



Installation and Reference Manual

# SlideDriver™

## TYM-HYD VF2/3

(X3)

Hydraulic slide gate operator with Smart Touch Controller



**Tymetal Corp.**  
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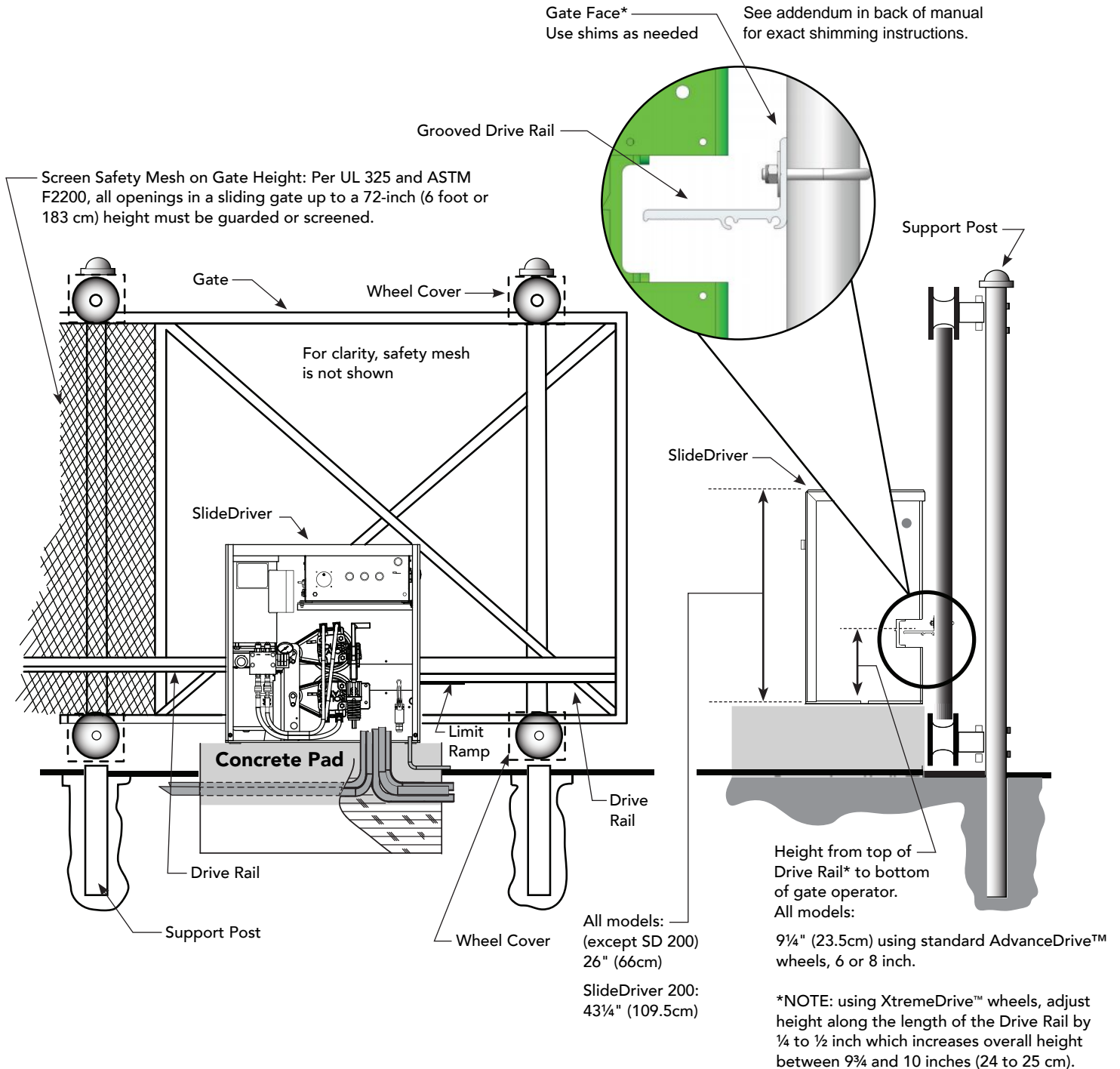
Dealer/Installer: \_\_\_\_\_

Phone: \_\_\_\_\_

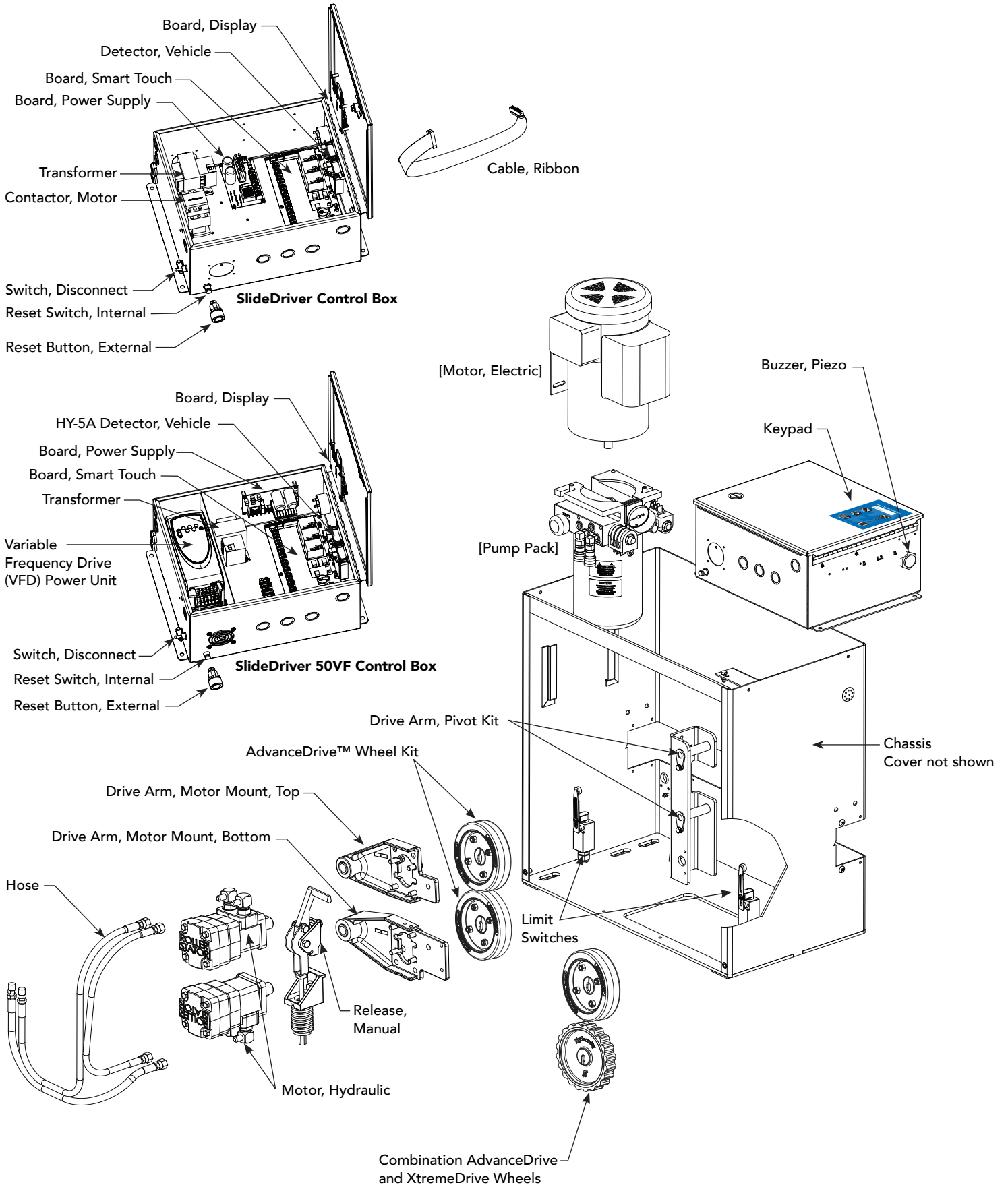
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# SlideDriver/SlideDriver 50VF Site Installation Overview



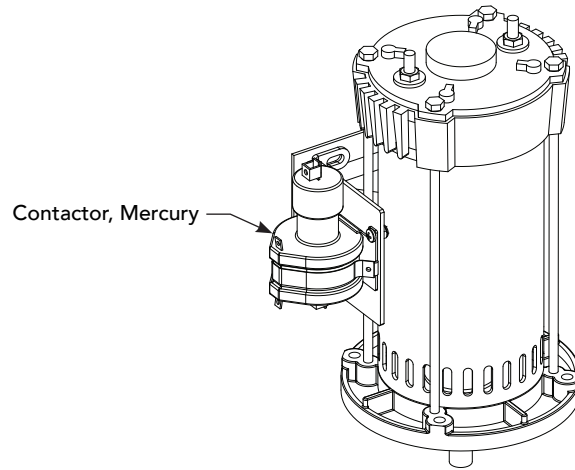
# SlideDriver/SlideDriver 50VF Components



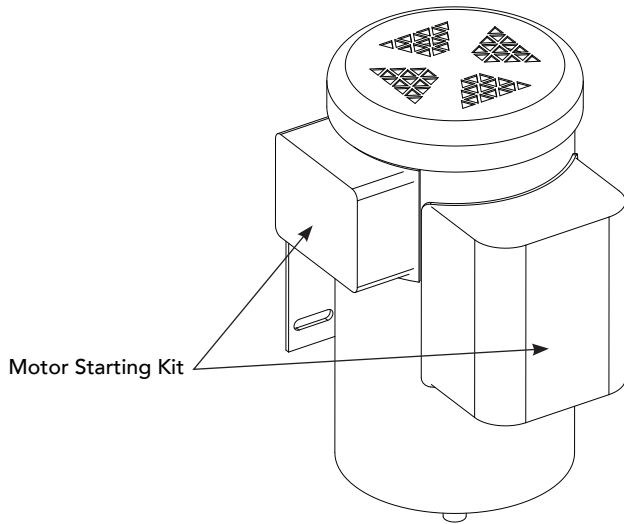


# SlideDriver/SlideDriver 50VF Components

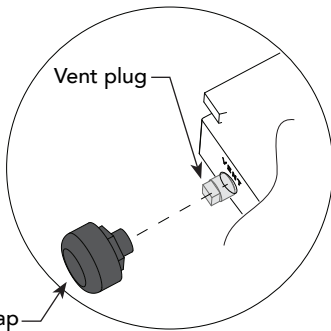
Motor, Electric, DC



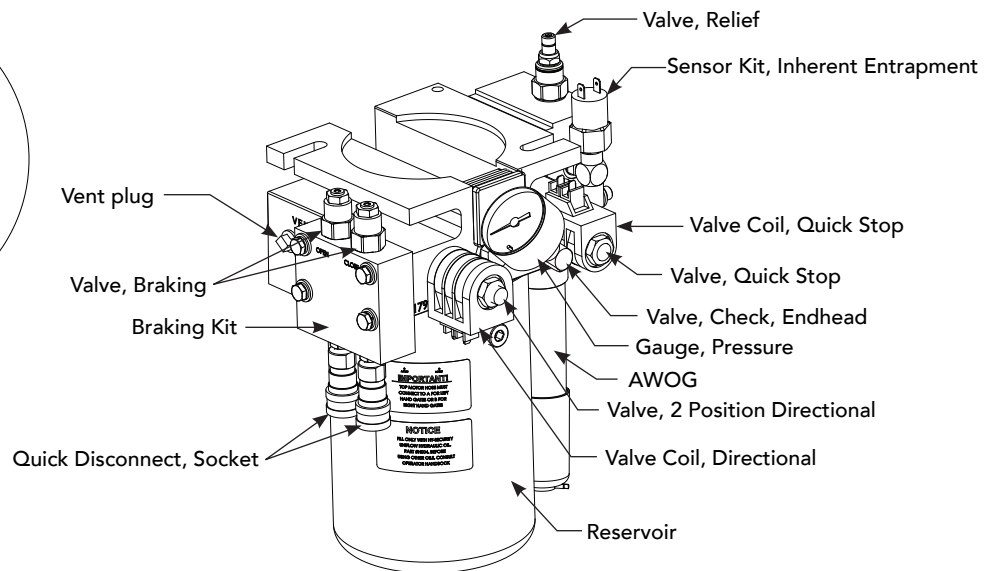
Motor, Electric, AC



Motor Starting Kit



Breather cap





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# Welcome to HySecurity

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Thank you for purchasing our premium SlideDriver™ gate operator. HySecurity Gate, Inc. has manufactured some of the finest, sturdiest, most innovative, and reliable hydraulic gate operators since the 1970s. We use the same hydraulic technology common in the aircraft industry while incorporating software capabilities that far exceed the competition.

All operator designs are tested for hundreds of thousands of cycles before being released to the market. Slide, swing, traffic barrier, fortified crash barrier gate and vertical lift operators have all received rigorous testing and certification. Security, low maintenance, flexible configuration, and overall toughness are the foremost criteria for all HySecurity products.

Our commitment to quality and innovation will become evident as the features and performance of the expertly engineered and manufactured SlideDriver become familiar to you. Thank you again for the confidence you've shown in becoming part of the HySecurity family and in choosing a premium, industry-leading product.



**HySecurity Gate, Inc. Headquarters in Kent, WA**

# CONTACT INFORMATION

Qualified HySecurity distributors are experienced and trained to assist in resolving any problems. For the name of a qualified distributor near you, call HySecurity at 800-321-9947.

Before contacting your distributor or HySecurity Technical Support, obtain the serial number of your operator.

For information about HySecurity training for installers, maintenance personnel, and end users, refer to the company website at [www.hysecurity.com](http://www.hysecurity.com).

# NOTICES AND BULLETINS

Installers should visit HySecurity's online Technical Support page at [www.hysecurity.com](http://www.hysecurity.com) or contact HySecurity prior to installing product to make sure they have received the most up-to-date information.

# SUPPLEMENTAL DOCUMENTS

The product literature is comprehensive and contains information needed to plan, install, operate and maintain your gate operator. Additional general information concerning HySecurity gate operators can be obtained from the following:

- HySecurity website [www.hysecurity.com](http://www.hysecurity.com) - Contains links to the product catalog, product order form, operator manuals, operator software downloads, technical support bulletins and other useful information.
- S.T.A.R.T. - Smart Touch Analyze and Retrieve Tool - User's Guide (D0049) detailing the extensive software, diagnostic and troubleshooting capabilities of the Smart Touch Controller board.
- Technical Bulletins (as applicable).

**NOTE:** Technical Bulletins are automatically issued to registered users of HySecurity products. The product warranty registration card can be filled out online at [www.hysecurity.com](http://www.hysecurity.com).

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# IMPORTANT SAFETY INFORMATION



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Read all the product safety information prior to installation. Automatic gate operators move the gate with high force and can cause serious injury and death! Make sure the automatic gate operator is installed to reduce the risks of entrapment. Verify the gate operator is installed to comply with all safety standards and local and federal regulations.

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Understand that you as the site designer, installer, maintenance crew, or owner/user must consider the risks associated with gate operators. Be sure to take responsibility, read, and follow the *Important Safety Information* in this manual and review all the literature that accompanies the product.

Hazards, associated with automatic gates, can be reduced with proper site design, installation, and use. Installers, maintenance crews, and owners/users must read and follow the safety requirements found in the HySecurity product manuals.

It is important that only qualified installers handle the installation of the HySecurity equipment and gate operator. A “qualified” installer has one of the following:

- A minimum of three years experience installing similar equipment
- Proof of attending a HySecurity Technical Training seminar within the past three years
- Significant manufacturer endorsements of technical aptitude in gate operator installation and operation

Underwriter Laboratories (UL) and the American Society for Testing and Materials (ASTM) are responsible for current safety standards and regulations regarding automatic vehicular gate operators. To pass certification, all aspects of gate operator and gate installation must comply with the appropriate safety standards.

For the most up-to-date ASTM F2200 Gate and Fence Standards, refer to [www.astm.org](http://www.astm.org).  
For UL 325 Safety Standards, refer to [www.ul.com](http://www.ul.com).



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A moving gate or barrier arm, bollard, or wedge can cause serious injury or death.

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To reduce the risk of injury or death:

1. **READ AND FOLLOW ALL INSTRUCTIONS.** Read the gate operator's product manual and review all the product labels and literature prior to installing, operating, or maintaining the automatic gate operator.
2. Never let children operate or play with gate controls. Keep all remote controls, especially radio transmitters, away from children. Do not allow children to play on or around the gate or gate operators.
3. Always keep people and objects away from the gate. **NO ONE SHOULD CROSS THE PATH OF THE MOVING GATE.** Start the gate operator only when a gate's travel path is clear.
4. Test the gate operator monthly. The gate **MUST** reverse on contact with a rigid object or stop when an object activates the non-contact sensors. After adjusting the force or the limit of travel, retest the gate operator. Perform routine tests of the entrapment protection sensors, such as photo eyes and gate edges. Failure to adjust and retest the gate operator properly can increase the risk of injury or death.
5. Use the emergency release only when the gate is not moving.
6. **KEEP GATES PROPERLY MAINTAINED.** Read the product manuals. Have a qualified service person make repairs to gate hardware and replace batteries in accessory or entrapment sensory devices on a regular basis.
7. The automated gate entry is for vehicle use only. Pedestrians must use a separate entrance. Make sure a separate walk-through entrance is nearby. Make certain a clear pedestrian path is designated and signs direct pedestrians to the walk-through gate.
8. Install the supplied **WARNING** signs on the inside and outside of the gate or barrier gate/operator so they are clearly visible from both the secure and public sides. Installing the signs is a requirement for UL 325 compliance.

## Safety - Additional Installer Responsibility

- Verify the gate operator usage class for the site. For all gate operators other than Crash-rated, refer to **Identifying Gate Operator Category and Usage Class** in this product manual. Install the operator only when the gate operator class is correct for the site, size, and type of gate.
- The gate operator must be properly grounded and the incoming power voltage must match the voltage label on the junction box.
- Install an automatic operator only on gates that comply with ASTM F2200 Gate and Fence Standards. Screen or enclose openings in the gate per UL 325 Safety Standards which include:
  - ◆ All horizontal slide gates must guard or screen openings from the gate's base support to a minimum height of 6 feet (183 cm) above the ground. This must prevent a sphere of 2¼-inches (57 mm) in diameter from passing through an opening in the gate or the adjacent fence that is covered in the gate's open position.
  - ◆ Physical stops must exist in the gate construction to prevent over-travel in both directions and, for slide gates, guard posts must be installed to prevent the gate from falling in the event of a roller failure.

## Safety - Installer's Responsibility, continued

- Before attaching the operator to the gate, move the gate or barrier gate in both directions. Make sure it is level and moves freely. A gate or barrier gate that moves easily reduces strain on operator components. Gravity should play no part in the opening or closing of a slide gate.
  - Never over-tighten a clutch or pressure relief valve to compensate for a stiff or damaged gate.
  - Make sure all exposed pinch points, rollers and wheels are guarded.
  - Reduce the risk of entrapment throughout the entire travel path by making sure the gate is installed in a location which ensures the required clearance between the gate and adjacent structures when opening or closing. On slide gates, minimize the parallel gap between the gate and the fence.
  - Install the gate operator on the secure (non-public) side of the gate. Note that swing gates cannot open into public areas.
  - Install external entrapment protection sensors so pedestrians are protected from entrapment in both directions of gate travel and all hazard areas are fully protected. On hydraulic gates, set the pressure relief valve at the lowest allowable setting that will reliably operate the gate. The pressure relief valve controls the applied force of the operator and the sensitivity of the inherent entrapment sensor (IES). Note that no IES exists in the StrongArm operator.
  - Never disable the Warn Before Operate buzzer. This buzzer provides an alert that the gate is about to move.
  - Mount access control devices beyond reach of the gate. The control devices that operate the gate must:
    - ◆ Be located in a clear line of sight to the gate. Locate controls (Open, Close, Stop/Reset) where a user will have a clear view of the gate.
    - ◆ Be mounted beyond 6 feet (183 cm) of the gate, to prevent users from touching or accessing the gate while operating the controls. People attempting to access the controls by reaching through or around the gate can be seriously injured or killed by the moving gate.
    - ◆ Incorporate a security feature to prevent unauthorized use.
    - ◆ Connect radio and other remote access (non-resetting controls) to the RADIO OPTIONS terminal.
  - Open and close the gate to confirm that it was properly installed and to ensure reduced risk of entrapment. Verify the clearance between the gate and adjacent structures per UL 325 Safety Standards. Have a qualified technician test the gate monthly.
  - When you complete the installation, demonstrate the safety features and operation of the gate operator to the end user:
    - ◆ Clearly explain and demonstrate the consequences of removing or defeating any of the safety features.
    - ◆ Remove the operator cover(s), and then turn the power on and off.
    - ◆ Manually release the gate. (Use the manual release only when the gate is NOT moving.)
    - ◆ Use the Emergency Stop Button. (If an emergency stop button is not available, show the user where the Stop button is located on the gate operator.)
- NOTE:** Gate operator instructions must be given to the owner per UL 325 Safety Standards.
- 
- ◆ Take photographs of the completed installation site and save it in your business files.



# Safety - Owner/User Responsibility

As the owner/user, you are responsible for the correct and safe installation, operation and maintenance of the SlideDriver gate operator. It is of the utmost importance that you read and follow the specific instructions and precautions found in the **IMPORTANT SAFETY INFORMATION** addressed in this manual. In addition, you must adhere to the safety standards of applicable federal, state, and local safety regulations, industry standards, and/or procedures.

**NOTICE:** For installations outside the United States, make sure that you follow the applicable international, regional, and local safety standards.

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- Automatic gates are for vehicular use only; provide and maintain walkways and signs to direct pedestrians to a separate walk-through entrance.
- An automatic gate can start at any time without warning; always keep people away from the gate area.
- Never let children operate or play with gate controls. Keep all remote controls, especially radio transmitters, away from children. Do not allow children to play on or around the gate, gate area, or gate operators.
- Learn how to turn the power on and off. Learn how to manually operate the gate.
- WARNING signs supplied with the gate operator must remain installed and clearly visible on both sides of the gate. The signs are required to maintain UL 325 compliance.
- Do not physically disable the warning buzzer and NEVER disconnect or cut its wires. The buzzer provides compliance with the Manual on Uniform Traffic Control Devices (MUTCD) standards. Disabling the warning buzzer may increase the risk of death or serious injury.
- Do not remove entrapment devices or any other safety features.
- Have a professional gate installer routinely inspect the gate hardware and test the entrapment protection sensors and overall gate operation. Have a qualified service person make repairs to gate hardware and equipment to keep the gate running smoothly.

## HAZARDOUS MATERIALS AND PROPER DISPOSAL

Be aware of the international, federal, and local codes in your area and how best to handle hazardous waste materials.

The pump pack fluid, found in all hydraulic HySecurity operators, can be recycled. Gear oil, found in HySecurity electromechanical gate operators, can also be recycled. If the fluids are mixed or contaminated with any solvents or other chemicals, they become hazardous waste. Hazardous waste requirements for storage and disposal must be followed.



If the gate operator has a battery backup system, the batteries contain materials that are considered hazardous to the environment. Proper disposal of the battery is required by federal law. In the U.S.A., refer to federal EPA guidelines for proper hazardous waste disposal.

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# IDENTIFYING GATE OPERATOR CATEGORY AND USAGE CLASS

The SlideDriver operator, according to UL 325 Safety Standards, falls in the horizontal slide, vertical lift and vertical pivot category for gate operators. Its usage class is determined by the area that the vehicular gate services.

Four different vehicular usage classes are defined by UL 325:

## Class I



Class I: Intended for use in garages or parking areas associated with a residence of one to four single families.

## Class II



Class II: Intended for use in a commercial location or building such as a multi-family housing units (five or more single family units) hotels, garages, retail stores or other buildings accessible by or intended to service the general public.

## Class III



Class III: Intended for use in an industrial location or building such as a factory or loading dock or other locations NOT accessible by or intended to service the general public.

## Class IV



Class IV: Intended for use in a guarded industrial location or building such as an airport security area or other restricted access locations, not servicing the general public, in which unauthorized access is prevented via supervision by security personnel.

# CHOOSING SECONDARY ENTRAPMENT PROTECTION

The site designer or installer must determine which secondary entrapment sensor devices will be installed with the SlideDriver operator to meet UL compliance. The type of entrapment sensor device systems are described below. For a complete listing of the requirements, refer to UL 325 Safety Standards.

**NOTICE:** SlideDriver is equipped with a primary, Type A, inherent entrapment sensor (IES) that complies with UL 325. Any impediment to gate travel causes the gate to stop and reverse.

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Usage Class	Primary Type Device	Secondary Type Device
Class I, II, III	A	B1, B2, C, or D
Class IV	A	B1, B2, C, D, or E

To comply with UL 325, refer to the chart and take the following steps:

1. Select the Usage Class according to the gate's locale and purpose.
2. The required UL 325 primary Type A sensor is an integral part of the SlideDriver system.
3. Based on the gate's usage class, choose Secondary Type Devices: B1, B2, C, D, or E.
  - To comply using B1 - install non-contact sensors (photoelectric sensor or the equivalent).
  - To comply using B2 - install contact sensors (edge sensor device or the equivalent).
  - To comply using a Type D device requires a CONSTANT HOLD push-button station. This CONSTANT HOLD push-button station must be the only device that opens and closes the gate. It can only be used where the gate and push button station will be monitored by personnel 24 hours a day in full view of the gate area. An automatic closing device (such as a timer, loop sensor, or similar device) must not be employed. A Warning placard stating, "WARNING - Moving Gate has the Potential of Inflicting Injury or Death - Do Not Start the Gate Unless the Path is Clear" must be placed adjacent to the gate operator controls.

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## CAUTION

While compliance is possible with Type C, which is a low force limiting clutch, the SlideDriver operator does not utilize a clutch, therefore this option is not available.

Similar compliance issues exist with a Type E device (audio warn before operate alarm). A Type E device is permitted as a means of secondary entrapment protection by UL 325 in Class IV applications, but it is not recommended by HySecurity because a buzzer warns, but cannot protect against possible entrapment. HySecurity highly recommends, even for Class IV use, that secondary entrapment protection (edge or photo-eye sensor) devices be installed to detect possible entrapment.

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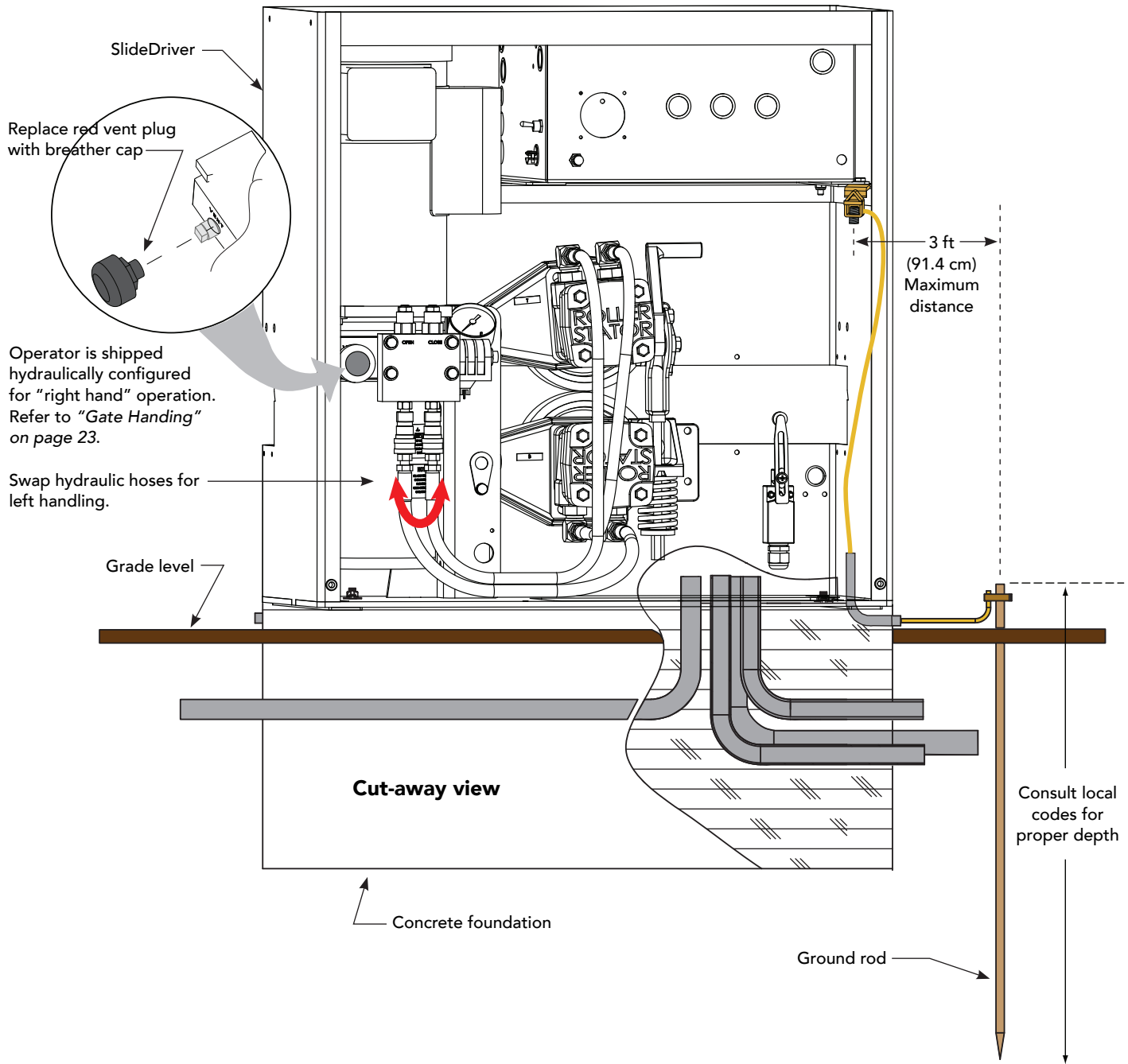
# GROUNDING, BREATHER CAP INSTALLATION & HANDING

The gate operator has a vent plug that keeps the hydraulic fluid from spilling during shipment. The vent plug must be replaced by the breather cap before operating the slide gate.



**Failure to perform the following procedure will cause premature pump shaft failure and void the Limited Warranty.**

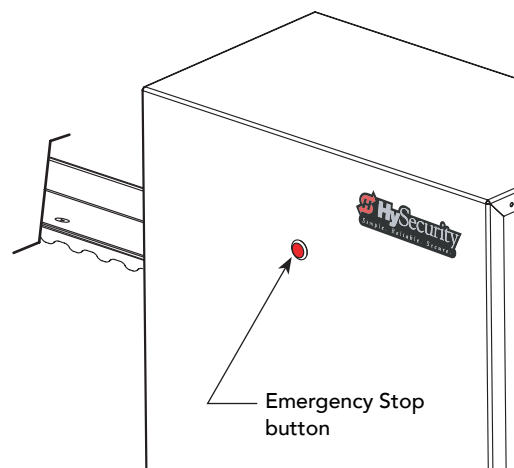
1. Remove the vent plug and discard it.
2. Replace the vent plug with the breather cap.



# EMERGENCY STOP BUTTON

Make sure all users of the gate know where the emergency stop button is located (see illustration). It complies with UL 325 Safety Standards requirements.

Pressing the emergency stop button while the gate is opening or closing disables the automatic close timer and stops gate travel. Gate travel remains stopped until the operator receives another open or close signal.



# EMERGENCY RELEASE



**WARNING**

**Before attempting a manual release, make sure the gate is not in motion and power is disconnected (turned OFF).**

Make sure and teach all users how to turn off electric power and how to move the gate manually. To prepare for manual operation, power must be turned off and the drive wheels must be released.

Know the weight of the gate you are moving. Excessively heavy gates can be difficult to move and may cause serious injury to those involved in moving the gate. Take the necessary precautions when manually moving any gate.



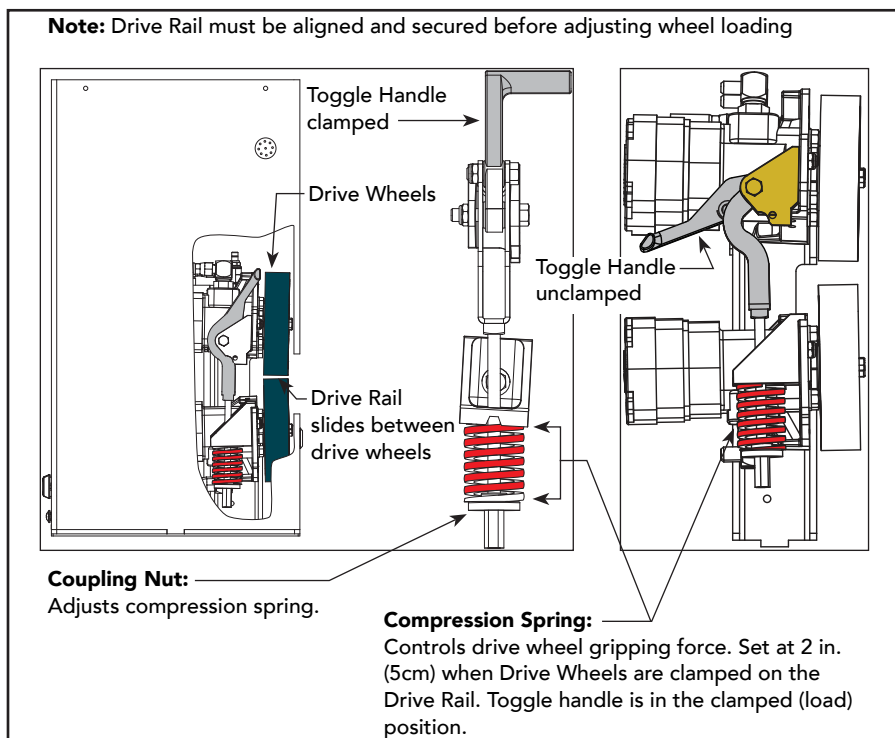
**WARNING**

**When releasing the handle inside the chassis, be careful as the mechanism is spring-loaded and drops rapidly. Hold the handle appropriately so your fingers do not get injured or pinched.**

To disengage the drive wheels from the drive rail and manually move the gate, take the following steps:

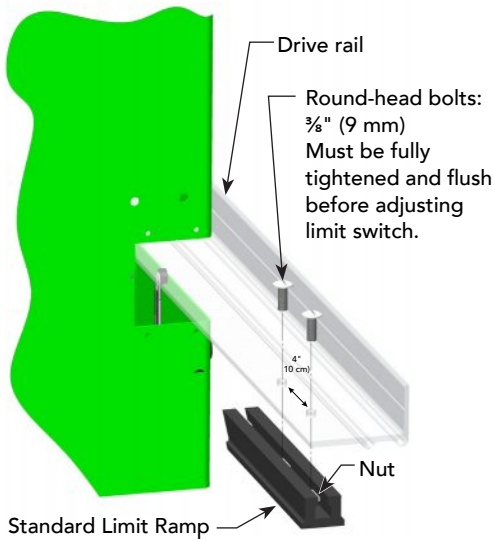
1. Remove the front chassis cover and set it aside.
2. Pull the toggle handle down. The manual release is located under the electric control panel and to the right of the hydraulic motors.

**NOTE:** For more information, refer to "Drive Wheel Spring Tension (Adjustment of Manual Release)" on page 87.



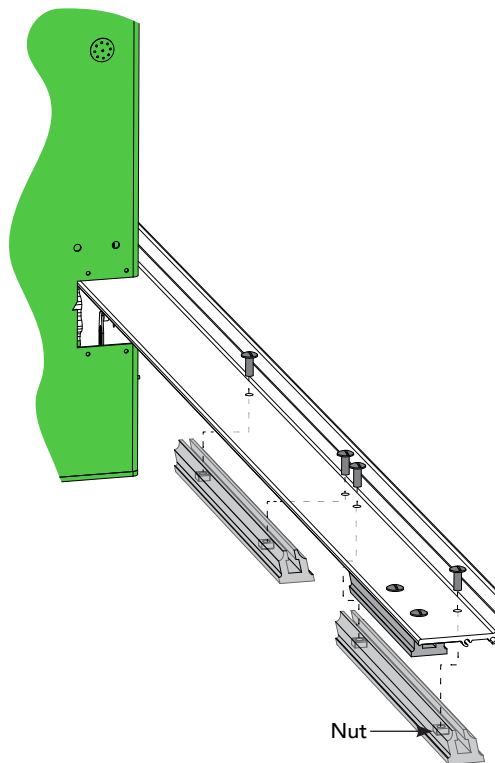
Other types of release mechanisms exist. For example, the Fire and Emergency Access Lock Box is available through HySecurity distributors. Contact your distributor for more information.

# SLIDE DRIVER SLOW DOWN LIMIT RAMPS

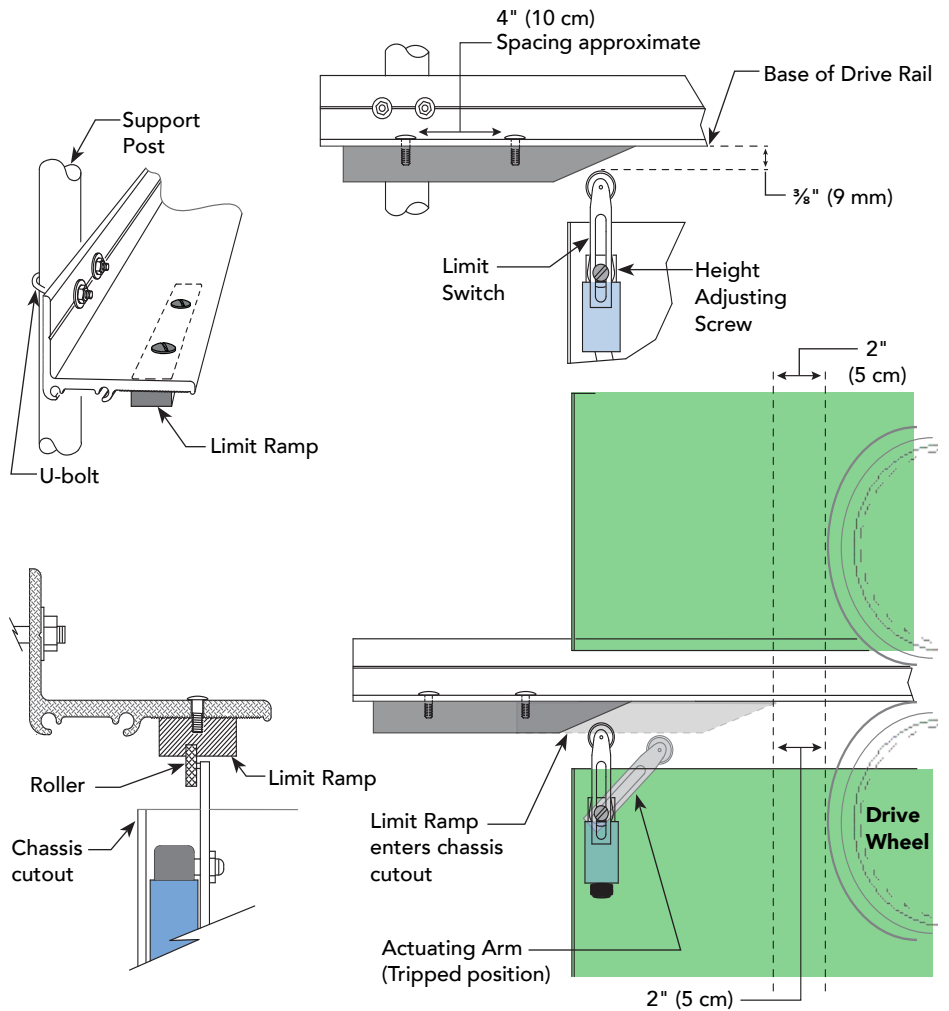


The standard limit ramp is positioned on the drive rail so it will make contact with the limit switch and stop approximately 2 inches (5 cm) from the drive wheel.

Limit ramps are attached to the underside of the drive rail when the gate is fully open and fully closed.



## SlideDriver 50VF Slow Down Limit Ramp Kit



Two truss head screws secure each limit ramp to the drive rail. The bolts are spaced about 4 inches (10 cm) apart.

The limit switch must be set  $\frac{3}{8}$ -inch (9 mm) from the base of the drive rail. A screw on the limit switch allows for slight adjustments in height. If XtremeDrive wheels are used, you will need to raise the drive rail  $\frac{1}{4}$  to  $\frac{1}{2}$  inch (3 to 13 mm) along the gate uprights and the entire drive rail path. The limit switch placement will need to be adjusted accordingly.

All the limit ramps are the same length.

**NOTE:** For a 50VF-series SlideDriver, you will need to order four (4) Slow Down Limit Ramp Kits.



Be sure to securely fasten all limit ramps to the underside of the drive rail when installing a 50VF-series operator.



# SAFETY NOTICES

The following four levels of safety notices are used where applicable within this manual; each notice contains information specific to the situation.



Indicates death or serious injury will occur if the hazardous situation is not avoided.



Indicates death or serious injury could occur if the hazardous situation is not avoided.



Indicates mild or moderate injury could occur if the hazardous situation is not avoided.

**NOTICE:** Indicates damage to equipment is probable if the hazardous situation is not avoided.

## COMMON INDUSTRIAL SYMBOLS

The following international safety symbols may appear on the product or in its literature. The symbols are used to alert you to potential personal injury hazards. Obey all safety messages that follow these symbols to avoid possible injury or death.



**Attention**  
- Take Note -



**- Danger -**  
Keep Away



**Entrapment**  
Zone



**Possible**  
Pinch Point

How to wire the operator is presented in the *Installation Instructions*, but detailed information about the earth and equipment ground, wiring to AC power and the availability of UPS systems are described in this section.

Supplemental documents to this section include:

- DC Power Supply supplemental manual

## INSTALLING THE EARTH GROUND

An earth ground refers to the grounding rod and accompanying equipment ground which need to be installed to safeguard against potential electrical shock and damage to personnel and equipment.

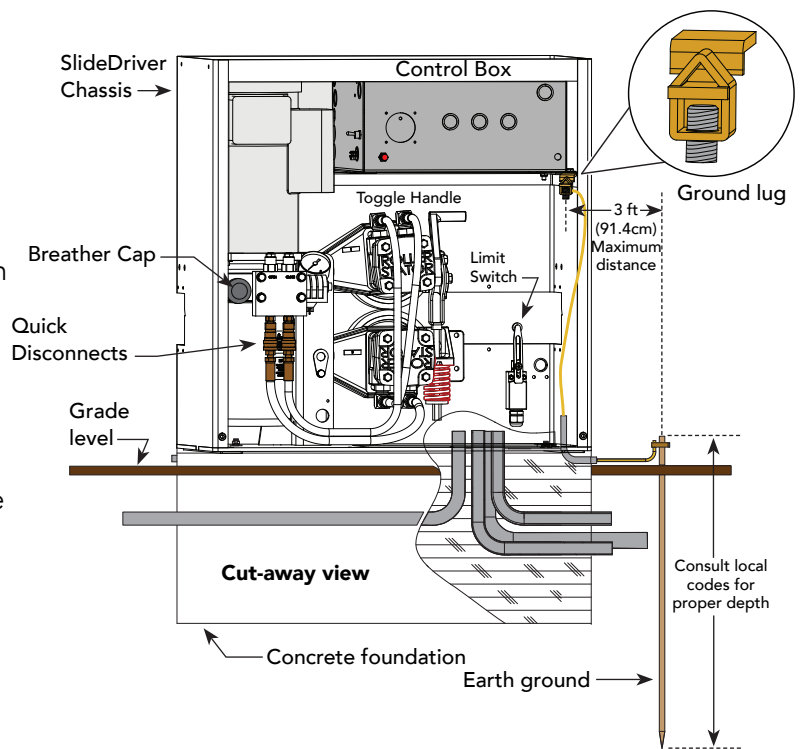


**The potential for lightning discharge exists with all gates, fences and gate operators. National Electric Code (NEC) - Article 250 requires a separate earth ground in addition to the required equipment ground.**

HySecurity recommends grounding the operator with a separate earth ground rod (or a similar device in the case of crash products) to shield the operator against electromagnetism and other electrical signals that may cause, erratic operation with, or damage to, the Smart Touch Controller and other electrical parts.

For earth grounding requirements in the U.S.A., refer to the National Fire Protection Association (NFPA) 780 - Standard for the Installation of Lightning Protection Systems. Highlights of the standard include:

- The ground rod must be UL listed copper-clad steel, solid copper, hot-dipped galvanized steel, or stainless steel. Minimum requirements: ½ inch (13 mm) diameter and 8 feet (244 cm) in length.
- The ground rod is driven into the earth (refer to local codes for proper depth requirements).
- The ground rod is electrically bonded to the chassis with a single length of un-spliced 6AWG copper wire less than 3 feet (91 cm) long. Due to the large concrete foundation on crash products, make the necessary adjustments to accommodate for earth ground requirements.
- Local jurisdictions may impose other requirements above the NEC, Article 250 and NFPA 780. Consult the local codes and regulations regarding requirements in your area.



**NOTICE:** Properly grounding the gate operator is critical to gate operator performance and the life of its electrical components. Use sufficient wire size during installation. If you do not ground the operator with a separate earth ground, you risk voiding the HySecurity Limited Warranty.

# Site Considerations

HySecurity gate operators are intended for permanent installation. Make sure you prepare the site with the following considerations:

- Make sure all electrical wiring is properly routed via conduits.
- Check the distance of the wiring run from the main panel to the gate operator. Make sure the wire size of the branch circuit supplying power to the gate operator is large enough to avoid excess voltage drop. Refer to “*Wire Sizing and Runs*” on page 16.
- Make sure the available power source matches the electrical requirements specified on the voltage nameplate.



Each gate operator is built to run on a specific line power voltage and phase. Failure to ensure the source voltage, phase and frequency match what is specified for the equipment, may result in severe damage to the equipment.

- 
- Make sure a 20-amp circuit (minimum) protected with a 20-amp Inverse Time Breaker is provided for all AC power connections.
  - Verify that the operator is electrically grounded per NFPA 780 and NEC Article 250, and local codes.

## WIRING AC POWER

The SlideDriver has separate *Installation Instructions* that explain how to connect to AC power. For reference purposes, the same information is provided below.

**In-rush Current:** The current needed to start the electric motor spinning in the proper direction (CCW). It may take as much as 6 to 9 times the run current to start one of the heavy duty operators.

**NOTE:** Use a 20A (minimum) slow kick (thermal) circuit breaker for all AC motors.

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Size the primary wires. Consider the voltage, horsepower, and length of the wire run from the main power panel.

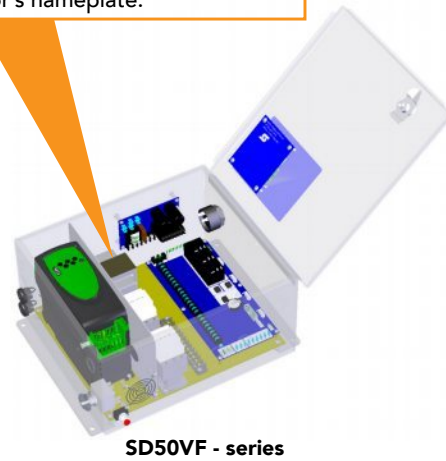
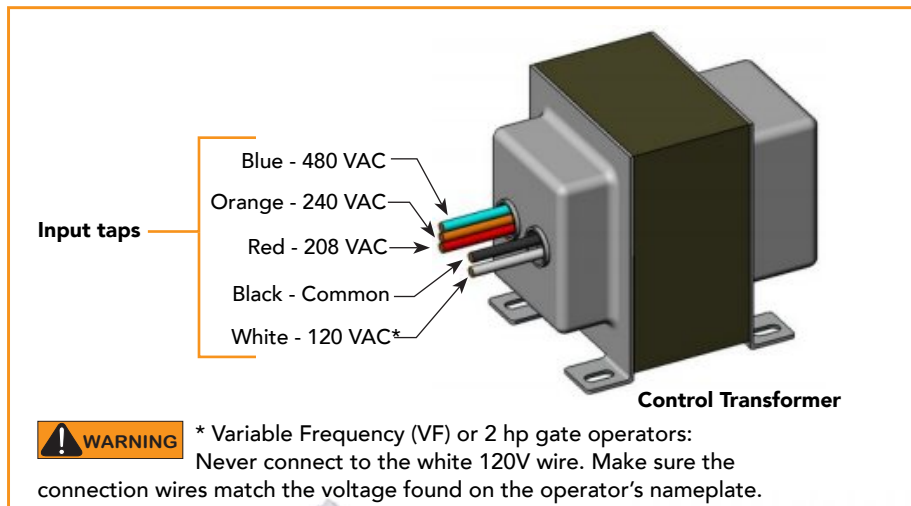
Make sure you have the proper voltage and conversion of voltage taps at the motor and transformer.



**Turn OFF AC power at the source (circuit breaker panel) before accessing the wires in the SlideDriver. Follow facility Lock Out/Tag Out procedures. Make sure all power switches are in the OFF position. Follow all electrical code standards and regulations.**

---

1. **Connect to Power:** Three wires and a ground are available for connection to a 3 Phase power source (3Ø). Loosen the screws on the power module to open the wire slots at the top and bottom.
2. **Connect AC Power:** Place the incoming power wires into their appropriate slots. Attach the ground wires to the chassis. A wiring diagram is provided in the appendix.



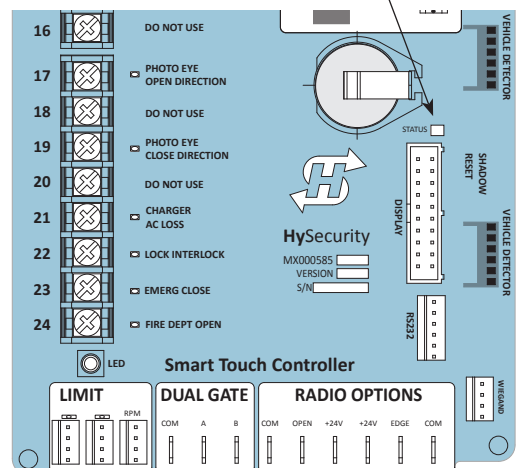
Wiring of gate operators must conform to NFPA and NEC standards and comply with all local codes. When the installation is compliant and complete, turn on AC power at the source and at the control box.

## Turning the Power Switch ON

The AC power disconnect switch is located on the same enclosure (control box) where the electrical components, Smart Touch Controller, transformer, power module, etc., are found.

When power is turned ON, a green status light on the Smart Touch Controller blinks. The status light appears below the coin battery and indicates that the processor is receiving power. For more information, refer to "Smart Touch Controller Inputs" on page 52.

Green LED flashes indicating processor is receiving power.



# WIRE SIZING AND RUNS

Supplying a gate operator with the correct electrical service is crucial to the performance of the operator and the life of its electrical components. If the wire size used is too small, the voltage loss, especially during motor startup, will prevent the motor from attaining its rated horsepower. The percentage of horsepower lost is far greater than the percentage of voltage loss.

A voltage loss can also cause the control components to chatter while the motor is starting, substantially reducing their life due to the resultant arcing. There is no way to restore lost performance resulting from undersized wires, except to replace them. Be sure to choose a sufficient wire size at initial installation to avoid costly rewiring. Refer to “Wire Sizing and Runs” on page 16.

The tables on the following page are based on copper wire and allow for a 5% voltage drop. The ampere values shown are the service factor ampere rating (maximum full load at continuous duty) of the motor. A 20A circuit (protected with a 20A Inverse Time Breaker) should be provided, at minimum.

Always connect electrical power and ground the operator in accordance with the NFPA 780 & NEC, Article 430 and Article 250. Research and adhere to other local codes that may apply.

## Low Voltage Control Wiring

The Smart Touch Controller has very sensitive control inputs. The following is a chart of maximum distances for wire size:

Wire Size	Maximum Distance
18 ga	7.0 miles (11 km)
20 ga	3.5 miles (5.6 km)
22 ga	2.7 miles (4.3 km)
24 ga	2.0 miles (3.2 km)
26 ga	1.0 mile (1.6 km)
28 ga	3700 feet (1.1 km)

# SlideDriver Wiring Charts (Incoming Power)

The maximum distance shown is from the operator to the power source, assuming that source power is from a panel box with adequate capacity to support the addition of this motor load. The values are for one operator, with no other loads applied to the branch circuit. Avoid placing more than one operator to a circuit, but if you must, be certain to reduce the maximum allowed wire distance by half.

**NOTE:** Distance shown in U.S. Standard "feet." Metric equivalent shown in parentheses.

<b>SlideDriver Wire Size Chart – 115V Single Phase</b>				
<b>Horsepower</b>	<b>½</b>	<b>¾</b>	<b>1</b>	<b>2</b>
<b>Amps</b>	<b>10</b>	<b>11.6</b>	<b>14.4</b>	<b>27.2</b>
<b>Wire Gauge</b>	<b>Distance</b>	<b>Distance</b>	<b>Distance</b>	<b>Distance</b>
<b>12</b>	90 (27m)	75 (23m)	60 (18m)	30 (9m)
<b>10</b>	140 (43m)	120 (37m)	100 (30m)	50 (15m)
<b>8</b>	220 (67m)	190 (58m)	155 (47m)	80 (24m)
<b>6</b>	350 (107m)	300 (91m)	245 (75m)	130 (40m)
<b>4</b>	555 (169m)	480 (146m)	385 (117m)	205 (62m)
<b>2</b>	890 (271m)	765 (233m)	620 (189m)	330 (101m)

<b>SlideDriver Wire Size Chart – 208V Single Phase</b>					
<b>Horsepower</b>	<b>½</b>	<b>¾</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Amps</b>	<b>5.5</b>	<b>6.1</b>	<b>7.6</b>	<b>14.2</b>	<b>16.2</b>
<b>Wire Gauge</b>	<b>Distance</b>	<b>Distance</b>	<b>Distance</b>	<b>Distance</b>	<b>Distance</b>
<b>12</b>	290 (88m)	260 (79m)	205 (62m)	110 (33m)	100 (30m)
<b>10</b>	460 (140m)	415 (126m)	330 (101m)	175 (53m)	155 (47m)
<b>8</b>	725 (221m)	650 (198m)	525 (160m)	280 (85m)	245 (74m)
<b>6</b>	1150 (350m)	1040 (317m)	835 (254m)	445 (135m)	390 (119m)
<b>4</b>	1825 (556m)	1645 (501m)	1320 (402m)	710 (216m)	620 (189m)
<b>2</b>	2920 (890m)	2630 (801m)	2110 (643m)	1130 (344m)	1000 (305m)

<b>SlideDriver Wire Size Chart – 230V Single Phase</b>						
<b>Horsepower</b>	<b>½</b>	<b>¾</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>5</b>
<b>Amps</b>	<b>5.0</b>	<b>5.8</b>	<b>7.2</b>	<b>13.6</b>	<b>14.8</b>	<b>27.0</b>
<b>Wire Gauge</b>	<b>Distance</b>	<b>Distance</b>	<b>Distance</b>	<b>Distance</b>	<b>Distance</b>	<b>Distance</b>
<b>12</b>	350 (107m)	300 (91m)	245 (75m)	130 (40m)	120 (37m)	65 (20m)
<b>10</b>	560 (171m)	480 (146m)	385 (117m)	205 (62m)	190 (58m)	105 (32m)
<b>8</b>	880 (268m)	760 (232m)	610 (186m)	325 (99m)	300 (91m)	165 (50m)
<b>6</b>	1400 (427m)	1120 (341m)	975 (297m)	515 (157m)	475 (145m)	260 (79m)
<b>4</b>	2220 (670m)	1915 (584m)	1550 (472m)	815 (248m)	750 (229m)	410 (125m)
<b>2</b>	3550 (1082m)	3080 (939m)	2465 (751m)	1305 (398m)	1200 (366m)	650 (198m)



**NOTE:** Distance shown in U.S. Standard "feet." Metric equivalent shown in parentheses.

<b>SlideDriver Wire Size Chart – 208V Three Phase</b>						
<b>Horsepower</b>	<b>½</b>	<b>¾</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>5</b>
<b>Amps</b>	<b>2.7</b>	<b>3.1</b>	<b>4.2</b>	<b>6.5</b>	<b>6.7</b>	<b>16</b>
<b>Wire Gauge</b>	<b>Distance</b>	<b>Distance</b>	<b>Distance</b>	<b>Distance</b>	<b>Distance</b>	<b>Distance</b>
<b>12</b>	590 (180m)	510 (155m)	375 (114m)	245 (75m)	235 (72m)	100 (30m)
<b>10</b>	930 (283m)	810 (247m)	600 (183m)	390 (119m)	575 (175m)	160 (49m)
<b>8</b>	1475 (449m)	1285 (392m)	950 (289m)	615 (187m)	595 (181m)	250 (76m)
<b>6</b>	2350 (716m)	2045 (623m)	1510 (460m)	975 (297m)	945 (288m)	400 (122m)
<b>4</b>	3720 (1134m)	3240 (987m)	2390 (728m)	1545 (471m)	1500 (457m)	630 (192m)

<b>SlideDriver Wire Size Chart – 230V Three Phase</b>						
<b>Horsepower</b>	<b>½</b>	<b>¾</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>5</b>
<b>Amps</b>	<b>2.4</b>	<b>3.0</b>	<b>3.8</b>	<b>6.2</b>	<b>6.4</b>	<b>15.4</b>
<b>Wire Gauge</b>	<b>Distance</b>	<b>Distance</b>	<b>Distance</b>	<b>Distance</b>	<b>Distance</b>	<b>Distance</b>
<b>12</b>	730 (222m)	585 (178m)	460 (140m)	280 (85m)	270 (82m)	115 (35m)
<b>10</b>	1160 (353m)	930 (283m)	730 (222m)	450 (137m)	435 (133m)	180 (55m)
<b>8</b>	1835 (559m)	1470 (448m)	1160 (353m)	710 (216m)	690 (210m)	285 (87m)
<b>6</b>	2925 (891m)	2340 (713m)	1845 (562m)	1130 (344m)	1095 (334m)	455 (139m)
<b>4</b>	4625 (1410m)	3700 (1128m)	2920 (890m)	1790 (546m)	1735 (529m)	720 (219m)

<b>SlideDriver Wire Size Chart – 460V Three Phase</b>						
<b>Horsepower</b>	<b>½</b>	<b>¾</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>5</b>
<b>Amps</b>	<b>1.2</b>	<b>1.5</b>	<b>1.9</b>	<b>3.1</b>	<b>3.2</b>	<b>7.7</b>
<b>Wire Gauge</b>	<b>Distance</b>	<b>Distance</b>	<b>Distance</b>	<b>Distance</b>	<b>Distance</b>	<b>Distance</b>
<b>12</b>	2915 (888m)	2350 (716m)	1850 (564m)	1130 (344m)	1100 (335m)	455 (139m)
<b>10</b>	4640 (1414m)	3710 (1131m)	2930 (893m)	1800 (549m)	1740 (530m)	725 (221m)
<b>8</b>	7340 (2237m)	5870 (1789m)	4650 (1417m)	2840 (866m)	2750 (838m)	1150 (350m)
<b>6</b>	11700 (3566m)	9350 (2850m)	7400 (2255m)	4550 (1387m)	4400 (1341m)	1800 (549m)
<b>4</b>	18500 (5639m)	14800 (4511m)	11700 (3566m)	7200 (2194m)	7000 (2134m)	2900 (884m)

# SlideDriver 50VF-series Wiring Chart (Incoming Power)

The maximum distance shown is from the operator to the power source, assuming that source power is from a panel box with adequate capacity to support the addition of this motor load. The values are for one operator, with no other loads applied to the branch circuit. Avoid placing more than one operator to a circuit, but if you must, be certain to reduce the maximum allowed wire distance by half.

Make sure proper wiring is being used. The following table shows the maximum allowable wire run from the power source to the operator for various wire sizes. Performance of 50VF-series operators on 1Ø and 3Ø 50 or 60 Hz Power.

**NOTE:** Distance shown in U.S. Standard "feet." Metric equivalent shown in parentheses.

SlideDriver 50VF-series Wire Size Chart						
Phase Ø	1	1	3	3	3	3
<b>Voltage</b>	<b>208</b>	<b>230</b>	<b>208</b>	<b>230</b>	<b>380</b>	<b>460</b>
<b>Horsepower</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>
<b>VFD Rating Amps</b>	<b>17.4</b>	<b>17.4</b>	<b>8.7</b>	<b>8.7</b>	<b>5.2</b>	<b>5.2</b>
<b>Wire Gauge</b>	<b>Distance</b>	<b>Distance</b>	<b>Distance</b>	<b>Distance</b>	<b>Distance</b>	<b>Distance</b>
<b>12</b>	90 (27m)	100 (30m)	220 (67m)	240 (73m)	680 (207m)	830 (253m)
<b>10</b>	150 (46m)	170 (52m)	350 (107m)	390 (119m)	1090 (332m)	1310 (399m)
<b>8</b>	240 (73m)	270 (82m)	560 (171m)	620 (189m)	1730 (527m)	2100 (640m)
<b>6</b>	390 (119m)	430 (131m)	900 (274m)	990 (302m)	2750 (838m)	3330 (1015m)
<b>4</b>	620 (189m)	680 (207m)	1430 (436m)	1580 (482m)	4380 (1335m)	5300 (1615m)
<b>2</b>	990 (302m)	1090 (332m)	2280 (695m)	2530 (771m)	6990 (2130m)	8470 (2582m)

## Performance of 50VF-series Operators on 1 and 3 Phase, 50 or 60Hz

A HySecurity 50VF2, 50VF-EFO, or 50VF3 operator can operate on a wide variety of incoming power.

- 50Hz/60Hz operation with no changes or reconnection
- 1Ø or 3Ø operation by field rewiring and reconnection
- The incoming voltage must match the operator nameplate. Although the electric motor can be reconnected, a different VFD (motor controller inside the grey control box) is required between 460V and 208V/230V.
- Any AC powered peripherals such as locks, card readers and other devices need to be checked for compatibility.
- The electric motors in all VF2 and VF3 operators are 3Ø/60Hz motors and are connected for the voltage shown on the operator's nameplate. (208V/230V or 460V)

How is this done?

- The VF controller in the operator is rated to operate on input frequencies ranging from 48Hz through 62Hz on 1Ø or 3Ø power (a jumper connection is required for phase change) but only on either 460VAC or 208V/230V. (A change between 460V and 230V, either direction, requires replacing the VF controller).
- The control transformer in the operator is tapped for multiple voltages and rated for 50/60Hz operation.
- The VF controller first rectifies and filters the incoming power to DC, which has no frequency or phase. It then creates 3Ø variable voltage/variable frequency AC for the motor from the DC.
- Depending on the model, the VF controller ramps the motor voltage and frequency from 0V@0Hz at start, to either 208/230 or 480 VAC @ 60Hz for full speed. This allows use of 60Hz motors regardless of the incoming frequency.
- Since the input voltage/frequency is converted to DC to begin with, there is absolutely no relationship between the input frequency/phase and frequency/phase of the power supplied to the motor. The input could be 1Ø or 3Ø, 48Hz or 62Hz and the controller/motor combination wouldn't care. It will create the ramped 3Ø voltage and frequency for which it is programmed.

**NOTE:** SlideDriver 50VF operators connected for 1Ø operation will draw more current because the utility power to run the machine will be carried to the operator on two wires instead of the three used for 3Ø operators. Be sure to allow for this difference when specifying wire size.

## In-Field Connections

SlideDriver 50VF-series operators are field re-connectable for 1Ø or 3Ø, 208/230VAC input power without changing the VFD.



SlideDriver 50VF-series operators CANNOT be connected to 120V, 1Ø power or 575V, 3Ø power. If any attempts are made to do so, serious injury, electrical shock, or death may result. Any electrical damage occurring to the operator will not be covered by the Limited Warranty.

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SlideDriver 50VF-series operators are NOT field reconfigurable between 208/230VAC and 480VAC power. The VFD Motor Controller in a 208/230VAC unit must be replaced with a VFD Motor Controller manufactured for the higher (480VAC) voltage input.

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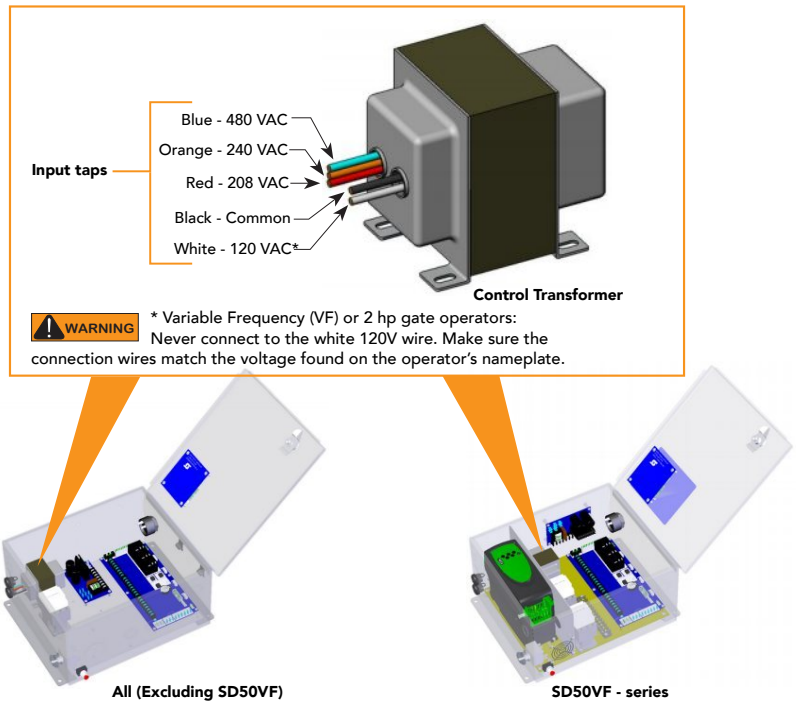
# CONTROL TRANSFORMER CONNECTIONS (Non-UPS)

Connect the AC input power to the control transformer according to the following procedure.

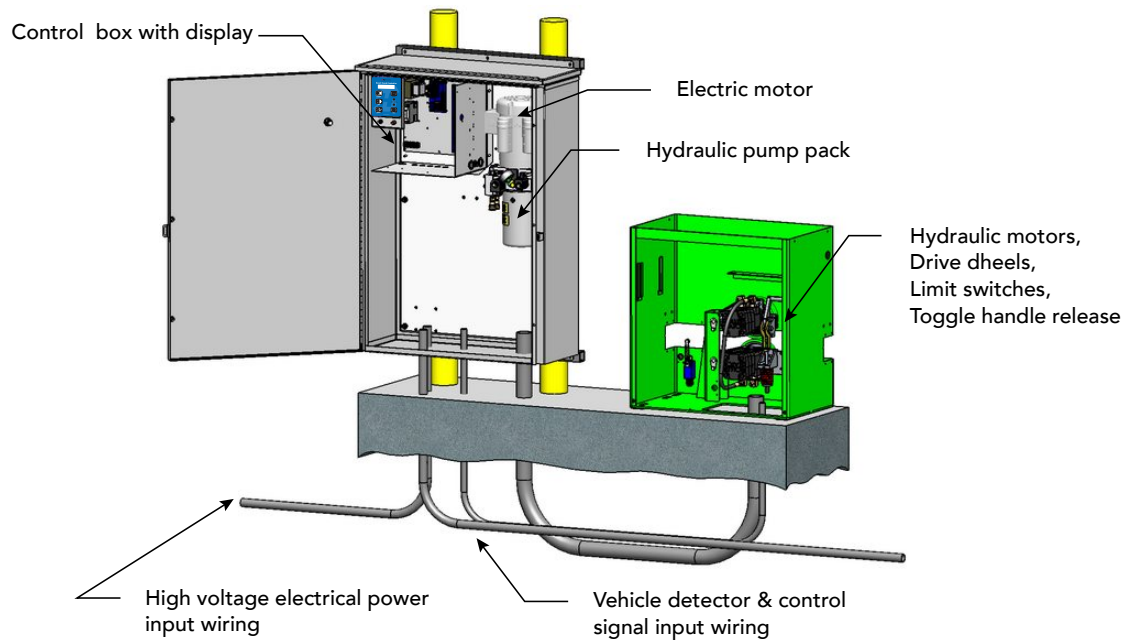
1. Ensure that the primary tap on the control transformer matches the line voltage and frequency connected to the gate operator.
2. Measure the line voltage carefully to distinguish between 208V and 230V branch circuits.

**NOTE:** A label on the transformer top identifies the various voltage taps available.

3. Use wire nuts or crimp-connectors to connect the power input conductors to the applicable taps on the Control Transformer.



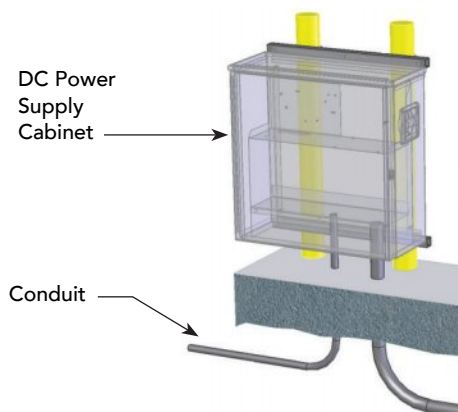
# GATE OPERATOR CONNECTIONS (MODULAR UNIT)



If you have the modular unit, additional conduit is needed to house the hydraulic hoses and electrical wiring. You need a 2-inch (5 cm) diameter conduit for hydraulic hoses and a 3/4-inch (19 mm) conduit for electrical wiring. AC input power is connected to the hydraulic pump and electrical components enclosure (HydraSupply).

A supplemental manual, provided with the product, describes the installation overview, wiring and conduit considerations.

# DC POWER SUPPLY (UPS) CONNECTIONS



If you have a gate operator with a DC Power Supply unit, you will need to connect the primary AC input power to the DC Power Supply.

Additional  $\frac{3}{4}$ -inch (19 mm) conduit is needed for electrical wiring interconnections between the gate operator and DC Power Supply Cabinet. AC input power is connected to the electrical components in the chassis, and additional wiring is run through conduit to the DC Power Supply Cabinet.

A supplemental manual (D0598), provided with the DC Power Supply Cabinet, describes the installation overview, wiring and conduit considerations.

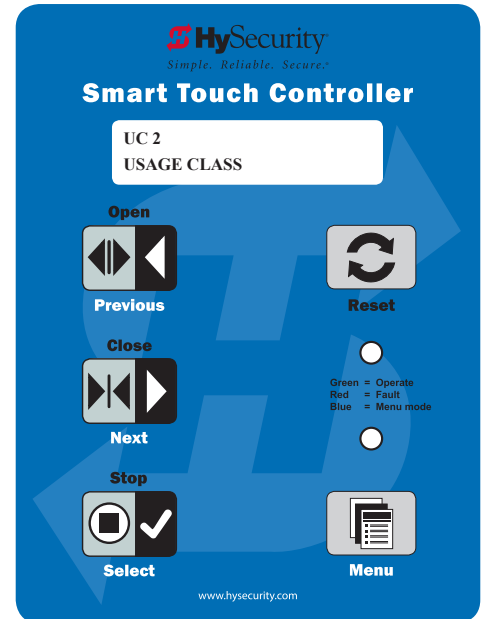
# Configure the Operator

When you first apply power to the operator, it is locked in Menu mode and prompts appear on the display. The gate will not move and the controls will not function until the prompts have been answered. The prompts include:

- Usage Class setting
- Gate handing

**NOTICE:** Before turning the power switch to ON, make sure all site requirements concerning proper wiring, safety, foundation installation, and electrical power have been met.

Five buttons on the display keypad provide operational controls. Refer to *Initial Setup* on page 35 for more information. To answer the initial prompts, use the Previous, Next, and Select buttons as described in the chart below:



**Smart Touch Controller: Menu Mode Navigation Buttons**

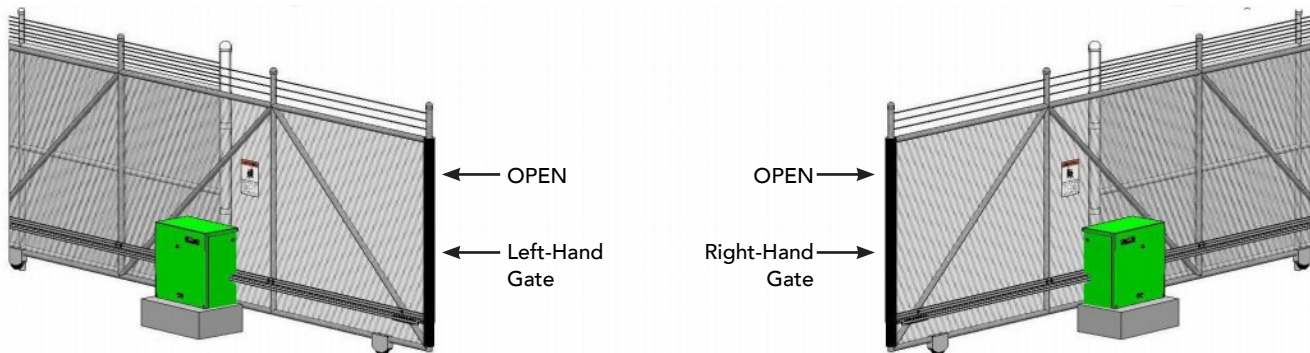
To change that data appearing in the display	To navigate through the Selections	To choose what appears on the display	To navigate between menu items
Press <b>Select</b> . Two left characters blink.	Press <b>Next</b> . Continue pressing Next to view all selections. (Press Previous to reverse direction.)	Press <b>Select</b> . Blinking characters become static.	Press <b>Next</b> or <b>Previous</b> . Advance - press Next Previous - press Previous

If you are unsure of the usage classification, refer to *Identifying Gate Operator Category and Usage Class* on page 7. It explains the different usage site classifications for UL 325.

## GATE HANDING

The handing is determined by the position of the operator and which way the gate opens.

To determine handing, face the front cover panel on the operator. Refer to the illustration below.



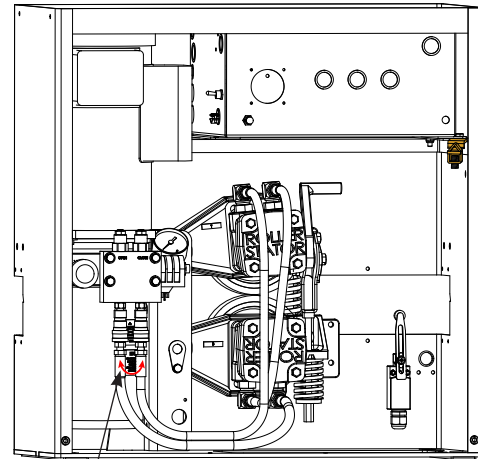
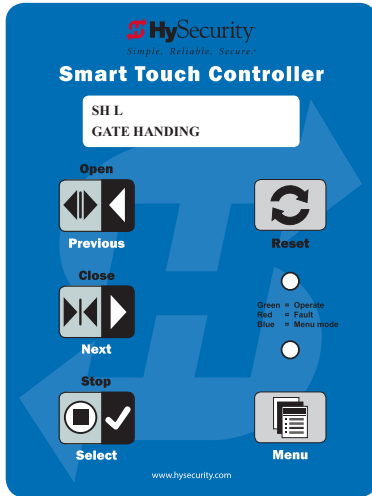


# HYDRAULIC HOSE SWAP

Gate Handing is determined by viewing the gate opening from the secure side. If the gate opens to the left, the gate must be set for left handing.

All SlideDrivers are set at the factory for right handing. If the gate has left handing, you must

- select SH L when prompted (or access the Installer Menu)
- swap position of the hydraulic hoses.



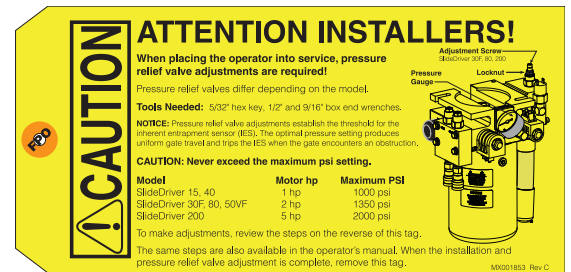
Factory set for right-handing. Swap hose connections for left-handing gate.

# ADJUSTING THE PRESSURE RELIEF VALVE

When placing the operator into service, pressure relief valve adjustments are required! To provide instruction during installation, a cautionary yellow tag is wire tied to every pump pack. The same instructions are provided in this section.

Pressure relief valves differ depending on the model.

**Tools Needed:** 5/32" hex key, 1/2" and 9/16" box end wrenches.

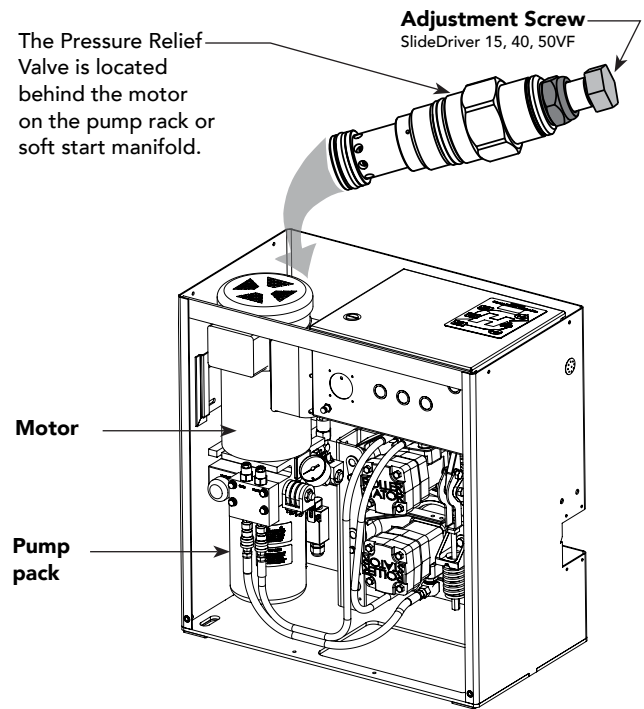
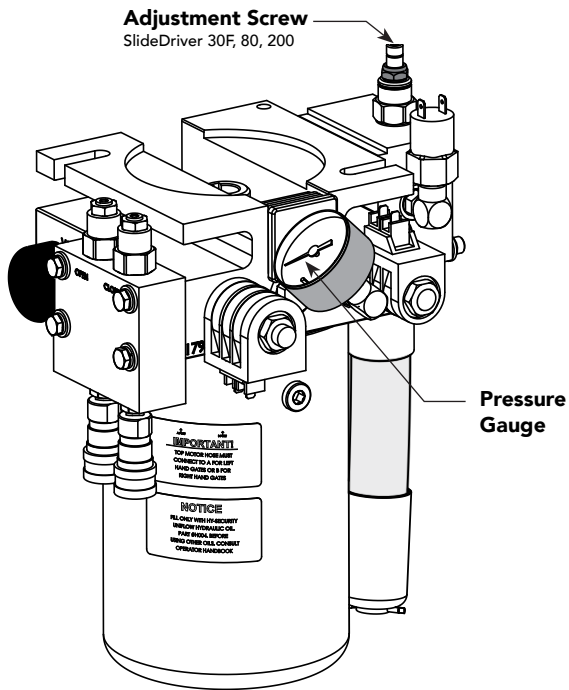


**NOTICE:** Pressure relief valve adjustments establish the threshold for the inherent entrapment sensor (IES). The optimal pressure setting produces uniform gate travel and trips the IES when the gate encounters an obstruction.

Model	Motor hp	Maximum PSI
SlideDriver 15, 40	1 hp	1000 psi
SlideDriver 30F, 80, 50VF	2 hp	1350 psi
SlideDriver 200	5 hp	2000 psi



Never exceed the maximum psi setting.



Make sure the gate is properly installed and aligned before performing the following steps. Take precautionary measures to keep the gate's travel path clear. The gate will be moving while you adjust the pressure relief valve.



**DO NOT attempt to adjust the pressure relief valve unless you are an experienced hydraulic gate operator installer. Incorrect pressure settings can cause injury and even death!**

1. Expose several threads on the Pressure Relief Valve by loosening the locknut with a  $\frac{1}{16}$ " box end wrench.
2. Depending on the model, insert a  $\frac{5}{32}$ " hex key or use a  $\frac{1}{2}$ " box end wrench to turn the Adjustment Screw.
3. Use the keypad to cycle the gate open or close and, while the motor is running, turn the Adjustment Screw clockwise (CW) to raise the pressure. The motor runs for a few seconds, stops, and then enters safe mode. SAFE appears on the display.
4. Press RESET and repeat step 3 until gate travel is reliably consistent without entering SAFE mode.
5. To lock in the pressure setting, hold the Adjustment Screw with a hex key or wrench and tighten the locknut.

# THE INHERENT ENTRAPMENT SENSOR (IES)

The IES on HySecurity hydraulic operators is a primary entrapment device that is required by UL 325 as a type “A” detection device. It is tripped through software programming OR hydraulic pressure settings. It does not function solely on its own accord and must be connected to the Smart Touch Controller. The sensitivity and response of the IES when tripped is factory set, but can be adjusted through the Installer Menu items:

- SE (Inherent Sensor sensitivity)
- SS (Inherent Sensor function)
- SR (IES reverse to open)

Smart Touch Controller™ – Installer Menu Functions for IES		
Installer Menu Display Code	Setting Options (Bold – Factory Settings)	Description
SE 2 IES SENSITIVITY	1 = max. sensitivity <b>2 = Default setting</b> 9 = least sensitivity	Adjusts the sensitivity of the internal inherent entrapment sensor (IES). Available settings are 1 to 9 with 9 being the least sensitive. HySecurity strongly recommends that you avoid setting the IES sensitivity higher than 6. <b>Note:</b> Adjust pressure relief valve on hydraulic operators for security and gate impact purposes prior to changing IES sensitivity. Refer to the operator’s manual for steps involved in adjusting the pressure relief valve setting.
SS 0 (OFF) IES STOP ONLY	<b>0 = stop, reverse for 2s</b> 1 = stop only	In a Usage Class IV environment, the operator can be set to stop the gate and not reverse gate travel after and IES trip.
SR 0 (FULL OPEN) REVERSAL LOGIC	0 = IES reverses full open <b>1 = 2 second reversal only</b>	The default setting is a 2-second duration reversal if the inherent sensor is triggered. The optional setting of 0 will cause the gate to reopen fully if triggered while closing.

## Manufacturer’s responsibility

- Build into the gate operator a means of detecting an obstruction or an inherent entrapment detection device (UL 325 30A.1.1)
- Accept input from external entrapment detection devices
- Provide warning signs and an installation manual which, if followed, will result in a UL 325 compliant installation

## Pressure Relief Valve – All Hydraulic Operators:

- Limits hydraulic system pressure
- By-passes fluid to tank when set-point exceeded
- By-passed fluid triggers the IES

**NOTICE:** Pressure relief valve adjustments establish the threshold for the Inherent Entrapment Sensor (IES). The optimal pressure setting produces uniform gate travel and trips the IES when the gate encounters an obstruction.

## Inherent Entrapment Sensor – (IES)

- Normally closed pressure switch on pump manifold
- Senses fluid flow “above” pressure relief valve indicating high pressure and possible gate obstruction
- An open contact during gate movement signals the Smart Touch Controller to put operator into “SAFE” mode
- Ignored for the first second of operation to get past starting pressure spike
- An open contact while the gate is not operating will generate Err2 – disconnected IES
- A second open contact, in either direction of travel, will lock the machine out and the “ENTR”, or entrapment mode, appears on the display

## MODBUS RTU IN SLIDEDRIVER 50VF-SERIES

In the 50VF series SlideDriver™, a communication protocol allows the Smart Touch Controller to constantly monitor the Variable Frequency Drive (VFD) and record events in the STC history log. The history log is easily accessible using the HySecurity S.T.A.R.T. program and a PC laptop computer.

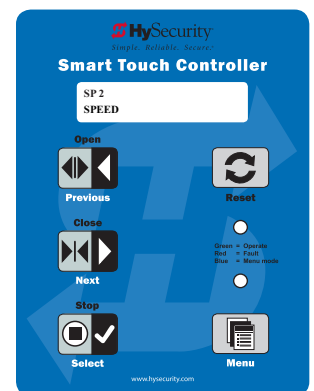
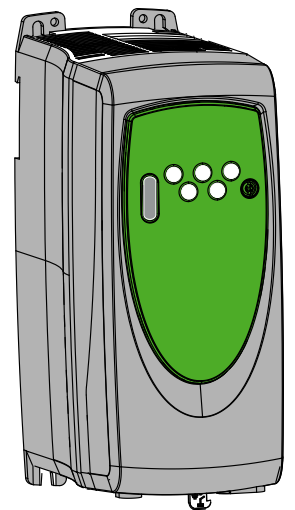
With the ModBus RTU:

- Reduction in field calls is likely because the STC resets VFD faults or error codes upon receiving a new command.
- Quality issues with the site power are controlled better which results in less intermittent operator problems.
- Smoother operator acceleration and deceleration enhances gate travel.

All 50VF2-3 series SlideDrivers shipped after January 1, 2012 have the new ModBus cable and RTU communication protocol installed. If you need replacement parts for your existing 50VF series operators, be sure to have the serial number of the operator available when you order parts.

If you install a new 50VF2/3 operator, the speed is factory set at 2 foot per second (2 ft/s). To change the speed, you will need to access the Installer Menu.

- SP 2 sets the 50VF2/3 speed to approximately 2 ft/s.
- SP 3 sets the 50VF2/3 speed to approximately 3 ft/s. Refer to “Emergency Fast Operate (EFO) in SlideDriver 50VF-series” on page 28.
- SP 0 and SP 1 are not used. (If you change the setting to 0 or 1, the operator will not run.)

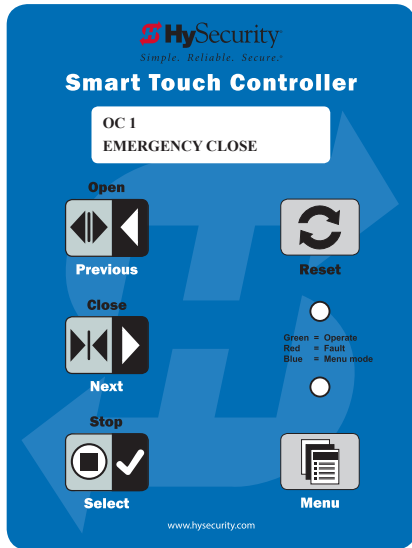


# EMERGENCY FAST OPERATE (EFO) IN SLIDE DRIVER 50VF-SERIES

## Setting the Emergency Fast Close

To enable the Emergency Fast Close option on a SlideDriver 50VF-series operator, you need to program the Smart Touch Controller by taking the following steps:

**NOTE:** When you are in programming mode the buttons on the keypad change from Open, Close, and Stop to Previous, Next, and Select. Refer to "Menu Mode Navigation" on page 36.



1. Make sure the operator is turned ON and a Run mode status (example, GATE OPEN) appears on the Smart Touch Controller, which indicates the machine is operational.
2. Press the Menu button twice to access the User Menu.
3. Press and hold the Reset button and then the Open button. Hold the buttons for two seconds and then release both buttons. FO x appears on the display which indicates you have accessed the Installer Menu.
4. Press Next until the Emergency Close (OC 0) appears on the display.
5. Press Select and OC starts blinking, which indicates the display can be changed.
6. Press Next or Previous to change the display to OC 1.
7. Press Select to accept the entry. (The display characters stop blinking.)
8. Press Program to exit programming mode and return to Run mode. A Run mode gate status appears (example, GATE OPEN).

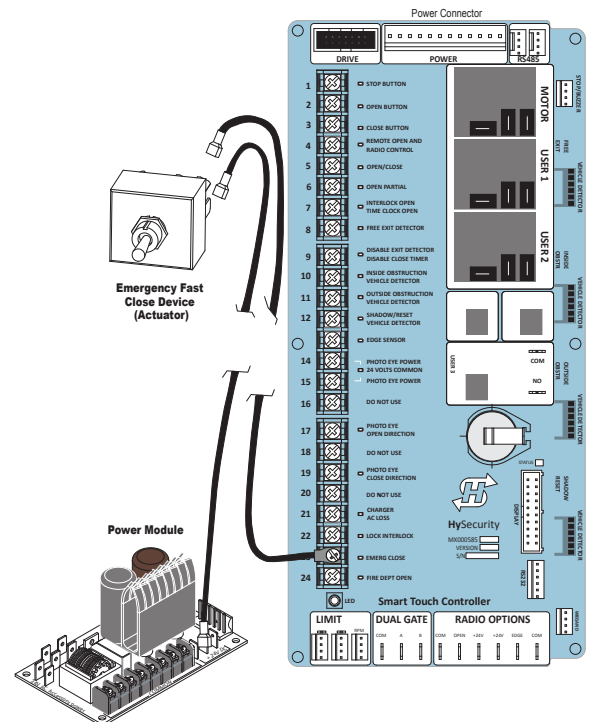
## Installing a Push-Button Device for EFC

The Emergency Fast Close on the 50VF-series is designed for a constant hold function, such as a push-button device that is held for the duration of gate travel. To operate properly, the device must be connected to Terminal 23 on the Smart Touch Controller and a +24VDC terminal on the Power Module.

When the connections are made, a constant hold signal transmitted to the Smart Touch Controller causes the Emergency Fast Close function to close the gate at a higher speed than usual, and photo eyes, vehicle loop inputs, and other safety devices are ignored.

## Emergency Fast Close Speeds

Operator	Close Speed	EFO Close
SlideDriver 50VF2	2.2 fps (26 in per sec)	3 fps (91 cm/s)
SlideDriver 50VF3	3 fps (91 cm/s)	3 fps (91 cm/s)



# Control Panel Overview

This section provides an overview of the the electrical controls found in your gate operator. The illustrations highlight the various components and describe their function. Each callout explains where to find more information about the component.

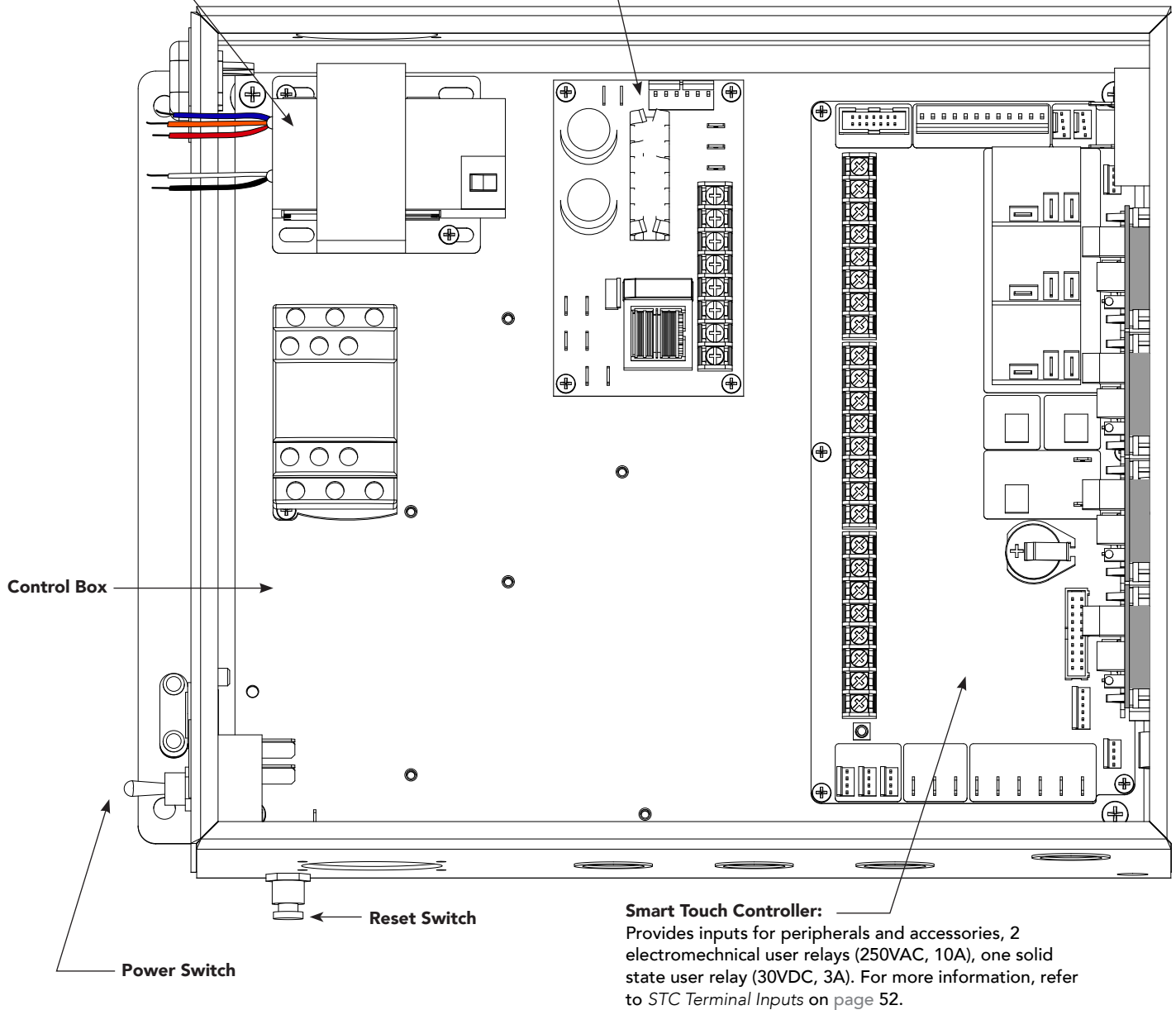
## SlideDrive Models: All, except 50VF Models

### Transformer:

Provides the connections for AC power and steps down the voltage to 24 VAC. For more information, refer to *Control Transformer Connections (Non-UPS)* on page 21.

### Power Module

Provides common and 24VAC & 24VDC terminals. Refer to *Overview of the STC and Power Module* on page 50.



### Smart Touch Controller:

Provides inputs for peripherals and accessories, 2 electromechanical user relays (250VAC, 10A), one solid state user relay (30VDC, 3A). For more information, refer to *STC Terminal Inputs* on page 52.





# VARIABLE SPEED DRIVE (VFD) CONTROL BOX

## SlideDriver 50VF Models

**Variable Frequency Drive (VFD):** Controls RPM for smooth acceleration & deceleration and connects to the STC through ModBus communication wires for diagnostic purposes and control handling.

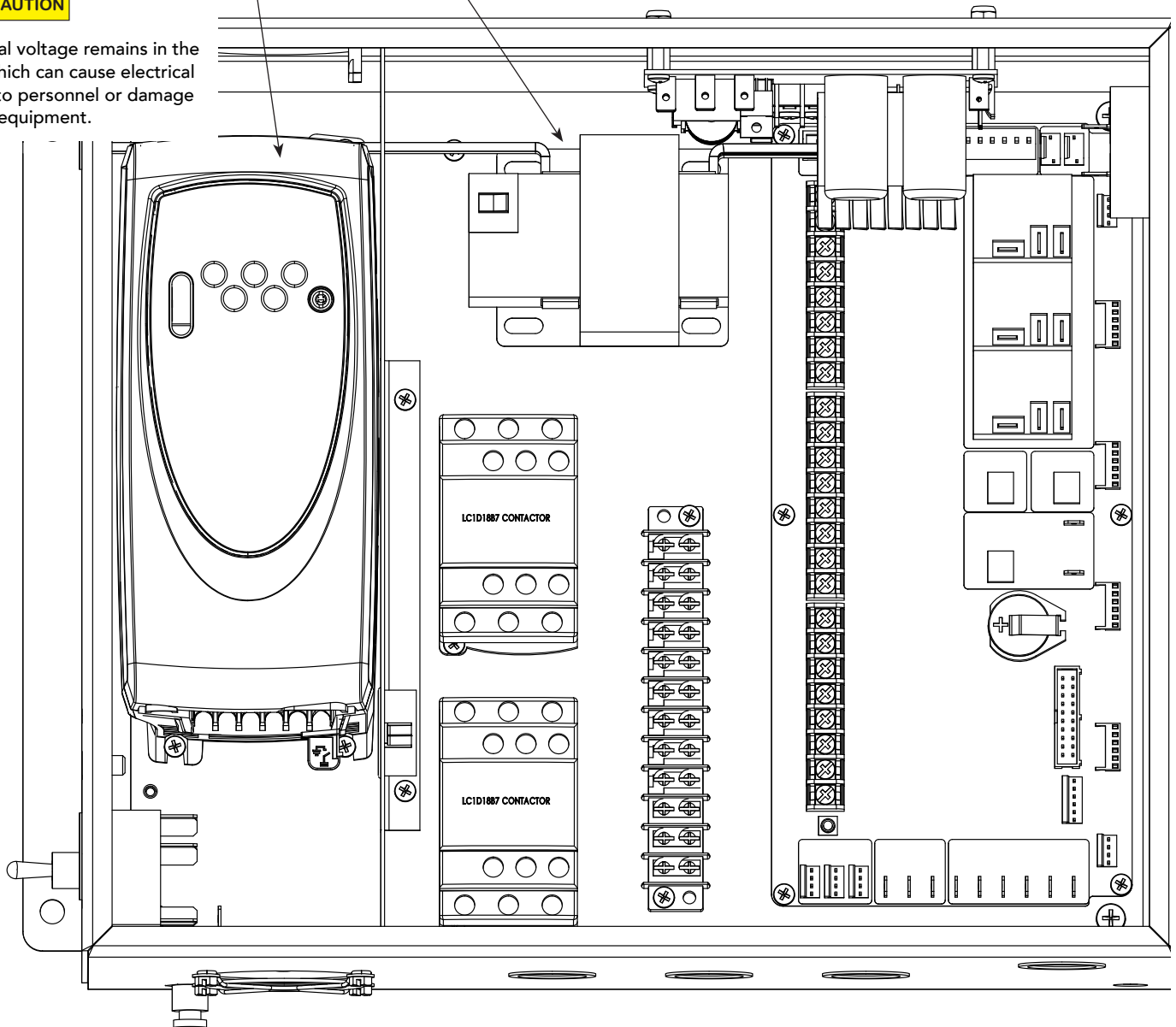
**Transformer:** Provides the connections for AC power and steps down the voltage to 24 VAC. For more information, refer to *Control Transformer Connections (Non-UPS)* on page 21.



\* On VFD operators, never connect to the white 120V wire. Make sure the connection wires match the voltage label found on the operator's name plate.

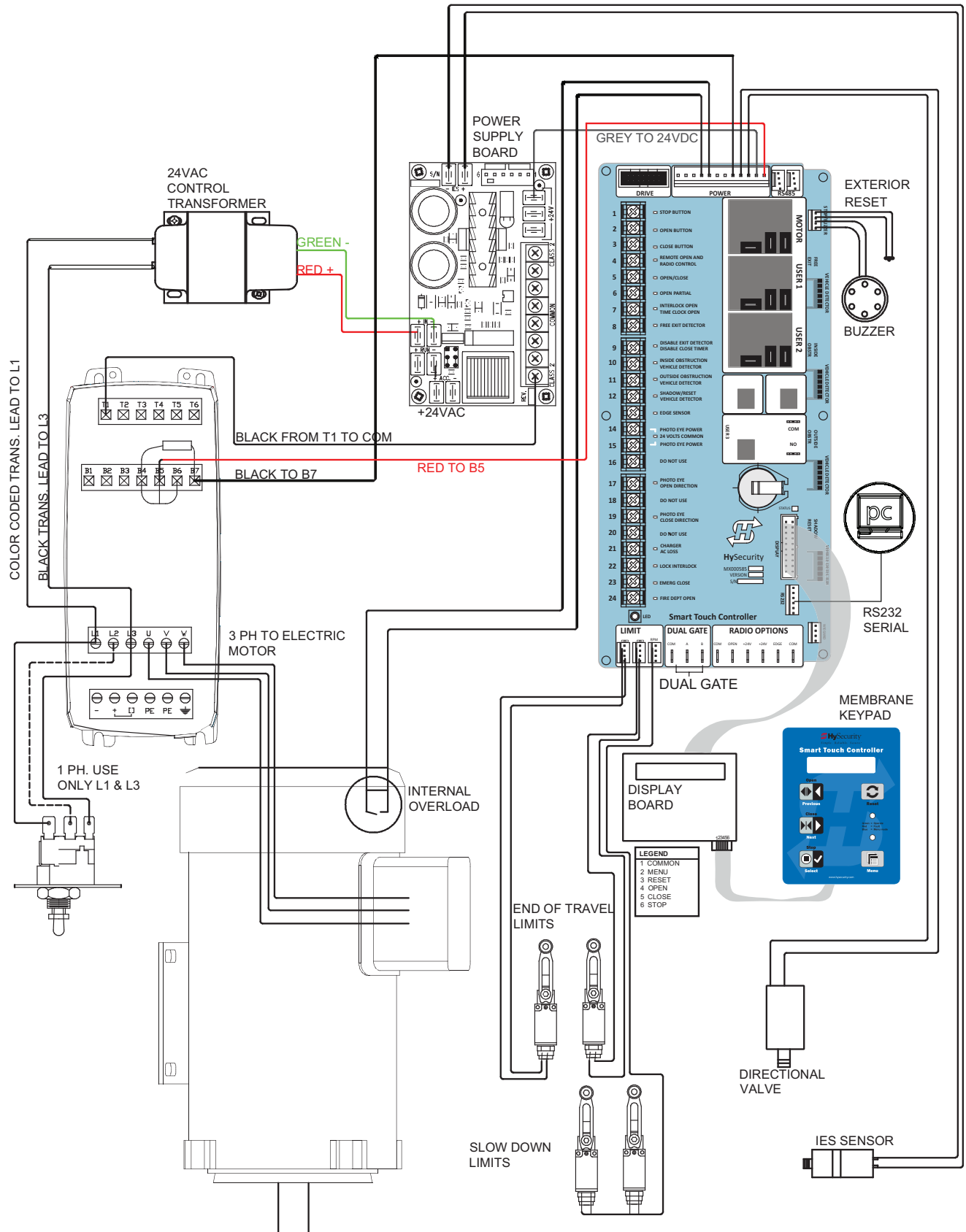


Residual voltage remains in the VFD which can cause electrical shock to personnel or damage to the equipment.



# VARIABLE SPEED DRIVE WIRING DIAGRAM

## SlideDriver 50VF Models



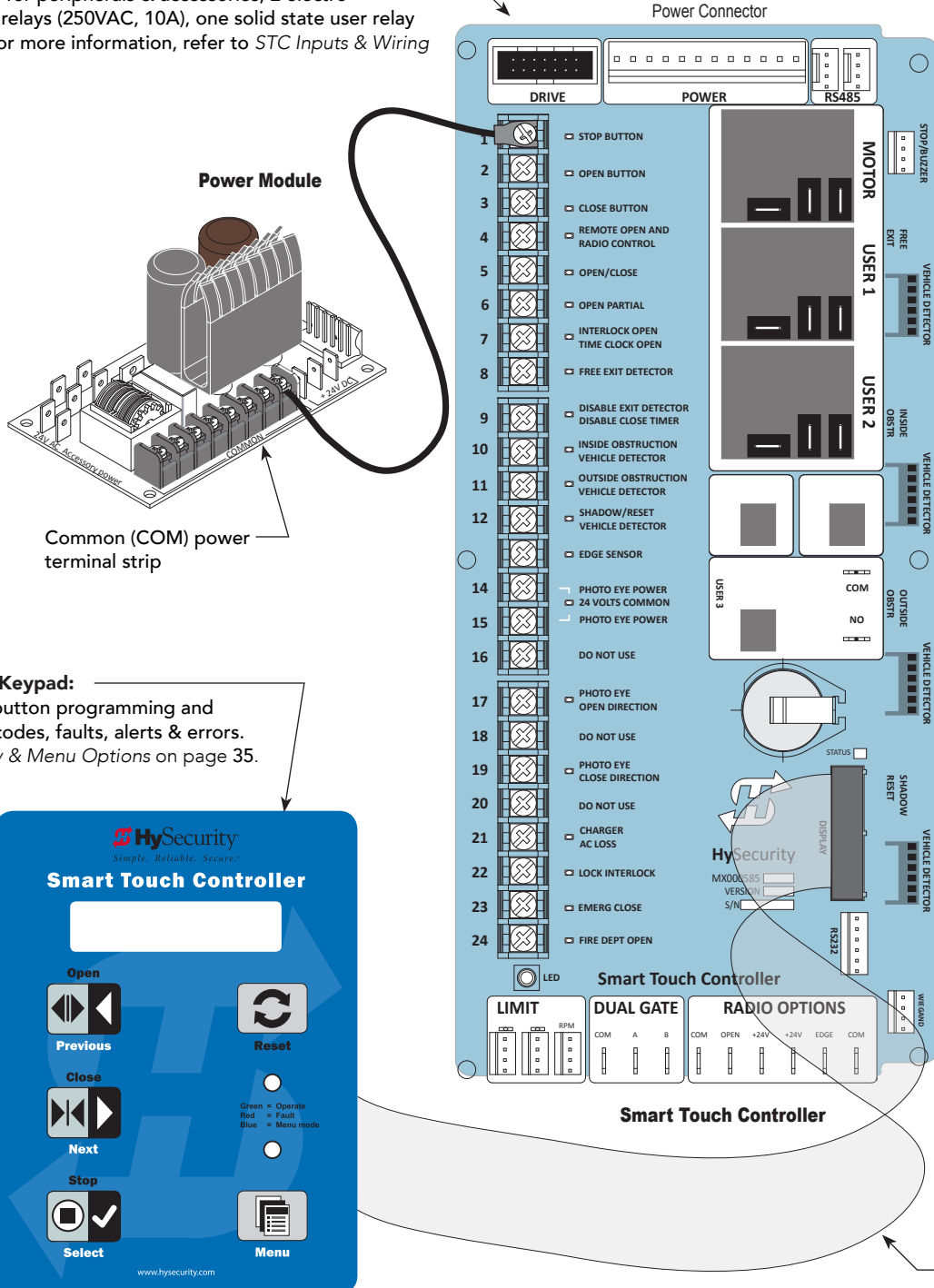
NOTE: DRAWING IS NOT TO SCALE.

# STC BOARD, POWER MODULE AND DISPLAY

The Smart Touch Controller provides connections for a multitude of peripherals and accessory devices. The Power Module offers 8 common bus terminals, 4 terminals (24VAC) and 3 terminals (24VDC) with a 3A maximum draw. The touch-sensitive keypad and 32-character display connects to the STC with a waterproof ribbon cable. For more information about STC Inputs and connections, refer to *STC Inputs & Wiring* on page 49. For more information about the display programming, operator modes and keypad navigation, refer to *Display & Menu Options* on page 35.

## Smart Touch Controller:

Provides inputs for peripherals & accessories, 2 electro-mechanical user relays (250VAC, 10A), one solid state user relay (30VDC, 3A). For more information, refer to *STC Inputs & Wiring* on page 49.



## STC Display & Keypad:

Provides push button programming and displays menu codes, faults, alerts & errors. Refer to *Display & Menu Options* on page 35.



# Display & Menu Options

Highly sophisticated software provides three different modes of operation: *run*, *program*, and *fault*. How to navigate using the Smart Touch Controller (STC) keypad, interpret status display codes and program the operator is found in this section.



Keep your operator current with the latest software version. Use of HyNet™ and other accessories requires software version h4.35 or higher.

## INITIAL SETUP

Once you have completed the installation, attached the wired accessories and turned the power ON, you're ready to program the operator. Two different approaches exist:

- Connect a laptop computer to the serial (RS-232) port, check for the most current software version and then set the operator menu configurations via the START software.

**NOTE:** Use a laptop computer at your place of business to conveniently download the free START software and most current software version from [www.hysecurity.com](http://www.hysecurity.com) before heading out into the field. This makes it easy to adjust settings using a laptop.



- Manually navigate through the User and Installer Menus using the STC keypad. The instructions for performing this second option are provided in this section.

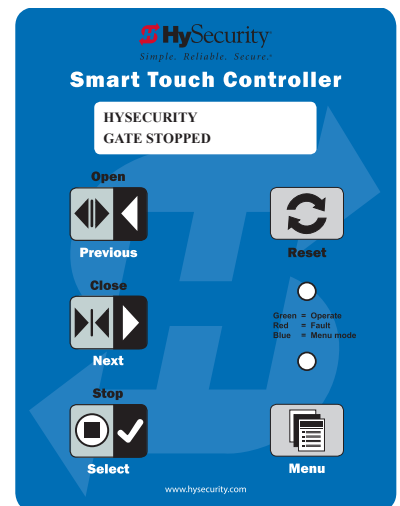
## UNDERSTANDING THE DISPLAY AND KEYPAD

The STC display and keypad provide access to the operator's sophisticated software and functionality.

Three different operational modes exist:

- Run Mode - gate is operational, awaiting commands.
- Program Mode - motor disengages and operator commands are ignored. Data entry, menu navigation, and menu selection can be accomplished via the keypad or through a START software connection using the RS-232 port.
- Fault Mode - alerts, faults, or errors appear on the display. Some errors or faults can be reset with the Reset button while more serious faults require additional troubleshooting. Faults indicate a need for diagnosis and resolution. Refer to *Troubleshooting* on page 73.

The keypad lets you navigate, change, or clear the information in the display menus. The singular use of these keys is dependent on the operator mode. The buttons with text above and below have two functions. Use these buttons to enter operating commands or navigate through the User and Installer Menus.

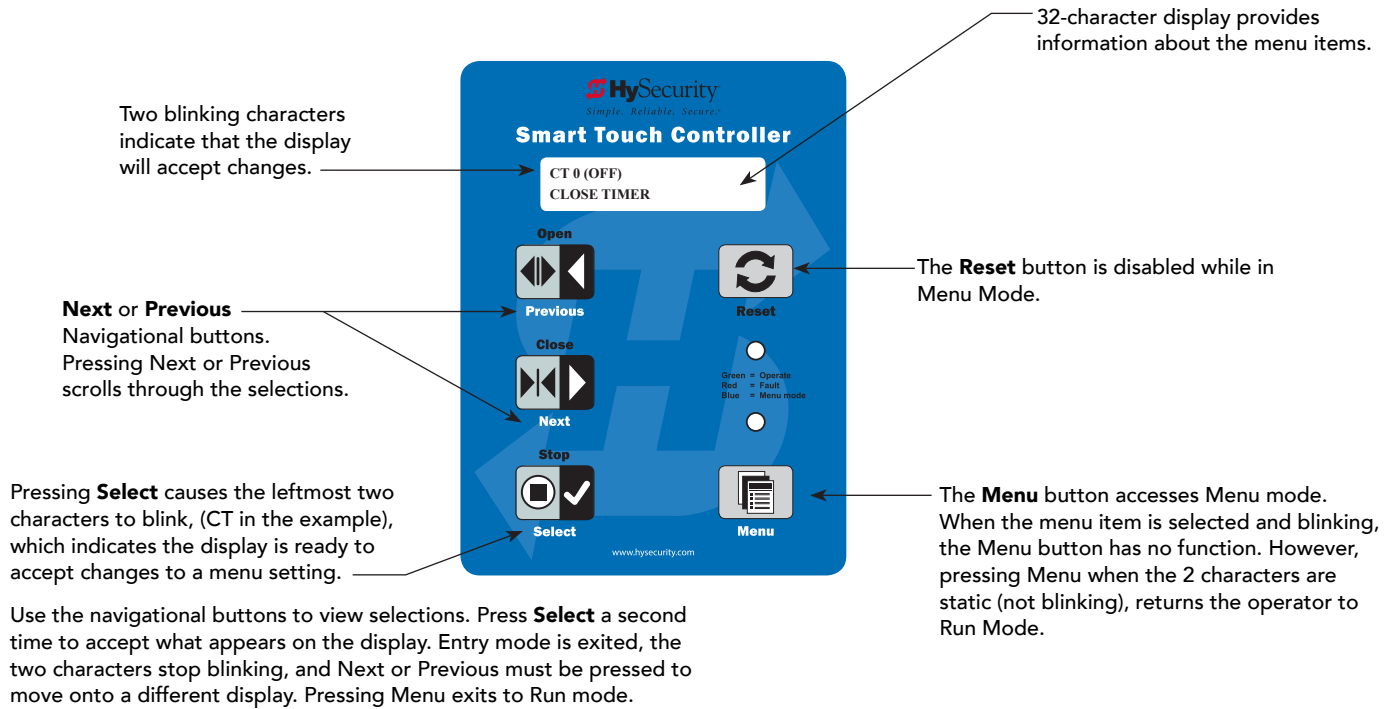


**Gate Status Display in Run Mode**

# MENU MODE AND THE STC KEYPAD

In Menu Mode, the motor disengages and operator commands are ignored. Data entry, menu navigation, and menu selection can be accomplished using the buttons on the Smart Touch Controller keypad.

**NOTE:** Menu Mode automatically returns to Run Mode if no activity (i.e. key presses) occurs for two minutes.



## MENU MODE NAVIGATION

Navigating within the program menus is easy once you learn how the keypad buttons function. Refer to the following chart.

**Smart Touch Controller: Menu Mode Navigation Buttons**

To change that data appearing in the display	To navigate through the Selections	To choose what appears on the display	To navigate between menu items
Press <b>Select</b> . Two left characters blink.	Press <b>Next</b> or <b>Previous</b> . Continue pressing Next to view all selections.	Press <b>Select</b> . Blinking characters become static.	Press <b>Next</b> or <b>Previous</b> . Advance - press Next Previous - press Previous



# RUN MODE AND THE STC KEYPAD

The Run Mode displays appear static when the operator is ready and waiting for a run command. When the display is flashing GATE OPENING or GATE CLOSING, a command has been received and the barrier gate is in motion. The command may come from a variety of sources: a card reader, push-button remote, or recognition of a vehicle passing over a loop detector. In all cases, the operator “runs” the motor when it receives an operational command.

Three displays indicate the position or status of the barrier gate. The keypad entry used to access the User or Installer menus, begins at one of these Run Mode displays.

32-character display identifies operator modes.

Pressing Open, Close, or Stop causes the gate to perform the command.

Pressing **Reset** clears alerts or faults and returns to Run Mode. **NOTE:** Press Reset at any Run mode status display to view the software version. For example: **h4.35**

Pressing **Menu** scrolls through operator status displays and accesses the User Menu. **NOTE:** Pressing the Menu button twice, bypasses the operator status displays.

**Run Mode Displays**

**NOTE:** To access the User or Installer menus, the motor cannot be engaged and the gate cannot be moving.

# VIEWING OPERATOR STATUS DISPLAYS

Press the Menu button once and the operator status displays scroll past in two second intervals. Pertinent information appears to provide a quick overview of the operator’s status or configurations.

The type of information that may scroll across the display includes: interlocked or sequenced gate (if applicable), operator type (OT), gate handing, Usage Class (UC), buss voltage, and life cycle counter.

**Example of Operator Status Displays**

The following chart describes the scrolling status displays in the SlideDriver or SlideDriver 50VF-series.

Operator Status Display	Variables	Description
Software Version A lower case "h" appears in front of the software version number.	The software version and revision number are hard-coded in the Smart Touch Controller.	Displays the software version when you press Reset or cycle power. You will need the software version when calling Technical Support.
Dual Gate or Sequenced Gate	This display only appears when the operator is used in interlocked or sequenced gate systems and indicates the function of the operator: Cfg 1 or Cfg 2 (Configuration 1/2)	Indicates, in an interlocked or dual gate setting, whether the operator is set to Primary or Secondary or Configuration 1 or 2 (Sequenced Gate setting). The setting is assigned in the Installer Menu.
Operator Type (OT)	OT 1 = SlideDriver OT 7 = SlideDriver 50VF series	Indicates and identifies the operator.
Set Handing (SH)	L = Left and R = Right	Indicates gate handing.
Usage Class (UC)	1, 2, 3, or 4	Displays the operator's Usage Class designation per UL 325 standards.
Battery Voltage	This display only appears when a DC power source is being used. The number varies depending on the voltage that the charger is providing.	Input voltage (DC Buss voltage) to the STC is shown.
Cycle Count (CC)	One cycle equals a full open and close sequence. Partial cycles are not counted	Displays the number of cycles the gate operator has incurred. Similar to an odometer, it resets to zero after 999,999 cycles.
Close Timer (CT)	The first menu item in the User Menu.	Displays the number of seconds before the open gate initiates. <b>NOTE:</b> You can also access the Installer Menu from this display.

## Stop the Status Display Scrolling

To stop the operator status display scroll and focus on one item, press Select. Press Select a second time, to resume the scrolling display.

## Change the Display Contrast

While the operator status displays are scrolling, you can change the contrast by pressing Select, and then pressing the up or down arrow keys. The display's contrast changes accordingly. To exit, press Select again and the operator status displays continue to scroll and stop at the User Menu entry item.

**NOTE:** Since sunlight does not affect readability on the OLED display, changing the display contrast is not available on SlideDriver models shipped with the 32 character display.

## Check Time and Date

An easy way to determine if your operator is set for the correct date and time zone can be accomplished by taking the following steps:

1. While in Run mode (gate status appears in the display), press and hold the STOP button.  
The date appears DD/MM, and then the time HH:MM.
2. If you need to change the time zone, refer to the Set Clock "CL" item in the User Menu. Refer to *User Menu: Table 1* on page 39.

# USER MENU

The User Menu consists of several items which can be modified using the Smart Touch Controller keypad.

## Access:

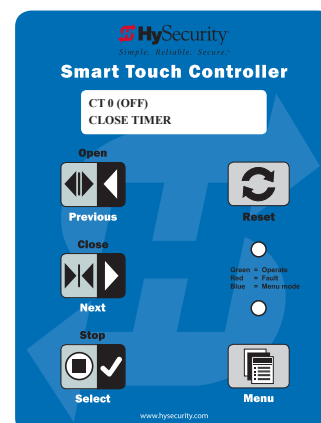
Pressing the Menu button, at one of the static Run Mode displays, causes the operator status displays to scroll past, stop and display the first user menu item.

When the CT, Close Timer (or HC, Hold to Close) display appears, it means you have accessed the User Menu. The Close Timer display is the first in a cyclical series of User Menu displays.

**NOTE:** To access the User Menu, the operator must be in Run Mode. To bypass the operator status displays, press the Menu button a second time.

Use the navigational buttons, Select, Next, and Previous to change or view the menu functions. Refer to the chart, *Smart Touch Controller: Menu Mode Navigation Buttons* on page 36.

Table 1 describes the User Menu items and supplies the factory defaults. (Factory default settings shown in bold.)



## USER MENU: TABLE 1

User Menu	Setting Options	Menu Tasks & Explanations	STC Wire Connections
CT 0 (OFF) CLOSE TIMER	<b>0 = Timer disabled (OFF)</b> 1 second to 99 seconds	The Close Timer assigns how many seconds before the open gate initiates closure. It provides a security precaution in case a CLOSE pulse from the Arm Smart DC controller is missed. Keep the setting at 0 if a hard-wired, push-button control device is being used. Refer to HC. <b>NOTE:</b> When the Hold to Close is set to 1 or more seconds, the Close Timer display does not appear and HC 1 becomes the User Menu entry display.	Not applicable (N/A)
HC 0 (OFF) HOLD TO CLOSE	<b>0 = off</b> 1 = on	Set to 0 to produce a gate closure when a momentary signal is transmitted. Set to 1 if a constant hold to close signal, such as a push button control, is being used. A setting of 1 also deactivates the automatic close timer and causes its menu to disappear. The Hold to Close replaces the Close Timer display as the User Menu entry display. <b>NOTE:</b> To comply with UL 325 Type D protection, set HC to 1. Type D UL 325 compliance means no automatic closing device, such as a timer, loop sensor, or similar device shall not be employed.	COM Close
HO (OFF) HOLD TO OPEN	<b>0 = off</b> 1 = on	Similar to Hold to Close, but configures the Open inputs for a constant-hold function. 0 = Momentary open signal 1 = Constant hold open push button required To comply with UL 325 Type D protection, you must set HO to 1.	COM Open

User Menu	Setting Options	Menu Tasks & Explanations	STC Wire Connections
AP 0 AC LOSS	<b>0 = UPS FAIL OPEN</b> 1 = UPS FAIL CLOSE 2 = AUTO OPEN 3 = NO CLOSE TIMER	This menu item only appears if the operator is DC powered. The setting configures how the gate functions when AC power fails. For more information, refer to the supplement provided with the DC Power Supply operator.	COM Terminal #21 UPS Terminal strip 24 VDC to control box power disconnect switch - and +
RO 0 (OFF) RADIO OPEN/CLOSE	<b>0 = off</b> 1 = on	A setting of zero, configures radio input for open only. Setting 1 adds the capability for radio input to close the gate, but only when it is fully open.	COM RADIO Open
BF 2 (ON 2 SEC) WARN BEFORE OPER	0 = off 1 = warning buzzer on throughout gate travel 2 = warning buzzer on for 2 seconds of gate travel <b>3 = warning buzzer on during gate travel</b>	Controls the warn-before-operate buzzer and can be configured three ways: Set to 0: Buzzer is disabled. The buzzer will still beep if alerts, faults, errors, or entrapment occur. Set to 1: Buzzer beeps for 3 seconds before gate moves and continues through entire length of travel. Set to 2: Buzzer beeps for 3s before gate moves and continues for 2s of travel. Set to 3: <b>Available on barrier operators only.</b> Buzzer beeps when gate starts to move and continues throughout gate travel.	Not applicable (N/A)
FA 0 (OFF) FORCE OPEN ALERT	<b>0 = off</b> 1 = on	Intended for highly secure facilities. Set to 1, the operator sounds the 3-second "warn before operate" buzzer alarm and initiates a closure if the gate is forced open and the closed limit switch disengages. The motor starts to secure the gate. If the gate does not fully close within 4s, the motor turns off and the buzzer sounds for 30 seconds. The display shows ALERT 1 - FORCED OPEN.	N/A
DA 0 (OFF) DRIFT CLOS ALERT	<b>0 = off (standard)</b> 1 = on (detailed)	Set to 1, the operator sounds the 3-second "warn before operate" buzzer at gate and initiates an open command if the gate is forced, or drifts, off the open limit switch. The motor starts to reopen the gate. The motor runs for a maximum of 4s and, if the gate is not fully open at the end of this period, the buzzer sounds for 10s. The display shows ALERT 2 - DRIFT CLOSED.	N/A
PE 0 (OFF) PHOTO EYE ALIGN	<b>0 = off</b> 1 = on	Set to 1, the operator serves as an aide in photo eye transmitter/receiver alignment. The buzzer chirps once when the emitter and receiver are not aligned. When the emitter and receiver are aligned, the buzzer chirps twice. If they go out of alignment again, the buzzer will chirp once. The Alignment Mode is reset with a close-limit input or by pressing the Reset button. <b>NOTE:</b> If the operator doesn't run when the power switch is initially turned ON, check the alignment of the photo eye and all the photo eye connections.	EYE Open EYE Close EYE COM
CL 0 SET CLOCK	<b>0 = off</b> 1 = on	To adjust the hour, minute, day, or month to a different time zone, select 1. Once the clock is set, the display returns to the 0 setting. It is important to adjust the clock for the operator's time zone, because significant events are time and date stamped which provides historical operation data retrievable through S.T.A.R.T. and a PC laptop.	N/A

User Menu	Setting Options	Menu Tasks & Explanations	STC Wire Connections
LD 5 LCD CONTRAST	<b>5</b> 0 through 9	Adjusts the contrast of the display. Available settings from low contrast 0 to 9 high contrast, with a factory default setting of 5. <b>NOTE:</b> Not used or available with the OLED 32 character display.	N/A
DS 0 (OFF) DIAGNOSTIC LOGS	<b>0 = off (standard)</b> 1 = on (detailed)	Set to 0, the STC logs pertinent operator events such as faults, errors, or menu manipulation. When experiencing intermittent problems, set this item to 1 to record all operator open and close events, in addition to the normal alert, fault and error logs. This parameter automatically resets to the default 0 (off) after 24 hours.	To read the log file, an RS-232 cable and PC laptop computer loaded with HySecurity free S.T.A.R.T. software is required. Visit <a href="http://www.hysecurity.com">www.hysecurity.com</a>
PD 0 SET PASSWORD	<b>0 = Off</b> 1 = On (Set Password)	<b>NOTE:</b> A System Address (SA) value in the installer Menu must be set before the Set Password display appears in the User Menu. To enter a password (up to 80 characters) for network connectivity, select 1. You can use the menu navigation buttons to enter the password (SELECT, NEXT, SELECT). When the password is set, the display returns to the 0 setting.	Network: Ethernet or RS-485

## INSTALLER MENU

The Installer Menu options provide more advanced configurations for the gate operators. Access to the Installer Menu is through the User Menu. The navigational buttons are the same in both menu modes. Refer to *Menu Mode Navigation* on page 36.

### Access:

While a static gate status is being displayed, press the Menu button twice. (Bypasses the operator status displays.)

When the Close Timer display appears (Hold to Close, if the Close Timer display is hidden):

1. **Access the Installer Menu** by simultaneously pressing and holding the Reset and Open buttons.
2. Release both buttons and the display changes, indicating you have arrived at the first item in the Installer Menu.

**NOTE:** Installer Menu options can also be configured through the use of a laptop computer and S.T.A.R.T. software. See *Smart Touch Analyze and Retrieve Tool* information found on the Hysecurity website: [www.hysecurity.com](http://www.hysecurity.com)

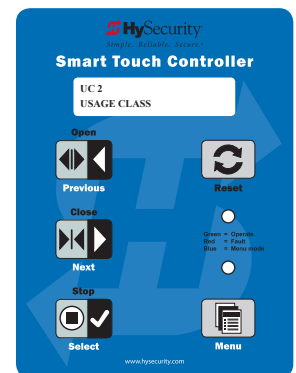
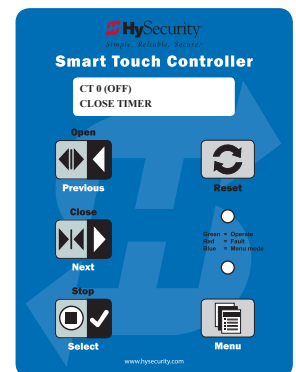
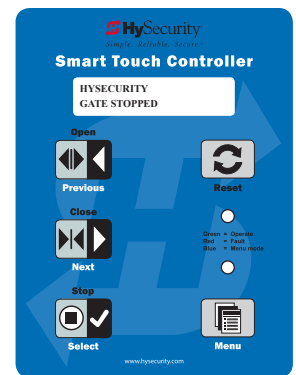


Table 2 describes the Installer Menu items and supplies the factory defaults. (Factory settings shown in bold.)

## INSTALLER MENU: TABLE 2

Installer Menu	Setting Options	Menu Tasks & Explanations	STC Wire Connections
OT 0 <model name>	<b>0 = Operator Type</b> 1 = SlideDriver (HSG) all models except 50VF series 2 = SwingRiser (HRG) 3 = HydraLift (HVG) 4 = StrongArm (HTG) 5 = SlideWinder 24 6 = SlideWinder 38 7 = SlideDriver 50VF 8 = StrongArm CRASH 9 = HydraSwing	Select the appropriate number for the operator. <b>NOTE:</b> This menu item only appears if the Smart Touch Controller is being replaced. <b>CAUTION: If you are replacing an STC board, remember to transfer the operator's menu settings from the existing board to the replacement board. Refer to the installation instructions that accompany the replacement STC board.</b>	Not applicable (N/A)
AD 0 AC/DC GATE	<b>0 = gate disabled</b> 1 = AC (alternating current) 2 = DC battery-power (OT 1-4, 7&8)	Select the type of power that the operator uses and is appropriately wired. <b>NOTE:</b> This menu item only appears when you set the OT (operator type).	N/A
SP 0 SET SPEED (or indicate Modbus control)	<b>0 = gate disabled</b> 1 = No ModBus communication** 2 = 2 ft/s 3 = 3 ft/s <b>**NOTE:</b> A setting of 1 indicates no ModBus communication or wiring is present. The VFD uses its factory settings to control speed.	Set the maximum speed for the gate. <b>NOTE:</b> This menu item only appears if the Slide-Driver operator is part of the 50VF series. It does not appear with any other operator type. <b>CAUTION: Standard and Stop extended limit ramps must be installed on the drive rails!</b>	N/A
UC 0 USAGE CLASS	<b>0 = gate disabled</b> 1 = single family dwelling 2 = multi-family 3 = industrial * 4 = guarded location * *not serving the general public	Designates the UL 325 Usage Class (UC). The installer sets the usage class for the operator to function. <b>NOTE:</b> The usage class setting does not appear on Crash products.	N/A
SH 0 GATE HANDING	<b>0 = gate disabled</b> R = viewed from the secure side, the gate moves right to open L = viewed from the secure side, the gate moves left to open	Handing only appears on slide gate operators (OT 1, 5 – 7). On slide gates, the installer sets the operator's handing before the operator will function, so an R or L appears in the display.	N/A
BU 0 LOUDEST BUZZER	<b>0 = buzzer not set</b> 1 = Frequency 1 * (on) 2 = Frequency 2 * (on) *Select the loudest buzzer	This menu item only appears if the operator type selected is 1 through 4. Choose the loudest buzzer. The operator provides an audible beep when you select either buzzer 1 or 2. Make sure to choose the loudest audible buzzer sound for your operator type.	N/A
FD 0 (OFF) FACTORY DEFAULTS	<b>0 = user settings (custom)</b> 1 = reload factory settings	Select setting 1 to return the operator to factory defaults. Globally restores all menu settings back to new operator status. <b>NOTE:</b> If factory defaults are restored, any customized menu settings will need to be reprogrammed. You can save your customized menu settings using a PC laptop & S.T.A.R.T.	N/A

Installer Menu	Setting Options	Menu Tasks & Explanations	STC Wire Connections
DG 0 (OFF) DUAL GATE	<b>0 = solo operator (off)</b> 1 = Secondary unit 2 = Primary unit 3 = Sally Port A 4 = Sally Port B	Establishes communication after wiring dual gate connections between two operators in Primary/Secondary or Sally Port site configurations. This menu item appears if the sequenced gate menu item (SG) is set at 0 (off).	Dual Gate COM (Gate 1) to Dual Gate COM (Gate 2) A to A B to B
SG 0 (OFF) SEQUENCED GATE	<b>0 = off</b> 1 = Loop Layout/Site #1 2 = Loop Layout/Site #2	Establishes communication after wiring two or more operators as sequential gates. This menu item only appears if the Dual Gate menu item (DG) is set at 0 (solo operator). <b>NOTE:</b> Access the User Menu in both operators and set a Close Timer.	Connect Dual Gate COM (Traffic Gate) to Dual Gate COM (Security Gate) A to A B to B
CH 0 (AC) CHARGER TYPE	<b>0 = AC powered charger</b> 1 = Solar powered charger	Does not appear on an AC-powered operator. The menu item only appears when using the DC Charger unit and designates the charger type.	
FO 0 (DISABLED) FIRE DEPT OPEN	<b>0 = disabled</b> 1 = enabled	Provides the Fire Dept. Open input. When set to 1, the open signal received by the operator overrides all photoelectric eyes and edge sensors, and opens the gate. Pressing the Reset, Open, or Reset button is required before the gate can be closed.	+24V Fire Dept Open (#24)
OC 0 (DISABLED) EMERGENCY CLOSE	<b>0 = disabled</b> 1 = enabled	Enables the Emergency Close input. When set to 1, the constant hold close overrides vehicle detectors, photo eyes and edge sensors, and closes the gate. Pressing the Reset button once or the Open button twice is required before the gate will open.	+24V EMERG CLOSE (#23)
SE 2 IES SENSITIVITY	1 = maximum sensitivity <b>2 = moderate (default)</b> 9 = lowest sensitivity	Adjusts the sensitivity of the internal inherent sensor. Available settings are 1-9 with 9 being the least sensitive.	
SS 0 IES STOP ONLY	<b>0 = (off) Stop and reverse for 2 seconds</b> 1 = (on) stop only ( <b>NOTE:</b> Functions in usage class IV only)	Only available in Usage Class IV gate operators and allows an option whereby the inherent sensor will only stop the gate.	
LC 0 LEAF DELAY CLOSE	<b>0 = none</b> 1 to 7 = ½ (minimum) to 3½ seconds (maximum) in ½-second steps (for Primary/Secondary only)	Only appears if the gate operator is set up as a Primary or a Secondary. Available settings are 1-7. Each increment adds ½ second, to a maximum of 3 ½ seconds time delay, before the operator activates when commanded to close.	
LO 0 LEAF DELAY OPEN	<b>0 = none</b> 1 to 7 = ½ (minimum) to 3½ seconds (maximum) in ½-second steps (for Primary/Secondary only)	Only appears if the gate operator is set up as a Primary or a Secondary. Available settings are 1-7. Each increment adds ½ second (with a maximum of 3 ½ seconds) time delay following a command to open before the operator activates.	
RT 0 (60 SECS) MAXIMUM RUN TIME	<b>0 = 60 Seconds max run</b> 1 = 300 Seconds max run	Allows an optional setting of 300 seconds if changed to [RT 1] as opposed to the maximum run timer default setting of 60 seconds.	
PO 0 (OFF) PARTIAL OPEN	<b>0 = none</b> 7 to 99 seconds	Activates the partial open input and allows an adjustable distance by setting the open duration. The available time settings are 7-99 seconds. The default setting [PO 0] leaves this input inactive.	



Installer Menu	Setting Options	Menu Tasks & Explanations	STC Wire Connections
EC 0 STOP ONLY EYE CLOSE LOGIC	<b>0 = Close eye stops only</b> 1 = Reverse to full open with barrier gates (2 second reverse to open on swing, slide, or vertical gates)	The default setting is non-reversal if the close photo eye is triggered. A setting of 1 causes the gate to reverse and travel full open if triggered while closing.	EYE Close #19 EYE COM (Inputs #14 or #15)
EO 0 STOP ONLY EYE OPEN LOGIC	<b>0 = Open eye stops only</b> 1 = 2 second reverse to close	The default setting is non-reversal if the open photo eye is triggered. The optional setting of [EO 1] will cause the gate to reverse to close for two seconds if triggered while opening.	
GR 0 FULL OPEN GATE EDGE LOGIC	<b>0 = Edge reverses fully open</b> 1 = 2 second reversal only	The default setting is reopen fully if the gate edge is triggered. The optional setting of [GR_1] sets the gate to a 2-second reversal if triggered while closing.	
SR 1 REVERSE 25 REVERSAL LOGIC	0 = IES reverses fully open <b>1 = 2 second reversal only</b>	The default setting is a 2-second duration reversal if the inherent sensor is triggered. The optional setting of [SR_0] will cause the gate to reopen fully if triggered while closing.	
PC 0 N.O. INPUT PHOTO EYE OUTPUT	<b>0 = Normal Open N.O. INPUT</b> 1 = Normal Closed N.C. INPUT (monitored)	The default setting is for photo eyes with Normally Close outputs for Crash Operators only. When set for NC, the connection is monitored and any open or short circuit fault will generate a FAL 2 alert which requires a Stop or Reset button press to clear and enter. All other HySecurity operators are factory set for normal open (a setting of zero).	EYE Close EYE COM 4 wires total: COM/+24 COM/ PHOTO EYE CLOSE (#19)
GC 0 N.O. INPUT GATE EDGE OUTPUT	<b>0 = Normally Open N.O. INPUT</b> 1 = Normally Closed N.C. INPUT (monitored)	The default setting is edge sensor with Normally Open (NO) output. The optional setting of 1 requires an (NC) output.	EDGE SENSOR (#13) COM
TC 1 (INTLOCK) TIME CLK/INTLOCK	0 = TIME CLK (Select Time Clock) <b>1 = INTLOCK</b> (Select Open Interlock)	Configures the input at Terminal No. 7 on the STC to be either for the gate interlock function, or for an external time clock to open input. The default setting is (TC_1) for the interlock function.	INTERLOCK OPEN (#7) COM
DT 0 FREE EXIT DISABLE FUNCTION	<b>0 = Disable Free Exit</b> 1 = Disable Close Timer	Configures Terminal #9 input to disable either the Free Exit Detector function or, alternately, the Timer Close function. The default setting disables the free exit detector. <b>NOTE:</b> When set to 0, the free exit is disabled while gate rests on closed limit. If the closed limit is not tripped, the free exit continues to work normally.	DISABLE EXIT DETECTOR (#9) COM
OR 1 REVERSE OUTSIDE OBS LOOP	0 = Pause closing only <b>1 = Enable reversing to open</b> 2 = Ignore and continue closing*	The default (1) is for full reversal when the Outside Obstruction Loop is triggered. A setting of 0 causes the gate to only pause when triggered. The gate closure begins as soon as the loop is clear again. *A setting of 2 is only available on CRASH barriers and provides for the most secure facilities where it is essential that the loop trigger is completely ignored and the barrier arm continues closing without pause or reversal.	OUTSIDE OBS LOOP (#11) COM or connection to HY-5A detector

Installer Menu	Setting Options	Menu Tasks & Explanations	STC Wire Connections
IR 1 REVERSE INSIDE OBS LOOP	0 = Pause closing only <b>1 = Enable reversing to open</b> 2 = Ignore and continue closing*	The default is for full reversal when the Inside Obstruction Loop is triggered. A setting of 0 causes the gate to only pause when triggered. Closure begins as soon as the loop is clear again. *A setting of 2 is only available on CRASH barriers and provides for the most secure facilities where it is essential that the loop trigger is completely ignored and the gate continues closing without pause or reversal.	INSIDE OBS LOOP (#10) COM or connection to HY-5A detector
DL 1 STANDARD DETECTOR LOGIC	<b>1 = Standard</b> 2 & 3 = Quick Close 4 = Full anti-tailgate	Determines how the operator responds to a tail gate notification. <b>NOTE:</b> Does not appear in barrier gate operators.	
RL 1 CLOSE LIM RELAY 1 LOGIC	<b>0 = Disabled</b> 1 = Close limit active (1 to 29 available)	Configures the function of the User 1 output relay. It has the capacity to switch both AC and DC loads and can be used for high voltage and/or high current loads. Connect devices directly to the top of the relay: COM and either NO and/or NC contacts. Multiple logic function options exist. Refer to <i>User Relays – Programming Procedure</i> on page 55.	User 1 Relay
R2 6 GATE LOCK RELAY 2 LOGIC	<b>0 = Disabled</b>  1 to 29 available	Configures the function of the User 2 output relay. It has the capacity to switch both AC and DC loads and can be used for high voltage and/or high current loads. Connect devices directly to the top of the relay: COM plus NO and NC contacts. Multiple optional logic function options exist. Refer to <i>User Relays – Programming Procedure</i> on page 55.	User 2 Relay
R3 1 CLOSE LIM RELAY 3 LOGIC	<b>0 = Disabled</b>  1 to 29 available	Relay 3 configures the function of the User 3 output relay, which is an electronic relay with the capacity for switching a DC load only. In the StrongArm M30/M50, Relay 3 is connected to the gate LED lighting and does not appear as an option in the Installer Menu.	User 3 Relay
R4 through R11 RELAY <n> LOGIC	<b>0 = Disabled</b>  1 to 29 available	Similar to Relay 1 Logic. <b>NOTE:</b> The Hy8Relay™ module option can be purchased to provide an additional 8 relay terminals. Relay #39 set aside for Factory Use.	COM <b>NOTE:</b> R4 through RB user relays on 7-segment display
TL 2 (45 SECS) OPEN TIME ALERT	<b>2 = 45 second delay</b> 0 = 0s delay 1 = 15s 3 = 75s 4 = 105s 5 = 135s	This menu item only appears if the #8 User Relay function has been selected. It adjusts the time delay before activation of the User Relay function.	User Relay
LT 3 (75 SECS) LOITERING ALERT	<b>3 = 75 second delay</b> 0 = 0s delay 1 = 15s 2 = 45s 4 = 105s 5 = 135s	This menu item only appears if the #13 User Relay function has been selected. It adjusts the time delay before activation of the User Relay. Refer to <i>User Relays – Programming Procedure</i> on page 55.	User Relay

Installer Menu	Setting Options	Menu Tasks & Explanations	STC Wire Connections
SA 0 (OFF) STC ADDRESS	<b>0 = No network</b> 1 to 99 = Network "drop" address	Sets the system address for network communication: 0 = no network communication 1-99 sets individual poling addresses.	RS-485. Involves additional hardware & software.
NE 0 (OFF) NETWORK SETUP	<b>0 = No network (off)</b> 1 = Network address (on)	Menu item appears when SA is not set to zero (0). If a system address exists a setting of 1 opens the network configuration menu. 0 = no network communication 1 = allows configuration of network addresses.	RS-485. Involves HyNet™ & software.
ELD0 RUN MODE EXIT LOOP SET	<b>0 = Run mode</b> 1 = Show frequency 2 = Show call level 0-7 3 = Set Frequency	Controls the HY-5A Free Exit loop detector.	HY-5A
ILD0 RUN MODE IND OBS LOOP SET	<b>0 = Run mode</b> 1 = Show frequency 2 = Show call level 0-7 3 = Set Frequency	Controls the HY-5A Inside Obstruction Loop detector.	HY-5A
OLD0 RUN MODE OUT OBS LOOP SET	<b>0 = Run mode</b> 1 = Show frequency 2 = Show call level 0-7 3 = Set Frequency	Controls the HY-5A Outside Obstruction Loop detector.	HY-5A
SLD0 RUN MODE SHADOW LOOP SET (Reset Loop Set)	<b>0 = Run mode</b> 1 = Show frequency 2 = Show call level 0-7 3 = Set Frequency	Controls the HY-5A Shadow Loop detector.	HY-5A

# SETTING THE CLOSE TIMER

As an added security measure, set the Close Timer. This ensures that the Security gate closes automatically within a reasonable time frame, after all loops are cleared.

The Close Timer assigns how many seconds will pass before the gate operator initiates closure of a fully opened gate after all open commands and reversing sensor inputs have ceased and loops cleared. Every gate operator needs to have the close timer set to a specific number of seconds (for example, 5 seconds) unless a hard-wired closing device is connected to the unit, such as a “hold to close” push button station.

To adjust the time (1 to 99 seconds) it takes before the operator initiates gate closure, take the following steps:

1. At a gate status display, press the Menu button twice. This accesses the User Menu and the Close Timer display appears.

**NOTE:** If you want gate personnel to operate the gate with the Hold to Close feature found in some push button stations, then set the Hold to Close menu item to 1. When the Hold to Close menu item is active (set to 1), the Close Timer menu item is unavailable.

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2. Use the Select, and then Next or Previous buttons to navigate and change the number of seconds appearing on the display. Refer to *Menu Mode Navigation* on page 36.
3. To exit the User Menu, press the Menu button. The gate status appears in the display indicating you have returned to Run Mode.

# TEST THE OPERATOR

Complete the installation by testing the operation of the gate.

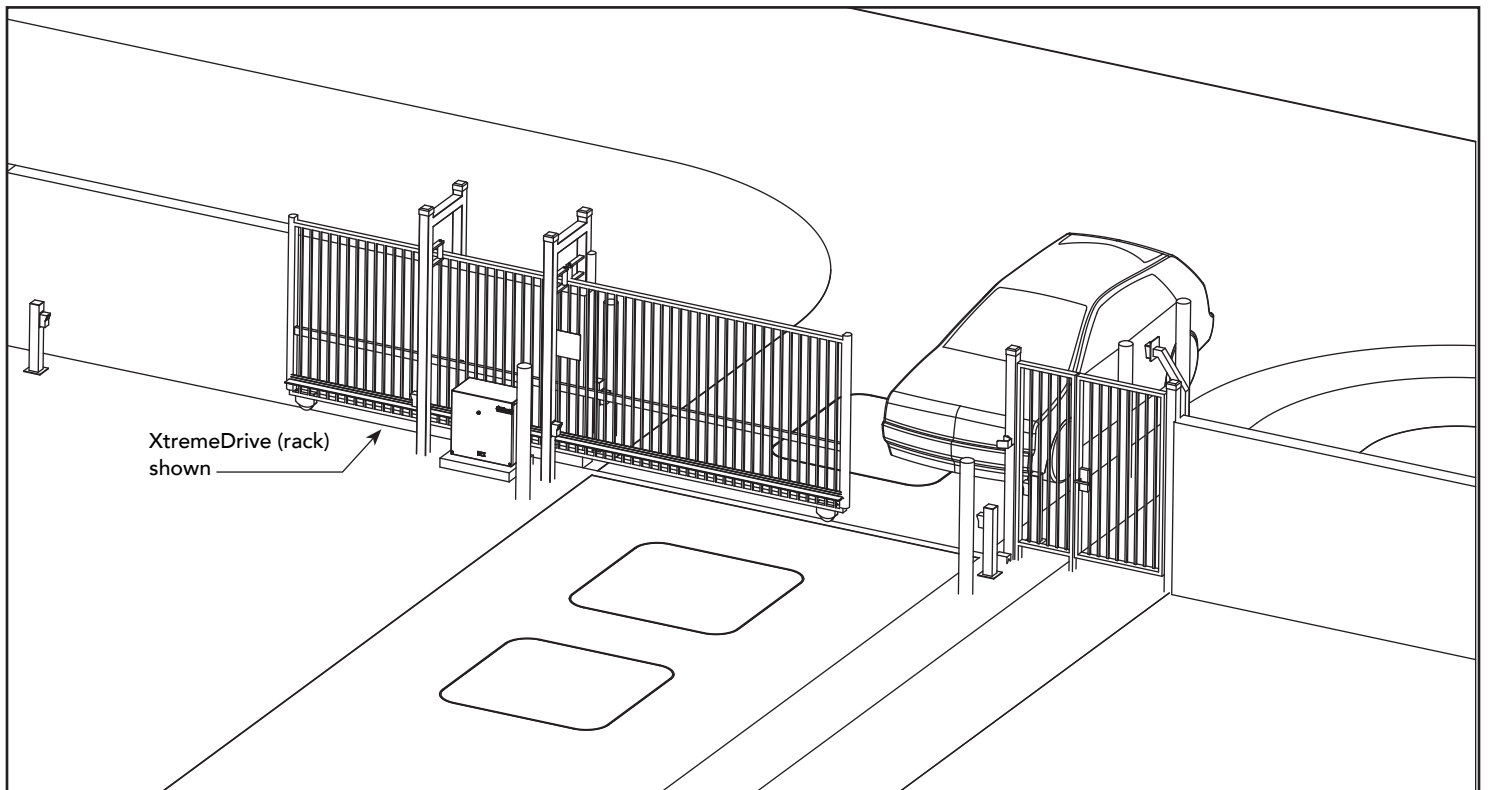
**NOTE:** The operator must be turned on and in Run mode. A Run mode display appears on the STC. If a Run mode status does not appear on the display, press Reset. If an error, alert, or fault appears on the display, refer to the *Troubleshooting* section to learn how to clear the display and return to Run mode.

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1. Press Open to open the gate.
2. Test the operator.
  - ◆ Cycle the gate a few times by pressing the Close and Open buttons.
  - ◆ If installed for emergency fast operation, test the EMERGENCY CLOSE using the constant hold device. Observe the travel speed of the gate when you press and hold the Emergency Close button. It will close a second or two faster than normal operation and ignore any photo eye, vehicle loop, or other safety device inputs.

**NOTE:** If additional accessories are to be added, read about *STC Inputs & Wiring* on page 49.

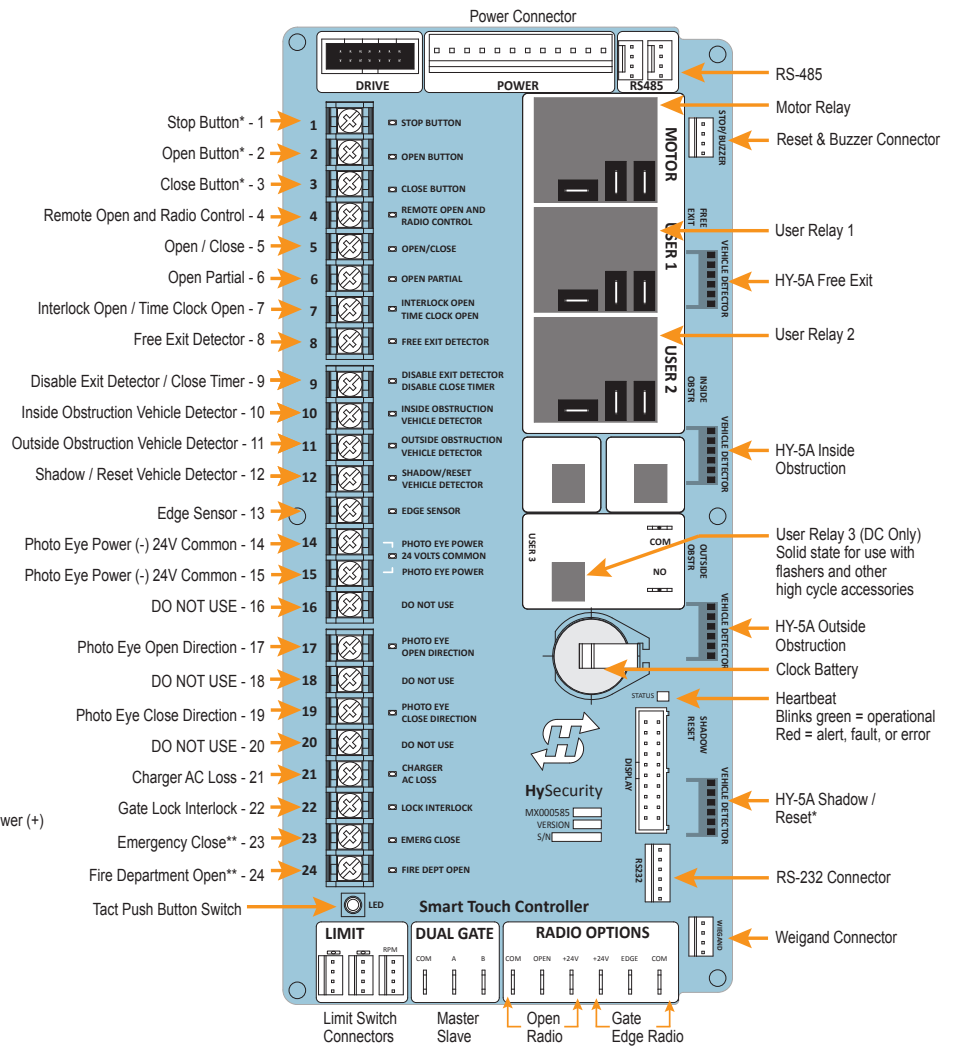
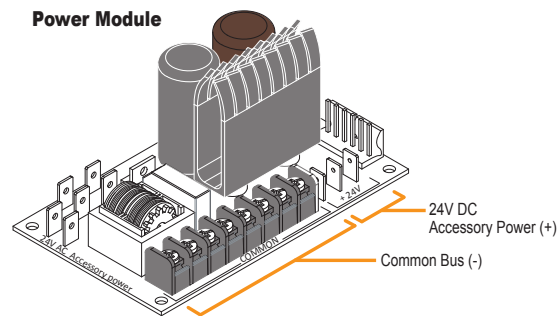
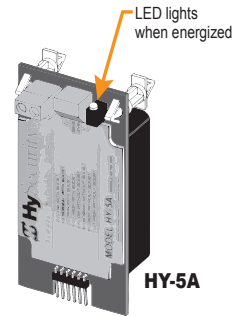
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# STC Inputs & Wiring

This section provides information about the Smart Touch Controller, its inputs for peripheral connections, and its monitoring capabilities. This section explains how to:

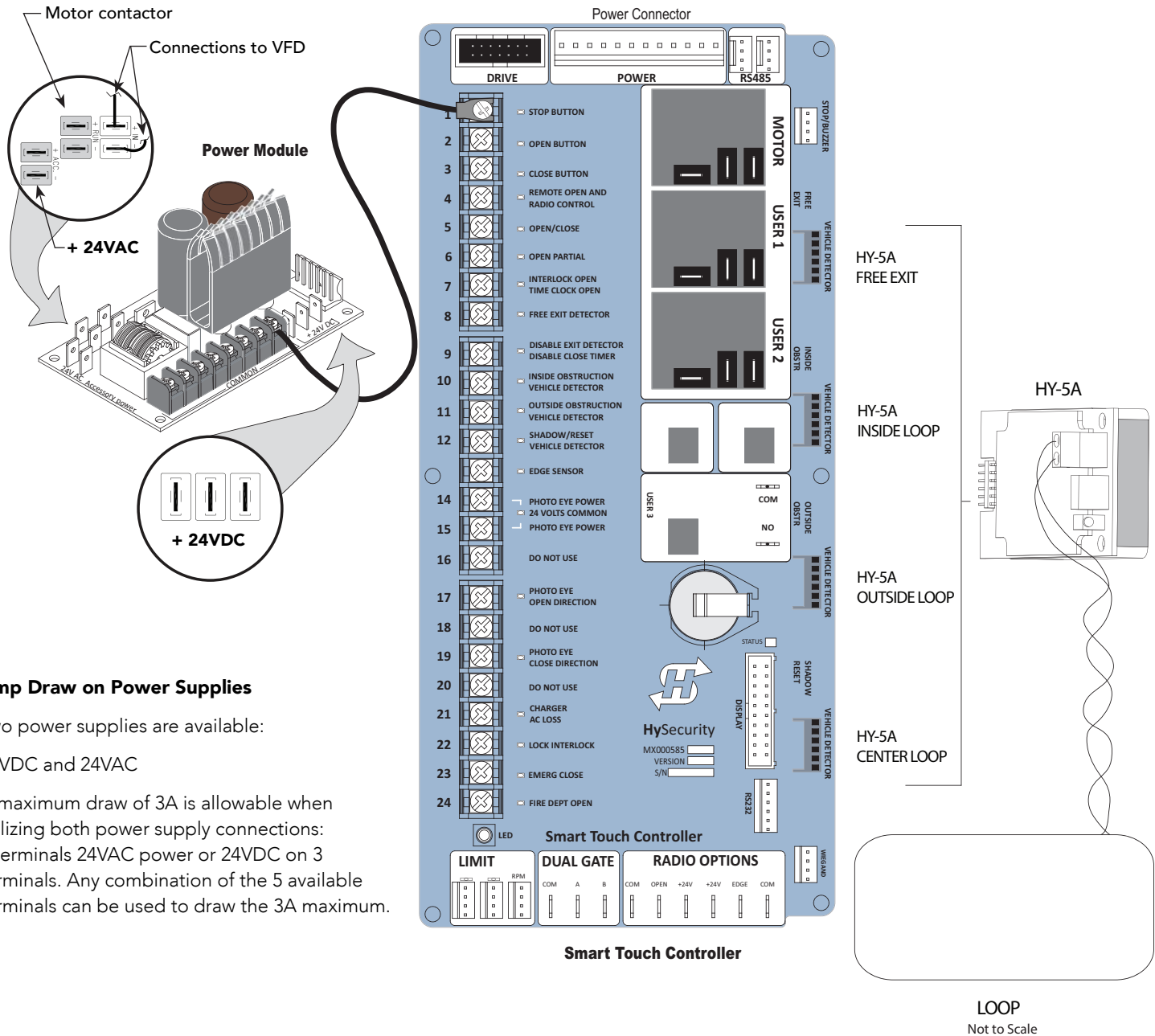
- Make Connections on the Smart Touch Controller
- Integrate with Security Systems
- Connect HY-5A Vehicle Detectors
- Connect Accessory Devices
  - ◆ Entrapment Sensor Connections
  - ◆ Access Controls
  - ◆ Push-button station
  - ◆ User Relays



# OVERVIEW OF THE STC AND POWER MODULE

The Smart Touch Controller uses LED's to indicate active inputs when AC power is present. For operators that use only DC power, you can push a Tact push button to show the active inputs. This Tact push button is at the bottom left corner beneath the #24 terminal input.

On a new operator, no active inputs should appear until external accessories and wiring are attached. If any inputs are active before connecting external wiring, refer to *Troubleshooting* on page 73.



## Amp Draw on Power Supplies

Two power supplies are available:

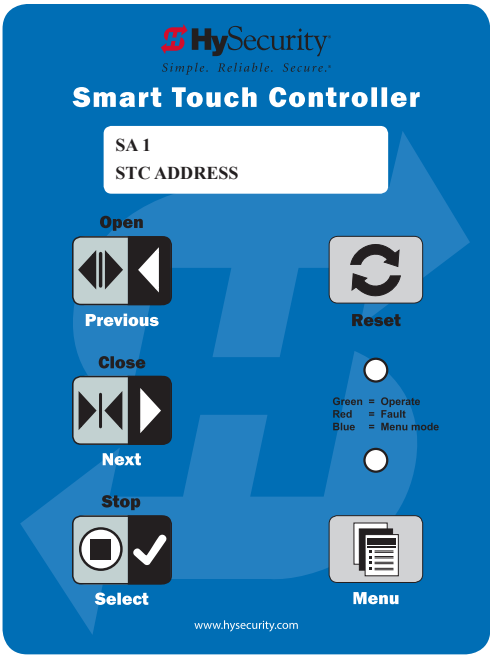
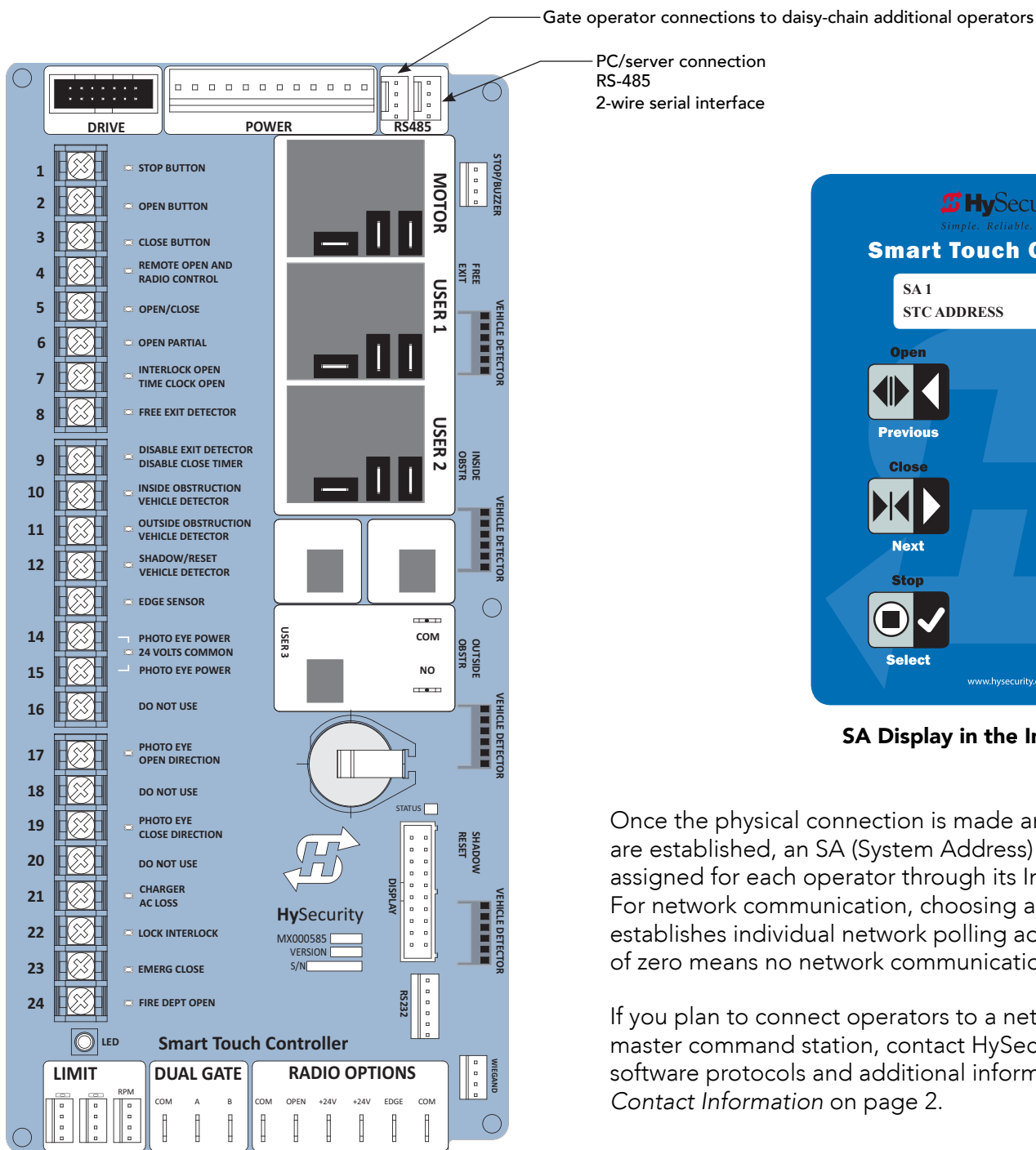
24VDC and 24VAC

A maximum draw of 3A is allowable when utilizing both power supply connections: 2 terminals 24VAC power or 24VDC on 3 terminals. Any combination of the 5 available terminals can be used to draw the 3A maximum.



# INTEGRATING WITH SECURITY SYSTEMS

HySecurity hydraulic gate operators provides a 2-wire, serial interface (RS-485 connection) which allows remote access to one or more operators. With software protocols provided by HySecurity, bi-directional status updates and control commands are easily integrated with a central controller (computer or server), which becomes the primary (master) to the connected operators. Up to 31 physical operators can be polled from the central master command station. Reset requests, gate control, gate status, and gate faults can be monitored and information can be retrieved from the central command station.



SA Display in the Installer Menu

Once the physical connection is made and protocols are established, an SA (System Address) must be assigned for each operator through its Installer Menu. For network communication, choosing a "SA" of 1 to 99 establishes individual network polling addresses. A "SA" of zero means no network communication is desired.

If you plan to connect operators to a networked central master command station, contact HySecurity for software protocols and additional information. Refer to *Contact Information* on page 2.

# SMART TOUCH CONTROLLER INPUTS

When using AC power, an LED lights next to any active input.

1. Test the open and close function of the gate before wiring to accessory devices (external control inputs). This makes it easier to troubleshoot if an unexpected functionality arises.

**NOTE:** If you are using the operator strictly in a DC capacity, the Smart Touch Controller has a tact button you can push which lights an LED next to the active inputs. This button is in the bottom left corner of the STC board. Press the SHOW LEDs push button switch to verify the status of the terminal inputs.

2. All the Smart Touch Controller inputs listed below are shown as a single input. The second wire is connected to the Common Terminal Bus on the Power Module.

**NOTE:** The Emergency Close and Fire Dept. Open inputs are an exception and require a +24V input. The +24V is located on Power Module next to the Common Bus. Refer to the drawing on page 54.

## STC TERMINAL INPUTS

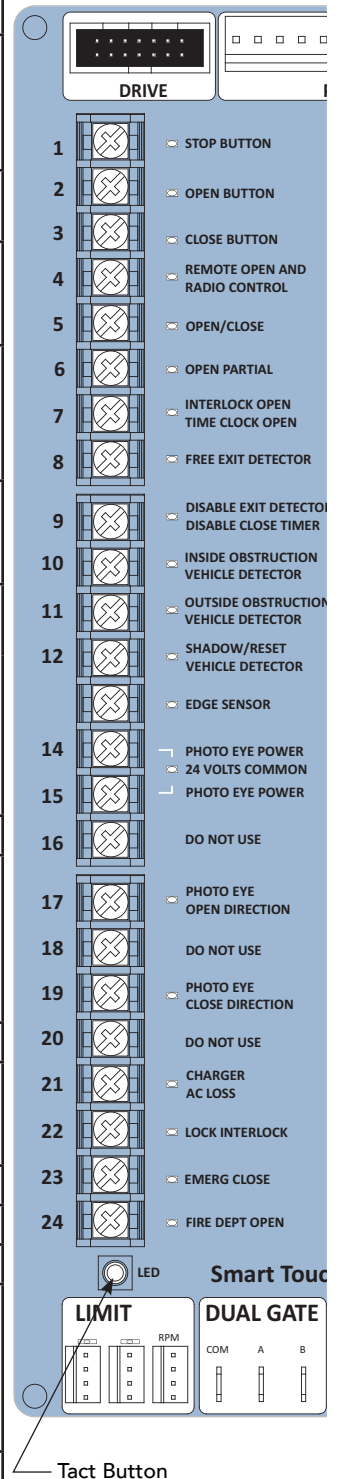


Use Terminal Inputs 4, 5, 6, and 7 for external control devices. DO NOT connect an external control device to Input Terminals, 1, 2, or 3 unless the controls are located in clear view of the entire gate area and being constantly monitored and supervised.

STC Inputs Chart

No.	STC Terminal	Wire Connections	Commonly used for...
1	Stop Button	Normally Closed input. Jumper to Common if input is not being used.	Line of sight, external stop button or 3-button station.
2	Open Button	Do not use for radio or remote access controls.	Line of sight, external open button or 3-button station.
3	Close Button	Do not use for radio or remote access controls.	Line of sight, external close button or 3-button station.
4	Remote Open & Radio Control	For radio/remote open device: Access the RO from the User Menu and set to 1.	Remote access control or radio controls
5	Open/Close Button	Connection for push button or radio controls.	Singular button device (multi-function)
6	Open Partial	<b>NOTE:</b> Terminal is only used in slide gates. Adjustable through the Installer Menu from 7 to 99 seconds.	Monitored access controls
7	Interlock Open/ Time Clock Open LED	The default is Interlock Open (TC1) but can be configured as the Time Clock Open (TC 0) input. Refer to the <i>Installer Menu: Table 2</i> on page 42.	Sequenced or interlocked gate inputs. Another use for this input is connection to a device that regulates the open timing.
8	Free Exit Detector	Refer to EB in the <i>Installer Menu: Table 2</i> on page 42.	Vehicle detector, box type connections for free exit loop.

No.	STC Terminal	Wire Connections	Commonly used for...
9	Disable Exit Detector/Disable Close Timer	Free Exit is only disabled if the Close Limit Switch is tripped. If the gate is partially opened, the Free Exit detector will trigger the gate to open fully.	Connection to free exit loop. Installer menu enabled. Refer to DT 0.
10	Inside Obstruction Vehicle Detector	Refer to the <i>Installer Menu: Table 2</i> on page 42.	Vehicle detector, box type connections inside reversing loop
11	Outside Obstruction Vehicle Detector	Refer to CR 0 in the <i>Installer Menu: Table 2</i> on page 42.	Vehicle detector, box type connections outside reversing loop
12	Shadow/Reset Vehicle Detector	Refer to CR, CB, and CP in the <i>Installer Menu: Table 2</i> on page 42.	Vehicle detector, box type connections. Shadow function for swing gates, reset function for barrier arm gates.
13	Edge Sensor	Refer to GC in the <i>Installer Menu: Table 2</i> on page 42.	Gate edge, entrapment device sensor connections. One input works for both travel directions.
14	Photo Eye Power (-) 24 Volts Common	If photo eyes are used in place of vehicle detector loops, connect 24V Common to Power Supply COM & connect NO output to appropriate vehicle loop detector input: Terminals 8, 10, 11 or 12. Refer to <i>Photo Eyes (Non-Contact) Installation</i> on page 61.	Photo eye open and close connections.
15	Photo Eye Power (-) 24 Volts Common		
16	DO NOT USE		
17	Photo Eye Open	Refer to EO and PC in the <i>Installer Menu: Table 2</i> on page 42. <b>NOTE:</b> Input disabled in HydraLift, StrongArm and CRASH barrier arm operators.	Photo eye open connection. Connect NO or NC to Terminal 17 & COM where entrapment is a concern such as the storage area along a slide gate fence line.
18	DO NOT USE		
19	Photo Eye Close	Refer to EC and PC in the <i>Installer Menu: Table 2</i> on page 42.	If photo eye close connection spans road: Connect NO or NC output to Terminal 19 & COM.
20	DO NOT USE		
21	Charger AC Loss	Connection from battery cabinet.	DC battery type operators only.
22	Gate Lock Interlock	Refer to user relay option 23.	Locking mechanisms.
23	Emergency Close	Activate with +24. Refer to OC setting in the <i>Installer Menu: Table 2</i> on page 42.	Installer menu enabled and input +24V to trigger. Requires constant hold or supervised input. Overrides photo eyes, gates edges & vehicle detectors.
24	Fire Dept Open	Jumper to +24. Refer to the <i>Installer Menu: Table 2</i> on page 42.	Installer menu FO enabled and input +24V to trigger. Overrides photo eyes and gates edges.

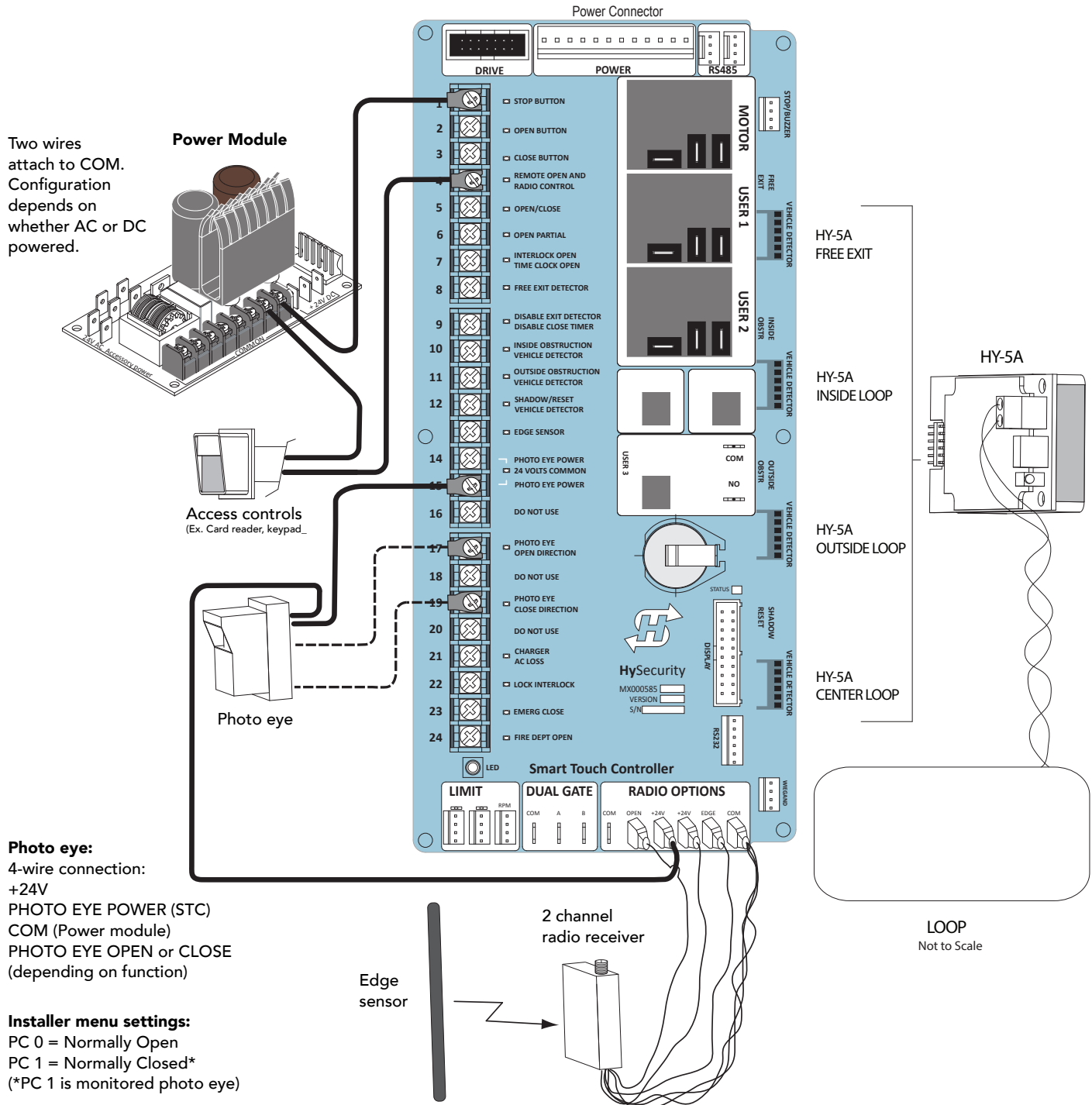


# CONNECTING ACCESSORY DEVICES

Devices, such as gate edge sensors and photoelectric beams, must be installed to protect against entrapment. These secondary entrapment protection devices are required for the gate installation to be in compliance with UL 325 Safety Standards. **NOTE:** Always check your local area codes and comply with all regulations.

Standard accessory (entrapment and loop wire) connections are shown in the following illustration. All accessories require a minimum of two connections:

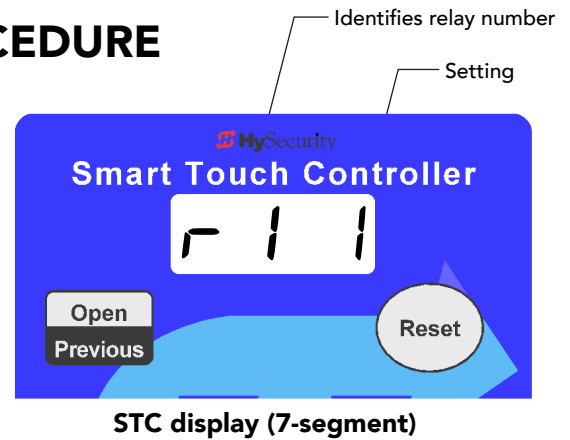
- a device input
- a Common Bus Terminal (COM)



# USER RELAYS – PROGRAMMING PROCEDURE

The Smart Touch Controller is able to interface with many types of external devices through the use of three user programmable output relays: two mechanical relays (User 1 and User 2), and one solid state relay (User 3) which is used most often for connection to flashing devices.

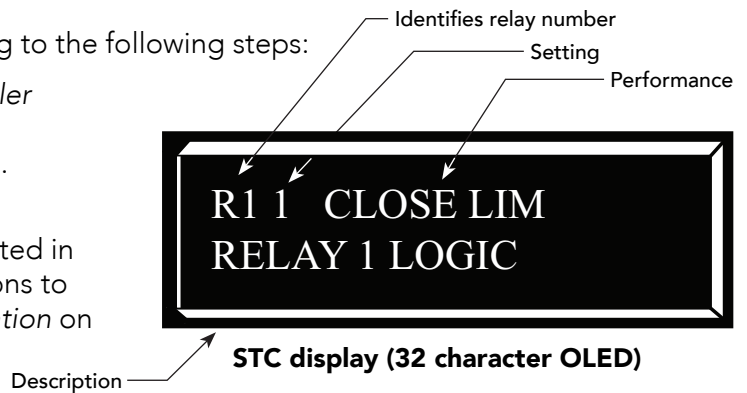
All of the user relay functions identified and described in the table below are accessible in the Installer Menu (R1 x, R2 x, R3 x) selections.



**NOTE:** A setting of zero disables a User Relay. The User Relays will operate normally to 18VDC. Below 18VDC, alert notification occurs. On Crash products User 3 relay is unavailable. It is pre-wired for the LED lights.

Use the STC buttons to program the user relays according to the following steps:

1. Select the relay you wish to use through the *Installer Menu: Table 2* on page 42. For example: R1 13 (RELAY LOGIC 1) or R2 15 (RELAY LOGIC 2).
2. Select the appropriate function (1 through 28) by changing the display to the associated number listed in the table. Use the Select, Next and Previous buttons to make your selection. Refer to *Menu Mode Navigation* on page 36.



**Programmable User Relays: Table 3**

Setting	Performance	Description	Wire Connection
1	Close limit output	Output can be used as an interlock signal to another operator's interlock input, or simply to indicate that the gate is secure. The relay is "off" when the gate is closed. The relay energizes when the fully-closed limit is released. (Any open command energizes the relay.)	Relay 1, 2 or 3
2	Close limit pulse output	Used in a sequenced system to command a second machine to close. Generates a brief pulsed output that occurs when the close limit is triggered.	Relay 1, 2 or 3
3	Open limit output	Indicates a full-open position. This output becomes active when an open-limit is triggered and deactivates when the open-limit is released or a close command is received.	Relay 1, 2 or 3
4	Open limit pulse output	Used in a sequenced gate system to command a second machine to open. Generates a brief pulsed output that occurs when the open limit is triggered.	Relay 1, 2 or 3
5	Warn before/during operate output	Controls an external warning device. This output operates at the same time as the internal warn before operate buzzer.	Relay 1, 2 or 3
6	Gate Lock output	Controls external solenoid or magnetic locks. In both directions of travel, this output is activated about 7/10ths of a second before the operator starts moving the gate and remains active while moving. Output remains active, for a few seconds, after stopping.	Relay 1, 2 or 3

Setting	Performance	Description	Wire Connection
7	Gate forced open output	Activated if the gate is forced off the closed limit switch and the operator is not able to restore the gate to full closed position within four seconds.  <b>NOTE:</b> This alarm resets itself in 30 seconds.	Relay 1, 2 or 3
8	Gate open too long output	Controls an external device. Activates when the gate is open longer than the user-selected period of time. Adjustable from 0 seconds with 15 to 135s selectable delay timeframes in 30s increments.  <b>NOTE:</b> TL - Open TIME ALERT adjustments can be made in the Installer Menu. The TL Installer Menu display only appears when using this relay.	Relay 1, 2 or 3
9	Safety Mode Alert output	Controls an external device. Activated when the system is in Safety Mode or Entrapment Mode. Safety Mode occurs when the gate encounters an obstruction. Entrapment Mode means the gate is stopped and occurs if the internal inherent sensor triggers while the system is in Safety Mode.	Relay 1, 2 or 3
10	Entrapment Mode Alert output	Controls an external device. Activated only when in the Entrapment Mode.	Relay 1, 2 or 3
11	Unauthorized Vehicle Entry output (Tail gate alert)	Controls an external device. Activated when a second vehicle enters from the outside without a valid input from an access control device. This output releases when an access control input signals open or the arm/gate reaches the close limit.	Relay 1, 2 or 3
12	Outside Obstruction Vehicle Detector output	Interlocks an entry device to prevent pedestrian use. This output is active whenever the Outside Obstruction Loop Detector is tripped.	Relay 1, 2 or 3
13	Loitering Alert	Indicates a vehicle is loitering on the Outside Obstruction Loop. Adjustable from 0 seconds with 15 to 135s selectable delay timeframes in 30s increments.  <b>NOTE:</b> LT LOITERING ALERT adjustments can be made in the Installer Menu. The LT Installer Menu display only appears when using this relay.	Relay 1, 2 or 3
14	Gate nearing full travel output	Applies to operators with position sensors only. Activated when the gate is 3s from expected limit switch trigger. <b>NOTE:</b> If the operator has not yet learned limits, it will energize Relay 14 when the motor begins moving the gate.	Relay 1, 2 or 3
15	Gate failure output	Activated to report occurrence of a problem. Indicates the system is in an Error Mode, Fault Mode or Entrapment Mode.	Relay 1, 2 or 3
16	Motor Running output	Active when the motor is running and gate is in motion.	Relay 1, 2 or 3
17	AC Power Failure output	This relay is normally energized and drops with loss of AC power.	Relay 1, 2 or 3
18	DC Power Failure output	<b>DC operators only.</b> The relay activates when the battery power is very low, but the output ceases when the battery is dead. The relay is triggered when the battery is less than 20 volts.	Relay 1, 2 or 3
19	Flasher Relay	Flashes lights once per second. The relay is constantly pulsing except when the open limit switch is triggered.  * Preferred connection is Relay 3, a solid state relay (except on Crash operators). On Crash products, Relay 3 is hard-wired for the LED barrier arm lights.	Relay 1 or 2* (Relay 3)
20	Free Exit Loop Vehicle Detector output	Active when the Free Exit Loop is tripped.	Relay 1, 2 or 3

Setting	Performance	Description	Wire Connection
21	Inside Obstruction Vehicle Detector output	Active when the Inside Obstruction loops is tripped.	Relay 1, 2 or 3
22	Reset Loop Detector output	Active when the Reset loop detector is tripped.	Relay 1, 2 or 3
23	External Latching gate Lock Output	Activates when the Lock Interlock Input (Terminal No. 22) is active at the start of an Open cycle and remains on until the Lock Interlock releases or 10 seconds elapse, whichever happens sooner. Also, activates a Close cycle and releases 1 second after reaching the Close limit.	Relay 1, 2 or 3
24	Gate at Partial Open Position	Active when the partial open position is reached or exceeded. Not used in StrongArm Crash.	Relay 1, 2 or 3
25	DC Power Alert	Deactivates when the software detects a low battery voltage (below 21VDC, but greater than 18VDC) for a duration of 2 seconds or more. To slow battery drain, accessory power loads are shed.	Relay 3
26	Free Vehicle Detector Pulse	Activates when the Exit Loop Detector is tripped and causes a 250mS pulse output to occur.	Relay 1, 2 or 3
27	Not Open (requires AC power)	When AC power is detected, this relay activates when the gate is NOT on the open limit. If AC power fails, or the gate is on the open limit, the relay is deactivated.	Relay 1, 2 or 3
28	Flasher (requires AC power)	Controls flashing lights that pulse 500ms per second. The relay is constantly activating except when the open limit switch is triggered or AC power fails.	Relay 1, 2 or 3
29	Test Output	For factory testing purposes	

## Hy8RELAY MODULE OPTION

The Hy8Relay (extended relay module) provides 8 numbered mechanical relays. R 4, RELAY 4 LOGIC through RB, RELAY 11 LOGIC can be access through the Installer Menu. Set the number for the relay based on the information found in Tables 4 or 5. Table 5 is oriented toward revenue control parking lot applications.

Wire communication cable connections between the DUAL GATE ports, at the base of the STC, and the extended mechanical relay module.



# VEHICLE DETECTOR LOGIC

HySecurity recommends that vehicle detectors be used for free exit and obstruction sensing logic only. The exception is in parking or barrier arm applications where detectors may also be used to close the gate. In applications employing our swing, vertical lift, or sliding gate operators, closing logic cannot be used except when the anti-tailgate logic is employed.

Vehicle detector functions (OR IR, HD, DL) are configurable through the *Installer Menu: Table 2* on page 42.

## TailGate Alert

User Relay 11 is available for notification devices. If a vehicle is tailgating, and a flasher or audio device is connected to User Relay 11, the relay will be triggered by the tailgating vehicle crossing the loops.

## Anti-TailGate Mode Selection

The Detector Logic (DL) menu item, found in the *Installer Menu: Table 2* on page 42, lets you set the anti-tailgate mode. This menu item works in conjunction with the Close Timer (CT) when the vehicle detector is triggered. If you plan to use the anti-tailgate feature, check the time delay aspect of the Close Timer (CL) setting.

The four selectable modes for DL are as follows:

**Mode 1 (Default):** An input from either the Free Exit, Outside Obstruction Loop, Inside Obstruction Loop, or the Center Loop will hold the gate open, reset the close timer, and ignore all close inputs. The close timer begins to count down only after all vehicle detectors are clear and no other open command is present.

**Mode 2:** The close timer does not wait for vehicle detectors to clear, but instead it starts counting down as soon as the open limit is reached.

**Mode 3:** When both inside and outside obstruction loops are simultaneously active, the gate will close immediately once all vehicle detectors are no longer triggered (vehicle loops clear) unless another open command is present.

**Mode 4:** Full anti-tailgate logic includes Mode 3 functions. In addition, the gate will stop during the opening cycle when both OOLD & IOLD are tripped simultaneously. When the OOLD & IOLD loops are cleared, the gate closes immediately. The OOLD & IOLD can be individually set so that, if tripped while closing, the gate may either, pause only or reverse to reopen. The free exit detector input is ignored while the gate is closing.

**NOTICE:** Using any vehicle detector logic mode other than Mode 1 (default) requires that all the loops be placed with the geometry and spacing as shown in the layout drawings on page 70 and 71. The detector Modes 3 and 4 require use of separate inner and outer obstruction detectors.

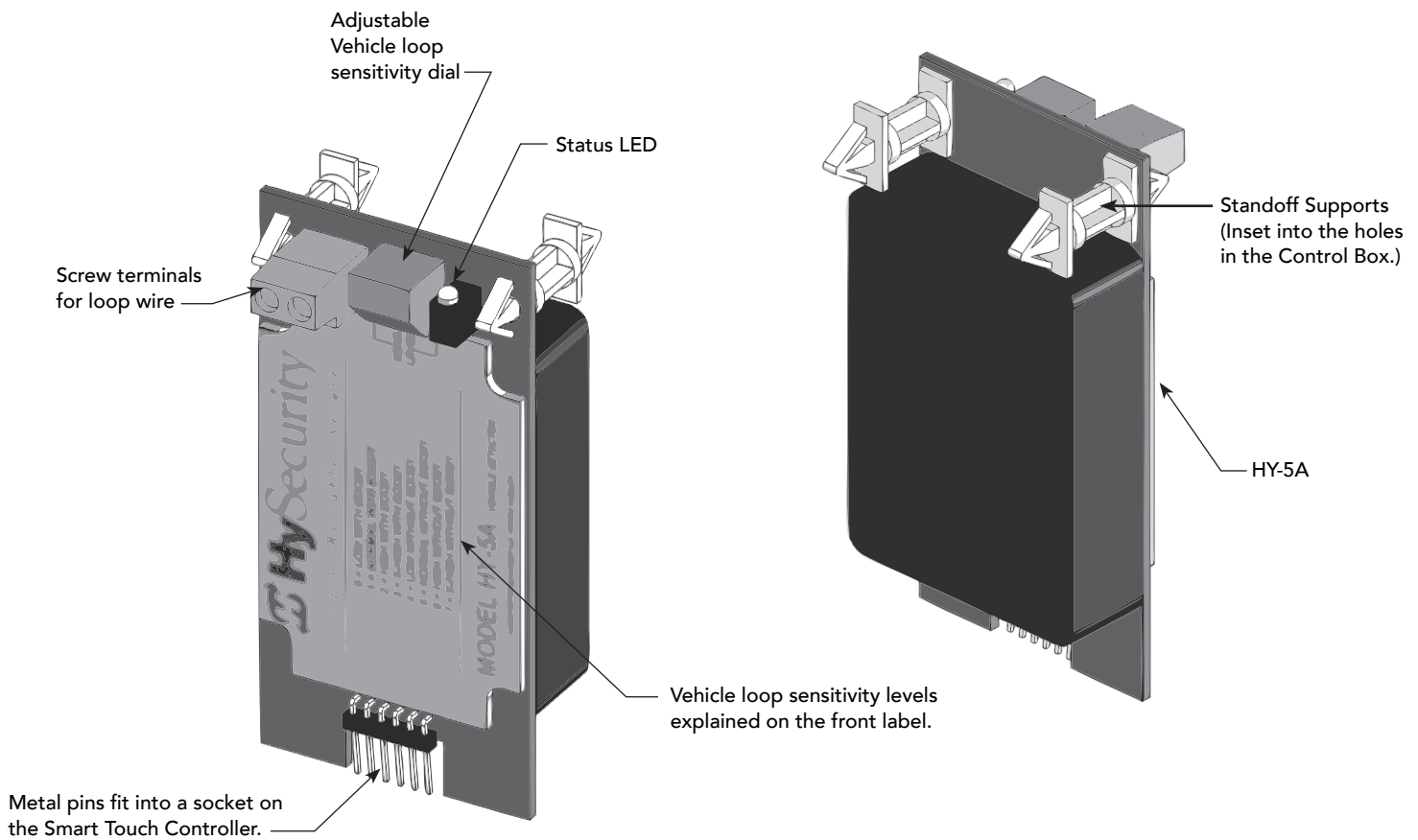
# VEHICLE DETECTOR INSTALLATION: HY-5A

The Smart Touch Controller provides an interface for up to four different vehicle detector functions.

Standard box type 11 pin (24 VDC or 24 VAC) vehicle detectors may be connected in the traditional manner, but HySecurity HY-5A mini-detector modules plug directly into the Smart Touch Controller, making field installation much faster and enhancing performance. The detector communicates with the Smart Touch Controller microprocessor to achieve the following benefits:

- Loop frequency is automatically set and monitored by the Smart Touch Controller.
- Best operating frequency for each loop is automatically selected.
- Cross-talk between multiple loops is impossible.
- Very low power draw, which is important for maximum UPS capability during a power failure or for solar applications.
- Loop frequency and call strength can be reported on the Smart Touch Controller display.
- Loop malfunctions are stored by the Smart Touch Controller and appear in code on the display.

**NOTE:** It is not mandatory to use two separate vehicle detectors for inner and outer obstruction detection; however, the benefits of using the two HY-5A detectors are great. Several new features are possible, such as second vehicle tailgating detection, loitering alert, and selectable non-reversing options.



**HY-5A Vehicle Detector Module**

Four vehicle detector inputs (terminals: 8, 10, 11, and 12) exist on the Smart Touch Controller, as well as the four direct plug ins for the HY-5A modules. Refer to *Overview of the STC and Power Module* on page 50.

The vehicle detector input functions are as follows:

- Free Exit Loop Detector - Opens a fully closed gate.
- Outside Obstruction Loop Detector (Out Obs Loop) - Triggered by the outside (public side) vehicle detector loop
- Inside Obstruction Loop Detector (In Obs Loop) - Triggered by the inside (secure side) vehicle detector loop
- Center/Reset/Shadow Loop Detector - On barrier arm gates, prevents closure when active. On swing gates, prevents gate from opening or closing when the vehicle detector is active.

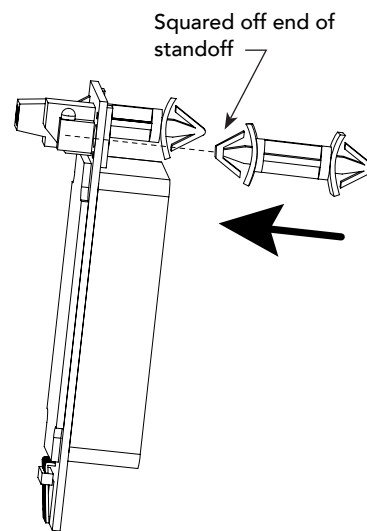
**NOTE:** Use of any combination of HY-5A detectors and box detectors is acceptable. On occasion, multiple obstruction detectors may be mandatory. For example, an area greater than 200 square feet (61 square meters) of vehicle loop cannot be connected to any one detector because the sensitivity becomes inadequate.

## CONNECTING HY-5A VEHICLE DETECTORS

**NOTE:** Refer to the installation instructions provided with the HY-5A vehicle detectors. It provides detailed illustrations and instructions that are not found in the steps below.

A quick overview on how to install the HY-5A Vehicle Detector modules, one at a time, follows:

1. Turn off the AC power switch on the Control Box.
2. Insert the locking end of the two white plastic standoffs into the mounting holes on the detector.
3. Plug the detector into the appropriate socket along the right edge of the Smart Touch Controller. Be careful to align the six detector pins into the socket correctly (the screws for tightening the terminals should face toward the board), and then snap the standoffs into the holes in the control box.
4. Route the loop wires through the holes provided in the control box and connect the loop leads to the two terminals on the HY-5A detector. Tighten the terminal screws securely.
5. To enable the detector, turn on power. The detector will immediately tune if it is connected to a vehicle loop. Make sure no cars or other metal objects are over the loop.
6. Repeat Steps 1 through 5 for each HY-5A detector.
7. If the detector module is unplugged after it is enabled, a communications alert (ALERT 10) will be triggered. If the fault is not resolved, an error message, ERROR 3 "Detector Failed" is displayed.



**NOTE:** If there is any detector fault, the gate operator functions as if the detector is triggered.

Pressing the RESET button:

- ◆ Clears any errors
  - ◆ Tunes the detectors on connected loops
  - ◆ Un-installs any detectors that have been removed
8. The Smart Touch Controller automatically governs frequency selection for all HY-5A detector modules. This simplifies installation and guarantees that there is no cross-talk between multiple loops. The frequency and call level can also be manually selected; if this is required, refer to the appropriate loop set ( ELD, ILD, OLD, RLD) in the *Installer Menu: Table 2* on page 42.
  9. Sensitivity is the only adjustment available on the detector itself. Generally, sensitivity does not need to be increased unless the loop is large or there are multiple loops connected to one detector.

**NOTE:** Do not exceed more than 200 square feet (61 square meters) of loop area to one detector.

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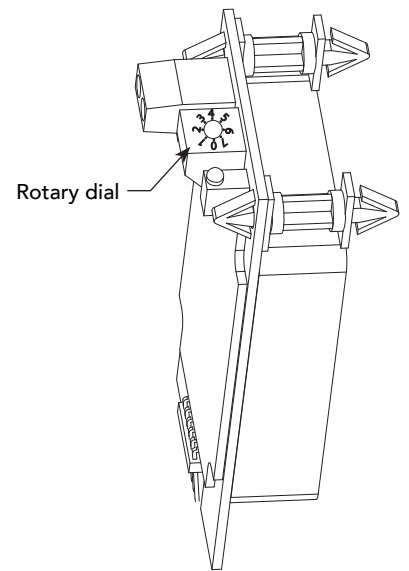
If required, adjust the sensitivity using the rotary dial.

The factory default setting is 1.

- |                        |                          |
|------------------------|--------------------------|
| 0 = Low with boost*    | 4 = Low without boost    |
| 1 = Normal with boost* | 5 = Normal without boost |
| 2 = Medium with boost* | 6 = Medium without boost |
| 3 = High with boost*   | 7 = High without boost   |

**NOTE:** \*A boost feature is applied for settings 0 through 3. Boost increases the sensitivity during a call and is useful for maintaining continuous detection if the signal becomes weak (such as with tractor-trailer trucks). Sensitivity settings 4 through 7 are the same as 0 through 3, but without the boost feature.

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## PHOTO EYES (NON-CONTACT) INSTALLATION

Plan to integrate photo eyes (photoelectric sensors) in your site plan. Photo eyes are wired to the STC and require low voltage conduit to the operator and power supply. If your site conditions require a battery-powered transmitter, it can be ordered through your distributor.

Understand your site requirements and use the layout diagrams available in the appendix to determine the most appropriate mounting positions for any additional photo eyes. The Smart Touch Controller has two photoelectric sensor inputs (Photo eye open and Photo eye close).

If there are no other secondary external entrapment protection sensors (typically an edge sensor), then for slide gates, swing gates or any site that must comply with UL 325 regulations, at least two photo eyes are required to serve and reverse the gate in each direction of travel.

The two common photoelectric sensor types are thru-beam and retro-reflective; each has its advantages. A thru-beam sensor is generally more powerful and able to function reliably with dirty optics and in poor weather.

A retro-reflective sensor has the convenience of not requiring the installation and electrical wiring of the remote emitter required in a thru beam system, but is generally less reliable in poor weather.

**NOTE:** In an outdoor environment because of reduced performance, avoid using a retro-reflective device to span a distance greater than 24 feet (7.3 meters).

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## Compatibility

The UL 325 standard requires that a photoelectric sensor be laboratory tested and “recognized” under UL 325. In order to be compatible with all HySecurity operators, a photo eye must be rated to function from 24 VDC source power.

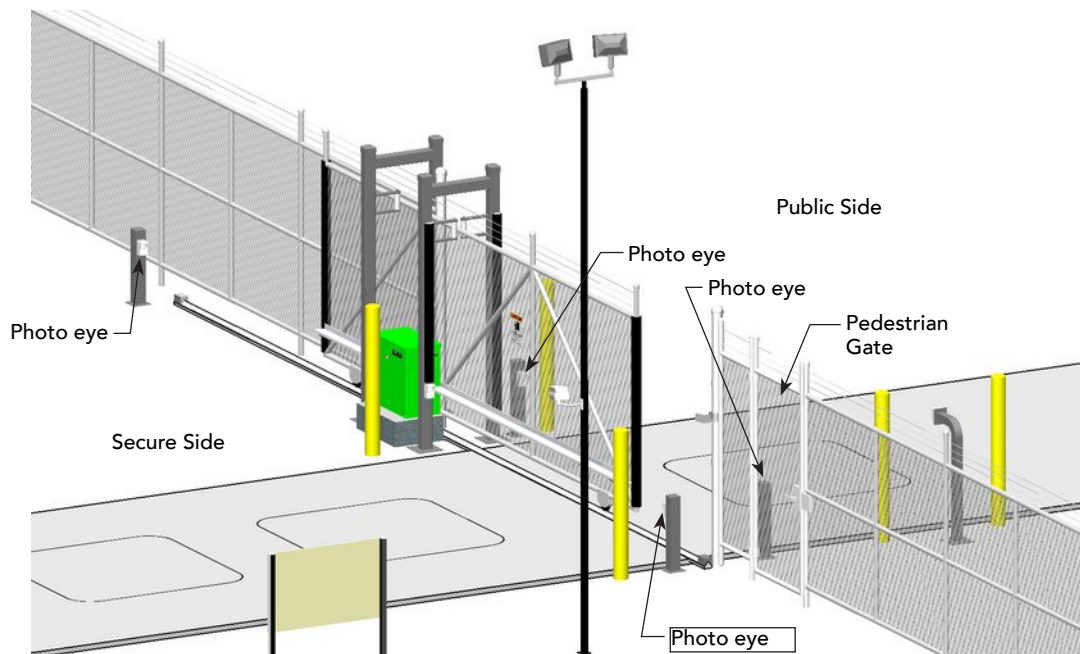
## Installation

Install additional photo eyes according to the following steps.

1. Locate the photo eye approximately 15 to 30 inches (38 to 76 cm) above the ground and as close to the gate as possible. Refer to site layout below.
2. Mount the receivers on the left or right side of the gate operator.
3. Mount the emitters just beyond the travel of the gate in the fully-closed position.

**NOTE:** The installation locations are intended for pedestrian detection. If photo eyes are also to be used for vehicular detection, consider (in addition to the low elevation photo eye for cars) installing another photo eye at a height of about 55 inches (140 cm) to detect semi (tractor- trailer) trucks.

---



# Configuration

Configure the photo eyes according to the following procedure.

1. If the photo eye has an internal switch for setting Light Operate versus Dark Operate, select Light Operate.
2. If the photo eye has a relay output and has both NO and NC terminals, some experimentation may be required to determine the proper connection because, when its in the Light Operate mode, the output relay is normally energized and releases when the beam is blocked.

**NOTE:** Some manufacturers label an output as NO (normally open), when it is actually an NC (normally closed) contact.

If the photo eye has a solid-state output, you must choose a sinking-type connection.

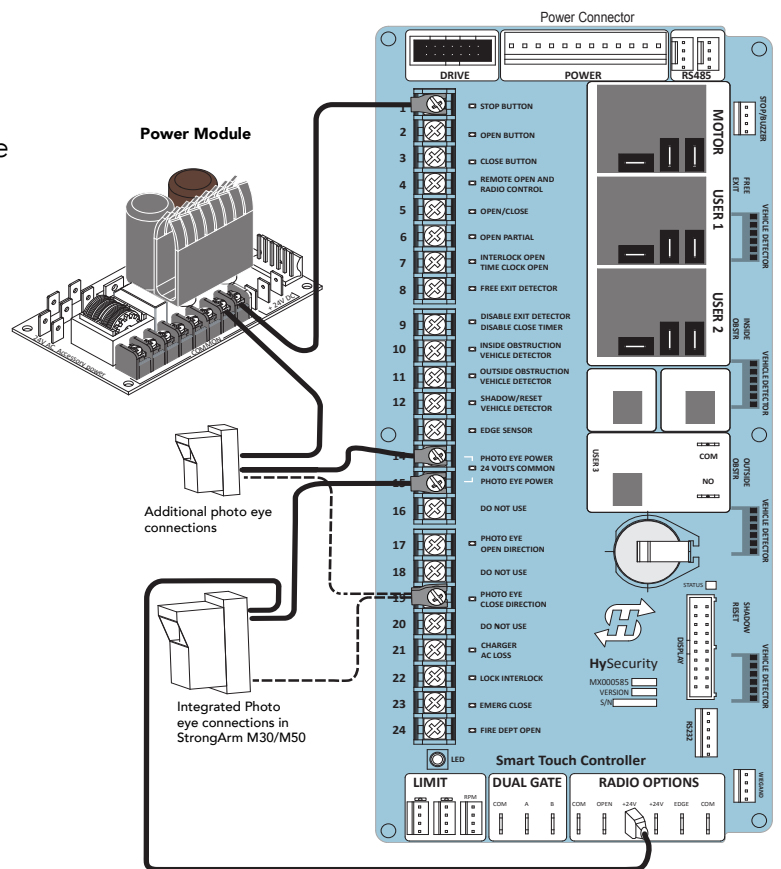
## Photo Eye Connections

Connect the three wires to the receiver and two wires to the emitter according to the following procedure.

1. Obtain the +24 Volt source power at one of the three spade-terminals on the power module.
2. Obtain the 24 Volt Common from screw-terminals 14 or 15 (which are labeled Photo Eye Power Common) on the Smart Touch Controller.

**NOTE:** The -24 Volt Photo Eye Power also supplies the photo eye output Common.

3. Perform the following, as applicable:
  - ◆ If the photo eye spans the road, connect the NO or NC output to Terminal No. 19 on the Smart Touch Controller.
  - ◆ If the photo eye spans the gate's open storage area as in a slide gate scenario, connect the NO or NC output to Terminal No. 17 on the Smart Touch Controller. (Not used on StrongArm M30/M50.)



## Photo Eye Alignment

Most photo eyes require careful optical alignment in order to aim the emitter beam to the center of the receiver or reflector. In order to avoid false triggering, it is important to carefully align the system, especially with retro-reflective photoelectric sensors. To that end, HySecurity has provided a unique feature that turns power on to the photo eyes and causes a buzzer to chirp when the photo eye enters and exits alignment. Align the photo eyes using this feature by taking the following steps:

1. Move the gate off (away from) the close limit.
2. Access the User Menu and select PE. Refer to *User Menu: Table 1* on page 39.
3. Set the menu item PE 0 to PE 1.
4. Move the photo eyes to align the emitter beam. The buzzer will chirp twice when the beam is broken and once when remade.
5. When the buzzer chirps once, indicating the photo eyes are aligned, close the gate. When the close limit is triggered, the menu item PE resets to 0.

## Monitored Connection

A monitored connection tests for the presence and correct operation of the photo eye prior to each gate activation and prevents gate operation if any fault is present. The Installer Menu item PC 0 must be changed to PC 1 to enable this feature.

## Photo Eye Function

If the gate is stationary, a tripped photo eye will prevent the gate from starting in either direction. If tripped while in motion, the standard function is to pause the gate motion and then automatically restart again if the photo eye is clear within five seconds. An optional setting in the Installer Menu will cause a 2 second reversal of travel. Refer to EC and EO in *Installer Menu: Table 2* on page 42.



# Dual Gate Systems

---

Configuring two or more operators to work together as an interlocked pair (Primary/Secondary or Sally Port) or sequenced gate system is easy to do with the Smart Touch Controller. There is no need to order a special model or any adapters. The area of the board marked Dual Gate employs a 3-wire RS-485 serial port for communication between the operators.

## CONNECTING AN INTERLOCKED PAIR (DUAL GATE)

The Smart Touch Controller (STC) provides dual gate connections and programming features to connect a pair of gate operators in a Primary/Secondary or interlocked Sally Port configuration. The STC software establishes the communication protocols when wiring the two gate operators. A Primary/Secondary pair of operators can be set for different open/close timing sequences and Sally Port gates are often used at correctional facilities. In Sally Port configurations, one operator cannot open unless the other is fully closed. To learn how to connect the wiring between operators, review the wire diagram on the next page.

**NOTE:** The operators do not have to be of the same type, but both need to have the most current and up-to-date software version installed on the Smart Touch Controller. A StrongArm M30/M50 can be interlocked with a SlideDriver to provide both crash and personnel security. The STC software integrates seamlessly between operators.

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RS-485 communication is available for networked security systems. Refer to *Integrating with Security Systems* on page 51 for additional information.

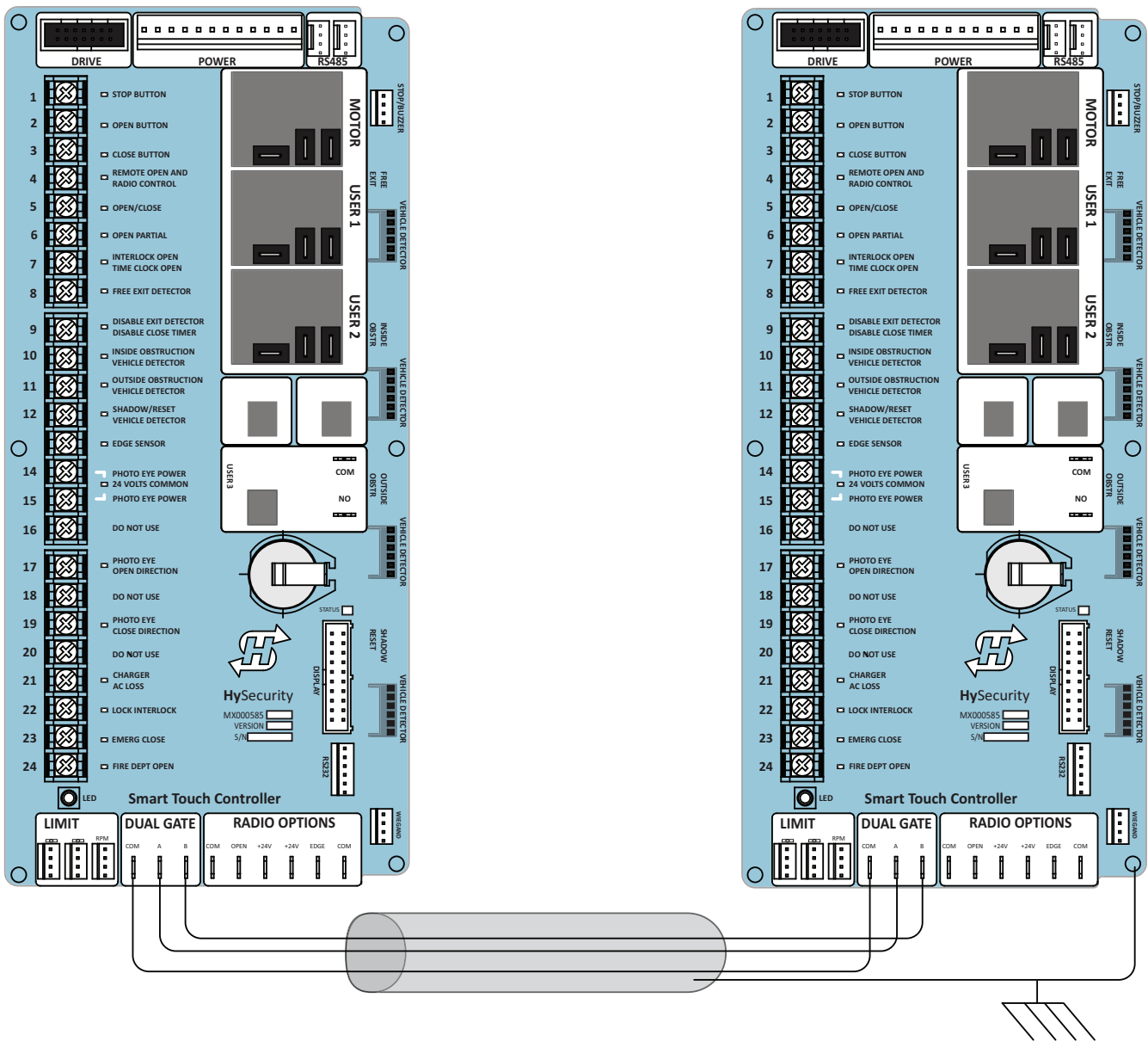
# Dual Gate Wiring Connections

To connect an interlocked pair of gate operators, simply follow the steps below.

1. As shown in the Wire Diagram, connect a shielded communications cable to the DUAL GATE inputs in each operator. The inputs are located near the base of the Smart Touch Controller. Be sure to connect the wires in pairs to the same terminal ports (A-A, B-B, COM-COM) on both operators.
2. Attach a ring terminal to the shield wire and connect it to the Smart Touch Controller's convenient ground screw.



Connect the ground shield wire to only one operator, not both. Use only 18-20 gauge twisted and shielded triple wire. To operate properly, both Smart Touch Controllers must be using the same software version.



**Wire Diagram: Interlocked Pair of Operators using DUAL GATE Wiring**

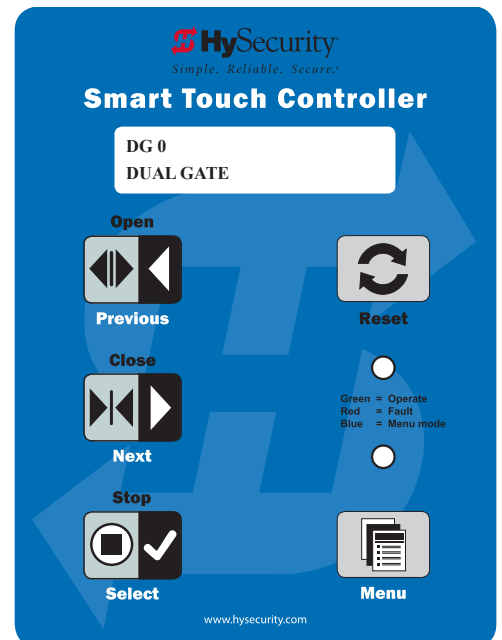
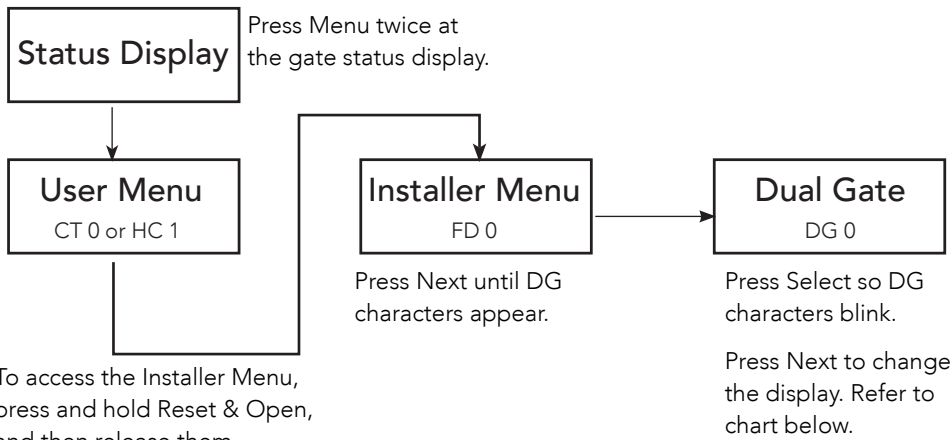
# Dual or Sequenced Gates: Power, Software & Accessory Requirements

When installing an interlocked pair, the following must be adhered to:

- An electrical conduit for interconnecting wires must span between the two operators. The interlock (dual gate) communication wires and any low voltage control wires must be installed in a conduit that is separate from the high voltage power cables.
- Complete the installation of both operators as separate machines and verify that their basic functions are correct as solo operators before interconnecting them.
- Be sure both operators are running the same software. The software version can be viewed on the display by pressing the RESET button.
- Keep the most current software loaded. It is available at <http://www.hysecurity.com>. Make it part of your maintenance routine to check for and install software updates on a regular basis.
- External control inputs (vehicle detectors and entrapment protection sensors) may be connected to either gate operator in a Primary/Secondary configuration, but in a Sally Port configuration, the external control inputs must be connected to Sally Port A. (Sally Port A being the first gate to open for incoming traffic. Be sure to designate Sally Port A in the dual gate menu item as 3 (DG 3) and Sally Port B as 4 (DG 4).

## Programming a Dual Gate (Interlocked Pair)

Both gate operators must be programmed so they know what function they are to perform as Primary and Secondary or Sally Port A and Sally Port B. (Sally Port A being the first gate to open for incoming traffic.) The Installer Menu provides the Dual Gate (DG) menu item that sets up the functionality of the gate operators. Access this menu item by taking the following steps:



Refer to the table below to set the operator's functionality.\*\*

**Interlocked Gate type	Operator 1 (Primary)	Operator 2 (Secondary)
<b>Sally Port</b>	1. Press Next until DG 3 appears on the display. 2. Press Select to establish the operator as Sally Port A.	1. Press Next until DG 4 appears on the display. 2. Press Select to establish the operator as Sally Port B.
<b>Primary / Secondary</b>	1. Press Next until DG 2 appears on the display. 2. Press Select to establish the operator as Primary.	1. Press Next until DG 1 appears on the display. 2. Press Select to establish the operator as Secondary.

# CONNECTING SEQUENCED GATES

Sequenced gates are slightly different than dual or interlocked gates. When two gate operators are connected as sequenced gates, a faster "Traffic Control Gate" operator (i.e. barrier arm or crash wedge) and a slower "Security Gate" operator (slide, swing, or vertical lift gate) operate in sequence to help prevent tailgating by unauthorized vehicles. Both operators open (Security Gate first followed by the Traffic Control Gate) and allow a vehicle through, but the faster moving Traffic Control Gate closes quickly once its reset/center loop and all obstruction loops are cleared. Upon reaching its closed limit, the Traffic Control Gate signals the Security Gate to close. Note that all shared vehicle detector loops must be cleared before the Security Gate closes.

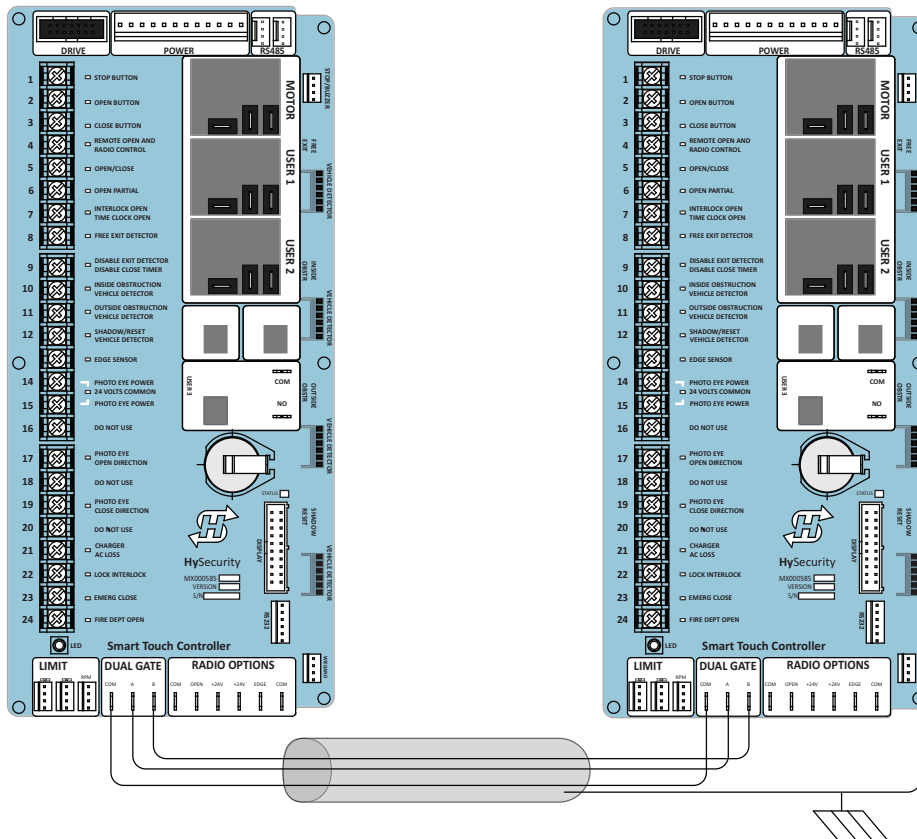
**NOTE:** An emergency open or close overrides the gate sequencing and acts upon both gates simultaneously.

The Smart Touch Controller (STC) provides the sequenced gate connections and programming features, and the STC software establishes the communication protocols when wiring the sequenced gate operators. To learn how to connect the wiring between operators, review the Wire Diagram below.



The operators do not have to be of the same type, but both need to have the most current and up-to-date software version installed on the Smart Touch Controller. A StrongArm M30/M50 can be sequenced with a SlideDriver to provide both crash and personnel security. The inherent STC software integrates seamlessly between operators and software protocols and allows RS-485 communication for networked security systems. Refer to *Integrating with Security Systems* on page 51 for additional information.

To connect a sequenced pair of gate operators, follow the steps on the next page.

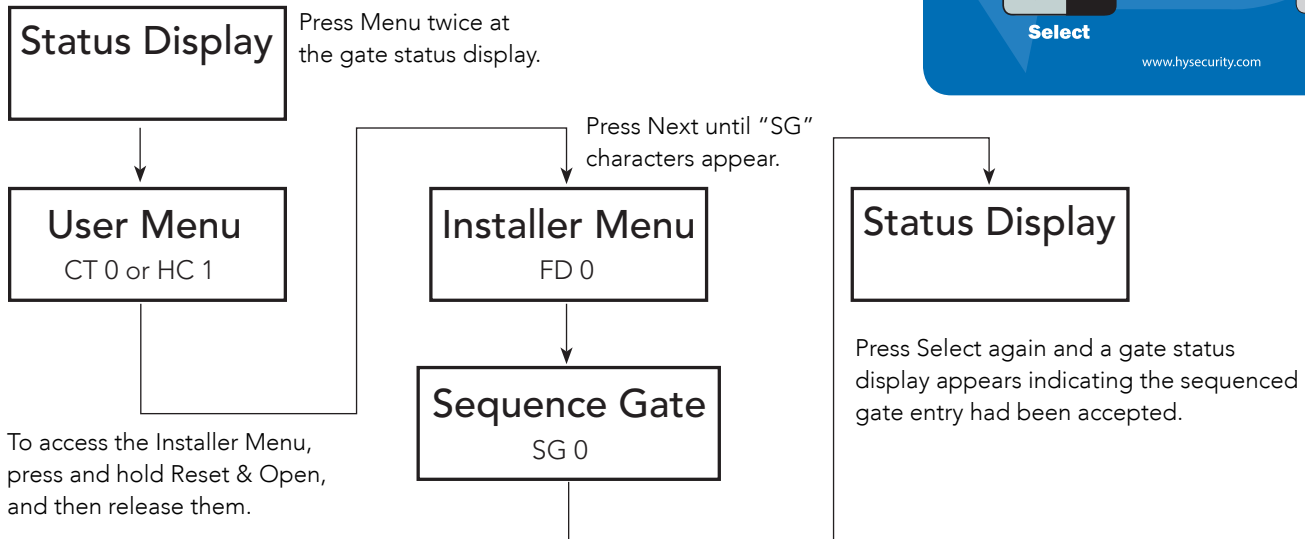
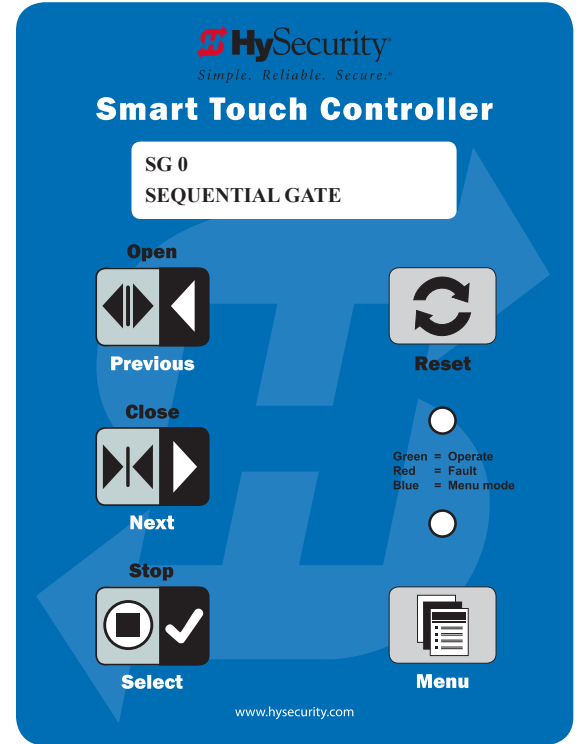


**Wire Diagram: Sequenced Pair of Operators using DUAL GATE Inputs**

1. As shown in the wire diagram on page 68, connect a shielded communications cable to the DUAL GATE inputs in each operator. The inputs are located near the base of the Smart Touch Controller. Be sure to connect the wires in pairs to the same terminal ports (A-A, B-B, COM-COM) on both operators.
2. Attach a ring terminal to the shield wire and connect it to the Smart Touch Controller's convenient ground screw.

**NOTE:** Connect the ground shield wire to only one operator, not both. Use only 18-20 gauge twisted and shielded triple wire.

Sequenced gates are very similar to dual gates (interlocked pair) in their Power, Software, and Accessory Requirements. To review the installation site requirements, refer to page 67.



To access the Installer Menu, press and hold Reset & Open, and then release them.

Press Select so "SG" characters blink.

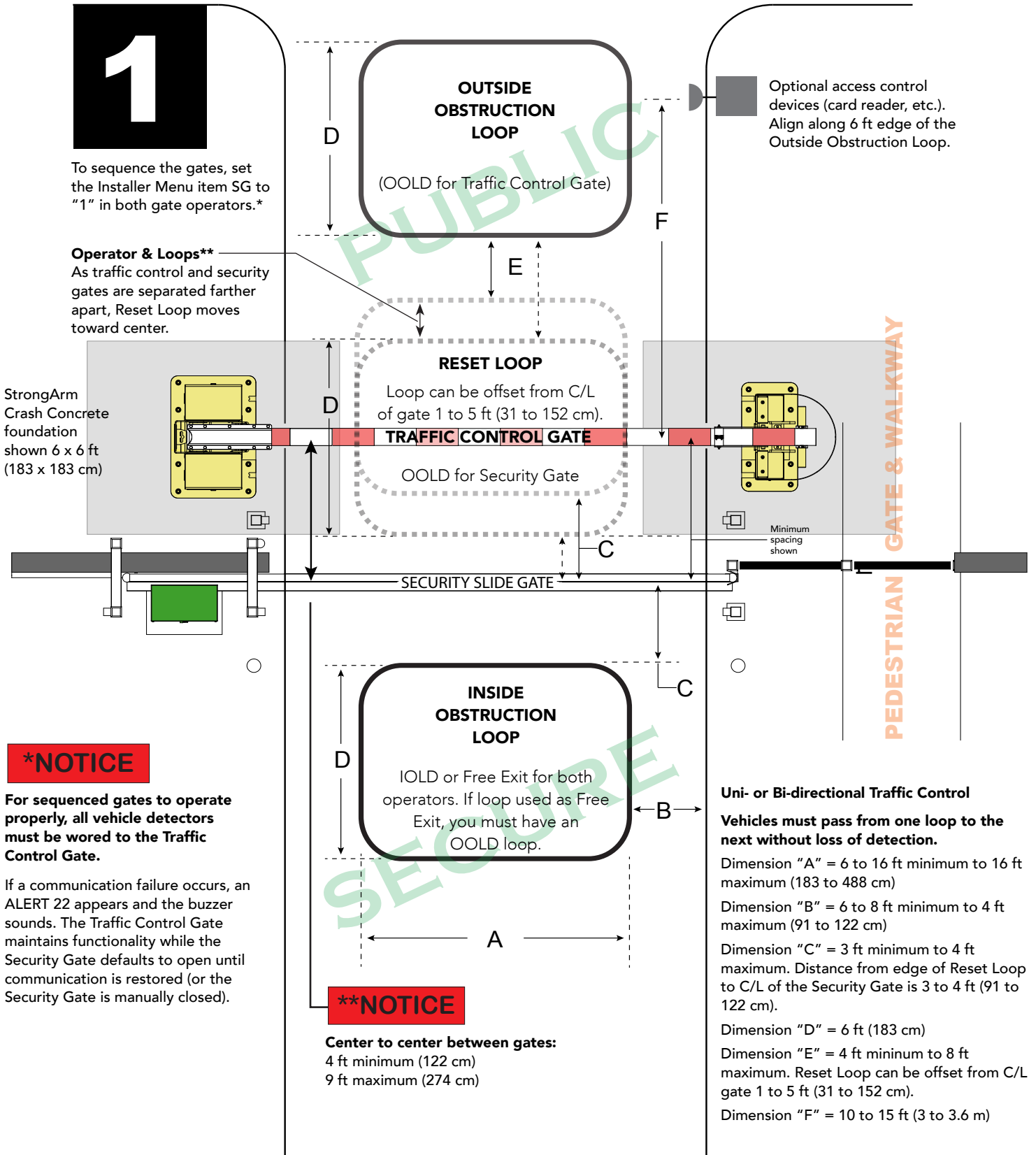
Press Next to change the display:

- SG 1 = Sequenced Gate #1 configuration
- SG 2 = Sequenced Gate #2 configuration

**NOTE:** Set both operators on the site to the same number. Refer to the site designs on the following pages.

# SEQUENCED GATE: CONFIGURATION #1

## Vehicle Loop Layout StrongArm M30/M50 with SlideDriver



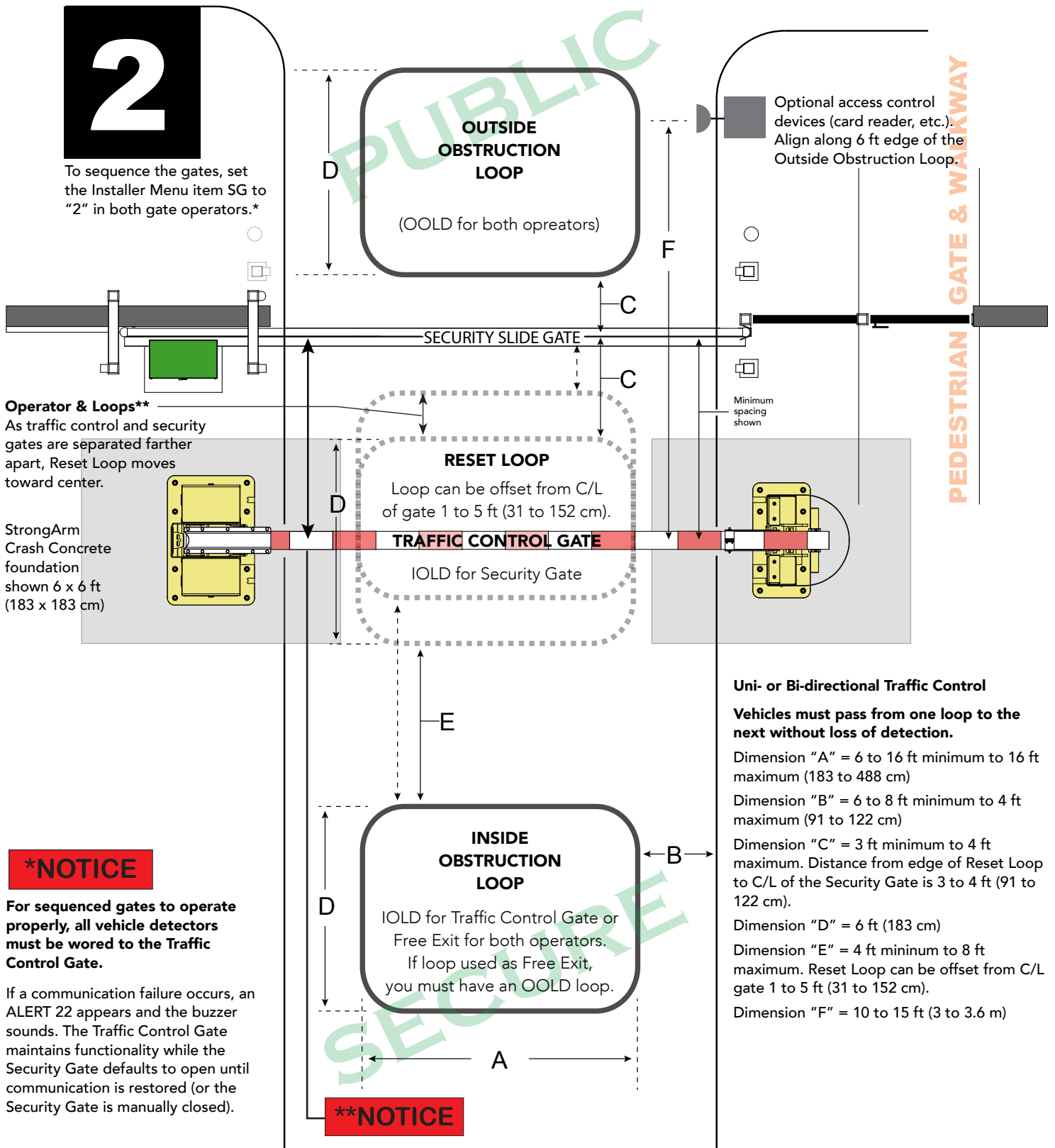
Drawings not to scale.

# SEQUENCED GATE: CONFIGURATION #2

## Vehicle Loop Layout StrongArm M30/M50 with SlideDriver

# 2

To sequence the gates, set the Installer Menu item SG to "2" in both gate operators.\*



### \*NOTICE

For sequenced gates to operate properly, all vehicle detectors must be wired to the Traffic Control Gate.

If a communication failure occurs, an ALERT 22 appears and the buzzer sounds. The Traffic Control Gate maintains functionality while the Security Gate defaults to open until communication is restored (or the Security Gate is manually closed).

### \*\*NOTICE

**Center to center between gates:**  
4 ft minimum (122 cm)  
9 ft maximum (274 cm)

### Uni- or Bi-directional Traffic Control

Vehicles must pass from one loop to the next without loss of detection.

Dimension "A" = 6 to 16 ft minimum to 16 ft maximum (183 to 488 cm)

Dimension "B" = 6 to 8 ft minimum to 4 ft maximum (91 to 122 cm)

Dimension "C" = 3 ft minimum to 4 ft maximum. Distance from edge of Reset Loop to C/L of the Security Gate is 3 to 4 ft (91 to 122 cm).

Dimension "D" = 6 ft (183 cm)

Dimension "E" = 4 ft minimum to 8 ft maximum. Reset Loop can be offset from C/L gate 1 to 5 ft (31 to 152 cm).

Dimension "F" = 10 to 15 ft (3 to 3.6 m)

Drawings not to scale.





# Troubleshooting

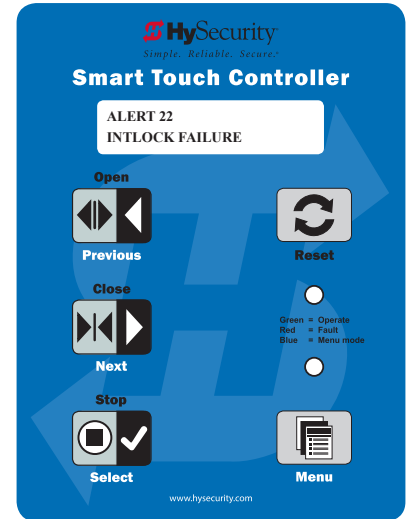
The Smart Touch Controller reports system malfunctions using three simultaneously occurring methods:

- Codes presented on its display (alert, fault or error)
- Activation of a buzzer which emits a series of chirps at defined intervals
- Stop gate travel

Refer to *Troubleshooting Codes: Table 3* on page 74 for details concerning identification and description of Alerts, Faults and Errors.

To help in diagnosing a controller board problem, the active status of each input on the Smart Touch Controller is indicated by its associated LED.

- On AC-powered gate Operators: Active-input LEDs are always illuminated.
- On DC-powered gate Operators (with AC input OFF): Press and hold the Tact button to illuminate the active-input LEDs.



**NOTE:** A qualified technician may troubleshoot the operator with the aid of the information and procedures that follow. If it is necessary to call a distributor for assistance, be sure to have the model and serial numbers available. Other helpful information is the job name, approximate installation date, and service records of any recently-performed maintenance work.

## SYSTEM DIAGNOSTIC MESSAGES

Code	Priority	How to clear
ALERT	Low	Enter new command such as Open or Close.
FAULT	Medium	Press the Stop or Reset button
ERROR	High Serious issue that may require technical service.	Errors can only be cleared by pushing the Reset button or cycling power.

**NOTE:** The green LED near the coin-sized battery on the Smart Touch Controller is the “heartbeat” of the processor. This LED flashes continuously and at a constant rate when the system is operating normally. When a fault, error, or alert occurs, it turns red.

The Smart Touch Controller maintains self-diagnostics. Specific codes appear on the display and the Audio Alert buzzer emits distinctive chirping sounds. Any Alert, Fault, or Error is logged into memory and stamped with the date and time. These diagnostic messages can be retrieved for analysis purposes via optional S.T.A.R.T. software and a PC laptop.

**NOTE:** S.T.A.R.T. configuration and diagnostic software is available at no charge from [www.hysecurity.com](http://www.hysecurity.com).

## Troubleshooting Codes: Table 3

Type	Alert/Fault/Error Display	Buzzer Chirp Sequence	Possible Cause & Suggested Corrective Action
ALERT	HYSECURITY ENTRAPMENT MODE	2 chirps per second every 2s while control input is active	An emergency close with constant hold or an emergency open has caused the entrapment code to appear. When a command of this nature is received, the operator stops and moves into ENTR mode. Clear the code and return to run mode operation, by pressing the Reset button.
ALERT	HYSECURITY SAFE MODE	2 chirps once when in Safe Mode	An gate "edge" has been tripped or the operator has exited entrapment mode. Refer to the description above. <b>NOTE:</b> Gate will operate, if it receives a RUN command.
ALERT	LOW 24VDC DC BUSS < 21V	No chirps; LCD flashes for 1s every 5s	Only occurs in DC powered operators.
ALERT	CRITICAL LOW POWER	No chirps: LCD steady and controls disabled	The system monitors the 24V control voltage in lieu of line voltage. Low incoming line voltage will cause low control voltage. Verify that the control transformer is connected properly, (white – not used, red for 208V, orange for 230V and blue for 460 V). Refer to <i>Control Transformer Connections (Non-UPS)</i> on page 21. Check the line voltage, as the motor starts, with a meter that has min/max hold capability. If the line voltage drops more than 10% below nominal (187 on 208 VAC, 207 on 230 VAC, or 416 on 460 VAC) the voltage is dropping too much and must be corrected. Generally, this requires larger wire size. On 3-Phase operators, check each leg of to ground to make sure it is balanced.  If the line voltage is not dropping below these limits, check the 24V AC and DC power at the power supply. Voltages less than 20V indicate an overloaded or failing transformer or power supply board. Remove the loads until the fault is found.
ALERT	DEAD BATTERY DC BUSS < 21V	3 chirps upon any operating command entry	DC operators only. Appears when the 24 VDC power drops too low, disabling the operator to prevent damage to the batteries from excessive discharge. Verify the AC power is present at the charger, the charger is on and charging (Red LED is illuminated). The charger should shut off (Green LED) when the batteries charge to 29.0 VDC. If the batteries will not "hold a charge" replace them.
ALERT	NO AC POWER	Chirps once whenever the gate reaches the close limit	AC power is shut off at the source (breaker) or is not connected. The AC power switch on the operator (lower rocker switch) is turned off, or the circuit breaker on the operator has tripped. <ul style="list-style-type: none"> <li>• Have a licensed electrician check the wiring.</li> <li>• Connect AC power to the operator.</li> <li>• Reset circuit breaker at the electrical panel.</li> <li>• Reset the operator circuit breaker.</li> <li>• Turn AC power switch on.</li> </ul>
ALERT	ALERT 1 FORCED OPEN	2 pulses per second for 30s	Set FA 1 in the User Menu, to enable this option. The operator will attempt to re-close itself if forced off the close limit switch, the buzzer sounds for 30 seconds. Check for attempted unauthorized access, external pressure trying to open the M30/M50 gate or a mis-adjusted/failed closed limit switch.

Type	Alert/Fault/Error Display	Buzzer Chirp Sequence	Possible Cause & Suggested Corrective Action
ALERT	ALERT 2 DRIFT CLOSED	2 pulses per second for 10 seconds	Set F01 in the User Menu, to enable this option. If a M30/M50 gate should begin to drift closed it automatically reopens (for up to 4s) once it leaves the full open limit. If it is not back on the open limit at the end of 4s, an audible alert occurs. Check for cylinder leakage, misadjusted/failed open limit, misadjusted brake valve, outside pressure (wind, fallen trees) trying to force the M30/M50 gate closed.
ALERT	ALERT 3 EXCESS DRIFT	Gate drift in transit - Advisory only. The alert appears and is being prevented from re-opening.	Will self-clear after an open or close input.
ALERT	ALERT 4 THERMAL OVERLOAD	2 chirps per second every 15 seconds	The motor windings have exceeded a preset temperature generally due to excessive current. Verify: <ul style="list-style-type: none"> <li>• The motor connections are correct for the supply voltage</li> <li>• Running voltage is within 10% of rated</li> <li>• High starting currents last 2 seconds or less; if not and voltage during start is correct, on 1Ø units you can replace the start switch/capacitor</li> <li>• Motor running current (all phases) is at or below rated ( at normal pressures)</li> <li>• When the motor is cool, open the motor connection box, disconnect the 2 small wires going into the motor, and use an ohmmeter to check continuity of these wires. They should be a short circuit; if not, replace the motor.</li> </ul>
ALERT	ALERT 5 BOTH LIM ACTIVE	2 chirps per second every 15 seconds	The STC is seeing both limits tripped at the same time. Reset the limits through the Installer Menu's Learn Limits reset.
ALERT	ALERT 6 LIM NOT RELEASED	2 chirps per second every 15 seconds	Is the pump developing pressure? Are the brake valves set properly? Is there hardware holding the gate? Check fluid levels and brake valve settings.
ALERT	ALERT 7 FREQ SHIFT FAULT	2 chirps per second every 15 seconds	HY-5A detector has detected a frequency change outside the normal range. Check the loops and the integrity of the loop installation.
ALERT	ALERT 8 LOOP SHORTED	2 chirps per second every 15 seconds	HY-5A detector has detected a short circuit in the loop. Temporarily switch detector to be sure the loop is at fault and then repair it.
ALERT	ALERT 9 LOOP OPEN	2 chirps per second every 15 seconds	HY-5A detector has sensed that the loop has become an open circuit. Check all connections and/or use an ohmmeter to find out where the break is.
ALERT	ALERT 10 I2C BUS ERROR	2 chirps per second every 15 seconds	Communication issue between the HY-5A and the Smart Touch Controller; reset and try again. Replace the HY-5A if the problem continues.
ALERT	ALERT 11 DETECTOR FAULT	2 chirps per second every 15 seconds	Unknown fault; perform the megaohm test and fix the loop if necessary. Replace the HY-5A if the problem continues.
ALERT	ALERT 12 ON TOO LONG	2 chirps per second every 15 seconds	The detector believes there has been a vehicle on the loop for greater than 5 minutes. <ul style="list-style-type: none"> <li>• Is there something metal on (or near) the loop?</li> <li>• Is the sensitivity adjustment set too high?</li> <li>• Is the roadway solid? If the underground loop moves it will give false readings.</li> <li>• There may be a problem with the loop itself. Check with a megohm meter. New loops should read 100 mega-ohms or better, between 50 and 100 operation are generally OK, below 50 meg-ohms install a new loop.</li> </ul>

Type	Alert/Fault/Error Display	Buzzer Chirp Sequence	Possible Cause & Suggested Corrective Action
ALERT	ALERT 13 STIFF GATE	2 chirps per second every 15 seconds	The STC detects a gate that, over time, is requiring more power to move it. Usually caused by degrading gate hardware or debris in a slide gate track, this alert appears in the history log. It does not affect opening or closing the gate. <ul style="list-style-type: none"> <li>• Check and correct gate hardware as required.</li> <li>• Check motor brushes for excessive wear.</li> </ul>
ALERT	ALERT 14 STUCK GATE	2 chirps per second every 15 seconds	The STC detects that it cannot move the gate at all possible caused by broken gate hardware or ice/snow buildup. <ul style="list-style-type: none"> <li>• Manually move the gate. Verify that it moves easily and is unobstructed throughout gate travel.</li> <li>• Check and correct gate hardware, as required.</li> </ul>
ALERT	ALERT 17 BAD COIN BATTERY	2 chirps per second every 15 seconds	Replace the 3V coin battery that controls the internal clock, with the AC power turned off. Use a CR2032 battery.
ALERT	ALERT 18 CHANGE BATTERY	1 chirp a minute	Batteries are not taking a charge properly. The STC has detected that the 24VDC UPS batteries need to be replaced. <p><b>NOTE:</b> The buzzer will chirp every minute until the UPS batteries are replaced.</p>
ALERT	ALERT 19 FALSE SLOWDOWN	2 chirps per second every 15 seconds	Appears only on gate operators with VFD. Slowdown switch tripped and released (less than 1 second) in middle of run. Check for loose wires, limits and misaligned rails or limit ramps.
ALERT	ALERT 20 EXT LOCK FAILED	2 chirps per second every 15 seconds	An interlock contact is closed, indicating that the M30 gate latch (lock) is engaged, preventing the operator from starting. Check the interlock and wiring.
ALERT	ALERT 21 DRIVE TRIP	2 chirps per second every 15 seconds	M30/M50 gate travel will not occur until the alert is cleared. Any open or close command resets the alert and starts the M30/M50 gate moving, unless the VFD is experiencing a fatal error. If you cannot clear the error alert by pressing the open or close button, contact HySecurity.
ALERT	ALERT 22 INTLOCK FAILURE	2 chirps per second every 3 seconds	Appears when the RS-485 communication connection is lost for more than 5s between interlocked (dual gate) or sequenced gate operators. Check cable connections and wiring. Make sure both operators are working properly and have the same current and up-to-date software versions. The alert auto clears when communication between the two operators is restored. If the operator on site is a singular gate and the display code ALERT 22 appears, access the Installer Menu. Verify the Installer Menu items: DG (Dual gate) and SG (Sequential gate) are both set to zero.
ALERT	ALERT 24 EXT RELAY FAULT	2 chirps per second every 15 seconds	The Hy8Relay (extended relay module) is not being recognized. Alert noted in diagnostic log. Check the wiring: <ul style="list-style-type: none"> <li>• Make sure the slide switch on the side of the extended relay module is set at "Normal."</li> <li>• (Y) Data + is connected to "A" DUAL GATE.</li> <li>• (G) DATA - is connected to "B" DUAL GATE.</li> <li>• Connector cable (4-pin) attaches to RS-485.</li> </ul> <p>If the Hy8Relay module is not connected, access the Installer Menu and check that the extended user relays are set to zero.</p> <p>STC = R4 to RB (7-segment display) SDC = R3 to R9 (16 character display) STC = R4 to R11 (16 character display)</p>

Type	Alert/Fault/Error Display	Buzzer Chirp Sequence	Possible Cause & Suggested Corrective Action
ELD OOLD IOLD SLD RLD	"Vehicle Loop Detectors"		Appears in sequence with another display code which pertains to the loop issue. Refer to the other display code for more information. ELD = Exit Loop Detector OOLD = Outside Obstruction Loop Detector IOLD = Inside Obstruction Loop Detector SLD = Shadow Loop Detector RLD = Reset Loop Detector
FAULT	FAULT 1 MOTOR RUN TIME	1 chirp once every 15 seconds	The STC has detected the motor is on longer than the maximum run time selected. Should not occur in StrongArmPark. <ul style="list-style-type: none"> <li>• Check and replace drive belt.</li> <li>• Increase Max Run Timer in the Installer Menu.</li> </ul> Not applicable to StrongArm M30/M50.
FAULT	FAULT 2 PHOTO EYE	2 chirps per second once per minute	"Monitored" means the STC must see the photo-eye NC contact change from closed to open and back to close after receiving the command to move, but before starting. (FAL2 indicates the Smart Touch did not see this sequence at start.) Be sure the photo-eye is capable of, and set to provide this function. Be sure the eye "common" wire is wired properly to the "Photo Eye Power 24V Common" Terminal and Installer Menu Item 18 (PEO/PEC-NO/NC) is set to 1.
FAULT	FAULT 3 LOW VOLTAGE SAG	2 chirps per second once per minute	The 24V control voltage is monitored in lieu of line voltage. Low incoming line voltage will cause low control voltage. Verify that the control transformer is connected properly, (white – not used, red for 208V, orange for 230V and blue for 460V). Check the line voltage as the motor starts with a meter that has min/max hold capability. If the line voltage drops more than 10% below nominal (187 on 208VAC, 207 on 230VAC, or 416 on 460VAC) the voltage is dropping too low and must be corrected. This condition is often caused by loose connections or power wiring which is too small. If the wire is too small, it must be replaced.
FAULT	FAULT 5 LIMIT FAILED	2 chirps per second once per minute	SD50VF only. Not applicable for StrongArm M30/M50.
FAULT	FAULT 14 STUCK GATE	2 chirps per second once per minute	The STC has tried 3 times to overcome a stuck gate/arm. The gate/arm is non-operational while this fault is triggered. Caused by broken gate/arm hardware or ice/snow buildup. <ul style="list-style-type: none"> <li>• Check and correct gate hardware as required.</li> <li>• Press RESET to clear fault.</li> </ul>
ERROR	ERROR 1 DIRECTION ERROR	3 chirps per second once per minute	Close Limit tripped after running Open or Open Limit tripped after running Closed. Assess cables and wire connections. Make sure wires are connected to the proper terminals.
ERROR	!ACTION BLOCKED PHOTO EYE CLOSE	1 chirp indicating that the command cannot be initiated	Operator received command to run, but movement is prevented. Photo eye is blocked or battery is dead. Clear photo eye path and realign photo eye. Replace photo eye battery if needed.
ERROR	!ACTION BLOCKED PHOTO EYE OPEN	1 chirp indicating that the command cannot be initiated	Operator received command to run open, but movement is prevented. Photo eye is blocked or battery is dead. Clear photo eye path and realign photo eye. Replace photo eye battery if needed.
ERROR	!ACTION BLOCKED GATE EDGE	1 chirp indicating that the command cannot be initiated	Operator received command to run open, but movement is prevented. Gate edge blocked or disconnected and causes operator to enter SAFE mode.

Type	Alert/Fault/Error Display	Buzzer Chirp Sequence	Possible Cause & Suggested Corrective Action
ERROR	ERROR 2 IES DISCONNECT	3 chirps per second once per minute	The IES sensor could be bad, check to see that the N.C. contact is intact. Check that you have the most current sensor; visit our website and view the technical bulletins in the Tech Support area. The sensor wire could be loose; you may want to tighten the female connectors with some pliers. The software may need to be updated. Make sure the brake valves aren't set too tightly by asking, "How fast does the gate panel stop when the limit switch is tripped?" (Tight brake valves will raise the system pressure.)
ERROR	ERROR 3 HY5A COMM ERROR	3 chirps per second once per minute	One or more detectors are not communicating properly. Remove detectors, reset the controller, and re-install detectors one at a time until faulty detector or loop is found.
ERROR	ERROR 4 DUAL GATE	3 chirps per second once per minute	Indicates a problem with the communication between the two crash gate operators of a Primary/Secondary Set. The software versions of these two operators must be the same. Check the version by cycling the power off and on to each operator. On power up the software version will flash on the screen (example: v4.23). Make sure the conductors are twisted and shielded. Beware of buried high voltage conductors that are too near to the interconnecting conductors, they may interfere. Be sure the parameter (DG) in the installer menu is set to 2 in the Primary and 1 in the Secondary unit. Error automatically clears when communication fault is resolved.
ERROR	ERROR 6 DRIVE BOARD	3 chirps per second once per minute	Internal error between the STC board and the VFD. Check cable connections and wiring. Make sure both units are working properly.
ERROR	ERROR 7 MENU CHECKSUM	3 chirps per second once per minute	Contact HySecurity.
ERROR	ERROR 8 RPM SENSOR	3 chirps per second once per minute	Check wiring from the hydraulic cylinder to the STC.
ERROR	ERROR 9 BATT DISCONNECT	3 chirps per second once per minute	Only applies to DC Power Supply connection. Contact HySecurity.
ERROR	ERROR 10 SLOWDOWN SWITCH	3 chirps per second once per minute	VFD only. The operator tripped the fully Open or CLoSe limit before the Slowdown limit tripped. Check: <ul style="list-style-type: none"> <li>• Slowdown limit wiring and adjustment</li> <li>• Adjustment of the limit ramps to verify that the limit switch is being tripped. Manually trip the slowdown limit. OPEN SLOWDOWN or CLOSE SLOWDOWN should appear on the display which indicates that it is working properly.</li> </ul>
FAIL	FAIL PROGRAM DATA ERR	3 chirps per second once per minute	1. Try turning off the power to the operator and having the customer re-seat all of the various connectors and cables. 2. Upload the latest software release. If the fail does not go away, Replace the STC board.



# ELECTRICAL ISSUES

A general set of troubleshooting procedures are provided in the following paragraphs. Use a voltmeter to take the measurements described in the steps. If at any point in the process, a result different than what's expected occurs, stop and identify the problem.

## AC-Powered Gate Operators

**PROBLEM 1:** Pushed the OPEN and CLOSE button, but the motor is not running.

1. Verify the incoming voltage and phase at the incoming power terminals matches the voltage and phase on the nameplate of the motor. They must match!
2. Verify the 24VAC transformer has the proper connection to the incoming power (the black wire is always connected); White – 115VAC\*, Red = 208VAC, Orange = 230VAC, Blue = 480VAC.

\***NOTE:** The white transformer wire is not used on SlideDriver 50VF-series operator.

3. Verify the primary tap wires match line voltage connected to operator. Measure the line voltage carefully to distinguish between 208V and 230V branch circuits or between 390V and 460V branch circuits. A label on top of the transformer identifies the various voltage taps. This connection must match the voltage on the operator nameplate.

**NOTE:** Primary taps do not exist on battery operators.

4. Verify the 24VAC is present at the Red and Green wires from the control transformer to the Power Module by measuring the bottom of the power supply board at the -ACC+ connectors.
5. Verify that the main power wires are at least the minimum wire size specified in the *Wire Sizing and Runs* on page 16. Be certain that the branch circuit wire size versus the distance of the run from the main panel is large enough to avoid excess voltage drop.
6. Verify 24VDC power is present on the Power Module between the +24VDC terminals above the terminal strip and any screw connection on the terminal strip.
7. Be sure a 20A circuit (protected with a 20A inverse time breaker) is provided.
8. Check and make sure the operator is electrically grounded per NEC Article 250 and local codes.
9. Verify the 24VDC is present at the +24VDC and common terminals located along the lower edge of the Smart Touch Controller board. (RADIO OPTIONS, etc.)
10. Verify that the "Heart Beat" LED is blinking green.
11. Verify the display is operational on the LCD and VFD display.
12. With the knowledge that the power is correct and the electric motor runs, check the STC display. If an error, alert or fault code appears, refer to *Troubleshooting Codes: Table 3* on page 74 to determine possible resolutions.

# MECHANICAL ISSUES

General problems concerning gate movement can usually be resolved by using the hand pump and manually moving the gate open and close.

General maintenance recommends scheduled inspection of all fasteners to make sure they are tightened securely and torqued to proper specifications. For torque specs, refer to *General Maintenance*.

# HYDRAULIC ISSUES

The speed at which the operator moves the gate is determined by the size of the hydraulic pump and software settings.



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Attempting to slow gate speed by changing a valve setting will cause inefficiency and increased heating of the hydraulic system, which will degrade system performance and also may result in premature system failure.

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**NOTE:** If the gate speed must be changed, contact your HySecurity distributor or HySecurity Tech Support.

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Extremely cold weather is unlikely to seriously affect the gate speed because HySecurity employs a special grade of hydraulic fluid (Uniflow), which maintains a linear viscosity over a broad temperature range. This high quality fluid, combined with other design considerations, allows HySecurity to rate its operators for service in ambient temperatures of -40°F to 158°F (-40°C to 70°C).

If the gate speed of your operator has been affected by cold weather, perform the following:

1. Verify the gate hardware is not impaired by ice.
2. Verify that the reservoir is filled with Uniflow fluid.

**NOTE:** Consider adding a heater in extreme cold weather regions. A biodegradable fluid option does exist, but it does not have the same fluid viscosity at extremely low temperatures. The biodegradable fluid option has a temperature rating between -10°F and 158°F (-23°C and 70°C).

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# TYPICAL PROBLEMS AND TROUBLESHOOTING PROCEDURES

A few typical problems and their associated troubleshooting procedures are provided to facilitate identification and resolution.

**PROBLEM 1:** Pressing the Open and Close buttons produce no response (nothing happens).

1. Verify the line voltage is present and matches the operator's input voltage requirement + 10%.
2. Verify the control voltage is present at the Power Supply Common and 24VDC terminals. It may be necessary to reset the circuit breaker (black button) on the transformer.
3. If an external Stop button is not used, verify a jumper wire connects Common to Stop.
4. Verify there are no Faults or Errors being reported on the LCD display.
5. Jump COM to the OPEN or CLOSE INPUT and verify that the LED lights on the STC board which indicates that the input is active and working properly. To help in diagnosing the problem, take note of what other inputs light up and check the display for codes.

**PROBLEM 2:** Hydraulic pump is running and the hydraulic pressure is between 0 - 700 PSI, but the gate is not moving.

The Smart Touch Controller reports system malfunctions on its LCD display and the buzzer will emit a series of chirps at defined intervals. Review the table of Alerts, Faults and Errors listed in *System Diagnostic Messages* on page 73. To check the status of all inputs on the terminal strip, the LED tact button must be pushed.

If the power is three-phase, verify counter-clockwise Electric Motor rotation. To reverse rotational direction, switch any two AC lines.

**NOTE:** The VFD Motor Controller displays trip and fault codes. Check to see if any error codes appear on the VFD display. Most VFD issues are resolved through the STC software and modbus interface.

1. Check the hydraulic fluid level by removing the plug in the pump reservoir. If necessary, add fluid at this location until the level is about ½ inch below the filler hole.
2. Unplug the hydraulic hoses and run the pump; if the pressure is low, adjust the Pressure Relief Valve.
3. If the Pressure Gauge does not respond to adjustment of the Pressure Relief Valve, completely remove the valve and depress the plunger at the nose end with a blunt tool (e.g., an Allen wrench) and blow on it to remove any debris.

**PROBLEM 3:** The gate only opens or only closes.

1. Verify that no external device is commanding the gate to open or close by watching the LEDs associated with each input.
2. If the gate only opens, the Directional Valve is probably stuck and needs to be checked for debris and cleared.
3. If the gate only closes, the Directional Valve Coil is not being energized or is defective.

**PROBLEM 4:** A run command causes PEC to appear on display.

1. Check that the photo eye is not blocked. If it is, remove the blockage and realign the photo eye. Refer to *Photo Eye Alignment* on page 64.
2. If you have a battery-powered photo eye, check that the batteries are viable and the batteries are fresh.
3. If needed, realign the photo eye. Refer to *Photo Eye Alignment* on page 64.



# General Maintenance

## SMART TOUCH ANALYZE AND RETRIEVE TOOL (S.T.A.R.T.)

HySecurity provides Smart Touch Analyze and Retrieve Tool (S.T.A.R.T.) software to help HySecurity gate operator users and installers conduct the following field service activities:

- Configure installer and user menu settings
- View the operator history (event) log
- Display monitored inputs for operator diagnostics
- Load Smart Touch Controller (STC) software



With S.T.A.R.T. software loaded on your laptop computer, you have an invaluable management tool for all HySecurity operators. The RS-232 serial port (found on the Smart Touch Controller), allows you to download system diagnostics and upload system configurations using the S.T.A.R.T. software. The free S.T.A.R.T. software is conveniently located at [www.hysecurity.com](http://www.hysecurity.com). Instructions for downloading S.T.A.R.T. are on the website.

### What You Need

HySecurity Serial RS-232 communication cable with USB adapter and current USB driver.

- Laptop computer with Windows PC operating system (XP, Vista, Win7, or Win8)
- Minimum 128MB of RAM
- Minimum 5MB of hard drive disk space
- VGA graphics card (minimum resolution of 800 x 600)

### Installing S.T.A.R.T. Software

Read the S.T.A.R.T. User Manual, and then take the following steps to download S.T.A.R.T. software:



The latest version of S.T.A.R.T. is encrypted. An error message will appear stating that the file is corrupt if you try to load new operator code using out-dated S.T.A.R.T. software. Be sure to “uninstall” any outdated versions of S.T.A.R.T. from your laptop and install the latest version from [www.hysecurity.com](http://www.hysecurity.com).

1. Bring up your web browser and type <http://www.hysecurity.com> in the command line.
2. Click Technical Support (left column) on the HySecurity home page.
3. Click Download: Smart Touch software.
4. Enter your user name and password. If you do not have a user name, register as an online member.
5. Click S.T.A.R.T. Software for Smart Touch and SmartDC to begin the software download.
6. Read the End User License Agreement and, if you agree to the terms, click, “**I accept**” (bottom of page).
7. Save the START< >\_setup.exe file to your desktop.

8. Double-click the file to begin the installation.
9. Click RUN. A setup window appears.
10. Follow the step-by-step instructions to complete the installation.\*
11. When the download is complete, log off the HySecurity website. Shortcuts for the S.T.A.R.T. and STC History Logs appear on your laptop's desktop.

**\*NOTE:** Confirm you have administrative rights by clicking the following on your computer screen:  
Windows start ->Control Panel ->User Accounts ->User Accounts. See if your name appears as an administrator.  
If you are the only user of a computer, you are by default the administrator. If not, you may need to consult with your company's system administrator prior to downloading the HySecurity S.T.A.R.T. program.

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## SOFTWARE MAINTENANCE

The software on the STC board is periodically being enhanced with new features that create an easier install and improve the on-board diagnostic tools. Be sure to check the HySecurity website for the latest version of software and operator code before heading out for field maintenance.

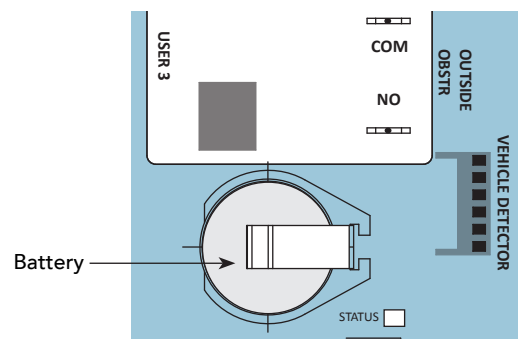
# ELECTRICAL CONTROLS

**NOTICE:** Before servicing, turn off all power switches.

No routine maintenance is needed for the electrical system or controls. If the environment is very sandy or dusty, or has many insects, be certain to seal all holes in the electrical enclosure. Blow the dust out of the electric panel with compressed air. Use the troubleshooting Table 3 on page 78 to assess and fix error, alert, and fault codes. If it is necessary to call a distributor for assistance, be sure to have your model and serial number ready. Other helpful information includes the name of the job, approximate date of installation, and the service record of the operator, especially if any work has been done recently.

## Clock Battery Replacement

A lithium coin battery supports the clock, so the date and time is retained even when the main power is turned off. Replace the battery about every five years (or as needed) with a DL 2025, DL 2032, or CR 2025, or CR 2032 battery.



# MECHANICAL CONTROLS

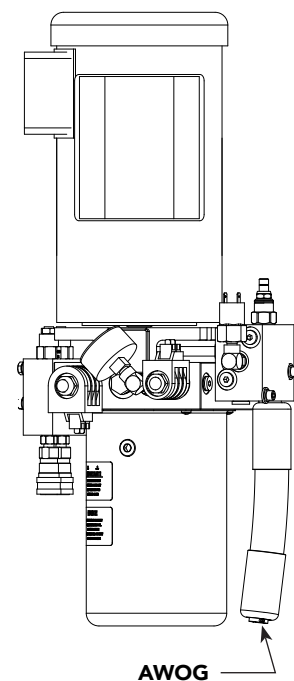
## Stopping the Gate

Most models (except SlideDriver 15 and 40) employ a time delay Soft Stop system. Additionally, brake valves are used to control the stopping of heavy or fast moving gates. These valves are exclusive to HySecurity operators. They are independently adjustable to allow the gate to stop predictably and without banging.

## Starting the Gate

To accommodate for loads moving beyond one foot per second, it is necessary to Soft Start the load gently and stop it smoothly. HySecurity accomplishes Soft Start with another exclusive feature we call an Accumulator With Out Gas (AWOG), which diverts some of the start-up hydraulic flow, accommodates for the load, and starts the gate smoothly, similar to letting your foot slowly off a car clutch without any lurching.

The downward facing AWOG (shown right) improves the life and performance of a gate system and never needs adjustment.





# MECHANICAL MAINTENANCE

**NOTICE:** Before checking the internal mechanisms of the operator, turn off all power switches.

The mechanical maintenance for the SlideDriver is not in depth or difficult, but should be performed on a routine basis.

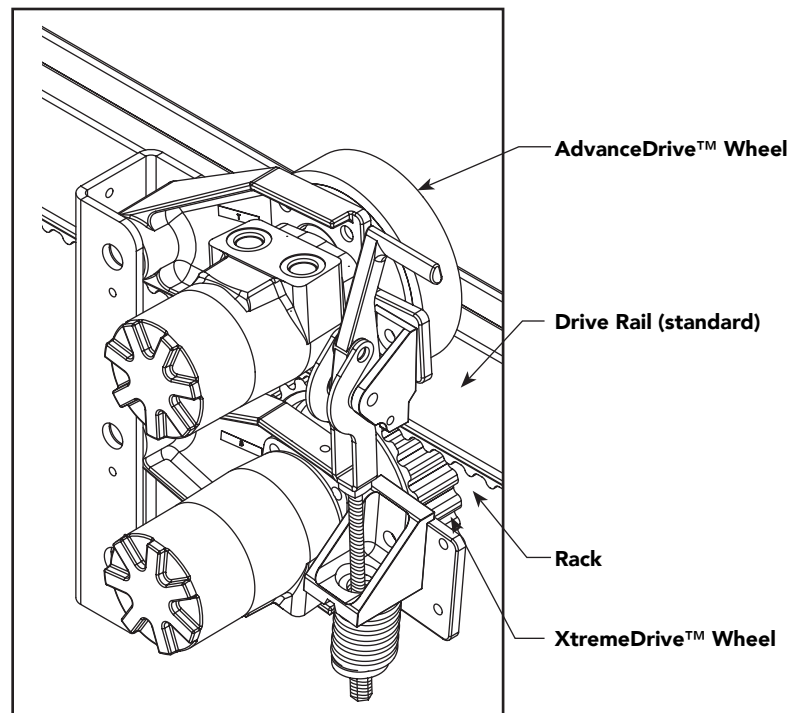
## Schedule regular maintenance:

- ✓ Check for signs of rust. The operator chassis is zinc plated which is corrosion-resistant, but some environments may increase the rate of corrosion. If any areas of rust are found, reduce the spread of corrosion by treating the areas with a rust inhibitor.
- ✓ Grease the hydraulic cylinder every 50,000 cycles. Use NLGI #2 Grade Moly EP lithium base grease only and apply it with a standard grease gun. Grease other bearings every 100,000 cycles.
- ✓ Check the motor. DC motors contain carbon brushes which wear over time and must be replaced. Failure to replace the brushes will result in damage to the DC motor. Brushes should be inspected every year in high usage applications or every 100,000 cycles and replaced as needed.
- ✓ Replace worn-out batteries. Refer to *Clock Battery Replacement* on page 85.

## Drive Rail

Verify that the drive rail does not move more than 1-inch up and down or ¼-inch side-to-side throughout the entire horizontal travel of the gate. Re-alignment is simple if the rail is mounted with U bolts. Adjusting the rail for side-to-side movements requires inserting shims between the rail and the gate where necessary. To adjust side-to-side movements, loosen the U bolts and add or remove shim stock. To adjust up or down, loosen the U bolts and simply tap the rail with a hammer until the correct height is reached.

The height of the drive rail needs to be set between 9½ to 10 inches (24 to 25 cm) from base of SlideDriver chassis if using XtremeDrive™ wheels. For site planning, see "SlideDriver/SlideDriver 50VF Site Installation Overview" on page ii.



**XtremeDrive™ System**

# Drive Wheel Spring Tension (Adjustment of Manual Release)

All SlideDriver operators come equipped with a toggle handle manual release mechanism to disengage the drive wheels from the drive rail.

During shipment, a piece of Styrofoam is placed between the coupling nut and the chassis. If the packaging is still in place, discard it.

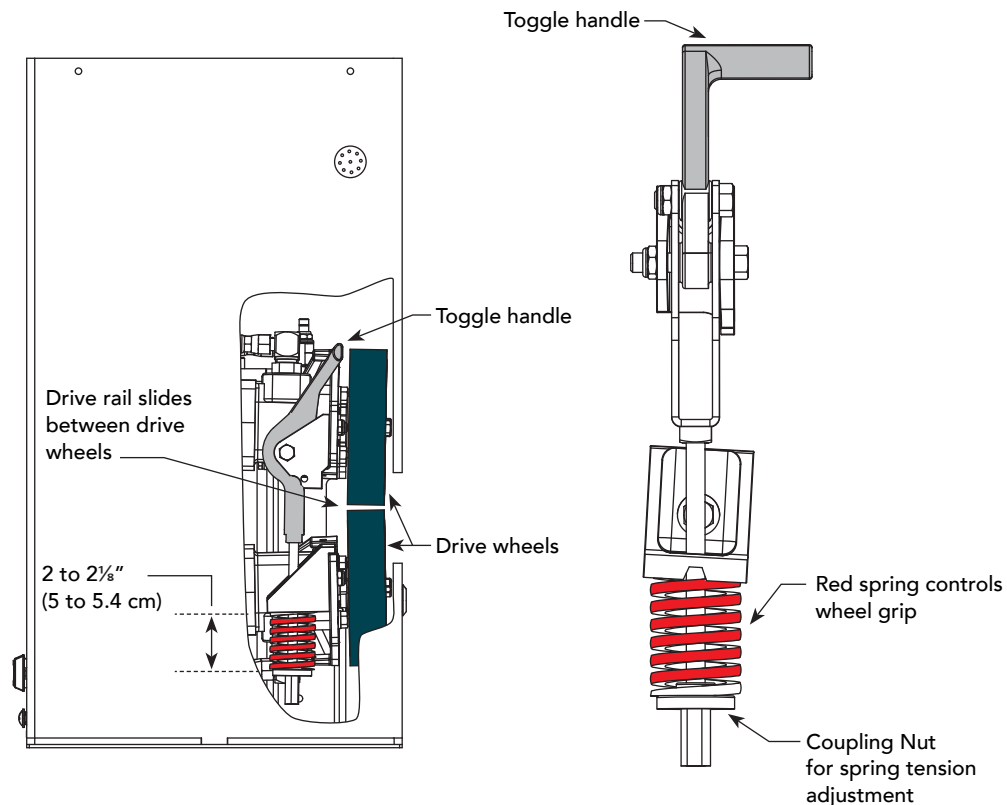


When releasing the handle inside the chassis, be careful as the mechanism is spring-loaded and drops rapidly. Hold the toggle handle appropriately so your fingers do not get pinched, hit, or crushed.

To disengage the drive wheels, simply pull the aluminum toggle handle down. As the lower drive wheel drops and disengages from the drive rail, it causes the coupling nut on the threaded rod to drop to its lowest position and push on the base of the operator. This causes the upper drive wheel to lift and disengage from the drive rail.

The coupling nut must be adjusted correctly so the wheels provide a strong clamping force on the drive rail. The red spring should measure 2 to 2½-inch (5 to 5.5cm) in height when under the correct compression.

**NOTE:** If the drive rail is installed at the correct height to the chassis, the toggle release mechanism spreads both wheels equally in relation to the drive rail. If the drive rail has been mounted higher than specified, it may be necessary to use an additional coupling nut and ½" bolt which can extend beyond the all thread and create additional lift clearance for the upper drive wheel when the toggle handle is released. If this extension method is used, adjust the ½" bolt so the drive wheels spread equally when they are fully disengaged.



# Grooved Drive Rail

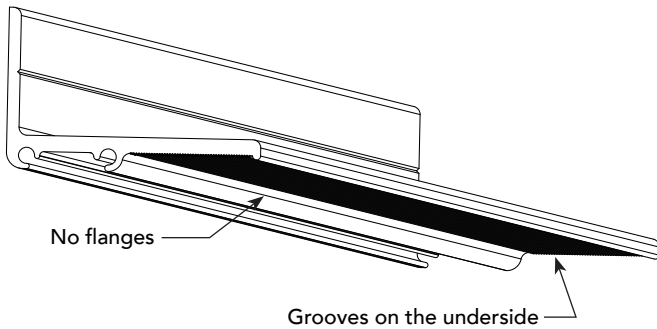
The grooved drive rail has become the standard for all new SlideDriver gate operator installations.

In this manual, several illustrations show the non-grooved, flanged drive rail which is no longer available unless a Solenoid Lock option is installed.

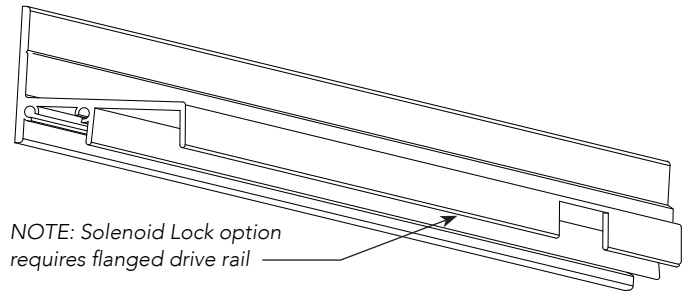
The grooved drive rail replaces the non-grooved, flanged drive rail.

A section of the two different drive rails is shown in the illustration.

**Standard grooved drive rail**



**Non-grooved, flanged drive rail**



## Grooved versus non-grooved, flanged drive rail

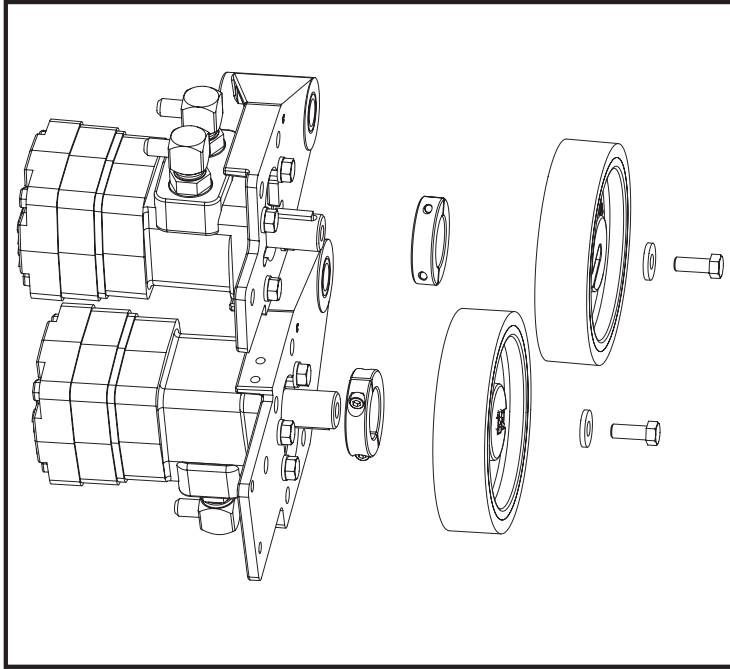
The small grooves on the underside of the new drive rail improve traction in slick or wet conditions and provide more pulling and stopping power in SlideDriver installations. The three underside flanges have been eliminated which reduces drive wheel wear and drag in misaligned gate installations. Additionally, the no-flange drive rail stacks better for shipping which reduces the likelihood of freight damage.

**NOTE:** The grooved drive rail is standard and will be on your order unless you specify otherwise. The non-grooved, flanged drive rail is still available for use with the Solenoid Lock option. The Solenoid Lock option requires an outer edge flange and therefore must be installed with the non-grooved, flanged drive rail.

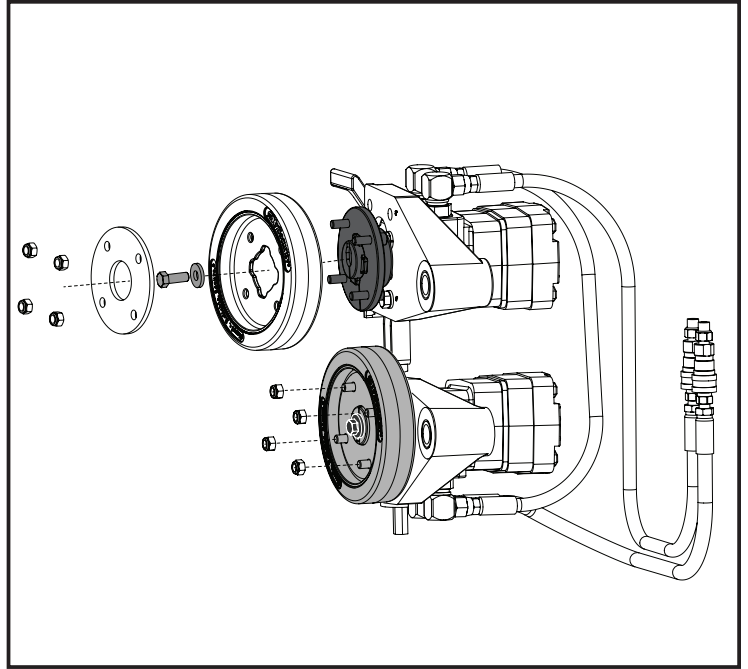
# Drive Wheel Assembly

Drive wheel assembly tasks are slightly different depending on the type: AdvanceDrive™ or XtremeDrive™.

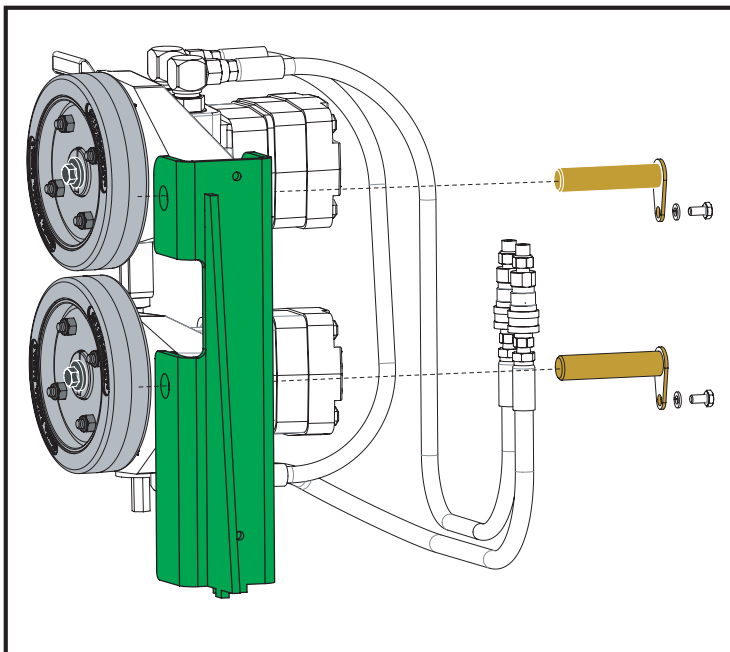
**NOTE:** Installation instructions are provided with the replacement drive wheels. However, a brief overview of the drive wheel assembly is shown below.



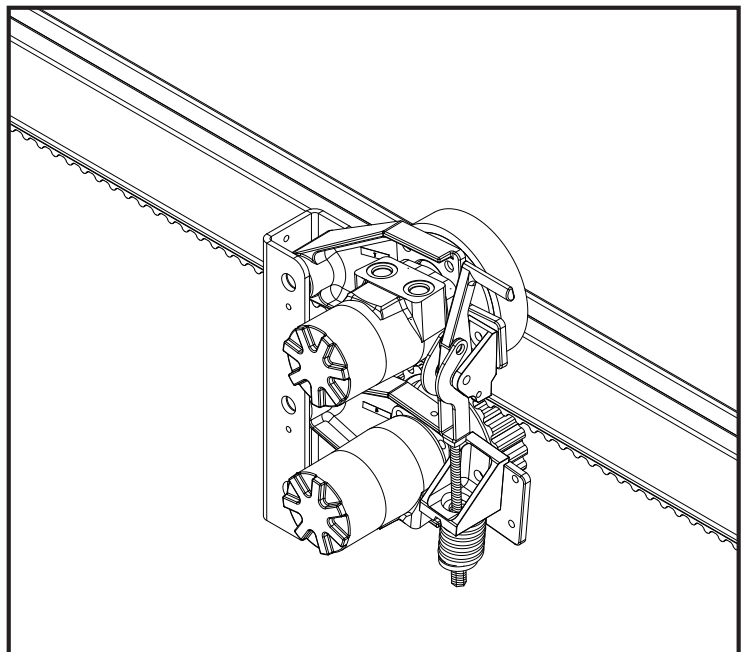
**Collared Drive Wheels**



**AdvanceDrive Wheels**



**AdvanceDrive Wheels assembled**



**AdvanceDrive and XtremeDrive Wheel combo**

# HYDRAULIC SYSTEM MAINTENANCE

**Fluid Level:** Under normal conditions, hydraulic systems do not consume fluid. Check the system thoroughly for leaks, before adding any fluid. If fluid needs to be added:

1. Remove the metal plug from the tank.
2. Use HySecurity Uniflow hydraulic fluid; part number MX000970. Gallon sold by our distributors.
3. Fill to within ½ inch of the plug level, and then replace plug.

**NOTICE:** Never use brake fluid. It will severely damage the hydraulic system. Use of any fluid other than fluid recommended by HySecurity may void the operator warranty.

**Look for leaks:** Occasionally there may be slight seeping at the fittings after some usage. Tightening of the fittings usually corrects the problem. If leaking persists, replace “O” rings, fittings or hoses, if required. No further leaks should occur.

**To Change Fluid:** Unlike a gas engine, the fluid inside a hydraulic system does not foul, so fluid changes do not need to occur often. HySecurity recommends draining the reservoir and replacing the fluid at five-year intervals. Fluid breakdown caused by heat is the main concern. If the unit is subjected to high use, or you are using the HySecurity biodegradable fluid option (especially in a wgate climate), change the fluid more frequently.

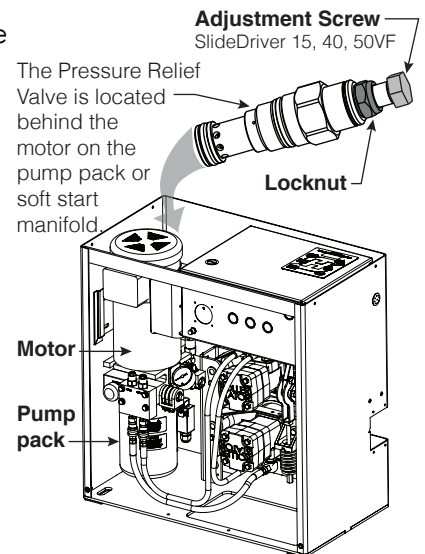
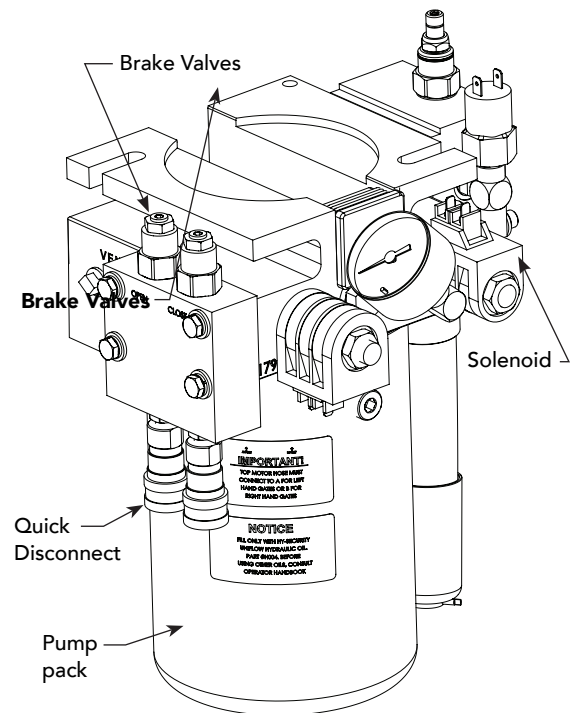
To change the hydraulic fluid,

1. Remove the reservoir from the pump pack.
2. Completely empty it.
3. Wipe the reservoir clean and clean the derby screen.
4. Re-assemble the pump unit and refill it with new Uniflow hydraulic fluid.
5. To avoid overfilling, slowly pour the fluid through the filler port near the reservoir's top until the fluid is within one inch of the port's opening.
6. Replace the plug and wipe up any spilled fluid. Spilled fluid dries to a sticky and messy consistency.

## Cold Weather Issues:

1. Check that your reservoir is filled with our Uniflow high performance fluid.
2. Excessive ice buildup can partially or totally jam gate operation. Operate the gate manually, while clearing the ice buildup.
3. If the operator is located in an area of extreme snow conditions, regular maintenance to dig the operator out may be required. A heater option may help.

**NOTE:** A biodegradable fluid option does exist, but it does not have the same fluid viscosity at extremely low temperatures. Uniflow fluid temperature rating is between -40°F and 158°F (-40°C and 70°C). The biodegradable fluid has a temperature rating between -10°F and 158°F (-23°C and 70°C).



## Brake Valve Adjustments

Proper adjustment of the brake valves is important for smooth operation of the gate. The position and placement of the limit ramps on the drive rail plays an important part on how the brake valves work.

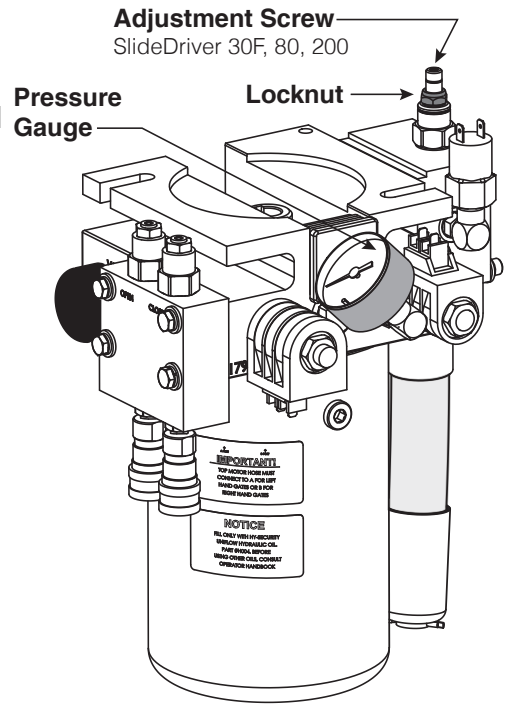
In order for the brake valves to have time to function, the limit ramp must trigger the limit switch at least two inches before the point at when you want the gate to stop.

Adjustment of the brake valves, one for each direction of travel, will determine how quickly the gate actually stops. If adjustment is needed, loosen the 9/16-inch lock nut on the top of the brake valve and make ¼-inch incremental turns on the adjustment stem with a hex key. Note that the adjustment screw varies depending on model type.

The adjustment is counter-intuitive.

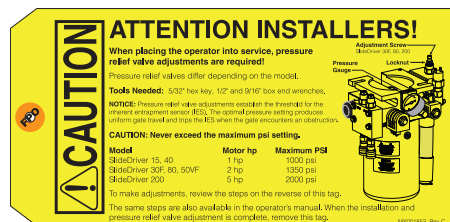
A counter-clockwise adjustment stops the gate more rapidly. If the adjustment is set too loose, the limit ramps will bang into the drive wheels. If the adjustment is set too tight, the system pressure will increase, the gate speed may decrease and the gate will jerk to a stop.

Brake valves are factory-set to midpoint, two turns. This should be sufficient for most applications. If the limit switch triggers and the drive rail stops more than two inches into the limit ramp, increase braking. When the adjustment is complete, retighten the locking nut to hold the setting.



## Pressure Relief Valve Adjustments

The Pressure Relief Valve governs the maximum system hydraulic pressure. It is located on the backside of the pump. The pressure relief valve is factory set and may need to be adjusted depending on the gate weight. See “Adjusting the Pressure Relief Valve” on page 24 or refer to the yellow tag wire tied to the unit and follow the instructions.



## Open Valve

The open valve is solenoid operated and, when energized, directs the hydraulic flow to open the gate. No adjustment of this valve is possible or necessary. The black solenoid coil mounts on its valve stem.

# SLIDE DRIVER OPERATOR MAINTENANCE SCHEDULE

Name of part	What to do	Check at these recommended monthly intervals				
		1	3	6	12	24
Gate and hardware	Check for damage and wear *1	X				
Drive wheels	Check for tightnes and wear *2		X			
Wheel clamp spring	Check for clamping tension *3		X			
Stop limit switches	Check for adjustment *4		X			
Deceleration switches	Check for adjustment *4			X		
Anchor bolts	Check for tightness			X		
Fluid level	Check for loss of fluid *5				X	
Hydraulic fluid	Drain and replace fluid					X
Clock battery	Replace *6					X
Motor Brushes (DC Only)	Replace *7					X

## Special Notes:

- \*1. Your gate and gate hardware will require more maintenance than your HySecurity operator. A damaged gate or worn hardware may cause slow or erratic operation and will result in excess drive wheel wear. Lubricate gate hardware more frequently and check for smooth operation by opening the toggle clamping mechanism and then pushing the gate manually. One person should easily be able to push all but the largest of gates. Damaged or warped gate panels should be straightened or replaced.
- \*2. Normally, drive wheel life is many years. They are designed to avoid slipping on the rail. Wheels may be greatly shortened by any of these faults: clamping spring not adjusted correctly, operator misaligned in relation to gate panel, badly warped gate panel, extremely stiff gate hardware, and/or loose wheel mounting bolts (tighten to 25 ft. lb).
- \*3. Verify that the red clamping spring is compressed tightly so that drive wheels apply a strong grip on drive rail. The red spring should normally be compressed to 2-inches in height. See 87.
- \*4. The limit switch and deceleration switch rollers should ride ¼ to ½-inch below the drive rail, near the center of the channel. Maladjustment may result in false or early tripping or no limit function at the end of travel. Verify that the limit trip ramps are tightly bolted to the drive rail.
- \*5. The fluid level should remain no less than one inch below the filler hole. Refer to maintenance instructions for fluid filling. Loss of fluid is not normal and indicates a leak that must be located and repaired. Use Uniflow fluid, part MX000970, if additional fluid is required.
- \*6. Replace the Smart Touch Controller coin battery with DL 2025 / DL 2032 or CR 2025 / CR 2032.
- \*7. DC Operators use DC motors with 4 carbon brushes which wear in normal operation. Worn brushes can damage the DC motor. Under severe conditions HySecurity recommends that brushes be checked after 2 years or 250,000 cycles and the replacement interval be adjusted as necessary.



# SLIDE DRIVER INSTALLER CHECKLIST

This check list is provided by HySecurity and is to be used after installing a SlideDriver gate operator.

1. Before checking the items in this list, make sure power is turned OFF at the main power disconnect and the operator's control box power switch is also in the OFF position.
2. Lower the toggle handle to unclamp the drive wheels from the drive rail and check the following:
  - Gate moves smoothly and freely by hand.
  - Electric motor and transformer wired properly.
  - Incoming power supply voltage matches the label on the motor.
  - Gate operator is level.
  - Operator is labeled as appropriate for both the type and UL usage class of the gate.

Make sure the phase, hertz, and power match the operator and its labeling:

- 1 Ø       3 Ø       50 Hz       60 Hz
  - DC-24V     115 VAC     208 VAC     230 VAC     480 VAC     \_\_\_\_V
  - Power cable run to the operator is of sufficient wire size to handle starting current.
  - NEC/NFPA ground rod is installed.
  - All wires and cables are clear of moving parts (limits, valves, power, etc.).
  - Breather cap has been installed, replacing the Vent Plug in the pump.
  - Oil level checked.
  - All chassis and base riser bolts are tight.
  - Gate wheels & rollers have covers.
  - Pinch points protected.
  - 6 foot (1.8 m) minimum distance to access controls.
  - Pedestrian gate exists.
  - Physical gate stops are present.
  - On gate, protective mesh complies with ASTM F2200 and UL 325 standards.
  - Gate is not on a slope.
3. For the remaining checks, you want to cycle test the gate operator. To do so,
    - Re-engage the wheels by lifting the toggle handle and clamping the drive wheels onto the drive rail.
    - Turn the main power ON, and then turn ON the power switch located on the operator's control box.

**NOTE:** Be sure to read the *Installation Instructions* and the *Programming and Operations Manual* that accompany the operator. The product literature explains, in detail, many aspects about installation, programming, maintenance and safety procedures. If you have further questions, please contact Technical Support at 800-321-9947.



4. Prior to moving the gate, make sure the wheel clamp spring is compressed to 2 inches (5 cm).
5. Cycle test the gate by pressing the CLOSE and OPEN buttons. Allow the gate to continue traveling throughout its entire range while you or your assistant check the following:
  - Gate handing is set correctly. See product literature for information on gate handing.
  - Horizontal rail surface is 9¼ in. ± ½ in. (23 cm ± 1 cm) above the pad over full gate travel. Keep in mind, if using XtremeDrive™, the placement of the drive rail is ¼ to ½ inch higher.
  - Rail flange, attached to the gate supports, remains at a distance of 1¾ in. ± 1/8 in. (4 cm ± 3 mm) from the outside edge of the operator (edge closest to the gate panel) over the full range of gate travel.
  - Drive wheel face(s) are parallel to the rail ± 1/8 in. (3 mm) with a 2 ft (61 cm) straight edge.
  - Limit switches are adjusted to clear the drive rail, but solidly contact the limit ramps.
  - Limit ramps are adjusted to stop the gate 1 to 2 inches (2 - 5 cm) from the end of the drive rail.
  - Pressure relief valve is properly set. Refer to the yellow tag inside the operator or refer to the product literature, "Adjusting the Pressure Relief Valve" on page 24.
6. Peripherals, accessories, safety devices, and options have been installed and tested.
7. Check all those that apply:
 

<input type="checkbox"/> Free exit	<input type="checkbox"/> Inside Obstruction Loop	<input type="checkbox"/> Outside Obstruction Loop	
<input type="checkbox"/> Open edge	<input type="checkbox"/> Close edge	<input type="checkbox"/> Open photo eye	<input type="checkbox"/> Close photo eye
<input type="checkbox"/> Stop input (1)	<input type="checkbox"/> Local Open (2)	<input type="checkbox"/> Close timer set (3)	<input type="checkbox"/> Radio open (4)
<input type="checkbox"/> IES sensor	<input type="checkbox"/> Fire Dept. Open	<input type="checkbox"/> Emergency Close	<input type="checkbox"/> Solenoid lock

WARNING placards mounted on both sides of the gate within sight of vehicle and pedestrian traffic per UL 325 standards.

Date: \_\_\_\_\_

Operator Serial Number: \_\_\_\_\_

Installer Name (please print): \_\_\_\_\_

End user's name (please print): \_\_\_\_\_

Site address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Notes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## LIMITED WARRANTY

### 1. Warranty.

Hy-Security Gate, Inc. ("HySecurity") warrants that at the time of sale each of its products will, in all material respects, conform to its then applicable specification and will be free from defects in material and manufacture. This warranty does not extend to items listed as "accessories" in HySecurity's price list, when those items carry another manufacturer's name plate and they are not a part of the base model. HySecurity disclaims all warranties for such accessory components, which carry only the original warranty, if any, of their original manufacturer. HySecurity hereby assigns its rights under such manufacturer warranties—to the extent that such rights are assignable—to Buyer.

The following additional durational warranties apply to HySecurity's products. *The term of these additional warranties is determined by whether (1) the product is purchased through an authorized HySecurity distributor and (2) whether a timely and complete warranty registration is submitted to HySecurity. It is therefore important that you register your product with HySecurity within the 60 day period described below.*

#### 1(a) Warranty Items (Registered Gate Operators Purchased from Authorized Distributors)

For any gate operator product that is purchased from an authorized HySecurity distributor (this excludes product purchased through internet resellers or any distributor not authorized by HySecurity), if the online Warranty registration is completed at [www.hysecurity.com/warranty](http://www.hysecurity.com/warranty) within 60 days of the date of purchase by the dealer/installer or if the warranty registration form sent with every HySecurity gate operator is completely filled out and returned to HySecurity within the same 60-day period, the following Warranty terms will apply: HySecurity will warrant that the product will remain serviceable for the following periods:

- a. Hydraulic Gate Operators: Five Years or 500,000 gate cycles (whichever occurs first) after the date of installation, or
- b. Electromechanical Barrier Arm Operators: Two Years or 1,000,000 gate cycles (whichever occurs first) after the date of installation, or
- c. Electromechanical Slide and Swing operators: Five Years after the date of installation—unless installed in a single family residential application, in which case the warranty term shall be Seven Years after the date the product is shipped from HySecurity; provided that the Five Year warranty period will not extend beyond Seven Years from the date that the product was shipped from HySecurity. This warranty does not apply to the components described below, which have the shorter warranty period indicated:
- d. Hydraulic Gate Operator Drive Wheels including XtremeDrive wheels and rack: Two Years from date of installation.
- e. Batteries used in all D.C. operators, inverters or other battery powered devices: One Year from date of shipment from HySecurity.
- f. Items subject to normal wear including, but not limited to, chains, belts, idler wheels, sprockets, fuses and motor brushes: One Year from date of installation.

#### 1(b) Warranty Items (Operators Not Purchased from an Authorized Distributor or Registered within 60 Days)

For any gate operator product that is not purchased from an authorized HySecurity distributor or for which the online Warranty registration or warranty registration form sent with every HySecurity operator was not filled out completely or not returned to HySecurity within 60 days of the date of purchase by the dealer/installer, the following One-Year Warranty will apply to that product: HySecurity warrants that the product will remain serviceable for the following periods, which begin on the date that the product was shipped from HySecurity:

- a. All Gate Operators: One Year or 100,000 gate cycles whichever comes first.
- b. Hydraulic Gate Operator Drive Wheels: One Year

#### 1(c) Replacement Parts

HySecurity warrants that replacement parts (whether new or reconditioned) will remain serviceable for One Year from the date that the product was shipped from HySecurity.

#### 1(d) Limitations and Exclusions Applicable to Each of the Preceding Warranties

The preceding warranties shall not apply to equipment that has been (1) installed or maintained improperly or contrary to instructions; (2) subjected to negligence, accident, vandalism, or damaged by severe weather, wind, flood, fire, or war; or

(3) damaged through improper operation, maintenance, storage or abnormal or extraordinary use or abuse. Any modification made to products will void the warranty unless the modifications are approved in writing by HySecurity, in advance of the change (this exclusion does not apply to normal installation of approved accessories and/or protective devices or sensors). It is the responsibility of the distributor, installer, or End User to ensure the software version in the operator is maintained to the latest revision level.

### THESE ARE THE ONLY WARRANTIES GIVEN BY HYSECURITY AND ARE IN PLACE OF ALL OTHERS.

These warranties extend to HySecurity's Distributors, to the Dealer/Installer, and to the End User of the product following installation. They do not extend to subsequent purchasers. Dealer/Installers or End Users may receive a replacement HySecurity Warranty form by calling HySecurity at 800-321-9947.

### 2. Exclusion of Other Warranties.

The warranties contained in Section 1 are the exclusive warranties given by HySecurity and supersede any prior, contrary or additional representations, whether oral or written. Any prior or extrinsic representations or agreements are discharged or nullified. HYSECURITY HEREBY DISCLAIMS AND EXCLUDES ALL OTHER WARRANTIES—WHETHER EXPRESS, IMPLIED, OR STATUTORY—INCLUDING ANY WARRANTY OF MERCHANTABILITY, ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND ANY IMPLIED WARRANTIES OTHERWISE ARISING FROM COURSE OF DEALING, COURSE OF PERFORMANCE, OR USAGE OF TRADE.

### 3. Buyer's Exclusive Remedies for Any Nonconformity.

If a HySecurity product fails to conform to the warranties in Section 1, Buyer must notify and order replacement parts from the Distributor through which the product was purchased within a reasonable time and in no event more than thirty (30) days after the discovery of the nonconformity. HySecurity will investigate and, in the event of a breach, will provide, within a reasonable period of time, one of the following: (1) repair or replacement of any nonconforming products or components or (2) refund of the price upon return of the nonconforming items. Replacement goods will conform to this warranty for the unexpired duration of the warranty period for the original, nonconforming product. HySecurity reserves the right to supply used or reconditioned material for all warranty claims. This warranty does not cover or extend to any incidental expenses, including labor, shipping, travel time or standby time, that are incurred for inspection or replacement of any nonconforming items. As a condition of warranty coverage, warranty claims must be submitted in accordance with the following paragraph. THE REMEDY SELECTED BY HYSECURITY IN ACCORDANCE WITH THIS PARAGRAPH SHALL BE THE EXCLUSIVE AND SOLE REMEDY OF BUYER FOR ANY BREACH OF WARRANTY. IN NO EVENT SHALL HYSECURITY BE OBLIGATED TO INDEMNIFY BUYER FOR ANY BREACH OF WARRANTY.

For warranty coverage, you must follow the procedures described on HySecurity's form, "RMA Procedures." A current version of the form is available from HySecurity.

### 4. Exclusion of Consequential and Incidental Damages.

IN NO EVENT SHALL HYSECURITY BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, WHETHER RESULTING FROM NONDELIVERY OR FROM THE USE, MISUSE, OR INABILITY TO USE THE PRODUCT OR FROM DEFECTS IN THE PRODUCT OR FROM HYSECURITY'S OWN NEGLIGENCE OR OTHER TORT. This exclusion applies regardless of whether such damages are sought for breach of warranty, breach of contract, negligence, or strict liability in tort or under any other legal theory. This exclusion does not apply to claims for bodily injury or death.

### 5. Severability.

If any provision of this warranty is found to be invalid or unenforceable, then the remainder shall have full force and effect, and the invalid provision shall be partially enforced to the maximum extent permitted by law to effectuate the purpose of the agreement.

### 6. Applicable Law.

This Warranty will be interpreted, construed, and enforced in all respects in accordance with the laws of the State of Washington, without reference to its choice of law principles. The U.N. Convention on Contracts for the International Sale of Goods will not apply to this Warranty.

# SPECIFICATIONS

	FAST Operators					
	1,500 lb (680 kg) gates 1 ft/s (30 cm/s)	4,000 lb (1,814 kg) gates 1 ft/s (30 cm/s)	8,000 lb (3,629 kg) gates 1 ft/s (30 cm/s)	20,000 lb (9,072 kg) gates 1 ft/s (30 cm/s)	3,000 lb (1,361 kg) gates 1.7 ft/s (50 cm/s)	5,000 lb (2,268 kg) gates 2.2 ft/s (70 cm/s) or 3 ft/s (91 cm/s)
<b>Model</b>	SlideDriver 15	SlideDriver 40	SlideDriver 80	SlideDriver 200	SlideDriver 30F	SlideDriver 50VF2/3
<b>Part #</b>	222 SS ST	222 E ST	222 X1 ST	444 XS ST	222 EX 1.7 ST	222 X3 ST
<b>Gate Weight Max.</b>	1,500 lb (680 kg)	4,000 lb (1,814 kg)	8,000 lb (3,629 kg)	20,000 lb (9,072 kg)	3,000 lb (1,361 kg)	5,000 lb (2,268 kg)
<b>Gate Length</b>	Limited only by weight					
<b>Drawbar Pull</b>	300 lb (136 kg)	300 lb (136 kg)	600 lb (272 kg)	1,200 lb (544 kg)	300 lb (136 kg)	300 lb (136 kg)
<b>Rate of Travel</b>	1 ft/s (30 cm/s)				1.7 ft/s (50 cm/s)	Field adjustable, 2.2 ft/s (70 cm/s) or 3 ft/s (91 cm/s) Emergency Fast Close 3 ft/s (91 cm/s)
<b>1 Phase Power</b>	115/208/230V 60 Hz 110/220V 50 Hz	115/208/230V 60 Hz 110/220V 50 Hz	208/230V 60 Hz 220V 50 Hz	230V 60 Hz	208/230V 60 Hz 220V 50 Hz	208/230V 60 Hz 220V 50 Hz
<b>3 Phase Power</b>	208/230/460/575V 60 Hz, 220/380V 50 Hz					
<b>Horsepower</b>	1 hp	1 hp	2 hp	5 hp	2 hp	2 hp
<b>Duty Cycle</b>	Continuous					
<b>Temperature Rating</b>	-40° F to 158° F (-40° C to 70° C) using environmentally friendly Uniflow fluid or -10° F to 158° F (-23° C to 70° C) using biodegradable fluid. No heater necessary.					
<b>Drive Wheels</b>	Two 6" (15 cm) AdvanceDrive wheels	Two 6" (15 cm) AdvanceDrive wheels	One 8" (20 cm) AdvanceDrive wheel, One 8" XtremeDrive wheel and 27 ft (8 m) of rack	Two 8" (20 cm) AdvanceDrive wheels, Two 8" XtremeDrive wheels and 52 ft (16 m) of rack	Two 6" (15 cm) AdvanceDrive wheels	Two 8" (20 cm) AdvanceDrive wheels
<b>User Controls</b>	Smart Touch Controller with 70+ configurable settings. Smart Touch keypad and display or a PC using S.T.A.R.T. software.					
<b>Relays</b>	Three configurable user relays: one 30VDC, 3A solid state and two 250VAC, 10A electromechanical					
<b>Communication</b>	RS-232, RS-485					
<b>UL 325 Listing</b>	Usage Class I, II, III, IV	Usage Class I, II, III, IV	Usage Class III, IV	Usage Class III, IV	Usage Class III, IV	Usage Class III, IV
<b>Limited Warranty</b>	5 year					
<b>Est. Shipping Wt</b>						

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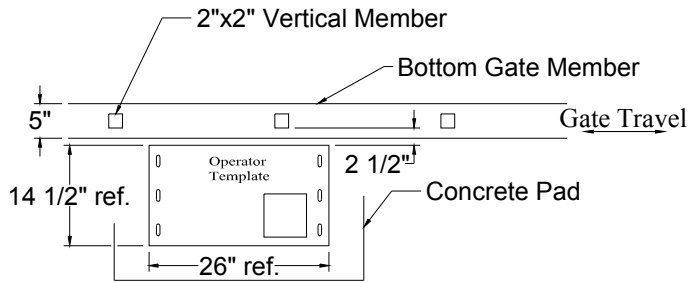
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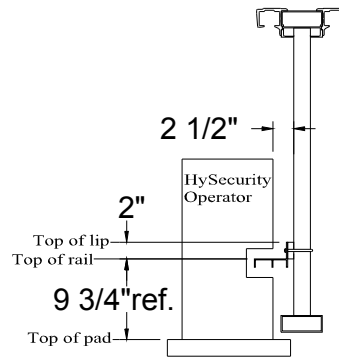
SlideDriver, StrongArm, SwingRiser, HydraLift, HydraSwing, StrongArm CRASH, SlideWinder, Smart Touch Controller, S.T.A.R.T. SwingSmart DC, SlideSmart DC, StrongArmPark DC, WedgeSmart DC, Smart DC Controller and the HySecurity logo are trademarks or registered trademarks of HySecurity Gate, Inc.

## Tymetal Gate w/ HySecurity Slide Driver

Tymetal's use of a heavy duty 2x5 bottom member requires the operator to be set 2 1/2" from the face of the gate's vertical members (not the face of the bottom member).

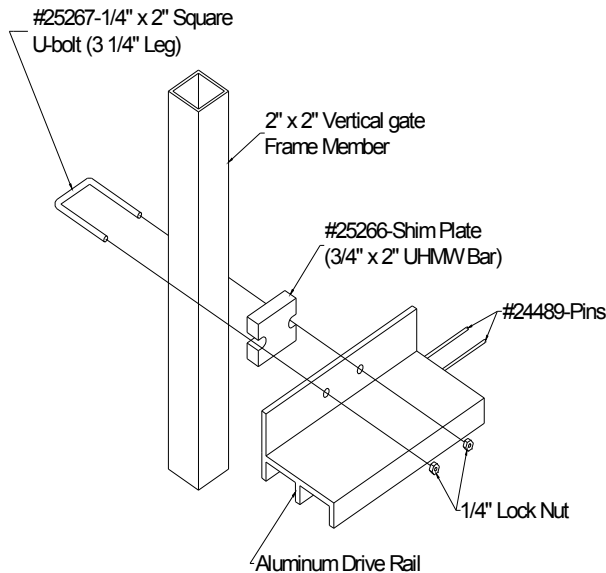


Plan View

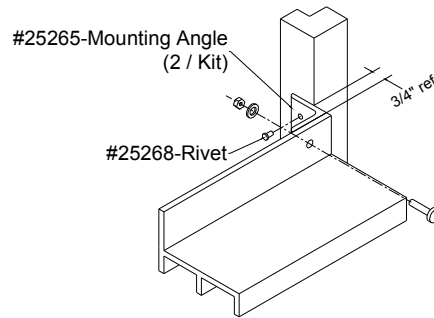


Side Elevation

Concrete Pad is to be located in the counterbalance area of the gate with a recommended minimum size of 20" w x 30" l x required depth for local frost conditions



2 x 2 attachment



Front Termination

## Tymetal Gate w/ HySecurity Slide Driver

## Recommended Drive Rail Installation Procedure

1. Using operator installation manual, **determine the correct height** of the top drive rail surface. Add 2" to compensate for the height of the drive rail mounting surface.
2. **Move gate to the FULL OPEN** position.
3. **Clamp #25265 Drive Rail Mtg. Angle** to the rear face of leading edge of gate(see illustration) in order to place the top drive rail surface at the correct height established in step #1.
4. **Fasten Drive Rail Mtg Angle #25265.** Drill ¼" holes and fasten with ¼" drive rivets provided.
5. **Disengage the operator drive wheels** and insert drive rail.
6. **Clamp drive rail** to #25265 Drive Rail Mtg. Angle at the appropriate mounting height on gate.
  1. Verify that rail height is correct in association with operator drive wheels. Disengaged drive wheels should be the same distance from the top and bottom drive rail surfaces.
7. **Move gate toward the CLOSED** position until the next 2 x 2 vertical member aligns near the operator.
  1. Verify that rail height is correct in association with operator drive wheels. Disengaged drive wheels should be the same distance from the top and bottom drive rail surfaces.
  2. **Install #25267 U-bolt and #25266 Spacer** requiring (2) 5/16" holes to be drilled in the mounting face of the drive rail. Snug the ¼" nuts provided.
8. **Repeat #6** until end of drive rail is reached.
  1. **#24489 Splice Pins (10) are provided** to connect the ends of 2 pieces of drive rail if required
9. At the 2 x 2 upright used to terminate the drive rail, **Mount #25265 Drive Rail Mtg. Angle** to the leading face of the upright(see illustration) in order to place the top drive rail surface at the correct height. Drill ¼" holes and fasten with ¼" drive rivets provided.
  1. Verify that rail height is correct in association with operator drive wheels. Disengaged drive wheels should be the same distance from the drive rail surfaces.
  2. Position and **clamp drive rail** to #25265 Drive Rail Mtg. Angle at the appropriate mounting height on gate.
10. **Move gate toward the OPEN position to re-verify** the correct drive rail height at each 2 x 2 upright. Re-tighten the ¼" nuts on U-bolts as you go.
11. **Drill and Fasten** the ends of the drive rail with the HHCS and nuts provided.
12. **Engage drive wheels, SET LIMITS** and test operator.