Programming and Operations Manual

SwingRiser™

14, 14 Twin, 19, 19 Twin, 30, 30 Twin

Hydraulic barrier gate operator with Smart Touch Controller



HySecurity®

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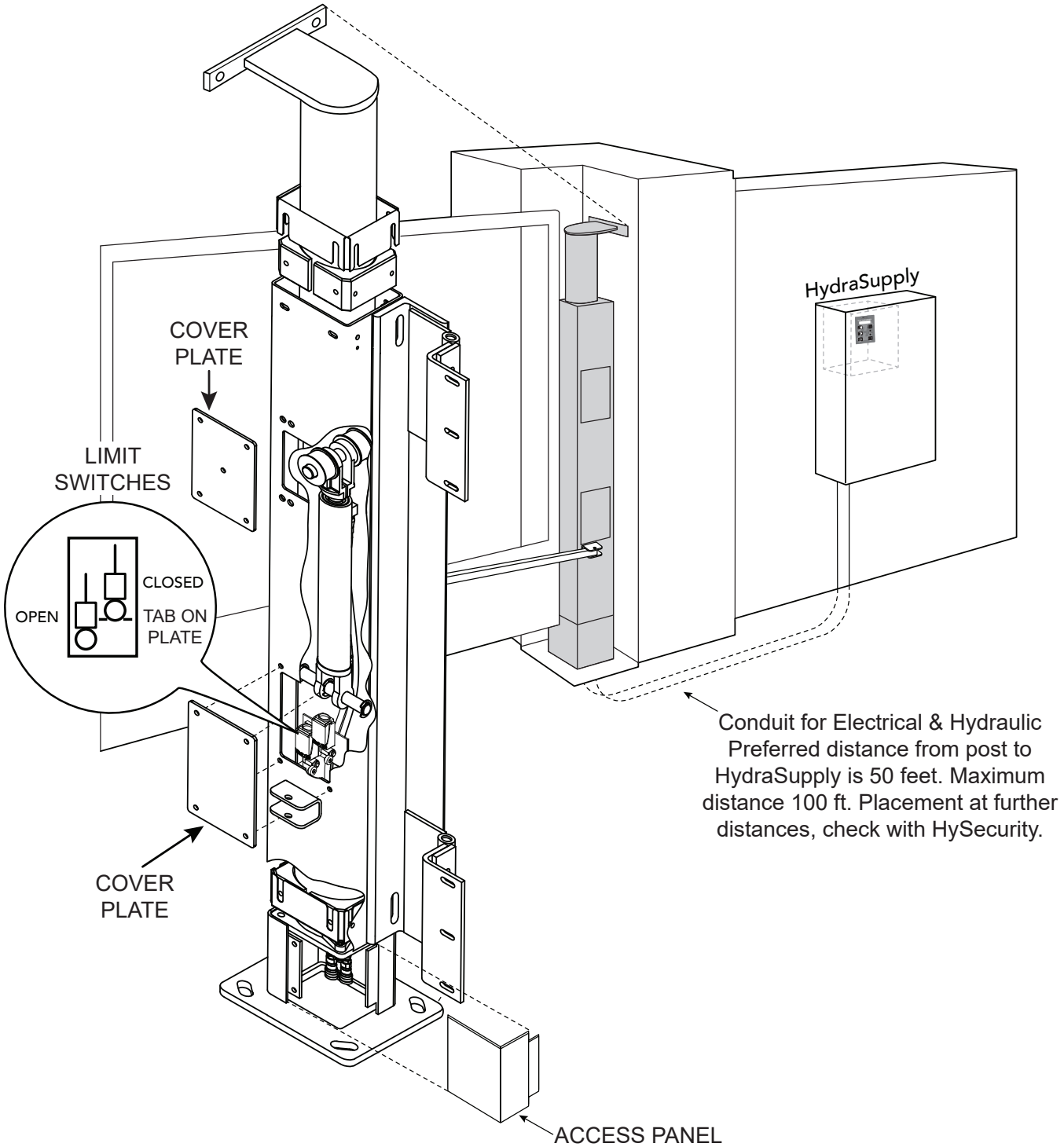
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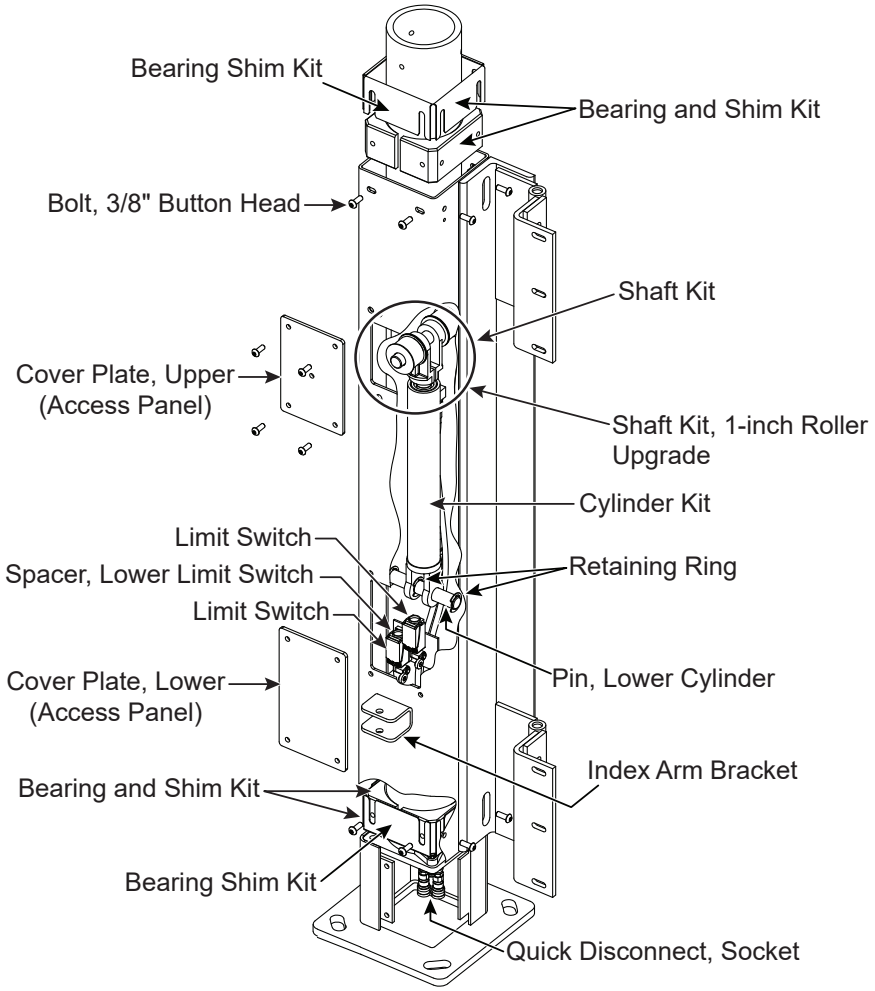
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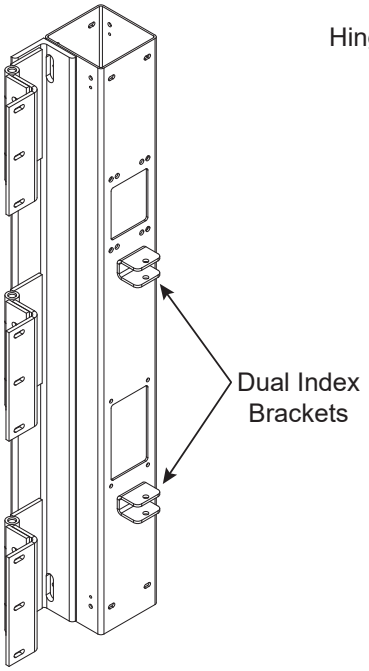
Visit https://hysecurity.com/technical-support/ for installation manuals, replacement part instructions, part diagrams and more.

SWINGRISER POST & HYDRASUPPLY COMPONENTS





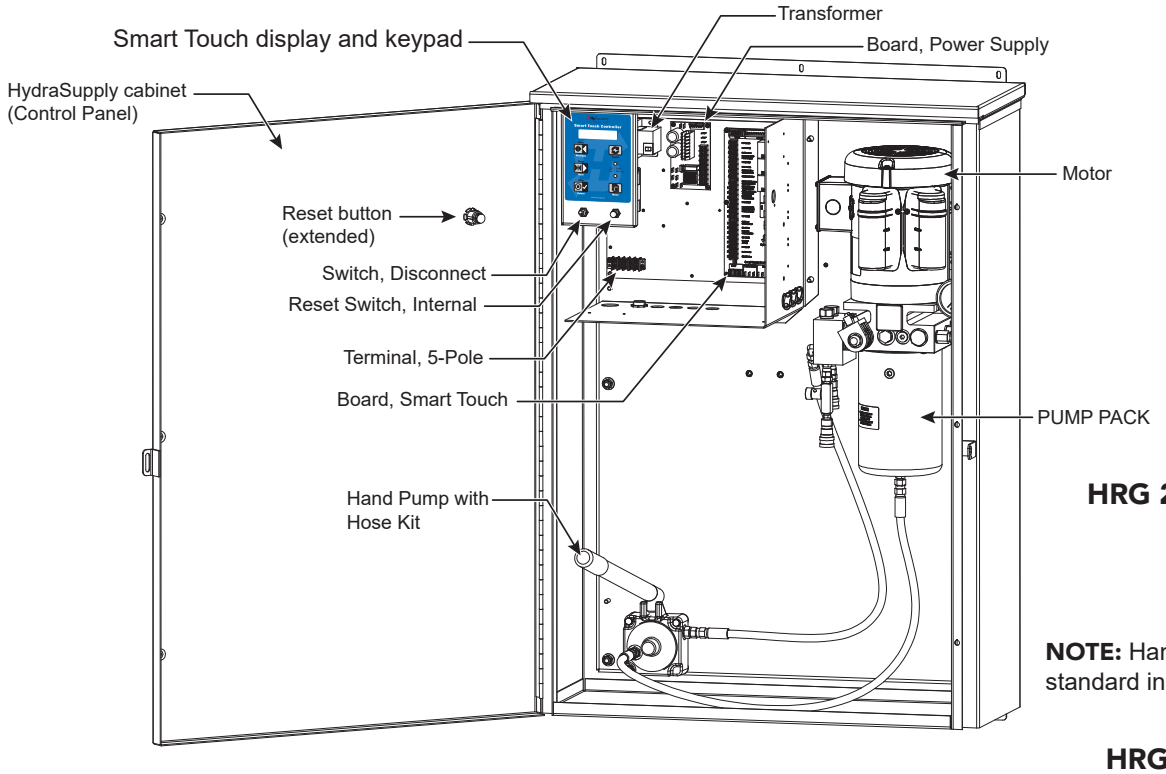
Triple Hinge Post



Quad Hinge Post



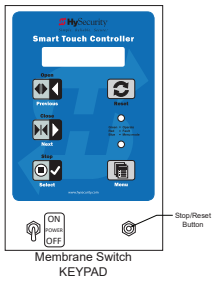
HYDRASUPPLY INTERNAL COMPONENTS



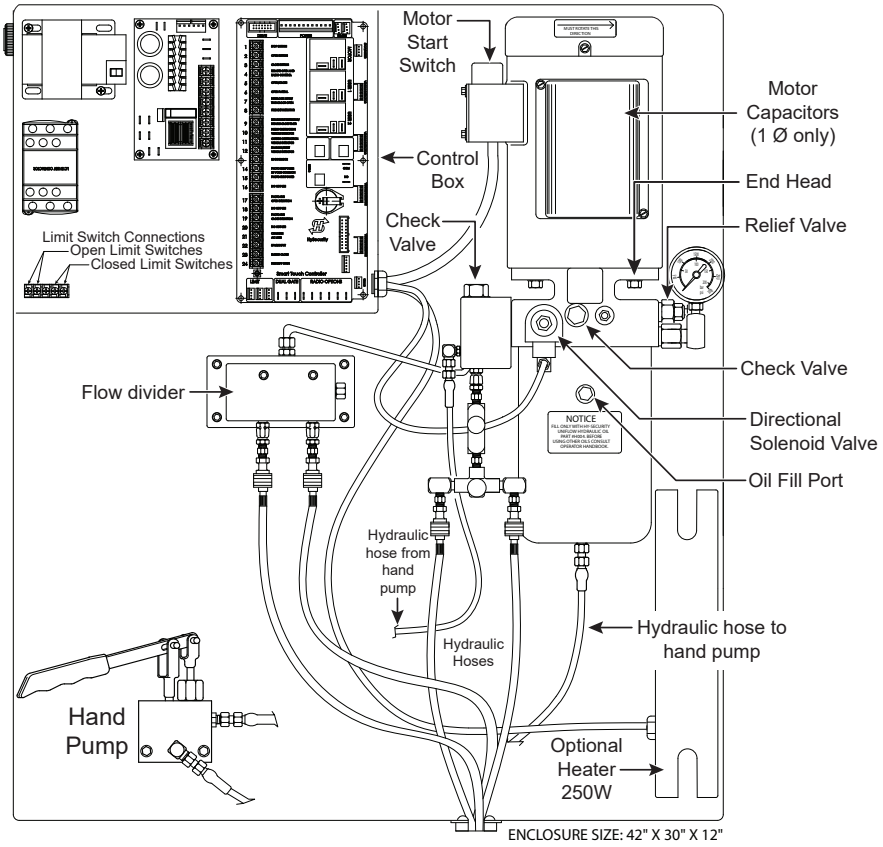
HRG 220

NOTE: Hand pumps are standard in all HRG models

HRG 222



Membrane Switch
KEYPAD

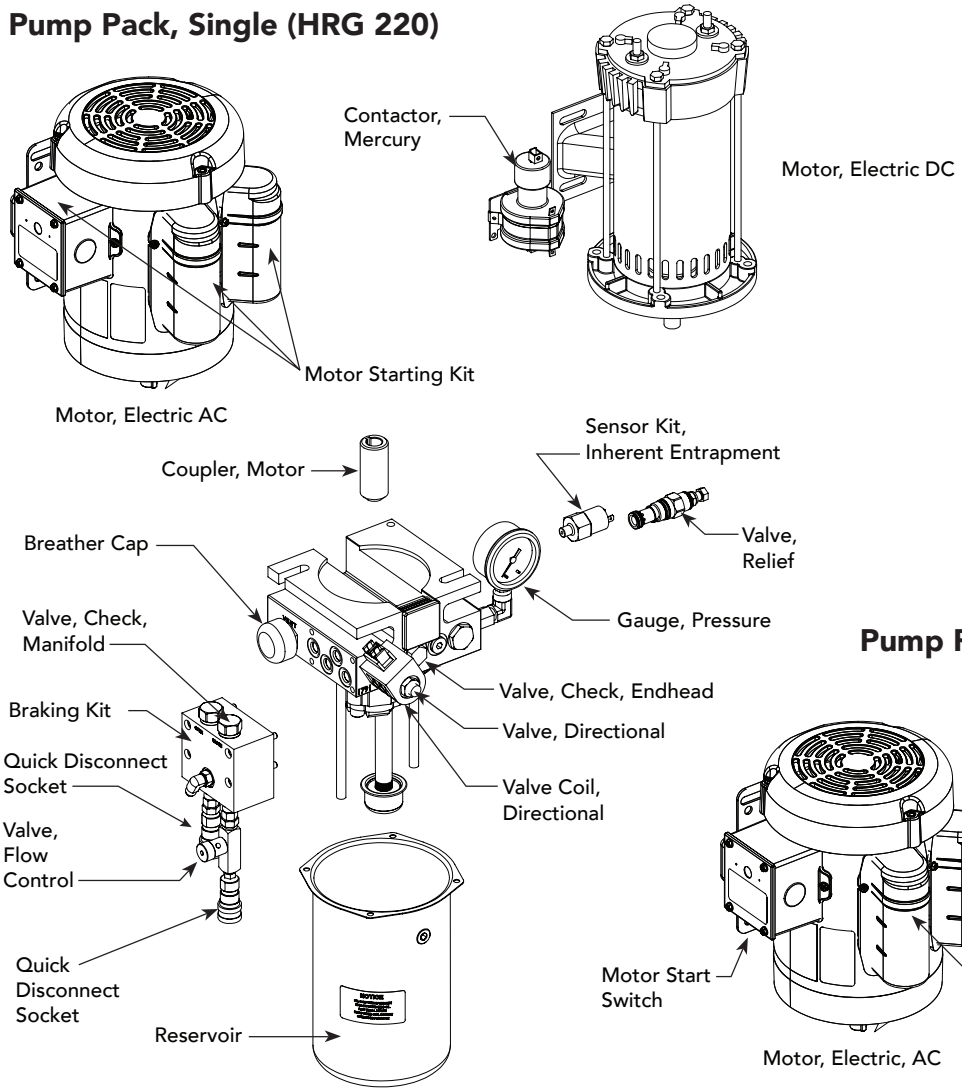


NOTE: Be certain to match the color coding on the Quick Disconnects both at the Flow Control Valves and at the base of the operator post. This is to ensure a correct connection.

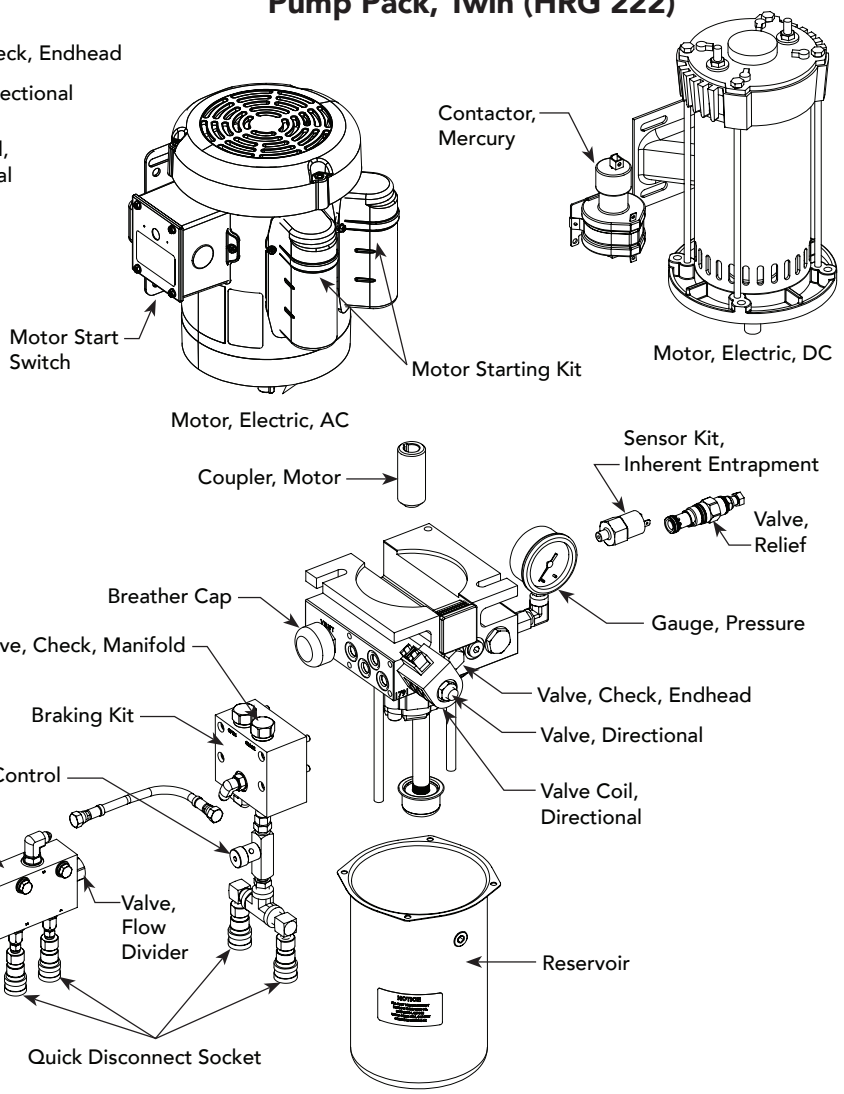
NOTE: Hand pump shown for Hoses historical purposes only. It has been replaced with a hand pump similar to the illustration shown in the HRG220.

SWINGRISER PUMP PACK COMPONENTS

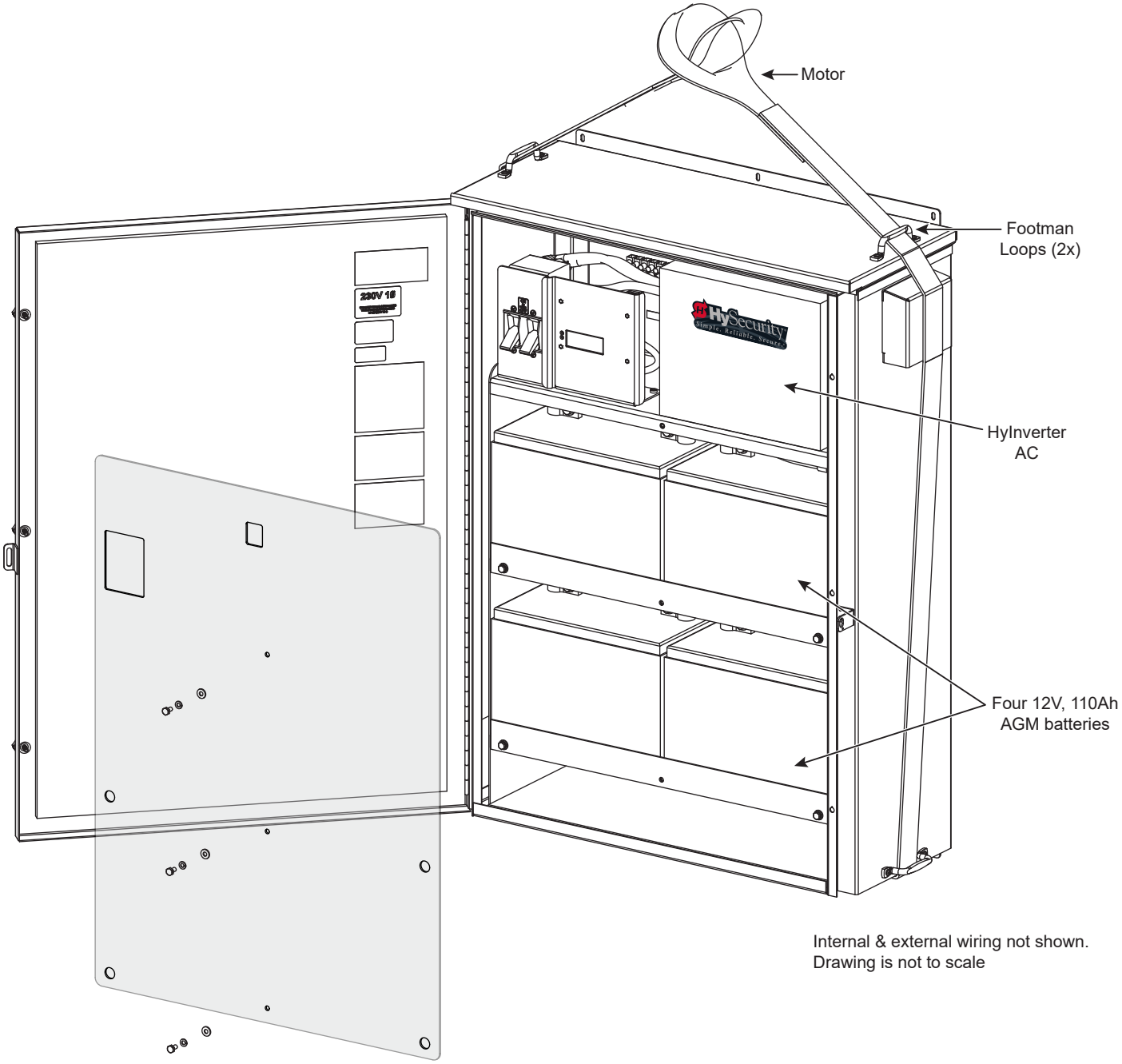
Pump Pack, Single (HRG 220)

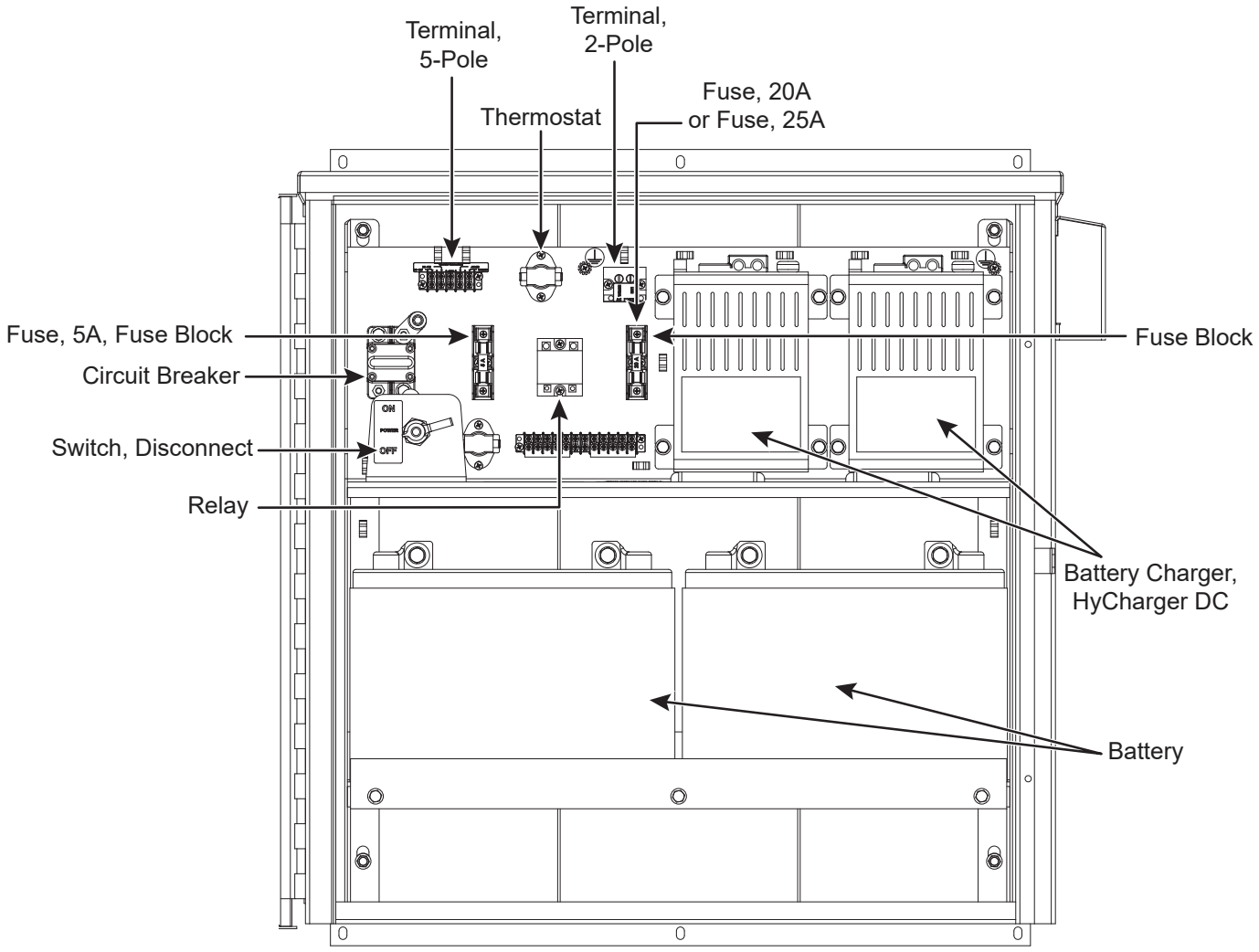


Pump Pack, Twin (HRG 222)

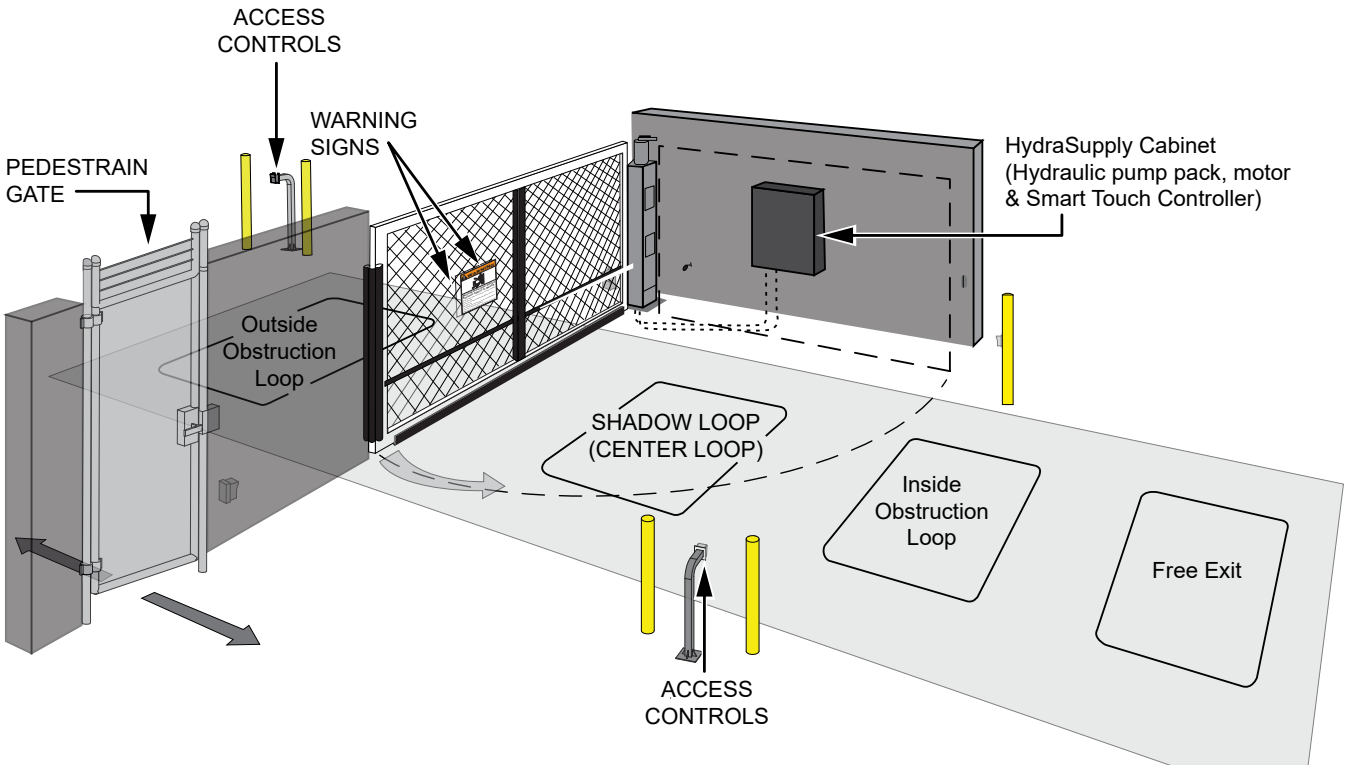


AC POWER SUPPLY WITH HYINVERTER AC




Terminal, 5-Pole
Terminal, 2-Pole
Thermostat
Fuse, 20A or Fuse, 25A
Fuse, 5A, Fuse Block
Circuit Breaker
Switch, Disconnect
Relay
Fuse Block
Battery Charger, HyCharger DC
Battery

GATE OPENS PERPENDICULAR TO A WALL



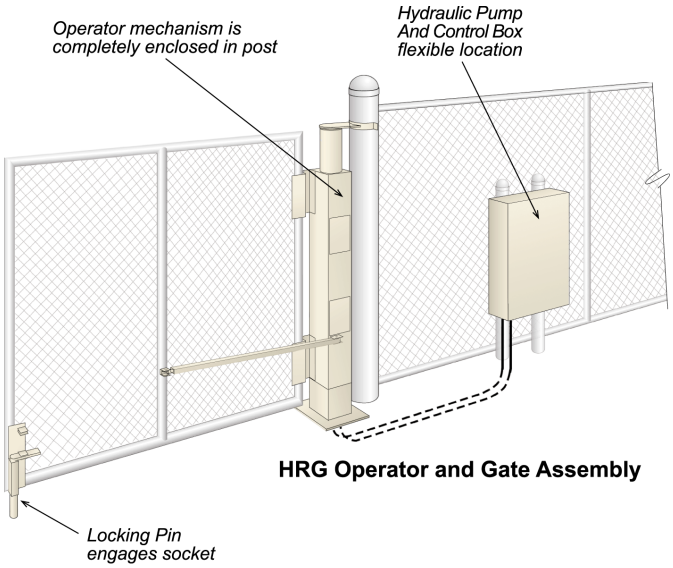
Determine site plan based on your site's specific layout. Considerations include:

- The swing gate operator automates the gate. SwingRiser may be ordered with left or right handing.
- The HydraSupply control box (Type 3R) houses the Smart Touch Controller (STC) and hydraulics.
- An access control opens the gate.
- Shadow loop prevents the gate from closing on a vehicle. The shadow loop is active only when the gate is fully opened or fully closed.
- Obstruction loops (reversing loops) located on the public and secure sides of the gate.
- Optional Free Exit loop.

For more information on loop layout, refer to "Vehicle Detector Installation and Loop Layouts" on page 102.

GATE OPENS TO EMPTY SPACE

Loop layouts and entrapment protection elements required in both designs. Always comply with UL 325 Standard of Safety.



HRG Operator and Gate Assembly

SAFETY MESSAGES

The safety messages below inform you about potential hazards that can result in injury. Safety messages specifically address level of exposure to operator and are preceded by one of four words: **DANGER, WARNING, CAUTION** or **NOTICE.**

DANGER

Indicates a hazardous situation which, if not avoided, **WILL** result in **DEATH** or **SERIOUS INJURY.**

WARNING

Indicates a hazardous situation which, if not avoided, **COULD** result in **DEATH** or **SERIOUS INJURY.**

CAUTION

Indicates a hazardous situation which, if not avoided, **COULD** result in **MINOR** or **MODERATE INJURY.**

NOTICE

Addresses practices not related to personal injury. Indicates damage to equipment is probable if the hazardous situation is not avoided.

COMMON INDUSTRIAL SYMBOLS

These international safety symbols may appear on product or in its literature to alert of potential personal injury hazards. Obey all safety messages that follow these symbols to avoid possible injury or death.

Symbol	Safety Hazard
	Attention - Take Notice
	Danger - Keep Away
	Entrapment Zone
	Possible Pinch Point

IMPORTANT SAFETY INSTRUCTIONS



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 HySecurity® product manuals.



It is important that only qualified installers handle installation of HySecurity Gate vehicular gate operators. A “qualified” installer has one of the following:

1. A minimum of three years experience installing similar equipment.
2. Proof of attending a HySecurity Technical Training seminar within the past three years.
3. 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 gate operators and automated gates. All aspects of gate installation must comply with the appropriate safety standard. For the most up-to-date ASTM F2200 Gate and Fence Standards, refer to www.astm.org. For UL 325 Safety Standard, refer to www.ul.com. Consult local government agencies for up-to-date rules and regulations as certain municipalities have established licensing, codes or regulations that regulate automated gate system design and installation.

GENERAL SAFETY INFORMATION

A gate operator is only a component in a gate system. The other parts of the gate system can include the gate, the external safety sensors, access controls, and vehicle detectors. To have a gate system that provides for safety, security, and reliable operation it is essential these components operate together as a system. It is the responsibility of the system designer and/or installer to ensure any safety or operational issues have been addressed.

⚠ WARNING

To reduce the risk of injury or death:

1. READ AND FOLLOW ALL INSTRUCTIONS.
2. Never let children operate or play with gate controls. Keep the remote control away from children.
3. Always keep people and objects away from the gate. NO ONE SHOULD CROSS THE PATH OF THE MOVING GATE.
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. 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 user's manual. Have a qualified service person make repairs to gate hardware.
7. The entrance is for vehicles only. Pedestrians must use separate entrance.
8. SAVE THESE INSTRUCTIONS.

IDENTIFYING GATE OPERATOR CATEGORY AND UL 325 USAGE CLASS

The UL 325 standard covers gate operators. Within this safety standard several Usage Classes are described that define different types of installations where gate operators can be applied. Some operators are restricted in their usage application. Appropriate Usage Classes are shown in the Specifications.

Class I



Class I: Intended for use in a location of one to four single family dwellings or a parking area associated with one to four single family dwellings.

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 servicing general public.

Class III



Class III: Intended for use in an industrial location or building such as factories or loading docks or other locations not accessible by the general public.

Class IV



Class IV: Intended for use in guarded industrial locations or buildings such as an airport security area or other restricted access location, not servicing general public, in which access is monitored by security personnel or via closed circuitry.

VEHICULAR TRAFFIC ONLY

WARNING

This automatic gate operator is not designed nor is it intended for pedestrian traffic. Vehicular gate operators must by their nature be powerful to function reliably. This power can cause injury or death. Accordingly, direct all pedestrian traffic to a separate walk-through gate.

Install this gate operator only when:

- The operator is appropriate for the construction of the gate and the usage Class of the gate.
- All openings of a horizontal slide gate are guarded or screened from the bottom of the gate to a minimum of 1.83 m (6 ft) above the ground to prevent a 57.2 mm (2-1/4 in) diameter sphere from passing through the openings anywhere in the gate, and in that portion of the adjacent fence that the gate covers in the open position.
- All exposed pinch points are eliminated or guarded.
- Guarding is supplied for exposed rollers.

The operator is intended for installation only on gates used for vehicles. Pedestrians must be supplied with a separate access opening. The pedestrian access opening shall be designed to promote pedestrian usage. Locate the gate such that persons will not come in contact with the vehicular gate during the entire path of travel of the vehicular gate.

The gate must be installed in a location so that enough clearance is supplied between the gate and adjacent structures when opening and closing to reduce the risk of entrapment. Swinging gates shall not open into public access areas.

The gate must be properly installed and work freely in both directions prior to the installation of the gate operator. Do not over-tighten the operator clutch or pressure relief valve to compensate for an improperly installed, improperly functioning, or damaged gate.

Permanently mounted controls intended for user activation must be located at least 1.83 m (6 ft) away from any moving part of the gate and where the user is prevented from reaching over, under, around or through the gate to operate the controls.

- Exception: Emergency access controls only accessible by authorized personnel (e.g. fire, police, EMS) may be placed at any location in the line-of-sight of the gate.

The Stop and/or Reset button must be located in the line-of-sight of the gate. Activation of the reset control shall not cause the operator to start.

A minimum of two (2) WARNING SIGNS shall be installed, in the area of the gate. Each placard is to be visible by persons located on the side of the gate on which the placard is installed.

For gate operators utilizing a non-contact sensor (Photo Eye):

- See instructions on the placement of non-contact sensors for each type of application.
- Care shall be exercised to reduce the risk of nuisance tripping, such as when a vehicle trips the sensor while the gate is still moving.
- One or more non-contact sensors shall be located where the risk of entrapment or obstruction exists, such as the perimeter reachable by a moving gate or barrier.

For a gate operator utilizing a contact sensor (Edge):

- One or more contact sensors shall be located where the risk of entrapment or obstruction exists, such as at the leading edge, trailing edge, and postmounted both inside and outside of a vehicular horizontal slide gate.
- A hardwired contact sensor shall be located and its wiring arranged so that the communication between the sensor and the gate operator is not subjected to mechanical damage.
- A wireless device such as one that transmits radio frequency (RF) signals to the gate operator for entrapment protection functions shall be located where the transmission of the signals are not obstructed or impeded by building structures, natural landscaping or similar obstruction. A wireless device shall function under the intended end-use conditions.
- One or more contact sensors shall be located on the inside and outside leading edge of a swing gate. Additionally, if the bottom edge of a swing gate is greater than 152 mm (6 in) but less than 406 mm (16 in) above the ground at any point in its arc of travel, one or more contact sensors shall be located on the bottom edge.

USE OF VEHICLE DETECTORS

Use of vehicle detectors (loop detectors) is strongly encouraged to prevent damage to vehicles caused by gates closing on them. This is not considered to be a safety item as vehicle detectors cannot provide protection to pedestrians. In some situations, photoelectric devices may be used as vehicle detectors, but should be wired accordingly.

GATE CONSTRUCTION AND SAFETY

Gate construction plays a very important role in ensuring the safety of any automated gate system. The standard for gate construction is ASTM F2200. Below are key areas to address in gate design for safety. For complete information consult the standard. Copies of the standard are available at:

https://www.astm.org/Standards/F2200.htm.

Another source of information is available from DASMA, the Door and Access System Manufacturer's Association. The Association publishes Technical Data Sheets, one of which concerns ASTM F2200. For more information, see:

http://www.dasma.com/PDF/Publications/TechDataSheets/OperatorElectronics/TDS370.pdf.

General Requirements for gate construction:

- Gates shall be constructed in accordance with the provisions given for the appropriate gate type listed. Refer to ASTM F2200 for additional gate types.
- Gates shall be designed, constructed and installed to not fall over more than 45 degrees from the vertical plane, when a gate is detached from the supporting hardware.
- Gates shall have smooth bottom edges, with vertical bottom edged protrusions not exceeding 0.50 in (12.7 mm) other than the Exceptions listed ASTM F2200.
- The minimum height for barbed wire shall not be less than 6 ft (1.83 m) above grade. The minimum height for barbed tape shall not be less than 8 ft (2.44 m) above grade.
- An existing gate latch shall be disabled when a manually operated gate is retrofitted with a powered gate operator.
- A gate latch shall not be installed on an automatically operated gate.
- Protrusions shall not be permitted on any gate. Consult ASTM F2200 for exceptions.
- Gates shall be designed, constructed and installed such that their movement shall not be initiated by gravity when an automatic operator is disconnected.
- For pedestrian access in the vicinity of an automated vehicular gate, a separate pedestrian gate shall be provided. The pedestrian gate shall be installed in a location such that a pedestrian shall not come in contact with a moving vehicular access gate. A pedestrian gate shall not be incorporated into an automated vehicular gate panel.
- Any non-automated gate that is to be automated shall be upgraded to conform to the provisions of this specification.
- This specification shall not apply to gates generally used for pedestrian access and to vehicular gates not to be automated.
- Any existing automated gate, when the operator requires replacement, shall be upgraded to conform to the provisions of this specification in effect at that time.

The following provisions shall apply to Class I, Class II, Class III, and Class IV vehicular horizontal swing gates:

Gates shall be designed, constructed and installed so as not to create an entrapment area between the gate and the supporting structure or other fixed object when the gate moves toward the fully open position, subject to the following provisions.

The width of an object (such as a wall, pillar or column) covered by a swing gate when in the open position shall not exceed 4 inches (102 mm), measured from the centerline of the pivot point of the gate. Exception: For a gate that is not in compliance with this provision, the defined area shall be subject to the entrapment protection provisions of UL 325.

Except for the zone specified above the distance between a fixed object such as a wall, pillar or column, and a swing gate when in the open position shall not be less than 16 inches (406 mm). Exception: For a gate that is not in compliance with this provision, the defined area shall be subject to the entrapment protection provisions of UL 325.

SECONDARY ENTRAPMENT PROTECTION SENSORS

Most HySecurity gate operators are equipped with a Type A, Inherent Entrapment Sensor (IES). UL 325 Safety Standard compliance requires installation of external entrapment protection sensors, the number of which, depends on entrapment hazards that exist at each particular installation.

To comply with UL 325, the following external sensors may be used:

- Contact sensors, such as edge sensors
- Non-contact sensors, such as photo eyes

Site designer or installer can choose either photo eyes, edge sensors, or a combination of these devices. Whatever devices are used, protection in both opening and closing directions of gate travel must be provided.

UL 325 Safety Standard for automatic sliding gates specifically requires that edge sensors, photo eyes, or a combination of both devices be installed to protect against pedestrian entrapment in BOTH directions of gate travel and wherever entrapment hazards exist.

PHOTO EYES: One or more non-contact sensor (photo eyes) shall be located where entrapment risk or obstruction exists, such as perimeter reachable by a moving gate.

Care shall be exercised to reduce the risk of nuisance tripping, such as when a vehicle trips the sensor while the gate is moving.

EDGE SENSORS: One or more contact sensors (edge sensors) shall be located at leading edge, trailing edge, and post-mounted, both inside and outside of a sliding gate.

One or more contact sensors shall be located on the inside and outside leading edge of a swing gate. Additionally, if the bottom edge of a swing gate is greater than 6"(152mm) but less than 16"(406mm) above the ground at any point in its arc of travel, one or more contact sensors shall be located on the bottom edge.

SENSOR SECURITY: A hard-wired contact sensor shall be located and its wiring arranged so that communication between sensor and gate is not subjected to mechanical damage.

⚠ CAUTION

A contact or non-contact sensor is also required to protect against possible entrapment if gate opens to a position less than 16 inches from any object, such as a post or wall.

SENSOR FUNCTION and COMMUNICATION: A sensor that transmits its signal to gate operator must be located so its signal is not impeded by building structures or other obstructions. All sensors must be installed so that they function as intended for end-use conditions.

UL 325 LISTING: Edge sensors and photo eyes must be tested and labeled as "Recognized Components" or otherwise certified to UL 325 requirements in order to be deemed acceptable for use in a gate operator. Study Important Safety Instructions and consider your specific installation to determine where greatest entrapment risks exist. Locate edge sensors and/or photo sensors accordingly. Be certain that a sufficient number of sensors are used so that pedestrians are protected from entrapment in both directions of gate travel and all hazard areas are fully protected. Most HySecurity gate operators require external entrapment sensors that utilize Normally Closed (NC) contact means of monitoring. HySecurity gate operators utilizing the SmartCNX Controller require external entrapment sensors that have a 10k Ohm or 4-wire pulsed monitoring scheme. Refer to UL website at www.ul.com for most up-to-date list of gate operator safety standards (UL 325). Refer to www.astm.org for a complete list of ASTM F2200 Gate and Fence Standards.

UL 325

Use of Approved External Entrapment Protection Sensors is REQUIRED

Gate operator will not automatically cycle the gate unless an indication that the appropriate number of external entrapment protection sensors are connected and operational.
The normally closed (NC) entrapment protection sensors wired to the Controller's SENSOR inputs are monitored using HySecurity software. Prompts appear on the display requesting specific configurations based on the gate operator type.

Effective August 1st, 2018, the UL 325 Standard has changed:

- The operator shall monitor for the presence of every device at least once during each open and close cycle (32.1.8)
- It shall not be possible to make simple modifications in the field by adding, suppressing or changing, either on the operator or external entrapment protection device(s), to bypass, interfere with, or otherwise defeat the monitoring function. (32.1.10)
- Entrapment zones are now defined for each gate type (4.23, 4.24, 4.29, 4.34)

SLIDE GATES: To enable fully automatic operation, all SLIDE gate operators will require a minimum of TWO monitored external entrapment protection sensors (one for each direction) to protect entrapment zones in both the open and close direction of travel.

Preferred solution for slide gates: A photo eye for the close direction and a hard-wired edge sensor for the open direction that is mounted to the face of the leading post of the fence behind the gate. (Reach through injuries are the most common hazard associated with automatic sliding gates)

SWING GATES: To enable fully automatic operation, all SWING gate operators will require a minimum of ONE monitored external entrapment protection sensor to protect entrapment zones in either the open or close direction of travel. However, an additional monitored sensor is required if there is a risk of entrapment in both directions of gate travel.

Preferred solution for swing gates: A photo eye for the close direction and/or a hard-wired wraparound edge sensor on the leading edge of the gate, which protects for both directions of gate travel.

For more information and latest updates, visit www.hysecurity.com/gatesafety

The following sensors have been tested with HySecurity gate operators by an independent laboratory and certified to comply with UL 325 7th Edition. Select sensors from this list for UL compliant gate automation solutions. Contact the sensor manufacturer for specific recommendations for use.

CAUTION **All external entrapment protection sensors must have NC sensor outputs and be wired to the SENSOR COM terminal for monitoring and powering purposes. Depending on software version, the sensor becomes powered when the gate operator's motor runs or is always powered when the operator is connected to AC power.**

HySecurity Recommended Sensors				
	Mfg. Part #	**Mfg.**	**Details**	**Hysecurity Part #**
Photo Eyes (Retroreflective)	E3K-R10K4-NR	Omron	40 ft max range limit	MX000999
	NIR-50-325	EMX	45 ft max range limit	
	IRB-RET	EMX	53 ft max range limit	
	E-931-S50RRGQ	Seco-Larm	46 ft max range limit	
Photo Eyes (Thru-Beam)	IRB-MON*	EMX	65 ft max range limit	MX3990
	E-960-D90GQ	Seco-Larm	90 ft max range limit	
Edge Sensors	Sentir Series**	ASO Safety	Channel mount, high profile Channel mount, low profile Round, wraparound Square, wraparound	AS1502-0440-05 AS1502-0430-05 AS1501-0760 AS1501-0790
	CPT210-2U-#-T2	Miller Edge	10k resistor termination (replace # with length requirement in feet)	
Edge Sensor, Converters (10K to NC Contact)	Hy2NC	HySecurity	2-channel edge converter	MX4018
Edge, Wireless Kits	iGAZE RE Kit	Transmitter Solutions	50 ft line of sight max range limit	
	WEL-200 (kit with receiver and transmitter)	EMX	200 ft line of sight max range limit	
Multi-Input Module	The Solution – MIM-62	Miller Edge	6 inputs to 2 outputs	

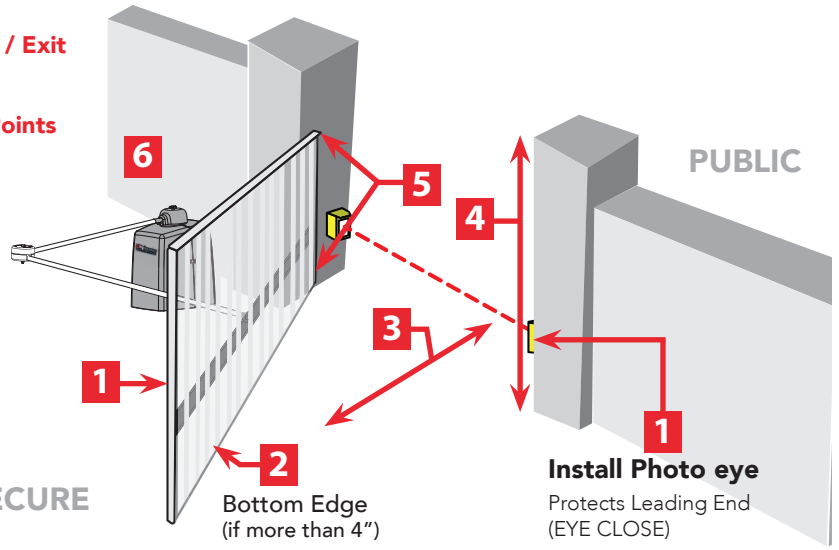
*IRB-MON photo eyes are pre-bundled with HySecurity SwingSmart DC, SlideSmart DC and SlideDriver operators.
**Sentir Series ASO edge sensors are pre-bundled with HySecurity SlideSmart DC, SlideSmart CNX and SlideDriver operators.

Installers must assess each specific site and install sensors that protect all potential entrapment zones.

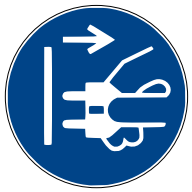
For more information visit Gate Safety at www.hysecurity.com/gatesafety or see latest operator manual at www.hysecurity.com/contact-us/technical-support/installation-manuals

Swing Gate Common Entrapment Zones

1. Leading Edge
2. Bottom Edge Entry / Exit
3. Posts
4. Post Pivot / Pinch Points
5. Arm Movement



ELECTRICAL SAFETY



- Turn gate operator and all circuit breakers OFF before performing maintenance on the gate operator or making contact with output receptacles.
- Never insert any objects into output receptacles during operation. The possibility exists of electrical shock, electrocution, or death.



- Never let power wires lay in water.
- Never use damaged or worn wire when connecting equipment. Inspect for cuts in the insulation.
- Never grab or touch a live power cord or cable with wet hands. The possibility exists of electrical shock, electrocution or death.



- Always make certain that proper power has been selected for the job. See Cable Selection Chart in this manual.

GROUNDING SAFETY



- Always make sure that electrical circuits are properly grounded to a suitable earth ground (ground rod) per the National Electrical Code (NEC) and local codes. Severe injury or death by electrocution can result from operating an ungrounded operator.
- Never use gas piping as an electrical ground.

BATTERY SAFETY

HySecurity operators use sealed Absorbed Glass Mat (AGM) batteries and HySecurity highly recommends replacing used batteries with new AGM-type batteries.

⚠ CAUTION

Batteries used with HySecurity gate operator contain materials considered hazardous to environment. Proper battery disposal is required by federal law. Refer to *Hazardous Waste Regulations* federal guidelines.

To reduce risk of fire or injury to persons:

- Observe polarity between batteries and charging circuit.
- Never mix battery sizes, types, or brands. Charging circuit on HySecurity DC operators is designed for AGM-type batteries, not flooded lead acid-type batteries.



- Exercise care in handling batteries. Be aware metal found in rings, bracelets, and keys can conduct electricity, short batteries, and cause potential injury.



- Do not open or mutilate batteries. Battery cells contain corrosive materials which may cause burns and other injuries. Material within batteries is toxic.



- Always dispose of batteries properly. Do not place batteries in fire. Battery cells may explode. Follow federal guidelines for proper disposal of hazardous waste.



- Always keep battery cables in good working condition. Repair or replace all worn cables.
- Replace batteries according to instructions found in *DC Battery Replacement*.

- Do not charge frozen battery. Battery can explode. If frozen, warm the battery to at least 61°F (16°C).

ENVIRONMENTAL SAFETY/ HAZARDOUS MATERIALS AND PROPER DISPOSAL



Decommissioning is a controlled process used to safely retire a piece of equipment that is no longer serviceable. If the equipment poses an unacceptable and unrepairable safety risk due to wear or damage or is no longer cost effective to maintain (beyond life-cycle reliability) and is to be decommissioned (demolition and dismantlement), be sure to follow rules below.

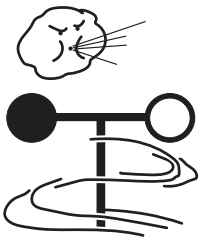
- Do not pour waste or oil directly onto the ground, down a drain or into any water source.
- Contact your country's Department of Public Works or recycling agency in your area and arrange for proper disposal of any electrical components, waste or oil associated with this equipment.
- When the life cycle of this equipment is over, remove battery and bring to appropriate facility for lead reclamation. Use safety precautions when handling batteries that contain sulfuric acid.
- When the life cycle of this equipment is over, it is recommended that the frame and all other metal and plastic parts be sent to a recycling center.

Metal and plastic recycling involves the collection of metal and plastic from discarded products and its transformation into raw materials to use in manufacturing a new product.

Recyclers and manufacturers alike promote the process of recycling metal and plastic. Using a metal and plastic recycling center promotes energy cost savings.

WIND LOAD FACTORS & SITE PREP

Wind load is always a factor when considering the appropriate gate for a particular site. Solid gate panels produce a larger wind load than gates with slats or open decorative features. If you are installing a gate operator in a high wind area, gate design will affect the load on the gate operator because wind load acts the same as an obstruction. Good gate panel design presents a low surface area to reduce the wind load.



If gate is heavy and near weight capacity of what the gate operator can handle (see specifications), make sure it has an open design that allows wind to flow through it. A solid or semi-solid gate design under certain wind load conditions may cause damage to gate operator and is not covered by the HySecurity Limited Warranty.

Several factors play into calculations of wind load on a gate panel. To find out maximum wind speed in areas around the United States, search for US government wind speed maps on the internet. If you don't know how to calculate for wind load, ask a mechanical engineer or site architect for assistance prior to installing gate operator and gate panels.

When the IES trips, it sends a signal to gate operator to stop and reverse direction. This feature may be falsely triggered in excessively windy conditions because wind itself, acting over surface area of gate panel, can provide necessary force to trigger IES.

⚠ CAUTION

Do not adjust IES sensitivity to accommodate for inappropriately designed gate panels. Loss of IES sensitivity increases mechanical wear on gate hardware and gate operator. It may also pose a safety hazard. Compensating for wind loads by adjusting IES may set IES sensitivity to a level which, when encountering an obstruction, ignores obstruction and fails to reverse direction. For more information, refer to Adjusting the IES Sensitivity.

MAINTENANCE OF GATE SYSTEMS

To keep your automated gate system performing both safely and reliably it is important to ensure that the components of that system are functioning properly.

At least monthly:

- Disconnect the gate operator and manually move the gate through its range of travel. Note any squeaks from rollers or hinges or areas of binding. The gate should travel smoothly and quietly throughout its range. If it does not, contact a gate professional to correct the problem.
- Reconnect the gate operator and perform the following tests:
  - With the gate opening, block any photo eyes and/or depress any safety edges used to protect the open direction. The gate should stop and/or reverse.
  - With the gate closing, block any photo eyes and/or depress any safety edges used to protect the close direction. The gate should stop and/or reverse.
  - Using a suitable obstruction in the path of the gate (a solid, immovable object), run the gate in the open direction until it contacts the obstruction. The gate should stop and reverse.
  - Using a suitable obstruction in the path of the gate (a solid, immovable object), run the gate in the close direction until it contacts the obstruction. The gate should stop and reverse.

BREATHER CAP INSTALLATION AND GROUNDING

Gate operator has a vent plug that keeps hydraulic fluid from spilling during shipment. Vent plug must be replaced by breather cap before operating automatic gate operator. See Figure 1.

⚠ DANGER

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

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

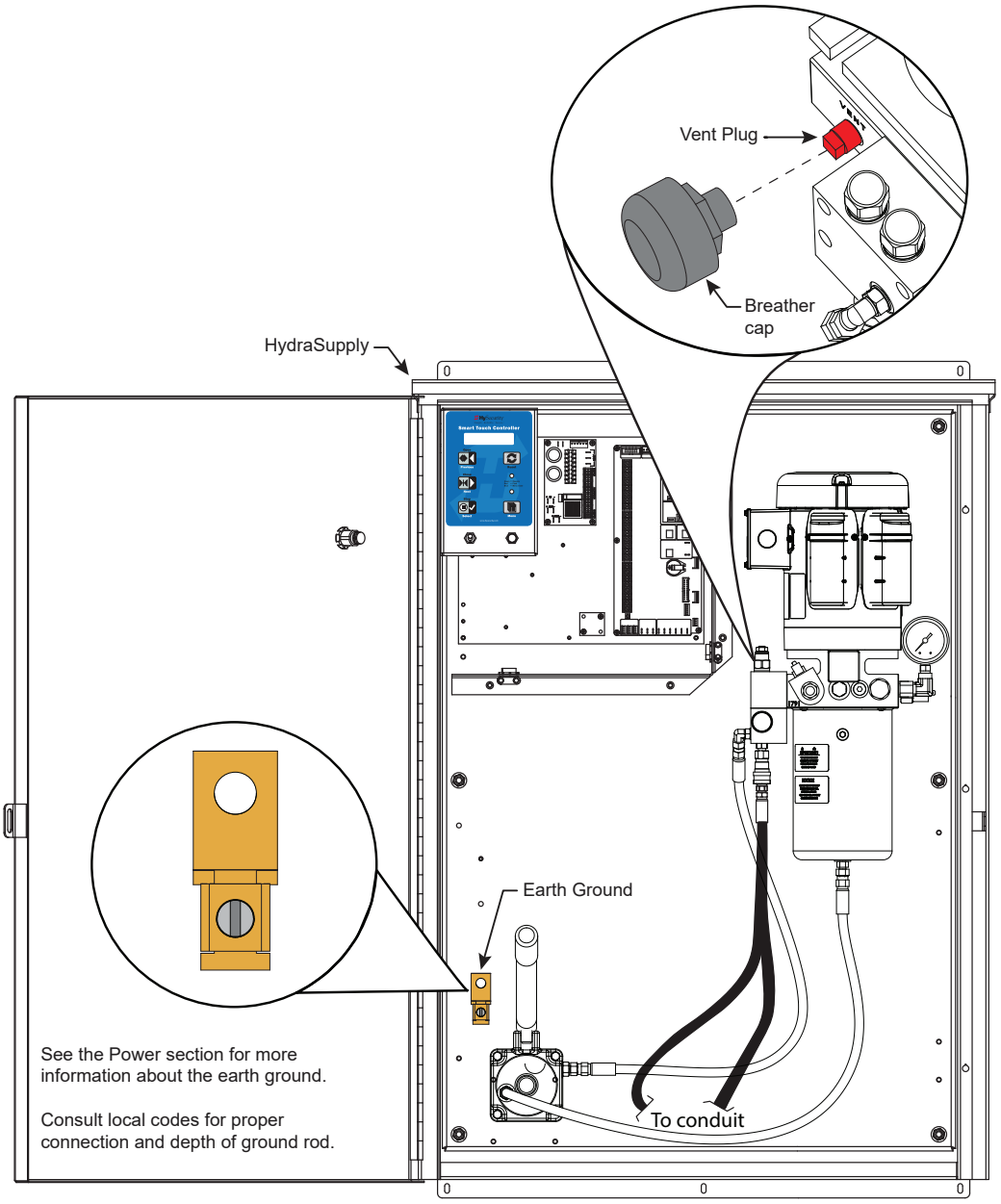


Figure 1. Breather Cap Installation and Grounding

EMERGENCY STOP BUTTON

Make sure all users of the gate know where the emergency stop button is located (see Figure 2). It complies with UL 325 Standard of Safety 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.

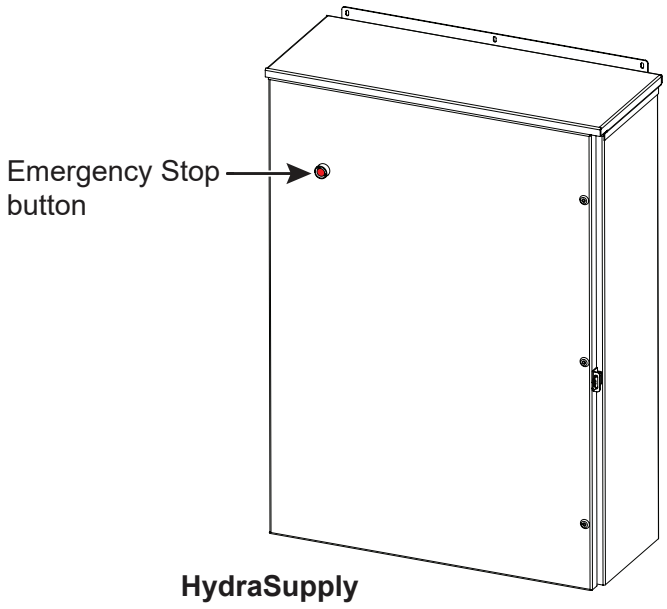


Figure 2. Emergency Stop Button

FLOW CONTROL VALVE – CLOSE

DIRECTION

The valve restricts the hydraulic fluid flow back to the pump pack and affects the closing speed of the gate.

NOTICE

Use the control valve to fine-tune the gate's closing speed. To affect closing speed adjustments on a broader scale, change the pump pack's size and the motor's horsepower.

⚠ CAUTION

Before adjusting the flow control valve, the SwingRiser posts must be installed, plumb, and wired to the HydraSupply. The gate must be secured on the posts with its index arm attached, adjusted, and tightened.

Two different methods exist for flow control adjustments. Older SwingRiser operators have color bands, newer operators do not. Instructions for handling both are found on page 150.

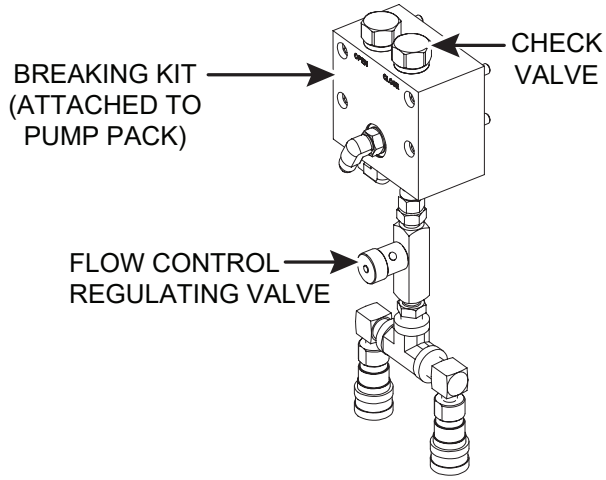


Figure 3. Flow Control Valve - Close Direction

MANUAL GATE RELEASE OPERATION

Two options exist for manual release of the gate depending on your site situation and needs:

- Option 1: Gate movement using its auxiliary hinges
- Option 2: Hydraulic movement of the cylinder to open or close the gate

Option 1: Release the Gate

1. Lift locking pin to free it from its receptacle.
2. Remove bolt or padlock from the index arm. The gate can now swing freely on its gate post hinges. Refer to index arm assembly on page 160.

Option 2: Hand Pump Gate Opening

⚠ WARNING

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

In the event of a power failure, manual operation can be achieved by accessing the hydraulics cabinet. Follow the steps below to open or close the gate.

1. Lift locking pin to free it from its receptacle.
2. Turn the power switch OFF.
3. Locate the knurled knob on the Open Valve.
4. Firmly, pull and twist the knurled knob counterclockwise. With a few threads showing, release the knob so that it remains in the open

NOTICE

If the valve re-seats itself, repeat the pull and twist in the opposite direction until the valve remains open.

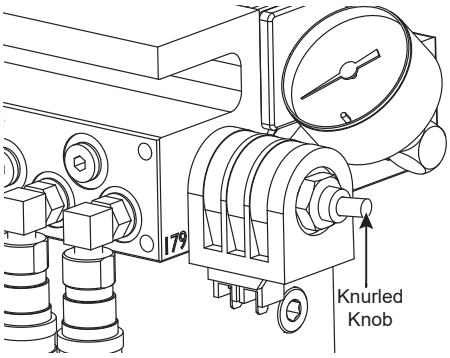


Figure 4. Opening Gate Using Hand Pump

5. Insert pump handle into its hand pump receptacle. Begin pumping handle up and down. Gate moves as hydraulic fluid is pumped into cylinder.
6. Continue pumping until gate reaches full open position.
7. Turn knurled knob so it springs back to closed position. This keeps the fluid level stable.

Close the Gate using the Hand Pump Gate Closing

1. Check that the knurled knob is in the closed position. Begin pumping the handle up and down. The gate slowly closes with the pumping motion.
2. The gate will maintain its position whenever you stop pumping.
3. Continue pumping until the gate reaches the full closed position.
4. If locking pin exists, reseat it to secure the gate.

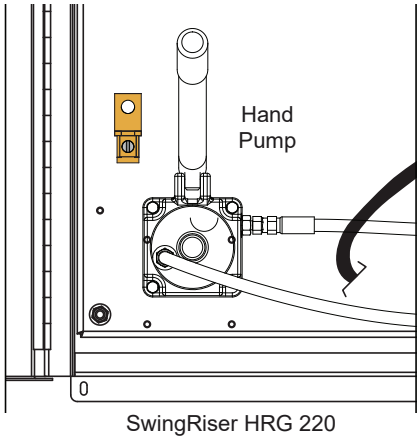


Figure 5. Close Gate Using Hand Pump

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 with HyCharger DC
- AC Power Supply with HyInverter AC

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.

⚠ DANGER

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: ⅝ inch (16 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 6 AWG 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 Warranty.

Site Considerations

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

⚠ WARNING

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 is severe damage to the equipment.

- 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 27.
- Make sure the available power source matches the electrical requirements specified on the voltage nameplate.
- 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 SwingRiser has separate Installation Instructions that explain how to connect to AC power. For reference purposes, the same information is provided below.

In-rush Current is 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 in-rush current to start one of the heavy duty operators.

NOTICE

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

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.

DANGER

Turn OFF AC power at the source (circuit breaker panel) before accessing the wires in the SwingRiser. 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:** Two pig tails and a ground are available for connection to a 1 Phase power source (1Ø) on the back of the keypad display enclosure.
2. **Connect AC Power:** Wire nut the incoming power wires to their appropriate pig tails. Attach the ground wire to the chassis. A wiring diagram is provided in the appendix.

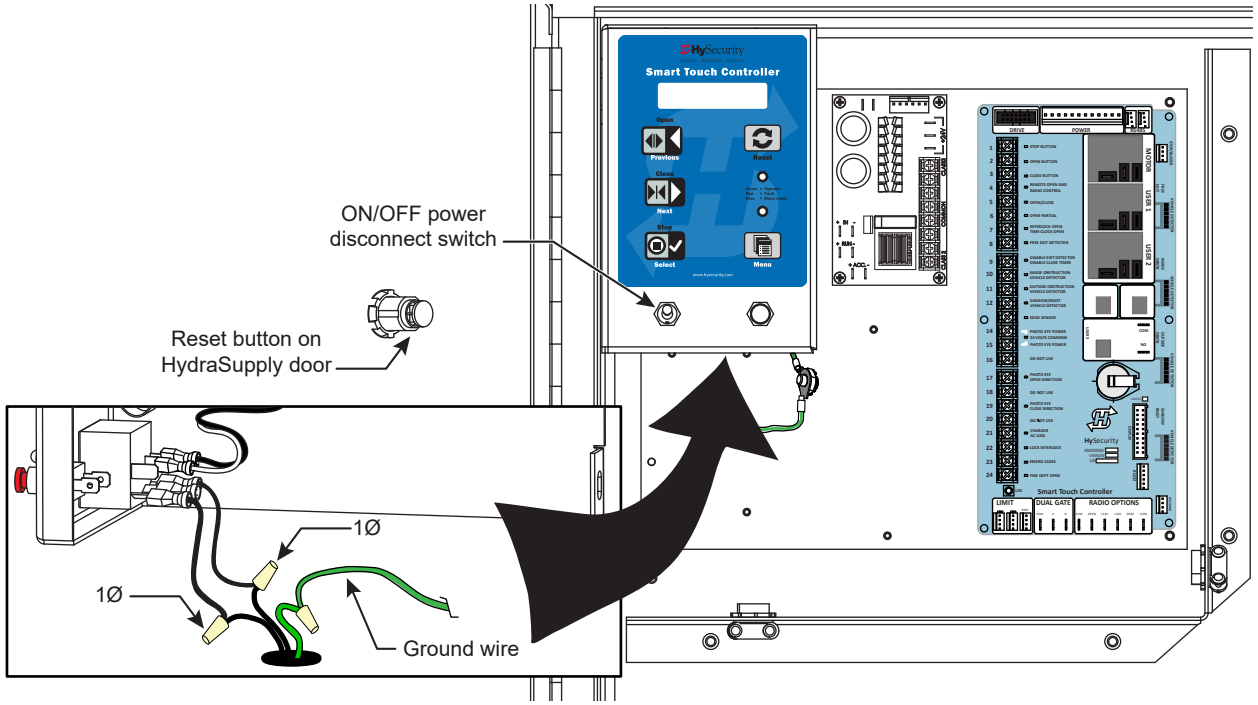


Figure 6. Wiring AC Power

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 supply board, 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 "Understanding the Display and Keypad" on page 45.

CAUTION

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.

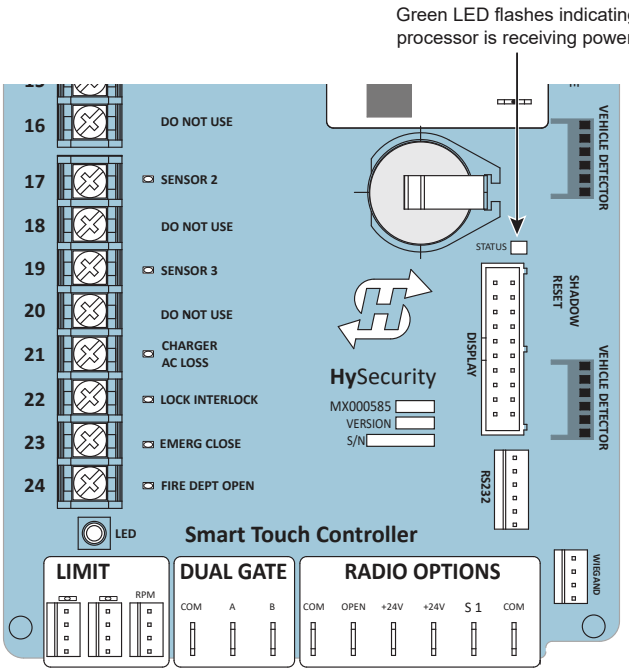
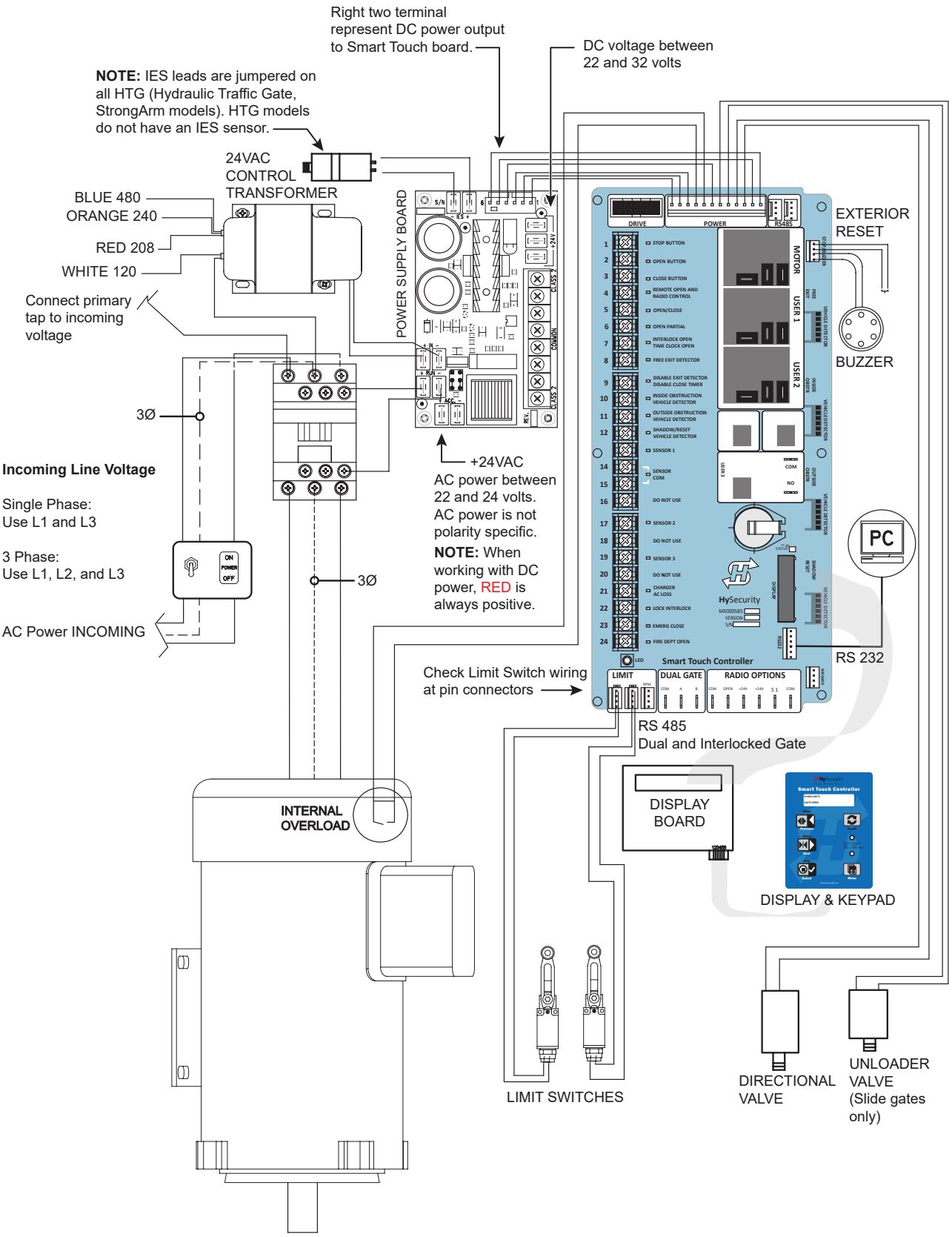


Figure 7. Turning Power Switch On

WIRING DIAGRAM: SMART TOUCH CONTROLLER SYSTEM



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. To avoid costly rewiring, be sure to choose a sufficient wire size during site planning phases and at initial installation.

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 of the motor (maximum full load at continuous duty). At minimum, a 20A circuit (protected with a 20A Inverse Time Breaker) should be provided.

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)

SwingRiser Wiring Charts (Incoming Power)

The maximum distance, shown in the chart below, reflects the distance 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.

NOTICE

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

SWINGRISER WIRE SIZE CHART						
	115V Single Phase		208V Single Phase		230V Single Phase	
Horsepower	1	2	1	2	1	2
Amps	14.4	27.2	7.6	14.2	7.2	13.6
Wire Gauge	Distance	Distance	Distance	Distance	Distance	Distance
12	60 (18m)	30 (9m)	205 (62m)	110 (33m)	245 (75m)	130 (40m)
10	100 (30m)	50 (15m)	330 (101m)	175 (53m)	385 (117m)	205 (62m)
8	155 (47m)	80 (24m)	525 (160m)	280 (85m)	610 (186m)	325 (99m)
6	245 (75m)	130 (40m)	835 (254m)	445 (135m)	975 (297m)	515 (157m)
4	385 (117m)	205 (62m)	1320 (402m)	710 (216m)	1550 (472m)	815 (248m)
2	620 (189m)	330 (101m)	2110 (643m)	1130 (344m)	2465 (751m)	1305 (398m)

SWINGRISER WIRE SIZE CHART						
	208V Three Phase		230 Three Phase		460V Three Phase	
Horsepower	1	2	1	2	1	2
Amps	4.2	6.5	3.8	6.2	1.9	3.1
Wire Gauge	Distance	Distance	Distance	Distance	Distance	Distance
12	375 (114m)	245 (75m)	460 (140m)	280 (85m)	1850 (564m)	1130 (344m)
10	600 (183m)	390 (119m)	730 (222m)	450 (137m)	2930 (893m)	1800 (549m)
8	950 (289m)	615 (187m)	1160 (353m)	710 (216m)	4650 (1417m)	2840 (866m)
6	1510 (460m)	975 (297m)	1845 (562m)	1130 (344m)	7400 (2255m)	4550 (1387m)
4	2390 (728m)	1545 (471m)	2920 (890m)	1790 (546m)	11700 (3566m)	7200 (2194m)

UPS BACKUP POWER OPTIONS

If you plan to use back up power options, additional site considerations are needed including conduit to house the hydraulic hoses and electrical wiring. You need a 2-inch (5 cm) diameter conduit for hydraulic hoses and a ¾-inch (19 mm) conduit for electrical wiring. Mounting locations such as pad mount or wall mount also need to be determined. See site planning overview in the installation instructions.

Supplemental manuals, available online, describe 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 ¾-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.

System features are covered in the DC Power Supply with HyCharger DC supplement shipped with the product and available online at www.hysecurity.com.

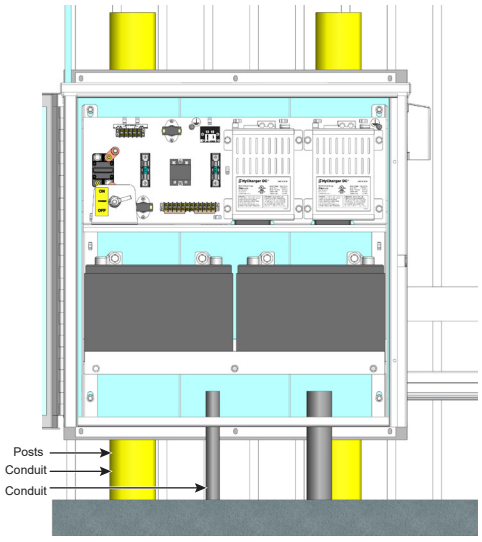


Figure 8. DC Power Supply (UPS) Connections

AC Power Supply with HyInverter AC

Gate operators equipped with the AC Power Supply with HyInverter AC option are powered by four 12-Volt, 110Ah DC batteries which, when AC power loss occurs, maintain a true Uninterrupted Power Supply (UPS) system. When the local AC power fails, the UPS back up system continues to move the gate. System features are covered in the *HyInverterAC Installation and Reference Manual* shipped with the product and available online at www.hysecurity.com.

NOTICE

The AC Power Supply with HyInverter AC option is intended for single phase (1 hp) gate operators and single phase (2 hp) gate operators that use Variable Speed Drives (VFD).

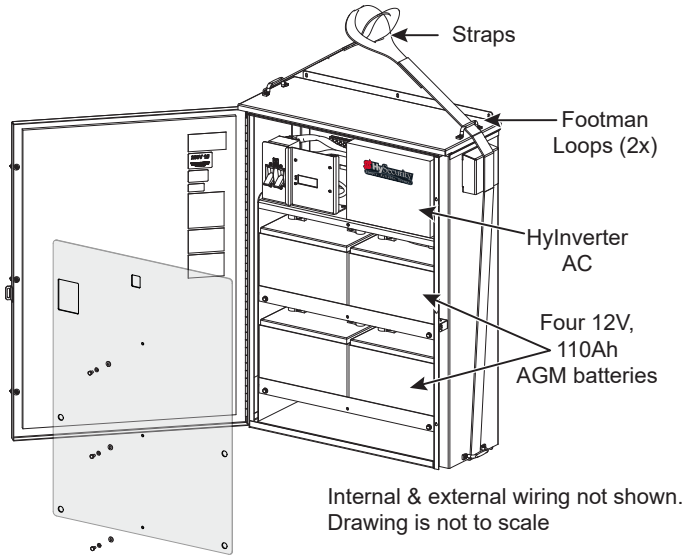


Figure 9. AC Power Supply with HyInverter AC

When you first apply power to the gate 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
- Three external entrapment protection SENSOR assignments

⚠ CAUTION

Before turning the power switch to ON, be sure to replace the vent cap with the breather cap. See page 8. 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 "Understanding the Display and Keypad" on page 45 for more information. To answer the initial prompts, use the Previous, Next, and Select buttons as described in the chart below:

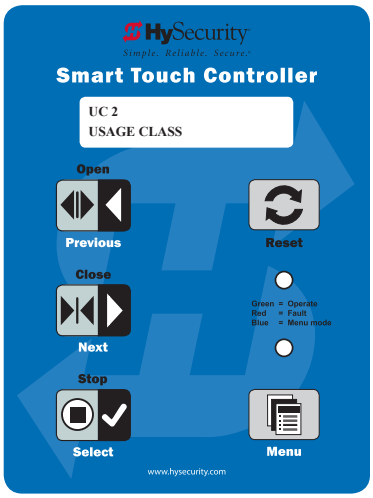


Figure 10. STC Usage Class

Table 1. 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 **Select.** Two left characters blink.	Press **Next.** Continue pressing Next to view all selections. (Press Previous to reverse direction.)	Press **Select.** Blinking characters become static.	Press **Next** or **Previous.** 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 21. It explains the different usage site classifications for UL 325.

SWINGRISER ORDER FORM

Gate speed, direction of swing, and degree of swing are fixed and cannot be changed in the field. Be sure to read and fill out the SwingRiser Order Form based on your site configuration. It walks you through all aspects, from outer and inner post heights, to top cap brackets, voltage requirements, direction & degree of swing and hose length considerations.

For more information, download the order forms by clicking on Technical Support from the HySecurity website.

GATE HANDING

Gate handing is determined by standing on the secure side of the gate and looking out toward the public side. See illustration.

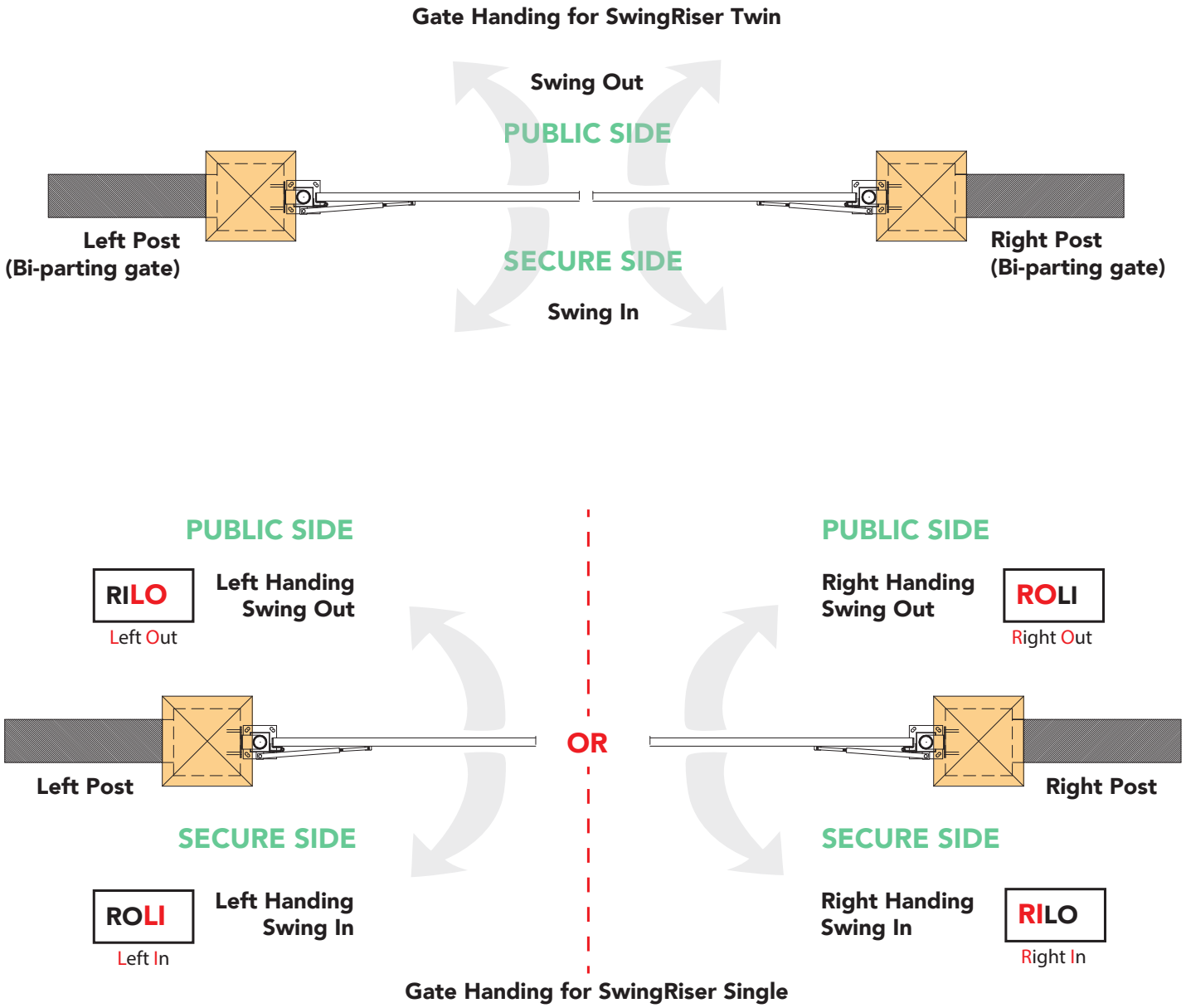


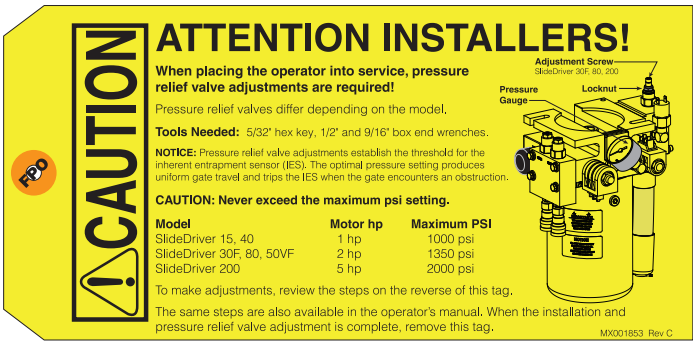
Figure 11. Gate Handing

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: ½" 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.

Table 2. Pressure Relief Adjustments

SwingRiser HRG 220	
Gallons per minute	3.1
Motor HP	1
Maximum PSI	2000
SwingRiser HRG 220	
Gallons per minute	4.0
Motor HP	2
Maximum PSI	2000

CAUTION

* Look at the pressure gauge while the gate is traveling open or close. Note maximum pressure while the gate is in motion and write it down. Never exceed 200 psi above that maximum pressure reading.

DANGER

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!

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.

1. Expose several threads on the Pressure Relief Valve by loosening the locknut with a 9⁄16" box end wrench.
2. Use a ½" 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 wrench and tighten the locknut.

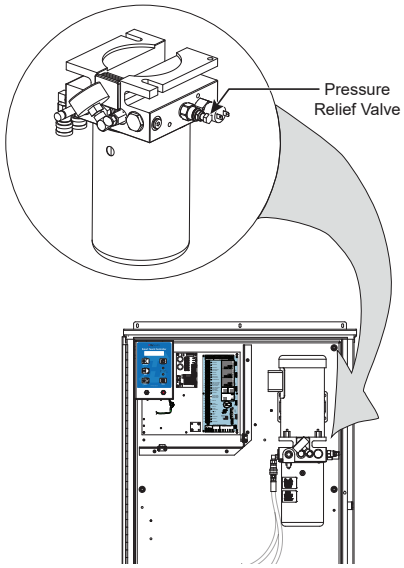


Figure 12. Pressure Relief Valve

ADJUSTING THE GATE SPEED

SwingRiser gate operators employ the use of a flow control valve to allow slight adjustments in the closing speed of the gate. The flow control valve is the small rectangular brass device with the knurled adjusting knob, located just above the hydraulic hose quick-disconnect.

For more information on how to adjust the flow control valve, refer to *"Adjustment of the Flow Control Valve without Color Bands"* or *"Adjustment of the Flow Control Valve with Color Bands" on page 151*.

INSTALLATION OVERVIEW

Review the material provided in *"SwingRiser Installation Drawings" on page 157*.

Areas that may require adjustment beyond what is discussed in this section, include:

- Limit switches *"Figure 69. SwingRiser Post Components" on page 162*.
- Index arm (*"Figure 59. SwingRiser Index Arm Assembly" on page 148*)
- Locking mechanism (*"Figure 74. SwingRiser Index Arm and Locking Pin Overview" on page 167*)
- Flow valve (*"Adjusting the Flow Control Valve" on page 150*)

Effective January 12th, 2016 UL 325 Standard of Safety requires all automated gate operators be able to monitor for entrapment protection sensors. Before gate movement occurs, the UL 325 compliant HySecurity gate operator verifies that the external entrapment protection sensors are connected and fully functional.

The site designer or installer must determine which external entrapment protection sensors will be installed with the gate operator to create a UL 325 compliant installation site.

The following bullet points highlight how your automated gate system sites can monitor sensors (external entrapment protection sensors) using HySecurity gate operators:

- **Normally Closed (NC) sensors** - Installing Normally Closed output sensors. External entrapment protection NC sensors are "monitored" by HySecurity gate operator software.
- **Build Year (BY)** - An added menu item distinguishes between pre-2016 manufacturing dates and UL 325 - 2016 manufacturing dates. Build Year (BY) is a factory-setting. Build Year 2 (BY 2) is the default for all HySecurity gate operators indicating a manufacturing date of 2016 in the serial number. Replacement controller boards for existing sites allow for a Build Year setting of 1 (BY 1, pre-2016). Build Year 3.
- **Independent Sensor Inputs -** The edge, photo eye and photo eye COM inputs on the Smart Touch Controller (STC) have been re-labeled. The same wiring connections become three independent methods for easy entrapment sensor configuration and normally closed outputs.

NOTICE

To enable fully automatic operation, the gate operator requires a MINIMUM of one external entrapment protection sensor to monitor potential entrapment zones in either the open or close direction of travel. Visit www.hysecurity.com/gatesafety for more information on UL 325 standards and gate safety.

MANUFACTURER'S RESPONSIBILITY

- Build into gate operator a means of detecting an obstruction or an inherent entrapment detection sensor
- Monitor input from external entrapment detection sensors
- 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
- Bypasses fluid to tank when set-point exceeded
- Bypassed fluid triggers the IES

NOTICE

Pressure relief valve adjustments establish threshold for Inherent Entrapment Sensor (IES). Optimal pressure setting produces uniform gate travel and trips IES when gate encounters an obstruction.

Inherent Entrapment Sensor (IES) System – Hydraulic Operators

- Is a normally closed pressure switch on pump manifold
- Senses fluid flow. High pressure spikes above pressure relief valve setting trigger gate obstruction notification
- Ignores first second of operation to preclude false trips due to starting pressure spike

An open contact:

- During gate movement signals the STC to place gate operator into SAFE mode
- While the gate is not operating will generate ERROR 2 (ERR2) - disconnected IES

NOTICE

A second open contact, in either direction of travel, will lock gate operator and ENTRAPMENT MODE (ENTR) appears on the display.

MONITORED EXTERNAL ENTRAPMENT SENSORS

As of January 2016, UL325 standard requires gate operators to monitor the presence of all external entrapment sensors, including non-contact (Photo Eyes) and contact (Edge) sensors. For operators built between January 1st, 2016 and July 31st, 2018 only one external entrapment sensor is needed to allow automatic operation, but all potential entrapment zones must be protected or eliminated. After July 31st, 2018, all Slide gate operators will need a minimum of 2 external entrapment sensors (1 open direction and 1 close direction) installed before automatic operation is allowed, but all potential entrapment zones must be protected or eliminated.

HySecurity monitors all external entrapment sensors connections by looking for NC contacts connected to input terminals. Smart touch software cycles power to device and looks for a time delay from when device powers on to when the contact closes (sensor input pulled low, meaning the sensor is not blocked/tripped).

Three programmable sensor inputs are available for use and must be programmed to a non-zero number when initial configuration is performed. The three inputs are labeled Sensor 1, Sensor 2, and Sensor 3 and are configurable in the installer menu (S1, S2, or S3) for the following options:

- 1 – Not Used
- 2 – Eye Close
- 3 – Edge Close
- 4 – Eye Open
- 5 – Edge Open
- 6 – Edge Both (Swing Only)
- 7 – Eye Both (Solo Slide Only)

It is the installers responsibility to determine the number of potential entrapment zones that exist and program the Sensor inputs according to which type of external entrapment sensor will be used to protect each zone. If more than three potential entrapment zones exist, then site design may be adjusted to eliminate risks or a Miller Edge MIM-62 may be used to connect additional sensors.

Potential entrapment zones on a slide gate are shown in Figure 13 Included in the drawing are examples of potential external entrapment sensor mounting/installation locations.

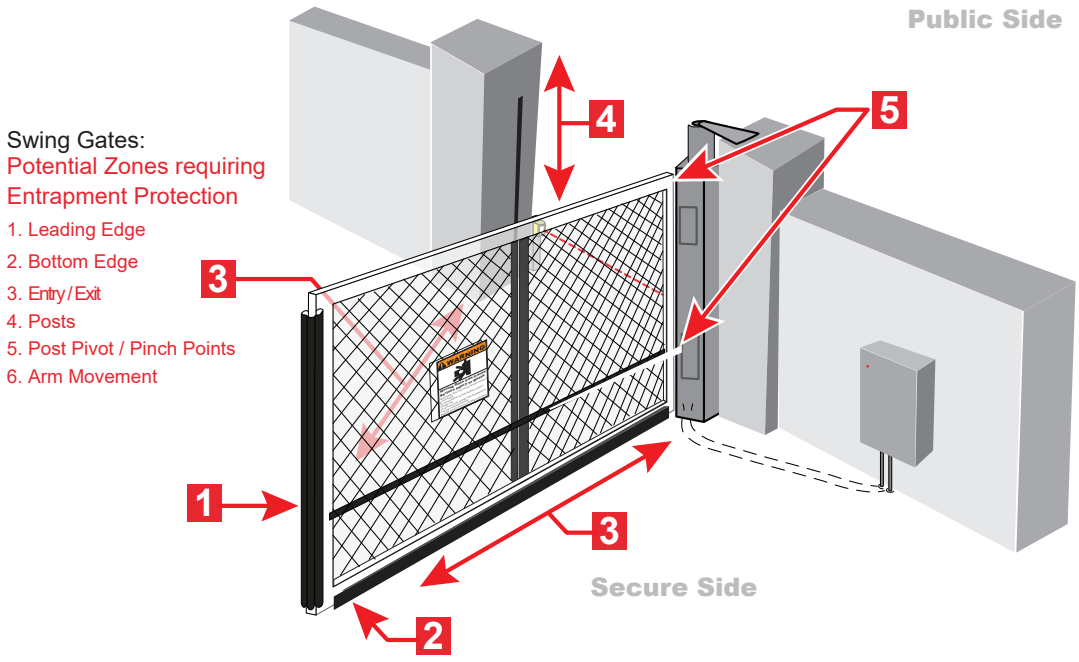


Figure 13. Site Overview

After programming the sensor inputs in the installer menu or during initial startup, the appropriate type and number of sensors will need to be connected. Figure 14 below shows the wiring and dip switch settings of an EMX-MON photo eye (typical thru-beam wiring). A retroreflective photo eye will be similar and only have wiring similar to the receiver of the thru-beam photo eye.

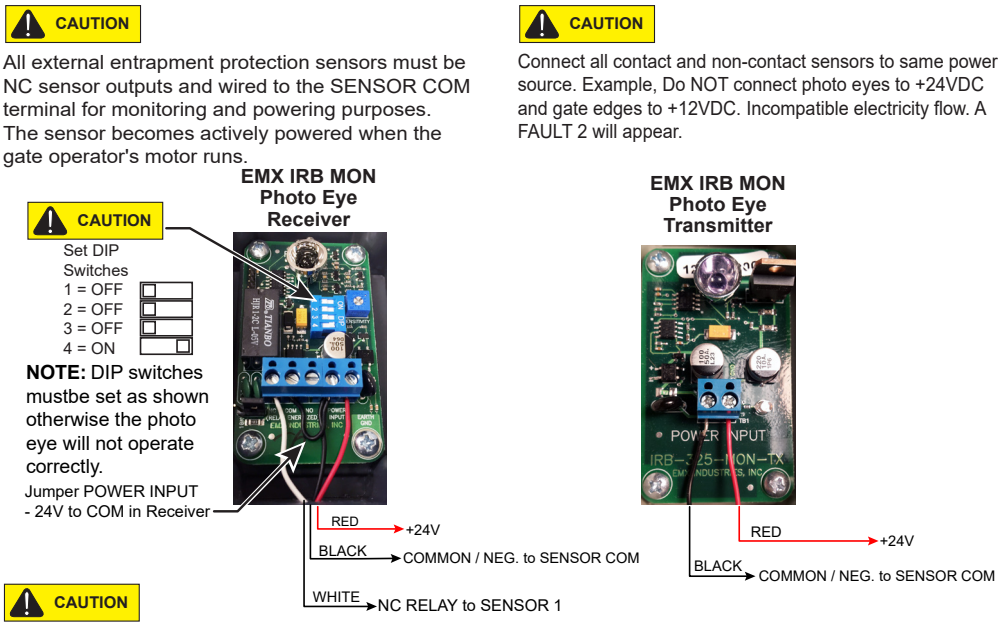


Figure 14. EMX-MON Photo Eye Wiring

An Edge Sensor can be either hardwired through an adapter module (Hy2NC) or a wireless transmitter/receiver combo (WEL-200 or iGAZE RE). Figure 15, below, shows the wiring and dip switch settings of a WEL-200. For more information and wiring diagrams of other recommended sensors see the "HySecurity External Entrapment Sensor Wiring Guide".

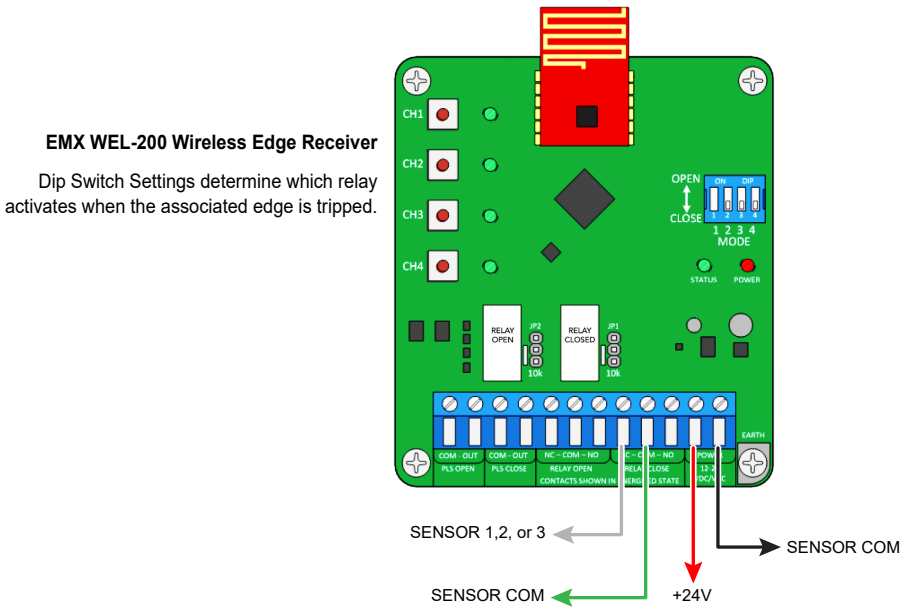


Figure 15. WEL-200 or iGAZE RE

THE INHERENT ENTRAPMENT SENSOR (IES)

IES on HySecurity gate operators is an entrapment sensor that is required by UL 325 as a Type "A" detection sensor. It is tripped through software programming OR hydraulic pressure settings. It does not function solely on its own accord and must be connected to Smart Touch Controller. Sensitivity and response of IES when tripped is factory set, but can be adjusted through 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 **2 = Default setting** 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. **Note:** 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	**0 = stop, reverse for 2s** 1 = stop only	A setting of 0, stops the gate and then reverses its direction of travel for 2 seconds. To stop gate travel with no reversal, the optional setting 1 can be selected if the gate operator is at a Usage Class IV site and assigned a UC 4 classification.
SR 0 (FULL OPEN) REVERSAL LOGIC	**0 = IES reverses fully open** 1 = Two second reversal only	Setting of SR 0 causes the gate to reopen fully if triggered while closing. With a setting of 1, if the inherent sensor is triggered, the default setting reverses the gate travel for a 2-second duration.

HOW SOFTWARE HANDLES MONITORING EXTERNAL ENTRAPMENT PROTECTION SENSORS

HySecurity gate operators use software to control gate movement, contacts, and accessories. The changeover in 2016 to monitoring sensors has been a simple process.

- Build Year is a new Installer Menu item in the Smart Touch Controllers versions h4.50 (and higher).
- New labels show where Edge, Photo Eye Open and Photo Eye Closed have changed to "SENSOR" inputs. You can program the type of sensor wired to each of those inputs. See table below.
- Installer Menu items, PC and GC (Photo eye output and edge sensor output) which used to default to Normally Open (NO) have been converted to Normally Closed (NC) contacts so the software can detect the presence and proper operation of external entrapment protection sensors.

Changes to Sensor Inputs on the Controller

Table 3. Controller Sensor Input Locations

Smart Touch Controller (STC): Hydraulic operators		
Input	**Current Silk Screen Label**	**2016 Silk Screen Label**
13	EDGE SENSOR	SENSOR 1
17	PHOTO EYE OPEN DIRECTION	SENSOR 2
19	PHOTO EYE CLOSE DIRECTION SENSOR 1	SENSOR 3

Table 4. Installer Menu Item Codes

Smart Touch Display		
Input	**OLED - two line, 32 character**	**LCD - 7 segment text**
13	S1 SENSOR 1	S1
17	S2 SENSOR 2	S2
19	S3 SENSOR 3	S3

NOTICE

Three inputs for external entrapment protection sensors are available on the HySecurity gate operator controller.

"Changes to Sensor Inputs on the Controller" indicates how the edge and photo eye inputs have been renamed to generic "sensor" inputs. They are interchangeable and configurable. The software must know what type of sensor is wired to SENSOR 1, 2, and 3 BEFORE it will allow gate travel.

EXTERNAL ENTRAPMENT PROTECTION SENSORS: WHAT THE INSTALLER NEEDS TO DO

NOTICE

All HySecurity gate operators, built after of 2016, will have the Build Year setting. A Build Year of 2 or 3 (BY 2 or BY 3) indicates that you gate operator is prepared to monitor for external entrapment protection sensors. The Build Year setting appears in the system scroll on the gate operator display. BY 2 is for operators built between January 1, 2016 and July 31, 2018. BY 3 is for operators built after July 31, 2018. The gate operator will not automatically cycle the gate unless an indication that the appropriate number of external entrapment protection sensors are connected and operational.

Normally closed (NC) entrapment protection sensors wired to Controller's SENSOR inputs are monitored using HySecurity software. Prompts appear in display requesting specific configurations based on gate operator type.

"Table 5. Installer Menu Options for SENSOR Inputs" illustrates options are available for HySecurity Controller's configurable inputs. Inputs labeling changed to:

- SENSOR 1
- SENSOR 2
- SENSOR 3
- SENSOR COM

Refer to illustration on page 44.

⚠ CAUTION

All external entrapment protection sensors must be wired to the SENSOR COM terminal for power and monitoring purposes. Depending on software version, the sensor becomes actively powered when the gate operator receives a run command or is always powered when AC power is present. Either way, the sensors are checked for presence at least once per cycle. The three SENSOR inputs are interchangeable and configurable. For example, it doesn't matter whether you wire a normally closed photo eye sensor or edge sensor to the SENSOR 1, 2, or 3 input. However, due to monitoring requirements, each SENSOR input (1, 2, and 3) can only accept one NC sensor output connection.

1 Assess Your Gate Site.

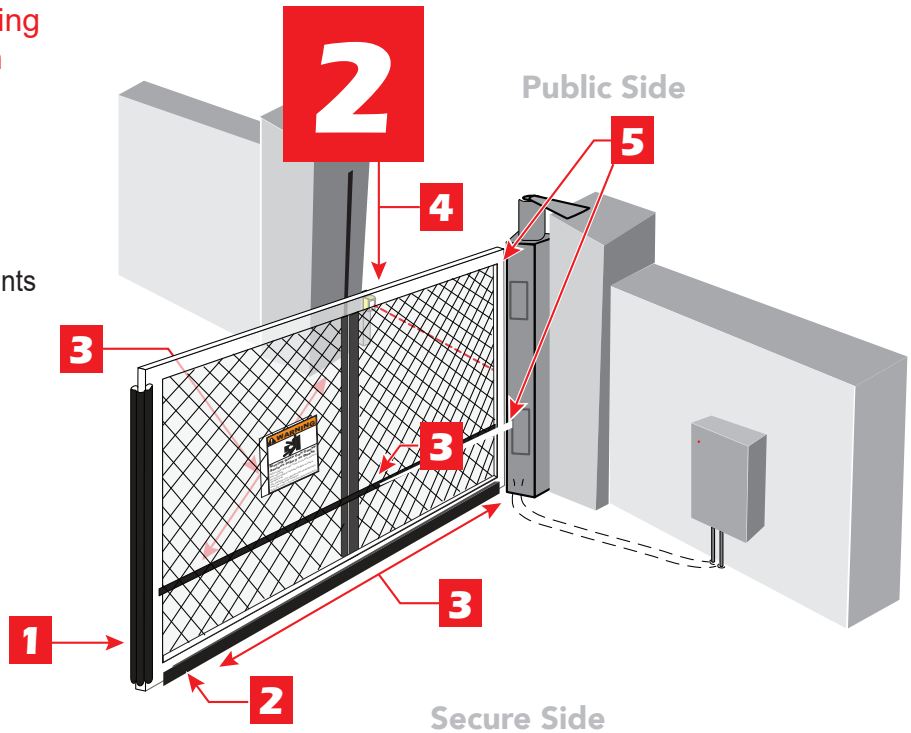
Design your gate installation so entrapment zones are kept to a minimum, and then install your HySecurity gate operator.

NOTICE

UL 325 Standard of Safety provides the MINIMUM safety standards. Site, gate hardware usage, and other conditions may dictate the use of additional safety designs/components. It is up to the gate system designer and installer to assess appropriate safety design and components above and beyond minimum UL 325 and ASTM F2200 standards. Always check your local area codes and comply with all regulations.

Swing Gates:
Potential Zones requiring Entrapment Protection

1. Leading Edge
2. Bottom Edge
3. Entry/Exit
4. Posts
5. Post Pivot / Pinch Points
6. Arm Movement



Drawing NOT TO SCALE

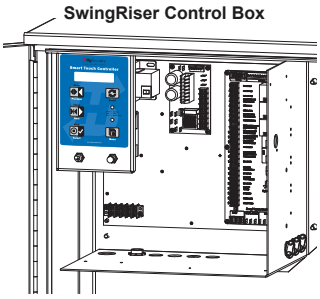
2 Install NC sensors.

Install contact and non-contact sensors (edge sensors and photo eyes) for all entrapment zones. HySecurity gates monitor normally closed (NC) sensors. Wire your NC sensors to SENSOR input terminals (SENSOR 1, SENSOR 2, or SENSOR 3) on the Smart Touch Controller.

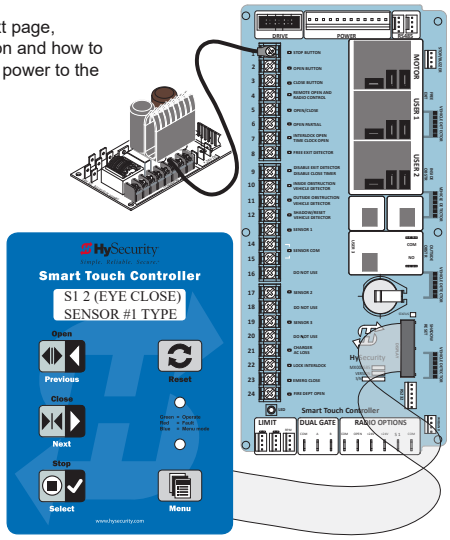
NOTICE

When installing wired edge sensors, the WIRED EDGE must be connected to an interface module that produces an NC output. Refer to "Wiring HySecurity Sensors:Smart Touch" on page 146. However, wireless edge sensors, require no interface module. Wireless edge sensors need the wireless gate links which include a transmitter and receiver.

3 Turn Power ON.



NOTE: On the next page, review LED function and how to provide temporary power to the sensors.



4 Answer Initial Setup Prompts.

Initial setup prompts appear and need to be addressed before your gate will move. Each SENSOR input, whether or not it has a contact or non-contact sensor wired to it, must be programmed to a non-zero setting before the gate will move.

NOTICE

The gate operator will not automatically cycle unless an indication is received that the appropriate number of external entrapment protection sensors are connected and operational. At minimum, external entrapment protection sensors must be used to protect either open or close direction of gate travel as long as their is no risk of entrapment in the other direction of a swing gate. For Slide gates, both open and close direction must have an external entrapment sensor.

Table 5. Installer Menu Options for SENSOR Inputs									
UL 325 HySecurity Gate Operator	Build Year 2016 (BY set)	Installer Menu Settings for STC & SDC Sensors 1, 2, or 3 (solo operators)							
		#0 DISABLED	#1 NOT USED	#2 EYE CLOSE	#3 EDGE CLOSE	#4 EYE OPEN	#5 EDGE OPEN	#6 EDGE BOTH DIRECTIONS	#7 EYE BOTH DIRECTIONS
SlideDrive (fixed speed)	2	●	●	●	●	●	●		●
SlideDriver VFD	2	●	●	●	●	●	●		●
SlideSmart DC 15	2	●	●	●	●	●	●		●
SlideSmart DC 10	2	●	●	●	●	●	●		●
SwingRiser	2	●	●	●	●	●	●	●	
SwingSmart DC	2	●	●	●	●	●	●	●	
HydraSwing	2	●	●	●	●	●	●	●	
HydraLift	2	●	●	●					

SUPPLY POWER TO THE SENSORS

CAUTION

All external entrapment protection sensors must be wired to the SENSOR COM terminal for monitoring purposes.

Review sensor wiring diagrams found in "Wiring HySecurity Sensors: Smart Touch" on page 146.

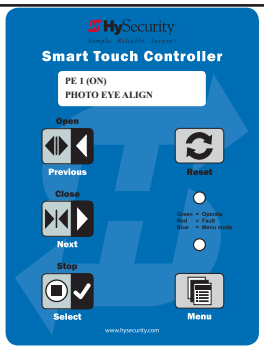
Until the gate operator receives a command to run (open or close command), the sensors are not receiving power (pre-h4.56 and 5.5.57 software). However, to **temporarily** power sensors and check that the gate operator is monitoring the sensors properly, turn on Photo Eye Align mode.

To turn on Photo Eye Align mode, take the following steps:

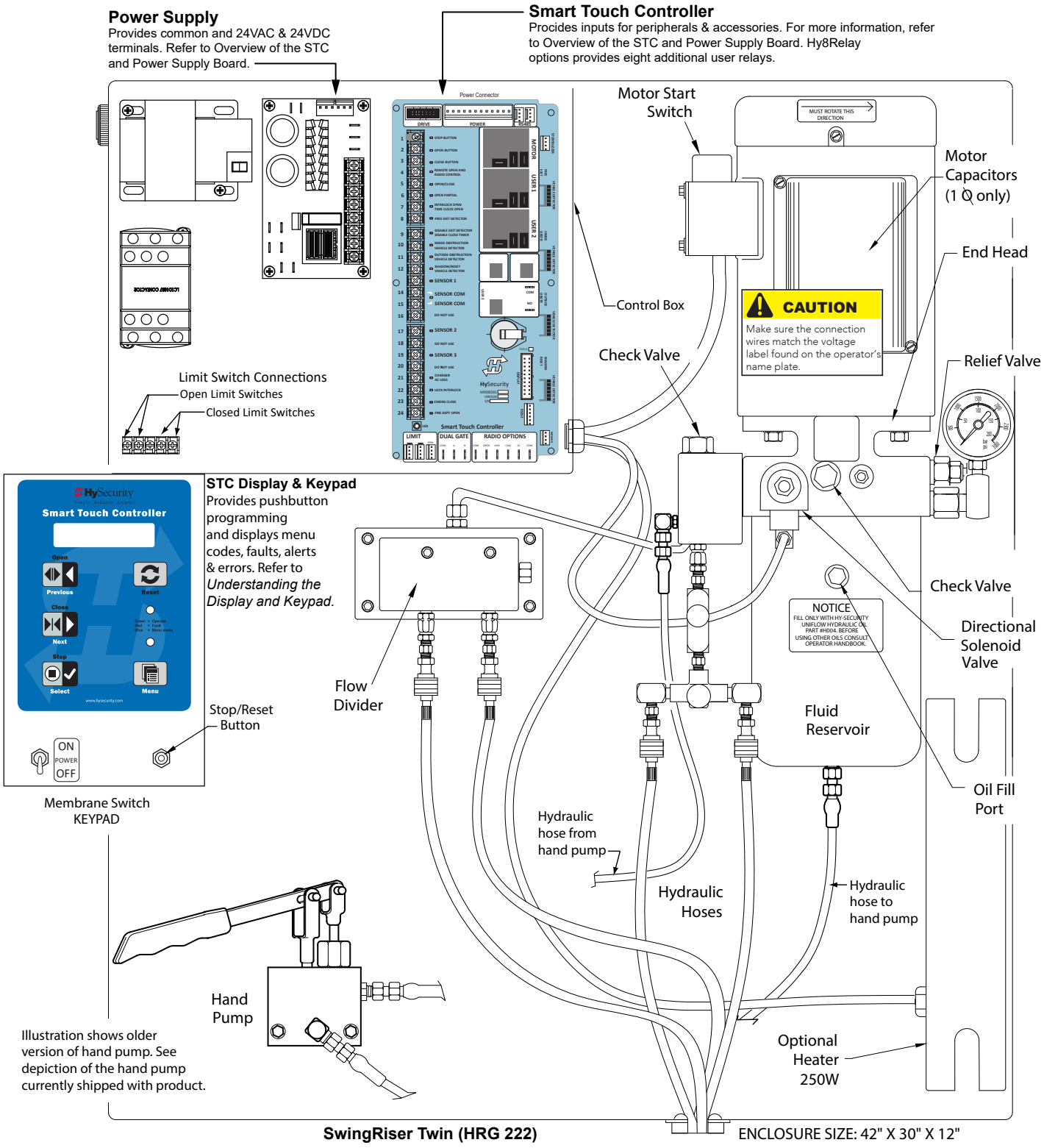
1. Access the User Menu and select PE. (Press the Menu button twice to access the User Menu. See chart on the previous page.)
2. Press NEXT and continue to press NEXT until PE 0 (OFF) appears.
3. Press SELECT. PE characters begin blinking.
4. To turn ON photo eye alignment and temporarily power the sensors, press NEXT so PE 1 (ON) appears.
5. Press SELECT. PE stops blinking.
6. Press MENU to exit Menu Mode and return to Run Mode.

NOTICE

The Photo Eye Align mode turns OFF with the next limit contact. For more information, see Photo Eye Alignment Feature on page 82.

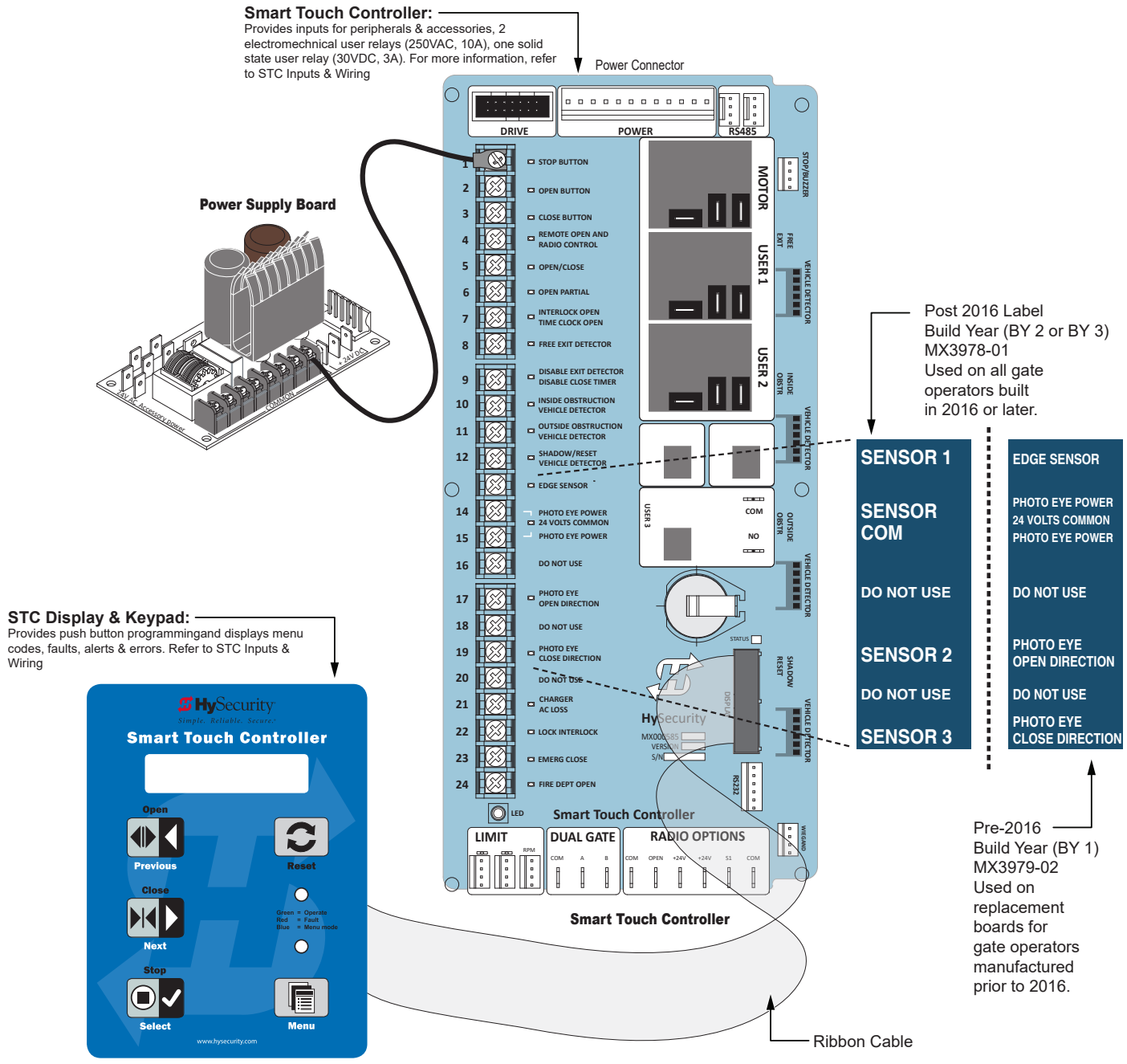
Controller	Temporarily apply Power to Sensors	LED Status
Smart Touch (Hydraulic gate operators)	PE 1 (ON) PHOTO EYE ALIGN 	LEDs next to the sensor connections will be lit when no power is being applied. When PE is turned ON, the LEDs turn off. If they do not turn off, check for wiring issues such as a short or misapplied relay COM connections.
Smart DC (electromechanical gate operators)	PE 1 (ON) PHOTO EYE ALIGN 	When PE is ON, the LEDs associated with the sensor devices will be lit if the sensors are properly connected and sensors are grounded. The LEDs turn off when the ground circuit is removed.

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



STC BOARD, POWER SUPPLY BOARD AND DISPLAY

The Smart Touch Controller provides connections for a multitude of peripherals and accessory devices. The Power Supply Board 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 84. For more information about the display programming, operator modes and keypad navigation, refer to "Display & Menu Options" on page 59



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.

⚠ CAUTION

Keep your operator current with the latest software version. If your gate operator was manufactured in 2016 (or later), it must monitor external entrapment protection sensors to be compliant with UL 325 - 2016 Standard of Safety.

UNDERSTANDING THE DISPLAY AND KEYPAD

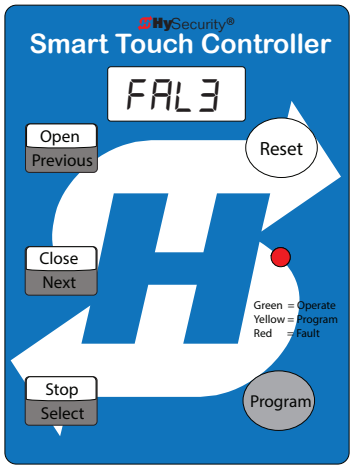
All system settings are performed using just four programming buttons and an easy-to-read 32 character display (OLED). RS-232 and RS-485 ports provide connections for external communication. A real time clock and an EEPROM logs events.

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

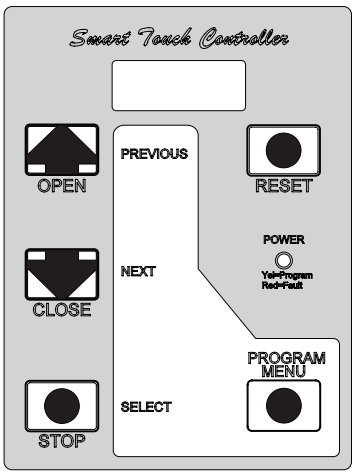
Three different operational modes exist:

- Run Mode – gate is operational, awaiting commands.
- Menu 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. Fault mode indicates a need for diagnosis and resolution. Refer to "Troubleshooting" on page 118.

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.



Smart Touch Display/Keypad, pre-2014



Smart Touch Display/Keypad, pre-2009

Figure 16. Old STC Keypads

INITIAL SETUP

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

- Connect a laptop computer to the serial RS-232 connector and set the operator menu configurations via the S.T.A.R.T. software. Refer to the START User Guide.

NOTICE

Use a laptop computer at your place of business to conveniently download the free START software from www.hysecurity.com before heading out into the fi eld. This makes it easy to adjust and confi gure operator settings using a laptop in the field.

- Manually navigate through the User and Installer Menus using the four Menu Mode buttons located on the Smart Touch Controller Keypad. The instructions for performing this second option are provided in this section.

After installing a new operator, an initial sequence of set up prompts appears when you first turn ON the Control Box power switch. You need to answer the prompts before the gate operator will run. The operator is in "MENU" mode.

For example:
In the SwingRiser operator, you must set usage class and address 3 sensor inputs.

UC = Usage Class. Set the usage class to 1, 2, 3, or 4 depending on the site.

Four different vehicular usage classes are defined by UL 325. Information about the classes can be found online through DASMA Technical Data Sheets www.dasma.com or UL 325 www.ul.com

S1, S2, and S3 = Contact and non-contact external entrapment protection sensor inputs that require monitoring per installation site and UL 325 Standard of Safety requirements.

For more information, refer to UL 325 - 2016 Monitored Entrapment Wiring Diagrams online.

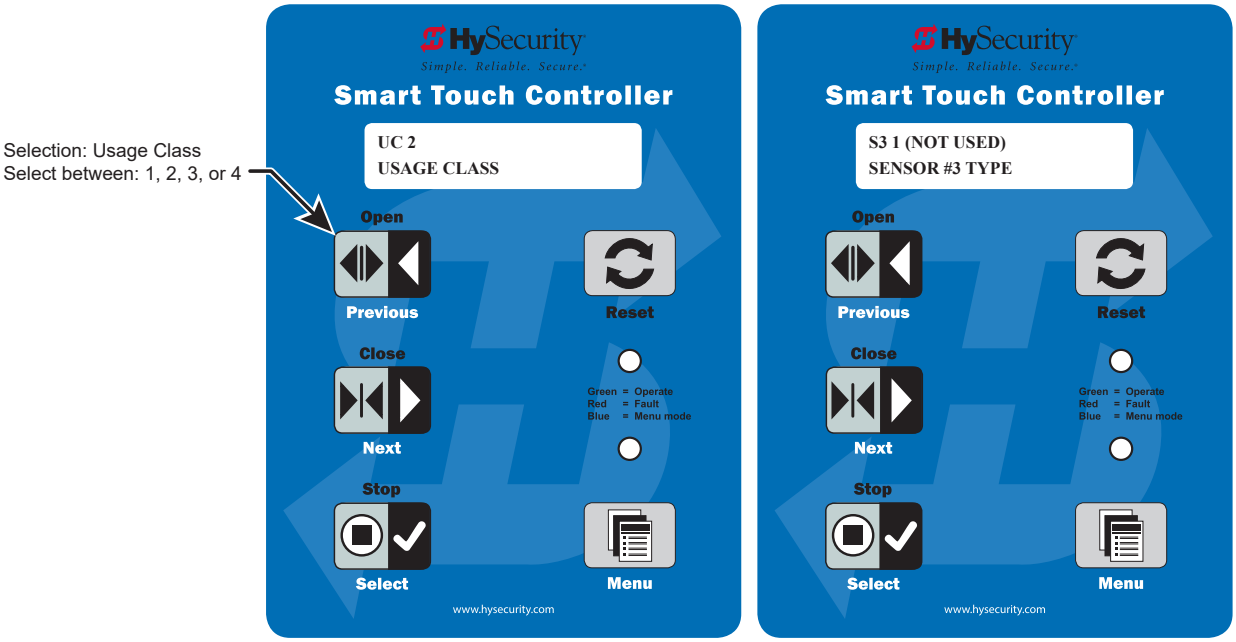


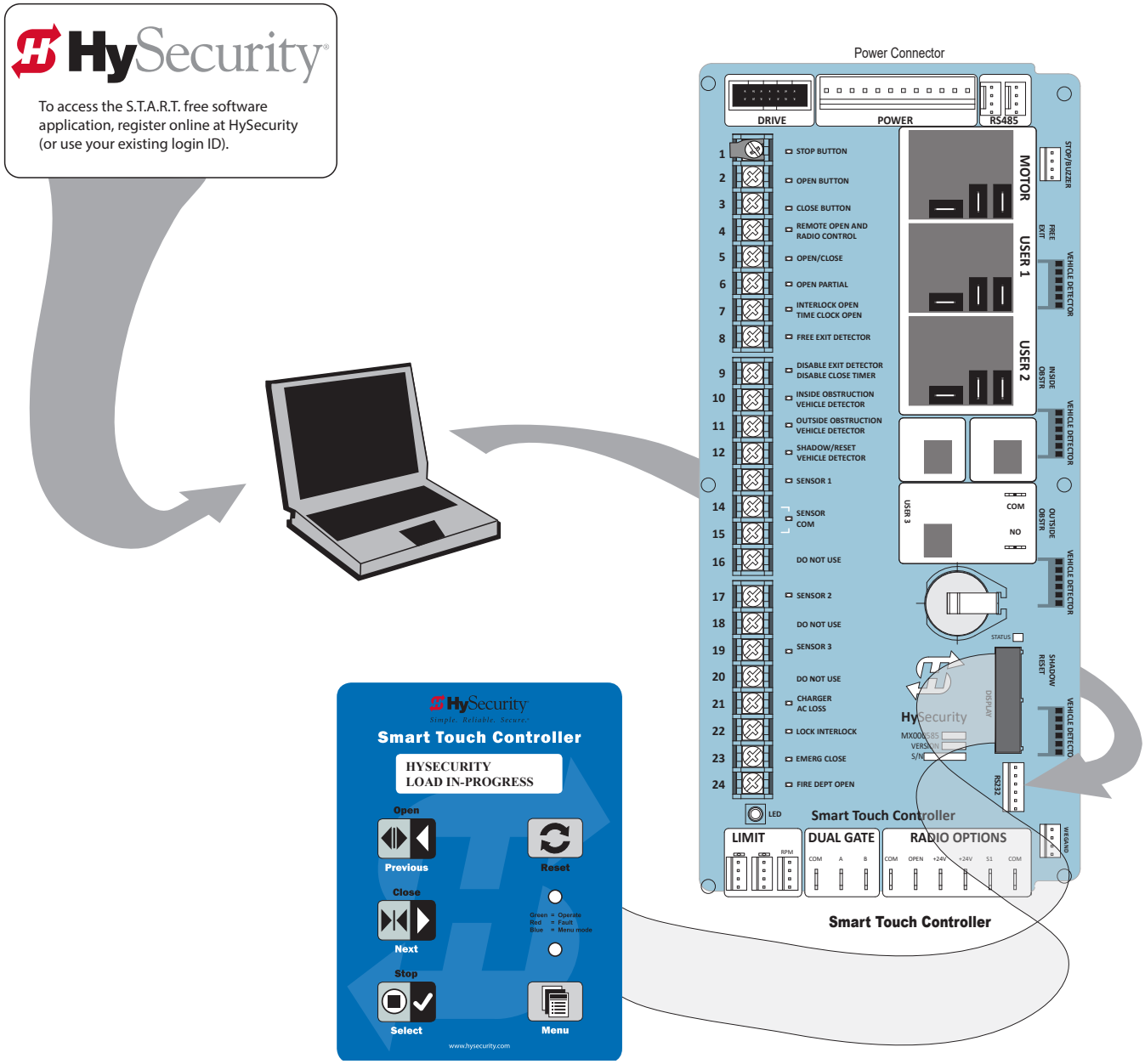
Figure 17. Usage Class and Sensor Type Setup

INITIAL SETUP USING S.T.A.R.T.

With the S.T.A.R.T. application (available online after registering at HySecurity) uploaded to your PC laptop, you can choose to set site menu configurations from the comfort of your office. Then, simply bring your PC laptop to the gate operator site, connect to the gate operator using an RS-232 to serial download cable and USB adapter, and download the configured menu settings file from your laptop to the specified gate operator.

Multiple operators can be configured in this way. No switches need to be set.

All the components are securely placed in a Control Box inside the chassis.

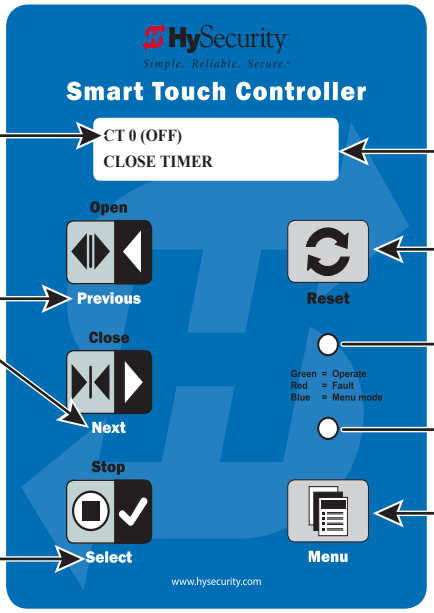


MENU MODE AND THE STC KEYPAD

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.

NOTICE

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



Two blinking characters indicate that the display will accept changes.

32-character display provides information about the menu items.

The **Reset** button is disabled while in Menu Mode.

Next or **Previous** Navigational buttons. Pressing Next or Previous scrolls through the selections.

LED	FUNCTION
GREEN	= Run/Operate
RED	= Fault Mode
BLUE	= Menu Mode

Pressing Select causes the left most two characters to blink, (CT in the example), which indicates the display is ready to accept changes to a menu setting. Use the navigational buttons to view selections. Press **Select** a second time to accept what appears on the display. Entry mode is exited, the two characters stop blinking, and Next or Previous must be pressed to move onto a different display. Pressing Menu exits to Run mode.

The **Menu** button accesses Menu mode. When the menu item is selected and blinking, the Menu button has no function. However, pressing Menu when the 2 characters are static (not blinking), returns the operator to Run Mode.

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

NOTICE

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

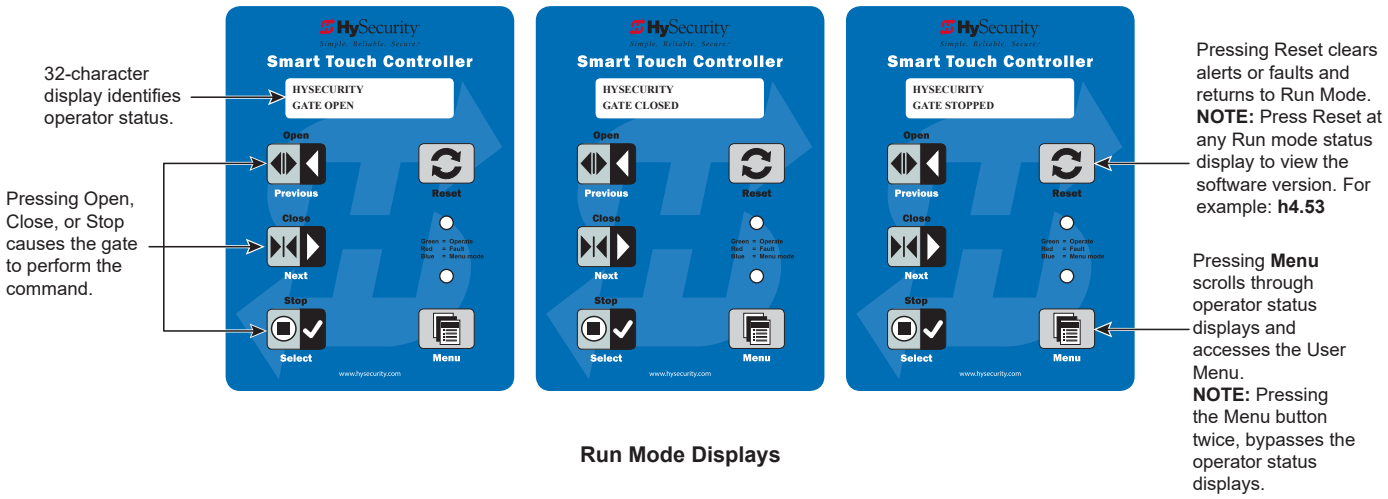
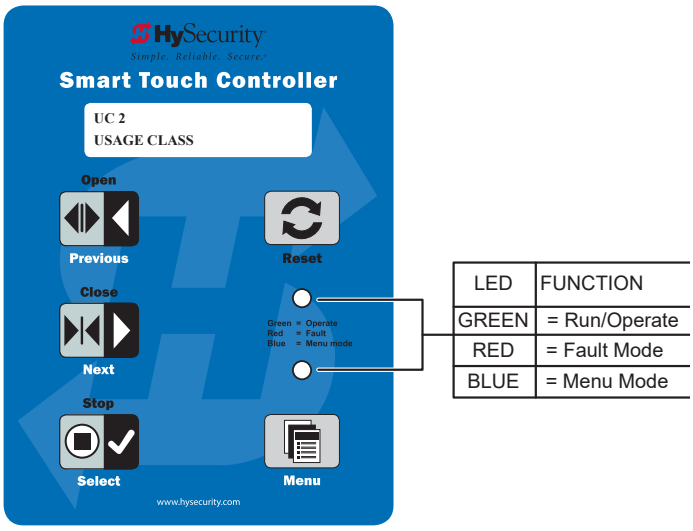


Figure 18. Run Mode Displays

VIEWING GATE OPERATOR SCROLLING STATUS

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), Usage Class (UC), buss voltage, and life cycle counter.



LED	FUNCTION
GREEN	= Run/Operate
RED	= Fault Mode
BLUE	= Menu Mode

Figure 19. View STC scrolling status screen

The following chart describes a few of the scrolling status displays that may appear in your gate operator.

Operator Status Display	Variables	Description
Build Year	Indicates whether the gate operator was manufactured before or after UL 325 -2016 Safety of Standard changes that require monitoring of external entrapment sensors.	All gate operators manufactured in 2016 or later will show Build Year - Post 2016 because it contains software version h4.50. If you plan to upload 4.50 software (or later) into your gate operator, you will need to set the appropriate build year according to the date of manufacture. In h4.60 and h5.60 software, or later, BY 2 is for operators built between January 1, 2016 and July 31, 2018. BY 3 is for operators built after July 31, 2018.
Dual Gate or Sequenced Gate	This display only appears when operator is used in interlocked or sequenced gate systems and indicates operator function. See "Bi-Parting & Dual Gate Systems" on page 96 and "Table 6. User Menu" on page 52.	Indicates, in an interlocked or dual gate setting, whether the operator is set to Primary or Secondary or Sequenced Gate Configuration). The setting is assigned in the Installer Menu.
Operator Type (OT)	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 10 = HydraSupply XL	Indicates and identifies the operator.
Usage Class (UC)	1, 2, 3, or 4	Displays the operator's Usage Class designation per UL 325 standards.
Input Voltage VDC	The number varies depending on the voltage that the power board is providing.	Input voltage (DC Buss voltage) to the STC is shown. Helps to determine proper power connections.
Cycle Count (CC)	One cycle equals a full open and close sequence. Partial cycles are not counted	Displays number of cycles 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. **NOTE:** You can also access the Installer Menu from this display.	Displays the number of seconds before the open gate initiates.

Stop the Status Display Scrolling

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

Change the Contrast on 7 Segment Displays

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

While operator status displays are scrolling, you can change contrast by pressing the up or down arrow keys. The display's contrast changes accordingly.

Display Power Saving Mode

To conserve energy, the display dims after a period of time if no keypress, run command or fault occurs. When an event (keypress, run command, or error/alert/fault notification) occurs, the display returns to full brightness.

Check the Software Version

Press Reset. The display indicates the software version loaded on the gate operator. To upload software, you will need a PC laptop. For more information, see "Smart Touch Analyze and Retrieve Tool (S.T.A.R.T.)" on page 142.

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 "Table 6. User Menu" on page 52.

USER MENU

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

NOTICE

To access the User Menu, the operator must be in Run Mode. To bypass the operator status displays, press the Menu button twice.

Access:

Pressing the Menu button, while the gate status is being displayed initiates the gate operator status to scroll. When the scrolling display stop, the first user menu item appears.

The Close Timer (or HC, Hold to Close) display is the first in a cyclical series of User Menu displays.

The LED on the keypad appears blue to indicate Menu Mode.

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 120.

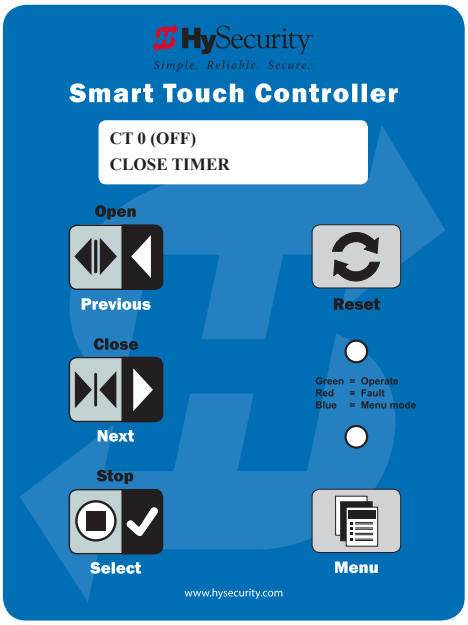


Figure 20. STC Close Timer Display

Table 6 describes the User Menu items and supplies the factory defaults. (Factory default settings shown in bold.)

Table 6. User Menu

User Menu	Setting Options	Menu Tasks & Explanations	STC Wire Connections
CT 0 (OFF) CLOSE TIMER	**0 = (OFF) Timer disabled** 1 second to 99 seconds	Assign how many seconds before open gate initiates automatic closure. Keep setting at 0 if a hardwired, push-button control device is being used. **NOTE:** Assign how many seconds before open gate initiates automatic closure. Keep setting at 0 if a hardwired, push-button control device is being used.	Not applicable (N/A)
HC 0 (OFF) HOLD TO CLOSE	**0 = off** 1 = on	Set to 0 produces 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 automatic close timer and causes its menu to disappear. You must set HC to 1 to comply with UL 325 Type D protection. Refer to Table Notes.	COM Close
HO (OFF) HOLD TO OPEN	**0 = off** 1 = on	Similar to HOLD TO CLOSE, but configures OPEN push button for a constant-hold function. 0 = Momentary open signal 1 = Constant hold open push button required to comply with UL 325 Type D protection.	COM Open
AP 0 AC LOSS	**0 = UPS FAIL OPEN** 1 = UPS FAIL CLOSE 2 = AUTO OPEN 3 = NO CLOSE TIMER	Setting designates what action gate performs during an AC power loss. Menu item only appears on DC powered operators. Setting configures how gate functions when AC power fails. For more information, refer to supplemental documentation.	COM Terminal #21 UPS Terminal strip 24 VDC to control box power disconnect switch - and +
RO 0 (OFF RADIO OPEN/CLOSE	**0 = off** 1 = on	Configures radio input for open only (0). If changed to setting 1 then adds capability for radio input to close gate, but only when gate is fully open.	COM RADIO Open

Table 6. User Menu			
User Menu	**Setting Options**	**Menu Tasks & Explanations**	**STC Wire Connections**
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** 3 = warning buzzer on during gate travel	Controls warn-before-operate buzzer and can be configured three ways: Set to 0: Buzzer is disabled. 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: Available on barrier operators only and UC 4 if sensor inputs set to 1 "NOT USED".* Buzzer beeps when gate starts to move and continues throughout gate travel. **NOTE:** * Gate operators or replacement boards manufactured in 2016 or later.	Not applicable (N/A)
FA 0 (OFF) FORCE OPEN ALERT	**0 = off** 1 = on	Intended for highly secure facilities. Set to 1, operator sounds 3-second "warn before operate" buzzer alarm and initiates a closure if gate is forced open and closed limit switch disengages. Motor starts to secure gate. If gate does not fully close within 4s, motor turns off and buzzer sounds for 30 seconds. Display shows ALERT 1 - FORCED OPEN.	N/A
DA 0 (OFF) DRIFT CLOS ALERT	**0 = off (standard)** 1 = on (detailed)	Set to 1, operator sounds 3-second "warn before operate" buzzer alarm and initiates an open command if gate is forced, or drifts, off open limit switch. The motor starts to reopen the gate. Motor runs for a maximum of 4s and, if gate is not fully open at end of this period, buzzer sounds for 10s. Display shows ALERT 2 - DRIFT CLOSED.	N/A

Table 6. User Menu			
User Menu	**Setting Options**	**Menu Tasks & Explanations**	**STC Wire Connections**
PE 0 (OFF) PHOTO EYE ALIGN	**0 = off** 1 = on	When set to 1, operator serves as an aide in photo-eye emitter/receiver alignment. Buzzer chirps once when emitter and receiver are not aligned. When emitter and receiver are aligned, buzzer chirps twice. If they go out of alignment again, buzzer will chirp once. Alignment Mode is reset with a limit input or reset input.	Sensor 1, 2 or 3 Sensor COM
CL 0 SET CLOCK	**0 = off** 1 = on	To adjust hour, minute, day, or month to a different time zone, select 1. Press Menu to return to User Menu mode when adjustments are complete.	N/A
LD 5 LCD CONTRAST	**5** 0 through 9	Adjusts display contrast. Available settings from low contrast 0 to 9 high contrast, with a factory default setting of 5. **NOTE:** Not used or available with 32 character OLED displays.	N/A
LG 0 (OFF) VIEW EVENT LOG	**0 = off** 1 = on	With h4.52 (or later) software, you can set LG to 1 and view abbreviated event logs on display. These messages are helpful for diagnostic purposes and reviewing gate operator's event history. Over 300 events can be logged before software overwrites existing history. See "Access the Event Log Through the User Menu" on page 150.	N/A
DS 0 (OFF) DIAGNOSTIC LOGS	**0 = off (standard)** 1 = on (detailed)	Set this item to 1 to record all gate operator open and close events, in addition to normal alert, fault and error logs. This parameter automatically resets to default 0 (off) after 24 hours, which is useful when experiencing intermittent problems. Set to 0, STC logs pertinent gate operator events such as faults, errors, or menu manipulation.	To read log file, an RS-232 cable and PC laptop loaded with HySecurity free S.T.A.R.T. software is required. Visit www.hysecurity.com

Table 6. User Menu			
User Menu	**Setting Options**	**Menu Tasks & Explanations**	**STC Wire Connections**
PD 0 SET PASSWORD	**0 = off** 1 = On (Set Password)	A System Address (SA) value in installer Menu must be set before Set Password display appears in User Menu. To enter a password (up to 80 characters) for network connectivity, select 1. You can use menu navigation buttons to enter password. When password is set, display returns to the 0 setting.	Network: Ethernet or RS-485 HyNet configuration

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 "RUN MODE AND THE STC KEYPAD" on page 49.

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.

NOTICE

Installer Menu options can also be confi gured 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

Table 7 describes the Installer Menu items and supplies the factory defaults. (Factory settings shown in bold.)

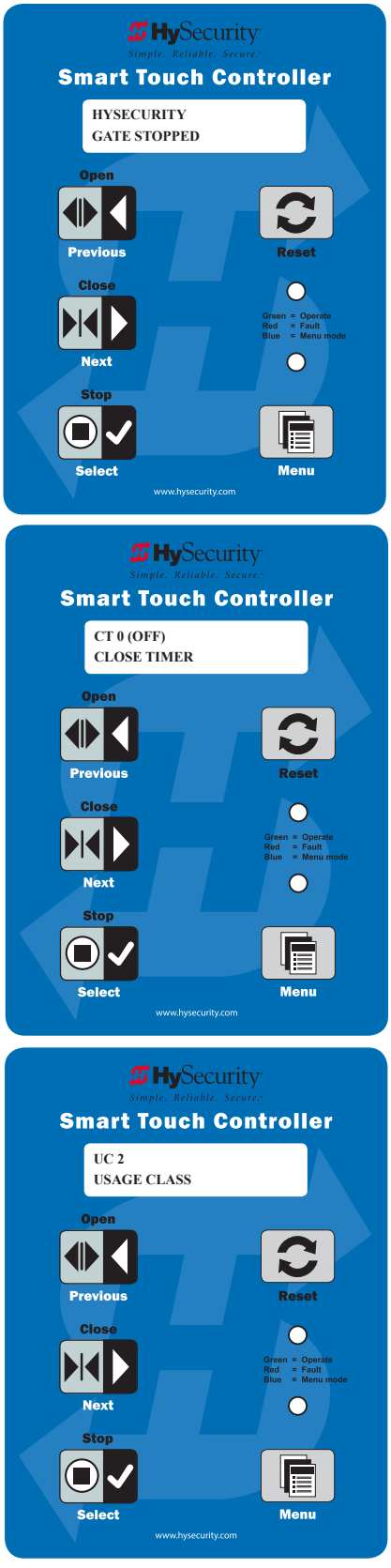


Figure 21. STC Access Installer Menu

Table 7. Installer Menu			
Installer Menu	**Setting Options**	**Menu Tasks & Explanations**	**STC Wire Connections**
OT 0 <model name>	**0 = Operator Type** 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 10 = HydraSupply XL	Select appropriate number for operator. **NOTE:** This menu item only appears if the Smart Touch Controller is being replaced. **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.**	Not Applicable (N/A)
AD 0 AC/DC GATE	0 = gate disabled 1 = AC (alternating current) 2 = DC battery-power 3 = HyInverterAC – Power Supply	Usually, power type (AC or DC) is factory set. Select the type of power that the gate operator uses and is appropriately wired for.	(N/A)
SP 0 SET SPEED (or indicate Modbus control)	**0 = gate disabled** 1 = No ModBus communication** 2 = 2 ft/s 3 = 3 ft/s ****NOTE:** A setting of 1 indicates no ModBus communication or wiring is present. The VFD uses its factory settings to control speed.	Menu item only appears on SlideDriver 50VF series operators. It does not appear with any other operator type.Set gate maximum speed. **CAUTION: Slow Down extended limit ramps must be installed on the drive rails!**	(N/A)
UC 0 USAGE CLASS	**0 = gate disabled** 1 = Residential 1 to 4 units 2 = Comm./public access 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. See "Identifying Gate Operator Category and Usage Class" on page 27.	(N/A)
SH 0 GATE HANDING	**0 = gate disabled** R = Right hand L = Left hand	Handing determines which way gate opens as you view it from operator side. If gate handing is changed after initial setup, operator resets limits. LEARN OPEN display appears when you exit Installer Menu. "Gate Handing" on page 31	(N/A)

[1] Installer Menu items do not appear when Build Year is set to 2 or 3 (BY 2 or BY 3). Exceptions exist for barrier arms, CRASH products, operators set to pre-2016 and Usage Class IV provisions.

Table 7. Installer Menu			
Installer Menu	**Setting Options**	**Menu Tasks & Explanations**	**STC Wire Connections**
BU 0 LOUDEST BUZZER	0 = buzzer not set 1 = Frequency 1 * (on) 2 = Frequency 2 * (on) *Select the loudest buzzer	Usually set at factory. If menu item appears, select either buzzer 1 or 2. Make sure to choose loudest audible buzzer sound for operator type.	(N/A)
FD 0 (OFF) FACTORY DEFAULTS	**0 = custom user settings** 1 = reload factory default settings	Globally restores all menu settings back to new operator status. Select setting 1 to return operator to factory defaults. **NOTE:** If factory defaults are restored, UL usage class, handing, gate weight, and any other modified menu settings will need to be reprogrammed.	N/A
DG 0 (OFF) DUAL GATE	**0 = solo operator (off)** 1 = Secondary unit 2 = Primary unit 3 = Sally Port A 4 = Sally Port B	Configures gate operator as a Primary or Secondary in a dual-gate installation. When you assign one unit as Primary, you must configure other as Secondary through Installer Menu. This menu is also used to configure a Sally Port system by setting one operator to Sally Port A and the other to Sally Port B.	Shielded cable to DUAL GATE input terminals. Connect Dual Gate COM (Gate 1) to Dual Gate COM (Gate 2). Pair wires: A - A, COM - COM, and B - B
SG 0 (OFF) SEQUENCED GATE	**0 = off** 1 = Loop View #1 2 = Loop View #2 3 = Loop View #3 4 = Loop View #4	Establishes communication after wiring two gate operators as sequential gates. This SG menu item only appears if Dual Gate menu item (DG) is set to 0 (solo operator). **NOTE:** After selecting SG settings, consider accessing the User Menu in each gate operator to address Close Timer (CT) setting.	Shielded cable to DUAL GATE input terminals on both operators. Pair wires: A - A, COM - COM, and B - B
CH 0 (AC) CHARGER TYPE	**0 = AC powered charger** 1 = Solar powered charger	Assigns charger type usually set at factory. If set to solar at factory then this menu item is hidden.	

[1] Installer Menu items do not appear when Build Year is set to 2 or 3 (BY 2 or BY 3). Exceptions exist for barrier arms, CRASH products, operators set to pre-2016 and Usage Class IV provisions.

Table 7. Installer Menu			
Installer Menu	**Setting Options**	**Menu Tasks & Explanations**	**STC Wire Connections**
FO 0 (DISABLED) FIRE DEPT OPEN	**0 = disabled** 1 = enabled	Enables Fire Department Open input. When set to 1, open signal received by operator overrides all photoelectric eyes and edge sensors, and opens gate. Pressing OPEN or RESET button is required before gate can be closed.	+24V Fire Dept Open (#24)
OC 0 (DISABLED) EMERGENCY CLOSE	**0 = disabled** 1 = enabled	Enables Emergency Close input. When set to 1, constant hold close overrides vehicle detectors, photo eyes and edge sensors, and closes gate. Pressing Reset button once or Open button twice is required before gate will open.	+24V EMERG CLOSE (#23)
SE 2 IES SENSITIVITY	1 = maximum sensitivity **2 = default setting** 9 = lowest sensitivity	Adjusts sensitivity of IES. Available settings are 1-9 with 9 being least sensitive. HySecurity strongly recommends avoiding setting IES sensitivity higher than 6.	N/A
SS 0 IES STOP ONLY	**0 = Stop, reverse for 2s** 1 = stop only	In a Usage Class 4 environment, operator can be set to stop gate and not reverse gate travel after an IES trip.	N/A
LC 0 LEAF DELAY CLOSE	**0 = none** 1 to 20	Appears if gate operator is set up as a Primary or a Secondary. Available settings are 1 to 20. Each numerical increment adds ½ second, to a maximum of 10 seconds time delay, before operator activates when commanded to close.	

[1] Installer Menu items do not appear when Build Year is set to 2 or 3 (BY 2 or BY 3). Exceptions exist for barrier arms, CRASH products, operators set to pre-2016 and Usage Class IV provisions.

Table 7. Installer Menu			
Installer Menu	**Setting Options**	**Menu Tasks & Explanations**	**STC Wire Connections**
LO 0 LEAF DELAY OPEN	**0 = none** 1 to 10	Appears if gate operator is set up as a Primary or a Secondary. Available settings are 1 to 20. Each numerical increment adds ½ second (with a maximum of 10 seconds) time delay following a command to open before the operator activates.	
RT 0 (60 SECS) MAXIMUM RUN TIME	**0 = 60 Seconds max run** 1 = 300 Seconds max run	Allows an optional setting of 300 seconds if changed to [RT 1] as opposed to maximum run timer default setting of 60 seconds.	N/A
PO 0 (OFF) PARTIAL OPEN	**0 = none** 7 to 99 seconds	Sets distance (from closed gate position) where gate stops if partial open input is activated. When a number is entered in PO display, open partial input becomes operational. Only available in Slide gate operators.	Open Partial #6 COM
EC 0 STOP ONLY EYE CLOSE LOGIC	**0 = Close eye stops only** 1 = 2s reverse to open. 2 = Full open.	Default setting is non-reversal if close photo eye is triggered while closing. A setting of 1 causes gate to reverse toward open for two seconds if triggered while closing. A setting of 2 reverses the gate to full open.	Sensor 1, 2, or 3 Sensor COM COM +24V
EO 0 STOP ONLY EYE OPEN LOGIC	**0 = Open eye stops only** 1 = 2s reverse to close	Default setting is non-reversal if open photo eye is triggered while opening. A setting of 1 causes gate to reverse travel and close for two seconds if triggered while opening.	Sensor 1, 2, or 3 Sensor COM COM +24V
GR 0 FULL OPEN GATE EDGE LOGIC	**0 = Edge reverses full open** 1 = 2s reversal only	Default setting is a full-open reversal if gate edge is triggered while closing. Optional setting of 1 causes gate to reverse for two seconds if triggered while closing.	Sensor 1, 2, or 3 Sensor COM +24V 10K resistor (Edge)

[1] Installer Menu items do not appear when Build Year is set to 2 or 3 (BY 2 or BY 3). Exceptions exist for barrier arms, CRASH products, operators set to pre-2016 and Usage Class IV provisions.

Table 7. Installer Menu			
Installer Menu	**Setting Options**	**Menu Tasks & Explanations**	**STC Wire Connections**
SR 1 REVERSE 25 REVERSAL LOGIC	0 = IES reverses full open **1 = 2s reversal only**	Default setting is a two-second duration reversal if inherent sensor is triggered. Optional setting of 0 will cause gate to reopen fully if triggered while closing.	N/A
PC 1 NO INPUT PHOTO EYE OUTPUT[1]	0 = Normally Open NO input **1 = Normally Closed NC input (monitored)**	Changes occurring in 2016. Default setting is for photo eyes with Normally Close outputs. When set for NC, the connection is monitored and any short circuit fault will generate a FAULT 2 (FAL2) alert. Press the Stop or Reset button to clear.	COM +24V COM PHOTO EYE CLOSE DIRECTION
GC 1 NO INPUT GATE EDGE OUTPUT[1]	0 = Normally Open NO input **1 = Normally Closed NC input (monitored)**	Changes occurring in 2016. The default setting is edge sensor with Normally Closed (NC) output. The optional setting of 0 requires an (NO) output.	COM +24V COM EDGE SENSOR
S1 0 SENSOR #1 TYPE	0 disabled 1 (NOT USED) 2 (EYE CLOSE) 3 (EDGE CLOSE) 4 (EYE OPEN) 5 (EDGE OPEN) 6 (EDGE BOTH) 7 (EYE BOTH)	UL 325 - 2018 sensor input setting for external entrapment protection sensor monitoring. All three sensor types must be configured to a non-zero number before gate operator will move gate. See "External Entrapment Protection Sensors: What the Installer Needs to Do" on page 38.	SENSOR 1 COM +24V SENSOR COM 10K resistor* *(Wired Edge sensor)
S2 0 SENSOR #2 TYPE	Same as Sensor 1	Same as Sensor 1	SENSOR 2 COM +24V SENSOR COM
S3 0 SENSOR #3 TYPE	Same as Sensor 1	Same as Sensor 1	SENSOR 3 COM +24V SENSOR COM

[1] Installer Menu items do not appear when Build Year is set to 2 or 3 (BY 2 or BY 3). Exceptions exist for barrier arms, CRASH products, operators set to pre-2016 and Usage Class IV provisions.

Table 7. Installer Menu			
Installer Menu	**Setting Options**	**Menu Tasks & Explanations**	**STC Wire Connections**
DT 0 FREE EXIT DISABLE FUNCTION	**0 = Disable Free Exit** 1 = Disable Close Timer	Configures BLOCK EXIT input to disable either Free Exit Detector function or, alternately, Close Timer function. Default setting disables free exit detector. **NOTE:** Free exit is disabled when gate is at its closed limit. If closed limit is not tripped, free exit continues to work normally.	DISABLE EXIT DETECTOR (#9) COM
TC 1 (INTLOCK) TIME CLK/ INTLOCK	0 = TIME CLK (Select Time Clock) **1 = INTLOCK (Select Open Interlock)**	Configures input at Terminal No. 7 on STC to be either gate interlock function, or for an external time clock to open input. Default setting is (TC_1) for interlock function.	INTERLOCK OPEN (#7) COM
OR 1 REVERSE OUTSIDE OBS LOOP	0 = Pause closing only **1 = Enable reversing to open** 2 = Ignore and continue closing*	Default is for full reversal when Outside Obstruction Loop is triggered while closing. A setting of 0 causes gate to only pause when triggered. Gate closure continues as soon as loop is clear again. *A setting of 2 is only available on CRASH barriers and provides for most secure facilities where it is essential that loop trigger is completely ignored and barrier arm continues closing without pause or reversal.	OUTSIDE OBS LOOP (#11) COM ,or, connection to Hy5B detector

[1] Installer Menu items do not appear when Build Year is set to 2 or 3 (BY 2 or BY 3). Exceptions exist for barrier arms, CRASH products, operators set to pre-2016 and Usage Class IV provisions.

Table 7. Installer Menu			
Installer Menu	**Setting Options**	**Menu Tasks & Explanations**	**STC Wire Connections**
IR 1 REVERSE INSIDE OBS LOOP	0 = Pause closing only **1 = Enable reversing to open** 2 = Ignore and continue closing*	Default is for full reversal when Inside Obstruction Loop is triggered while closing. A setting of 0 causes gate to only pause when triggered. Closure begins as soon as 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 Hy5B detector
HD 1 HOLD CLOSE CENTER LOOP HOLD	0 = Hold Open only **1 = Hold Close and hold Open**	**Swing gates:** Configures Center Loop (Shadow Loop) function when triggered: Setting 1 - holds gate from starting open and from starting close. This setting prevents gate opening and closing when Center Loop is tripped if gate is on either (opened or closed) limit switches. Setting 0 - holds gate from starting closed. This setting prevents closing when on open limit switch.	CENTER LOOP (#10) COM or connection to Hy5B detector
[1] Installer Menu items do not appear when Build Year is set to 2 or 3 (BY 2 or BY 3). Exceptions exist for barrier arms, CRASH products, operators set to pre-2016 and Usage Class IV provisions.			

Table 7. Installer Menu			
Installer Menu	**Setting Options**	**Menu Tasks & Explanations**	**STC Wire Connections**
DL 1 STANDARD DETECTOR LOGIC	**1 = Standard** 2 = Quick Closed 3 = Forced Time Out 4 = Full anti-tailgate	This selection determines whether close timer begins to count down after vehicles have departed detector loops or whether close timer will count down while loops are occupied. Gate can only close when all loop detectors are clear. Default settings causes Close Timer to start when all loops are clear. A setting of 2 causes Close Timer to start when open limit is reached. A setting of 3 forces Close Timer to 0 when OOLD and IOLD are tripped simultaneously. A setting of 4 stops gate when OOLD and IOLD are tripped simultaneously and closes from that point when loops clear. See "Anti-TailGate Mode (Closing Logic)" on page 91. **NOTE:** Does not appear in barrier gate operators.	Hy5B
RL 1 CLOSE LIM RELAY 1 LOGIC	0 = Disabled **1 = Close limit active** (1 to 33 available)	Configures user 1 output relay function, which is an electromechanical relay. It has capacity to switch, both AC and DC and can be used for high voltage and/or high current loads. Connect devices directly to top of relay: COM plus NO and NC contacts. Up to 45 optional relay functions exist. Refer to "Figure 26. STC and Accessory Devices" on page 77.	User 1 Relay

[1] Installer Menu items do not appear when Build Year is set to 2 or 3 (BY 2 or BY 3). Exceptions exist for barrier arms, CRASH products, operators set to pre-2016 and Usage Class IV provisions.

Table 7. Installer Menu			
Installer Menu	**Setting Options**	**Menu Tasks & Explanations**	**STC Wire Connections**
R2 6 GATE LOCK RELAY 2 LOGIC	**0 = Disabled** **6 = Gate Lock** 1 to 33 available	Configures User 2 output relay function. It has capacity to switch both AC and DC loads and can be used for high voltage and/or high current loads. Connect devices directly to relay top: COM plus NO and NC contacts. Multiple optional logic function options exist. Refer to "Figure 26. STC and Accessory Devices" on page 77.	User 2 Relay
R3 1 CLOSE LIM RELAY 3 LOGIC	0 = Disabled **1 = Close Limit** 1 to 33 available	Relay 3 configures User 3 output relay function, which is an electronic relay with capacity for switching a DC load only. In the StrongArm M30/M50, Relay 3 is connected to gate LED lighting and does not appear as an Installer Menu option.	User 3 Relay
R4 through R11 RELAY <n> LOGIC	**0 = Disabled** 1 to 33 available	Similar to Relay 1 Logic. **NOTE:** The Hy8Relay™ module option can be purchased for eight additional NO relay outputs. Relay #39 set aside for Factory Use.	COM **NOTE:** R4 through RB user relays appear on 7-segment display
TL 2 (45 SECS) OPEN TIME ALERT	0 = 0s delay 1 = 15s **2 = 45 second delay** 3 = 75s 4 = 105s 5 = 135s	Adjusts time delay before activating a user relay. Maximum time setting is 135 seconds. **NOTE:** **NOTE:** This menu controls a user relay set to Function No. 8	User Relay 8

[1] Installer Menu items do not appear when Build Year is set to 2 or 3 (BY 2 or BY 3). Exceptions exist for barrier arms, CRASH products, operators set to pre-2016 and Usage Class IV provisions.

Table 7. Installer Menu

Installer Menu	Setting Options	Menu Tasks & Explanations	STC Wire Connections
LT 3 (75 SECS) LOITERING ALERT	0 = 0s delay 1 = 15s 2 = 45s **3 = 75 second delay** 4 = 105s 5 = 135s	This function monitors activation of Outside Obstruction Loop when the gate is closed and not running. When adjustable period of time is exceeded, User Relay No. 13 triggers and reports loitering in diagnostics log. Adjust time delay before activating user relay.Maximum time setting is 135 seconds. **NOTE:** This menu controls a user relay set to Function No. 13	User Relay 13
SA 0 (OFF) STC ADDRESS	**0 = No network** 1 to 99 = Network "drop" address	Set system address for network communication: 0 = no network communication 1 - 99 sets individual polling addresses. Use addresses 1-4 when connecting to HyNet.	RS-485.
NE 0 (OFF) NETWORK SETUP	**0 = No network** 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. Used with HyNet™.	RS-485. Involves HyNet™ & software.
ID 0 HYINVERTER DIAGNOSTICS	0 = no diagnostics displayed 1 = view diagnostics displays HYINVERTER INPUT - LINE xxx.x VAC HYINVERTER TEMP - xxx.xF / xxx.x C HYINVERTER VOLTS - BATTERY xx.x VDC HYINVERTER - BATTERY xxx.x %	Controls which system diagnostics appear on display. With a setting of 1, you can access the AC Power Supply with HyInverter AC diagnostic mode. Use gate operator keypad's Next or Previous buttons to view diagnostics on the STC display. **NOTE:** These same diagnostics appear on AC Power Supply with HyInverter AC display in a constant scrolling format.	AC Power Supply with HyInverter AC to STC (Modbus RTU communication protocol via RS-485.)

[1] Installer Menu items do not appear when Build Year is set to 2 or 3 (BY 2 or BY 3). Exceptions exist for barrier arms, CRASH products, operators set to pre-2016 and Usage Class IV provisions.

Table 7. Installer Menu			
Installer Menu	**Setting Options**	**Menu Tasks & Explanations**	**STC Wire Connections**
ELD0 RUN MODE EXIT LOOP SET	**0 = Run mode** 1 = Show frequency 2 = Show call level 0-7 3 = Set Frequency	Controls Hy5A or Hy5B Free Exit detector. If an Hy5B is used, additional settings of 4-8 are available.	Hy5B
ILD0 RUN MODE IND OBS LOOP SET	**0 = Run mode** 1 = Show frequency 2 = Show call level 0-7 3 = Set Frequency	Controls Hy5A or Hy5B Free Exit detector. If an Hy5B is used, additional settings of 4-8 are available.	Hy5B
OLD0 RUN MODE OUT OBS LOOP SET	**0 = Run mode** 1 = Show frequency 2 = Show call level 0-7 3 = Set Frequency	Controls Hy5A or Hy5B Free Exit detector. If an Hy5B is used, additional settings of 4-8 are available.	Hy5B
SLD0 RUN MODE SHADOW LOOP SET (Reset Loop Set)	**0 = Run mode** 1 = Show frequency 2 = Show call level 0-7 3 = Set Frequency	Controls Hy5A or Hy5B Free Exit detector. If an Hy5B is used, additional settings of 4-8 are available.	Hy5B

[1] Installer Menu items do not appear when Build Year is set to 2 or 3 (BY 2 or BY 3). Exceptions exist for barrier arms, CRASH products, operators set to pre-2016 and Usage Class IV provisions.

SETTING THE CLOSE TIMER

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. It is recommended that every gate operator 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 gate operator, 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.

NOTICE

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.

2. Use the Select, and then Next or Previous buttons to navigate and change the number of seconds appearing on the display. Refer to "RUN MODE AND THE STC KEYPAD" on page 49.

3. To exit the User Menu, press the Menu button. The gate status appears in the display indicating you have returned to Run Mode.

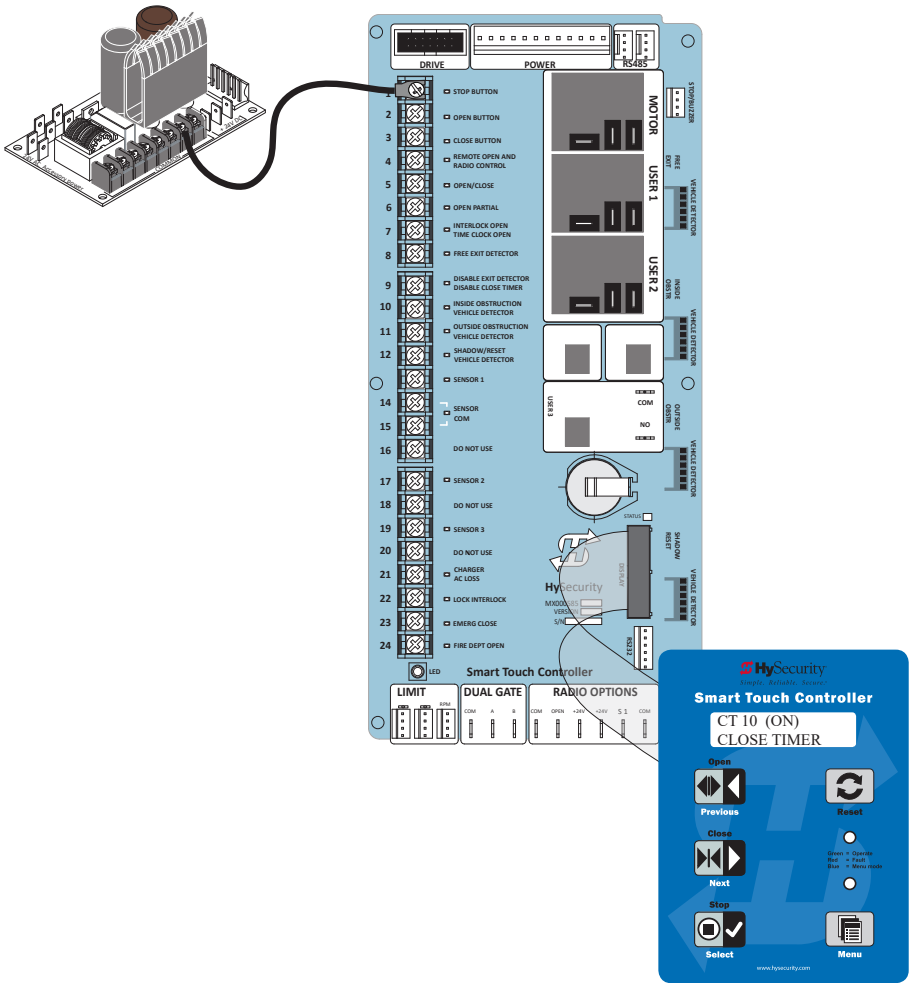


Figure 22. Setting Close Timer

TEST THE OPERATOR

Complete the installation by testing the operation of the gate.

NOTICE

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.

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 sensor inputs.

NOTICE

If additional accessories are to be added, read about "STC Inputs & Wiring" on page 84.

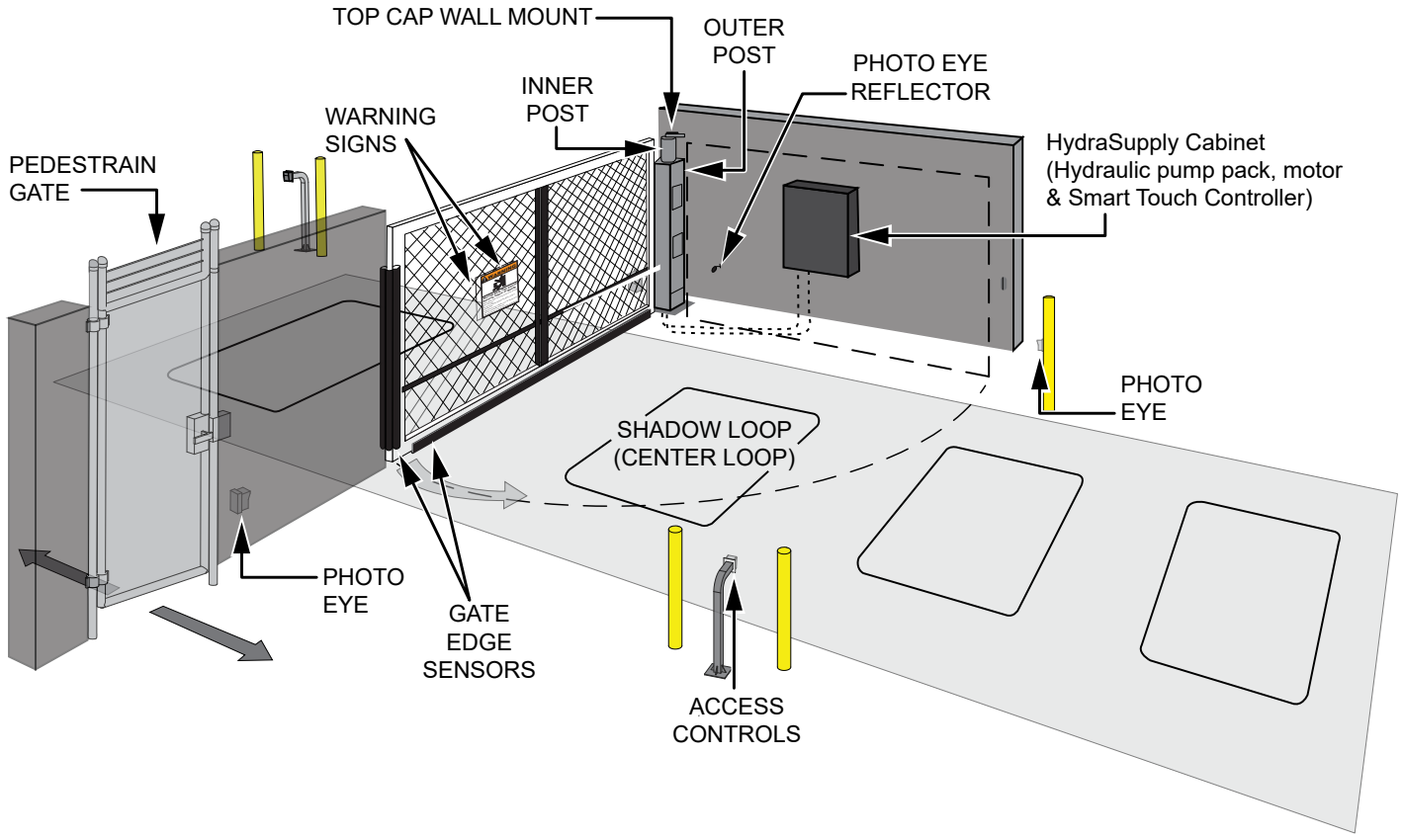


Figure 23. SwingRiser Site Example

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
- Adapt User Relays for your Gate Site

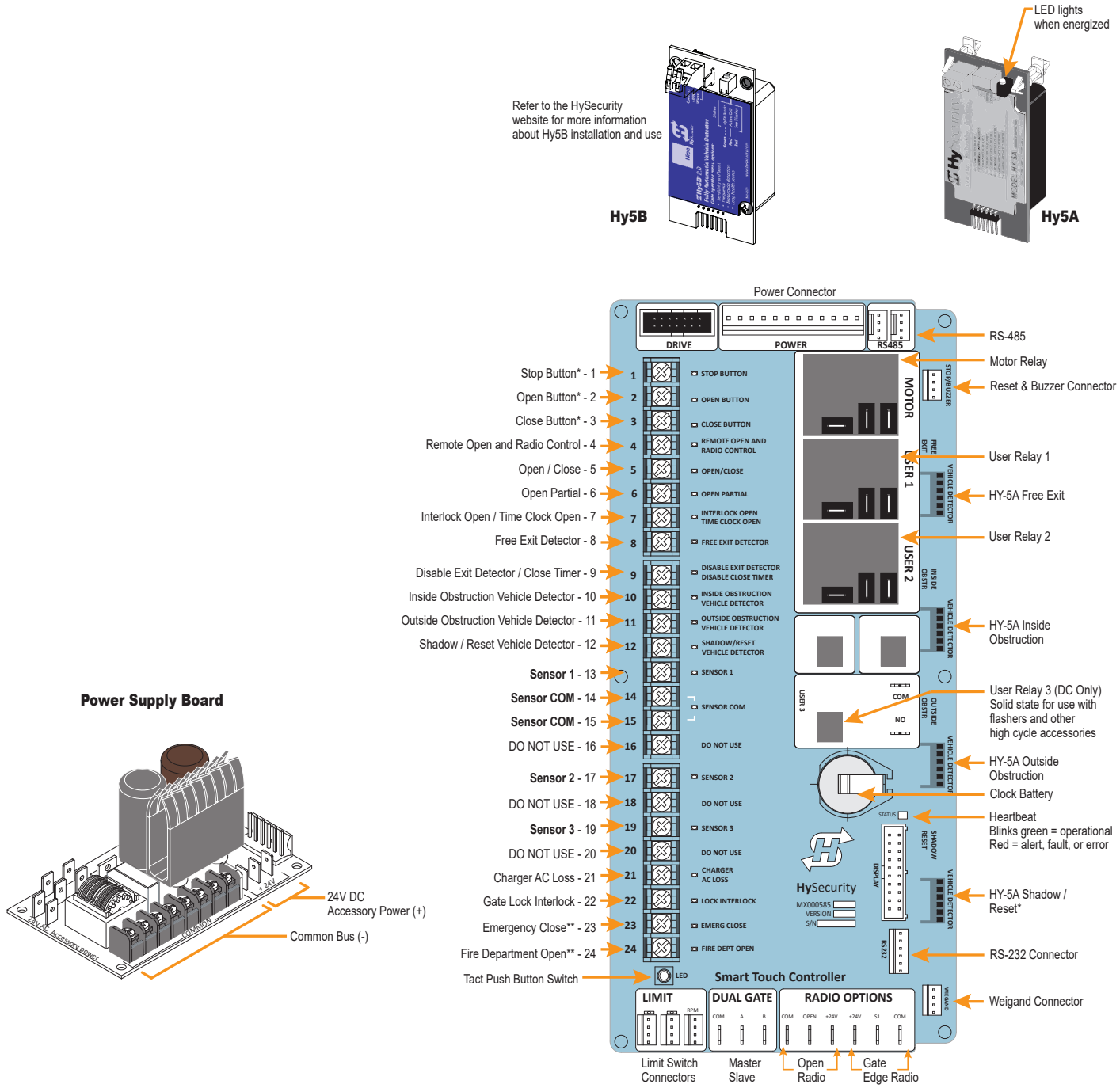
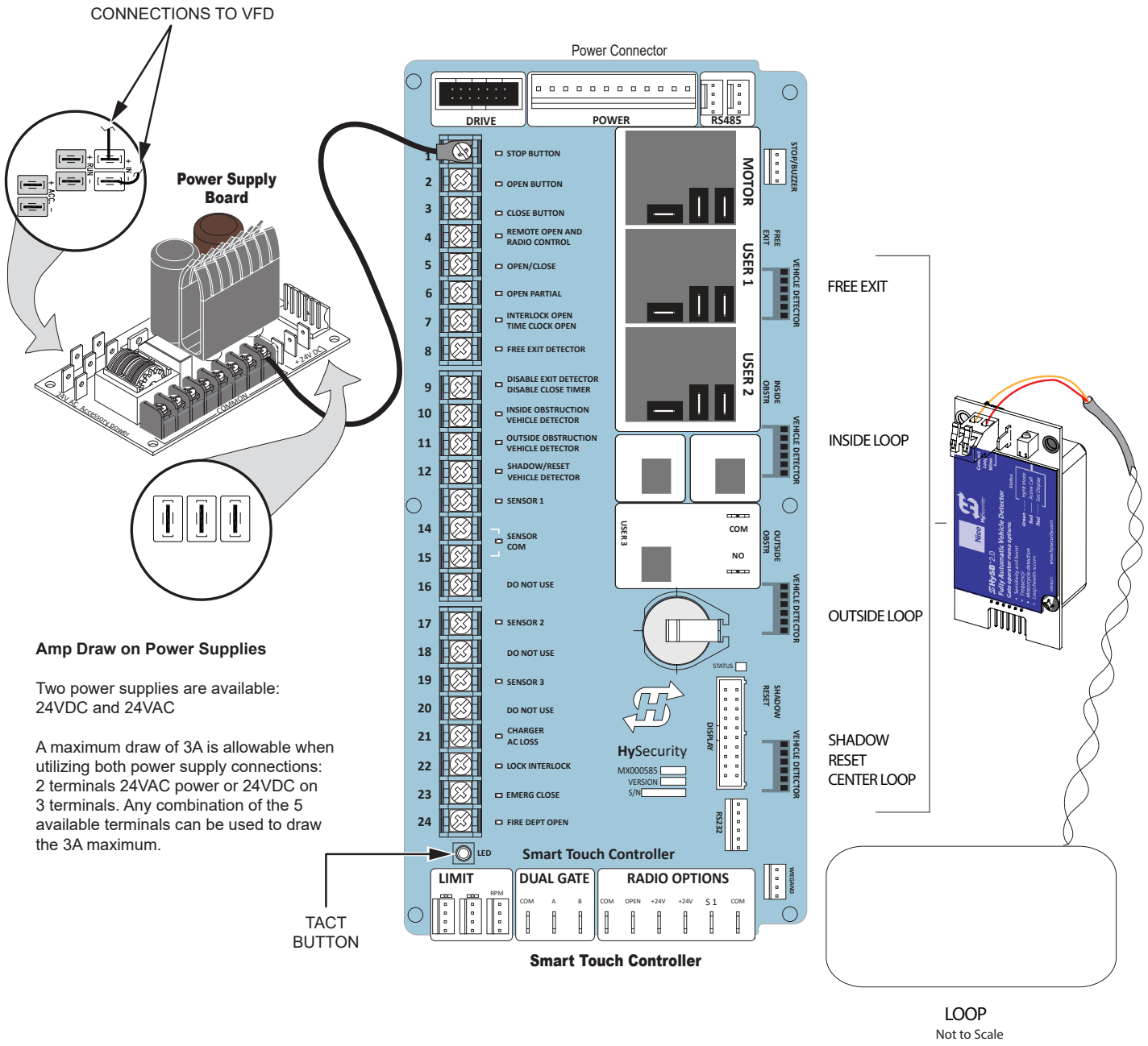


Figure 24. STC Board and Hy5A and Hy5B

OVERVIEW OF THE STC AND POWER SUPPLY BOARD

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 121.



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.

Figure 25. STC and Power Supply Board

INTEGRATING WITH SECURITY SYSTEMS AND HYNET™ GATEWAY

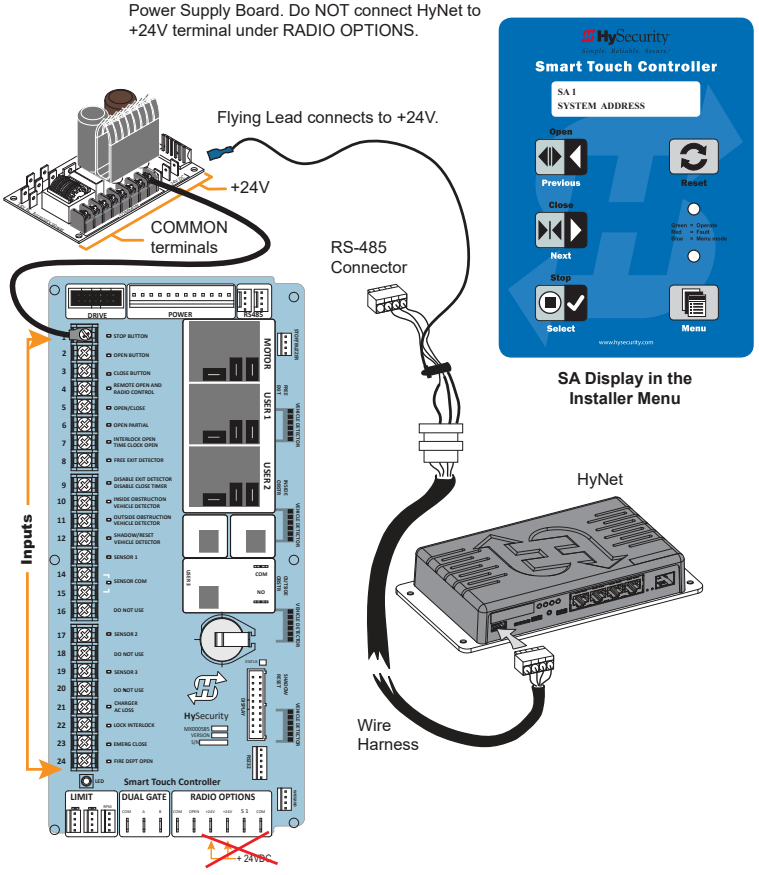
HySecurity hydraulic gate operators provides a 2-wire, serial interface (RS-485 connection) which allows remote access to one or more operators. With software protocols provided by HySecurity, bi-directional status updates and control commands are easily integrated with a central controller (computer 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.

The RS-485 interface is also used to communicate with the HyNet Gateway, a web-enabled interface. To view the user guide and quick start information regarding HyNet Gateway SFP 4/1, go to the HySecurity website, Technical Support Installation Manuals.

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 14.

NOTE: Connect HyNet power to +24VDC on the Power Supply Board. Do NOT connect HyNet to +24V terminal under RADIO OPTIONS.



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.

NOTICE

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 Supply Board.

NOTICE

The Emergency Close and Fire Dept. Open inputs are an exception and require a +24V input. The +24V is located on Power Supply Board next to the Common Bus. See drawing on previous page.

STC TERMINAL INPUTS

⚠ WARNING

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 are being constantly monitored and supervised.

NOTICE

UL 325 2016 sensor input label changes shown in **Bold**.

Table 8. Smart Touch Controller Inputs Chart				
No.	**Smart Touch Terminal UL 325 - 2016**	**Smart Touch Terminal pre-2016**	**Wire Connections**	**Commonly used for...**
1	Stop Push Button	Stop Push Button	Normally Closed (N.C.) input. Jumper to Common if input is not being used.	Line of sight, external stop button or 3-button station.
2	Open Push Button	Open Push Button	Normally Open (N.O.) input. Not for radio or remote access controls.	Line of sight, external open button or 3-button station.
3	Close Button	Close Button	N.O. input. Connection for a close push-button.	Line of sight, external open button or 3-button station.
4	Remote Open & Radio Control	Remote Open & Radio Control	N.O. input. For radio/ remote open device - Program to also Close in User Menu (RO 1).	Remote access control or radio controls
5	Open/Close Button	Open/Close Button	Connection for push button or radio controls.	Singular button device(multi-function)
6	Partial Open	Partial Open	N.O. input. This input will cause the gate to open to the Partial Open position programmed in the Installer Menu (7-32ft). **NOTE:** Terminal is only used in slide gates. Adjustable through the Installer Menu from 7 to 99.	Monitored access controls
7	Interlock Open/Time Clock Open LED	Interlock Open/Time Clock Open LED	The default is Interlock Open (TC 1) but can be configured as Time Clock Open (TC 0) input. Refer to your gate operator's product manual.	Sequenced or interlocked gate inputs. Another use for this input is connection to a device that regulates the open timing.

*Do not connect an external control to STOP or OPEN inputs unless controls are located in clear view of entire gate area.

**Use RADIO OPEN input or RADIO OPTIONS spade connections for all out-of-sight controls, such as a telephone entry or radio operated controls.

***Fire Department Open control must be keyed or guarded so that it can only be used by authorized personnel.

Table 8. Smart Touch Controller Inputs Chart				
No.	**Smart Touch Terminal UL 325 - 2016**	**Smart Touch Terminal pre-2016**	**Wire Connections**	**Commonly used for...**
13	**SENSOR 1**	Edge Sensor	N.C. input. Monitored External Entrapment sensor connection. Type of sensor used is programmable in Installer Menu (S1). Refer to "Table 7. Installer Menu" on page 57.	External entrapment sensors.
14	**Sensor COM**	Photo Eye Power -24V Common	When External Entrapment Sensor common wires are connected to this terminal, the sensors are energized when AC Power is present. The devices are then checked for presence and correct operation when the open limit is reached. Refer to "How Software Handles Monitoring External Entrapment Protection Sensors" on page 38 and "Wiring HySecurity Sensors:Smart Touch" on page 150.	Device common power. Connect external entrapment protection sensors to these terminals. Sensors energize only when the gate operator receives a run command. Use these terminals to preserve battery power. **NOTE:** For pre-2016 gate operators, inputs are labeled as Photo Eye Power and 24V Common.
15	**Sensor COM**	Photo Eye Power -24V Common		
16	Do Not Use	Do Not Use		
17	**SENSOR 2**	Photo Eye Open direction	N.C. input. Connection of a Monitored External Entrapment sensor. Type of sensor used is programmable in Installer Menu (S2). Refer to How Software Handles Monitoring External Entrapment Protection Sensors on page 27.	Connection to external entrapment protection sensors.
18	Do Not Use	Do Not Use		

*Do not connect an external control to STOP or OPEN inputs unless controls are located in clear view of entire gate area.

**Use RADIO OPEN input or RADIO OPTIONS spade connections for all out-of-sight controls, such as a telephone entry or radio operated controls.

***Fire Department Open control must be keyed or guarded so that it can only be used by authorized personnel.

Table 8. Smart Touch Controller Inputs Chart				
No.	**Smart Touch Terminal UL 325 - 2016**	**Smart Touch Terminal pre-2016**	**Wire Connections**	**Commonly used for...**
19	**SENSOR 3**	Photo Eye Close direction	N.C. input. Connection of a Monitored External Entrapment sensor. Type of sensor used is programmable in Installer Menu (S3).Refer to "How Software Handles Monitoring External Entrapment Protection Sensors" on page 38.	Connection to external entrapment protection sensors.
20	Do Not Use	Do Not Use		
21	Charger AC Loss	Charger AC Loss	Connection from battery cabinet.	DC battery type operators only.
22	Lock Interlock	Lock Interlock	Refer to user relay option 23.	Locking mechanisms.
23	Emergency Close	Emergency Close	Activate with +24. Refer to OC setting in the "Table 7. Installer Menu" on page 57.	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	Fire Dept Open	N.O. input. Jumper to +24. See the "Table 7. Installer Menu" on page 57.	Emergency Open must be enabled via Installer Menu. It is energized by connecting to +24V terminal above it. EMERG OPEN overrides photo eye & edge sensor commands.

*Do not connect an external control to STOP or OPEN inputs unless controls are located in clear view of entire gate area.

**Use RADIO OPEN input or RADIO OPTIONS spade connections for all out-of-sight controls, such as a telephone entry or radio operated controls.

***Fire Department Open control must be keyed or guarded so that it can only be used by authorized personnel.

CONNECTING ACCESSORY DEVICES

Sensors, such as gate edges and photoelectric beams, protect against potential entrapment. These external entrapment protection sensors must be monitored for the gate installation to be in compliance with the 2018 revision to UL 325 Standard of Safety.

NOTICE

Always check your local area codes and comply with all regulations.

Other types of accessory connections are shown in the following illustration. All accessories require a minimum of two connections:

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

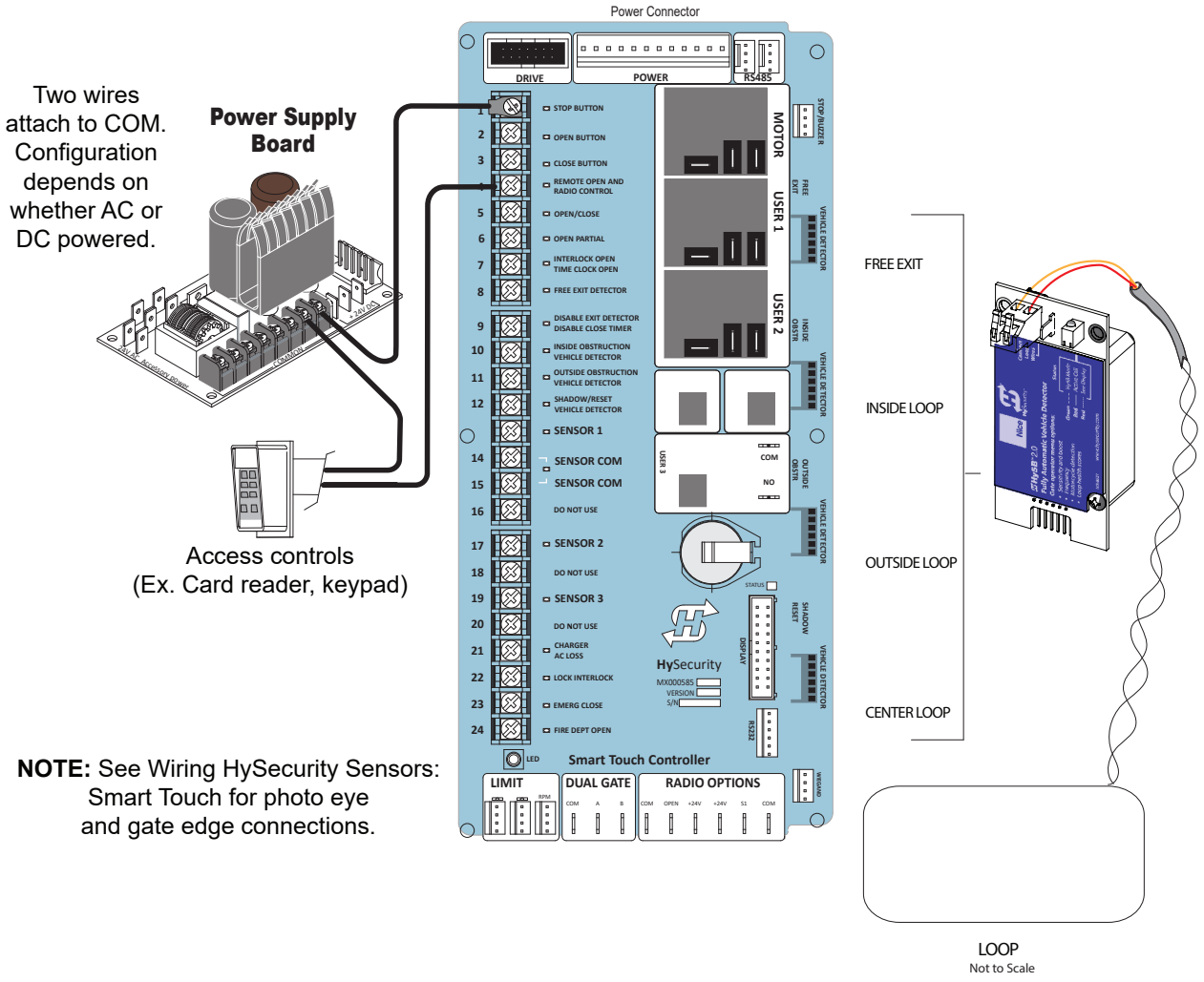


Figure 26. STC and Accessory Devices

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 Relay 1 and User Relay 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.

NOTICE

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.

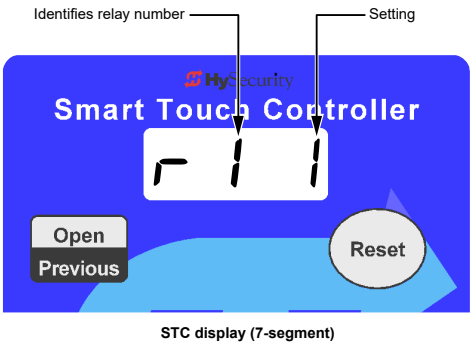


Figure 27. STC 7-Segment Display

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. See "Table 7. Installer Menu" on page 57. For example: R1 13 (RELAY LOGIC 1) or R2 15 (RELAY LOGIC 2).
2. Select the appropriate function (1 through 33) 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 "RUN MODE AND THE STC KEYPAD" on page 49.

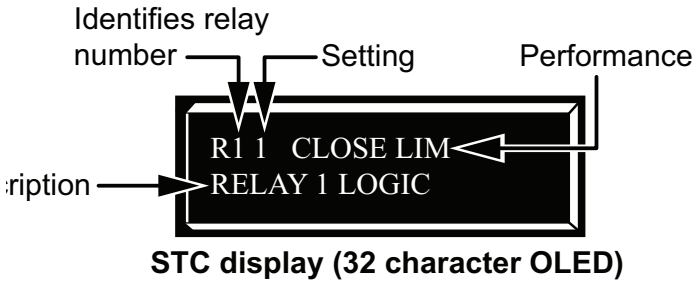


Figure 28. STC 32-character OLED Display

Table 9. Programmable User Relays			
Setting	**Performance**	**Description**	**Wire Connection**
1	Close limit output	Creates an interlock signal to another operator's interlock input, or simply to indicate that gate is secure or not. Relay is released when fully-closed limit switch is tripped. Relay is energized when fully-closed limit is released. (Any open command energizes 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 open-limit is released or a close command is received.	Relay 1, 2 or 3
4	Open limit pulse output	Triggers a sequenced barrier arm gate operator to open. Generates a brief pulsed-output when open-limit is triggered. An additional pulse is also generated with any new open command even when gate is already fully-opened.	Relay 1, 2 or 3
5	Warn before/during operate output	Controls an external warning device. This output is active whenever internal warn before operate buzzer is sounding but the relay output is constant on. Activation timing of this relay is controlled by setting User Menu for Warn Before Operate [bF].	Relay 1, 2 or 3
6	Gate Lock output	Controls external solenoid locks or magnetic locks. In both directions of travel, this output is activated about 7/10ths of a second before operator starts moving the gate.	Relay 1, 2 or 3
7	Gate forced open output	Activated if gate is forced off closed limit switch and operator is not able to restore gate to full closed position within four seconds. The buzzer resets itself in 30 seconds but relay stays active until gate receives a run command.	Relay 1, 2 or 3
8	Gate open too long output	Activates when gate is open longer than the user-selected period of time. Adjustable from a 0 second to 135 seconds delay in 15-second increments. **NOTE:** TL - OPEN TIME ALERT adjustments can be made in Installer Menu.	Relay 1, 2 or 3
9	Safety Mode Alert output	Activated when system is in Safety Mode or Entrapment Mode. Safety Mode occurs upon an impact with an obstruction. Entrapment Mode means gate is stopped and occurs if inherent entrapment sensor triggers while system is in Safety Mode.	Relay 1, 2 or 3

Table 9. Programmable User Relays			
Setting	**Performance**	**Description**	**Wire Connection**
10	Entrapment Mode Alert output	Activated only when system is in Entrapment Mode.	Relay 1, 2 or 3
11	Unauthorized Vehicle Entry output	Activated when a second vehicle enters from outside without a valid input from an access control device. The OOLD and IOLD loops must be capable of being triggered at the same time for this relay to ever activate. This output releases when an access control input signals open or gate reaches the close limit position.	Relay 1, 2 or 3
12	Outside Obstruction Vehicle Detector output	This output is active whenever Outside Obstruction Loop Detector is tripped. Interlocks an entry device to prevent pedestrian use.	Relay 1, 2 or 3
13	Loitering Alert	Indicates vehicle is loitering on Outside Obstruction Loop with the gate closed. Adjustable from a 0 second to 135 second delay in 15-second intervals. **NOTE:** LT - LOITERING ALERT adjustments can be made in Installer Menu	Relay 1, 2 or 3
14	Gate nearing full travel output (Nearing Limit)	Activated when gate is approaching full open or full closed. Relay activates three feet from where software expects limit switch to be triggered whether moving toward full open, full close, or in a reverse travel mode.	Relay 1, 2 or 3
15	Gate failure output (Fault mode alert)	Activated to report occurence of problem. Indicates the system is in an Error, Fault, Alert, or Entrapment Mode. If active, gate is disabled.	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 (Low battery alert)	**DC operators only.** Activated when battery power is very low, but output ceases when battery is dead (18 volts). The relay is triggered when the battery is less than 20 volts.	Relay 1, 2 or 3
19	Flasher Relay	Controls flashing lights to pulse once per second. Relay is constantly pulsing except when open limit switch is triggered. Recommended to use User Relay 3 since it is an electronic relay	Relay 1 or 2* (Relay 3)
20	Free Exit Loop Vehicle Detector output	Active whenever Free Exit Loop is tripped.	Relay 1, 2 or 3
21	Inside Obstruction Vehicle Detector output	Active whenever Inside Obstruction loops is tripped.	Relay 1, 2 or 3

Table 9. Programmable User Relays			
Setting	**Performance**	**Description**	**Wire Connection**
22	Center Loop Detector output	Active whenever Center (Shadow) loop detector is tripped.	Relay 1, 2 or 3
23	External Latching gate Lock Output (Prison Lock)	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 partial open position is reached or exceeded.	Relay 1, 2 or 3
25	DC Power OK Alert Battery OK Alert	Deactivates when 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 Exit Vehicle Detector Pulse	Outputs a 250ms pulse when the free exit vehicle detector is tripped.	Relay 1, 2 or 3
27	Not Open (requires AC power)	Activated when gate is not on open limit and AC power is present. Deactivated when AC power fails or gate is on open limit.	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
41	Test Open Pulse	Output pulses five seconds after close limit is activated. Typically used for cycle testing.	Do not use
42	Break-Away Switch Output	Activates when arm break-away switch is tripped.	
43	Warn Before	Relay is active while warn before and motor running.	Relay 1, 2,or 3
44	Partial Open Pulse	Pulses for 250ms when gate, commanded with Partial Open input, reaches Partial Open Limit, or, gate is past Partial Open Limit and Partial Open input is activated.	Relay 1, 2,or 3
45	Outside Obstruction/ Arming Loop Detector	Activated when OOLD/OALD detector input tripped and gate closed. Used for 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 accessed through the Installer Menu. Set the number for the relay based on the information found in "Table 9. Programmable User Relays" on page 79.

Wire communication cable connections between the DUAL GATE ports, at the base of the STC, and the extended mechanical relay module. Refer to instructions that accompany the Hy8Relay Module.

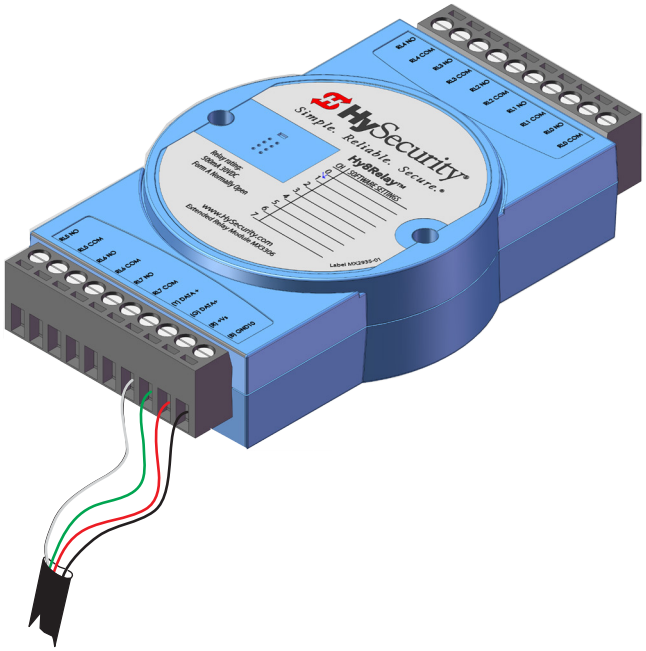


Figure 29. Hy8Relay Module

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 (STC). 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.

NOTICE

RS-485 communication is available for networked security systems. For additional information, refer to "Connecting Sequenced Gates" on page 87. The SwingRiser Twin is comprised of two gates run with one motor and one Smart Touch Controller. SwingRiser Twin models are categorized as singlular systems, not dual gate systems.

CONNECTING AN INTERLOCKED PAIR (DUAL GATE)

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

NOTICE

Both SwingRiser gate systems need to have compatible software versions installed on their Smart Touch Controllers.

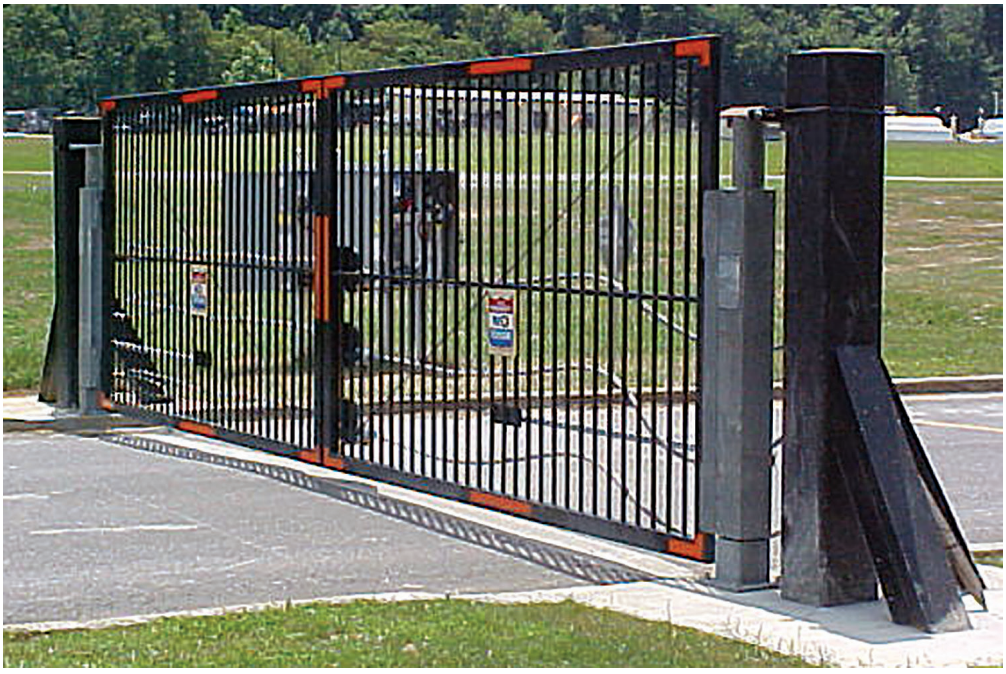


Figure 30. Bi-parting SwingRisers

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.

⚠ CAUTION

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.

NOTICE

Use a 2-pair, twisted, shielded cable with one pair of wires used to connect A-A and B-B terminals between the two boards. The other pair will connect the Common terminals. The shield should then be grounded on one end to one of the operators.

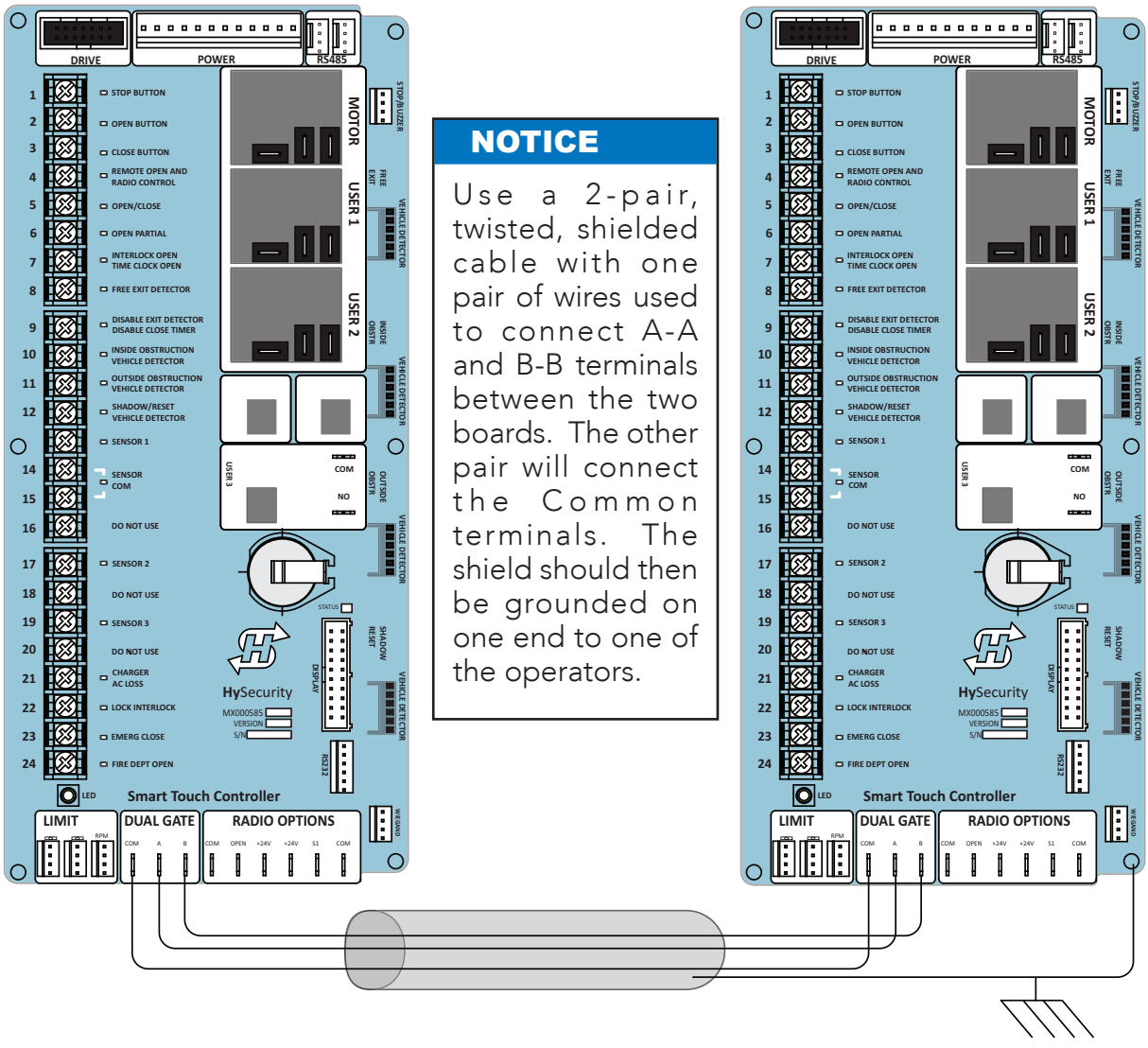


Figure 31. Wire Diagram: Interlocked Pair of Operators wired to DUAL GATE Inputs

DUAL OR SEQUENCED GATES: POWER, SOFTWARE & ACCESSORY REQUIREMENTS

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

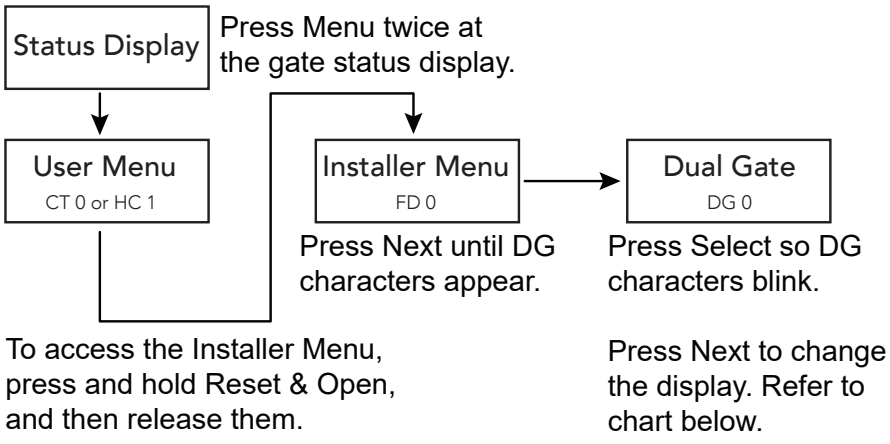
- An electrical conduit for interconnecting wires must span between the two operators. The dual gate communication wires and any low voltage control wires must be installed in a conduit that is separate from the high voltage power cables.
- Complete the installation of both operators as separate machines 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. The software version appears beneath the word HYSECURITY. Keep the most current software loaded. Software downloads are available at 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 external entrapment protection sensors) may be connected to either gate operator in a Primary/Secondary configuration without regard to preference. In a Sally Port configuration, the external control inputs must be connected to each controller as only one gate is allowed to be off the open limit at a time.
- Both operators can not be connected to the same 20A circuit breaker in the main panel. The wire size affects operator performance.

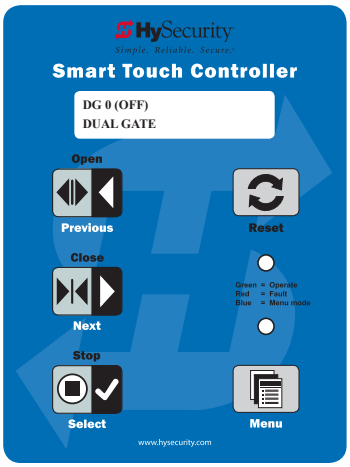
NOTICE

If using the Hy8Relay, connect it to the dual gate spades on the Primary controller.

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 and referring to the chart below to the operator's functionality:





**Interlocked Gate type	Operator 1 (Primary)	Operator 2 (Secondary)
Sally Port	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.
Primary / Secondary	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 Primary.

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 or unauthorized entry. 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.

NOTICE

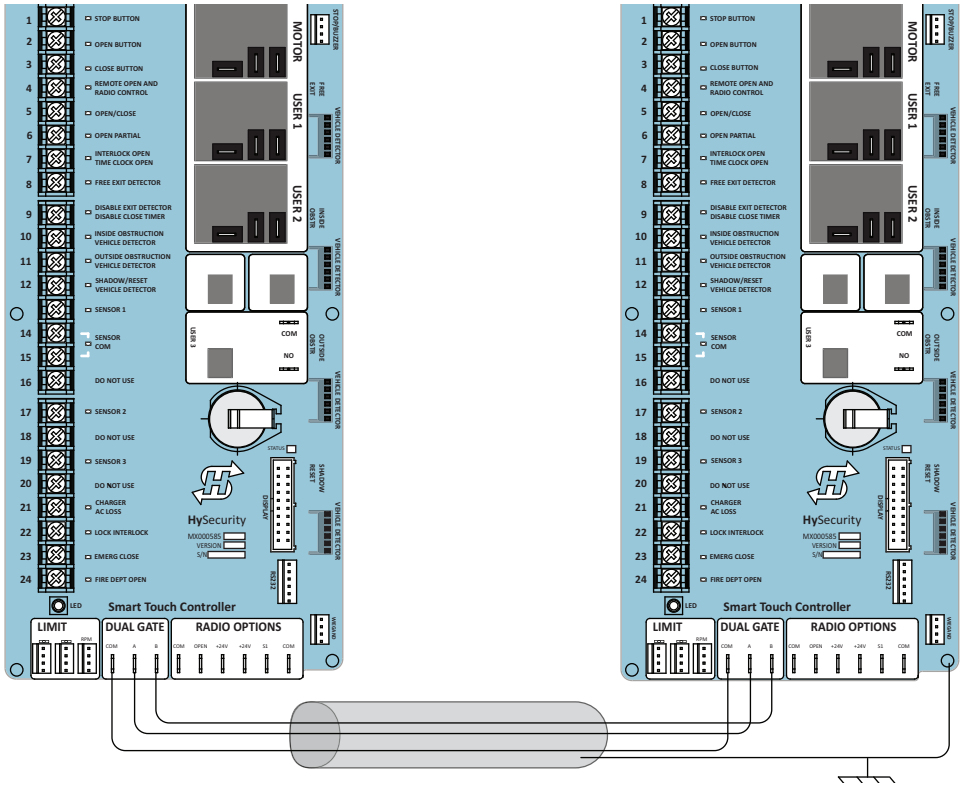
An emergency open or close overrides the gate sequencing and acts upon both gates simultaneously.

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.

⚠ CAUTION

The operators do not have to be of the same type, but both need to have identical software versions installed on the Smart Touch Controller. For example, a StrongArmCrash M30 can be sequenced with a security gate to provide both personnel security and crash provisions. 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 and HyNet™ Gateway" on page 82 for additional information.

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



NOTICE

Use a 2-pair, twisted, shielded cable with one pair of wires used to connect A-A and B-B terminals between the two boards. The other pair will connect the Common terminals. The shield should then be grounded on one end to one of the operators.

Figure 32. Wiring Diagram - Sequenced Pair of Operators wired to DUAL GATE Inputs

1. As shown in the wire diagram on page 64, 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.

NOTICE

Connect the ground shield wire to only one operator, not both. Use only 18-20 gauge twisted and shielded 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 "Bi-Parting & Dual Gate Systems" on page 95.

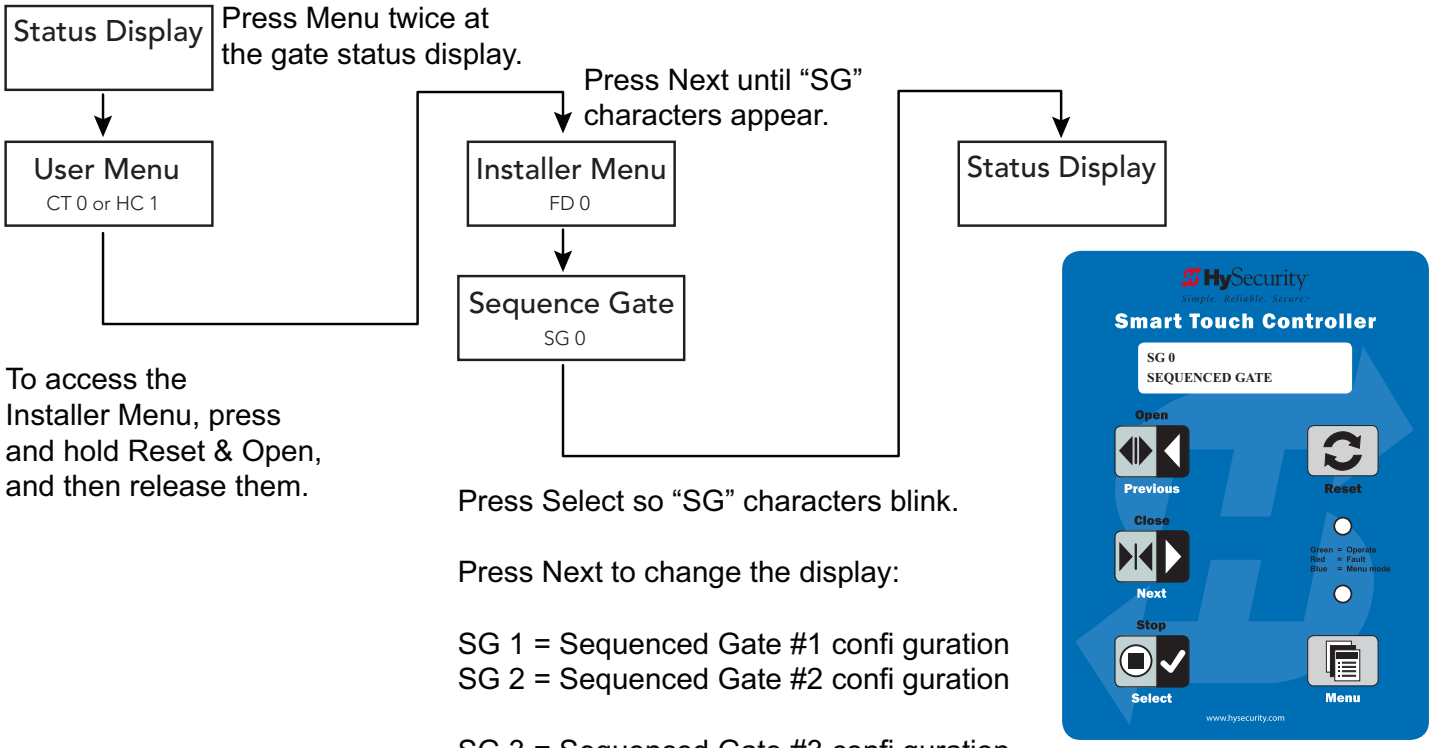
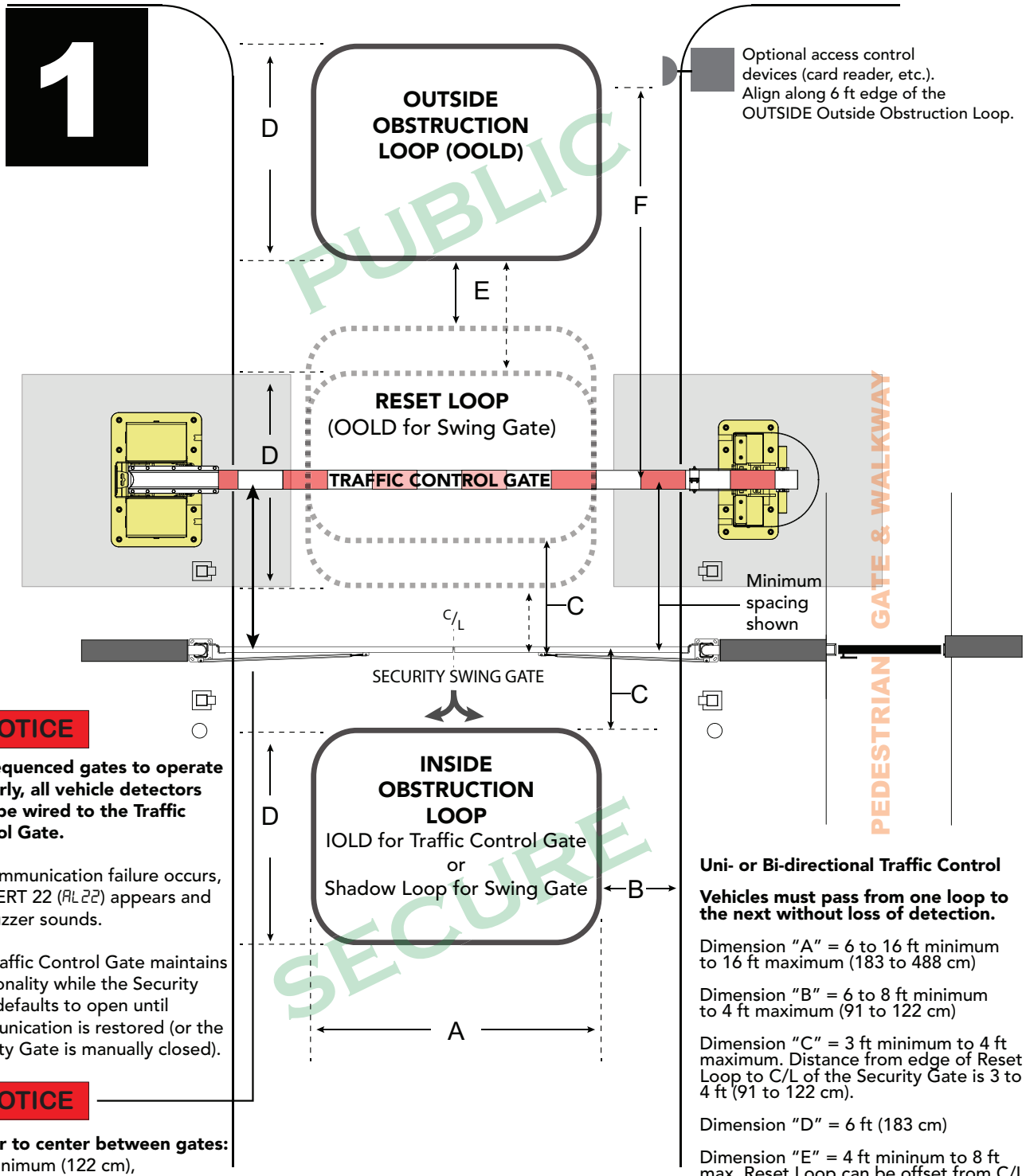


Figure 33. STC Menu Navigation

SEQUENCED GATE: CONFIGURATION #1

Vehicle Loop Layout

SwingRiser with StrongArm M30



PUBLIC
SECURE

***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 (AL22) 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)

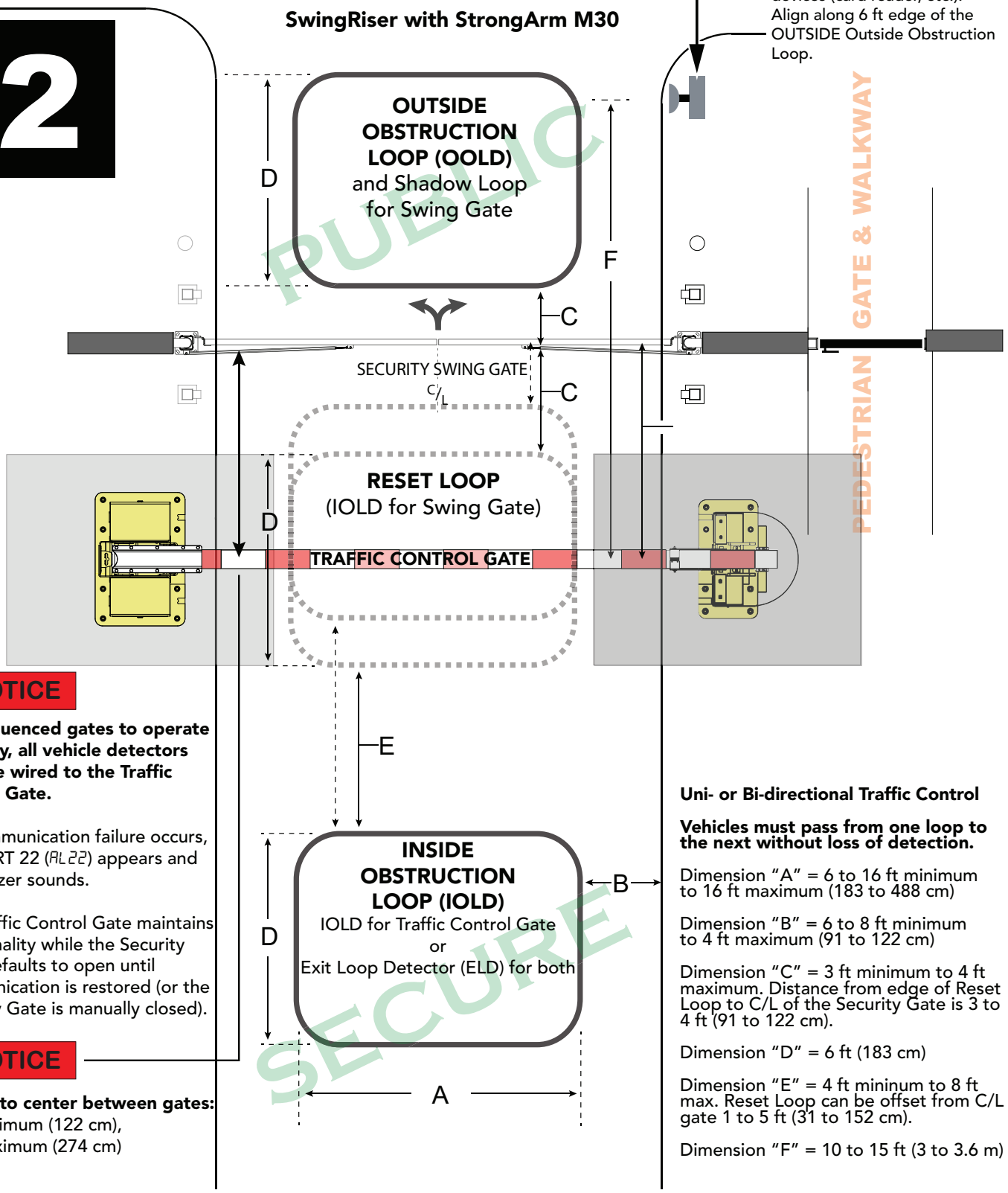
Dimension "E" = 4 ft mininum to 8 ft max. Reset Loop can be offset from C/L gate 1 to 5 ft (31 to 152 cm).

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

Vehicle Loop Layout

SwingRiser with StrongArm M30

2



***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 (AL22) 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 mininum to 8 ft max. 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)

VEHICLE DETECTOR INSTALLATION AND LOOP LAYOUTS

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 "Table 7. Installer Menu" on page 57.

NOTICE

For in-depth information regarding Hy5B vehicle detectors, click Tech Support on the HySecurity website and follow the link to Installation Manuals.

ANTI-TAILGATE MODE (CLOSING LOGIC)

The Detector Logic (DL) installer menu item 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 (OOLD), Inside Obstruction Loop (IOLD), or the Center Loop (CLD/RESET/Shadow) 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 (unless another open command is present) once all vehicle detectors are no longer sensing active loops (i.e. vehicle loops are clear).

Mode 4: Full anti-tailgate logic includes Mode 3 functions. In addition, the gate will stop during the opening cycle when both OOLD & IOLD (reversing loops) 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 loop layout drawings. The detector Modes 3 and 4 require use of separate inner and outer obstruction detectors. Mode 4 is not available in HydraWedge SM50 or gate operators functioning with HydraSupply XL.

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. See "Figure 26. STC and Accessory Devices" on page 77.

VEHICLE DETECTOR INSTALLATION AND LOOP LAYOUTS

VEHICLE DETECTORS AND THE SMART TOUCH CONTROLLER

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

NOTICE

Standard box type 11 pin (24VDC or 24VAC) vehicle detectors may be connected in the traditional manner to the controller, but HySecurity Hy5B mini-detector modules plug directly into the board, making field installation much faster and enhancing performance.

The Hy5B detector communicates with the Smart Touch Controller microprocessor to achieve the following benefits:

- **Automatic Sensitivity –** The Hy5B monitors vehicle traffic over the loop and automatically adjusts the loop sensitivity based on vehicle type and volume.
- **Automatic Gate Compensation –** The Hy5B discerns gate travel over the loop and automatically compensates for its effect. The compensation allows the Hy5B to operate with a higher sensitivity which provides better detection capability.
- **No Loop Crosstalk –** Exclusive use of Hy5B vehicle detectors in HySecurity gate operators, completely eliminates crosstalk and the need to set frequency levels.
- **Vehicle Counting –** Hy5B detects passenger vehicles and motorcycles.
- **Automatic Lightning Suppression -** Where lightning strikes occur often, connecting to the ground terminal minimizes the chance of activation or lock-up.
- **Health Scores for Loop –** Hy5B monitors the loop for changes that are indicative of possible problems. A score is accessible through the event log, LG menu item.
- **Automatic Hy5A emulation mode** for backward compatibility.

HY5B INSTALLATION

To install an Hy5B vehicle detector, you will need to take the following steps:

1. Test the vehicle loop.
2. To use all the features of Hy5B, update the software version on the gate operator to the latest version using S.T.A.R.T. and a PC laptop. Access free software updates from the HySecurity website: www.hysecurity.com
3. Install the Hy5B vehicle detector.
4. Fully cycle the gate at least 2 times to allow the detector to adjust to the effects of the gate during travel. Drive a test vehicle over the loops.

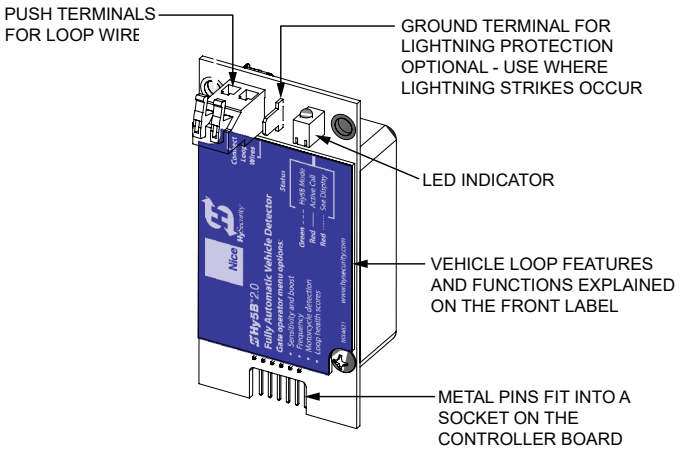


Figure 34. Hy5B Module

TEST THE VEHICLE LOOP

Run diagnostic tests on the vehicle loops before installing Hy5B vehicle detectors to ensure the loops are in good working condition. The following tests cannot guarantee a functioning loop, but failure of either test means that the loop may be damaged or need to be replaced.

1. Test – Measure the resistance of the loop and lead-in wire. It should not exceed 4.0 ohms.
2. Test – Measure the resistance to earth ground with a Megohmeter (Megger). It should be 100 Megohms or more. Below 50 mega-ohms, install a new loop.

NOTICE

Loops may function at 100 Megohms or less, but will not be reliable (for example, when the ground is wet from rainfall). A low megohm reading on the resistance to earth ground usually occurs due to broken or moisture saturated insulation. Be sure to use wire with a direct burial jacket such as XLPE or XHHW wire. Do NOT use THHN wire.

There are four vehicle detector inputs available on the Smart Touch Controller:

- Free Exit Loop Detector - This opens a fully closed gate or reopens a closing gate.
- Outside Obstruction Loop Detector (Out Obs Loop) - Reversing loop on public side
- Inside Obstruction Loop Detector (In Obs Loop) - Reversing loop on secure side
- Center Loop Detector - Not used for slide gates.

NOTICE

Standard box type 11 pin (24V DC or 24V AC) vehicle detectors may be connected in the traditional manner as described in Installing Standard 11-Pin Box Type Vehicle Detectors.

CONNECTING HY5B VEHICLE DETECTORS

Install the Hy5B Vehicle Detector modules according to the following procedure:

1. Turn off both AC and DC power switches.
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 board. **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 Hy5B detector. Tighten the terminal screws securely.
5. Repeat Steps 1 through 3 for each Hy5B detector.
6. To enable the detectors, turn on power. The detectors will immediately tune if they are connected to loops. Make sure no cars or other metal objects are over the loops.
7. If the detector module is unplugged after it is enabled, a communications alert (ALERT 10) will be triggered; if the fault continues an error message, ERROR 3 "Detector Failed" is displayed.

NOTICE

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 Hy5B detector modules. This simplifies installation and guarantees that there is no cross-talk between multiple loops. The frequency can also be manually selected; if this is required, refer to "Table 7. Installer Menu" on page 57
9. Sensitivity adjustment is available for each Hy5B in the installer menu. Generally, sensitivity does not need to be increased unless the loop is large or there are multiple loops connected to one detector. The Hy5B sensitivity defaults to automatic.

NOTICE

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

If required, adjust the sensitivity by accessing the ELD, OOLD, IOLD, or CLD menu items in the installer menu.

- A = Automatic,
- M = Motorcycle
- 0 = Low with boost (See NOTE.)
- 1 = Normal with boost (See NOTE.)
- 2 = High with boost (See NOTE.)
- 3 = X-High with boost (See NOTE.)
- 4 = Low without boost
- 5 = Normal without boost
- 6 = High without boost
- 7 = X-High without boost

NOTICE

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.

10. Vehicle detector functions are configurable through the Installer Menu as described in Table 10.

Table 10. Vehicle Detector - Configurable Functions

Display	Meaning	Installer Menu Setting Options (Bold - Default)
OR 1	Outside Obstruction loop detector function	0 = Pause closing only **1 = Enable reverse to full open.**
IR 1	Inside Obstruction loop detector function	0 = Pause closing only **1 = Enable reverse to full open.**
DL 1	Vehicle detector logic	**1 = Standard** (Close Timer does not begin counting until all loops have cleared) 2 = Quick close (Close Timer can count to zero, even while loops are active, so the gate will close as soon as the loops are clear) 3 = Forced time out (Close Timer is forced to zero when both the OOLD & IOLD are tripped simultaneously. Additionally, all other close inputs are memorized and the gate closes immediately when all open commands and vehicle detector inputs are clear. 4 = Full Anti-tailgate (In addition to the functions of 3, the gate stops during the opening cycle when both OOLD & IOLD are tripped simultaneously.). When the OOLD and IOLD loops are cleared, the gate closes immediately.

CHECK SOFTWARE VERSION

1. In the field, open the gate operator's Control Box.
2. To view the software version, press the RESET key. To use Hy5B features, the software version must be h4.55 or h5.56 (or later). Otherwise, the Hy5B reverts to Hy5A emulation mode.
3. If you wish to update the software, download the current S.T.A.R.T. software to your PC laptop, and then load the gate operator code to the controller board before installing Hy5B vehicle detectors. See www.hysecurity.com for updates.



Figure 35. START Software Screen

NOTICE

Hy5A emulation mode does not include all the features of Hy5B. If you are replacing Hy5A detectors and updating the gate operator software, be aware Build Year will need to be set. BY2 and BY3 requires monitoring of external entrapment protection sensors per UL 325 - 2016 Standard of Safety. If the gate operator was installed prior to 2016, BY1 may be used. For more information, refer to the gate operator's product manual.

INSTALL HY5B VEHICLE DETECTORS

Install one Hy5B detector at a time. Each vehicle detector socket is labeled.

1. Turn power OFF in control box.

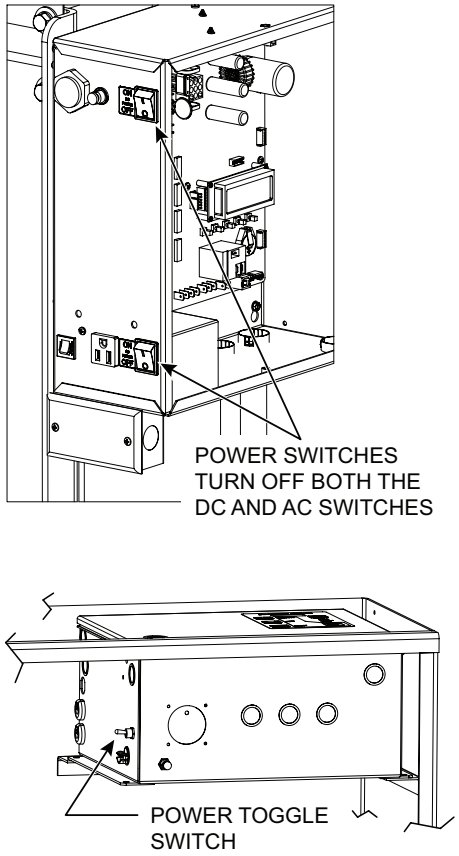


Figure 36. SmartDC (top) and STC (bottom) Control Boxes

2. Insert the squared-off end of the plastic standoff through the hole in the Hy5B detector.

NOTICE

The plastic standoff "squared-off end" does not fit into the mounting holes of the control box. Double check the orientation of squared-off ends.

3. To minimize excessive flexing, keep each Hy5B perpendicular to the control board as you plug it into the Hy5B socket.
4. Secure the Hy5B by inserting each plastic standoff into the chassis.

5. Place the two wires from the loop into the push terminals of the Hy5B. For ease of installation, the wire gauge should be 20 - 14 AWG. Refer to "Vehicle Loop Sets" on page 112.

NOTICE

If you have more Hy5B detectors, repeat the steps 2 through 4 for each additional Hy5B detector.

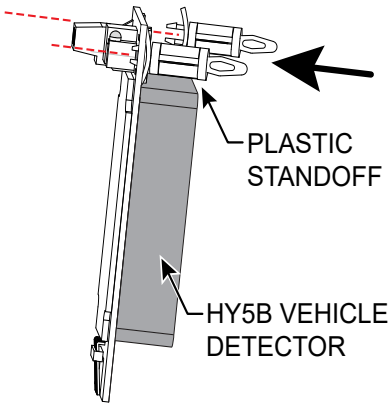


Figure 37. Hy5B Standoffs

LED Display Status		
LED Activity	**Indicates**	**Condition & Resolution**
OFF	Hy5B mode	Emulation mode. Some Hy5B features are unavailable.
GREEN PULSING	Heart beat	Normal operation.
RED ON	Call Mode	Status indicates loop activation in process.
RED FLASHING	View display for more information: *Initializing or Faulty loop*	If initializing, wait until initialization is complete. If flashing during loop operation, take following steps: 1. Check loop wiring. See "There are four vehicle detector inputs available on the Smart Touch Controller:" on page 93. 2. Replace loop. 3. If loop is not at issue, swap out Hy5B vehicle detector with a known operational Hy5B. 4. If necessary, replace Hy5B.

Vehicle Loop Sets				
Loop Type	**Installer Menu**	**Loops Smart DC**	**Loops Smart Touch**	**Description**
Exit Loop	ELD	EXIT LOOP	FREE EXIT	Opens a fully-closed gate.
Inside Reversing Loop	ILD	INSIDE OBSTRUCTION	INSIDE OBSTR	Connects to the inside reversing loop.
Outside Reversing Loop	OLD	OUTSIDE OBSTRUCTION	OUTSIDE OBSTR	Connects to the outside reversing loop.
Reset/ Shadow/ Center	SLD/CLD	CENTER LOOP	SHADOW / RESET	Prevents a gate from starting open or closed when a vehicle is in the path of the gate.

5. Turn power to the gate operator back ON.

6. The Hy5B indicator light flashes red and the following appears.

Smart Touch 7-segment Display	STC (OLED) and Smart DC Displays
InIt	INITIALIZING

7. When the LED on the Hy5B detector stops flashing red, it begins pulsing green which indicates initialization is complete and the detector is ready for use.

NOTICE

If using Hy5A emulation mode, the LED does not flash green, it goes dark. Refer to "LED Display Status" on page 112.

8. Press the Reset button. * When you press Reset, the following occurs:
   - Checks Hy5B loop connections and re-tunes Hy5B to prevent crosstalk
   - Un-installs memory of vehicle detectors physically removed
   - Clears alerts

*** Best** Practice: When "re-tuning" Hy5B vehicle detectors, verify that the loops are clear before pressing the Reset button.

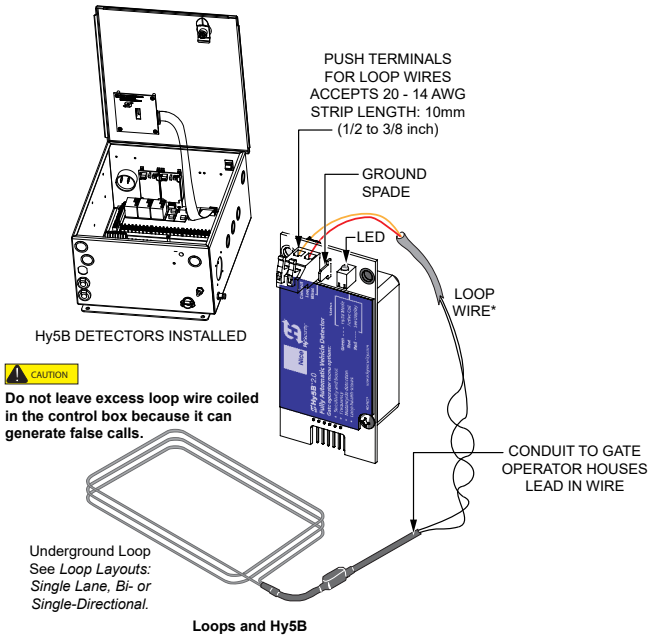
NOTICE

If the Hy5B is unplugged after it is initialized, an alert appears on the display, ALERT 10. If the issue is not resolved, ERROR 3 appears. When faults of this nature occur, the gate operator functions as if the Hy5B is triggered.

⚠ CAUTION

Do not connect Free Exit loop wires to the same Hy5B detector containing obstruction loop wires (reversing loops). You cannot combine Free Exit vehicle detection with reversing loop detection. If you attempt to do so, vehicles crossing over the Free Exit will not be detected.

For more information, refer to the Hy5B User Guide and additional instructional material found online HySecurity website / Tech Support.



Loops and Hy5B

Figure 38. Loops and Hy5B

INSTALLING STANDARD 11-PIN BOX TYPE VEHICLE DETECTORS

NOTICE

If photo eyes are used to monitor vehicle traffic instead of loop detectors, connect the photos eyes using the same steps described below.

If standard 11-pin box type vehicle detectors are to be used, perform the following procedure.

NOTICE

Box detectors with relays require five times more power than Hy5B detectors. One Hy5B detector draws about 0.005A. Consider Hy5B vehicle detectors for DC and Solar powered sites.

1. If there is sufficient space, install the sockets in the control box; if not, then install them in a separate external housing. Carefully consider your peripheral connections. Any peripheral device required for safe gate operation should be attached to 24VDC in case of an AC power outage.

NOTICE

Carefully consider your peripheral connections. Any peripheral device required for safe gate operation should be attached 24VDC in case of an AC power outage. Additionally, box detectors with relays require five times more power than Hy5B detectors. UPS battery life will be extended if you use Hy5B detectors instead.

2. Connect 24V power to the detector. Connect Pin No. 1 to a 24VAC or 24VDC terminal and Pin No. 2 to common.
3. Connect output Pin No. 6 to the Common Bus and output Pin No. 5 to one of the four detector terminal inputs (depending upon the detector function required) on the Smart Touch Controller.
4. If multiple detectors are used, route the power wires and common wire from socket to socket (daisy-chaining) rather than individually running each wire to the same location. The only wires that are separate are the output wire to the Smart Touch Controller and the detector loop input wires.

NOTICE

Always keep the detector loop wires well twisted at all places beyond the area of the loop. The lead in portion should be twisted to the detector to help mitigate problems associated with electrical noise getting into the loop wires. The wires should then be encapsulated in the saw cut with a flexible loop sealant.

NOTICE

Both 24VAC and 24VDC are available, so either detector voltage may be used. 24VAC is not available if the Gate Operator is equipped with the UPS option. 24VAC is available at the spade terminals on the lower left corner of our power supply (marked ACC); 24VDC is available from the Common and the +24V spade terminals.

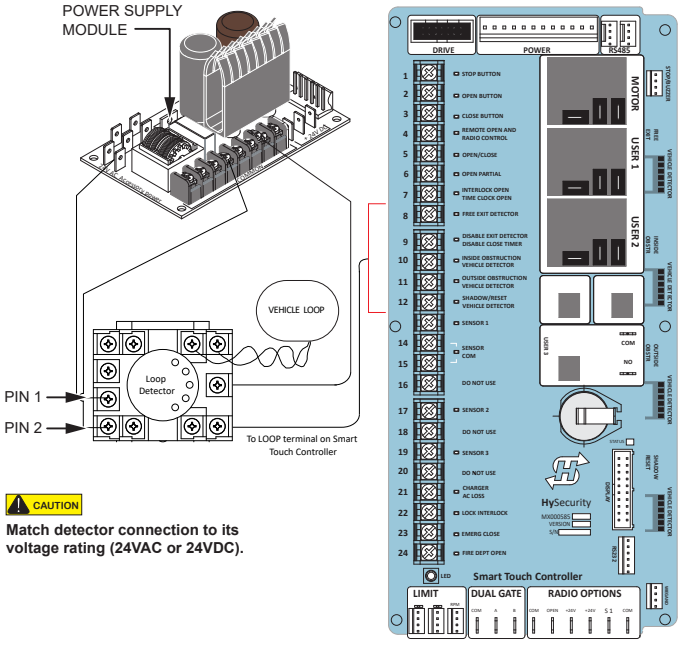
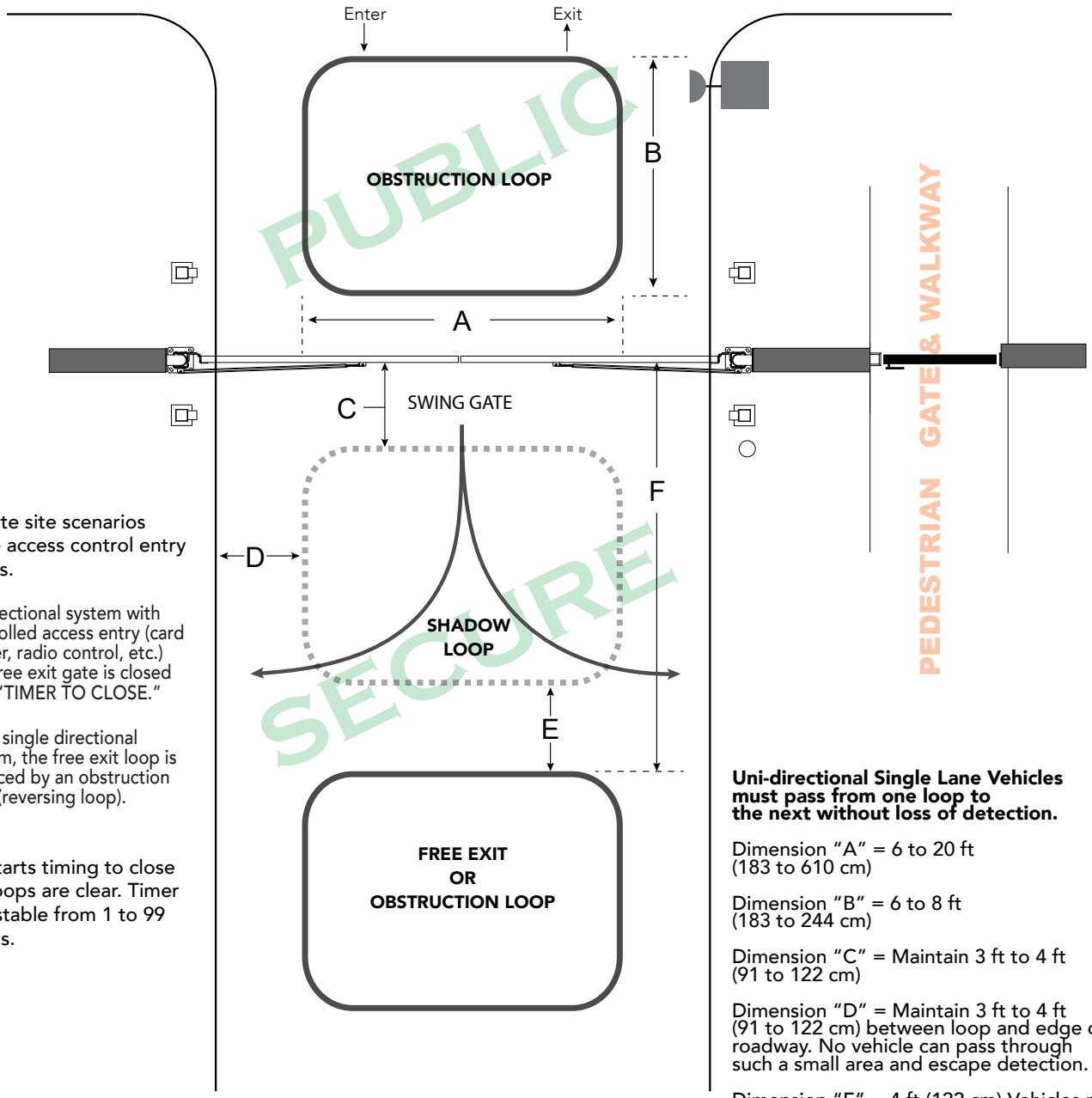


Figure 39. 11-Pin Box Type Vehicle Detector

LOOP LAYOUTS: SINGLE LANE, BI- OR SINGLE-DIRECTIONAL

For Openings less than 28 Feet



Two gate site scenarios include access control entry systems.

- Bi-directional system with controlled access entry (card reader, radio control, etc.) and free exit gate is closed by a "TIMER TO CLOSE."
- For a single directional system, the free exit loop is replaced by an obstruction loop (reversing loop).

Gate starts timing to close as all loops are clear. Timer is adjustable from 1 to 99 seconds.

Uni-directional Single Lane Vehicles must pass from one loop to the next without loss of detection.

Dimension "A" = 6 to 20 ft (183 to 610 cm)

Dimension "B" = 6 to 8 ft (183 to 244 cm)

Dimension "C" = Maintain 3 ft to 4 ft (91 to 122 cm)

Dimension "D" = Maintain 3 ft to 4 ft (91 to 122 cm) between loop and edge of roadway. No vehicle can pass through such a small area and escape detection.

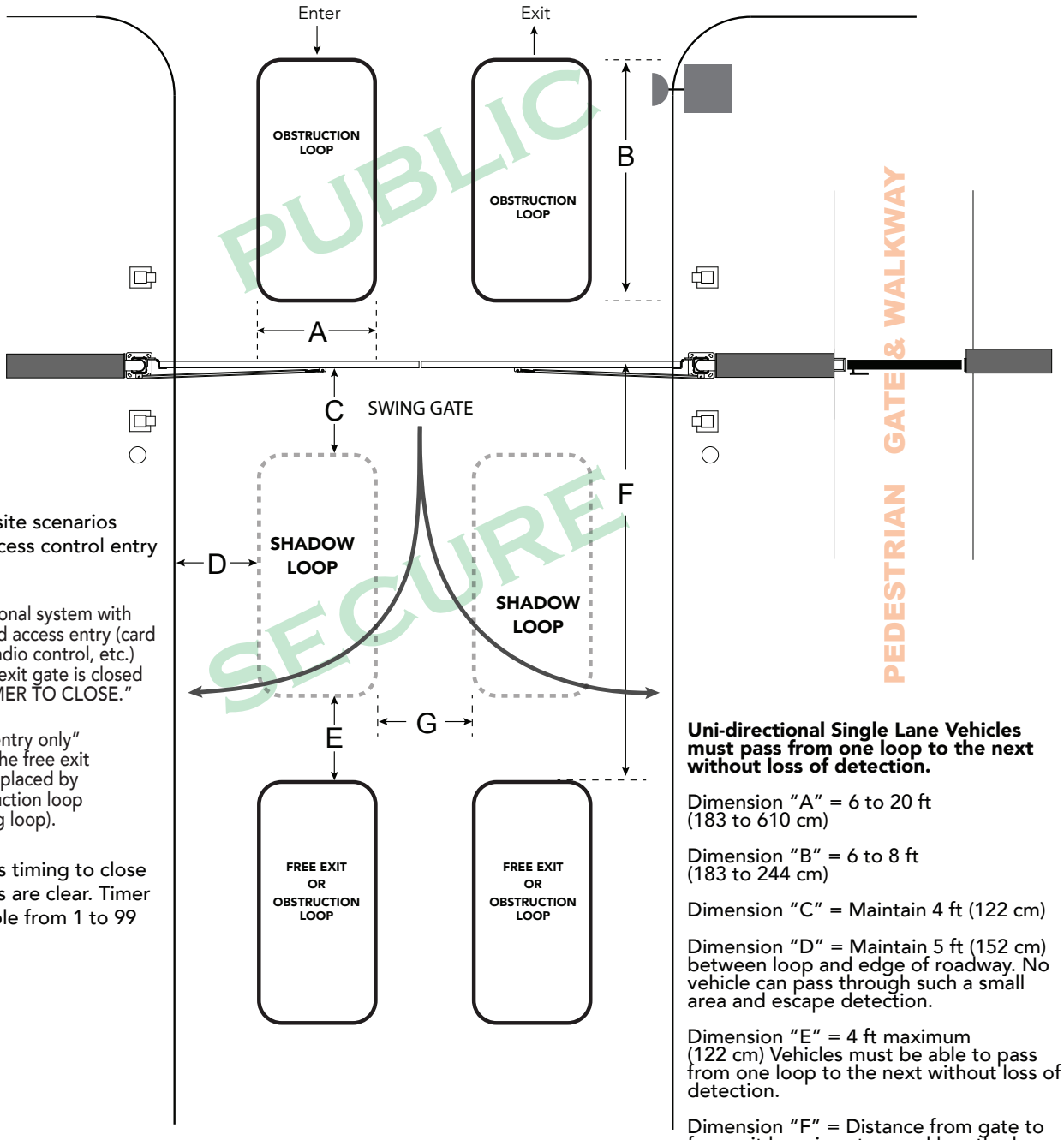
Dimension "E" = 4 ft (122 cm) Vehicles must be able to pass from one loop to the next without loss of detection.

Dimension "F" = Distance from gate to free exit loop is gate panel length plus 4 ft (122 cm)

NOTE: A minimum of three (3)detectors are required for this type of gate site scenario.

LOOP LAYOUTS: TWO LANE, BI-DIRECTIONAL

For Openings greater than 28 Feet



PUBLIC SECURE

Two gate site scenarios include access control entry systems.

- Bi-directional system with controlled access entry (card reader, radio control, etc.) and free exit gate is closed by a "TIMER TO CLOSE."
- For an "entry only" system, the free exit loop is replaced by an obstruction loop (reversing loop).

Gate starts timing to close as all loops are clear. Timer is adjustable from 1 to 99 seconds.

Uni-directional Single Lane Vehicles must pass from one loop to the next without loss of detection.

Dimension "A" = 6 to 20 ft (183 to 610 cm)

Dimension "B" = 6 to 8 ft (183 to 244 cm)

Dimension "C" = Maintain 4 ft (122 cm)

Dimension "D" = Maintain 5 ft (152 cm) between loop and edge of roadway. No vehicle can pass through such a small area and escape detection.

Dimension "E" = 4 ft maximum (122 cm) Vehicles must be able to pass from one loop to the next without loss of detection.

Dimension "F" = Distance from gate to free exit loop is gate panel length plus 4 ft (122 cm)

Dimension "G" = 4 to 6 ft (122 to 183 cm)

NOTE: A minimum of three (3)detectors are required for this type of gate site scenario.

A monitored connection tests for the presence and correct operation of the photo eyes (and other monitored sensors) prior to each gate activation. The monitored connection prevents gate operation if an entrapment protection sensor is missing or any fault is present.

Sensors, such as gate edges and photoelectric beams, must be installed to protect against entrapment. These external entrapment protection sensors are required for the gate installation to be in compliance with the 2018, UL 325 Standard of Safety (7th Edition).

MONITORED EXTERNAL ENTRAPMENT SENSORS

As of January 2016, UL325 standard requires gate operators to monitor the presence of all external entrapment sensors, including non-contact (Photo Eyes) and contact (Edge) sensors. For operators built between January 1st, 2016 and July 31st, 2018 only one external entrapment sensor is needed to allow automatic operation, but all potential entrapment zones must be protected or eliminated. After July 31st, 2018, all Slide gate operators will need a minimum of 2 external entrapment sensors (1 open direction and 1 close direction) installed before automatic operation is allowed, but all potential entrapment zones must be protected or eliminated.

HySecurity monitors all external entrapment sensors connections by looking for NC contacts connected to input terminals. Smart touch software cycles power to device and looks for a time delay from when device powers on to when the contact closes (sensor input pulled low, meaning the sensor is not blocked/tripped).

Three programmable sensor inputs are available for use and must be programmed to a non-zero number when initial configuration is performed. The three inputs are labeled Sensor 1, Sensor 2, and Sensor 3 and are configurable in the installer menu (S1, S2, or S3) for the following options:

- 1 – Not Used
- 2 – Eye Close
- 3 – Edge Close
- 4 – Eye Open
- 5 – Edge Open
- 6 – Edge Both (Swing Only)
- 7 – Eye Both (Solo Slide Only)

It is the installers responsibility to determine the number of potential entrapment zones that exist and program the Sensor inputs according to which type of external entrapment sensor will be used to protect each zone. If more than three potential entrapment zones exist, then site design may be adjusted to eliminate risks or a Miller Edge MIM-62 may be used to connect additional sensors.

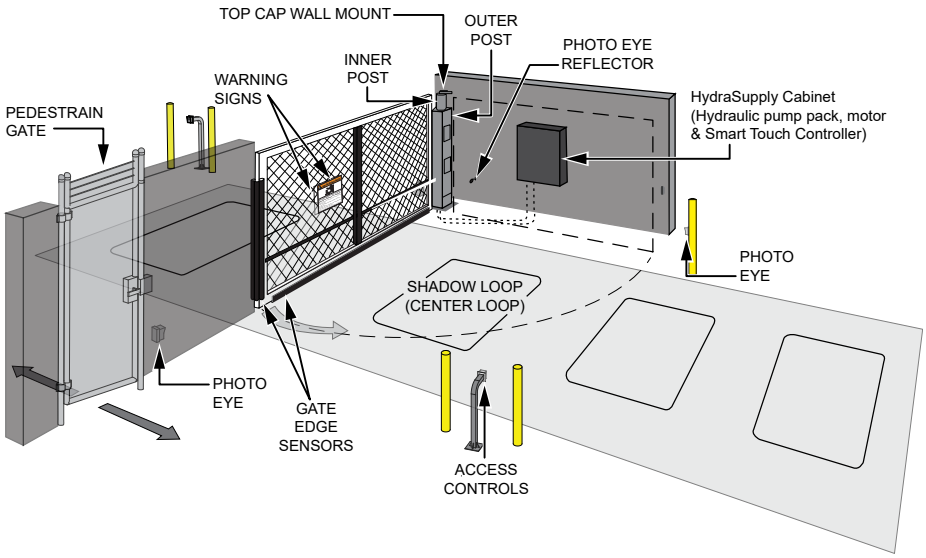


Figure 40. SwingRiser Photo Eye Layout

After programming the sensor inputs in the installer menu or during initial startup, the appropriate type and number of sensors will need to be connected. Figure 41 below shows the wiring and dip switch settings of an EMX-MON photo eye (typical thru-beam wiring). A retroreflective photo eye will be similar and only have wiring similar to the receiver of the thru-beam photo eye.

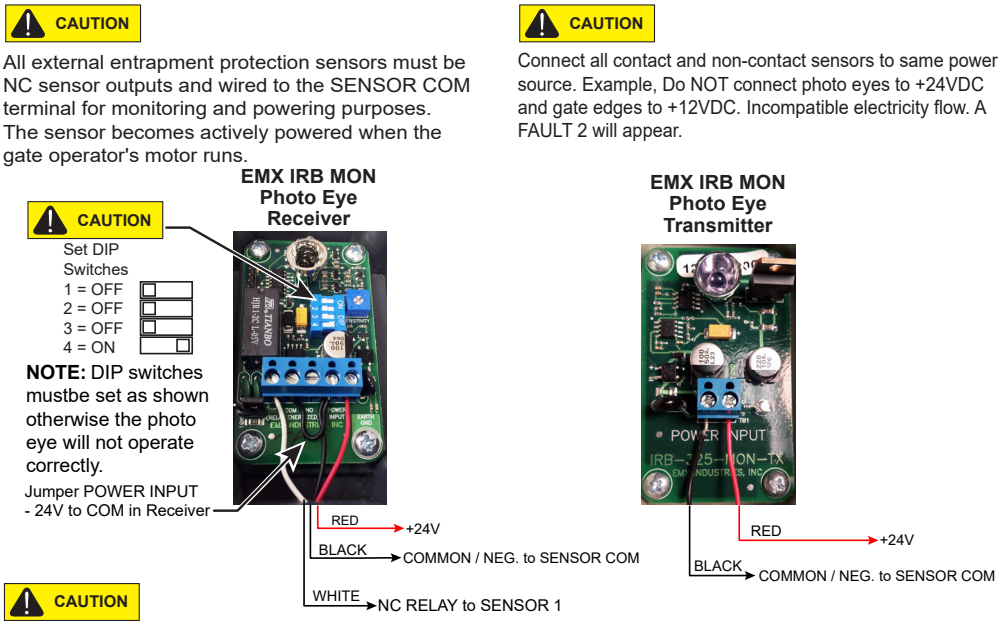


Figure 41. EMX-MON Photo Eye Wiring

An Edge Sensor can be either hardwired through an adapter module (Hy2NC) or a wireless transmitter/ receiver combo (WEL-200 or iGAZE RE). Figure 42XX below shows the wiring and dip switch settings of a WEL-200. For more information and wiring diagrams of other recommended sensors see the "HySecurity External Entrapment Sensor Wiring Guide".

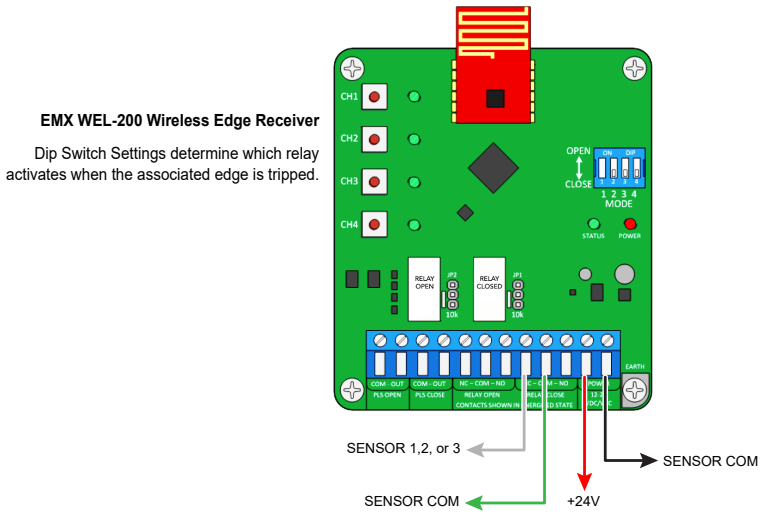


Figure 42. WEL-200 or iGAZE RE

NOTICE

UL 325 Standard of Safety provides the MINIMUM safety standards. Site, gate hardware usage, and other conditions may dictate the use of additional safety designs/components. It is up to the gate system designer and installer to assess appropriate safety design and components above and beyond minimum UL 325 and ASTM F2200 Standard of Safety. Always check your local area codes and comply with all regulations.

To learn more about external entrapment protection devices or to learn how to temporarily supply power to the sensors that are wired to the gate operator, review "External Entrapment Protection Sensors: What the Installer Needs to Do" on page 38 and "Supply Power to the Sensors" on page 42.

PHOTO EYE INSTALLATION TIPS

Underwriters Laboratories requires that any non-contact sensor used as an external entrapment protection device, must be tested to, and recognized by, the UL 325 Standard.

- There are two common types of photoelectric sensors, thru-beam and retro-reflective, and 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 does not require the installation and extra wiring of a separate emitter and receiver as is required in a thru-beam system, but retro-reflective eyes are generally more problematic in poor weather. Avoid using retro-reflective devices across outdoor distances greater than 24 ft (7.3m) because of performance and reliability issues.
  - For pedestrian detection, mount thru-beam type photo eyes approximately 15" to 30" (4.6 to 9m) above the ground and as close to the gate as possible. A minimum of one photo eyes is required, but two is recommended, one photo eye to guard the open direction and the other for the close direction of travel, unless gate edges for entrapment protection are installed.
- Three wires to the receiver and two wires to the emitter are all that is required.
  - Depending on how the photo eyes are to be wired, +24VDC or +12VDC, power is provided via spades located just to the right of the COM terminal strip near the left side of the board.
  - The receiver and emitter common wires are connected to the SENSOR COM terminal at the bottom, left of the Smart DC Controller.
  - The photo eye NO or NC output wires connect to the Smart DC Controller at the Appropriate Sensor Input (1, 2, or 3). The appropriate sensor input must be programmed for Eye Open or Eye Close based on whether it spans the road or the "catch" area of an opening gate.
- If tripped while in motion, the standard function is to stop the gate and automatically restart again if the photo eye is clear within five seconds. An optional setting in the Installer Menu will cause a two second reversal of travel, or, if closing, can be programmed to reverse to full open.

NOTICE

Sensor COM & +24V is the recommended way to connect monitored photo eyes to Smart DC Controller.

NOTICE

If photo eyes are to be used for vehicle detection and logically function the same as a vehicle detector, connect the common wires to the COM terminals on the left side of the board and wire the NO output contact to the appropriate vehicle detector input: EXIT LOOP, IN OBS LOOP, and OUT OBS LOOP.

If the photo eye has an internal switch for setting Light Operate vs. Dark Operate, select Light Operate. 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. This is because, in the Light Operate mode, the output relay is normally energized and releases when the beam is blocked. Some manufacturers label an output as NO, when it is actually an NC contact. If the photo eye has a solid-state output you must choose a sinking type connection.

CONFIGURATION

Configure photo eyes attached to gate operators manufactured in 2016 or beyond according to "Wiring HySecurity Sensors:Smart Touch" on page 156.

NOTICE

HySecurity gate operators, manufactured with 2016 (or later) in the serial number, require Normally Closed output sensors. Some manufacturers label an output as N.O. (normally open), when it is actually an N.C. (normally closed) contact. Review "External Entrapment Protection Sensors monitored by HySecurity Gate Operators" on page 6.

If your gate operator is manufactured prior to 2016 and your gate operator is set to Build Year 1, consider the following:

NOTICE

To check the Build Year for your gate operator, press the Menu button. The gate status scroll reveals the Build Year. “Build Year Pre-2016” means the gate operator is configured for Build Year 1.

PHOTO EYE FUNCTION

A tripped photo eye will prevent the gate from starting in either direction if the gate is stationary. If tripped while in motion, the standard function is to stop 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 two second reversal of travel. Refer to Eye Close Logic and Eye Open Logic (EC and EO) in the "Table 7. Installer Menu" on page 57 for more information.

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 retroreflective photo eyes. The best way to assure true centering of the beam is with some trial testing where the emitter is shifted to move the beam left and right and up and down until the range of the invisible cone of the infrared beam is known. Photo eyes usually provide alignment aid LED's for this setup, but they can be hard to see. HySecurity has provided a unique feature that turns power on to the photo eyes and causes the buzzer to chirp when the photo eyes enter and exit alignment. See "Table 6. User Menu" on page 52 to enable this feature. Set the menu item PE - PHOTO EYE ALIGN from a 0 to a 1. The buzzer chirps once when the emitter and photo eye 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. This “alignment mode” will automatically reset to 0 the next time the Close Limit Switch is triggered or the RESET key is pressed.

RETRO-REFLECTIVE PHOTO EYE SYSTEMS

Correct installation and alignment of a retro-reflective photo eye and its reflector is important for trouble free performance. Any system operating at a range greater than 16 feet is more prone to false triggering due to dirty optics, condensation or poor weather. If care is taken in the initial mounting and alignment of the 3-inch reflector, the chance of problems is greatly reduced. Use only through beam photo eyes for a distances greater than 24 feet because the function of a retro-reflective photo eye will be too unreliable.

Taking steps to protect the photo eye and the reflector from being exposed to fog and being absolutely certain the photo eye is perfectly aligned will greatly reduce any false triggering of the system. The ideal mounting of a retro-reflective photo eye is inside an enclosure.

The ideal reflector mounting suspends it inside a 12-inch long piece of 3-inch PVC conduit. Cut the opening of the PVC conduit at a 45-degree angle to act as a drip shield. Hold the reflector against the backside of the PVC conduit by attaching a 3-inch male connector. Do not cement the connector. This would prevent the reflector from being reached for future cleaning. To create a mounting base, attach a 3-inch aluminum flange (electric meter hub) to the connector. This whole package can be mounted to any flat surface.

Locate the reflector in the center of the invisible beam of infrared light to achieve the most sensitive alignment. The beam center is determined by the following test: while holding the reflector in your hand, slowly raise it until the beam is no longer returned and the photo eye trips. Mark this maximum height. Now lower your hand and determine the lower limit of the infrared beam by watching for the trip point. Mark this position as well. Repeat the same procedure for left and right at the center elevation of the beam, as determined by the previous test. Once the four limits have been determined, either mount the reflector in the center of the area outlined or realign the eye for the position of the reflector. If photo eye is realigned, be sure to perform centering test again to verify that the reflector is truly in the center.

USING PHOTO EYE SENSORS INSTEAD OF VEHICLE LOOPS

Some site conditions (for example, dirt or gravel roads) may warrant use of photo eye sensors for vehicle detection. In this type of application, the photo eye pair is connected to vehicle loop terminals on the Controller.

NOTICE

A pair of photo eye sensors, used in place of vehicle loops and wired to vehicle loop terminals on the Controller, does not satisfy UL 325 Standard of Safety for "monitored" external entrapment protection. To understand external entrapment protection and how HySecurity equipment monitors sensors, refer to the section titled "Entrapment Protection" on page 50.

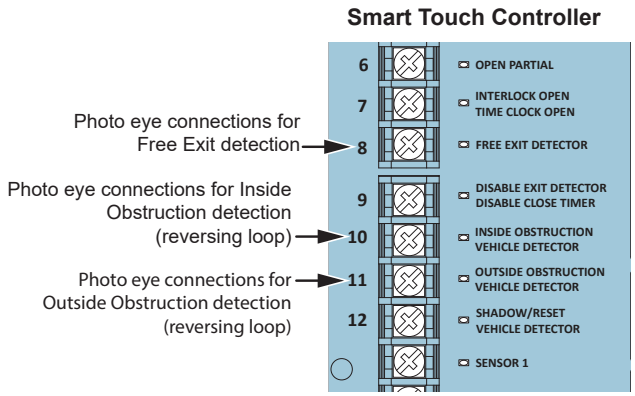


Photo Eye sensor terminal connections when PE sensors used in place of vehicle loops

Figure 43. STC PE Sensor Connections

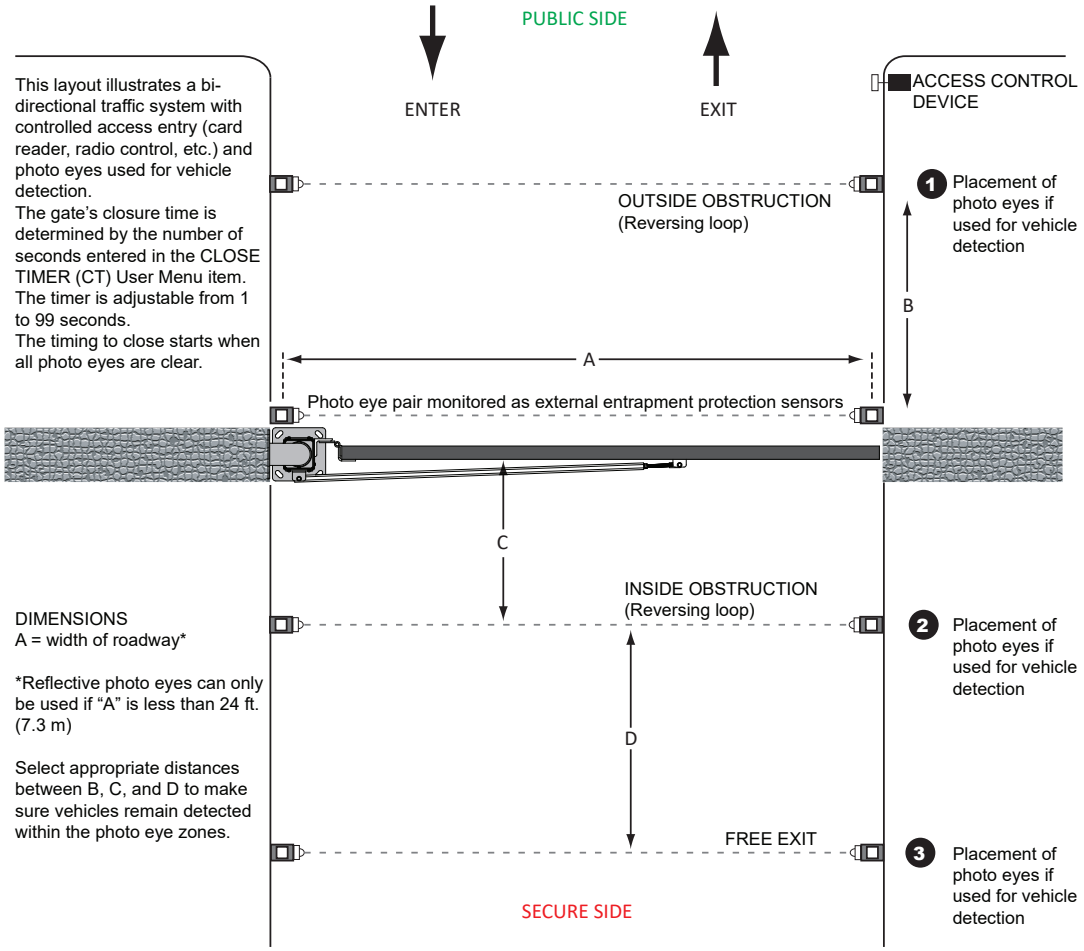


Figure 44. SwingRiser Photo Eye Sensor Site Layout

PHOTO EYE ALIGNMENT FEATURE

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.

Align the photo eyes using this feature by taking the following steps:

1. Access the User Menu and select PE. To access the User Menu, press the Menu button twice. For a refresher on using the Menu Mode navigational buttons, refer to the chart below.

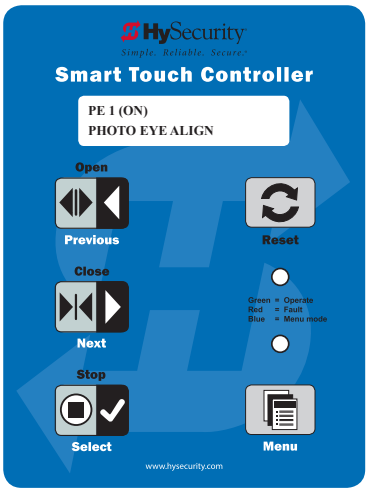


Figure 45. STC Photo Eye Align

2. Press NEXT and continue to press NEXT until PE 0 (OFF) appears.
3. Press SELECT. PE characters begin blinking.
4. To turn ON photo eye alignment and temporarily power the sensors, press NEXT so PE 1 (ON) appears.
5. Press SELECT. PE stops blinking.
6. Move the photo eyes (up/down, side to side) to align the emitter beam.

Audible Chirp	Beam Aligned ??
One	No
Two	Yes

7. When the buzzer chirps twice, indicating the photo eyes are aligned, set the next photo eye (if the site has one) and continue the process until all photo eyes are aligned.
8. Press MENU to exit Menu Mode and return to Run Mode.
9. Move the gate with an open or close command. When a limit is triggered, the User Menu item PE resets to zero (OFF).

NOTICE

To cover the potential entrapment areas, mount photo eyes preferably within 5 inches (13 cm) of the gate face. See Installation on page 78. To learn how to temporarily power external entrapment protection sensors using the PE User Menu item, see "Supply Power to the Sensors" on page 42.

A monitored connection tests for the presence and correct operation of the gate edge sensors (and other monitored sensors) prior to gate activation. The monitored connection prevents gate operation if a sensor is missing or any fault is present.

Sensors, such as gate edges and photoelectric beams, must be installed to protect against entrapment. These external entrapment protection sensors are required for the gate installation to be in compliance with the 2018, UL 325 Standard of Safety (7th Edition).

Assess your gate site for the most appropriate placement of edge sensors. Plan to integrate contact (gate edge) and non-contact (photo eyes) sensors in your site plan. Sensors are wired to the Controller and require low voltage conduit to the operator and power supply. Refer to "External Entrapment Protection Sensors monitored by HySecurity Gate Operators" on page 6.

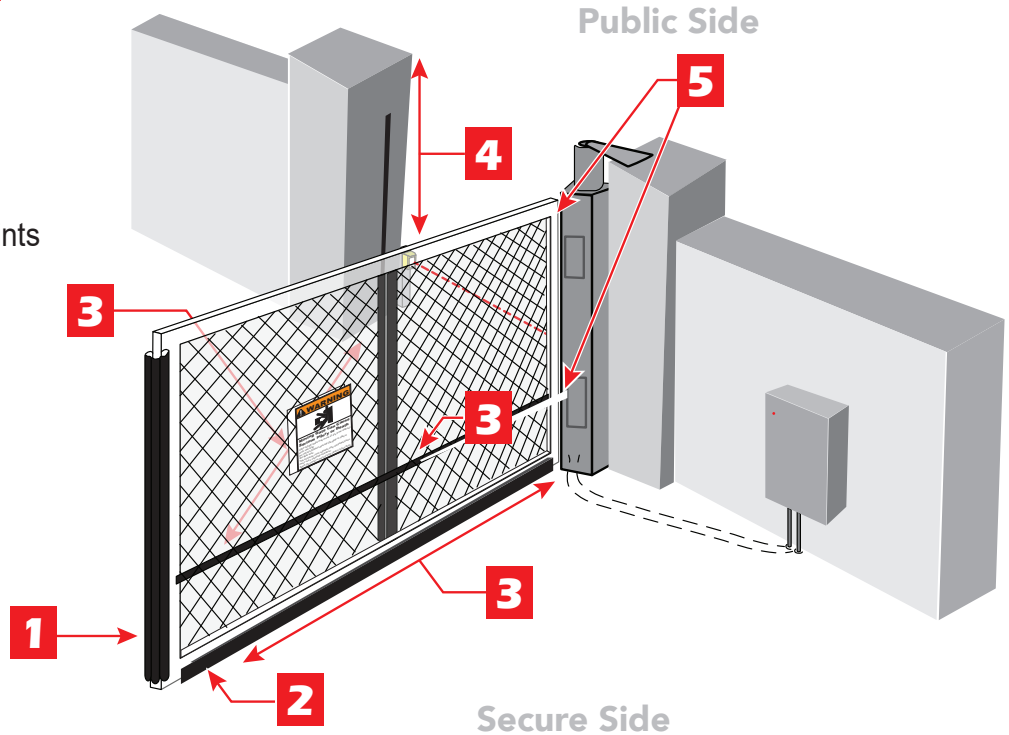
To enable fully automatic operation, this gate operator requires a MINIMUM of one external entrapment protection sensor to monitor potential entrapment zones in either the open or close direction of travel. Visit www.hysecurity.com/gatesafety for more information on UL 325 standards and gate safety.

NOTICE

UL 325 Standard of Safety provides the MINIMUM safety standards. Site, gate hardware usage, and other conditions may dictate the use of additional safety designs/components. It is up to the gate system designer and installer to assess appropriate safety design and components above and beyond minimum UL 325 and ASTM F2200 Standard of Safety. Always check your local area codes and comply with all regulations.

Swing Gates:
Potential Zones requiring Entrapment Protection

1. Leading Edge
2. Bottom Edge
3. Entry/Exit
4. Posts
5. Post Pivot / Pinch Points
6. Arm Movement



Drawing NOT TO SCALE

Figure 46. Swing Gate Edge Sensor Placement

COMPATIBILITY

The UL 325 Standard of Safety requires that an edge sensor be laboratory tested and "recognized" under UL 325. In order to be compatible with all HySecurity gate operators, a edge sensor must be rated to function from 24VDC source power.

A list of tested and approved external entrapment protection sensors (normally closed contacts) that are compatible with HySecurity gate operators can be found online at the following public site: Gate Safety for HySecurity Gate Operators.

INSTALLATION

NOTICE

Follow the manufacturer's installation and assembly instructions to properly mount the sensor. Wiring diagrams for several sensor devices are found in "Wiring HySecurity Sensors:Smart Touch" on page 146.

HySecurity gates monitor normally closed (NC) sensors. Wire the NC sensors to SENSOR input terminals (SENSOR 1, SENSOR 2, or SENSOR 3) on the Smart Touch Controller and set the Installer Menu item S1, S2, or S3 to the appropriate setting for the area being monitored.

When using wired edge sensors, the wired edge must be connected to an interface module with an NC output. ASO has UL 325 - 2018 compliant edge sensors with blue electrical tape on the output wire. These edge sensors have a 10k Ω resistor that connects to an interface module. The interface module provides the NC output for monitoring purposes. Refer to "Wiring HySecurity Sensors:Smart Touch" on page 170.

For wireless edge sensors, no interface module is required. Wireless edge sensors need the wireless gate links which include a transmitter and receiver. HySecurity has created kits for all-inclusive shipment.

NOTICE

The installation locations are intended for pedestrian detection and safety. The potential zones requiring entrapment protection are areas that need to be protected for pedestrian safety.

GATE EDGE FUNCTION

If the gate is stationary, a tripped gate edge sensor will prevent the gate from starting in either direction. If tripped while in motion, the standard function is to stop the gate movement and, if tripped while closing, automatically re-open fully. An optional setting in the Installer Menu will cause a 2 second reversal if triggered while closing. Refer to "Table 7. Installer Menu" on page 57 for more information.



Example: Wired gate edges used with 10K Ω (8.2K Ω) resistor



Example: Wireless gate link (transmitter & receiver) used with wireless gate edges

Figure 47. Gate Edge Wiring Examples

EDGE SENSOR INSTALLATION TIPS

- If edge sensors are used sliding gates, one or more contact sensors (edge sensors) must be located at the leading edge, trailing edge and post-mounted both inside and outside of the sliding gate.
  - Three-sided detectors are ideal for slide gates.
  - If the clearance of the gate is 6" (15cm) or more above the road, then an edge sensor must be mounted on the bottom edge.
  - If gate is sliding open to a wall with less than 16" (41cm) of clearance, mount an edge sensor to wall that aligns with gate in open position.
  - Always route leads from edge sensors to gate operator so that they are protected from physical damage.
  - Underwriters Laboratories requires that any contact sensor used as an external entrapment protection device, must be laboratory tested to, and recognized to the UL 325 Standard.
- To enable monitoring of edge sensors, there must be a terminating resistor in the embedded in the edge. This resistor is typically 8.2K or 10K and always has a small current draw to confirm that it is installed.
- HySecurity gate operators must see a NC contact for monitoring purposes, therefore any edge sensor with a terminating resistor will need an interfacing device to convert the resistor output into a NC contact.
  - Types of devices that will convert the resistor output to NC output include the Hy2NC and the WEL-200.
  - Hy2NC enables the Edge Sensor to be hard wired to the board.
  - The WEL-200 is a wireless transmitter/receiver kit that communicates the state of the Edge Sensor wirelessly from the gate mounted transmitter to the operator mounted receiver.
- Hard-wired edge sensor adaptors (like Hy2NC) have inputs for up to two resistor terminated edges and up to two NC contact outputs.
  - HySecurity suggests the use of hard-wired edge sensor adaptors with an edge mounted to lead fence post to protect draw-in entrapment zone when the gate is running.
- Wireless transmitters are always monitoring for presence of resistor terminated edge(s) connected to it. Status of edge is then continuously communicated back to receiver which determines when to switch NC contact to NO and tell board edge is tripped or missing.
  - Receiver can only give a NC (edge not tripped) signal or a NO (edge tripped or missing) signal to control board.
  - If edge is tripped, missing, or resistor value is too low, transmitter will communicate this information to receiver which will indicate this to control board as a tripped edge (NC contact opens).
  - Additionally, if communication between transmitter and receiver is ever lost or corrupted, due to too much RF “noise” in area, then the receiver will indicate to control board that the edge is tripped, even if edge is present and functioning normally with transmitter.
- When selecting a wireless edge as one of the external entrapment sensors, be aware of the environment around it and know that RF interference from outside sources can drastically diminish range and performance of wireless device.
  - Airports, police stations, fire departments, hospitals, and other sites with a lot of radio traffic have shown to have a lot of RF noise in frequencies that most transmitter/receiver kits function.
  - Install transmitter in a way that it is in direct line of site with receiver’s antenna throughout gate motion.
  - Limit distance between transmitter(s) and receiver(s) to what is specified by manufacturer, and be aware that range may be greatly diminished when operating in a noisy RF environment.

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 (and/or reverse direction of travel)

Refer to "Table 9. Troubleshooting Codes" on page 129 for details concerning identifi cation and description of Alerts, Faults and Errors.

Overriding a tripped sensor or fault condition on a HySecurity gate operator with monitored entrapment sensors requires a 2-step process:

- Press Open or Close momentarily. Audible beeps in quick succession indicate tripped sensors or fault conditions.
- Within 5 seconds of hearing the beeps, apply constant hold pressure to override the tripped sensor or fault. The gate operator runs while pressure is maintained to actuating device (examples include, Push button Open, Push button Close, Open Partial or Keypad Open/Close), or a limit is reached, or another sensor trips.

NOTICE

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.

TIP: On AC-powered gate operators, the active status of each input on the Smart Touch Controller is indicated by its associated lit LED. However, an exception exists in the case of external entrapment protection sensors. The LEDs next to the sensor connections will be lit when no power is being applied. For more information, refer to "Supply Power to the Sensors" on page 42.

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.

NOTICE

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 AudioAlert 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.

NOTICE

S.T.A.R.T. configuration and diagnostic software is available at no charge from www.hysecurity.com.

Table 11. Troubleshooting Codes			
Alert/Fault/Error Display	**Buzzer Chirp Sequence**	**Possible Cause**	**Solutions**
HYSECURITY Entrapment Mode ENTR	2 chirps per second every 2s while controlinput is active	Occurs when IES is tripped when gate is already in Safe Mode. Operator will not function until it is reset, which can occur by: ● An Open or Stop command from a push-button control ● Pressing black button on operator side ● Pressing RESET button below display With any one of these inputs, operator will return to Safe Mode. Gate binding or wind can cause a false alert.	1. Remove obstruction. 2. Adjust IES sensitivity. 3. Correct gate hardware.
HYSECURITY Safe Mode SAFE	2 chirps once when in Safe Mode	Occurs when either edge sensor or Inherent Entrapment Sensor (IES) has been tripped. In Safe Mode, automatic close timer is disabled, but any command will reset and/or start gate in motion. Safe Mode clears when full travel is reached or RESET button is pressed. Gate binding, wind, a faulty edge sensor, or worn motor brushes can cause a false alert.	1. Remove obstruction. 2. Adjust IES sensitivity. 3. Correct gate hardware. 4. Correct faulty edge sensor. 5. Check for worn motor brushes and replace, if necessary.

Table 11. Troubleshooting Codes			
Alert/Fault/Error Display	**Buzzer Chirp Sequence**	**Possible Cause**	**Solutions**
Low 24VDC DC BUSS < 21V	No chirps; LCD flashes for 1s every 5s	Only occurs in DC powered operators. Occurs when battery voltage has dropped to less than 22V. At this level, batteries are 80% depleted. Normal function until 21V.	1. No AC Power. See above item. 2. Wiring / Connector problem - check all connections. Clean or repair as required. 3. Check battery condition. 4. Smart Touch Controller charger failure - check charger voltage and replace Smart Touch Controller. 5. Transformer failure - replace transformer.

Table 11. Troubleshooting Codes			
Alert/Fault/Error Display	**Buzzer Chirp Sequence**	**Possible Cause**	**Solutions**
Critical Low Power	No chirps: LCD steady and controls disabled	System monitors 24V control voltage in lieu of line voltage. Low incoming line voltage will cause low control voltage. Verify control transformer is connected properly, (white – not used, red for 208V, orange for 230V and blue for 460 V). As motor starts, check line voltage with a meter that has min/max hold capability. If line voltage drops more than 10% below nominal (187 on 208 VAC, 207 on 230 VAC, or 416 on 460 VAC) voltage is dropping too much and must be corrected. Generally, this requires larger wire size. On 3-Phase operators, check each leg to ground to make sure it is balanced. If line voltage is not dropping below these limits, check 24VAC and DC power at power supply. Voltages less than 20V indicate an overloaded or failing transformer or power supply board. Remove loads until the fault is found.	

Table 11. Troubleshooting Codes			
Alert/Fault/Error Display	**Buzzer Chirp Sequence**	**Possible Cause**	**Solutions**
Dead Battery DC BUSS < 21V	3 chirps upon any operating command entry	Occurs when battery voltage has dropped to less than 21V. At this level, batteries are 90% depleted. Gate will automatically open or close depending upon setting chosen. Refer to AP - AC LOSS "User Menu" on page 49 XX. No additional automatic function is possible, but limited push button control is available to 18V.	1. No AC Power. See above item. 2. Wiring / Connector problem - check all connections. Clean or repair as required. 3. Check battery condition. 4. Smart Touch Controller charger failure - check charger voltage and replace Smart Touch Controller. 5. Transformer failure - replace Transformer.
No AC POWER	Chirps once whenever gate reaches close limit	AC power is shut off at source (breaker) or is not connected. AC power switch on operator (lower rocker switch) is turned off, or circuit breaker on the operator has tripped.	1. Turn AC power switch on or connect power to operator. 2. Reset operator circuit breaker or connect power to AC switch. 3. Reset circuit breaker at electrical panel. 4. Have a licensed electrician check wiring.
!ACTION BLOCKED PHOTO EYE CLOSE PEC	5 chirps indicating that command cannot be initiated	Photo eye is not recognized as active.	Correct malfunctioning photo eye.

Table 11. Troubleshooting Codes			
Alert/Fault/Error Display	**Buzzer Chirp Sequence**	**Possible Cause**	**Solutions**
!ACTION BLOCKED PHOTO EYE OPEN PEO	5 chirps indicating that command cannot be initiated	Photo eye is not recognized as active.	● Clear photo eye path ● Realign photo eye. Refer to Photo Eye Alignment Feature on page XX. ● Replace photo eye battery ● Check N.C. wiring (verify wires are not disconnected or shorted) ● Review wiring diagrams. Especially path to SENSOR COM ● Make sure SENSOR settings S1, S2, and S3 are correctly assigned. Refer to "External Entrapment Protection Sensors: What the Installer Needs to Do" on page 38 XX.

Table 11. Troubleshooting Codes			
Alert/Fault/Error Display	**Buzzer Chirp Sequence**	**Possible Cause**	**Solutions**
!ACTION BLOCKED GATE EDGE (Open or Close) GEO	5 chirps indicating that 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. Gate edge is not recognized as active.	● Replace sensor batteries ● If using Miller Monitored Edge Link, be aware. Issues with radio interference cause false trips. Placing antenna high and reducing environmental "noise" is critical to proper wireless transmission. Avoid placing receiver sets within 100 feet of each other as crosstalk may occur. Use receivers & transmitters Version 1.02 or later. ● Verify wired edges are using a gate edge converter-type module. Miller Edges must have a wire with blue tape. Blue tape indicates that a resistor is built in. ● Check N.C. wiring (verify wires are not disconnected or shorted) ● Review wiring diagrams. Especially path to SENSOR COM ● Make sure SENSOR settings S1, S2, and S3 are correctly assigned.

Table 11. Troubleshooting Codes			
Alert/Fault/Error Display	**Buzzer Chirp Sequence**	**Possible Cause**	**Solutions**
ALERT 1 Forced Open	2 pulses per second for 30s	Gate has been forced open from a full close limit and is being prevented from re-closing.	Will self-clear after an open or close input.
ALERT 2 Drift Closed	2 pulses per second for 10 seconds	Gate has drifted closed from a full open limit and is being prevented from re-opening.	Will self-clear after an openor close input.
ALERT 3 EXCESS DRIFT	Gate drift in transit - Advisory only. The alert appears and is being prevented from reopening.	Alert appears if gate drifts three times in a five minute period.	Check track to make sure it is level.
ALERT 4 THERMAL Overload	2 chirps per second every 15 seconds	Motor drive heat sink exceeds 195°F. Alert will temporarily disable operator, but will automatically reset itself when it cools down. May also occur if the heatsink temperature is 70°F. higher than ambient temperature.	Check gate hardware, weight/ length of gate. Alert automatically clears when temperature drops below threshold.
ALERT 5 Both Lim ACTIVE	2 chirps per second every 15 seconds	The STC is seeing both limits tripped at the same time. Check for a stuck limit switch or debris caught in limit switch area and repair any wiring issues.	Reset the limits through the Installer Menu item, LL Learn Limits.
ALERT 6 LIM NOT RELEASED	2 chirps per second every 15 seconds	Is pump developing pressure? Are brake valves set properly? Is there hardware holding gate?	Check fluid levels and brake valve settings.

Table 11. Troubleshooting Codes			
Alert/Fault/Error Display	**Buzzer Chirp Sequence**	**Possible Cause**	**Solutions**
ALERT 7 Freq SHIFT FAULT	2 chirps per second every 15 seconds	Hy5x detector has detected a frequency change outside the normal range. Check the loops and the integrity of the loop installation.	Loop lead in wires and roadway should be checked for problems or replaced.
ALERT 8 LOOP SHORTED	2 chirps per second every 15 seconds	Hy5x detector has detected a short circuit in the loop. Temporarily switch detector to be sure the loop is at fault and then repair it.	Loop lead in wires and roadway should be checked for problems or replaced.
ALERT 9 LOOP OPEN	2 chirps per second every 15 seconds	Hy5x 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.	Loop lead in wires and roadway should be checked for problems or replaced.
ALERT 10 I2C BUS ERROR	2 chirps per second every 15 seconds	Communication issue between the Hy5x and the Smart Touch Controller; reset and try again. Replace the Hy5x if the problem continues. This message will also indicate which detector alert applies to: Exit Loop (ELD), Inside Obstruction Loop (IOLD), Outside Obstruction Loop (OOLD), or Center Loop (CLD) - (User Relay 22)	Remove and re-install the Hy5B and press RESET. Replace Hy5B, if necessary.

Table 11. Troubleshooting Codes			
Alert/Fault/Error Display	**Buzzer Chirp Sequence**	**Possible Cause**	**Solutions**
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 Hy5x if the problem continues. Caused by a fault within Hy5B. This message will also indicate which detector alert applies to: Exit Loop (ELD), Inside Obstruction Loop (IOLD), Outside Obstruction Loop (OOLD), or Center Loop (CLD) - (User Relay 22).	Remove and re-install the Hy5B and press RESET. Replace Hy5B, if necessary.
ALERT 12 ON TOO LONG	2 chirps per second every 15 seconds	The detector believes there has been a vehicle on the loop for more than 5 minutes. "Active" loop can be actual or false. This message will also indicate which detector alert applies to: Exit Loop (ELD), Inside Obstruction Loop (IOLD), Outside Obstruction Loop (OOLD), or Center Loop (CLD) - (User Relay 22).	Check traffic patterns at site. Loop and lead in wires should be checked for problems or replaced.

Table 11. Troubleshooting Codes			
Alert/Fault/Error Display	**Buzzer Chirp Sequence**	**Possible Cause**	**Solutions**
ALERT 13 STIFF GATE	2 chirps per second every 15 seconds	Smart Touch Controller has detected a gate that, over time, has taken more power to move than it used to. Caused by degrading gate hardware or debris in track. This alert appears in history log. It does not have any effect with regard to opening or closing gate	Check and correct gate hardware as required.
ALERT 14 STUCK GATE	2 chirps per second every 15 seconds	Smart Touch Controller has detected that it cannot move gate at all. Caused by broken gate hardware or ice/ snow buildup.	Check and correct gate hardware as required.
ALERT 15 NO TARGET		Not used on SwingRiser. Target magnet on the chain is missing or has not been detected. Target magnet fell off or target sensor wires are damaged.	1. Make sure target is properly fastened to chain. 2. Check target sensor to make sure it is reading magnet. Change sensor if it or its wires are damaged.
ALERT 16 COM BUS ERROR		Smart Touch Controller has detected an internal communications error. Several possible causes: ● Excessive electrical noise. ● Lack of earth grounding. ● Internal problem on Smart Touch Controller.	1. Determine and remedy source of electrical noise. 2. Install a ground rod. 3. Replace Smart Touch Controller.

Table 11. Troubleshooting Codes			
Alert/Fault/Error Display	**Buzzer Chirp Sequence**	**Possible Cause**	**Solutions**
ALERT 17 BAD COIN BATTERY	2 chirps per second every 15 seconds	CR2032 Coin battery is loose or dead.	1. Verify that battery is properly seated. 2. Replace coin battery. 3. Restore power. 4. Press RESET button
ALERT 18 CHANGE BATTERY	1 chirp a minute	Batteries are not taking a charge. The STC has detected that the 24VDC UPS batteries need to be replaced.	The buzzer will chirp every minute until the UPS batteries are replaced.
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 20 EXT LOCK FAILED	2 chirps per second every 15 seconds	An interlock contact is closed, indicating that the gate latch (lock)is engaged, preventing the operator from starting.	Check the interlock terminal and wiring.
ALERT 21 DRIVE TRIP	2 chirps per second every 15 seconds	Gate travel will not occur until the alert is cleared. Any open or close command resets the alert and starts the 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.

Table 11. Troubleshooting Codes			
Alert/Fault/Error Display	**Buzzer Chirp Sequence**	**Possible Cause**	**Solutions**
ALERT 22 INTLOCK FAILURE	2 chirps per second every 3 seconds	Appears when RS-485 communication connection is lost for more than 5s between interlocked (dual gate) or sequenced gate operators.	1. Check cable connections and wiring. Make sure both operators are working properly and have same current and up-to-date software versions. Alert auto clears when communication between two operators is restored. 2. If operator on site is a solo gate operator and display code ALERT 22 appears, access Installer Menu. Verify Installer Menu items: DG (Dual Gate) and SG (Sequential Gate) are both set to zero.

Table 11. Troubleshooting Codes			
Alert/Fault/Error Display	**Buzzer Chirp Sequence**	**Possible Cause**	**Solutions**
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: ● Make sure the slide switch on the side of the extended relay module is set at "Normal." ● (Y) Data + is connected to "A" DUAL GATE. ● (G) DATA - is connected to "B" DUAL GATE. ● Connector cable (4-pin) attaches to RS-485. If Hy8Relay module is not connected, access the Installer Menu. Check that the extended user relays are set to zero. STC = R4 to RB (7-segment display) SDC = R3 to R9 (32 character display) STC = R4 to R11 (32 character display)
ALERT 25	N/A	HyNet Only. The HyNet coin battery is dying. Turn off AC power to the HyNet and replace the existing coin battery with a CR1220 coin battery. Turn On power to the HyNet. The ALERT should reset and disappear from the display.	

Table 11. Troubleshooting Codes			
Alert/Fault/Error Display	**Buzzer Chirp Sequence**	**Possible Cause**	**Solutions**
ALERT 26	2 chirps per second every 15 seconds	Only appears in HydraSupply XL. When valve closures or IES trips do not detect limit switch triggers or, if the appropriate limit switch is not reached within 10s of receiving an operate command and the pressure switch is open, then Alert 26 – Lim Not Reached will be declared. If the barrier moves by pressing an operate command, the display resets and the ALERT 26 timer rearms.	

Table 11. Troubleshooting Codes			
Alert/Fault/Error Display	**Buzzer Chirp Sequence**	**Possible Cause**	**Solutions**
ALERT 27	2 chirps per second every 15 seconds	Only appears in HydraSupply XL. The fluid level in the accumulator is low. An EFO may not trigger properly. Have service personnel check the HydraSupply XL. Cycle the barrier and watch the pressure gauge. If the pressure islow, the blocking plate does not rise or the motor times out, check hoses for leaks. If necessary, recharge the accumulator. While ALERT 27 appears on the display, a renewed close command will attempt to run the barrier, but the alert will not clear unless the close limit is reached or a reset is pressed.	

Table 11. Troubleshooting Codes			
Alert/Fault/Error Display	**Buzzer Chirp Sequence**	**Possible Cause**	**Solutions**
"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 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.	Check and replace drive belt on applicable gate operators.Increase Max Run Timer in the Installer Menu.
FAULT 2 FAL2	2 chirps per second once per minute	Photo eye is missing or not working. See "Wiring HySecurity Sensors: Smart Touch". Be sure the eye "common" wire is wired properly to the SENSOR COM terminal.	Correct malfunctioning photo eye.

Table 11. Troubleshooting Codes			
Alert/Fault/Error Display	**Buzzer Chirp Sequence**	**Possible Cause**	**Solutions**
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. This condition is often caused by loose connections or the wire size being too small. If the wire is too small, it must be replaced.	● Verify that the control transformer is connected properly ● Check the line voltage as the motor starts with a meter that has min/max hold capability.
FAULT 4 GATE NO LOAD	Smart Touch Controller has detected there is no load on operator. Gate is non-operational while this fault is triggered.	Possible causes: ● Motor wires disconnected. ● DC switch off.	
FAULT 5 LIMIT FAILED	2 chirps per second once per minute	**50VF** series only. Not applicable for StrongArm M30/M50. Slow down to stop limit took too long. Possible bad limit switch.	● Verify limits and placement of slow down limit ramps. ● With drive wheels clamped, test Open (GATE OPENING appears on display). Test Close (GATE CLOSING appears on display.
FAULT 14 STUCK GATE	2 chirps per second once per minute	The STC has tried 3 times to overcome a stuck gate. The gate is non-operational while this fault is triggered. Caused by broken gate hardware or ice/snow buildup. Check and correct gate hardware as required. Press RESET to clear fault.	1. Check DC motor wires. 2. Turn DC power switch on. 3. Press RESET to clear fault.

Table 11. Troubleshooting Codes			
Alert/Fault/Error Display	**Buzzer Chirp Sequence**	**Possible Cause**	**Solutions**
ERROR 1 DIRECTION ERROR	3 chirps per second once per minute	Smart Touch Controller detects operator ran in wrong direction. Refer to "Gate Handing" on page 31.	1. Check motor wiring and correct, as needed. 2. Press RESET to clear fault.
ERROR 2 IES DISCONNECT	3 chirps per second once per minute	● The IES sensor could be bad, check to see that the NC 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. ● Verify the version of the software by pressing the Reset button. The software version appears on the display. Make a note of it. The software version should be h4.50 or h5.50 (or later). ● If necessary, update the software using a PC laptop and S.T.A.R.T. Register and login in at www.hysecurity.com	

Table 11. Troubleshooting Codes			
Alert/Fault/Error Display	**Buzzer Chirp Sequence**	**Possible Cause**	**Solutions**
ERROR 3 HY5 COMM ERROR	3 chirps per second once per minute	Caused by Hy5B removal or lack socket connection integrity. Message indicates which detector alert applies to: Exit Loop (ELD), Inside Obstruction Loop (IOLD), Outside Obstruction Loop (OOLD), or Center Loop (CLD).	1. Press RESET. 2. Remove and re-install Hy5B. 3. Replace Hy5B, if needed.

Table 11. Troubleshooting Codes			
Alert/Fault/Error Display	**Buzzer Chirp Sequence**	**Possible Cause**	**Solutions**
ERROR 4 PRIMARY- SECONDARY COM	3 chirps per second once per minute	Several possible causes: ● Primary/Secondary communication cable has not been installed correctly. See Primary and Secondary Wiring Connections. ● Primary/Secondary not configured properly through Installer Menu. ● Operator not properly Operator not properly earth grounded. ● Primary/Secondary communication cable installed in same conduit as high-voltage AC power. ● One operator does not have power applied to it. ● One operator may have a different software version.	1. Correct communication cable. 2. Verify each operator is configured properly via Installer Menu. Set one operator as Primary, one as Secondary. 3. Install ground rod per NEC/NFPA standard. 4. Install separate communication cables conduit. 5. Ensure AC power is present at both operators and all power switches are ON. 6. Check software version currently loaded in operator by pressing RESET. Make sure both operators are running same software version.
ERROR 5 NO DISPLAY		Display provides no indication of this error, but it can appear in START log and means that Smart Touch Controller has detected a serious internal error.	1. Turn both switches off to reset software. 2. Update to latest software version using START. 3. Replace Smart Touch Controller.

Table 11. Troubleshooting Codes			
Alert/Fault/Error Display	**Buzzer Chirp Sequence**	**Possible Cause**	**Solutions**
ERROR 6 STC-VFD COMM ERR	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 7 MENU CHECKSUM ERR7	3 chirps per second once per minute	Software issue exists that may require factory reset. Corrupt software or data.	Contact HySecurity.
ERROR 8 RPM SENSOR	3 chirps per second once per minute	Motor Encoder or wires are damaged or unplugged.	Check wiring from the hydraulic cylinder to the STC.
ERROR 9 BATT DISCONNECT	3 chirps per second once per minute	Only applies to DC Power Supply connection.	Contact HySecurity.
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. OPEN SLOWDOWN or CLOSE SLOWDOWN should appear on the display which indicates that it is working properly.	● Check slowdown limit wiring and adjustment. ● Adjustment of the limit ramps to verify that the limit switch is being tripped. ● Manually trip the slowdown limit.
FAIL PROGRAM DATA ERR FAIL	3 chirps per second once per minute	Try turning off the power to the operator and having the customer re-seat all of the various connectors and cables. Upload the latest software release. If the fail does not go away, contact Technical Support.	

ACCESS THE EVENT LOG THROUGH THE USER MENU

NOTICE

While you are viewing the event log, the gate operator is in Menu mode and cannot run open or close.

1. To enter the User Menu, press the Menu key twice.
2. Press Next and scroll until "LG 0 (OFF)" appears in the display.

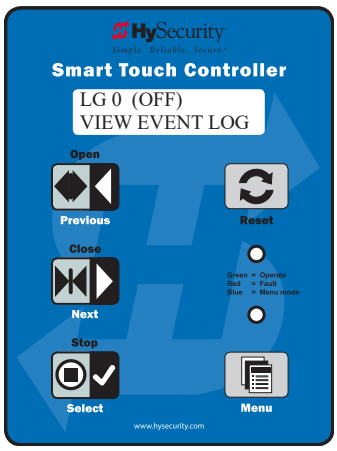


Figure 48. LG 0 (OFF) View Event Log

3. Press Select. LG blinks.
4. Press Next to change the number to 1,

   LG 1 (ON)

   VIEW EVENT LOG

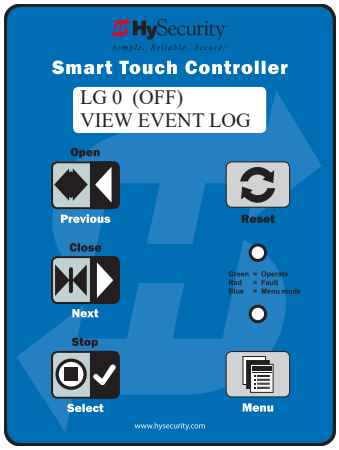


Figure 49. LG 1 (ON) View Event Log

5. Press Select. The most recent event recorded in the log appears.
6. To scroll through the event log, press Next or Prev. Hold down Next or Prev to scroll quickly toward the top or bottom of the event log.

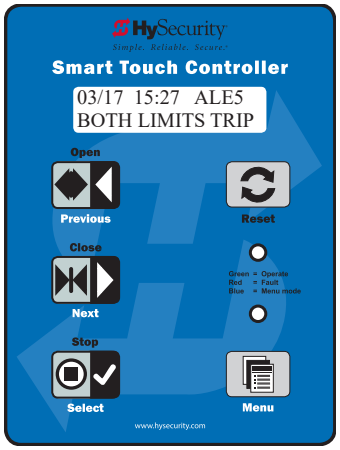


Figure 50. STC Event Log

7. To exit, press Menu. The display resets to LG 0 (OFF).
8. Press Menu again to exit the User Menu and return to Run/Program mode.

Month / Day	Time (HH:MM)	Event Type
03/17	15:27	ALE5
Description: ALERT 5: BOTH LIMITS TRIPPED		

NOTICE

Over 300 events can be recorded before the software begins overwriting the existing log history.

The event log is also accessible through S.T.A.R.T. software with the use of a PC laptop and interface cable. Refer to the S.T.A.R.T. User Guide.

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.
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.

NOTICE

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 Supply Board 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 Wire Sizing and Runs on page XX. 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 Supply Board 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 Table 8: Troubleshooting Codes on page 78 to determine possible resolutions.

MECHANICAL ISSUES

Gates that run smoothly and operate well significantly improve the life of the gate operator's motor and component parts. Refer to "Mechanical Maintenance" on page 144.

On site gate movement issues can usually be resolved in the short term by manually moving the gate open and close. See "Manual Gate Release Operation" on page 22.

HYDRAULIC ISSUES

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

⚠ CAUTION

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

NOTICE

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

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.

NOTICE

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 23°C 70°C).

VEHICLE DETECTOR AND LOOP FAULT DIAGNOSTICS

If HySecurity Hy5B vehicle detector modules are used, the Smart DC Controller has the ability to store and report detector and loop fault information for performance diagnostics.

If the Smart DC Controller senses a loop or detector problem:

- The LCD display flashes the name of the affected detector or error and the appropriate alert code.
- The buzzer chirps continuously at regular intervals until the issue is resolved.

Table 12. Hy5B Vehicle Detector Faults and Errors			
Alert or Error #	**LCD Description**	**Advisory**	**Resolution**
ALERT 7	FREQ SHIFT FAULT	Hy5B vehicle detector - Abnormal frequency change alert.	Alert indicates an unstable loop frequency. Check loop and lead in wires for problems. Replace them, if necessary.
ALERT 8	LOOP SHORTENED	Hy5B vehicle detector - Loop is shorted.	Alert indicates that loop and lead in wires are shorting out. Check wires for problems. Replace them, if necessary.
ALERT 9	LOOP OPEN	Hy5B vehicle detector - Disconnected loop alert.	Alert indicates loop wires are loose or disconnected. Check wires for problems. Replace them, if necessary.
ALERT 10	I2C BUS ERROR	Hy5B vehicle detector - Communications alert.	Alert indicates detector is not communicating properly with Smart DC Controller. Alert occurs if detector is unplugged or connection is unstable. If communication is not reestablished within 30 seconds, controller will reset and message changes to ERROR 3.

Table 12. Hy5B Vehicle Detector Faults and Errors			
ALERT 11	DETECTOR FAULT	Hy5B vehicle detector - Malfunction alert.	Display indicates Hy5B detector malfunction. Check detector for problems. Replace it, if necessary.
ALERT 12	ON TOO LONG	Detector input triggered too long - More than five minutes.	Display indicates Hy5B detector malfunction. It alert also works for any input connected to terminal strip for standard box detectors. Check that a vehicle is not parked on loop. Also, determine if loop is stable. An unstable loop can hold detector in a triggered state.
ERROR 3	DETECTOR FAILED	Hy5B vehicle detector - Communication failed. Smart DC Controller will behave as if detector is triggered, usually holding gate fully open.	Alert indicates detector is not communicating properly with Smart DC Controller. Alert occurs if detector is unplugged or detector has failed. To replace detector, press RESET button to clear error and re-seat detector or install a new one.

Even if the loop problem self heals, historical data about detector/loop performance and a log of Alerts, Faults and Errors can be retrieved from the Smart DC Controller by downloading from the RS232 communications port or the USB port. HySecurity's free START software, a laptop computer, and a special download cable or USB cable are required to retrieve and read this data.

Loop Health:
The Hy5B monitors loop health which is comprised of loop noise, loop step changes and loop reference changes. Loop health readings accumulate throughout a 24 hour period and the accrued readings are posted to the Event Log each day at midnight. After midnight, the loop health baseline resets to its highest value of 777.

Example of an Event Log posting (Figure 51):

```
Event log:
02/09  EVENT - CLD Loop Health: noise 5, step 6, ref 7
```

Figure 51. Hy5B Event Log

Loop Presence:
Loop presence is dependent on "disturbance effect" of the entire vehicle. Presence determines how long to hold the "memory" of a stationary vehicle on a loop before it is forgotten and ignored. Set the presence of the loop:

- LONG (default) lasts about 20 hours dependent on call strength and sensitivity setting. The Hy5B tunes out the "disturbance effect" when a vehicle is stationary on a portion of the loop, but keeps the undisturbed (unaffected) portion of the loop operational.

- INFINITE never drops the call. The INFINITE setting requires a certain amount of signal strength. A "threshold" is maintained and it will hold the call forever. The loop connected to an Hy5B with this setting may become nonfunctioning.

Table 13. Setting Loop Presence		
Sub-menu Item	**Display**	**Example Site Scenario**
PR 0	(LONG)	With sensitivity set to A (AUTO) and a large sedan stationary on loop, LONG presence may hold call for many hours before vehicle's presence is tuned out. Then, stationary vehicle is ignored and unaffected portion of loop becomes operational. In contrast, with sensitivity set to M (MOTORCYCLE), default threshold only lasts about 1 hour before presence of motorcycle on loop is tuned out.
PR 1	(INFINITE)	A site where standing or parked vehicular traffic (on large area loops) is a daily or consistent basis, INFINITE presence setting is a viable option. When loop may have vehicles parked on it for more than several hours and it must hold the call, set presence to INFINITE.

NOTICE

Hy5B has ability to continue counting vehicles passing over loop even though a stationary vehicle may be on a portion of loop. Controller and Hy5B detector also exchange pertinent information, so if a power failure were to occur, controller can determine if a vehicle is on loop when power returns.

Frequency:
Knowing the exact frequency of a loop can be useful as a diagnostic tool, and verifying the stability of the loop frequency is valuable information. To view the actual loop frequency of a specific vehicle detector, go to the setting for that detector in the Installer Menu, switch the selection from 0 to 1, and press the Select button. The display will show the loop frequency. The frequency is usually between 20,000 to 80,000 Hertz.

Changing the Loop Frequency:
Hy5B detectors can never crosstalk. If for any reason, you want to manually change the loop frequency, change the Installer Menu option for the desired loop from 0 to 3, and then press the Select button. Each detector has a choice of four frequencies. Press the Select button when the desired frequency setting is found, and the controller will perform a reset and tune to the new frequency setting.

Call Strength Level:
Knowing the call strength of a detector is valuable because it provides information about how well the loop is actually "seeing" a specific vehicle. For example, it may be useful to check to see if the loop is easily detecting the middle of a high bed semi-truck. The strength of a detector call can be displayed in real time, on a scale of 0 to 7. As indicated in the table below, when the Installer Menu setting for a given detector is set to 2, and the Menu button is pressed, the LCD display will read Level 0 - 7 Call Level. If the call strength on the display appears as a level 4 or less, consider increasing the sensitivity level by adjusting the rotary switch on the Hy5B detector.

Table 14. Hy5B Vehicle Detector Call Level Display		
Installer Menu	**LCD Description**	**Setting Options (Bold = Factory Settings)**
ELD 0	EXIT LOOP SET	0 = Run mode 1 = Show frequency 2 = Show call level 0-7 3 = Set Frequency 4 = Show Sensitivity 5 = Set Sensitivity 6 = Show Inductance 7 = Show Loop Health 8 = Set Presence
ILD 0	IN OBS LOOP SET	
OLD 0	OUT OBS LOOP SET	
CLD 0	CENTER LOOP SET (Can be used as an arming loop with User Relay 22.)	

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 128.

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

NOTICE

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: Hydraulic pressure above 700 PSI

1. Verify that the quick connects at the hose ends are fully seated on the valve stems.
2. Check the flow control valve, it must not be turned too far clockwise. See " " on page 153.

PROBLEM 4: 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 solenoid coil may not be energizing or it may be defective.
4. Carefully, replace the valve.

PROBLEM 5: The gate panels move in the wrong direction.

1. Check hose connections to verify the correct order red to red and brass to brass. Note that newer gate operators manufactured after 2012, may not have color bands on the quick disconnects.

2. With the system engaged to open, verify that the open valve coil develops a strong pull. (This can be tested by removing the nut retaining the coil and grasping the coil to feel its magnetism.)

PROBLEM 6: I have a bi-parting gate system or twin models and the gate panels won't synchronize.

1. Air trapped in the hydraulic system can cause slow or jerky movement and prevent the panels from synchronizing.
2. On twin models, make sure leaf delay (LC or LO) in the Installer Menu is not set.
3. Refer to General Maintenance and read the instructions for bleeding air from the SwingRiser hose which is found in the Hydraulic section.

PROBLEM 7: The gate panels move very slowly and seem to shudder throughout gate travel.

1. Air trapped in the hydraulic system can cause slow or jerky movement.
2. Refer to General Maintenance and read the instructions for bleeding air from the SwingRiser hose which is found in the Hydraulic section.

PROBLEM 8: Gate speed

The speed in which a hydraulic operator moves a gate is determined by the size of the pump and the size of the actuator components. Just like a gear box, this speed is not adjustable. Attempting to slow a gate by changing any valve setting will cause a great deal of inefficiency and heat. If the speed of a gate must be changed, contact your HySecurity distributor.

PROBLEM 9: Gate speed in extremely cold weather

Extremely cold weather is unlikely to seriously affect the speed of the gate, because HySecurity employs a special grade of hydraulic oil which maintains a very linear viscosity over a broad range of temperatures. Because of this high quality oil and other design considerations, we rate our operators for service in ambient temperatures of - 40°F to 158°F (- 40°C to 70°C). If the speed of your operator has been affected by cold weather, verify that the gate hardware is not impaired by ice and verify that the reservoir it is filled with UNIFLOW oil. In severe conditions, consider adding a heater. SwingRiser heaters are available from your distributor.

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. Instructions for downloading S.T.A.R.T. are on the website.

WHAT YOU NEED

- Standard USB 2.0 A-B communications cable. If you are using the HySecurity RS-232 to USB adapter, be sure to install the USB driver in your laptop.
- Laptop computer with Windows PC operating system (XP, Vista, or Windows 7/8/8.1/10)
- 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 START User Manual, and then take the following steps to download START software:

1. Bring up your web browser and type in http://www.hysecurity.com in the command line.
2. Click Technical Support (left column) on the HySecurity home page.
3. Enter your user name and password. If you do not have a user name, register as an online member.
4. Click to Download: S.T.A.R.T. software for Smart Touch and Smart DC.
5. Read the End User License Agreement and, if you agree to the terms, click on, I accept (bottom of the page).
6. Click RUN. A setup window appears.

NOTICE

If the operating system on your laptop is VISTA or Windows 7, you must first disable the "User Account Control Settings," refer to the procedure in "Setting User Account Controls" on page 116 and then continue to step 9.

7. Follow the step-by-step instructions to complete the installation.
8. When the download is complete, log out of the HySecurity website. Shortcuts for the START and Smart DC Controller History Logs appear on your laptop's desktop.
9. When the download is complete, log off the HySecurity website. Shortcuts for the S.T.A.R.T. and STC History Logs should appear on your laptop's desktop.*

Setting User Account Controls

Because of the security settings inherent in VISTA and Windows 7, you need to disable the "user account controls" in the operating system before uploading START software onto your laptop. Take the following steps:

In Windows 7:

Go to Start Menu -> Control Panel -> User Accounts and Family Safety -> User Account -> Change User Account Control Settings "slide the slide bar to the lowest value (toward Never Notify), with description showing Never notify me -> Press Ok -> Reboot Computer.

In Vista:

Go to the Start Menu type "msconfig" and press Enter -> In System Configuration select the tools tab -> Scroll down till you find "Disable UAC" and single click it -> Press the Launch button -> Press the Apply button -> Press OK -> Reboot Computer.

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 "Table 9. Troubleshooting Codes" on page 129 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.

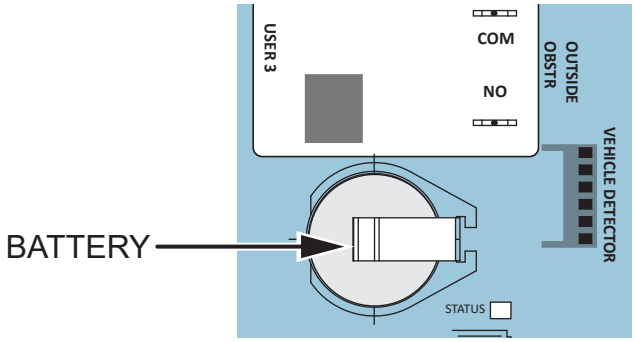


Figure 52. dsafsdf

MECHANICAL MAINTENANCE

NOTICE

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

The mechanical maintenance for the HySecurity gate operator 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 hydraulic cylinders using NLGI #2 Grade Moly EP lithium base grease only and apply it with a standard grease gun. Grease other bearing locations per "SwingRiser Operator Maintenance Schedule" on page 152.
- Replace worn-out batteries.
- Maintain gate hardware in good-working order.

OPERATOR POST

The operator post is the workhorse of the gate. Schedule regular maintenance on operator post to include following:

Smooth gate operation: Open and close gate several times. Check for consistent speed and smooth stops. If adjustment is necessary, refer to Adjustment of the Flow Control Regulating Valve.

Indexing arm: To hold gate in correct position, indexing arm may need to be adjusted to align locking pin with its receptacle. Adjustment is usually required only after gate has been hit by a vehicle or otherwise damaged.

To adjust, refer to Mounting the Gate Panel, Index Arm, and Locking Pin Assembly.

Most reliable operation occurs when indexing arm is adjusted to over-extend gate closure. Goal is to have locking pin strike its receptacle firmly. Added pressure in slight over-extension of the gate aids in keeping locking pin aligned in its receptacle.

UHMW bearings and shims: Inspect the white UHMW plastic bearings (inside the upper and lower portions of the square post). See the photo in the Cut-away View. The bearings are designed to wear during normal operation and must be inspected at regular intervals and re-shimmed or replaced, as necessary.

- If the gap between the bearing and the inner tube exceeds 1/8-inch (3mm), the bearing needs to be re-shimmed. See Reshimming the Bearings.
- If the bearing is extensively worn and ¼-inch (6mm) or less of plastic bearing material remains, replace the bearing. Replace both the upper and lower bearings by following the steps in Replacing the Bearings.

NOTICE

If you plan to replace the bearings, a replacement part kit must be ordered from HySecurity. The kit includes the upper and lower UHMW bearings and 16 shims.

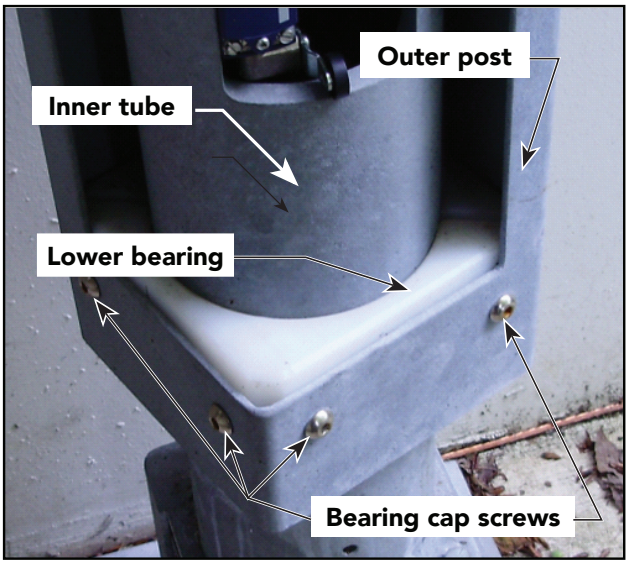


Figure 53. Cut-away View of SwingRiser Post

RESHIMMING THE BEARINGS

To add shims, you need to order the Shim Kit. It includes four 0.020 and four 0.060 shims. Refer to the HySecurity Price Book for the appropriate part number.

Important aspects to consider when you are shimming bearings:

- One half of the bearing is usually worn more than the other. Use different shim thicknesses (0.020 or 0.060) to keep the inner tube centered inside the post.
- The weld seam inside the post may prevent the shim from sliding behind the bearing cleanly. If this happens, cut 1 inch out of the middle of a shim and install the two slotted pieces on each side of the weld.

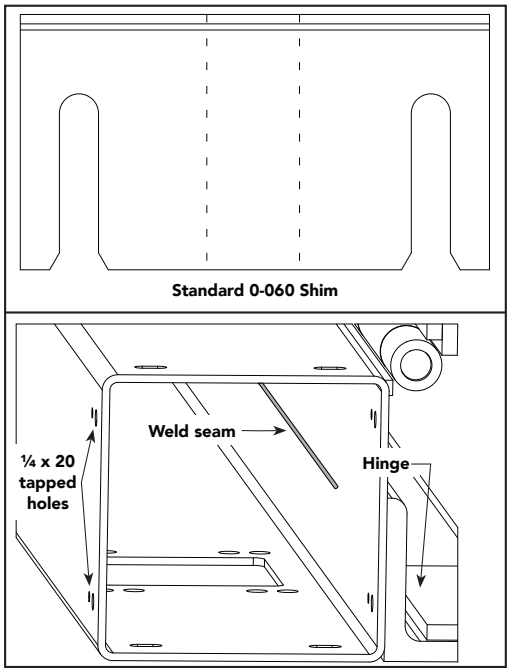


Figure 54. HySecurity Shim Kit

To install shims, take the following steps:

1. To access the upper bearing, close the gate.
2. Turn off the gate operator's power source. This ensures that the gate will not move while you are installing the shims.

   IMPORTANT: Measure the thickness of the material remaining in the upper bearing. Be sure to measure the thinnest portion of the bearing. If the thickness is ¼-inch or less, do not use the shims. Instead, replace both the upper and lower bearings. See Replacing the Bearings.
3. Use a jack screw to lift and block the gate panel. This transfers the weight off the bearings.
4. Loosen, but do NOT remove the four screws in the outer post that secure the worn portion of the bearing. There are four ¼-20 tapped holes adjacent to the screws. Bolts (¼ - 20) may be screwed into these holes to aid in adjusting the gap while shimming.
5. Make a shim packet with 0.060 and 0.020 shims and close the gap tolerance to under 0.020 of an inch. Use a feeler gauge to measure the gap.

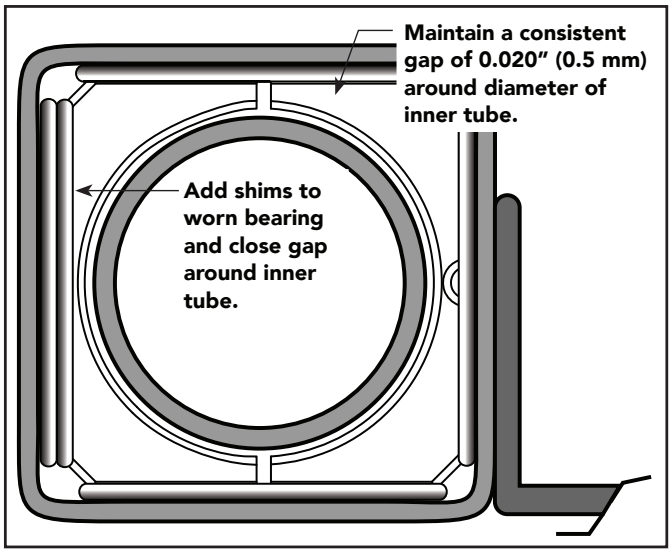


Figure 55. Shim Packet

6. Force the shim pack into the space between the worn bearing (A) and the square post. If the gap between the inner tube and the bearings (both portions A and B) remains higher than 0.020-inches, loosen the screws that secure portion B and force equal-sized shim packets between bearing (B) and the outer post.

   IMPORTANT: Keep the bearings centered and maintain a consistent gap around the diameter of the ¾" (19 mm) inner tube. Another way to measure for consistent gap tolerance is shown in the illustration. If the distance between the outside of the post and the outside diameter of the tube equals ¾" (19mm) and the bearings are centered, a consistent gap should exist around the inner tube. It is likely that the gap is within the needed 0.020 tolerance.

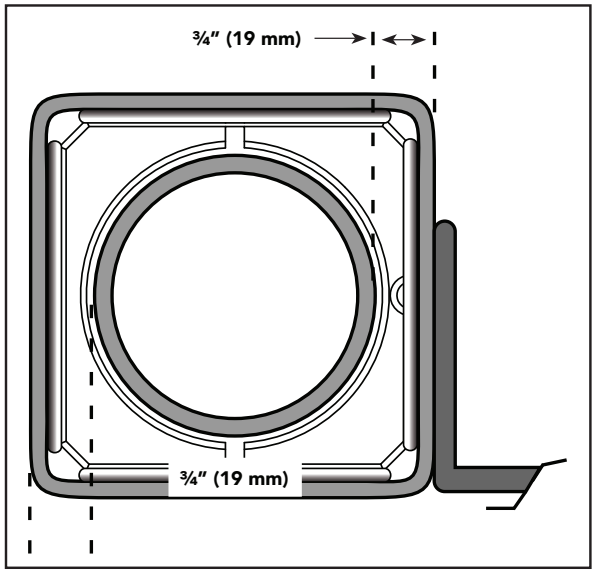


Figure 56. Shim Installation

7. Re-tighten the screws to secure the re-shimmed bearings.
8. Remove the block from the gate.
9. Turn the power back on.

REPLACING THE BEARINGS

To replace the bearings, you need to order the replacement part kit. You may want to order replacement fasteners as well. You will need eight cap screws per bearing.

Part #	Name	Description
MX001718	SwingRiser Bearing and Shim Kit, Upper & Lower	Includes upper and lower post bearings and 16 shims. This kit can be used on operators manufactured from 2/2008 to the present.
MX001089	Nickel-plated cap screws (3/8 x 16 x 1-inch)	Replacement fasteners. If needed, order eight cap screws per bearing.

NOTICE

If you are working on a SwingRiser manufactured prior to January 2008, refer to Technical Bulletin: SwingRiser Maintenance – Bearing Replacement and Shimming.

Important aspects to consider when you are replacing bearings:

- Locate weld seam inside square post. It should run along side that is attached to gate hinges. Notched portion of bearing half must be installed so that notch aligns with weld seam. If weld seam is not evident inside post, place bearing so notch is on hinge side.
- Shims are inserted at factory with 0.0 to 0.020-inch clearance in relation to post. Replacement bearings need to be shimmed to a similar clearance.
- When installing new bearings, use an equal number of shim packets on opposite sides. Packets may be composed of 0.060 and 0.020 shims.
- Always start with a .060" shim on each of the four outside edges when installing a new rectangular bearing.

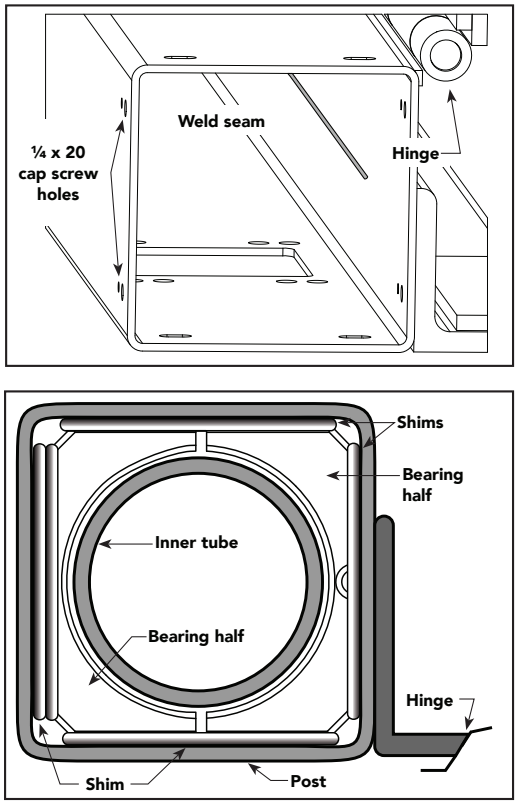


Figure 57. Bearing Replacement

To replace the bearings, take the following steps:

NOTICE

Refer to SwingRiser Bearings Chart to determine what replacement kit you need to order.

1. To access the upper bearing, close the gate.
2. Turn off the gate operator's power source. This ensures that the gate will not move while you are installing the bearings.
3. Use a jack screw to lift and block the gate panel. This transfers the weight off the bearings.
4. Loosen the post screws and remove any shims surrounding the bearings.
5. Alleviate the possibility of the bearing falling into the post's interior by using two self-tapping screws and some string. Fasten a separate strand to each screw. Turn the screw into each half of the UHMV plastic bearing until each screw is secure.
6. Remove the four screws in the outer post that hold the worn half of the bearing in place. Pull on the string to remove the bearing from inside the post, and then perform the same step for the other half of the bearing.
7. Use the screw and string technique on the two new bearing halves. Make sure the notch in the bearing is aligned with the post's weld seam.
8. Replace both bearing halves and use the fasteners removed in step 6 to hold them in place. Do not fully tighten the fasteners until the shims have been properly installed.
9. Shim each side evenly so the distance between the outside edge of the post and the inner tube is equal to ¾-inch (19mm). Make sure the bearing halves are centered in the post and the gap surrounding the inner tube is consistent.
10. Remove the block from the gate.
11. Turn the power back on.
12. Open the gate to access the lower bearing.
13. Repeat steps 2 through 11 to replace the lower bearing.

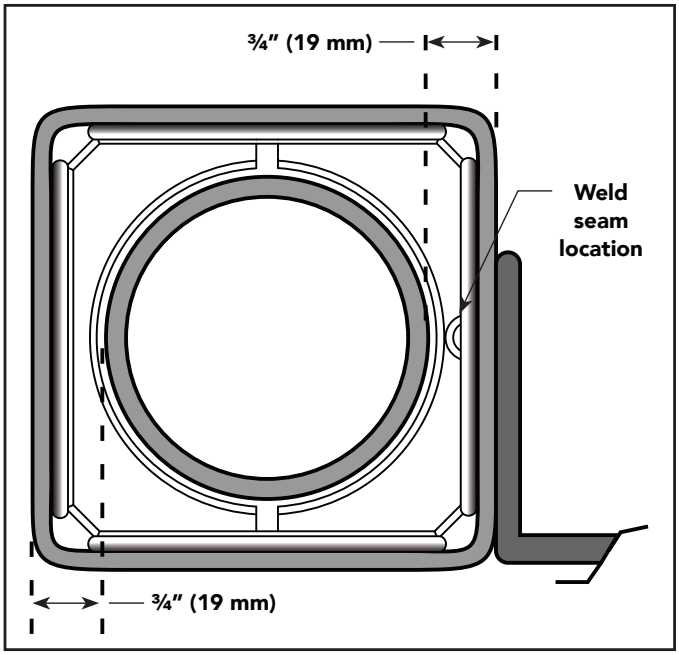


Figure 58. Replace Bearings Dimensions

SWINGRISER INDEX ARM ASSEMBLY

Two spacers (5/8-inch nuts) have been added to the SwingRiser index arm assembly. The stabilizing index arm directly affects the cam and its path inside the support post. When the index arm is held securely in its mounting bracket, the outcome increases the longevity of SwingRiser components.

For assembly instruction, review the illustration below and the drawings in the "Figure 73. SwingRiser Twin (HRG 222) Installation Reference" on page 166.

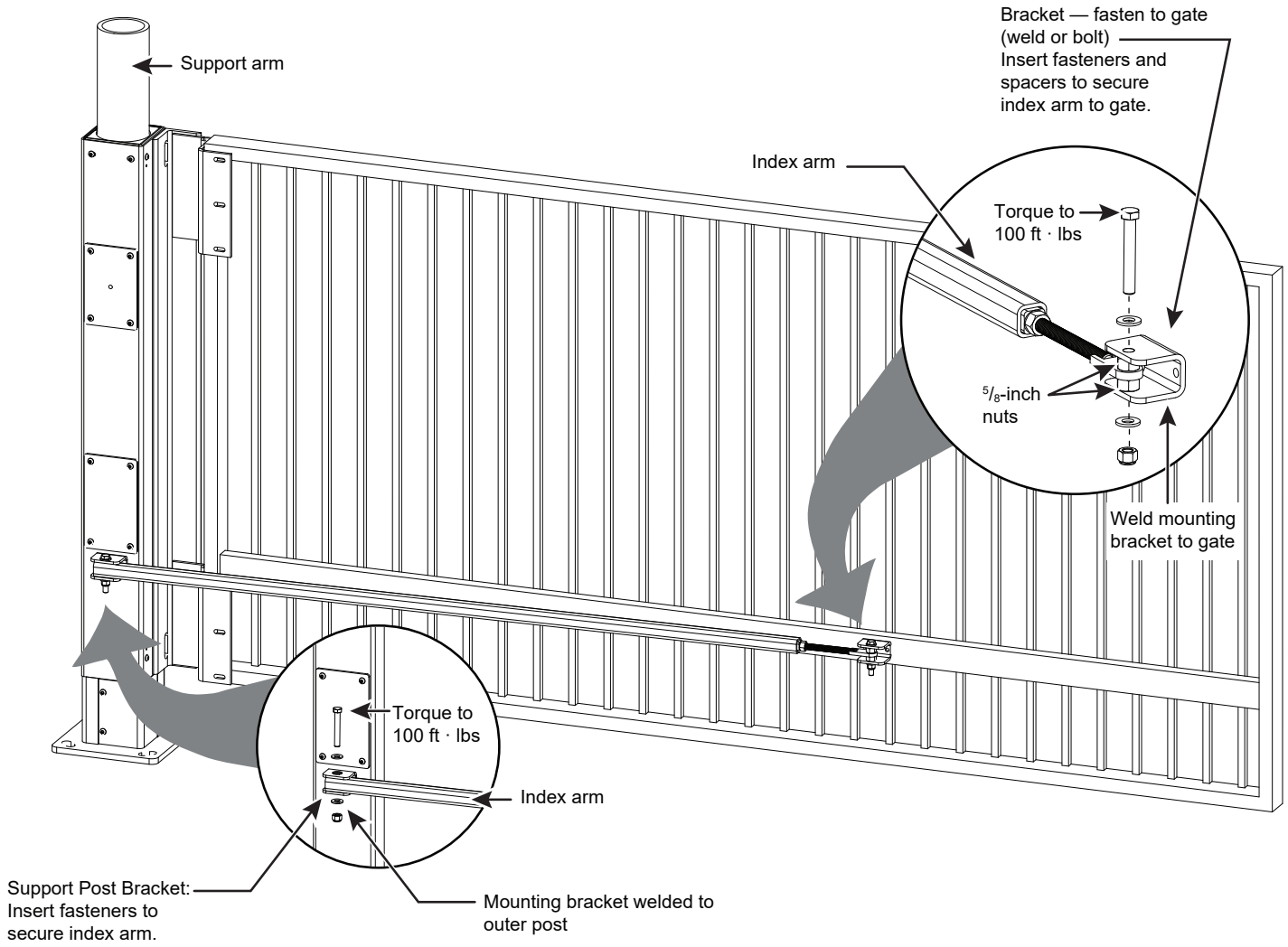


Figure 59. SwingRiser Index Arm Assembly

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 warm climate), change the fluid more frequently.

To change the hydraulic fluid,

1. Remove the reservoir from the pump pack.
2. Completely empty it.
3. Re-assemble the pump unit and refill it with new Uniflow hydraulic fluid.
4. 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.
5. 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.

   Excessive ice buildup can partially or totally jam gate operation. Operate the gate manually, while clearing the ice buildup.

   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.

NOTICE

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).

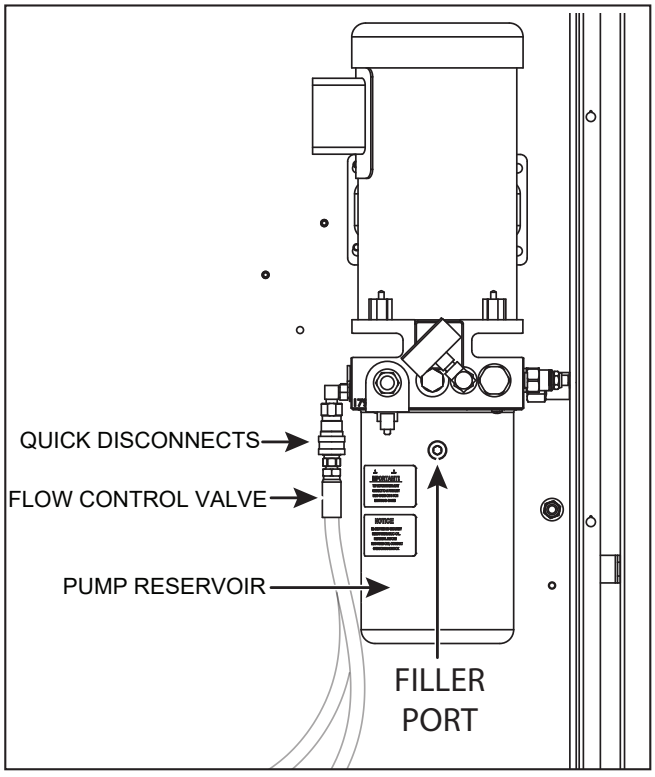


Figure 60. Hydraulic Reservoir

ADJUSTING THE PRESSURE RELIEF VALVE

The Pressure Relief Valve governs maximum system hydraulic pressure. It is located on pump backside . The pressure relief valve is factory set and may need to be adjusted depending on gate weight.

Pressure relief valve adjustments establish threshold for inherent entrapment sensor (IES). Optimal pressure setting produces uniform gate travel and trips IES when gate encounters an obstruction.

See "Pressure Relief Valve - All Hydraulic Operators:" on page 34 and follow the instructions.

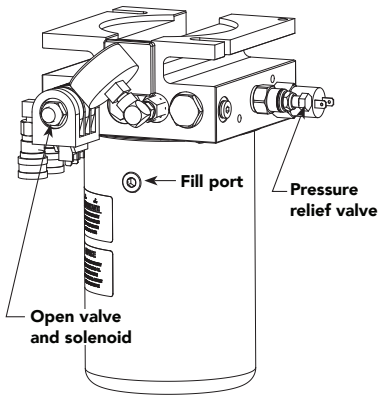


Figure 61. Pressure Relief Adjustment

OPEN VALVE

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

Adjustment of the Flow Control Valve with color bands is used on older operators. A flow control valve without color bands is now used in production of SwingRiser operators.

If you have a flow control valve without color bands, use the following steps to restrict hydraulic fluid flow back to pump pack. This action can fine tune closing gate speed.

NOTICE

Change pump pack size and motor horsepower to affect closing speed adjustments on a broader scale.

ADJUSTING THE FLOW CONTROL VALVE

⚠ CAUTION

Before adjusting flow control valve, SwingRiser posts must be installed, plumbed, and wired to HydraSupply. Gate must be secured on posts with its index arm attached, adjusted, and tightened. Note that over-tightening flow control valve causes gate operator to draw more motor horsepower than necessary or desirable. Over time this aspect can cause additional stress and wear on hydraulic power unit and void warranty.

Use flow control valve to fine-tune gate's closing speed. As gate slows (optional locking pin rests into its locking receptacle), use fine-tuning of flow control valve to make proper adjustments. Valve affects how quickly hydraulic fluid flows to pump pack, effectively changing closing speed of gate.

NOTICE

Flow control valve is for fine-tuning closure speed on the gate. To affect closing speed adjustments on a broader scale, change pump pack's size and motor's horsepower.

Two different methods exist for flow control adjustments. Older SwingRiser operators have color bands, newer operators do not. Make sure you are following correct steps.

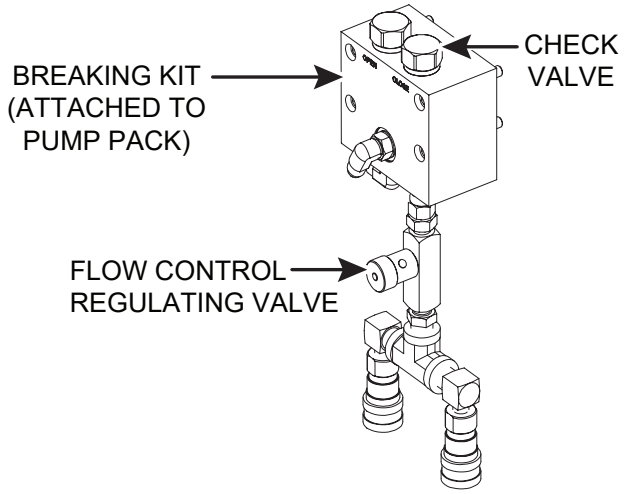


Figure 62. Flow Control Adjustment

Flow Control Valve Adjustment without Color Bands

If you have a flow control valve with color bands, take steps in "Adjustment of the Flow Control Valve with Color Bands".

1. Start with operator in closed position. When gate is closed, GATE CLOSED appears on display.
2. Using a 5/64-inch hex key, loosen small set screw located on flow control regulating valve.
3. Press OPEN button on keypad. Let operator run until it stops on open limit.
4. Press CLOSE. As gate moves in closed direction, slowly turn flow control regulating valve in one of following directions to adjust closing speed:

- Clockwise – restricts hydraulic fluid flow back to tank, increases pressure and, to a small extent, slows closing speed
- Counterclockwise – increases hydraulic fluid flow back to tank, reduces pressure and boosts closing speed

5. Make adjustments so the gate closes smoothly and does not over-swing or slam into or against the lock socket.
6. Run a few open and close cycles to make sure flow control adjustment is set properly.

NOTICE

Check pressure gauge as gate closes and opens. Make sure steady state pressure is slightly higher as gate closes than when it opens. Flow control regulating valve is only to be used for fine adjustments. Valve affects hydraulic fluid flow to pump pack tank which, in turn, slightly affects closing speed of gate. Change pump pack and motor size to make larger scale adjustments to gate closing speed.

7. With gate stopped in closed position, tighten small set screw loosened in step 2.
8. Follow bleeder tool instructions to bleed air out of hydraulic lines.

Adjustment of the Flow Control Valve with Color Bands

SwingRiser gate operators employ the use of a flow control valve to allow slight adjustments in the closing speed of the gate.

To adjust the close flow control valve correctly, take the following steps:

1. Pre-set the valve set such that only two of the color bands (red & blue) below the adjusting knob are exposed.
2. Run the gate in the close direction and turn the flow control valve clockwise until you have achieved a proper gate closing speed and the locking pin sets gently into position.
3. Other important adjustments are necessary for correct locking. See "Figure 54. asfdasfds" on page 160.
4. Be sure to tighten the set screw on the adjusting knob to lock your adjustment.

BLEEDING AIR FROM SWINGRISER HOSES

Air trapped in the hydraulic systems of SwingRiser (HRG) operators can cause slow and/or jerky operation. In SwingRiser Twin (HRG 222) systems (two gate panels operating from a single hydraulic supply), air can prevent the two panels from synchronizing.

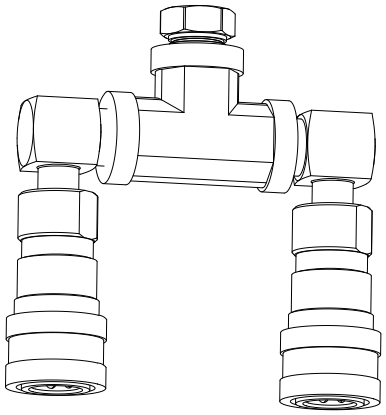


Figure 63. Air Bleeder Tool

If these symptoms are appearing in your operator, you may need to bleed the air from the hoses between the hydraulic supply and the operator post.

In SwingRiser Twin systems, both posts must be bled at the same time. The gate will be inoperative during the bleeding process. If traffic needs to pass, remove the index arm and pivot the gate on the mounting hinges manually.

Look for leaks:

- 7/32" Allen wrench (for cover plate screws)
- Bleeder tool assembly, refer to the HySecurity Price Book for the part number. A single gate requires one Bleeder tool. A twin gate system requires two Bleeder tools.
- Two electrical jumper cables

Detailed instructions on how to use the bleeder tool are shipped with it. You can also find the instructions online by logging into your distributor or installer site and accessing Technical Support Resources, Replacement Part Instructions.

SWINGRISER OPERATOR MAINTENANCE SCHEDULE

Part Name	What To Do	Recommended Monthly Check Intervals				
		1	3	6	12	24
Gate and hardware	Check for damage and wear *1	X				
Anchor bolts	Check for tightness *2			X		
Large Hydraulic cylinder	Grease end pin (50,000 cycles) *3				X	
Hydraulic cylinder (inside)	Grease end pin (100,000 cycles) *4				X	
Fluid level	Check for loss fluid *5				X	
Hydraulic fluid	Drain and replace fluid *6					X
Clock battery	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 toggle clamping mechanism and then manually pushing gate. One person should easily be able to push all but largest of gates. Damaged or warped gate panels should be straightened or replaced.

*2. Check anchor bolts are tight and cover secure.

*3. Grease large hydraulic cylinder end pin as regular maintenance every 50,000 cycles or 1 year (whichever comes first).

*4. Grease two serk fittings on hydraulic cylinder trunion bearing (inside, near cylinder base) regularly, every 100,000 cycles or 1 year (whichever comes first).

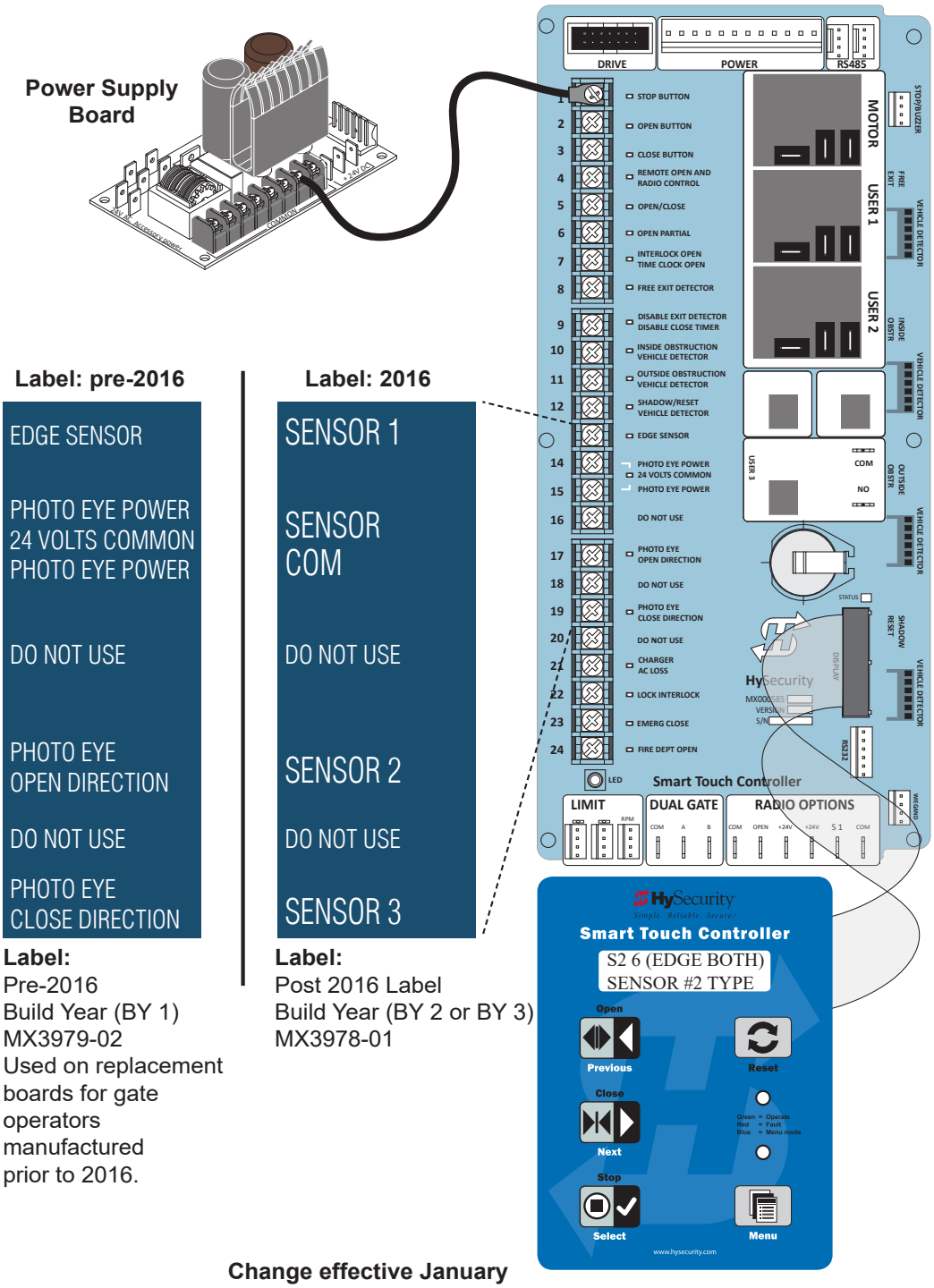
*5. Fluid level should remain no less than one inch below filler hole. Refer to maintenance instructions for fluid filling. Loss of fluid is not normal and indicates a leak that must be located and repaired. Use Uniflow fluid, part MX000970, if additional fluid is required

*6. Every two years, drain the hydraulic fluid and refill the reservoir. Use Uniflow fluid only, part MX000970.

*7. Replace the Smart Touch Controller battery with DL 2025 / DL 2032 or CR 2025 / CR 2032.

WIRING HYSECURITY SENSORS: SMART TOUCH

Wiring diagrams are provided on the following pages. The diagrams illustrate how to connect sensors and program the gate operator. HySecurity Smart Touch gate operators can monitor entrapment protection sensors per UL 325 - 2018 Standard of Safety using software version h4.50 (or later). The site designer or installer must determine which external entrapment protection sensors will be installed with the gate operator to create a UL 325 compliant installation site. For additional information, review Gate Safety on the HySecurity website.



Change effective January 12th 2016 per UL 325 - 2016 Standard of Safety

WIRING TIPS FOR SENSOR COM TERMINAL: SMART TOUCH

Two SENSOR COM terminals exist (Terminal 14 and Terminal 15). If using multiple sensor devices, use a wire nut as a junction and pigtail to SENSOR COM. Or, install a separate terminal block and jumper outputs to one lead for either SENSOR COM terminal.

⚠ CAUTION

All external entrapment protection sensors must be NC sensor outputs and wired to the SENSOR COM terminal for monitoring and powering purposes. The sensor becomes actively powered when the gate operator receives a run command.

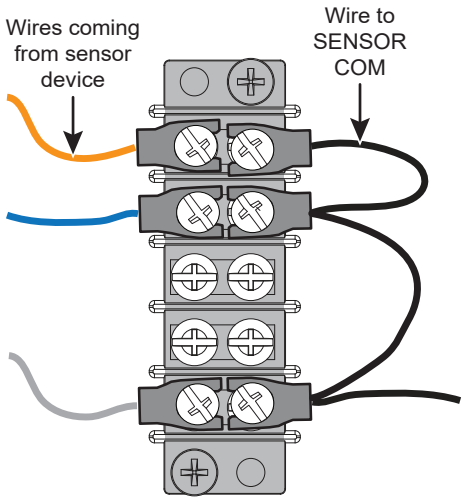


Figure 64. Added Terminal Block

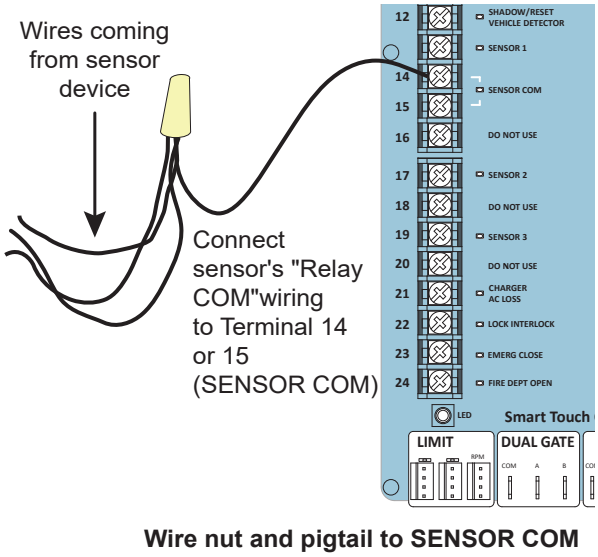


Figure 65. Wire Nut and PigTail to SENSOR COM

NOTICE

LEDs next to the sensor connections will be lit when NO POWER is being applied. To temporarily supply power to the sensors. See "Figure 44. SwingRiser PhotoEye Sensor Site Layout" on page 106. When PE is turned ON, the LEDs turn off. If they do not turn off, check for wiring issues such as a short or misapplied relay COM connections. See "Supply Power to the Sensors" on page 42.

SMART TOUCH: CH WIRED EDGE WITH HY2NC

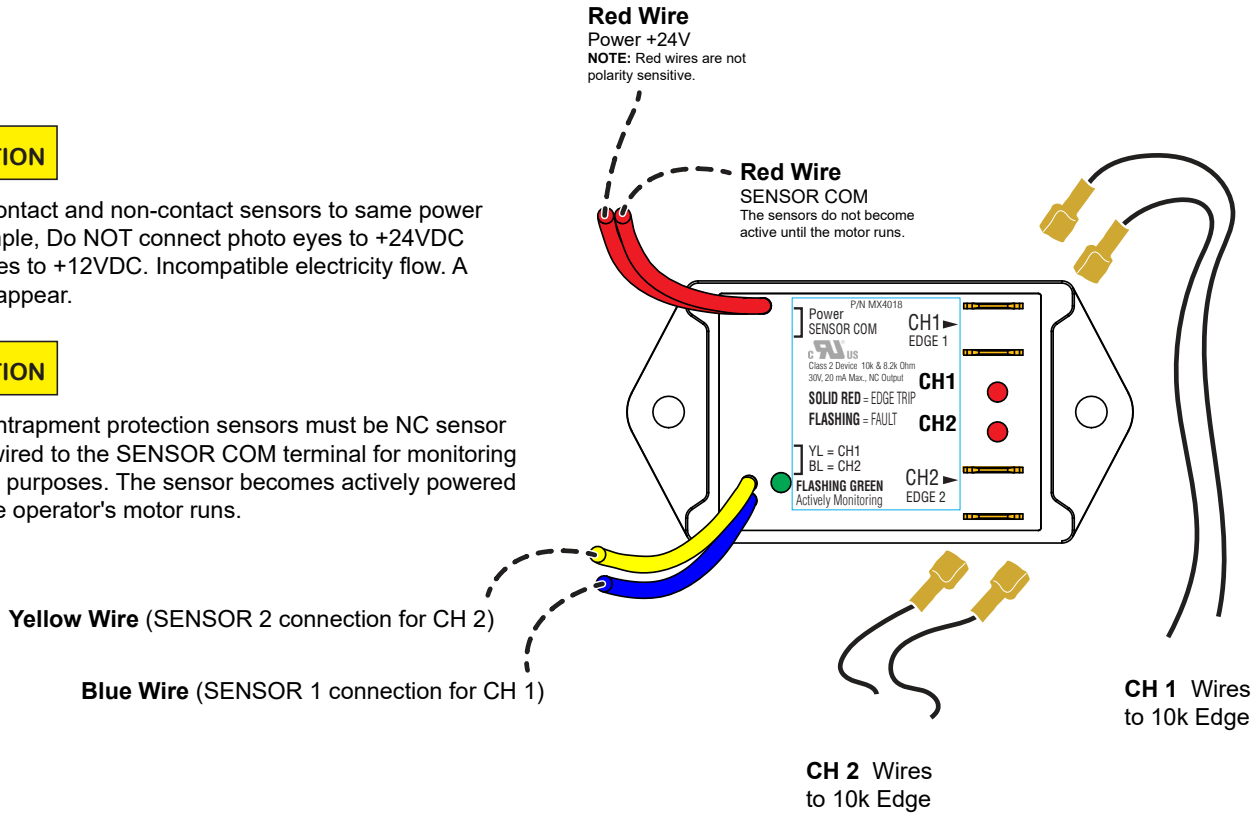
The wiring diagram illustrates a WIRED edge receiver connected to the STC controller via the 2 channel Wired Edge Sensor N/C adapter Hy2NC™.

CAUTION

Connect all contact and non-contact sensors to same power source. Example, Do NOT connect photo eyes to +24VDC and gate edges to +12VDC. Incompatible electricity flow. A FAULT 2 will appear.

CAUTION

All external entrapment protection sensors must be NC sensor outputs and wired to the SENSOR COM terminal for monitoring and powering purposes. The sensor becomes actively powered when the gate operator's motor runs.

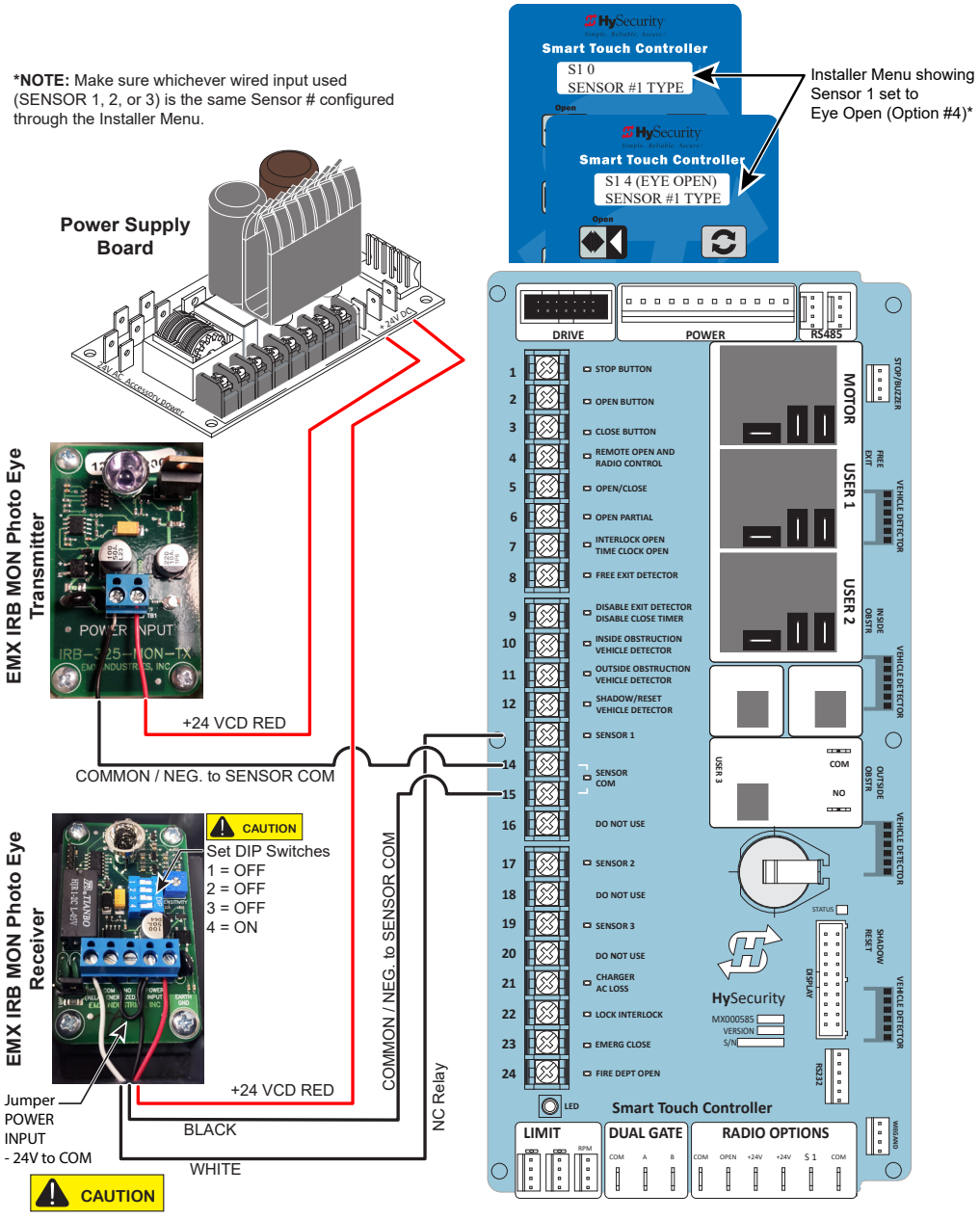


SMART TOUCH: PHOTO EYE THRU BEAM (EMX IRB MON)

1. Connect photo eye wiring.
2. Turn ON power.
3. Access the Installer Menu and configure SENSOR setting according to the entrapment area that the photo eye is monitoring. Refer to table on page 41.

NOTICE

Make sure whichever wired input used (SENSOR 1, 2, or 3) is the same Sensor # configured through the Installer Menu.



DIP switches must be set as shown otherwise the photo eye will not operate correctly. If you receive an Alert, "!ACTION BLOCKED" "Photo Eye Open" PEO or "Photo Eye Close" PEC, take steps to align the photo eye.

SMART TOUCH: PHOTO EYE / REFLECTIVE (E3K R10K4)

1. Set Photo Eye switch to LIGHT ON.

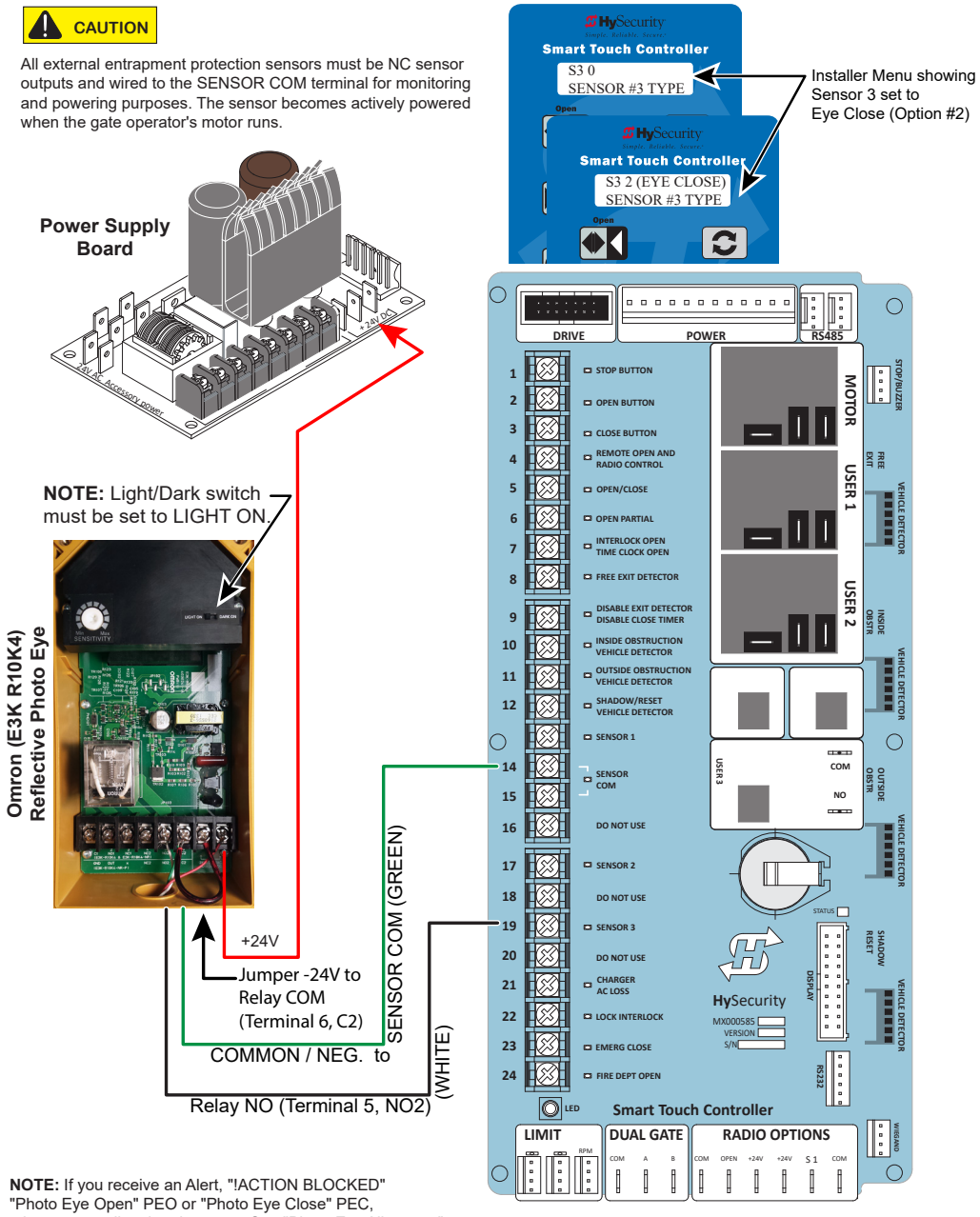
NOTICE

Run a jumper between photo eye -24V and Relay COM (C2) terminals. See photo.

2. Connect photo eye wiring.
3. Turn ON power.
4. Access the Installer Menu and configure SENSOR setting according to the entrapment area that the photo eye is monitoring. Refer to table on page 41.

CAUTION

All external entrapment protection sensors must be NC sensor outputs and wired to the SENSOR COM terminal for monitoring and powering purposes. The sensor becomes actively powered when the gate operator's motor runs.



NOTE: If you receive an Alert, "!ACTION BLOCKED" "Photo Eye Open" PEO or "Photo Eye Close" PEC, take steps to align the photo eye. See "Photo Eye Alignment".

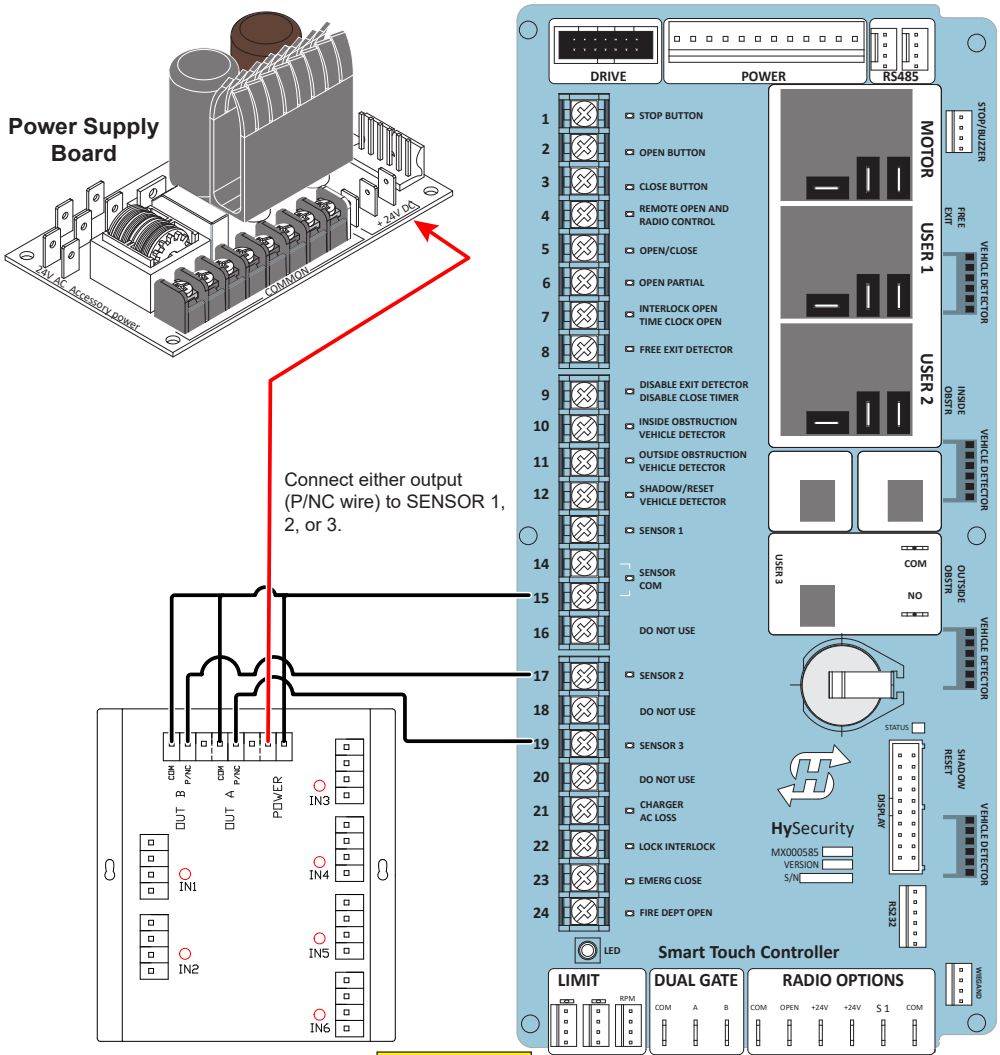
SMART TOUCH: THE SOLUTION, MIM-62 (MULTI-INPUT MODULE)

1. Turn OFF AC power.
2. Input channels 1 and 2 must be used and are always assigned to OUTPUT A.
3. All other input channels may be configured to either A or B.

NOTICE

If different sensor types are connected to the same output, then program the Controller SENSOR type for EDGE options.

4. Turn ON power.
5. Access the Installer Menu. Configure SENSOR setting according to the types of sensors wired to the Smart Touch Controller.



Input channels 1 and 2 must be used and are always assigned to OUTPUT A. All other input channels may be configured to either A or B.
NOTE: If different sensor types are connected to the same output, then program the Controller SENSOR type for EDGE options.

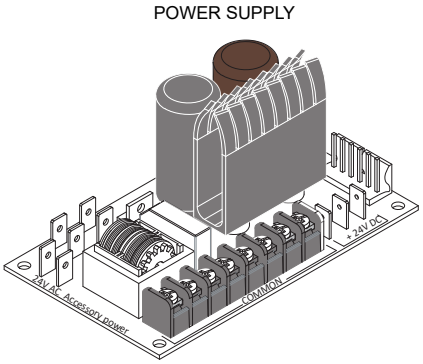
CAUTION

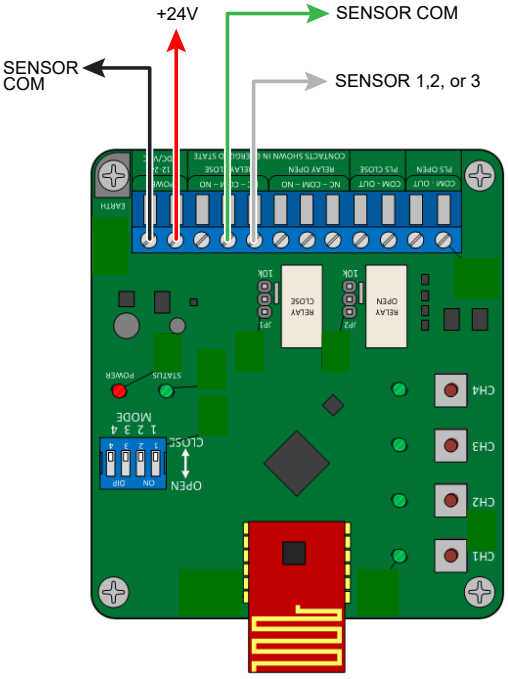
All external entrapment protection sensors must be NC sensor outputs and wired to the SENSOR COM terminal for monitoring and powering purposes. The sensor becomes actively powered when the gate operator's motor runs.

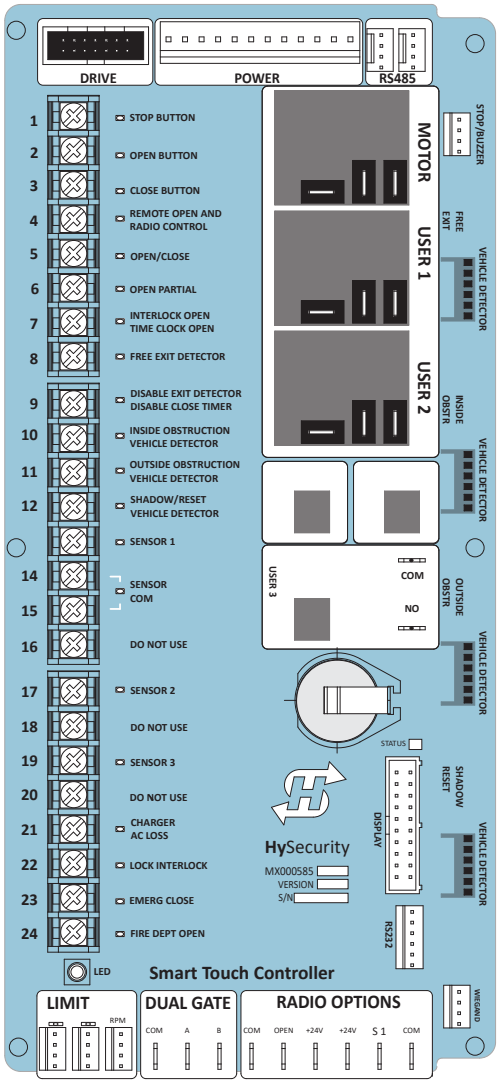
SMART TOUCH: WIRELESS EDGE, WIRELESS GATE LINK

A WEL-200 transmitter/receiver are required.

1. Turn OFF power.
2. Connect the wiring per the diagram shown.
3. Turn ON power and access the Installer Menu.
4. Configure SENSOR setting accordingly (i.e. Edge Open, Edge Close, or Edge Both).







Drawings pertinent to SwingRiser installation are found in this section. For additional information and order forms, refer to the HySecurity website. Before installing the SwingRiser, read this manual thoroughly. Site design and installation is the responsibility of the site specifier and installer. The information provided in these pages is for reference only.

SWINGRISER: GATE SWING AND PILLAR / POST VIEWS

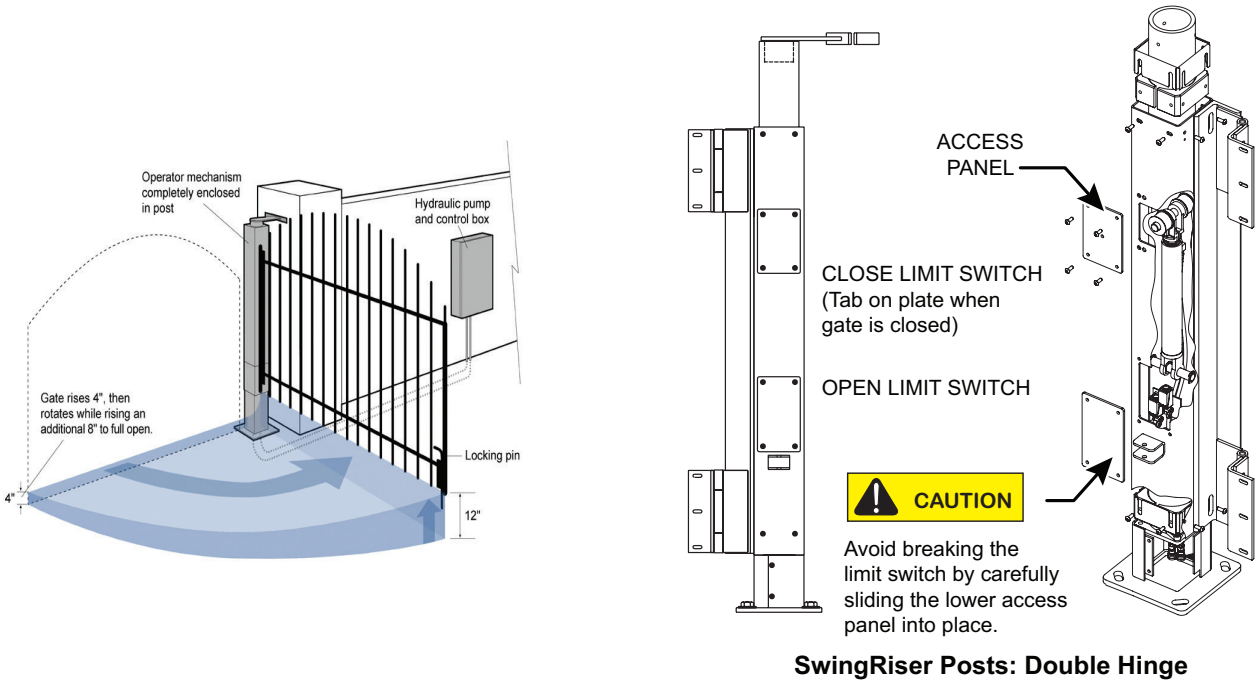


Figure 66. SwingRiser Gate Swing and Pillar/Post Views

SWINGRISER TWIN: SITE SKETCH

See "Site Planning Samples" on page 16.

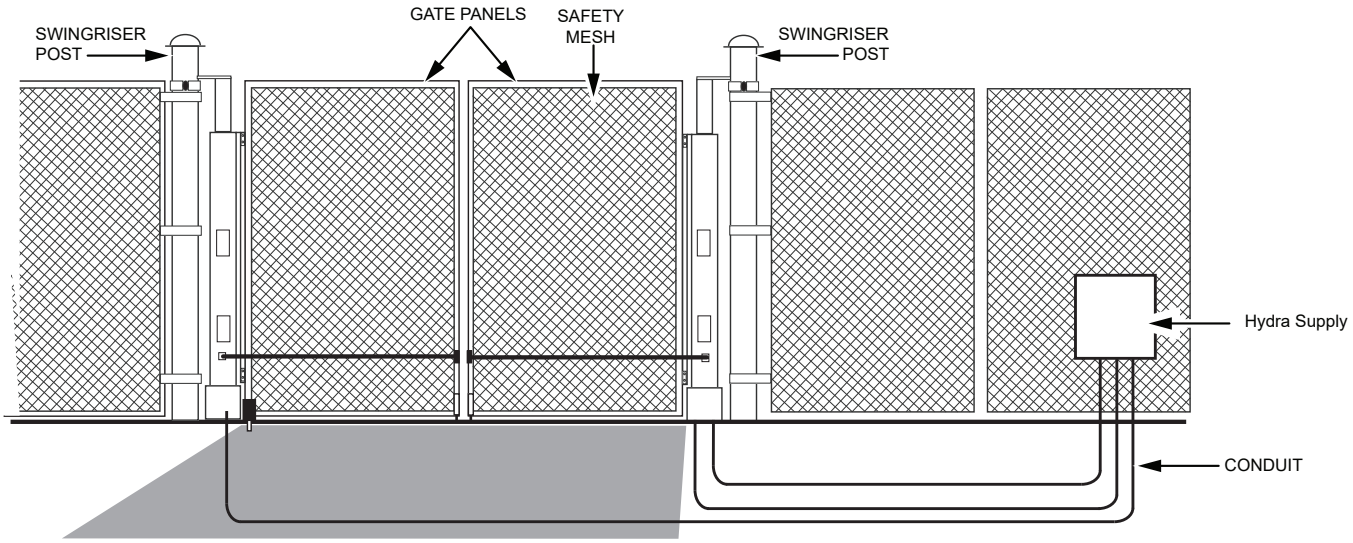


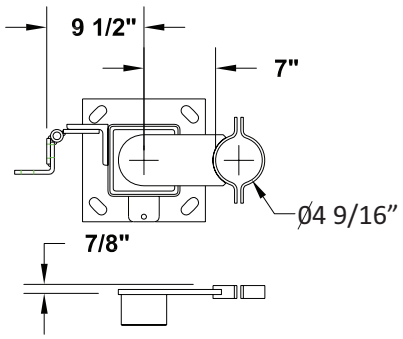
Figure 67. SwingRiser Twin Site Sketch

SWINGRISER POST: TOP CAP OPTIONS

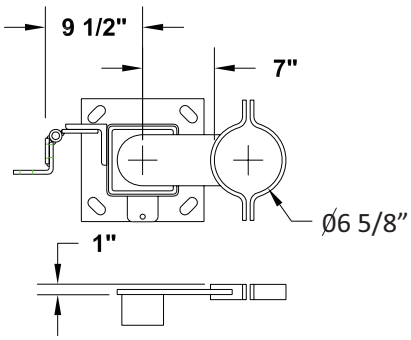
A variety of top caps exist for wall or post mounts. The different types are illustrated in the SwingRiser order form. Be sure to order the appropriate Top Cap for your site.

4” Pipe Bracket

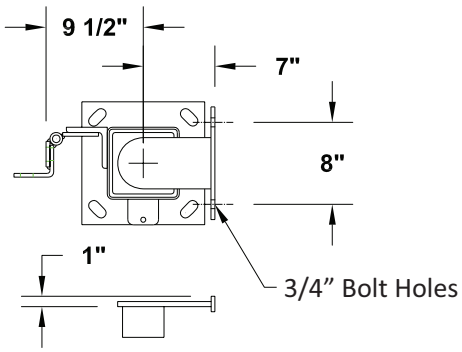
Use Restricted To 1000LB,
12’ Long Gate Panels Max.



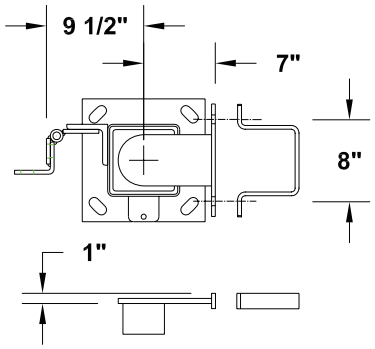
6” Pipe Bracket



Pilaster Bracket



6” Sq Tube Bracket



8” Pipe Bracket

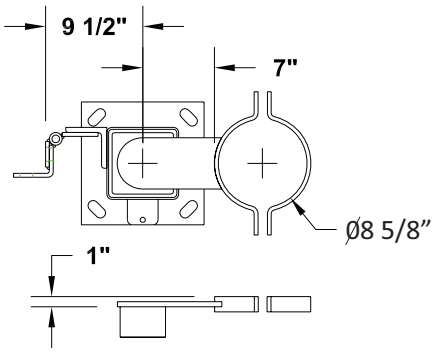
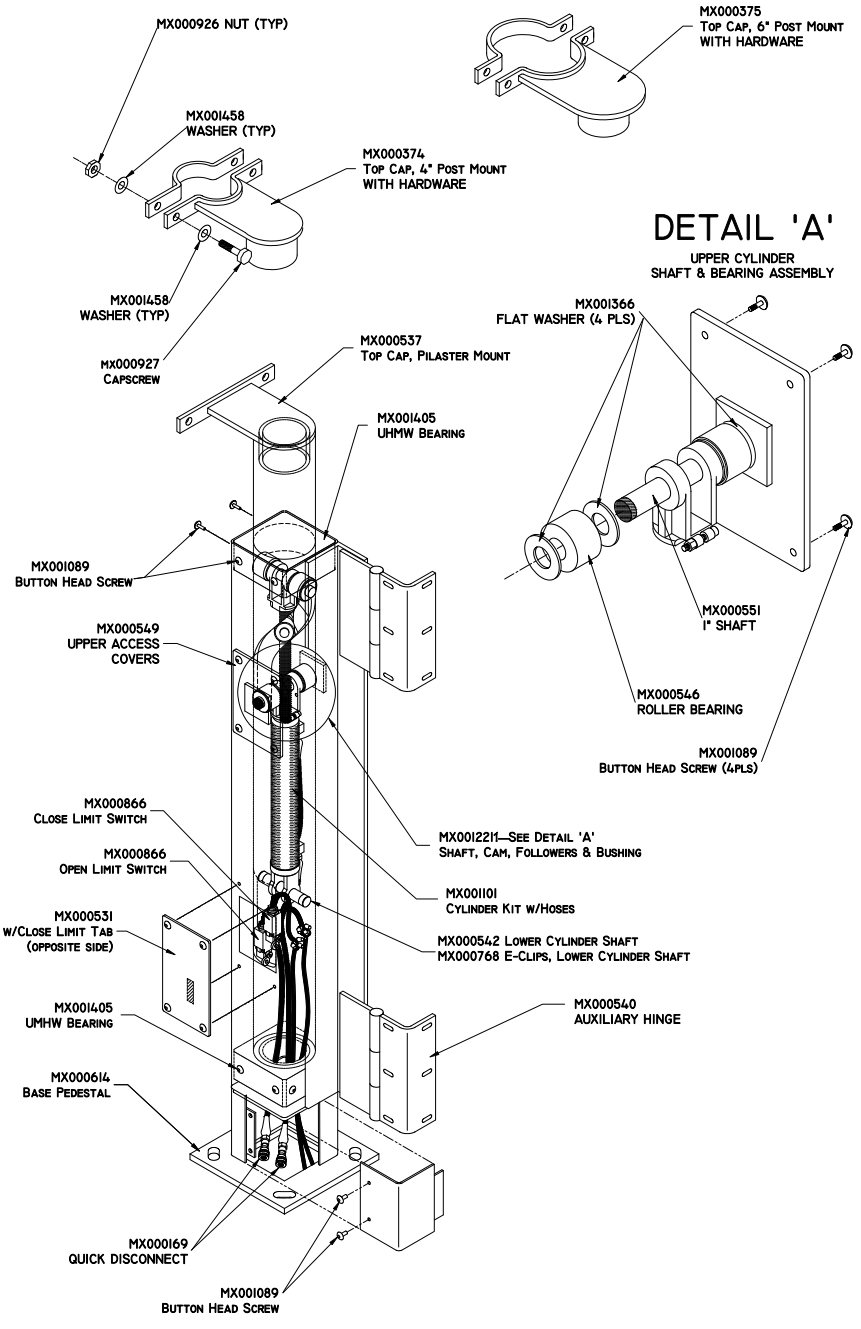


Figure 68. SwingRiser Post Top Cap Options

SWINGRISER POST: COMPONENTS

LTR	DESCRIPTION	DATE	APPRV'D
C	UPDATED ALL PART NUMBERS.	8/19/2010	RAW



NOTE: DRAWING IS NOT TO SCALE.

HySecurity Kent, Washington	DOCUMENT TITLE: SwingRiser (HGR SWING GATE POST), TYP	DRAWN –	DATE 10/05/1999	DOCUMENT NUMBER: HR14	REV C	
		CHECKED –	DATE –			
		APPROVED –	DATE –	THIRD ANGLE PROJECTION	SHT 1	OF 1

Figure 69. SwingRiser Post Components

SWINGRISER POSTS & INSTALLATION REFERENCE

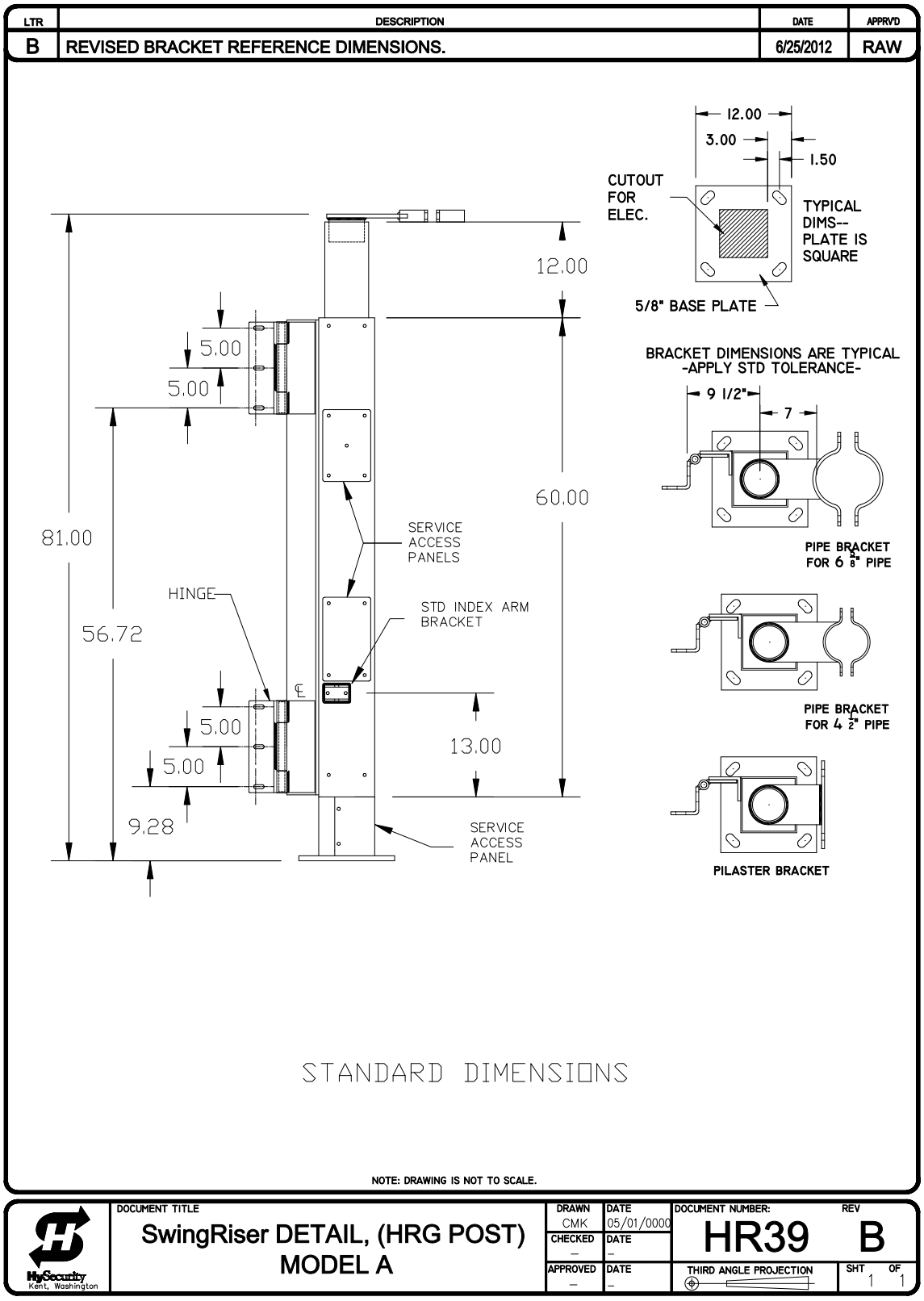
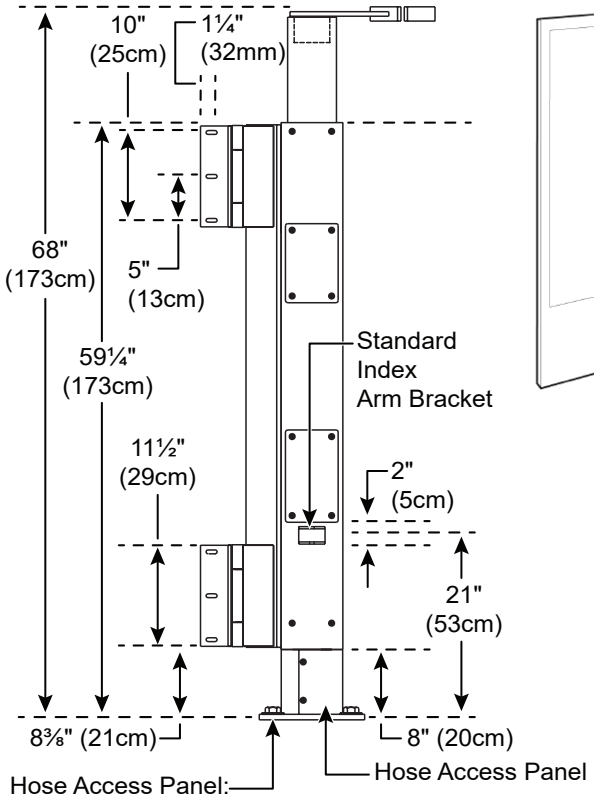


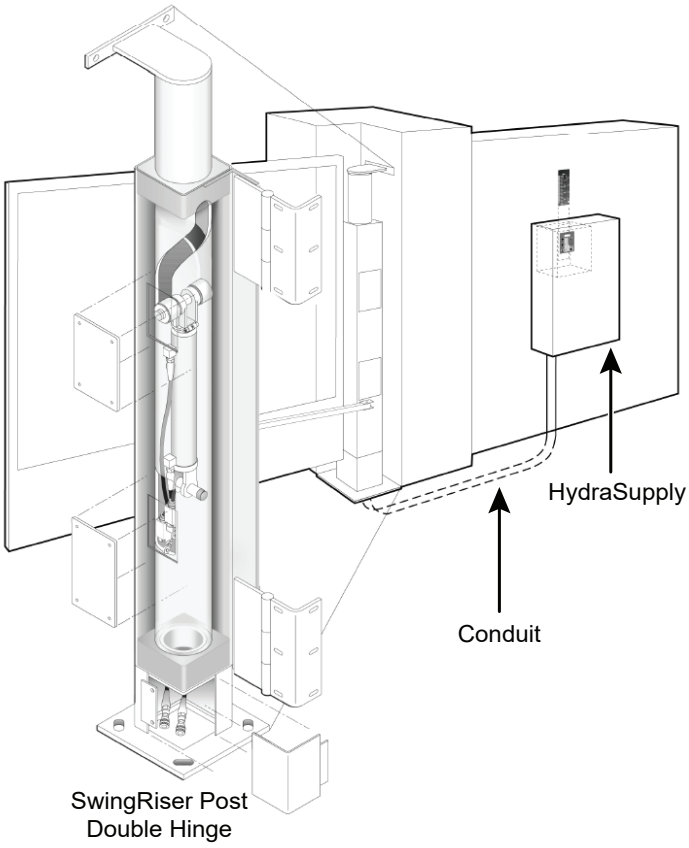
Figure 70. SwingRiser Posts and Installation Reference

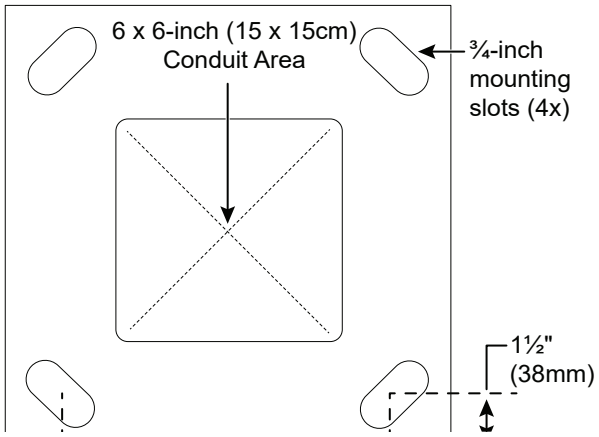
SWINGRISER POSTS & GATE SITE: OVERVIEW

Illustrations show:
- Concrete pad dimensions
- Clearance requirements
- Anchor bolt locations
- Support post dimensions



Hose Access Panel:
⅝" (16mm)
Use ⅝" to ¾" anchor bolts.
Minimum clearance 1" between baseplate and backing post or wall.
Minimum clearance 3½" between operator post and backing post.





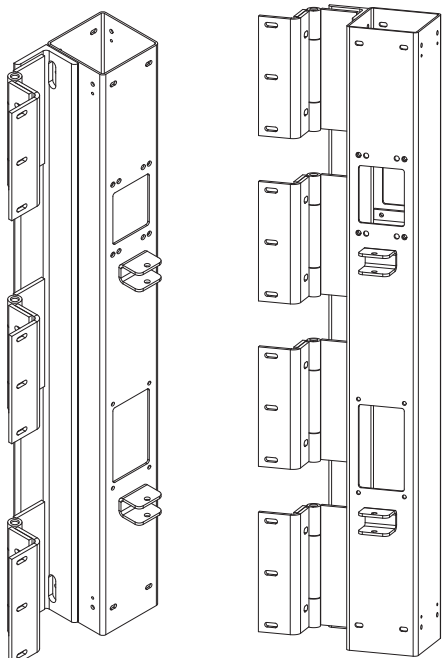


Figure 71. SwingRiser Posts and Gate Site Overview

SWINGRISER SINGLE (HRG220): INSTALLATION REFERENCE

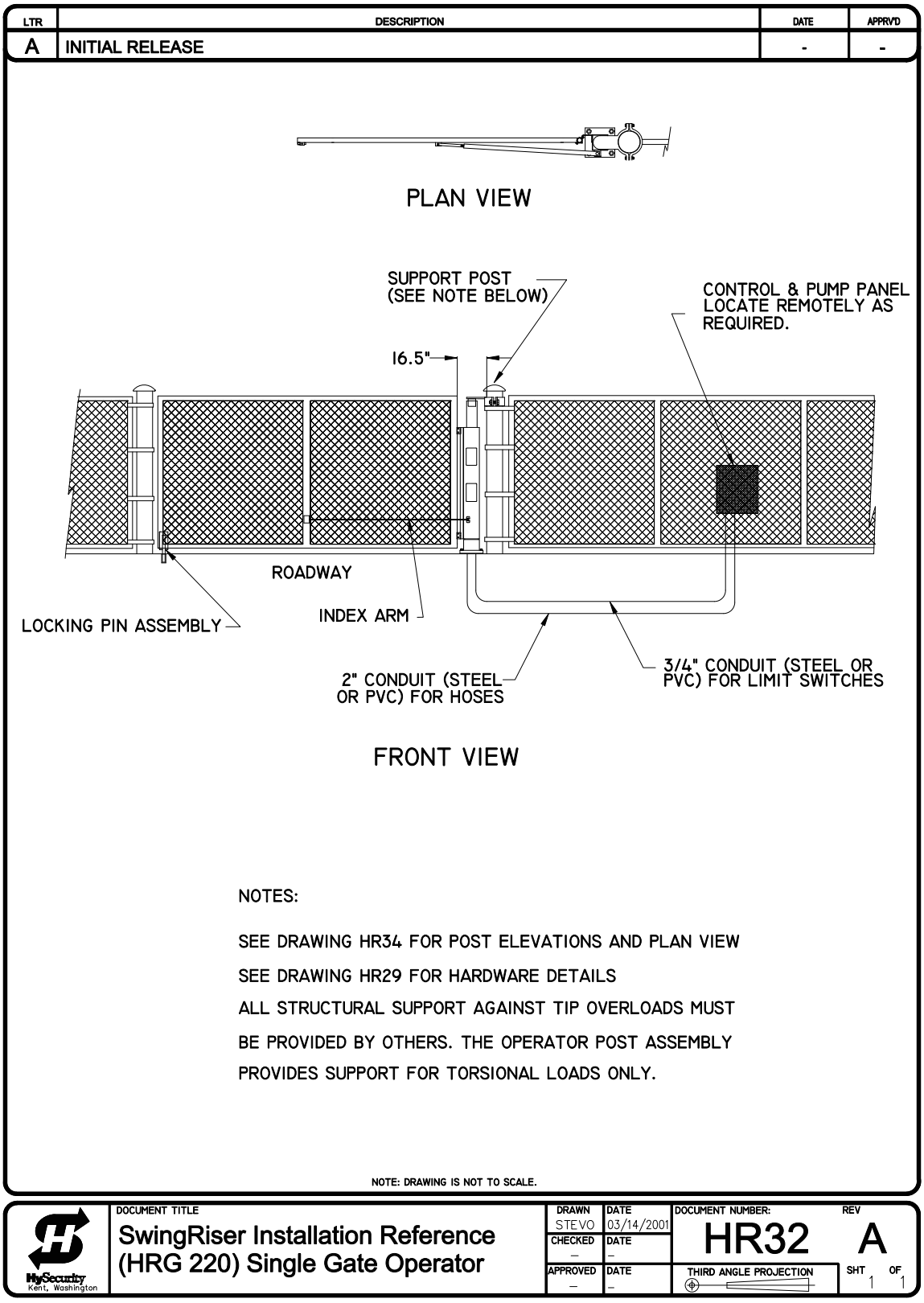


Figure 72. SwingRiser Single (HRG220) Installation Reference

SWINGRISER TWIN (HRG 222): INSTALLATION REFERENCE

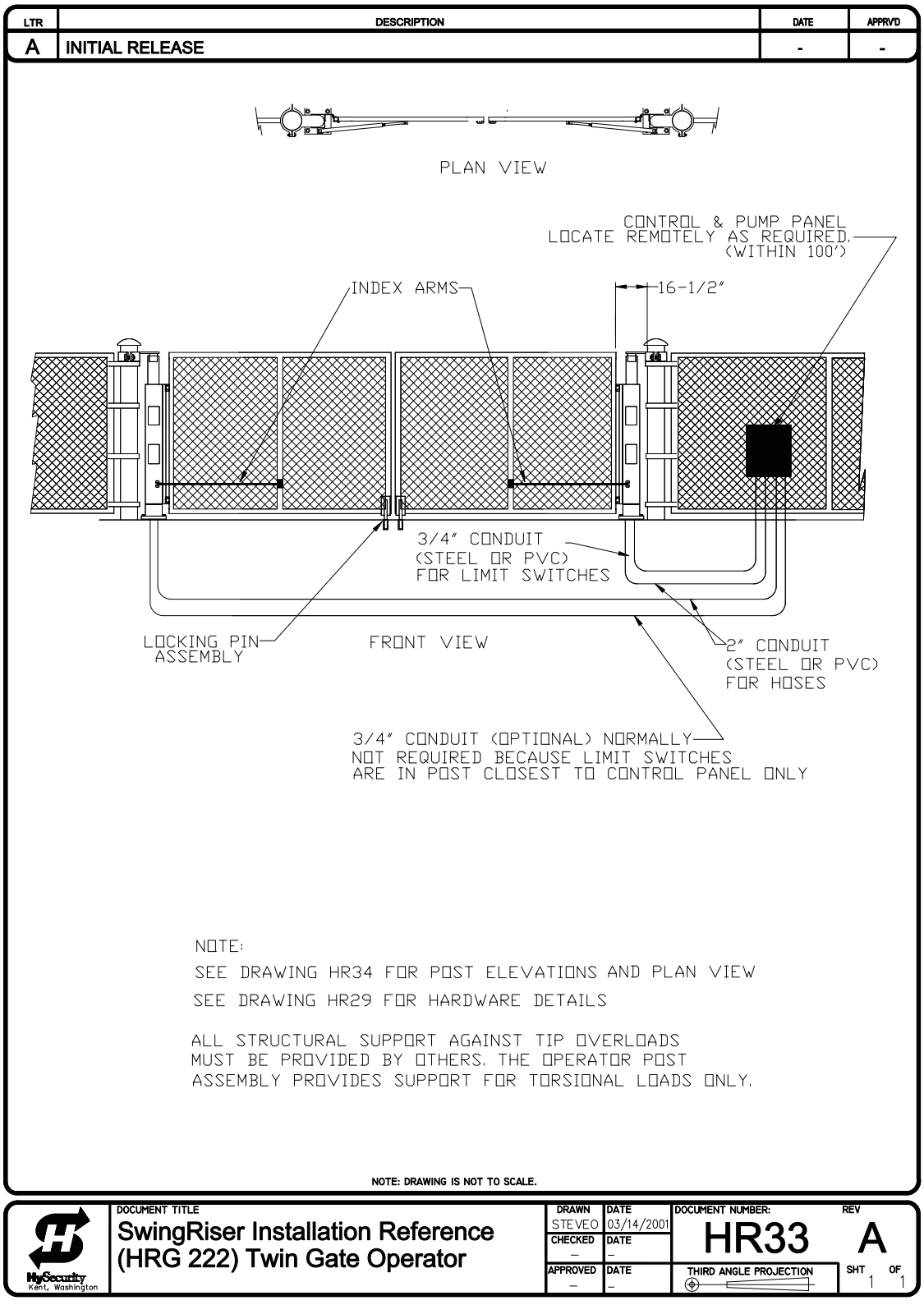


Figure 73. SwingRiser Twin (HRG 222) Installation Reference

SWINGRISER: INDEX ARM & LOCKING PIN OVERVIEW

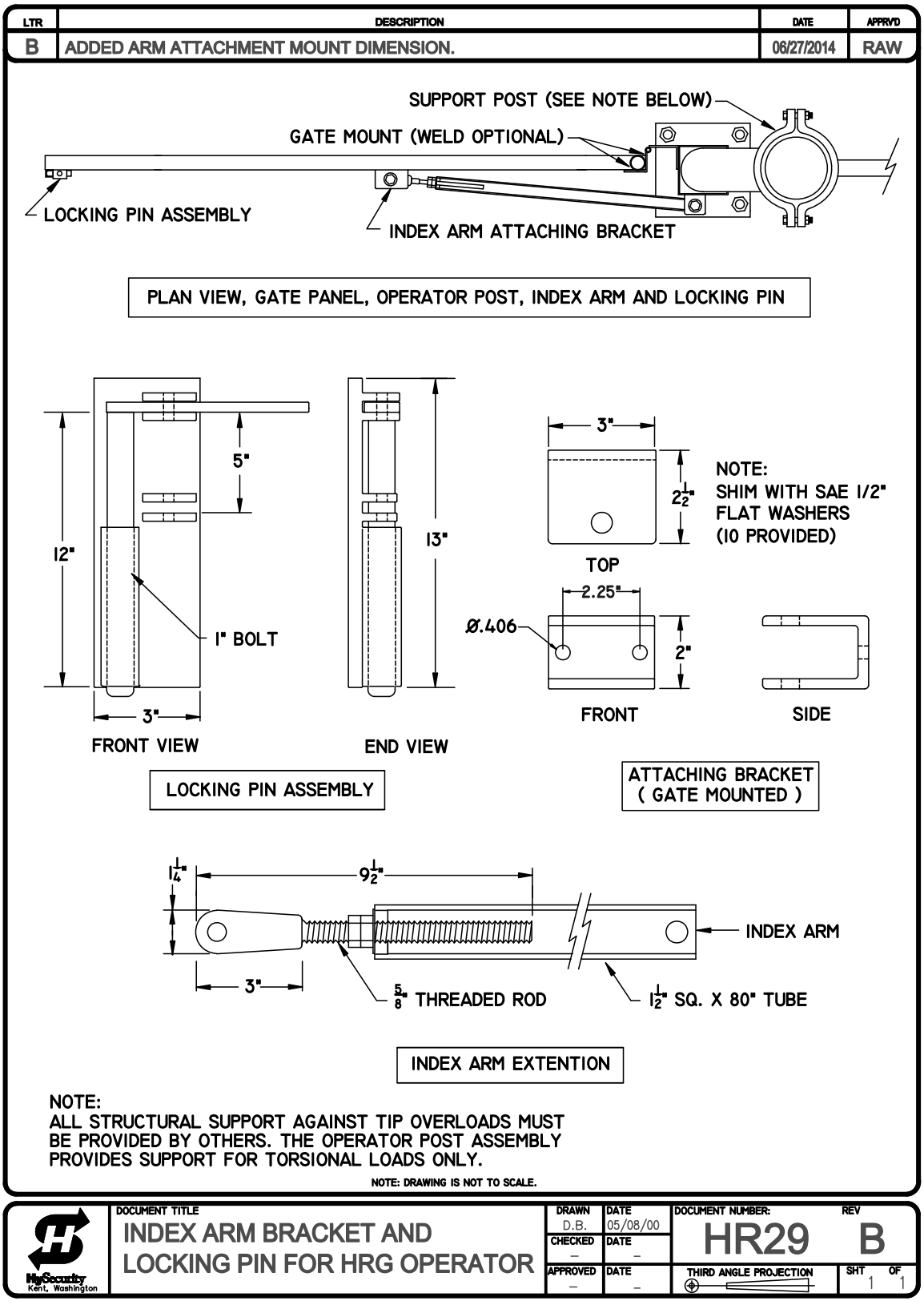


Figure 74. SwingRiser Index Arm and Locking Pin Overview

SWINGRISER: POST MOUNT LOCKING PIN INSTALLATION

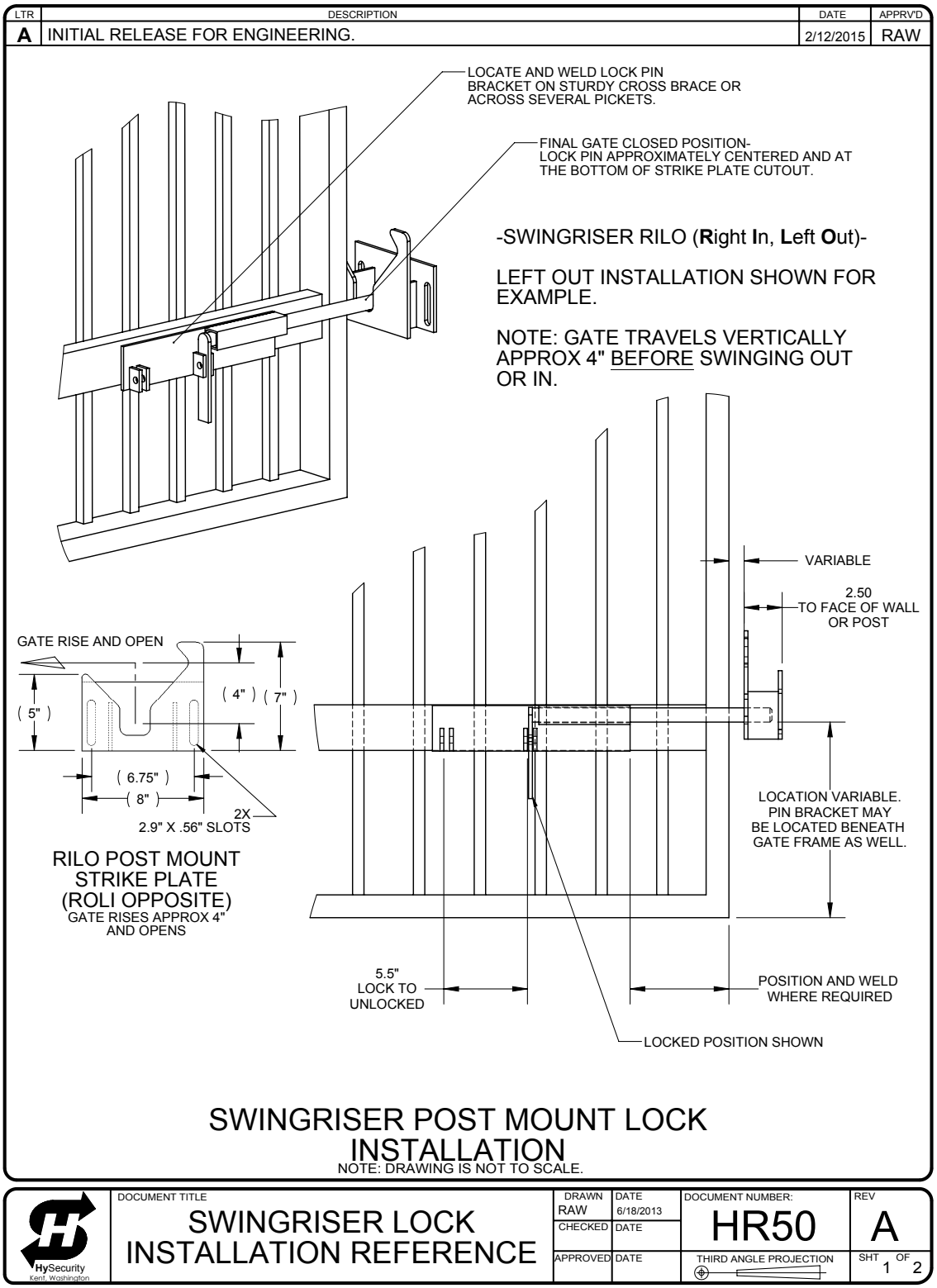


Figure 75. SwingRiser Post Mount Locking Pin Installation

SWINGRISER: GROUND LOCKING PIN INSTALLATION

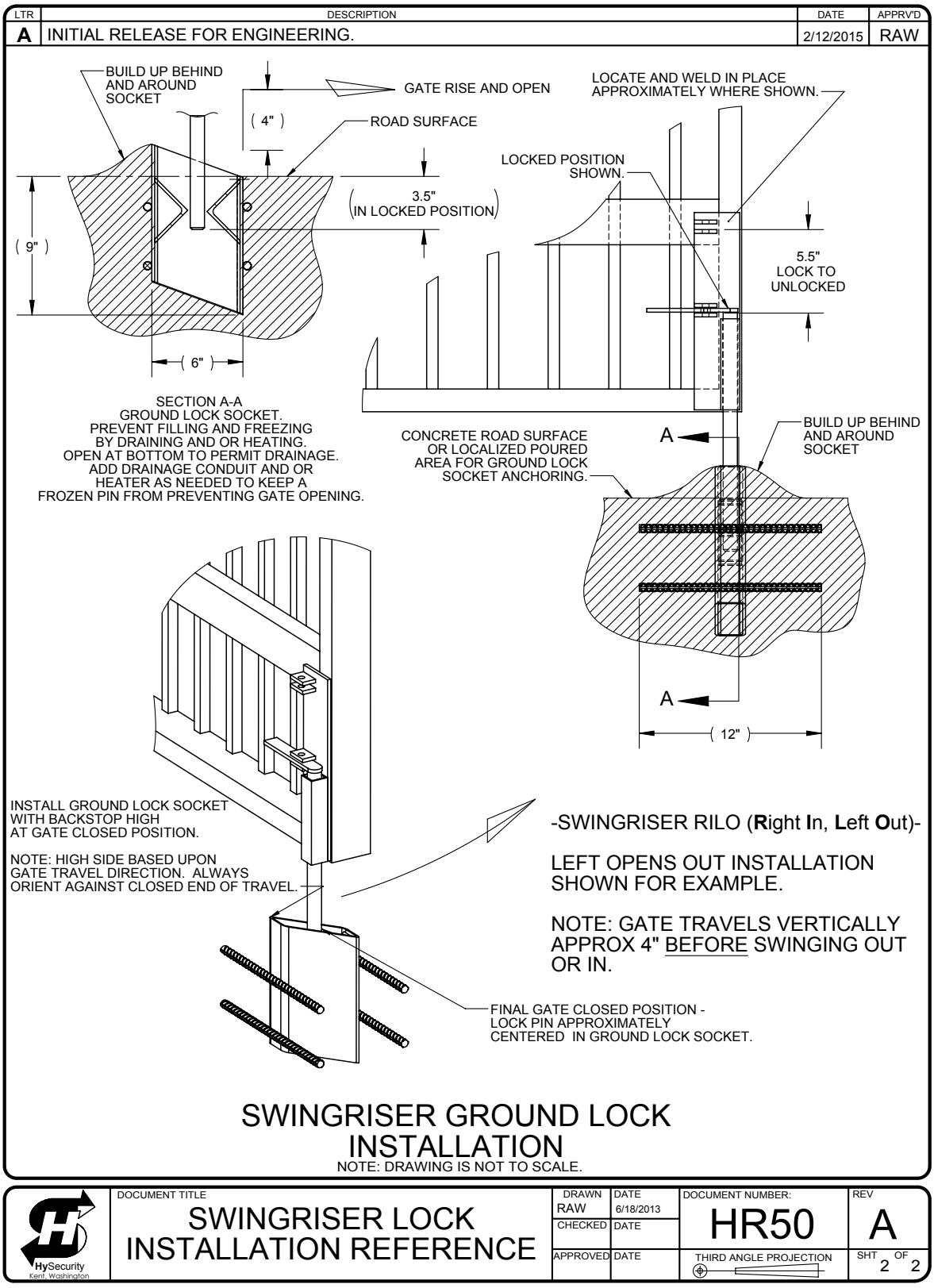


Figure 76. SwingRiser Ground Locking Pin Installation

SWINGRISER: HYDRASUPPLY INSTALLATION OVERVIEW

Wall or post-mount the HydraSupply cabinet (Type 3R). If planning a post mount, mounting holes need to be drilled (U-bolts, fasteners, and unistrut are not provided). Cabinet may also be wall-mounted with anchor bolts.

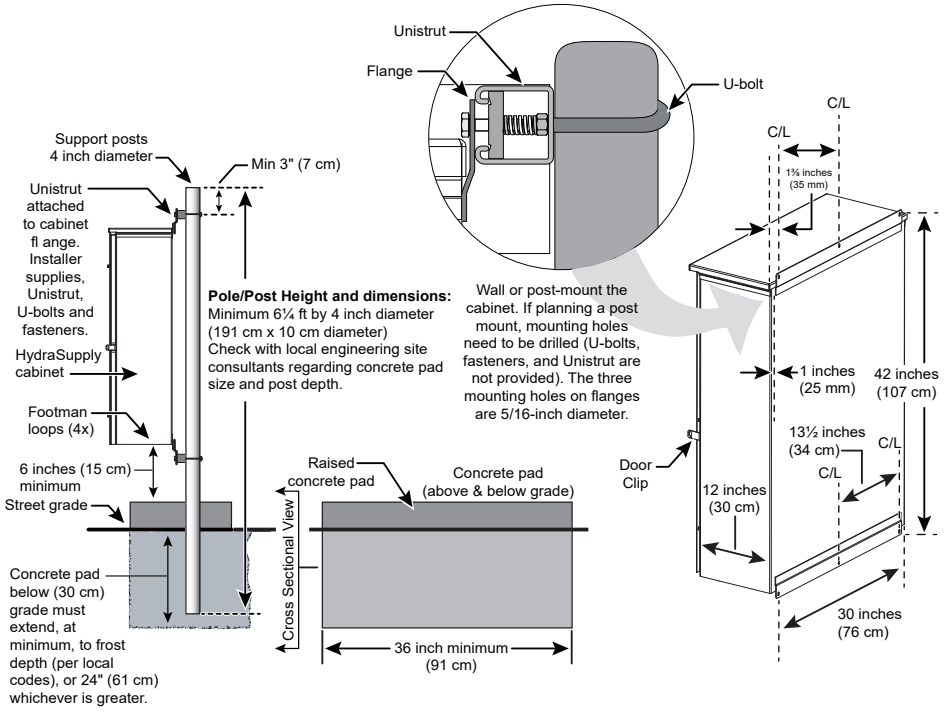


Figure 77. HydraSupply Installation Overview Profile and Control Box

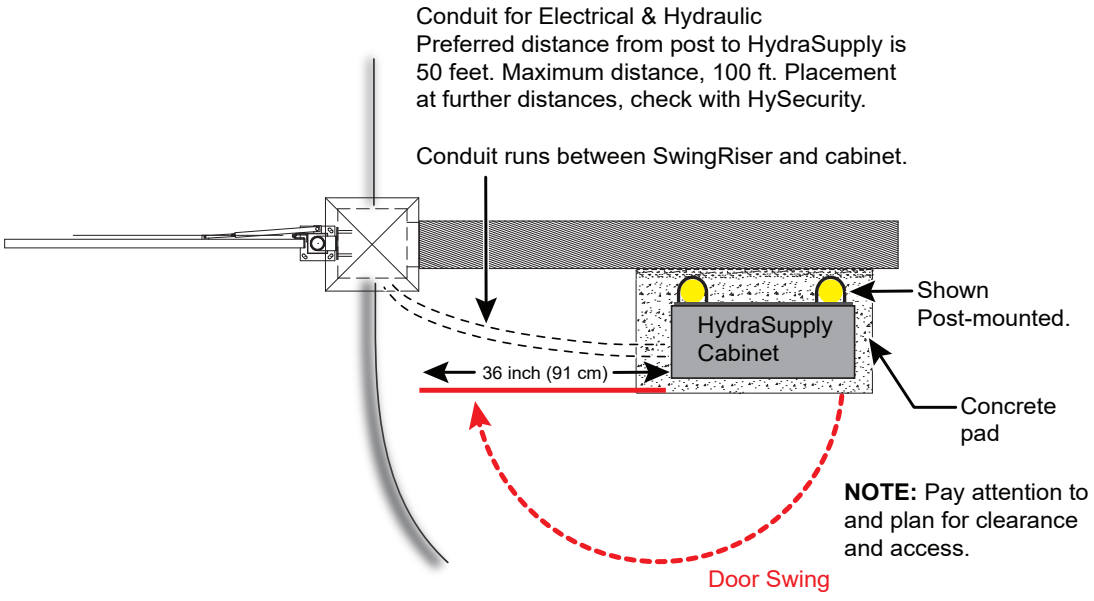


Figure 78. HydraSupply Installation Overview Top Electrical and Hydraulic Conduits

FRENCH TRANSLATIONS

The following French translations provided below are found in the Safety Section located at the beginning of the manual.

English	French
IMPORTANT SAFETY INSTRUCTIONS WARNING – To reduce the risk of injury or death:	INSTRUCTIONS DE SÉCURITÉ IMPORTANTES AVERTISSEMENT – Pour réduire les risques de blessures et de mort :
1. READ AND FOLLOW ALL INSTRUCTIONS.	1. LISEZ CETTE NOTICE ET CONFORMEZ-VOUS AUX MISES EN GARDE
2. Never let children operate or play with gate controls. Keep the remote control away from children.	2. Ne laissez jamais les enfants manoeuvrer les commandes de la barrière ou jouer avec celles-ci. Laissez la télécommande hors de la portée des enfants.
3. Always keep people and objects away from the gate. NO ONE SHOULD CROSS THE PATH OF THE MOVING GATE.	3. Tenez toujours à l'écart de la barrière toute personne ou tout objet avoisinant. IL NE FAUT JAMAIS PASSER DANS LA TRAJECTOIRE D'UNE BARRIÈRE EN MOUVEMENT.
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. Failure to adjust and retest the gate operator properly can increase the risk of injury or death.	4. Vérifiez le fonctionnement de l'ouvre-barrière une fois par mois. Le sens de la course DOIT s'inverser lorsque la barrière entre en contact avec un objet dur ou la barrière DOIT s'arrêter lorsqu'un objet active les capteurs sans contact. Vérifiez à nouveau l'ouvre-barrière après tout réglage de la force de déclenchement ou du seuil de fin de course. Un réglage incorrect de l'ouvre-barrière ou l'omission de vérifier à nouveau le fonctionnement de l'ouvre-barrière peut causer des blessures, voire la mort.
5. Use the emergency release only when the gate is not moving.	5. Ne déclenchez le dispositif de désaccouplement d'urgence que lorsque la barrière ne bouge pas.
6. KEEP GATES PROPERLY MAINTAINED. Read the user's manual. Have a qualified service person make repairs to gate hardware.	6. ASSUREZ-VOUS QUE LA BARRIÈRE EST CORRECTEMENT ENTRETENUE. Lisez le manuel de l'utilisateur. Confiez la réparation du matériel de la barrière à un technicien qualifié.
7. The entrance is for vehicles only. Pedestrians must use separate entrance.	7. La voie d'accès est réservée aux véhicules seulement. Les piétons doivent utiliser une voie d'accès différente.
8. SAVE THESE INSTRUCTIONS.	8. CONSERVEZ CES INSTRUCTIONS.

APPENDIX A - FRENCH TRANSLATIONS

English	French
2.3 Install the gate operator only when:	2.3 N'installez l'ouvre-barrière que si :
a. The operator is appropriate for the construction of the gate and the usage Class of the gate,	a. l'ouvre-barrière est approprié pour la structure et la classe d'utilisation de la barrière;
b. All openings of a horizontal slide gate are guarded or screened from the bottom of the gate to a minimum of 1.83 m (6 ft) above the ground to prevent a 57.2 mm (2-1/4 inch) diameter sphere from passing through the openings anywhere in the gate, and in that portion of the adjacent fence that the gate covers in the open position,	toutes les ouvertures de la barrière coulissante sont protégées ou grillagées du bas de la porte jusqu'à un minimum de 1,83 m (6 pi) du sol si bien qu'une sphère de 57,2 mm (2 1/4 po) de diamètre ne peut passer par une ouverture au niveau de la barrière et de la portion de la clôture adjacente que la barrière couvre en position ouverte;
c. All exposed pinch points are eliminated or guarded, and	c. tous les points de pincement sont éliminés ou protégés;
d. Guarding is supplied for exposed rollers.	d. des protections sont fournies pour les galets exposés.
2.4 The operator is intended for installation only on gates used for vehicles. Pedestrians must be supplied with a separate access opening. The pedestrian access opening shall be designed to promote pedestrian usage. Locate the gate such that persons will not come in contact with the vehicular gate during the entire path of travel of the vehicular gate.	2.4 L'ouvre-barrière est destiné à n'être installé que sur des barrières utilisées pour les véhicules. Il faut fournir une autre voie d'accès aux piétons. La voie d'accès pour les piétons doit être conçue pour favoriser le passage des piétons. Placez la barrière de sorte que personne ne puisse entrer en contact avec la barrière pour les véhicules sur l'ensemble de sa trajectoire
2.5 The gate must be installed in a location so that enough clearance is supplied between the gate and adjacent structures when opening and closing to reduce the risk of entrapment. Swinging gates shall not open into public access areas.	c) Pour réduire les risques de coincement lors de l'ouverture et de la fermeture, la barrière doit être installée dans un endroit où la barrière et les structures avoisinantes sont suffisamment éloignées l'une de l'autre. Les barrières battantes ne doivent pas ouvrir dans une zone d'accès public.

APPENDIX A - FRENCH TRANSLATIONS

English	French
2.6 The gate must be properly installed and work freely in both directions prior to the installation of the gate operator. Do not over-tighten the operator clutch or pressure relief valve to compensate for a damaged gate.	2.6 La barrière doit être bien installée et fonctionner librement dans les deux directions avant d'entreprendre l'installation de l'ouvre-barrière. Ne serrez pas trop l'embrayage ou la soupape de surpression de l'ouvre-barrière pour compenser une barrière endommagée.
2.7 Controls intended for user activation must be located at least 1.83 m (6 ft) away from any moving part of the gate and where the user is prevented from reaching over, under, around or through the gate to operate the controls. Exception: Emergency access controls only accessible by authorized personnel (e.g. fire, police, EMS) may be placed at any location in the line-of-sight of the gate.	2.7 Les commandes destinées à l'activation par l'utilisateur doivent être situées à au moins 1,83 m (6 pi) des pièces mobiles de la barrière et à un endroit où l'utilisateur ne peut pas atteindre les commandes par le dessus, par le dessous, par les côtés et au travers de la barrière. Exception : Les commandes d'accès d'urgence accessibles au personnel autorisé seulement (p. ex. pompier, policier, SMU) peuvent être placées à tout endroit dans le champ de visibilité de la barrière.
2.8 The Stop and/or Reset button must be located in the line of-sight of the gate. Activation of the reset control shall not cause the operator to start.	2.8 Le bouton d'arrêt, le bouton de réenclenchement ou ces deux boutons doivent être situés dans le champ de visibilité de la barrière. L'activation des commandes de réenclenchement ne doit pas mettre en marche l'ouvrebarrière.
2.9 A minimum of two (2) WARNING SIGNS shall be installed, in the area of the gate. Each placard is to be visible by persons located on the side of the gate on which the placard is installed.	2.9 Au moins deux panneaux de mise en garde doivent être installés dans la zone de la barrière. Chaque étiquette doit être visible des personnes situées de chaque côté de la barrière sur laquelle l'étiquette est installée.
2.10 For gate operators utilizing a non-contact sensor	2.10 Pour les ouvre-barrières qui fonctionnent avec des capteurs
a. See instructions on the placement of non-contact sensors for each Type of application,	a. Voir les instructions sur le positionnement des capteurs sans contact pour chaque type d'utilisation.
b. Care shall be exercised to reduce the risk of nuisance tripping, such as when a vehicle, trips the sensor while the gate is still moving, and	b. Des précautions doivent être prises pour réduire les risques de déclenchement inutile, comme lorsqu'un véhicule déclenche le capteur alors que la barrière est encore en mouvement.
c. One or more non-contact sensors shall be located where the risk of entrapment or obstruction exists, such as the perimeter reachable by a moving gate or barrier.	c. Un capteur sans contact ou plus doit être situé où il existe un risque de coincement ou d'obstruction, comme dans l'espace que peut occuper la barrière lorsqu'elle est en mouvement.
2.11 For a gate operator utilizing a contact sensor	2.11 Pour les ouvre-barrières qui fonctionnent avec des capteurs

APPENDIX A - FRENCH TRANSLATIONS

English	French
a. One or more contact sensors shall be located where the risk of entrapment or obstruction exists, such as at the leading edge, trailing edge, and postmounted both inside and outside of a vehicular horizontal slide gate.	a. Au moins un capteur de contact doit être situé où il existe un risque de coincement ou d'obstruction, comme sur le bord d'ouverture, sur le bord de fermeture et sur les poteaux montés sur l'intérieur ou l'extérieur d'une barrière coulissante pour véhicules.
b. A hardwired contact sensor shall be located and its wiring arranged so that the communication between the sensor and the gate operator is not subjected to mechanical damage.	b. Un capteur de contact doit être installé et câblé de sorte à éviter que la communication entre le capteur et l'ouvrebarrière soit gênée par des dommages mécaniques.
c. A wireless device such as one that transmits radio frequency (RF) signals to the gate operator for entrapment protection functions shall be located where the transmission of the signals are not obstructed or impeded by building structures, natural landscaping or similar obstruction. A wireless device shall function under the intended end-use conditions.	c. Un dispositif sans fil, comme un appareil qui transmet des signaux de radiofréquence (RF) à l'ouvre-barrière pour prévenir le coincement, doit être situé à un endroit où la transmission des signaux ne sera pas obstruée ou gênée par des structures, des arbres ou d'autres obstacles similaires. Un dispositif sans fil doit fonctionner selon les conditions d'utilisation finale prévues.
d. One or more contact sensors shall be located on the inside and outside leading edge of a swing gate. Additionally, if the bottom edge of a swing gate is greater than 152 mm (6 inches) but less than 406 mm (16 inches) above the ground at any point in its arc of travel, one or more contact sensors shall be located on the bottom edge.	d. Au moins un capteur de contact doit être situé sur les bords d'ouverture intérieur et extérieur d'une barrière battante. De plus, si le dessous d'une barrière battante est situé à plus de 152 mm (6 po) mais à moins de 406 mm (16 po) du sol à l'un des points de sa trajectoire, au moins un capteur de contact doit être situé sur le bord inférieur.

HySecurity
a Nice group company

WARRANTY

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Kent, WA 98032
800-321-9947
www.hysecurity.com

1. Warranty.

Hy-Security Gate, Inc. ("HySecurity") warrants that at the time of sale each HySecurity-branded product that it sells will, in all material respects, conform to its then applicable specification and will be free from defects in material and manufacture.

The following additional durational warranties apply to HySecurity products, depending on whether (1) the product is purchased through an authorized HySecurity distributor and (2) whether a timely and complete product registration is submitted to HySecurity.

It is therefore important that you register your product with HySecurity, online at www.hysecurity.com/warranty, within the 60-day period described below.

1(a) HySecurity Products Purchased Through Authorized Distributors and Properly Registered

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 product registration is completed by the Dealer/Installer or End User within 60 days of the date of purchase, the following warranty terms will apply. HySecurity warrants that the product will remain serviceable for the following periods:

a) Hydraulic industrial gate operator hydraulics, controls, and mechanical components: Five Years or 500,000 gate cycles (whichever occurs first) after the date of installation,
b) Hydraulic wedge operator hydraulics and controls: Five Years or 500,000 cycles (whichever occurs first) after the date of installation. Wedge mechanical components: Two Years after the date of installation,
c) Electromechanical pad-mounted Slide and Swing operators: Five Years or 500,000 cycles (whichever occurs first) after the date of installation, except single family residential usage, where the warranty term shall be Seven Years after the date the product was shipped from HySecurity,
d) Electromechanical linear actuator Swing operators: Two Years after the date of installation,
e) Electromechanical surface mount wedge operator electronics: Two Years or 500,000 gate cycles (whichever occurs first), after the date of installation,
f) Electromechanical Barrier Arm Operators: Two years or 1,000,000 gate cycles (whichever occurs first) after the date of installation,

provided that the preceding Five Year warranty period in (a), (b), and (c) will not extend beyond seven years from the date that the product was shipped from HySecurity, and the Two Year warranty period in (b), (d), (e), and (f) will not extend beyond four years from the date that the product was shipped from HySecurity.

The preceding warranty durations do not apply to the products or components described below (g-j), which have a shorter warranty period:

g) Hydraulic gate operator drive wheels, including XtremeDrive™ wheels and rack: Two Years from date of installation.
h) AC and DC power supplies, chargers, and inverters and HyNet™ Gateway: Two Years from date of installation, except batteries.
i) Batteries: One Year from date of shipment from HySecurity.
j) Components subject to normal wear including, but not limited to, chains, belts, idler wheels, sprockets and fuses: One Year from date of installation.

1(b) HySecurity Products *Not* Purchased Through an Authorized Distributor or Not Properly Registered within 60 Days

For any product that is not purchased from an authorized HySecurity distributor or for which the product registration was not completed by the Dealer/Installer/End User within sixty (60) days of the date of purchase, the following warranty will apply: 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) AC and DC power supplies, chargers, or inverters: One Year.
c) HyNet™ Gateway: One Year.
d) 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 part was shipped from HySecurity or the remaining period of the Gate Operator warranty, whichever is longer.

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, maintained, or used improperly or contrary to instructions; (2) subjected to negligence, accident, vandalism, or damaged by severe weather, wind, flood, fire, terrorism 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, Dealer/Installer, or End User to ensure that the software version in the product is maintained to the latest revision level.

The preceding warranties do not extend to accessories 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.

These warranties extend to HySecurity's Distributors, to the Dealer/Installer, and to the first End User of the product following installation. They do not extend to subsequent purchasers.

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**, ANY LIABILITY FOR INFRINGEMENT, AND ANY 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. HySecurity reserves the right to supply used or reconditioned material for all warranty claims. HySecurity will not be considered to be in breach of or default under this Warranty because of any failure to perform due to conditions beyond its reasonable control, including any force majeure. This warranty does not cover any incidental expenses, including fines or penalties, temporary security, 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 procedures described on the HySecurity form, "RMA Procedures."

THE REMEDY SELECTED BY HYSECURITY IN ACCORDANCE WITH THIS PARAGRAPH SHALL BE THE **EXCLUSIVE AND SOLE REMEDY OF BUYER FOR ANY BREACH OF WARRANTY.**

4. Exclusion of Consequential and Incidental Damages.

HYSECURITY SHALL NOT BE LIABLE FOR ANY INCIDENTAL, SPECIAL, 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. This exclusion applies regardless of whether such damages are sought for breach of warranty, breach of contract, negligence, or strict liability. 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.

6. Proprietary Rights.

HySecurity retains and reserves all right, title, and interest in the intellectual property rights of its products, including any accompanying proprietary software. No ownership of any intellectual property rights in the products or accompanying software is transferred to Distributor, Dealer/Installer, or End User.

7. 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.

12 SwingRiser™ Models

	1,000 lb gate, 14 second open		1,600 lb gate, 19 second open		3,000 lb gate, 30 second open	
	Single Leaf	Twin	Single Leaf	Twin	Single Leaf	Twin
Model	**SwingRiser 14**	**SwingRiser 14-Twin**	**SwingRiser 19**	**SwingRiser 19-Twin**	**SwingRiser 30**	**SwingRiser 30-Twin**
Part #	HRG 220-A ST	HRG 222-A ST	HRG 220-B ST	HRG 222-B ST	HRG 220-C ST	HRG 222-C ST
Duty Cycle	Continuous					
Horsepower	1 hp	2 hp	1 hp	2 hp	1 hp	2 hp
Drive	Hydraulic					
Gate Length Max.	Up to 9 ft (3 m)	Up to 9 ft (3 m) each leaf	Up to 16 ft (5 m)	Up to 16 ft (5 m) each leaf	Up to 16 ft (5 m)	Up to 16 ft (5 m) each leaf
Gate Weight Max.	1,000 lb (453 kg)	1,000 lb (453 kg) / leaf	1,600 lb (726 kg)	1,600 lb (726 kg) / leaf	3,000 lb (1,361 kg)	3,000 lb (1,361 kg) / leaf
Open/Close Time	14 seconds		19 seconds		30 seconds	
Temperature Rating	-40° to 158° F (-40° to 70° C)					
1 Phase Power	115/208/230V 60Hz 110/220V 50Hz **	208/230V 60Hz 220V 50Hz **	115/208/230V 60Hz 110/220V 50Hz **	208/230V 60Hz 220V 50Hz **	115/208/230V 60Hz 110/220V 50Hz **	208/230V 60Hz 220V 50Hz **
3 Phase Power	208/230/460V 60Hz, 220/380/440V 50Hz					
Communication	RS-232, RS-485, Ethernet/fiber using optional HyNet™ Gateway accessory					
User Controls	Smart Touch Controller with 70+ configurable settings. Smart Touch keypad and display or a PC using S.T.A.R.T. software.					
Relays	Three configurable user relays: one 30VDC, 3A solid state and two 250VAC, 10A electromechanical. Optional Hy8Relay™ for 8 additional relay outputs					
Finish	Zinc flame sprayed					
Enclosure	HydraSupply: Type 3R, 30w x 42h x 12d inch (76w x 107h x 30.5d cm)					
ETL Listed (UL 325)	Usage Class I, II, III, IV					
Warranty	5 year w/product registration					

UPS Battery Backup Power Options

DC Power Supply* †	SwingRiser 14 UPS	SwingRiser 14-Twin UPS	SwingRiser 19 UPS	SwingRiser 19-Twin UPS	SwingRiser 30 UPS	SwingRiser 30-Twin UPS
AC Power Supply with HyInverter AC*	**SwingRiser 14 with HyInverter AC**	—	**SwingRiser 19 with HyInverter AC**	—	**SwingRiser 30 with HyInverter AC**	—

* The operator's normal duty cycle and the actual number of gate cycles available from battery depends upon gate resistance to travel, cycle length, battery size, state of charge and health, ambient temperature, accessory power draw and frequency of gate cycles during power outage.

** Refer to Installed Options on pricing for all 50Hz voltages, which are special order.

† 115V requires a 30A branch circuit. Choose voltage with care as chargers are not field convertible.

To enable fully automatic operation, all SWING gate operators require a minimum of ONE monitored external entrapment protection sensor to protect entrapment zones in either the open or close direction of travel. However, an additional monitored sensor is required if there is a risk of entrapment in both directions of gate travel. Visit hysecurity.com/gatesafety for more information on UL 325 standards and gate safety.

Contact Information:

Visit https://hysecurity.com/technical-support/ for installation manuals, replacement part instructions, part diagrams and more.

Qualified HySecurity distributors are experienced and trained to assist in resolving installation 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.