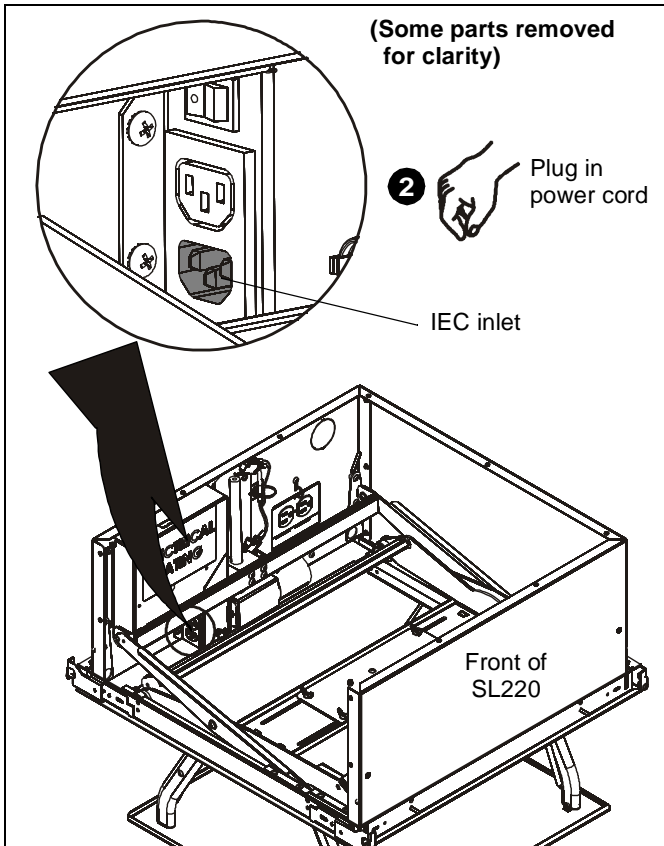


Figure 11



**WARNING:** PINCH HAZARD! FINGERS OR HANDS BETWEEN MOVING PARTS CAN LEAD TO SEVERE PERSONAL INJURY! Keep fingers and hands away from mount when operating.

3. Open and **fully extend** SL220 using remote control following instructions included with the remote control and instructions in the **Remote Control Capabilities** section.
4. Remove power cord.

### Removing Projector Cradle (Optional)

**NOTE:** Removing the projector cradle is optional, but recommended for a single person installation. If NOT removing projector cradle, proceed to **Placing SL220 into Ceiling Structure** section.

1. Remove and save Phillips head screw and disconnect the grounding strap leading from inside front of SL220 to projector cradle. (See Figure 12)
2. Loosen the screws in the linkage on each side of projector cradle at rear of SL220. (See Figure 13)
3. Gently pull projector cradle away from sides at rear of SL220. (See Figure 14)
4. The forward/aft adjustment screws may need to be loosened for this. If so, loosen the screws, but do NOT remove the screws. (See Figure 13)

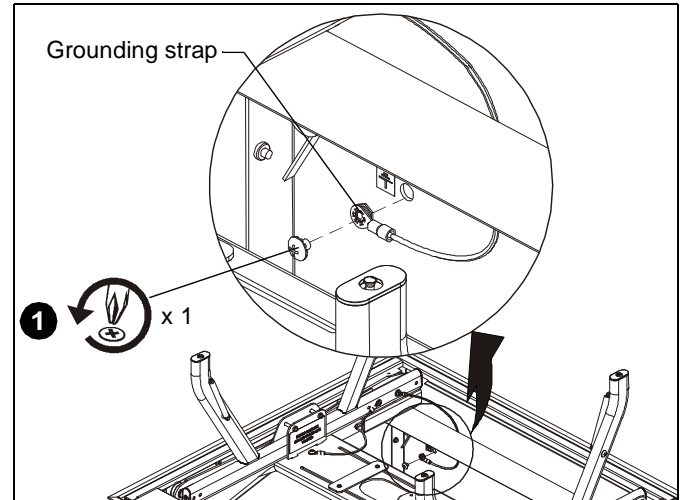


Figure 12

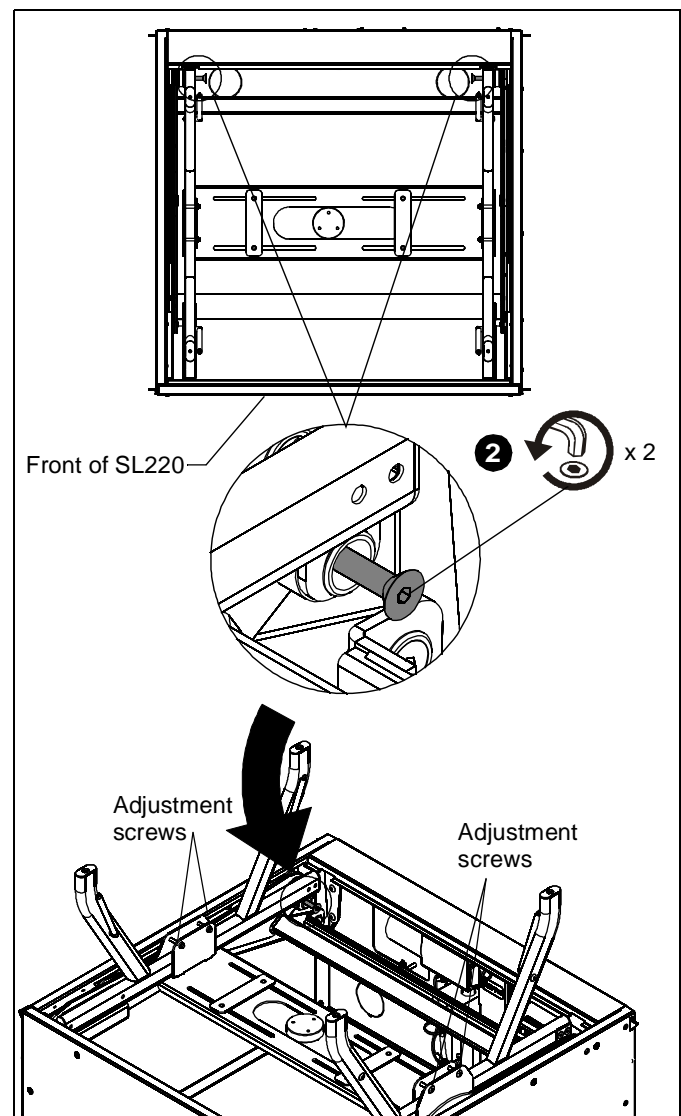


Figure 13

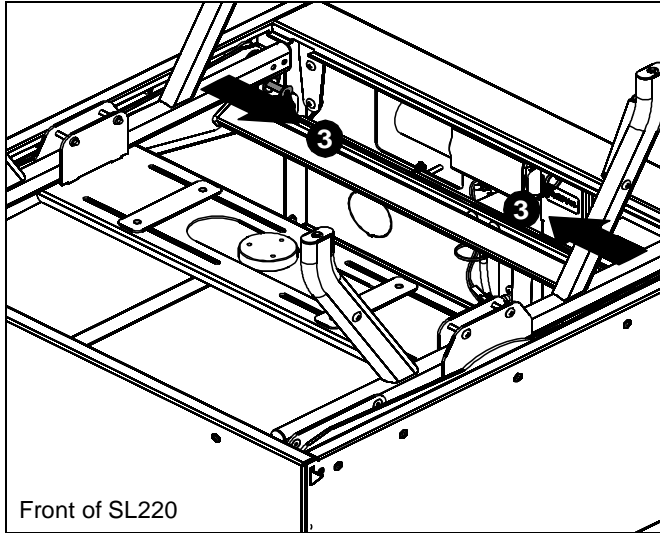


Figure 14

5. While still pulling the projector cradle away from the sides of the SL220, slide front channels towards back, off of bearings and remove projector cradle from SL220. (See Figure 15)

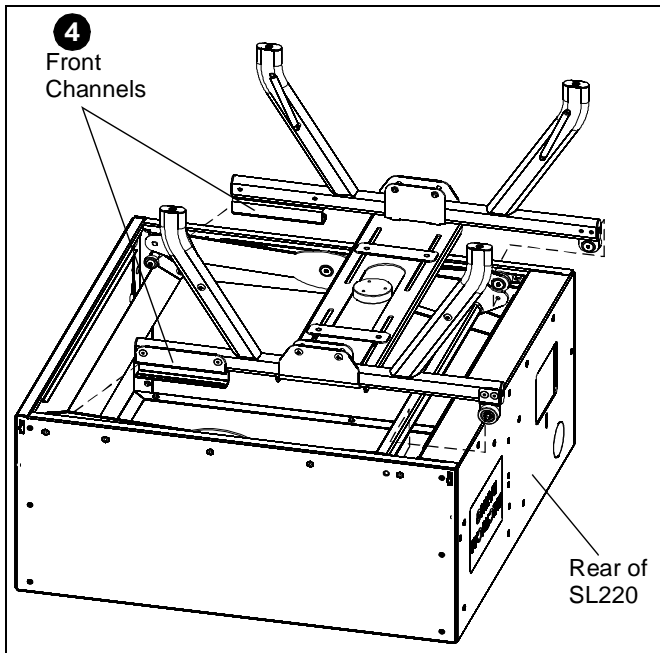


Figure 15

**PLACING SL220 INTO CEILING STRUCTURE**

1. Orient SL220 so that the rear of the SL220 (with the electrical opening) lines up with the outlet box attachment plate (H) on the SL220 frame. (See Figure 16)
2. Lift SL220 (A) into place through the SL220 frame (B). (See Figure 16) Ensure that there are four audible clicks---each corner hook "clicking" into place onto the frame. (See Figure 17)
3. Lower onto SL220 frame, carefully lining up outlet box attached to SL220 frame, with opening at rear of SL220. (See Figure 17)

4. Secure the SL220 (A) to the SL220 frame (B) using four 8-32 x 1" Phillips head screws (L), two in the front and two in the back of the SL220. (See Figure 17)
5. Secure the outlet box attachment plate (H) to the SL220 using one 8-32 x 1" Phillips head screw (L). (See Figure 17)

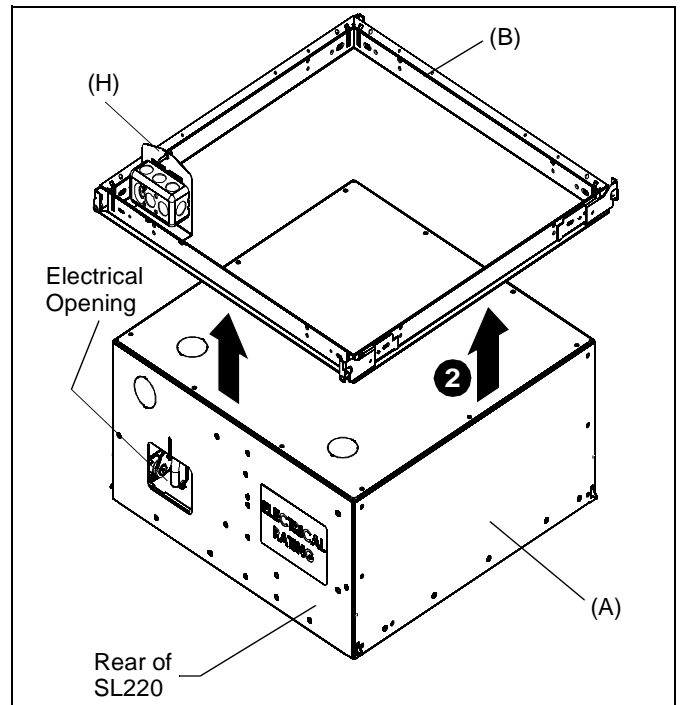


Figure 16

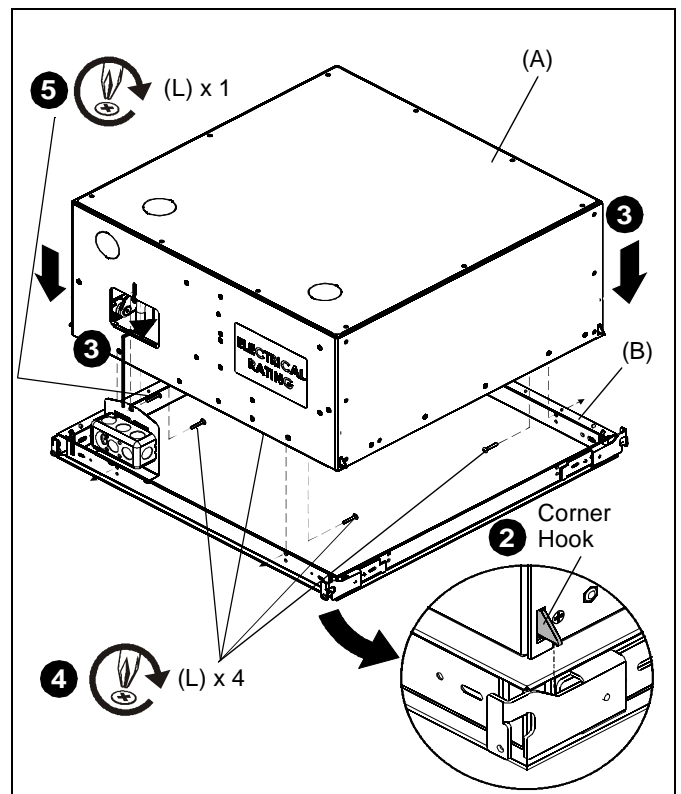


Figure 17

### Replacing Projector Cradle

1. Slide front channels of projector cradle forward onto the SL220 bearings. (See Figure 18)

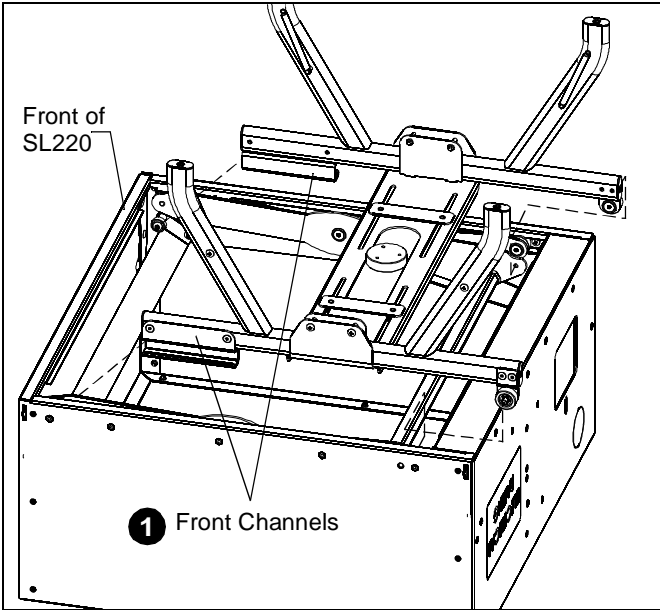


Figure 18

2. Line up rear spacers with attachment holes on SL220 arms. (See Figure 19)
3. Tighten rear spacers.

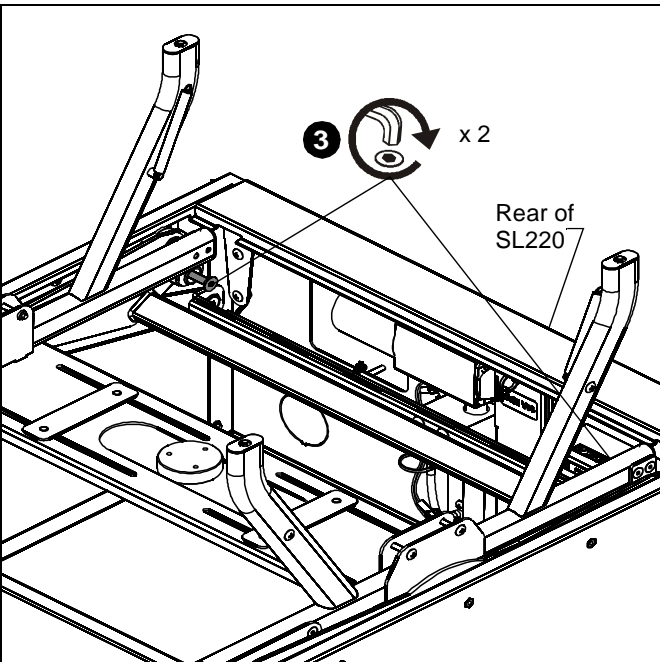


Figure 19

4. Reconnect grounding strap from inside front of SL220 to projector cradle, using the Phillips head screw previously removed. (See Figure 20)

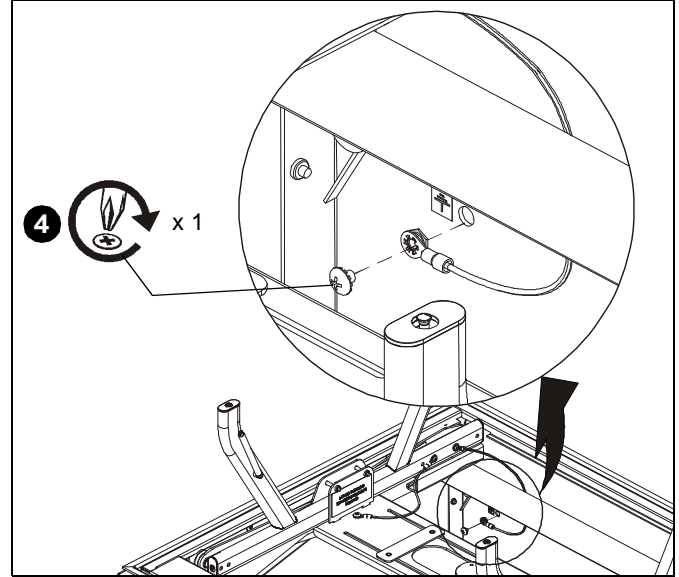


Figure 20

### Installing RPA/RPM/RSA/RSM Bracket and Projector

1. Install RPA/RPM/RSA/RSM (a Listed accessory - not included) to the projector cradle following instructions included with the RPA/RPM/RSA/RSM. (See Figure 21)

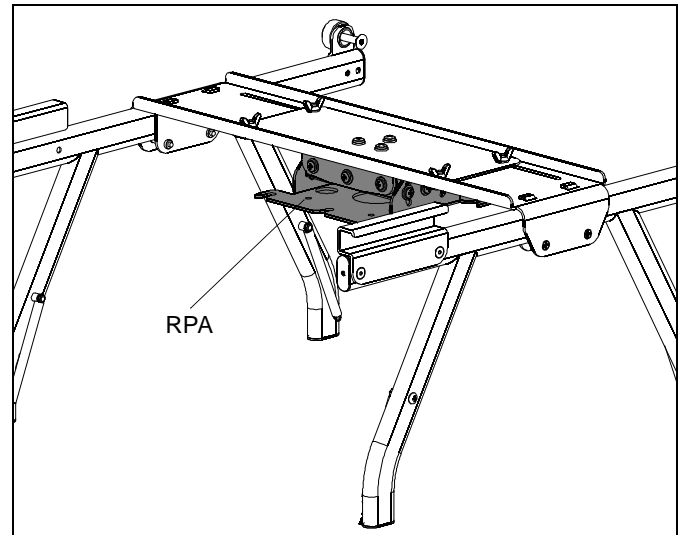


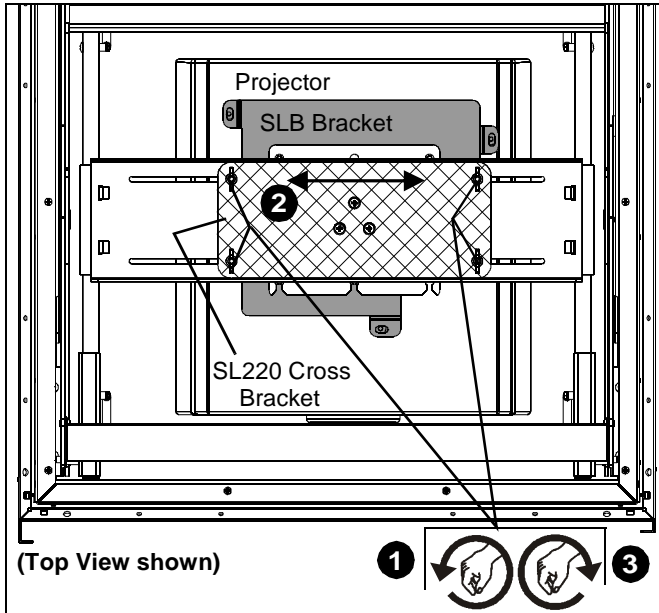
Figure 21

**NOTE:** The projector is secured from the top by a corresponding Chief interface bracket (not included).

2. Attach the interface bracket to the projector following the instructions included with the interface bracket.
3. Attach the interface bracket with the projector to the RPA/RPM/RSA/RSM following the instructions included with the RPA/RPM/RSA/RSM.

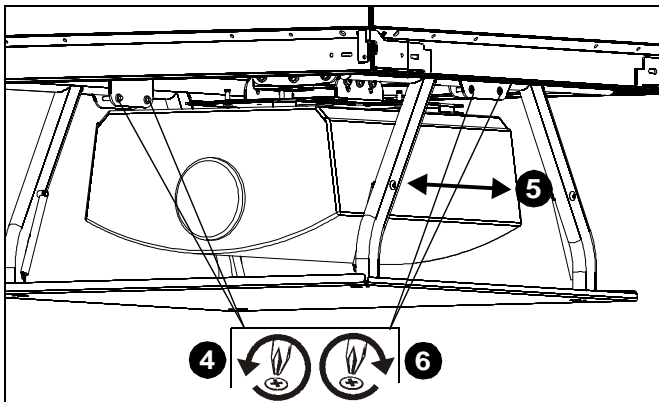
**Adjustments**

1. Adjust projector left or right by loosening the wing nuts on the SL220 cross bracket. (See Figure 22)
2. Slide the SL220 cross bracket to the left or right as required.
3. Tighten wing nuts. (See Figure 22)



**Figure 22**


4. Adjust projector forward or backward by loosening two screws on each side of SL220. (See Figure 23)
5. Slide projector forward or backward as required.
6. Tighten two screws on each side of SL220. (See Figure 23)



**Figure 23**

7. Any pitch, roll or yaw adjustments should be made following instructions included with the RPA/RPM/RSA/RSM.

**Connecting Control Wiring**



**WARNING:** All wiring should be performed following all local codes and ordinances.

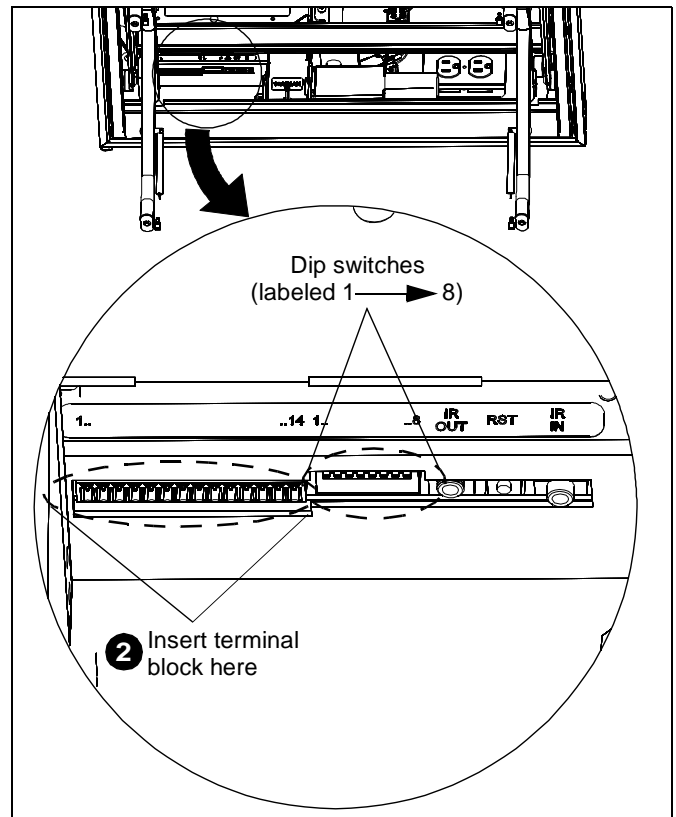
1. Use two-sided tape, or a similar attachment device to attach the IR sensor (S) in a convenient location for your installation.

**NOTE:** Ensure that IR sensor "eye" has "line of sight" to the remote control signal.

2. Insert terminal block (R) into SL220. (See Figure 24)
3. Connect control wiring following instructions included with the third party automation and control equipment and user-supplied switching devices, and information in Wiring Table (See Table 4).

**NOTE:** Any knockouts removed in the SL220 must be replaced with a supplied rubber grommet (T).

4. Feed the video and/or communications cables through the knockouts in the rear or top of the lift and connect it to the projector.



**Figure 24**

5. OPTIONAL: Use appropriate projector cord (U or V) to connect projector to IEC outlet on rear panel inside SL220. (See **Projector Shutdown Mode (Optional)** section.)

**IMPORTANT ! :** Select projector cord (U or V) suitable for projector. If neither supplied cord is appropriate for projector, use a projector cord that has an attachment plug on one end that meets IEC-60320 and on the other end is appropriate for use with the projector being used with the lift.



**CAUTION:** SHOCK, INJURY OR DAMAGE TO EQUIPMENT IS POSSIBLE! Avoid placing cables near moving parts and pinch points to avoid damage to the cables. Ensure there is enough slack in the cables to allow for up and down movement of the lift.

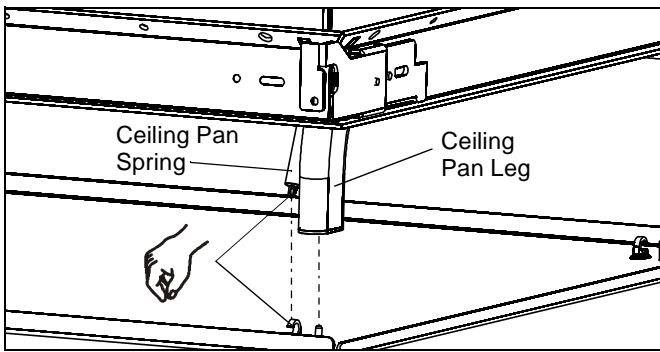
6. Secure cables as necessary using supplied mounting pads (N) and cable ties (P).



**CAUTION:** KEEP SL220 OPEN WHILE PROJECTOR IS RUNNING OR IN COOLING MODE! Premature bulb failure or damage to electrical components may occur if lift closes.

**Replacing Ceiling Pan**

1. Line up small peg on ceiling pan with hole in leg of projector cradle. (See Figure 25)
2. Attach spring on projector cradle to hook on ceiling pan. (See Figure 25)
3. Repeat for all four corners of the ceiling pan.



**Figure 25**

4. Reconnect power cord to IEC inlet on rear panel inside SL220. (See Figure 11) Power cord must be plugged into outlet installed in the outlet box attachment plate. (See Figure 26)

**OPERATING MODES**

**Projector Shutdown Mode (Optional)**

**IMPORTANT ! :** The SL220 has a shutdown feature which removes power from the projector when the lift is retracted. This prevents possible damage to the projector if the SL220 is inadvertently closed while the projector is on.

By default, this feature is disabled. To enable or disable this feature, use the rocker switch directly above the IEC outlet. To **enable** depress the blank side of rocker switch. To **disable** depress the white dot side of rocker switch. The projector **MUST** be plugged into the IEC outlet in order for this feature to function. (See Figure 26)

**IMPORTANT ! :** Select projector cord (U or V) suitable for projector. If neither supplied cord is suitable for projector, use a projector cord that has an attachment plug on one end that meets IEC-60320 and on the other end is appropriate for use with the projector being used with the lift.

**NOTE:** Projector **MUST** be plugged into the IEC outlet located within the lift. (See Figure 26)

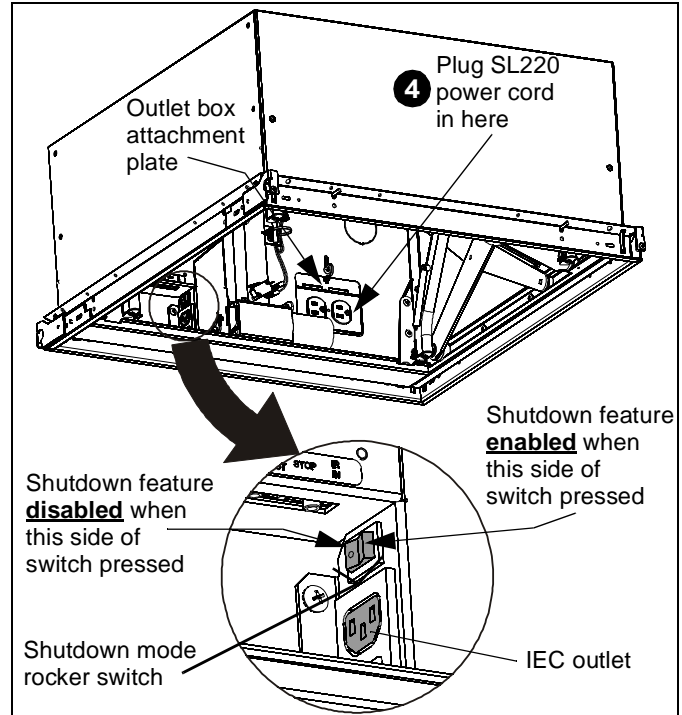
**NOTE:** Enabling this feature may have an adverse effect on projector bulb life.

**Current Sense Mode (Optional)**

**IMPORTANT ! :** The SL220 **MUST** be extended when this process is started.

**NOTE:** Projector **MUST** be plugged into the IEC outlet located within the lift. (See Figure 26)

**IMPORTANT ! :** Select projector cord (U or V) suitable for projector. If neither supplied cord is suitable for projector, use a projector cord that has an attachment plug on one end that meets IEC-60320 and on the other end is appropriate for use with the projector being used with the lift.



**Figure 26**

1. Extend lift.
2. Make sure Projector Shutdown Mode is disabled. (See Figure 26)
3. Flip DIP switch #8 (See Figure 24) to activate the Current Sense mode.
4. Turn on the projector so that the lift will learn the normal current draw of the projector.

**NOTE:** Allow projector to fully warm up.

5. Turn off projector.

In most cases, the lift will be able to detect the fan on the projector shutting off. However, the lift cannot detect this on all projector models.

If a fan shutoff was not detected by the lift within 5 minutes (default setting) of the projector turning off, the lift will automatically close assuming that the fan turning off was undetected.

The amount of time the lift waits between when it senses the projector turn off and when the lift assumes the fan turn-off was missed is adjustable. (See Table 1)

**Table 1: EQUIPMENT COOLDOWN**

Equipment Cooldown Time	Dip switches 5 & 6
5 Minutes	5 Off; 6 Off (Default)
3 Minutes	5 On; 6 On
2 Minutes	5 Off; 6 On
1 Minute	5 On; 6 Off

**Fault Condition**

**IMPORTANT !** : If the SL220 control system sees a fault condition it will stop the operation and a red light will flash on the control board (visible through the control housing).

For most faults:

1. Correct the problem. (Oftentimes, the cord routing may need to be corrected.)
2. Press STOP on the supplied remote control (M) which will reset the system and allow normal function.

**NOTE:** If there are repeated faults, please contact Chief Technical Support.

**RS485 Information**

Communication parameters as specified in ANSI TIA/EIA-485-A:

**Table 2: COMMAND STRINGS FOR SL-220**

Baud Rate	Data Length	Parity	Stop Bit	Flow Control
9600	8 Bits	None	1	None

- The serial control command string is set up as follows:

**Table 3: SERIAL CONTROL COMMAND STRING**

Start of Message (HEX)	Product ID (HEX)	Address (HEX)	Command (HEX)	Message Data (HEX)	Check Code (HEX)	End of Message (HEX)
>	XX	XX	XX	XX	XX	[Carriage Return]

- Product ID** for the SL-220: **05**
- Address** controlled by dip switch settings
- Basic Commands** available for the SL-220 in the factory-supplied configuration:
  - 03: Cancel Move** = >0500037D[Carriage Return]
  - 10: Extend to End of Travel** = >0500107B0D[Carriage Return]
  - 12: Retract to End of Travel** = >0500127D0D[Carriage Return]
- Message Data** = The data is required for the available commands:
  - 03:** None
  - 10:** None
  - 12:** None
- Check Code** is calculated.

**NOTE:** For further information, reference the Advanced Programming document and the web site calculator.



**Remote Control Capabilities**

The remote control has a range of 20-30ft (6-9m), and is powered by 2 AAA batteries that are accessed from the back of the remote.

**NOTE:** If operation of the mount is required at a greater distance than remote control will allow, the mount can be controlled through other methods.

The following table and illustration identify mount functionality and response by button on the remote control.

**Normal Operating Mode**

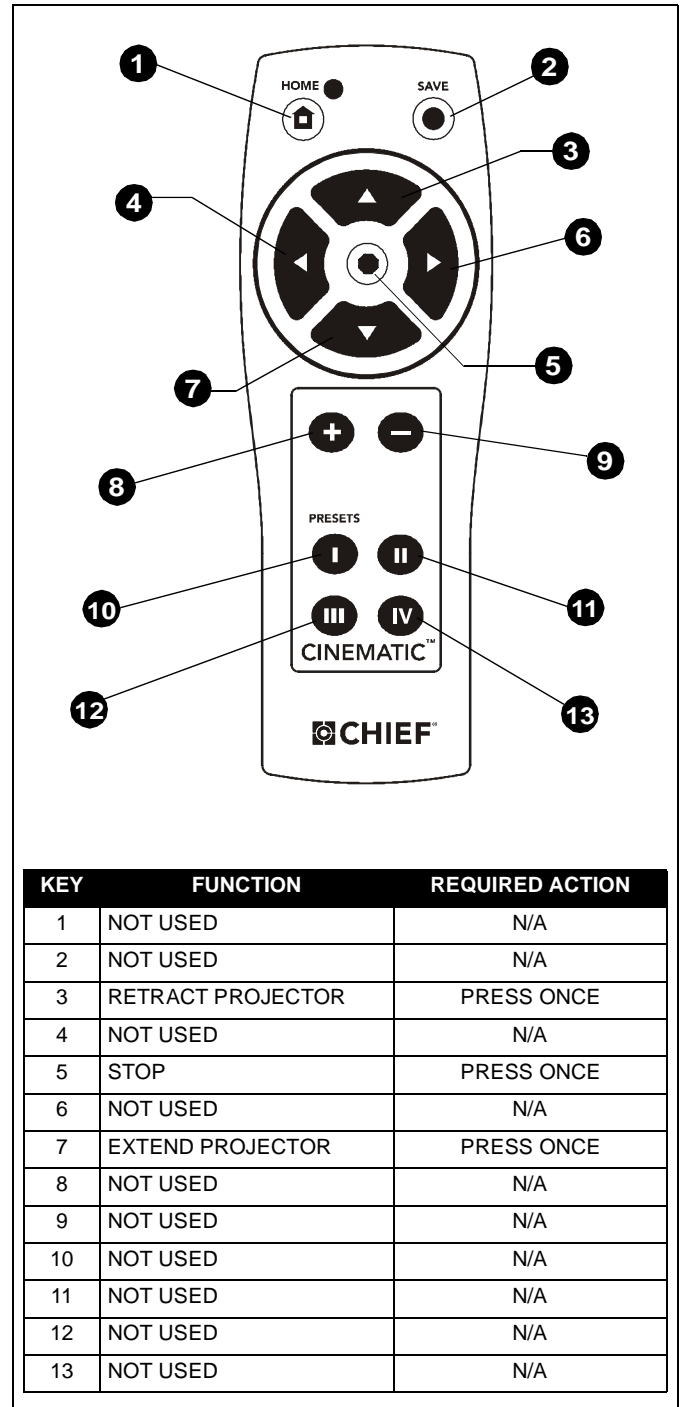


Figure 27

Table 4: WIRING TABLE

Accessory\Product	SL-220	
Pushbutton (Supplied on some models) (Momentary SPST)	Red	9 (toggle)
	Black	10 (ground)
	Other	
ASP-401	Up	7 (retract)
	Down	8 (extend)
	Open	N/A
	Close	N/A
	Left	N/A
	Right	N/A
	Common	10 (ground)
12V Trigger (will actually work with 5-30V AC or DC)	12V+	5 (trigger +)
	Ground	6 (trigger -)
IR-10	+12V	Built-in IR
	GND	
	C1	
	C2	
	C3	
	COMM	
RC-10	(radio power) - Red	N/A
	(relay) - Black	
	(24V) - White	
	Other	
Low Voltage Wall Switch or Relay Control	Up	7 (retract)
	Down	8 (extend)
	Service	N/A
	Open	N/A
	Close	N/A
	Sequence (Show Mode)	N/A
	Stop	N/A
	Left	N/A
	Right	N/A
	Common	10 (ground)
Error Reversing (contact between error input and common indicates an error and unit reverses direction)	Extend Error	Built-in (unit stops)
	Retract Error	(unit stops)
	Common	
Relay Contacts (relay closes when unit reaches end of travel)	Extend Relay a	11 (retract relay in)
	Extend Relay b	12 (retract relay common)
	Retract Relay a	13 (extend relay in)
	Retract Relay b	14 (extend relay common)
Serial	RS-485 +	1
	RS-485 -	2
	RS-485 Signal Return (Ground)	3





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