PROGRESSIVE AUTOMATIONS
FORWARD THINKING

PA-CB40-2-12V24V

Dual Hall Effect Linear Actuator Synchronization Control Box

Datasheet Ver 1.0

Table of Contents

Safety Precautions 3
Specifications 4
Quick Start Guide 5
Dimensional Drawing (Imperial) 7
Dimensional Drawing (Metric) 7
Connectors 8
Instructions 9
Errors and Troubleshooting 13

Safety Precautions

When installing and using your Progressive Automations Control Box, basic safety precautions should always be taken. Please read all safety precautions thoroughly and be familiar with all functions of the product before use. Apply all other relevant precautions when operating electrical devices.

⚠ DANGER

To mitigate the risk of damage and injuries:

- Do not attempt to modify or repair the Control Box.
- Avoid using the Control Box beyond its specified Ingress Protection rating.
- Avoid programming the Control Box (changing mode of operation or adding removing remotes) under load or connected to a load. Always disconnect it from any load before programming or changing settings.

⚠ WARNING

To reduce the risk of burns, fire, electrical shock, and injury to people:

- Ensure the applied power to the Control Box has correct polarity, meets the minimum requirements, and has a regulated output.
- Follow recommended load ratings and specifications for the Control Box.
- Avoid operating the Control Box where there may be high electromagnetic interference.
- Ensure that the Control Box and controlled device is visible to the user during operation, with no obstructions or potential for bodily harm.
- Progressive Automations does not assume any liability for preventing damage or bodily harm when using the Control Box. All necessary precautions must be taken by the user to ensure safe operation.

Operating Notes

Warranty
Any attempts to disassemble or tamper with the Control Box's internal components or operation outside of the advertised usage limitations will result in immediate voiding of the product's warranty. For more information on our warranty terms, visit: https://www.progressiveautomations.com/pages/warranty-terms.

Specifications
This Control Box must be used within the specified power, voltage and current input and current output ratings outlined in this documentation. Load must be evenly distributed within an application. Exceeding the recommended ratings may result in failure of the Control Box or permanent damage. Providing reverse voltage input to the Control Box may damage the product and void the warranty.

Specifications

Number of Channels	2
Input Voltage	12/24VDC (10VDC - 26VDC)
Output Voltage	12/24VDC (10VDC - 26VDC)
Current	12.5A @12VDC Per Channel 6.25A @24VDC Per Channel
Efficiency	99%
Ambient Current Draw	3mA
Standby Response Time	60mS
Sleep Mode Response Time	100mS
Duty Cycle	25% (Max 5 minutes continuous)
Feedback Input	Linear Actuator with Hall Effect Sensor - 5VDC, 2 Channels, 50% duty cycle, 90 degree offset
Limit Switch	Linear Actuator must have built-in limit switches. Not compatible with current-detection type limit switch.
Operational Temperature	-10°C to 50°C (14°F to 122°F)
Housing Color	Black / Blue
Housing Material	ABS Plastic
Kit Includes	1x Control Box, 1x Wireless Remote (with Battery)
Cable Length	See compatible Power Input Cable accessories
Wireless Frequency	433.92 MHz
Wireless Range	Minimum 100 Feet
Wireless Remote Functions	Up, Down, Programming Modes, Stop
Remote Battery Type	12V 27A Alkaline (included)
Dimensions (WxDxH)	5.83" x 4.28" x 1.25" (148mm x 109mm x 32 mm)
Unit Weight	0.31 lbs (140g)
Features	• 300-Watt Total Power Output / 150-Watt Per Channel • Automatic Power Saving Mode • Instant Wake Up (Single press, 100mS response time) • Wireless Remote Mode Selection • Wireless Remote Pairing • Pair Up to 4 Remotes • Smooth Motion Mode • Momentary and Non-Momentary Control • 2x LED Indicator, Buzzer and Push Button
Safety Features	• Out of Synchronization • Output Short Circuit • Overcurrent / Overload • Over Duty Cycle • Out of Range Input Voltage • Reverse Input Voltage
Warranty	18 Months

Quick Start Guide

Linear Actuator Synchronization

- The Control Box uses Hall Effect Feedback to continuously monitor all connected Linear Actuators, ensuring they move synchronously and maintain alignment or same position in real time even under uneven loads or speed variations.
- In the event of misalignment:
    - Automatic realignment occurs when all actuators reach full extension or retraction.
    - Manual realignment can be performed via the Soft Reset or Hard Reset procedures.

Compatibility

Before setting up, verify that your components meet compatibility requirements:

- Refer to the Connector and Specifications sections to confirm that the connected Linear Actuators and Power Supply are supported.

Wireless Remote Setup

- Each Control Box includes at least one Wireless Remote, pre-paired from the factory.
- Ensure the remote has adequate power:
- Check that the LED indicator on the remote lights up when a button is pressed.
    - Replace the battery if needed—see Battery Specifications for details.
- To pair a new or replacement remote, refer to the Wireless Remote Pairing Procedure section.

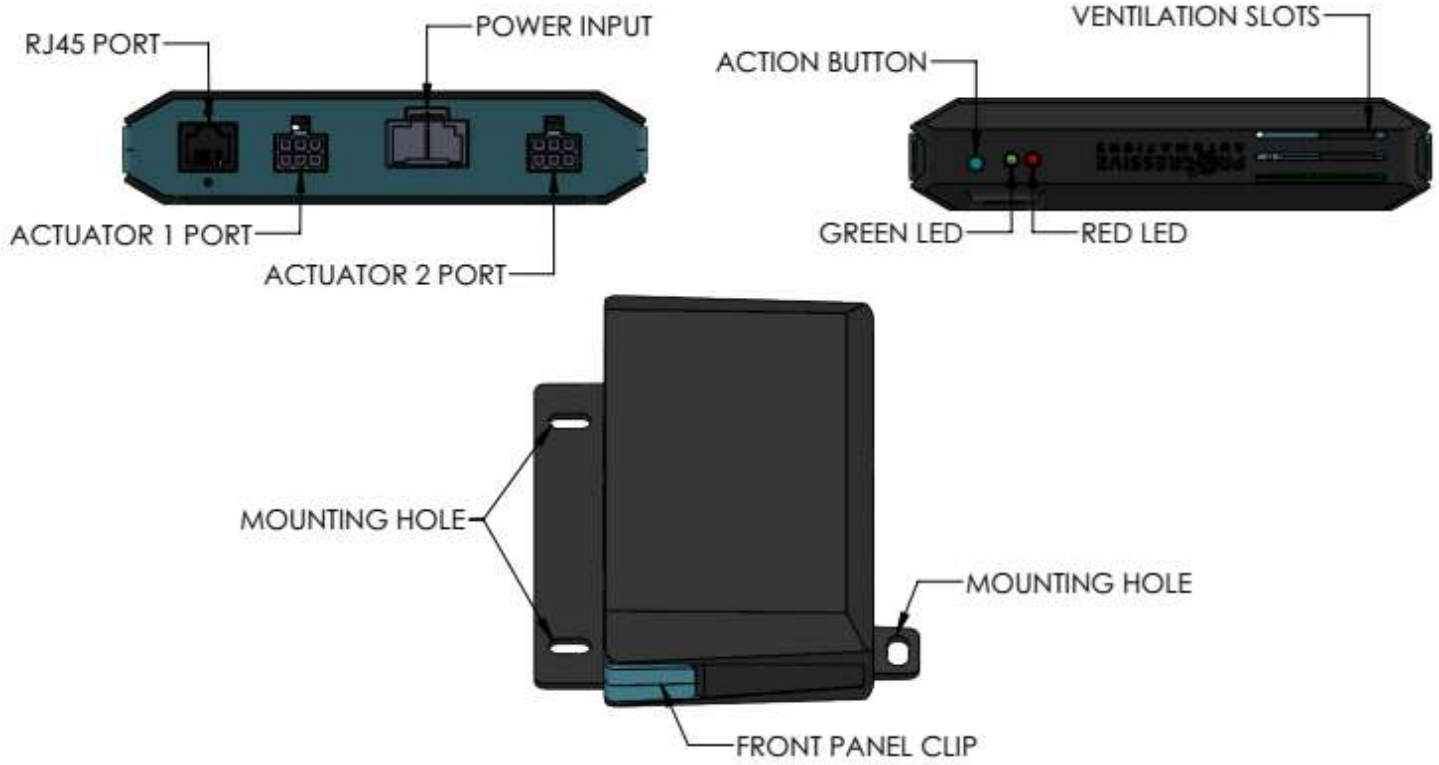
Hard Reset Procedure

- Before first use, a Hard Reset must be performed to initialize the system.
- See the Reset Procedure section for step-by-step instructions.

Wireless Remote Operation

- UP: Extend linear actuators
- DN: Retract linear actuators
- M: Programming Mode
- S: Stop linear actuators
- Pressing any button while linear actuators are in motion will stop the actuators.
- Automatic Power Saving Mode when Linear Actuators not in motion.

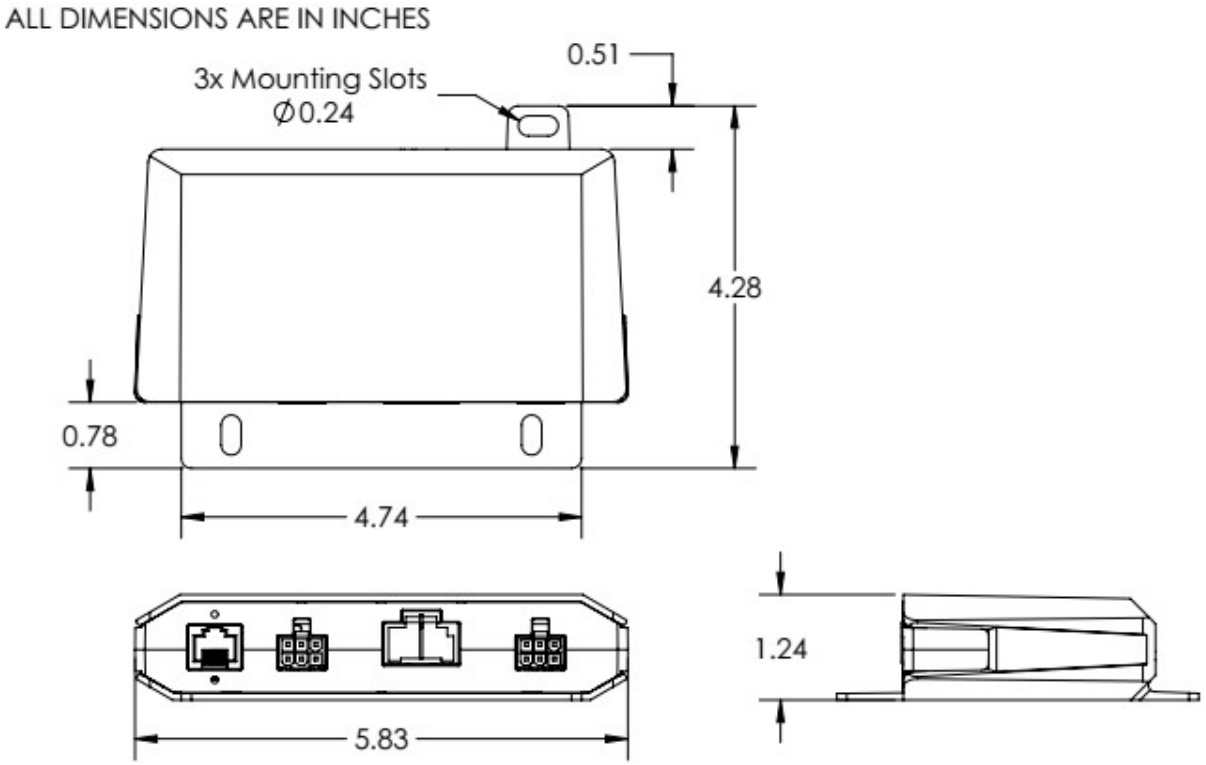
Control Box



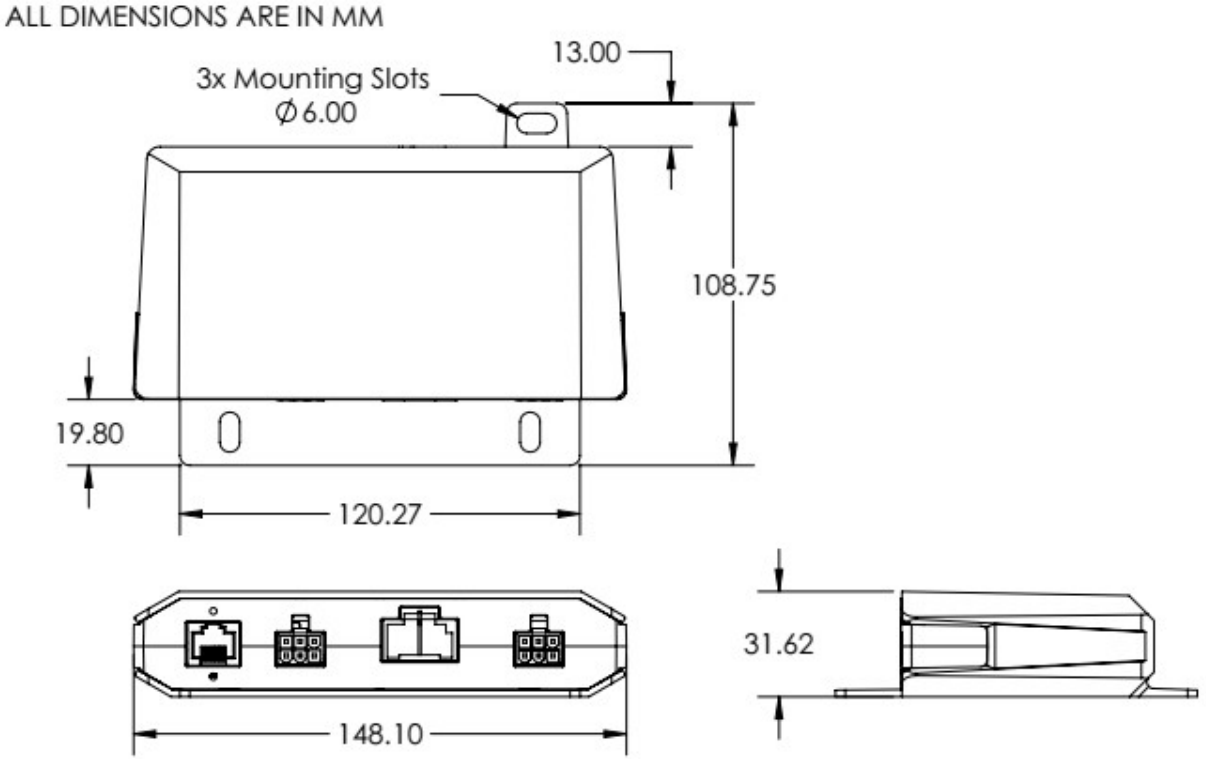
NOTE: RJ45 Port is currently reserved for internal diagnostics or firmware updates only.

Wireless Remote

Dimensional Drawing (Imperial)

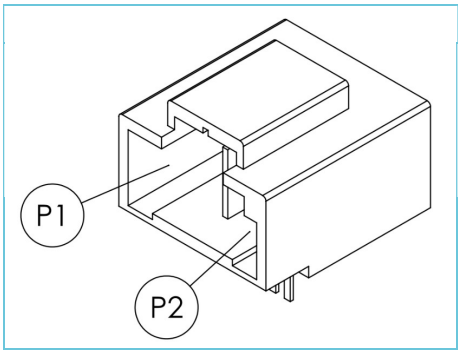


Dimensional Drawing (Metric)



Connectors

Power Input

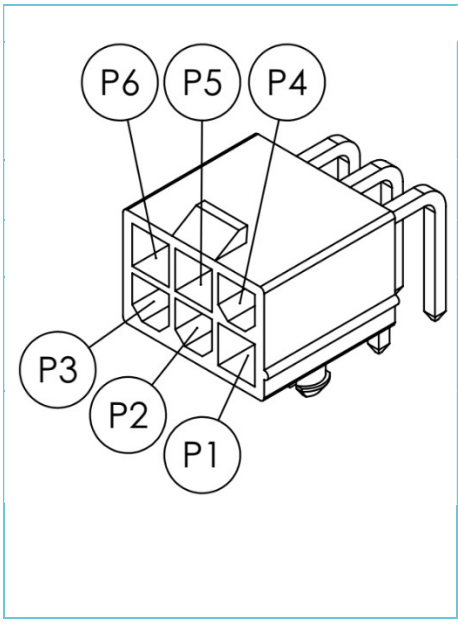


Pin Location	Function	Wire Color	Wire Gauge
P1	Power Input COM / Negative (-)	Black	10 AWG
P2	Power Input VCC / Positive (+)	Red	10 AWG

Parts List

	Part Name	Part Number	Mating Part Number
Power Input Housing	Hirose Connector Header, Through Hole, Right Angle, 2 Position	DF60-2P-10.16DS(27)	DF60A-2S-10.16C
Power Input Terminals			DF60-1012SCA

Actuator Port



Pin Location	Function	Wire Color	Wire Gauge
P1	Hall Effect 2 - signal leads when extending	Orange	22 AWG
P2	Hall Effect GND	Black	22 AWG
P3	Hall Effect 5V	Red	22 AWG
P4	**Motor- / Retract** actuator when (+) voltage applied	Black	16 AWG
P5	**Motor+ / Extend** actuator when (+) voltage applied	Red	16 AWG
P6	Hall Effect 1 - signal leads when retracting	Yellow	22 AWG

Parts List

	Part Name	Part Number	Mating Part Number
Housing	Molex Mini-Fit Jr. Header, Through Hole, Right Angle, 6 Position	39-30-1060	39-01-2060
Motor Terminals	Molex Mini-Fit Jr. Female Terminal, 18-24 AWG	-	39-00-0038
Hall Effect Terminals	Molex Mini-Fit Jr. Female Terminal, 22-28 AWG	-	39-00-0046

Instructions

Control Box Status

Status	Green LED	Red LED	Buzzer	Completion	Cancellation
Initial Power-Up	Blink once	Blink once	-	-	-
Linear Actuator Output ON	ON	-	-	-	-
Programming Mode	Slow blinking	-	Loop: 1x short beep	-	-
• **Submenu**	Slow blinking	-	-	1x medium buzzer beep	-
• **Submenu Setting Changed**	-	-	-	2x medium buzzer beep	-
Wireless Remote Pairing Mode	Slow blinking	-	Loop: 2x short beep	2x medium buzzer beep	-
Soft Reset Procedure	ON	Slow blinking	Loop: 3x short beep	3x medium buzzer beep	1x long buzzer beep
Hard Reset Procedure	ON	Fast blinking	Loop: 4x short beep	4x medium buzzer beep	1x long buzzer beep
Pending Hard Reset Procedure	-	Fast blinking	-	-	-

Programming Mode

Programming Mode allows the user to access various Control Box procedures and setting adjustments.

Ensure that both the LED indicators and buzzer are clearly visible for system feedback and maintain uninterrupted wireless reception to ensure reliable operation.

1. Entering Programming Mode
    a. Press and hold the M button for 5 seconds, then release
2. Navigating Submenus
    a. Press the appropriate button (e.g., UP, DN, S) to enter the desired submenu
3. Exiting Programming Mode
    a. Press the M button once at any time to return to Normal Mode

Programming Mode Submenus

- Press DN: Enter Standard Submenu
    - Press UP: Toggle Momentary/Non-Momentary Control
    - Press DN: Enter Wireless Remote Pairing Mode
    - Press S: Toggle Smooth Motion Control
- Press S: Enter Hall Effect Submenu (Hall Effect related functions)
    - Press S: Start Soft Reset Procedure
    - Hold S for 5 seconds: Start Hard Reset Procedure

Normal Mode

Wireless Remote Operation

- UP: Extend linear actuators
- DN: Retract linear actuators
- M: Programming Mode
- S: Stop linear actuators
- Pressing any button while Linear Actuators are in motion will stop the actuators

- Automatic Power Saving Mode when Linear Actuators not in motion

Momentary / Non-Momentary Control (Default)

The Control Box will be in Non-Momentary Mode by default and will retain the last selected Mode.

1. On the paired Wireless Remote
    a. Hold M for 5 seconds: Enter Programming Mode
    b. Press DN once: Enter Standard Menu
    c. Press UP once to toggle between Momentary and Non-Momentary Mode
        i. **Non-Momentary Control (Default):** Press UP or DN once. The actuator will keep moving until a button is pressed again or the actuator reaches its travel limit. When the actuator reaches its travel limit, the Control Box will power it off automatically.
        ii. **Momentary Control:** Hold UP or DN to operate the actuator. Movement stops when you release the button or reach the travel limit.
2. Normal Mode will automatically resume

Wireless Remote Pairing Mode

The Control Box is paired with the 1x Wireless Remote included and can be paired with up to 4 Wireless Remotes in total.

Deleting Paired Wireless Remote

- If more than 4 Wireless Remotes are paired, the oldest paired Wireless Remote will be deleted
- A single Wireless Remote can be paired up to four times to delete all other paired Wireless Remotes.

Pairing Using a Paired Wireless Remote

1. On the paired Wireless Remote
    a. Hold M for 5 seconds: Enter Programming Mode
    b. Press DN once: Enter Standard Menu
    c. Press DN once: Enter Pairing Mode
2. You have now entered Pairing Mode
    a. Green LED: Slow blinking
    b. Buzzer: Loop: 2x short beep
    c. Normal Mode will resume after 15 seconds if no buttons are pressed.
3. On the new Wireless Remote that is being paired
    a. Press any button once, for at least 1 second
        i. Successfully Paired: 2x short buzzer beeps
    a. Normal Mode will automatically resume

Pairing Using the Control Box Action Button

1. Press the Action Button for at approximately 1 second, until the buzzer beeps once
2. You have now entered Pairing Mode
    a. Control Box Status:
        i. Green LED: Slow blinking
        ii. Buzzer: Loop: 2x short beep
    b. Normal Mode will resume after 15 seconds if no buttons are pressed.
3. On the new Wireless Remote that is being paired
    a. Press any button once, for at least 1 second
        i. Successfully Paired: 2x short buzzer beeps
    b. Normal Mode will automatically resume

Smooth Motion Control (OFF by default)

Smooth Motion gradually ramps the actuator's speed when it starts or stops, ensuring smoother operation. By default, Smooth Motion is OFF for immediate starts and stops, which is useful for precise positioning.

1. On the paired Wireless Remote
    a. Hold M for 5 seconds: Enter Programming Mode
    b. Press DN once: Enter Standard Menu

c. Press S once to toggle between Smooth Motion Control ON and OFF
2. Normal Mode will automatically resume

Reset Procedure (Soft and Hard)

Hard Reset Procedure

Used for calibrating Linear Actuators to the Control Box.

Important: The Hard Reset Procedure must be completed once before use.

- Ensure Linear Actuators are disconnected from the application, unloaded, and free from any mechanical obstructions. This is to ensure accurate calibration and prevent binding.
- The Control Box will not allow actuator movement until this reset is performed
- Linear Actuator Synchronization is disabled during Hard Reset—binding may occur

Used for initial system setup to fully calibrate the Linear Actuators with the Control Box

1. On the paired Wireless Remote
    a. Hold M for 5 seconds: Enter Programming Mode
    b. Press S once: Enter Hall Effect Menu
    c. Hold S for 5 seconds: Start Hard Reset Procedure
2. You have now started Hard Reset Procedure
    a. Press any button to cancel the procedure.
        i. Buzzer: 1x long beep
    b. Control Box Status:
        i. Green LED: ON
        ii. Red LED: Slow blinking
        iii. Buzzer: Loop: 4x short beep
    c. Sequence:
        i. Linear actuators will retract at 100% speed until fully retracted
        ii. Then extend at 100% speed until fully extended
        iii. Then retract at 100% speed until fully retracted
3. Completion:
    a. Buzzer: 4x long beep
    b. Calibrates Linear Actuators to Control Box and Clears all Error Modes.
    c. Normal Mode will resume automatically

Soft Reset Procedure

Used for realignment or clearing Error Modes.

Note: Linear Actuator Synchronization is enabled to prevent further misalignment. However, Out of Sync Error will not stop motion as this prevents successful realignment of misaligned Linear Actuators.

On the paired Wireless Remote
    a. Hold M for 5 seconds: Enter Programming Mode
    b. Press S once: Enter Hall Effect Menu
    c. Press S once: Start Soft Reset Procedure
2. You have now started Soft Reset Procedure
    a. Press any button to cancel the procedure.
        i. Buzzer: 1x long beep
    b. Control Box Status:
        i. Green LED: ON
        ii. Red LED: Slow blinking
        iii. Buzzer: Loop: 3x short beep
    c. Sequence:
        i. Linear actuators will retract at 50% speed until fully retracted
        ii. Then momentarily extend at 100% speed
        iii. Then retract at 100% speed until fully retracted
3. Completion:
    a. Buzzer: 3x long beep
    b. Realigns Linear Actuators and Clears all Error Modes.

c. Normal Mode will resume automatically

Control Box Reboot

Used to reboot the Control Box:

- Clear unexpected or erratic behavior
- Clear outstanding Error Modes that do not require a Soft or Hard Reset

Action Button Reset

1. Press and hold the Action Button for approximately 10 seconds, release once Green LED flashes.
2. Green and Red LED will flash once.
3. The Control Box Reboot is complete.

Power Input Reset

1. Disconnect the power supply from the Control Box.
2. Wait at least 10 seconds.
3. Reconnect the power to complete the reboot.
4. Green and Red LED will flash once.
5. The Control Box Reboot is complete.

Errors and Troubleshooting

- All Error Modes will immediately halt all Control Box actions and cancel any outstanding commands.
- All Error Mode notifications occur once initially.
- If the user attempts to operate the Control Box without completing the required Troubleshooting Steps, the error notification will repeat with each attempt.
- Error Mode does not prevent the Control Box from entering Power Saving Mode.
    - The error condition will persist after wake-up until resolved.

Error Mode	Troubleshooting Steps	Green LED + Buzzer
Out of Synchronization: Linear Actuator positions are too far apart, risking binding.	• Check for Linear Actuator wiring faults (e.g. broken wires, disconnected connector) • Confirm there are no physical obstructions preventing movement • Confirm Linear Actuator load is within rated limits • Confirm Linear Actuator is fully operational **To clear:** Perform Soft Reset Procedure or Hard Reset.	2x long beep then 1x short beep
Output Short Circuit: Output current exceeds 40A per channel.	• Disconnect power • Check for wiring faults (e.g. broken or shorted wires) • Confirm there are no physical obstructions preventing movement • Confirm Linear Actuator load is within rated limits • Confirm Linear Actuator is fully operational • Verify Linear Actuator inrush current is below 50A ○ Enabling Smooth Motion Mode may reduce this **To clear:** perform Control Box Reboot	1x long beep then 1x short beep
Out of Range Input Voltage: Input voltage is above 27.0 VDC or below 10 VDC	• Disconnect power • Verify input voltage is within range. **To clear:** Normal Mode will automatically resume once Input Voltage is within range and Control Box is awake - 2x buzzer medium beep.	1x long beep then 2x short beep
Overcurrent / Overload: Per channel current output exceeds 155W in 2 seconds.	• Confirm there are no physical obstructions preventing movement • Confirm Linear Actuator load is within rated limits • Confirm Linear Actuator is fully operational • Check for Linear Actuator wiring faults (e.g. broken wires, disconnected connector) **To clear:** Perform Control Box Reboot or Hard Reset Procedure.	1x long beep then 3x short beep
Over Duty Cycle: Control Box operation exceeds 5 minutes continuous and 25% duty cycle.	• Confirm the total operation time is within the Duty Cycle limits. **To clear:** Automatically resumes after 15 minutes of inactivity or performing Control Box Reboot	1x long beep then 4x short beep