ECI 4000 Series Door Operator Installation Manual

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1 Warnings and Disclaimer

Thank you for purchasing equipment from ECI America, INC. We want your new equipment to operate safely. Anyone who installs or uses this equipment should read this publication (and any other relevant publications) before installing or operating the equipment.

To minimize the risk of potential safety problems, you should follow all applicable local and national codes that regulate the installation and operation of your equipment. These codes vary from area to area and usually change with time. It is your responsibility to determine which codes should be followed, and to verify that the equipment, installation and operation is in compliance with the latest revision of these codes.

There may be local regulatory or government offices that can also help determine which codes and standards are necessary for safe installation and operation. Equipment damage or serious injury to personnel can result from failure to follow all applicable codes and standards. We do not guarantee the products described in the publication are suitable for you particular application, nor do we assume any responsibility for your product design, installation or operation.

Our products are not fault-tolerant and are not designed, manufactured or intended for use or resale as online control equipment in hazardous environments requiring fail-safe performance, such as in the operation of nuclear facilities, aircraft navigation of communication systems, air traffic control, direct life support machines or weapon systems in which the failure of the product could lead directly to death, personal injury, or severe physical or environmental damage ("High Risk Activities"). ECI America, Inc. specifically disclaims any expressed or implied warranty of fitness for High Risk Activities.

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2 Trademarks

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3 Conventions Used



When you see the "notepad" icon in the left-hand margin, the paragraph to its immediate right will be a special note. Notes represent information that may make your work quicker and more efficient. The word NOTE: in boldface will mark the beginning of the text.



When you see the "exclamation point" icon in the left hand margin the paragraph to its right will be a warning. The information could prevent injury, loss of property, or even death in extreme cases. Any waring in this document should be regarded as critical information that should be read in its entirety. The word WARNING: in boldface will mark the beginning of the text.

4 Safety Information



Know the safety hazards related to any procedure you are about to perform. Know what equipment has been specified for each specific contact and know what tools and materials you should plan to have available. Before connecting electrical wiring, take precautions to prevent accidents from happening to yourself and others around you.

ALWAYS CONSIDER SAFTY FIRST!

- Wear a hard hat when working in the hoist way.
- Wear safety glasses or goggles when using power tools
- Always wear protective gloves when installing or removing access covers, conduits, wireway or electrical devices.
- When working on car canopy, always be aware of where the sides of the car are located.
- Use properly grounded cords and power equipment (ground fault circuit interrupters).
- Make sure there are proper clearances in hoist way between the car and other devices. Before connecting wiring, cover sharp edges to keep hands and arms from being cut.
- Always know where other people are and how the elevator wiring can affect their safety.



- Safety lock and tag out procedures are always required before performing and kind of service, repair, adjustment, lubrication or inspection of power equipment.
- To reduce the danger of electrical shock, always make sure electrical connections are secure. Also make sure no bare wires are exposed after pulling cable.
- Use a circuit tester to be certain the circuit is not active before touching it.



5 Unpacking and Inventory

1. Remove front cover and inspection inside of unit for any obvious damage.
2. Take inventory of all installation hardware.
3.

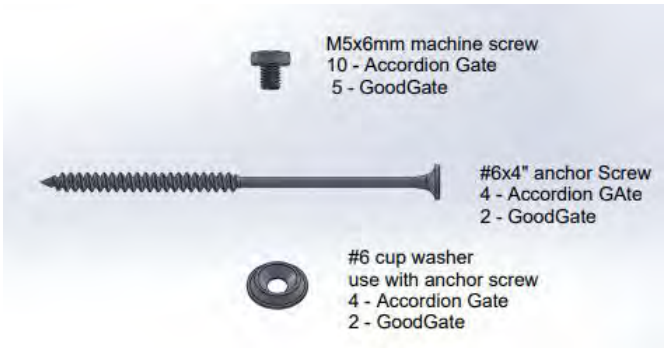


Figure 1 - Operator Mounting Hardware

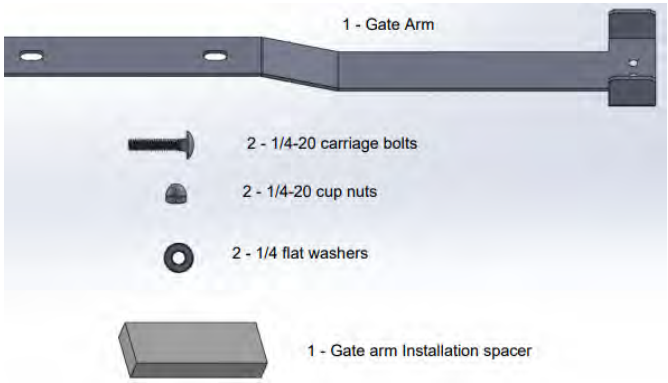


Figure 2 - Accordion Gate Hardware

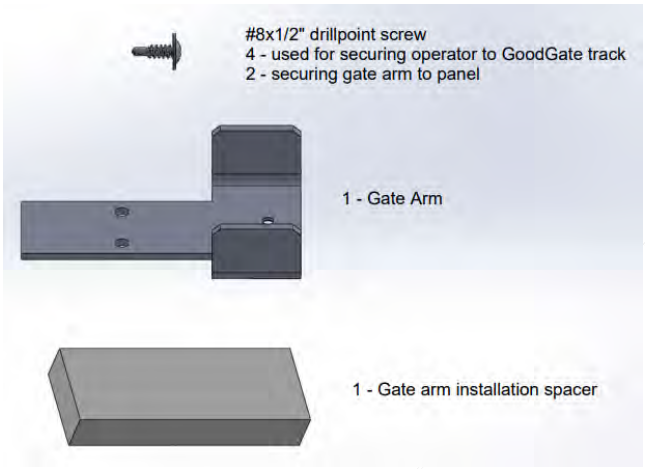


Figure 3 - GoodGate Installation hardware

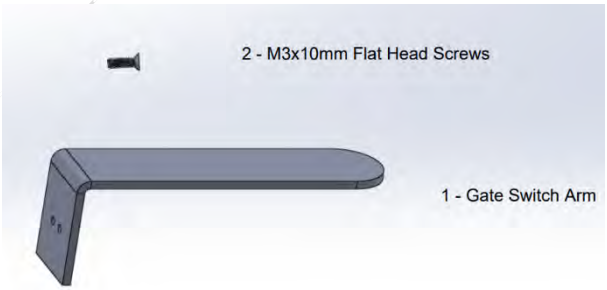
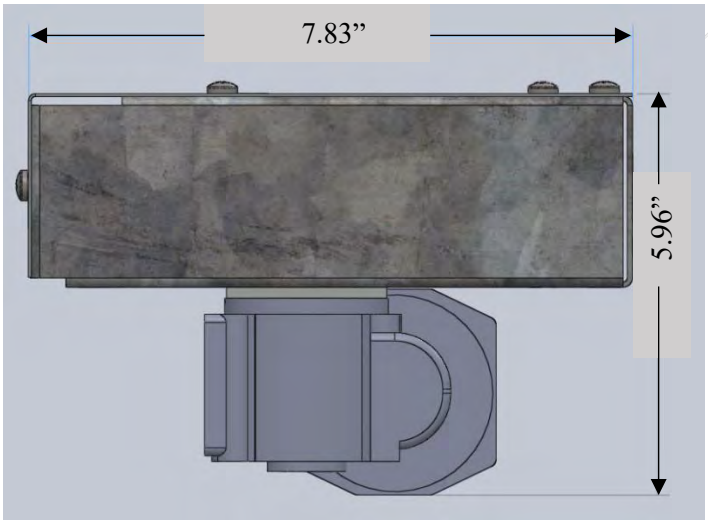


Figure 4 - Gate Switch Arm and M3x10mm Screws

6 Operator Dimensions





FOR GOODGATE INSTALLATION GO TO PAGE 10

7 Accordion Gate Installation

IMPORTANT: DO NOT USE A HAMMER DRILL OR IMPACT WRENCH TO INSTALL OPERATOR. USE A HAND DRILL WITH APPROPRIATE TOUQUE ADJUSTMENTS AS TO PREVENT OEVER TIGHTENING OF SCREWS

1. Attach the rear and front (BLACK) support brackets using M5x6MM machine screws.

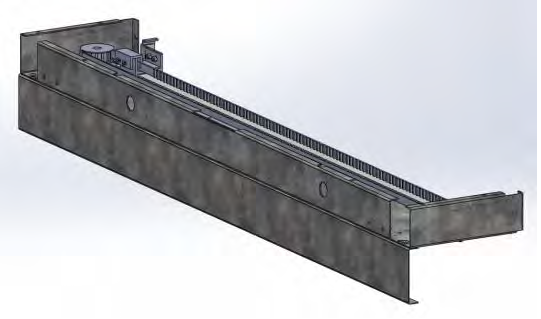


Figure 5 - Rear Support Bracket

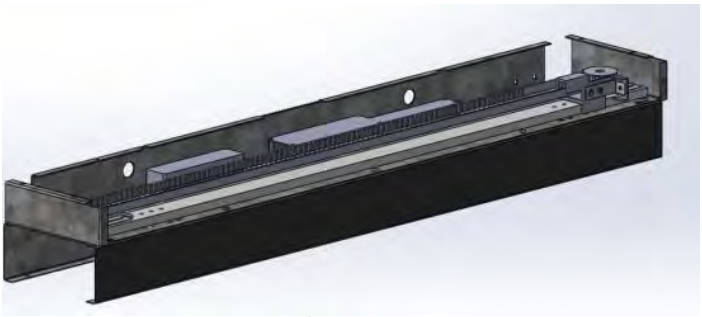


Figure 6 - Front Support Bracket

2. Place Operator on top of car as shown (Right hand operator shown). For right hand operator set unit on the right side of the car and left side for a left hand operator. Align the front edge of the front support bracket with the front edge of the car.



Figure 7 - Right Hand Operator Placement

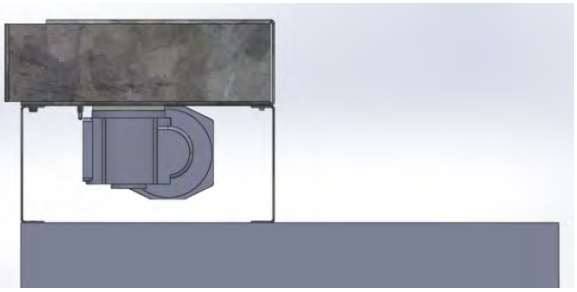


Figure 8 - Front Edge Alignment

3. Be sure the *Belt Bracket* is against the *Closed Stop*.

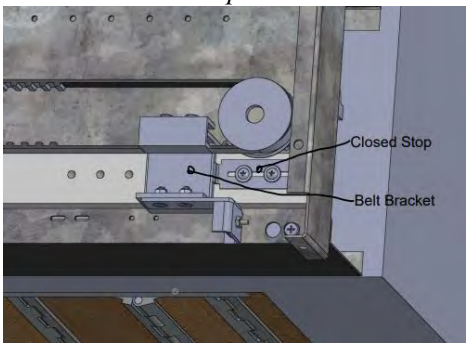


Figure 9 - Belt Bracket Against Closed Stop

4. Fully close the Gate. Place the *Gate Arm* against the *Magnet* and align the operator so the *Gate Arm* is aligned with the edge of the *Gate.*

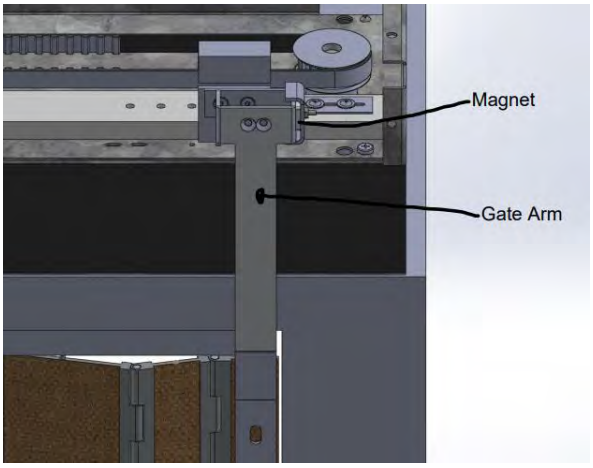


Figure 10 - Gate and Operator Alignment

5. Using the 4 anchor screws supplied with the hardware package, secure the operator in place as shown.

CAUTION: DO NOT OVER TIGHTEN THE ANCHOR SCREWS. OVER TIGHTENING ANCHOR SCREWS WILL CAUSE DAMAGE TO THE SUPPORT BRACKET. THEY SHOULD BE SNUGGED DOWN TO HOLD THEOPERATOR IN PLACE.

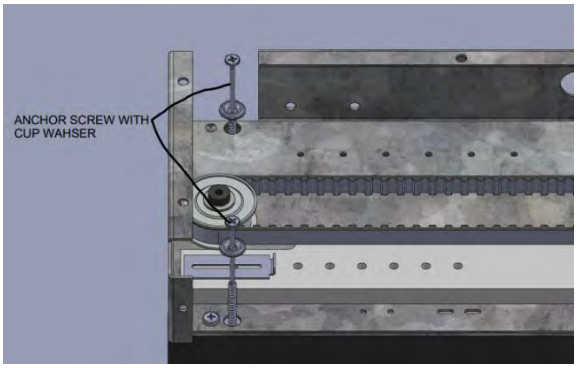


Figure 11 - LEFT SIDE ANCHOR SCREWS

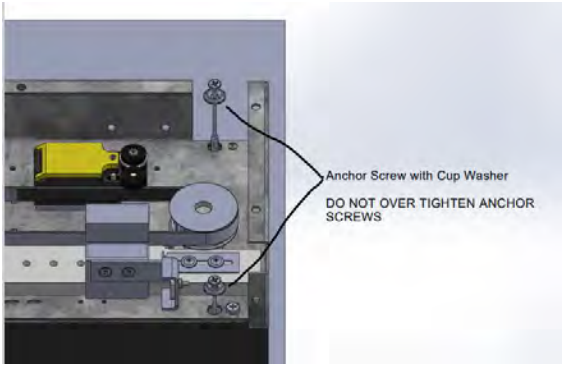


Figure 12 - RIGHT SIDE ANCHOR SCREWS

6. Partially open the gate and place the *Gate Arm Spacer* on the deck of the operator with the *Gate Arm* on top as shown.

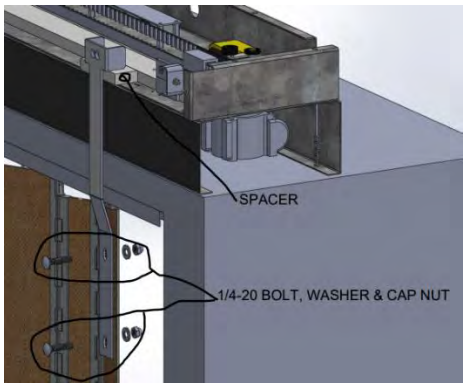


Figure 13 - Gate Arm Alignment

7. Align the Gate with the Gate Arm and secure Gate Arm to Gate using ¼-20 hardware and shown.
8. Remove the Gate Arm Spacer and ensure the gate moves freely between fully open and closed positions.
9. With the Belt Bracket against the Closed Stop, fully close the gate and ensure the Gate Arm makes full contact with the magnet without hitting the bracket edge.

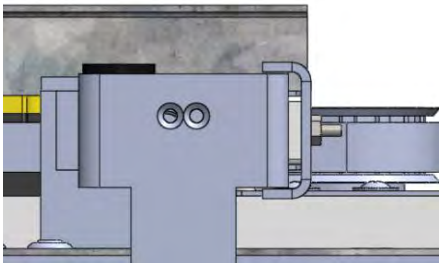


Figure 14 - Gate Arm Magnet Alignment

10. Attach Gate Switch Arm to Gate Arm as Shown using M3x10mm screws.

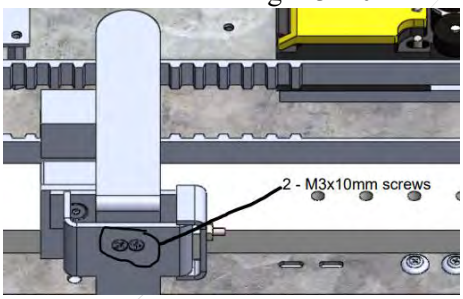


Figure 15 - Attaching Gate Switch Arm

11. Pull the gate away from the magnet until the gate is at its fully open position.
12. Measure the car opening with the gate fully open.
13. Set the Open Stop to that distance plus 1.75 inches from the Closed Stop. Secure Open Stop in place.
14. Close the gate so it catches the magnet.
15. With the Belt Bracket fully against the Closed Stop, align the Gate Switch Arm with the Gate Switch Lever and adjust the position of the Gate Switch as shown.

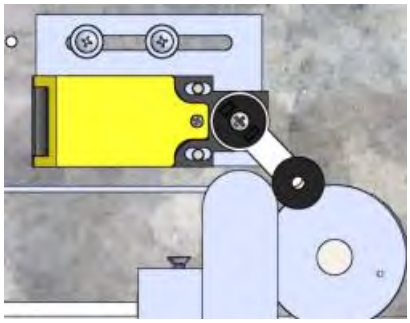


Figure 16 - Gate Switch Adjustment

Figure 17 – Dimensions

Proceed to Section 9 – Connecting Power and Checking Operation

8 Installation for Good Gate panel doors

8.1.1.1 Good Gate Track Installation

1. Place track in place per manufacturer's instructions but only install one "Z" bracket as shown below.
2. Attach a single "Z" bracket for the type of operator being installed using screws from Good Gate Mounting Hardware package. See Figure 18 - Left Hand Operator Figure 19 - Right Hand



Figure 18 - Left Hand Operator

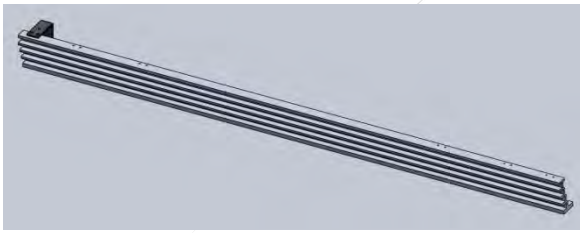
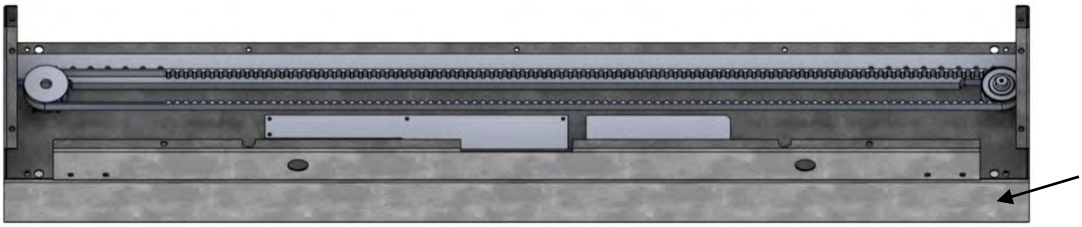


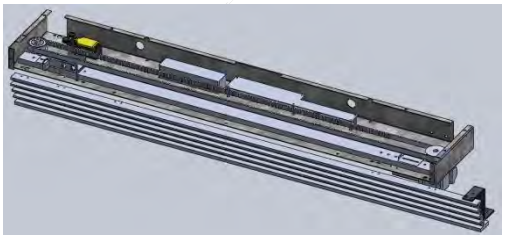
Figure 19 - Right Hand Operator

8.1.1.2 Operator Installation

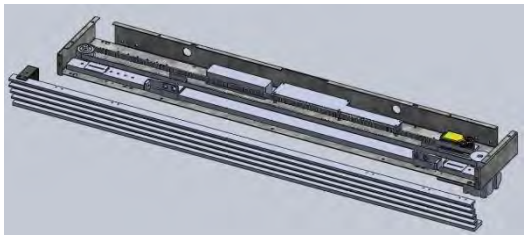
1. Attach the rear support bracket using 5 – M5x6mm screws of the operator as shown.



2. Place operator on top of track as shown for left- and right-hand operators.



Left Hand Operator



Right Hand Operator

3. Line up the holes on the operator and the GoodGate Track. For Left Hand Operator, using the 3 #8x1/2" drill point screws provided. Secure the left front of the operator with 2 drill point screws and one drill point screw on the right side as shown in Figures 20 & 21.

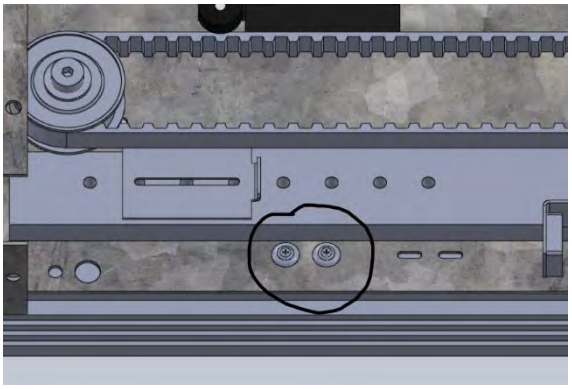


Figure 20 - Left side Drill Point Screws

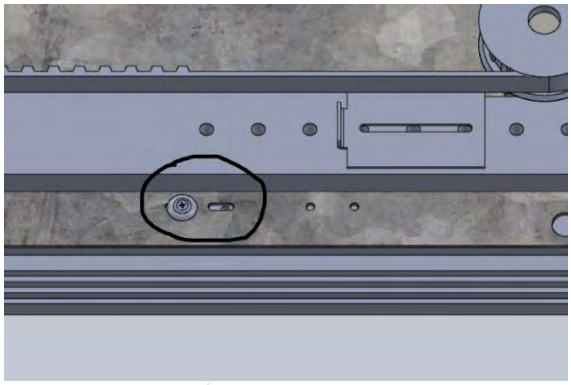


Figure 21 - Right Side Drill Point Screws

4. For Right Hand Operator, using the 3 #8x1/2" drill point screws provided. Secure the right front of the operator with 2 drill point screws and one drill point screw on the left side as shown in Figures 22 & 23.

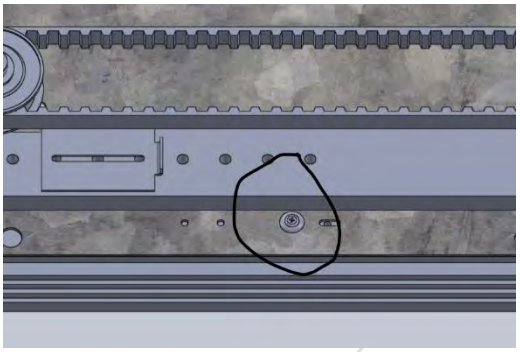


Figure 22 - Left Side Drill Point Screws

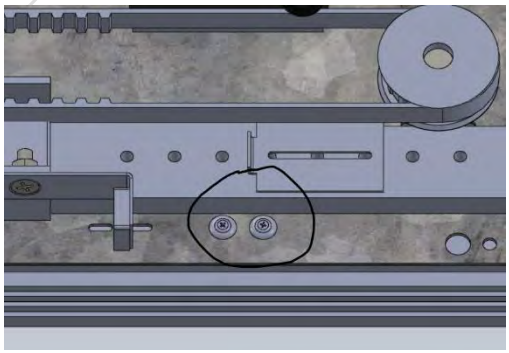


Figure 23 - Right Side Drill Point Screws

CAUTION: DO NOT OVER TIGHTEN THE ANCHOR SCREWS. OVER TIGHTENING ANCHOR SCREWS WILL CAUSE DAMAGE TO THE SUPPORT BRACKET. THEY SHOULD BE SNUGGED DOWN TO HOLD THEOPERATOR IN PLACE.

5. Secure the rear of the operator using the 2 supplied wood screws.

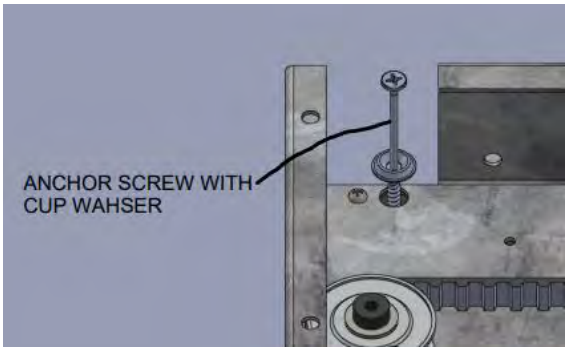


Figure 24 - Left Side Anchor Screw

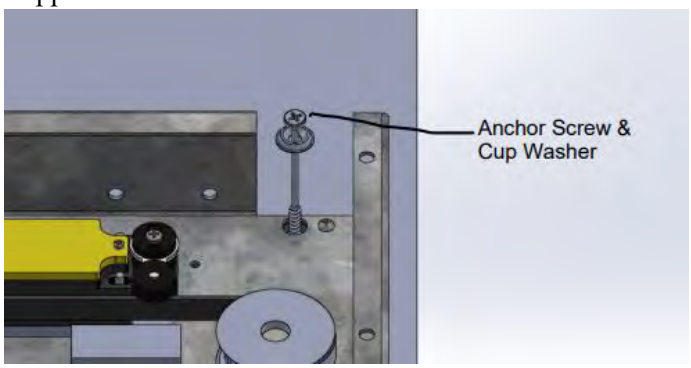


Figure 25 - Right Side Anchor Screw

6. With the operator secured in place, fully close the Gate and place the Gate Arm against the Magnet. Using a marker or pencil, mark the left side of the Gate Arm on the GoodGate Panel as shown.

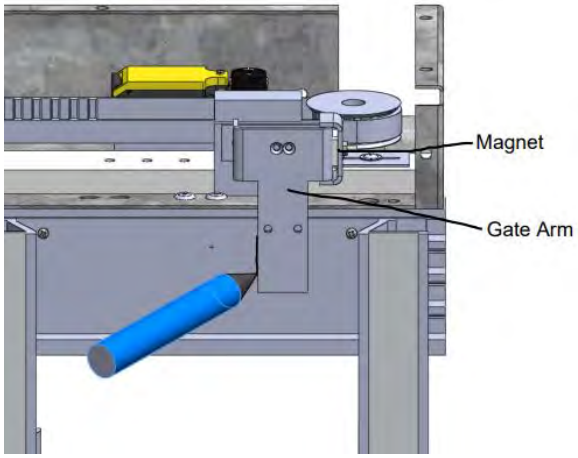


Figure 26 - Marking Gate Arm Position

7. Move the GoodGate panel away from fully closed and pull the Gate Arm off the Magnet.
8. Place the Gate Arm Spacer on the deck of the operator as shown with the Gate Arm on top.
9. Align the left side of the Gate Arm with the pencil mark and secure it in place with 2 drill point screws

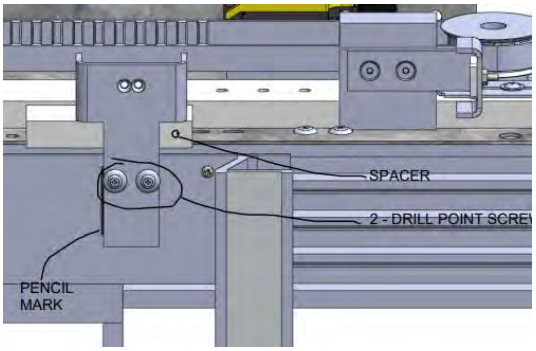


Figure 27 - Securing Gate Arm

10. Remove the Spacer
11. Move GoodGate panel to fully closed position and ensure Gate Arm makes with the Magnet without contacting the edge of the Bracket.

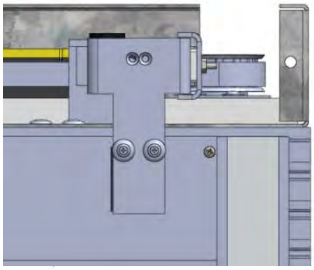


Figure 28 - Gate Arm Magnet Alignment

12. Move the Gate until it catches the magnet. Be sure the door is fully closed against the edge of the car opening.
13. If required, move the Belt Bracket until the gate is fully closed. The Closed Stop may need to be moved to achieve a fully closed gate.
14. Position the Closed Stop bracket against the Belt Bracket As shown. Secure the Stop in place.

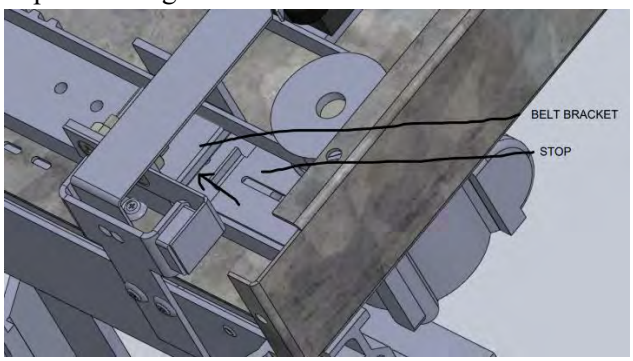


Figure 29 - Positioning the Close Stop

15. Pull the gate away from the magnet until the gate is at its fully open position.
16. Measure the car opening with the gate fully open.
17. Set the Open Stop to that distance plus 1.75 inches from the Closed Stop. Secure stop in place.
18. Close the gate so it catches the magnet.
19. Adjust the Gate Switch Arm so it aligns with the gate switch lever as shown.
20. Adjust the Gate Switch to a position where the switch contacts are closed.
21. Secure arm and the GATE Switch in place.

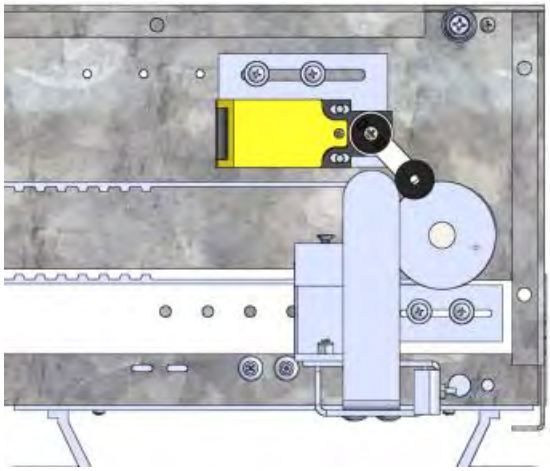
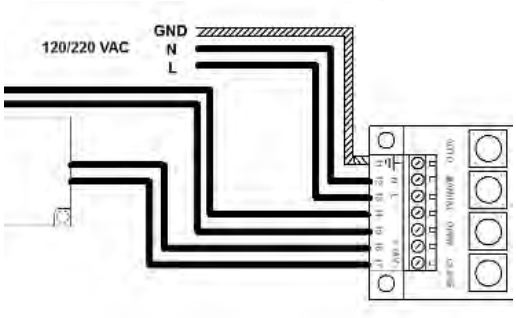


Figure 30 - Setting Gate Switch Level

9 Connecting Power and Checking Operation

NOTE: Wiring access holes come equipped with locking grommets to protect wiring. These can be removed for optional 7/8" wiring clamps.

1. With all power off, make the following power connections to the Control Board shown in Figure 8. **Each connection will accept maximum wire gauge of 14AWG stranded.**



11 – Power ground
12 – AC Neutral
13 – AC Line (120VAC/1.2A 220VAC/1A, 50/60Hz Single Phase)

Figure 31- Control Board Power Connections

1. Apply power to operator. The Display on the Control Board should show the following:

```
    ECI America 3000
   BLDG Door Operator

Please run learning
Cycle first!

                  <ENTER>
```

2. Press the ENTER button of the Control Board. The display should read:

```
    ECI America 3000
    BLDG Door Operator

       Learning cycle
Left hand operator
Right hand operator

                     <ENTER>
```

3. Use the + and – Buttons of the Control Board to move the selection between Left- and Right-Hand operators. Then press the ENTER button.
   The Operator should start to open the car gate to the fully open position, hold for a couple seconds then close the Car Gate and again hold for a couple seconds.
   The operator then performs one more open and close cycle.



Be sure to check that the gate arm does not rub or scrape against the top edge of the car and the gate moves freely without obstruction or binding.
If gate binds or jams press the ESC button to stop learn cycle, reposition operator and repeat learn cycle

4. If operator performed without obstruction or scraping of the top of the car, secure the 2 “L” brackets, at the rear of the operator, to the top of the car.
5. After Learn cycle is complete the display then reads:

```
    ECI America 3000
    BLDG Door Operator

      Learning cycle
      complete

                     <ESC>
```

6. Pressing the ESC button will display the Main Menu.

```
    ECI America 3000
    BLDG Door Operator

 Edit parameters
 Load defaults
 Diagnostics
 Learning cycle
```

10 Wiring Gate Switch

1. Open the cover of the gate switch and wire to the normally open contacts 13, 14 as shown in Figure 32 - Gate Switch Wiring. **Will accept a maximum wire gauge of 14AWG stranded.**

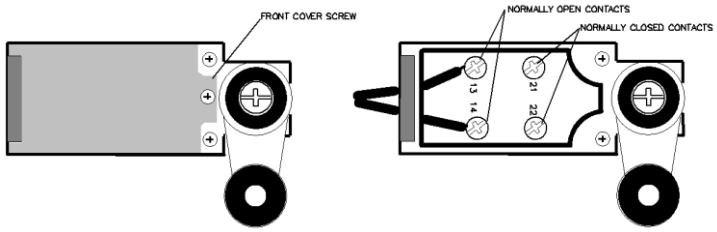


Figure 32 - Gate Switch Wiring

2. Perform an OPEN and CLOSE cycle of the operator using the OPEN and CLOSE buttons on the control board. Do this several times and check that the Gate Switch reads 0 ohms each time the door is fully closed. If not, move the Gate Switch closer to Actuator position.
3. Replace cover to Gate Switch.

11 Control Board and Gate Operator Adjustments

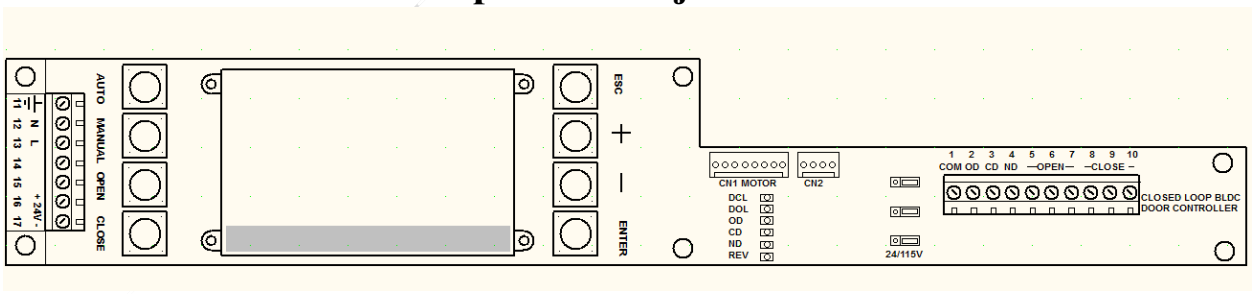


Figure 33 - Control Board

11.1.1 User Interface

11.1.1.1 Keypad

AUTOMATIC – Puts board in automatic mode. Door board will respond to OPEN, CLOSE and NUDGE commands OD, CD and ND

MANUAL – Puts door board in manual mode where open and close commands are controlled by the OPEN and CLOSE keys.
OPEN – Pressing key will open door when in manual mode
CLOSE – Closes the door when in manual mode
PLUS (+) - Moves curser UP in the display menu and INCREASES parameter values.
MINUS (-) - Moves curser DOWN in the display menu and DECREASES parameter values
ENTER – Selects menu displayed on screen and enters the parameter currently selected.
ESC – Returns to previous menu

11.1.1.2 LEDs

- DCL – Door Close Limit. On when operator is at fully closed position.
- DOL – Door Open Limit. On when operator is at fully open position.
- OD – Open Command. On when an open command is present at input
- CD – Close Command. On when close command is present at input.
- ND – Nudge Command. On when a nudge command is present at input.
- REV – Reverse. On when REOPEN is triggered.

11.1.2 Main Menu

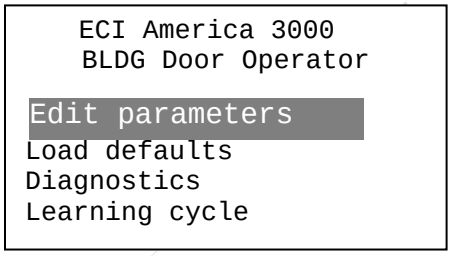


Figure 34- Main Menu

Figure 34- Main Menu shows the MAIN MENU. Pressing the "-" key moves the curser down to show remaining menu selections:

- Learning cycle
- Technical support

11.1.2.1 Edit Parameters

Moving the curser to *EDIT PARAMETERS* then pressing ENTER will enter the parameters menu. Using the +/- keys you can move to the desired parameter, then pressing ENTER will enable editing of that parameter through the arrow keys. See Table 2

Parameter	Definition	Default	Min	Max
Close speed	Fast closing speed	80	10	100
Cl slow speed	Closing speed after braking position	20	10	100
Cl braking pos	Encoder count from fully closed where Cl slow speed starts	500	1	1000
Close torque	Amount of force to motor in close direction. Higher number is higher force	140	1	300

Cl holding force	Not used	0		
Open speed	Open fast speed	80	10	100
Op slow speed	Open speed after braking position	20	10	100
Op braking pos	Encoder count from fully open where Op slow speed starts	500	1	1000
Open torque	Amount of force to motor in open direction. Higher number is higher force	140	1	300
Op holding force	Not used	0		
Acceleration	Acceleration rate. Higher number quicker accel	100	5	250
Deceleration	Deceleration rate. Higher number slower decel	225	5	250
Nudge speed	Speed when NUDGE input and Close input are both valid	30	10	100
Timeout	Open or close max time setting in seconds. If open or close exceeds time setting motor will stop until next input command	15	5	20
Reopen trigger s	Reopen sensitivity setting for obstruction in close direction where door will reopen. Higher number more sensitive. Setting of 0 is off	0	0	5
Auto Close	Door opens with the open command OD command and closes Door automatically once the OD command is removed from the input. 0 = disabled – Door closes with CD command 1 = enabled – Door closes when OD command removed	0	1	1

Table 1- Parameter settings



IMPORTANT: After setting all parameters you must hit ESC to return to Main Menu. This saves all changes to permanent memory. Failure to do so will result in parameters reverting to default settings in the event of a power loss.

11.1.2.2 Load Defaults

Selecting Load Defaults will reset all parameters to their default settings. It does not affect the learn cycle settings.

11.1.2.3 Diagnostics

```
   ECI America 3000
  BLDG Door Operator

VBUS : 23.41V
Speed:  0 POS:      0
Temp :  26C
Motor:   0A
Cycle:    0     <ESC>
```

Figure 35- Diagnostic Screen

- VBUS: Motor Bus Voltage
- Speed: Current speed of the motor
- POS: Current encoder position of the *Gate.* 0 is fully closed
- Temp: Temperature of the motor drivers
- Motor: Present current draw of the motor
- Cycle: The number of cycles since manufacture

11.1.2.4 Learning cycle

Selecting LEARNING CYCLE will perform a learning cycle on the gate operator when fully installed.

11.1.2.5 Technical Support

Selecting TECHNICAL SUPPORT will display Electronic Controls Inc. contact information.

11.1.3 Controller Connections

Each connection will accept up to 16AWG stranded wire.

- 1 - COM: Common for 115/24 VAC/VDC command inputs
- 2 - OD: Open command input. 115/24 volt as determined by jumper setting.
- 3 - CD: Close command input. 115/24 volt as determined by jumper setting.
- 4 - ND: Nudge command input. 115/24 volt as determined by jumper setting.
- 5 - OPEN: OPEN relay Common
- 6 - OPEN: OPEN Relay N.C. Connected to OPEN Common when off open limit
- 7 - OPEN: OPEN Relay N.O. Connected to OPEN Common when at OPEN LIMIT
- 8 - CLOSED: CLOSE Relay Common
- 9 - CLOSED: CLOSED Relay N.C. Connected to CLOSED Common when off CLOSE LIMIT.
- 10 - CLOSED: CLOSED Relay N.O. Connected to CLOSED Common when at CLOSE LIMIT.

12 Controller Input Wiring

1. Configure the Control Board for 115- or 24-volt operation as shown in Figure 36. **Each connection will accept a maximum wire gauge of 14AWG stranded.**

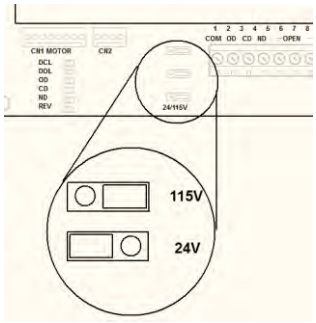


Figure 36 - Input Configuration

2. Connect controller inputs to COM, OD, CD, ND pins and LIMIT Outputs as shown in example in Figure 37- Controller Wiring. Depending on controller input the N.C. contacts of the LIMIT relays may also be used.

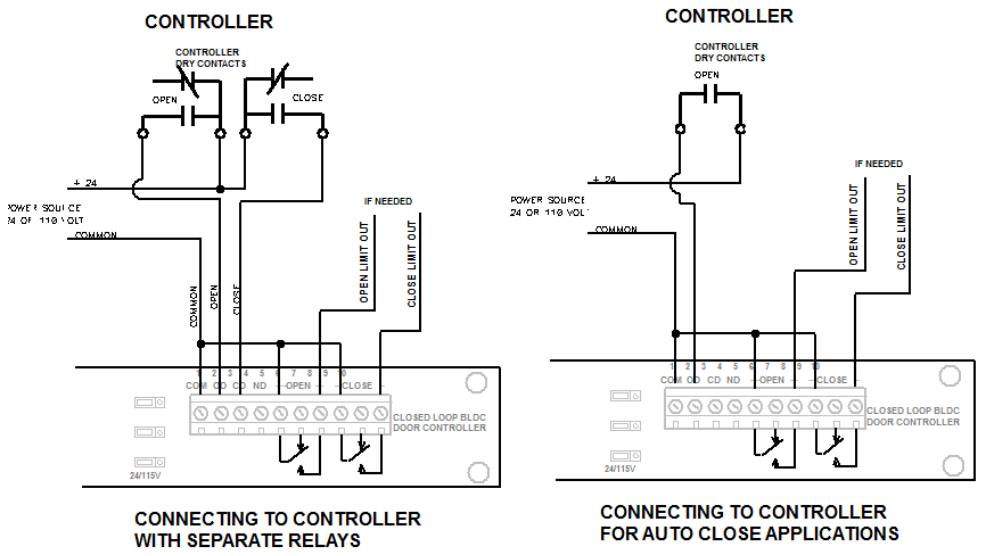


Figure 37- Controller Wiring

13 Trouble Shooting

14 No Display

1. Check for +24 volts DC at pins 16 and 17 of *Control Board.* If present call Technical Service.
2. If no +24VDC check for 110 VAC at pins 14 and 15 of Control *Board*. If present then the power supply may be bad. Call Technical Service.
3. If no 110VAC at pins 14 and 15 check for 110VAC at pins 12 and 13 of *Control Board.* If present then check connections at pins 14, 15. If no 110Vac check AC source.

15 Gate will not fully Close or Open

1. Check for obstructions or binding.
2. If *Gate* stalls in the middle of travel increase *Open* and/or *Close Torque* adjustments.
3. If *Gate* is stalling within an inch of fully closed or open the operator may need a *Learning cycle*.

16 Unable to increase speeds

1. If unable to increase speeds the *Control Board* is limiting current to the motor. Increase *Open* and *Close Torque* adjustments until speeds increase.

17 Gate moves slow, no speed control

1. Go Diagnostic screen and check POS indicator when door is moving.
    a. If POS count is changing go to 7.3 Unable to increase speeds
    b. If POS display is ---- when gate is moving then the encoder has lost its position.
        i. Perform Learning Cycle.

18 Door does not close

1. Check that the AUTO CLOSE parameter is set for your application.
    a. 0 = Close when OC command present
    b. 1 = Auto Close when OD not present
2. Check that speed parameters are set properly for your installation

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