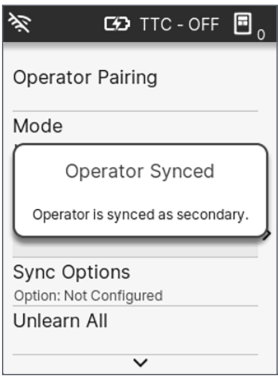


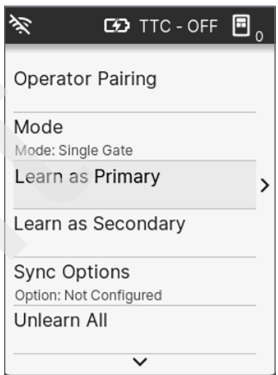
Adjustment (continued)

- 5. On the secondary operator, check for the notification that the secondary operator is synced with the primary operator.



To deactivate the wireless feature:

- 1. On the LCD Menu for either operator, navigate to "Operator Pairing > Unlearn All > Enter".
- 2. Repeat the steps for the other operator.



Wired Tandem Setup

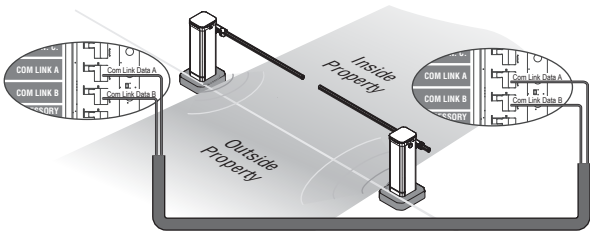
Use only the same operator models in a tandem setup. Before digging, contact local underground utility locating companies. Use PVC conduit to prevent damage to cables.

- 1. Disconnect ALL power to the operator and turn OFF the battery and AC power switches.
- 2. Trench across driveway to bury the shielded twisted pair cable.
- 3. Connect the wires from the shielded twisted pair cable to the Com Link terminals on the primary gate operator's main control board.

NOTE: We recommend that all accessories and board configurations are set on the primary operator.

- 4. Route the shielded twisted pair cable to the secondary gate operator's main control board.
- 5. Connect the wires from the shielded twisted pair cable to the Com Link terminals on the secondary operator's main control board (Com Link A to Com Link A and Com Link B to Com Link B). Ground the shield of the cable to the chassis ground of one operator.
- 6. Connect ALL power to the operator and turn ON the battery and AC power switches.
- 7. Navigate the LCD Menu to "Gate Setup > Tandem >" on the primary operator.

TANDEM GATE WIRE TYPE (SHIELDED TWISTED PAIR CABLE)	
22AWG up to 200 feet (61 m)	18AWG - 200-1000 feet (61-305 m)
Wire must be rated at 30 Volt minimum.	



Adjustment (continued)

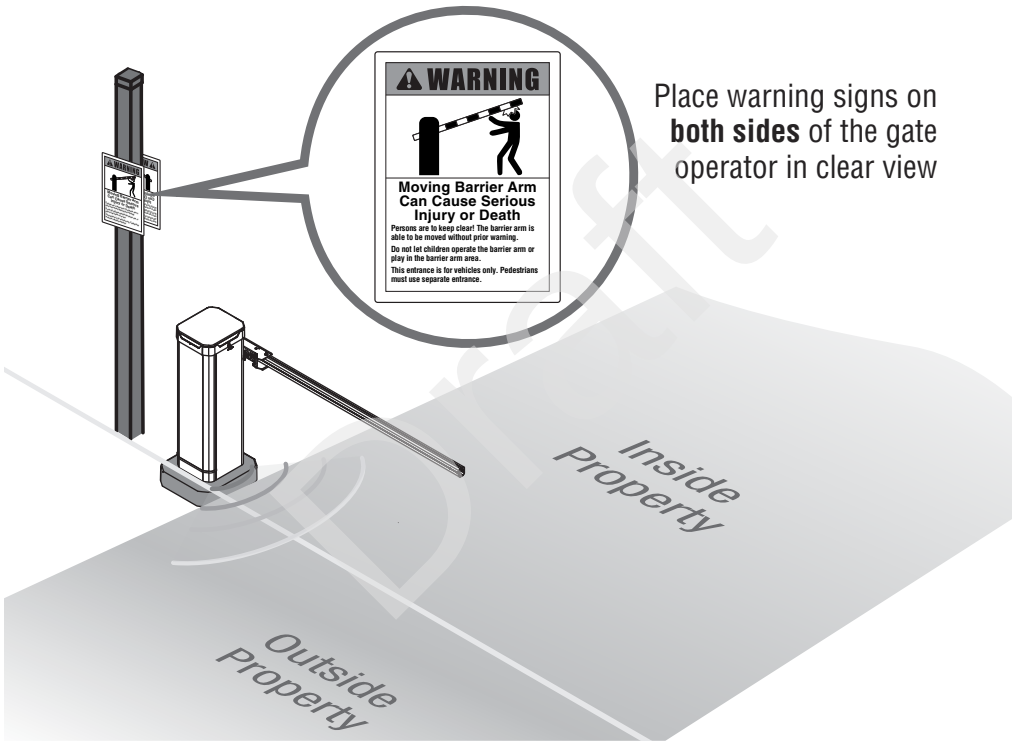
12 Close and Secure Cabinet

Before securing the door, follow the instructions in the Adjustment section to adjust the limits, speed, and force.

1. Close the operator cabinet door.
2. Close the operator cover.
3. Lock the operator.

13 Install Warning Signs

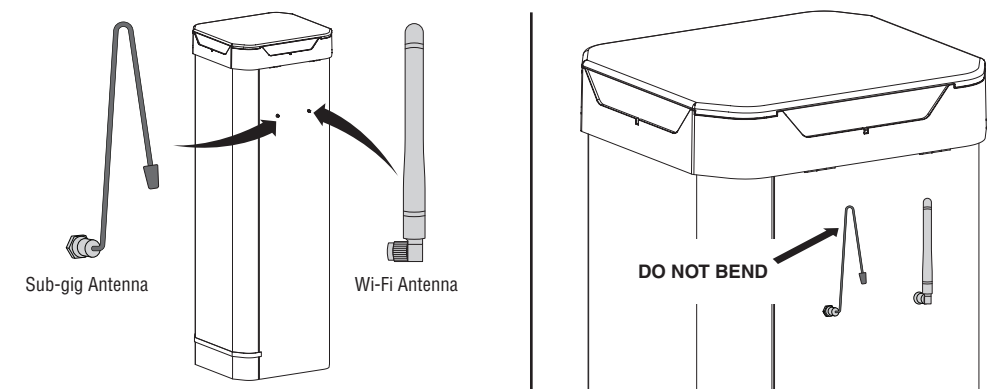
Installers **MUST** install the UL required warning signs. The signs **MUST** be installed in plain view on **both sides** of each barrier arm gate operator installed. Use the fastening holes in each corner to permanently secure the sign.



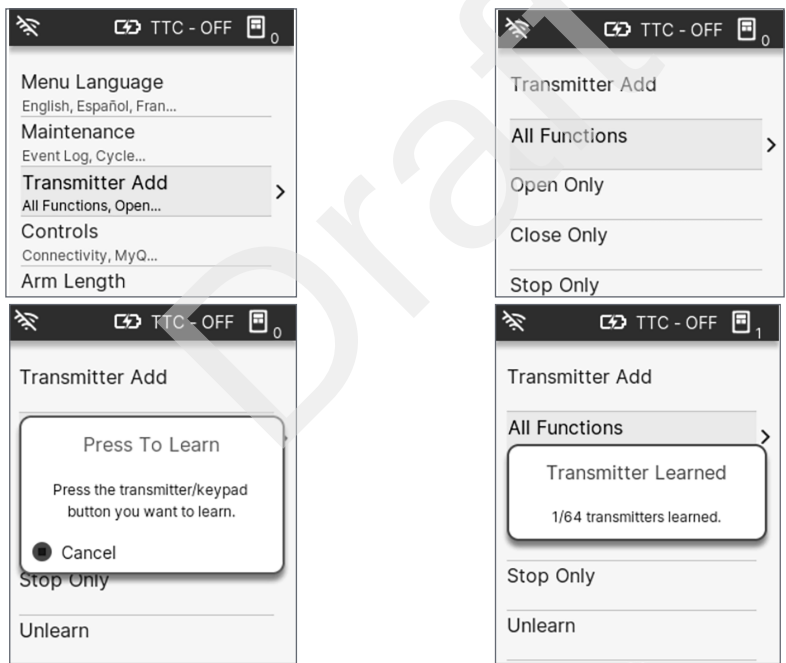
Place warning signs on **both sides** of the gate operator in clear view

Programming

Antenna Assembly



Transmitters (Not Provided)



A total of 50 Security+ 2.0® remote controls or KPW250 keypads and 2 keyless entries (1 PIN for each keyless entry) can be programmed to the operator. When programming a third keyless entry to the operator, the first keyless entry is erased to allow the third keyless entry to be programmed. When the operator's memory is full, it exits the programming mode and the remote control is not programmed. The memory needs to be erased before programming any additional remote controls.

NOTE: If installing an 86LM to extend the range of the remote controls, DO NOT straighten the antenna.

Programming (continued)

There are 3 different options for programming the remote control, depending on how you would like the remote control to function. Choose a programming option:

Option	Description	Programming Steps
Single button as OPEN only	Program a single button on the remote control for open only. The Timer-to-Close can be set to close the gate.	1. On the LCD Menu, navigate to "Transmitter Add". Press the Enter button to scroll to "Open Only". 2. Select "Learn" and press the Enter button. 3. When the LCD Menu prompts with the message "Press to Learn", press the remote control button that you would like to program.
Single button (SBC) as OPEN, CLOSE, and STOP	Program one remote control button as an open, close, and stop.	1. On the LCD Menu, navigate to "Transmitter Add". Check that "All Functions" is displayed on the top line. 2. Select "Learn" and press the Enter button. 3. When the LCD Menu prompts with the message "Press to Learn", press the remote control button that you would like to program.
Three separate buttons as OPEN, CLOSE, and STOP	Program each remote control button as an open, close, and stop.	1. On the LCD Menu, navigate to "Transmitter Add". 2. Select "Open Only", "Close Only", or "Stop Only", depending on the desired function. 3. Select "Learn" and press the Enter button. 4. When the LCD Menu prompts with the message "Press to Learn", press the remote control button that you would like to program.

The operator automatically exits learn mode (the LCD displays "Transmitter Learned") if programming is successful. To program additional Security+ 2.0® remote controls or remote control buttons, repeat the programming steps above.

NOTICE: This device complies with Part 15 of the FCC rules and Industry Canada's license-exempt RSSs. 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.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device must be installed to ensure a minimum 20 cm (8 in.) distance is maintained between users/bystanders and device.

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules and Industry Canada ICES standard. 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 communications. However, there is no guarantee that 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 or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. -
- Consult the dealer or an experienced radio/TV technician for help.

myQ® Smart Facility Access

One Platform allows you to manage access for unlimited facilities, users and vehicles.

The myQ® Smart Facility Access allows you to control all your access points in the facility from the myQ® website application from anywhere. Monitor and control your vehicular access doors, gated entry locations, and even dock positions from a universal platform. myQ® technology uses an Ethernet, Wi-Fi, or 900MHz signal connection to communicate securely from your connected devices to myQ® enabled operators and accessories.

Setup a myQ® Smart Facility Access Account

NOTE: If you have an existing myQ® account, your myQ® Business™ account will have the same password.

We have made the account setup process easier than ever. It's completely self-service. Go to account.myq.com and begin the process.

1. Select Country, Name, email, and create password.
2. Verify the email with a 4-digit code.
3. Select property manager or partner.
4. To create a myQ® Facility, select property type, property name, property manager information. You are now ready to access your dashboard and all other myQ® features.
5. Set up the Facility and add users and groups to provide access to the Facility (refer to the available Help in myQ® Business™).

Programming (continued)

6. You will get a welcome email from LiftMaster. Accept the invitation and register or login to your account.
7. Set up the Facility and add users & groups to provide access to the Facility (refer to the available Help in myQ® Business™).
8. Follow on-screen prompts to get your Gate Operator and additional devices connected.

Connect Internet

The gate operator can connect to the Internet with a wired connection, a Wi-Fi® (wireless) connection, or a 900MHz gateway connection. See "Internet Requirements" on page 9.

OPTION 1 WIRED CONNECTION – ETHERNET (DHCP AND STATIC)

The Local Area Network (LAN) port is a 10/100 Ethernet interface with an RJ45 jack for connecting the gate operator to a hub, switch, or router in order for it to gain connectivity to the Internet. Use a straight, (i.e., non-crossover) Cat5e, or Cat6 cable to connect to a local hub, switch or router. This type of cable is referred to as an Ethernet cable in this manual.

1. Connect an Ethernet cable from the hub, switch, or router to the LAN port on the main control board of the operator.
2. On the LCD Menu, navigate to "Controls > Learn". The Ethernet wired connection will turn on with default or previously saved settings. The wired connection will remain enabled on every power cycle until disabled or another connection option is selected. When connected properly and enabled, the Ethernet icon will be shown on the LCD display.
3. Enabling the Wired Connection on the LCD menu will activate the operator's Wi-Fi Access Point Page to allow for further configuration of the Wired Connection. On your mobile device, go into Wi-Fi configuration and look for the gate operator's Wi-Fi network. The Wi-Fi Access Point Page will be "MyQ-xxx" where xxx is the last three digits of your gate operator's CP#.

NOTE: Once the learning process is started any previous connection, configuration, or credential will be deleted.

4. If "Internet may not be available" message is received, select "keep Wi-Fi connection".
5. Open a web browser (e.g., Edge, Chrome) and enter either **setup.myqdevice.com** or **192.168.1.1**.
Note that if you exit the gate operator's MyQ-xxx Wi-Fi network, you will need to open a new web browser and enter setup.myqdevice.com or 192.168.1.1 to restart the configuration after re-connecting to the gate operator's MyQ-xxx Wi-Fi network. If page cannot be reached with myqdevice.com, try 192.168.1.1.
6. Select Start to see the current Internet connection method.
7. For DHCP, select Ethernet DHCP and click on "Next" icon.
8. For Static, select Ethernet Static and click on "Next" icon. Then fill in the information and click on "Next" icon.
9. If the operator's Ethernet icon is not active or if the phone is still on the "connecting to Internet" screen after 3 minutes, check the connections on operator and Ethernet hub. Resolve and repeat from Step 1. When connected properly, there will be a congratulation message indicating that your device is connected. The Ethernet icon will be solid on the operator's LCD display.
10. From your mobile device, exit the MyQ-xxx Wi-Fi Access Point Page.

OPTION 2 WI-FI® (WIRELESS)

1. On the LCD Menu, navigate to "Controls > Learn". The Wi-Fi connection will turn on with default or previously saved settings. The Wi-Fi connection will remain enabled on every power cycle until disabled or another connection option is selected. When connected properly and enabled, the Wi-Fi icon will be shown on the LCD display.
2. Enabling the Wi-Fi Connection on the LCD menu will activate the operator's Wi-Fi Access Point Page to allow for further configuration of the Wi-Fi Connection. On your mobile device, go into Wi-Fi configuration and look for the gate operator's Wi-Fi network. The Wi-Fi Access Point Page will be "MyQ-xxx" where xxx is the last three digits of your gate operator's CP#.
3. If "Internet may not be available" message is received, select "keep Wi-Fi connection".
4. Open a web browser (e.g., Edge, Chrome) and enter either **setup.myqdevice.com** or **192.168.1.1**.

Note that if you exit the gate operator's MyQ-xxx Wi-Fi network, you will need to open a new web browser and enter setup.myqdevice.com or 192.168.1.1 to restart the configuration after re-connecting to the gate operator's MyQ-xxx Wi-Fi network. If page cannot be reached with myqdevice.com, try 192.168.1.1.

Programming (continued)

5. Select Start to see the current Internet connection method.
6. Select Wi-Fi and click on "Next" icon.
7. Select your site's Wi-Fi network.
8. Enter you Wi-Fi network password and then click on "Next" icon.
9. Click "Next" icon again to acknowledge update.
10. If the operator's Wi-Fi icon is not active or if the phone is still on the "connecting to Internet" screen after 3 minutes, check the Wi-Fi router location and signal strength. Resolve and repeat from Step 1. When connected properly, there will be a congratulation message indicating that your device is connected. The Wi-Fi icon will be solid on the operator's LCD display.
11. From your mobile device, exit the MyQ-xxx Wi-Fi Access Point Page.

OPTION 3 CONNECT THROUGH LIFTMASTER INTERNET GATEWAY (NOT PROVIDED)

NOTE: When using a Liftmaster Internet Gateway, firmware updates of the operator will not be supported. It is recommended to setup the operator's Ethernet or Wi-Fi Internet connections to allow the operator to receive firmware updates. To program the operator to the LiftMaster Internet Gateway:

1. Connect an Ethernet cable between the LiftMaster Internet Gateway and the network router.
2. Connect power to the LiftMaster Internet Gateway.
3. Download the myQ® App.
4. Set up an account and follow the app instructions to add your gate operator.
5. On the LCD Menu of the gate operator, navigate to "Controls > myQ Gateway > Learn".
6. The LiftMaster Internet Gateway pairs to the operator if it is within range.

The gate operator can then be controlled through the myQ® App.

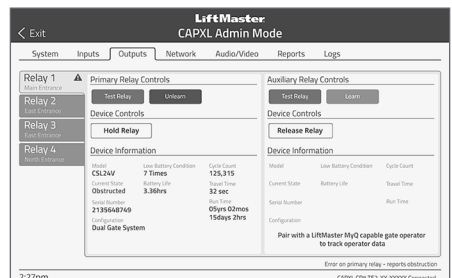


To Erase the Gateway:

1. On the LCD Menu, navigate to "Controls > myQ Gateway > Unlearn".
2. Select "Unlearn All" and confirm.
3. The LCD displays the message "Devices Unlearned".

CAP PRODUCT CONNECTED ACCESS PORTAL

The CAP product can communicate wirelessly to LiftMaster® DC vehicular barrier arm gate operators to send open commands, monitor gate position, and send email notifications if an error occurs in the operator (email notifications are configured in myQ® Business™). Multiple gate operators can be paired with CAP products - one for each primary and auxiliary relay. If using dual gates, program the CAP product to the primary operator.

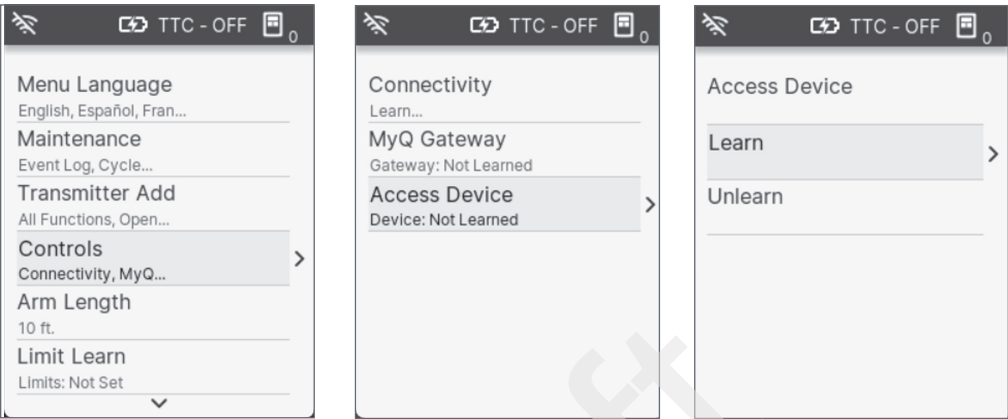


Programming (continued)

To Program the CAP Product:

1. Enter Admin Mode: See CAP product installation manual for instructions on entering Admin Mode.
2. Select Outputs and Relay: Select the Outputs tab. Then select the desired relay on the left-hand side.
3. On the LCD Menu of the gate operator, navigate to "Controls > Access Device > Learn".

NOTE: The operator times out of programming mode after 180 seconds.



4. Select the LEARN button on the display. The Learn button changes from blue to red. The CAP product beeps once and the gate operator LCD display Device Learned, indicating programming is successful.
5. Validate functionality by selecting Test Relay on the CAP product display.

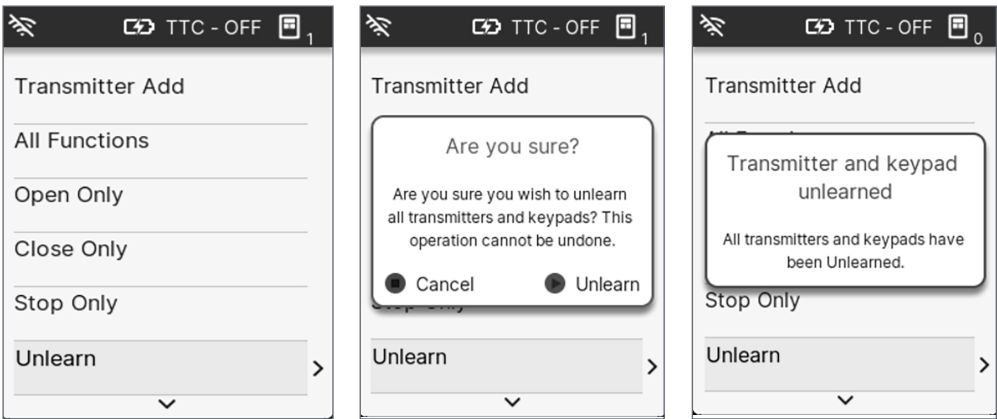
For more information, refer to the CAP product documentation.

myQ® Business™

To find out more on how to simply secure all of your access points with an easy to manage integrated system, myQ Business, please visit: www.myqbusiness.com.

ERASE ALL TRANSMITTER AND KEYPAD CODES

1. On the LCD Menu, navigate to "Transmitter Add > All Functions > Unlearn All > Enter".
2. Enter "Unlearn All" to confirm on the LCD menu.
3. The LCD will display the message "Transmitters Unlearned".



Programming (continued)

UNLEARN MONITORED SAFETY DEVICES

1. Remove the safety device wires from the terminal block.
2. To remove all Monitored Safety Devices, on the LCD Menu, navigate to "Eyes, Edges, Loops > Unlearn All Monitored > Enter".
3. Confirm removal of all.
4. To remove a specific Monitored Safety Device, first remove the safety device wires from the terminal block. On the LCD menu, navigate to "Eyes, Edges, Loops > Learn > Enter".
5. This will re-learn all remaining connected safety devices.

Draft

Operation

Modes of Operation

The following are example setups for the barrier arm gate operator. Your specific site requirements may be different. Always setup the operator system to the site requirements, including all necessary safety devices.

RESIDENTIAL: One to four residential homes sharing a gated entrance/exit, allowing vehicle access trumps security concerns.

COMMERCIAL/GENERAL ACCESS: A residential community (more than four homes) having one or more gated entrances/exits, allowing vehicle access trumps security concerns.

COMMERCIAL: Business site where security (gate closed) is important.

INDUSTRIAL: Large business site where security is required.

Setting	Residential	Commercial/General Access	Commercial	Industrial
Quick Close switch setting	Normally set to OFF. Normal gate close (timer or control).	Normally set to OFF. Normal gate close (timer or control).	Normally set to OFF. Normal gate close (timer or control).	Set to ON, so that gate closes immediately after vehicle passes CLOSE EYES/Interrupt loop.
AC Fail Open switch setting	Normally set to BATT. Run on battery if AC power fails.	Normally set to BATT. For local jurisdiction requirement, set to OPEN so that the gate opens approximately 15 seconds after AC power fail.	Normally set to BATT. Run on battery if AC power fails.	Normally set to BATT. Run on battery if AC power fails.
Low Battery Menu setting	Normally set to OPEN. If powered from battery and battery is low, gate automatically opens and stays open.	Normally set to OPEN. If powered from battery and battery is low, gate automatically opens and stays open.	Normally set to CLOSE. If powered from battery and battery is low, gate stays closed.	Normally set to CLOSE. If powered from battery and battery is low, gate stays closed.
Anti-Tail switch setting	Normally set to OFF. CLOSE EYES/Interrupt loop reverses a closing gate.	Normally set to OFF. CLOSE EYES/Interrupt loop reverses a closing gate.	Set to ON. In attempt to prevent vehicle tailgating, CLOSE EYES/ Interrupt loop pauses a closing gate.	Set to ON. In attempt to prevent vehicle tailgating, CLOSE EYES/ Interrupt loop pauses a closing gate.
Aux Relay Out – Open Limit Switch	For DUAL-GATE site, set to ON for gate that delays upon opening.	Use with SAMS (Sequence Access Management System).	1. Use with SAMS (Sequence Access Management System). 2. Connect "Gate Open" indicator (e.g. light).	1. Use with SAMS (Sequence Access Management System). 2. Connect "Gate Open" indicator (e.g. light).
Aux Relay Out – Close Limit Switch	Typically not required.	Typically not required.	Connect "Gate Close/ Secure" indicator (e.g. light).	Connect "Gate Close/ Secure" indicator (e.g. light).
Aux Relay Out – Gate Motion	Attach alert signal (audible or visual alert system).	Attach alert signal (audible or visual alert system).	Attach alert signal (audible or visual alert system).	Attach alert signal (audible or visual alert system).
Aux Relay Out – Pre-Motion Delay	Attach alert signal (audible or visual alert system).	Attach alert signal (audible or visual alert system).	Attach alert signal (audible or visual alert system).	Attach alert signal (audible or visual alert system).

Operation (continued)

Setting	Residential	Commercial/General Access	Commercial	Industrial
Aux Relay Out – Tamper	Attach alert signal (audible or visual alert system) to indicate if gate is manually tampered with by being pushed off of close limit.	Attach alert signal (audible or visual alert system) to indicate if gate is manually tampered with by being pushed off of close limit.	Attach alert signal (audible or visual alert system) to indicate if gate is manually tampered with by being pushed off of close limit.	Attach alert signal (audible or visual alert system) to indicate if gate is manually tampered with by being pushed off of close limit.
Cycle Quantity Feedback	Use during servicing only to determine operator cycles.	Use during servicing only to determine operator cycles.	Use during servicing only to determine operator cycles.	Use during servicing only to determine operator cycles.
Fire Dept Open Input	Typically not required.	Connect emergency access system (Knox box switch, SOS system, etc.).	Typically not required.	Typically not required.

Operator Alarm

PRE-WARN ALARM

The operator will sound the Pre-Warn Alarm when the operator gate begins to open.

This setting can be changed within the LCD menu.

To change this setting, on the LCD menu, navigate to the Alarm and choose OFF or ON.

Maintenance

WARNING

To reduce the risk of SEVERE INJURY or DEATH:

- READ AND FOLLOW ALL INSTRUCTIONS.
- TEST THE GATE OPERATOR MONTHLY. The barrier arm MUST reverse on contact with an object, or by hand. Barrier arm must reverse when noncontact sensors are activated. After adjusting the force, speed, or the travel, retest the gate operator. Failure to adjust operator properly can increase the risk of INJURY or DEATH.
- ANY maintenance to the operator or in the area near the operator MUST NOT be performed until disconnecting the electrical power (AC or solar and battery) and locking-out the power via the operator power switch. Upon completion of maintenance the area MUST be cleared and secured, at that time the unit may be returned to service.
- Disconnect power at the fuse box BEFORE proceeding. Operator MUST be properly grounded and connected in accordance with national and local electrical codes. **NOTE:** *The operator should be on a separate fused line of adequate capacity.*
- For continued protection against fire, replace ONLY with fuse of same type and rating.
- KEEP GATES PROPERLY MAINTAINED. Read this manual. Have a trained gate systems technician make repairs to gate hardware.
- ALL maintenance MUST be performed by a trained gate systems technician.
- NEVER let children operate or play with gate controls. Keep the remote control away from children.
- Activate gate ONLY when it can be seen clearly, is properly adjusted and there are no obstructions to gate travel.
- ALWAYS keep people and objects away from the gate. NO ONE SHOULD CROSS THE PATH OF THE MOVING GATE.
- To reduce the risk of FIRE or INJURY to persons use ONLY LiftMaster part 29-NP712 for replacement batteries.
- The entrance is for vehicles ONLY. Pedestrians MUST use separate entrance.
- If forecasted wind speeds are greater than 60 mph, the gate arm should be uninstalled to minimize the risk of damage.
- Call 1.800.528.2806 with any questions.
- **SAVE THESE INSTRUCTIONS.**

CAUTION

- ALWAYS wear protective gloves and eye protection when changing the battery or working around the battery compartment.

Maintenance (continued)

Maintenance Chart

Disconnect all power (AC, solar, battery) to the operator before servicing.

NOTE: Avoid servicing the operator, main control board, motor board, and electronics during rain to avoid damage from water.

Description	Task	Check at least once every		
		Every Month	Every 3 Months	Every 6 Months
Safety Devices	Check and test inherent (built into the operator) and external devices for proper operation.	X		
Warning Signs	Make sure they are present and replace if worn or broken, see "Accessories" on page 57.	X		
Spring Module	Inspect for wear or damage. Lubricate with a dry lubricant such as WD-40 dry lube with PTFE.		X	
Arm Bracket System	Inspect for wear or damage.		X	
Accessories	Check all for proper operation.		X	
Electrical	Inspect all wire connections.		X	
Chassis Mounting Bolts	Check for tightness.		X	
All Bolts	Check for any loose bolts.		X	
Operator	Inspect for wear or damage.		X	
Diagnostic History	Review diagnostic history for identification of intermittent problems.		X	
Batteries	Inspect and test batteries. Replace if needed.			X

NOTES:

- Replace spring module after 1.5 million cycles.
- High cycle usage may require more frequent maintenance checks.
- Limits may need to be adjusted after any adjustments to the arm bracket.
- It is suggested that while at the site voltage readings be taken at the operator. Using a digital voltmeter, verify that the incoming voltage to the operator is within ten percent of the operator's rating.
- Reset counterbalance spring assembly any time the arm bracket is removed or adjusted.

Batteries

Batteries degrade over time depending on temperature and usage. The operator alarm beeps 3 times with a command if the battery is low. Batteries do not perform well in extremely hot or cold temperatures. For best performance, the batteries should be replaced every 2 years. Use only LiftMaster part 29-NP712 for replacement batteries. The batteries contain lead and need to be disposed of properly.

The operator comes with two 7AH batteries. Two 33AH batteries (A12330SGLPK), with battery harness model K41-0102-000 (not provided), may be used in place of the 7AH batteries.

Drive Train

Troubleshooting



WARNING

For continued protection against fire:

- Replace **ONLY** with fuse of same type and rating.

Diagnostic Codes

TO VIEW THE CODES

1. On the LCD display, navigate to "Maintenance > Event Log > ENTER".
2. Scroll down the list to see the Event Log list.
3. Press Enter to view the details of the highlighted Event Code.

TO SCROLL THROUGH THE SAVED CODES

The operator will only keep track of up to 50 codes, then will start saving over the oldest codes as new codes occur.

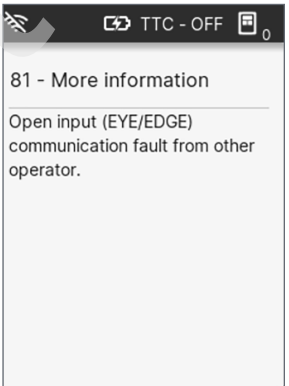
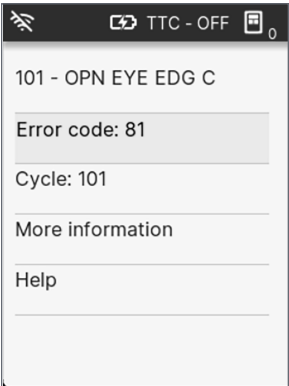
See "Diagnostic Codes Table" on page 63.

TO EXIT

Press the STOP button to exit. The display will also time out after two minutes of inactivity.

TO CLEAR THE EVENT LOG HISTORY

1. On the LCD display, navigate to "Maintenance > Event Log > Clear All - ENTER".
2. Press Enter to confirm.



Solar

Solar Setup

SOLAR PANEL(S)

SOLAR PANELS ARE NOT PROVIDED. SEE ACCESSORIES.

NOTE: The use of photoelectric sensor heaters (model LMTBUL) is NOT recommended in solar applications.

Solar Application Requirements

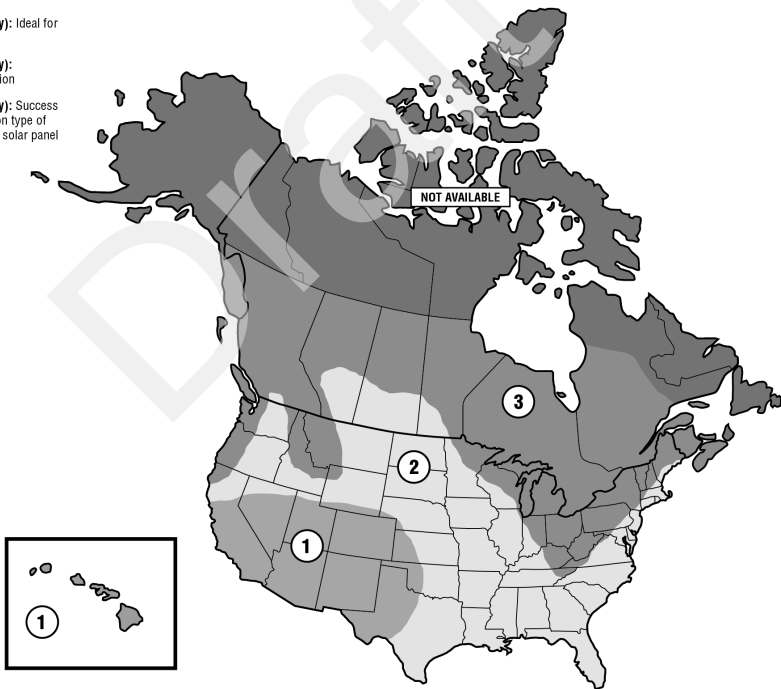
Solar rating: 20W MIN - 60 Watt MAX, 24V

- A minimum of two 10 Watt solar panels in series (Model SP10W12V).
- A maximum of six 10 Watt solar panels (Model SP10W12V).
- A heater cannot be used with a solar application.

SOLAR ZONES

Solar panel recommendations are based upon the average solar radiation and the temperature effects on batteries in the given zones as shown on the map below. Local geography and weather conditions may require additional solar panels. Solar powered gate operator installations are not supported in northern climates due to cold weather and a reduced number of hours of sunlight during the winter months. The cycles/day ratings are approximations. Ratings vary based on gate construction, installation, and temperature. Solar panels cannot be installed in areas that experience long periods of heavy fog, lake effect

- 1 **ZONE 1 (6 Hours of Sunlight/Day):** Ideal for solar application
- 2 **ZONE 2 (4 Hours of Sunlight/Day):** Recommended for solar application
- 3 **ZONE 3 (2 Hours of Sunlight/Day):** Success of solar application will depend on type of gate operator and location of the solar panel
- NOT AVAILABLE



Solar (continued)

Solar Current Draw

SOLAR USAGE GUIDE

All performance metrics are estimates and are subject to change at any time. Actual results vary due to variables specific to the site.

NOTE: For additional details and specifications on solar usage, please refer to liftmaster.com.

NOTE: The use of photoelectric sensor heaters (model LMTBUL) are NOT recommended in solar applications.

PBG24DC & CBG24DC ESTIMATED SOLAR CYCLES PER DAY 12ft arm, Medium Speed						
	Zone 1 (6 Hrs Sunlight/Day)		Zone 2 (4 Hrs Sunlight/Day)		Zone 3 (2 Hrs Sunlight/Day)	
	7AH batteries	33AH batteries	7AH batteries	33AH batteries	7AH batteries	33AH batteries
20 Watt Panels	86	131		15		
40 Watt Panels	335	568	121	253		9
60 Watt Panels	470	1000	197	532		103

Solar (continued)

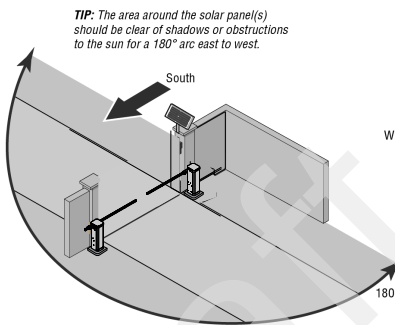
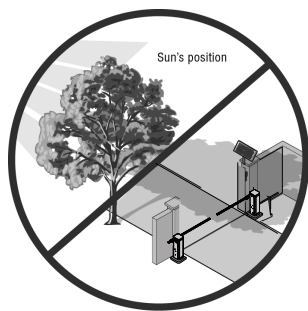
Solar Installation

POSITION

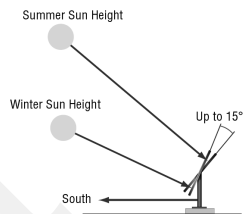
The location of the panel(s) is critical to the success of the installation. In general, the panel(s) should be mounted using the provided angle bracket facing due south. The solar panel(s) should be mounted in an area clear of all obstructions and shade from buildings and trees. If the panel(s) is not casting a shadow, the battery is not being charged.

NOTE: Tall trees or buildings that do not shade the solar panel(s) in the summer could shade the solar panel(s) during the winter months when the sun sits lower in the sky.

MAXIMUM WIRE LENGTH			
AMERICAN WIRE GAUGE (AWG)	WATTS OF PANELS		
16	(71.6 m)	(35.1 m)	(24.4 m)
14	(114.3 m)	(57.9 m)	(38.1 m)
12	(182.9 m)	(91.4 m)	(61 m)
10	(286.5 m)	(144.8 m)	(96 m)
Chart assumes: copper wire, 65°C, 5% drop, 30V nominal			



TIP: The area around the solar panel(s) should be clear of shadows or obstructions to the sun for a 180° arc east to west.



TIP: To optimize the system for winter operation the angle can be increased an additional 15° (solar panel(s) sits more vertical).

INSTALLATION

Solar panel(s) MUST be installed facing south. Use a compass to determine direction. Below are general instructions for installing the solar panel(s). Your installation may vary slightly depending on the solar panel purchased.

1. Position the mounting bracket on the mounting surface. Mark and drill holes.
2. Secure the solar panel to the mounting bracket using the hex bolts, hex nuts and washers provided.
3. Secure the solar panel to the mounting surface using lag screws provided.

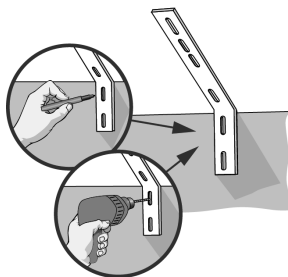
WIRE THE SOLAR PANELS AND BATTERIES

20 Watts min. - 60 Watts max. for solar applications.

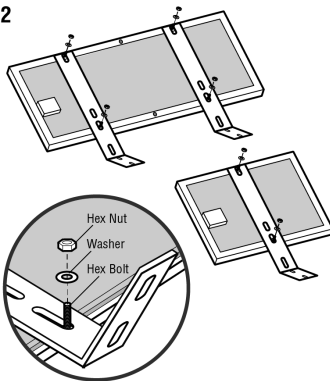
NOTE: 33AH batteries are strongly recommended for optimal solar performance.

1. Connect (+) wire from solar panels to (+) pin on CHARGE IN connector on the main control board.
2. Connect (-) wire from solar panels to (-) pin on CHARGE IN connector on the main control board.
3. Set the WALL XFMR/SOLAR switch to SOLAR as shown on page 55.

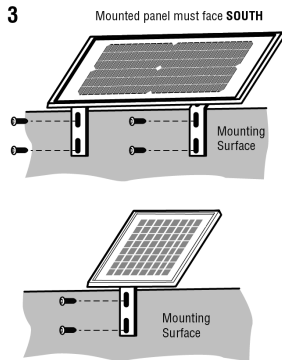
1



2



3



Solar (continued)

