

StrongArm®

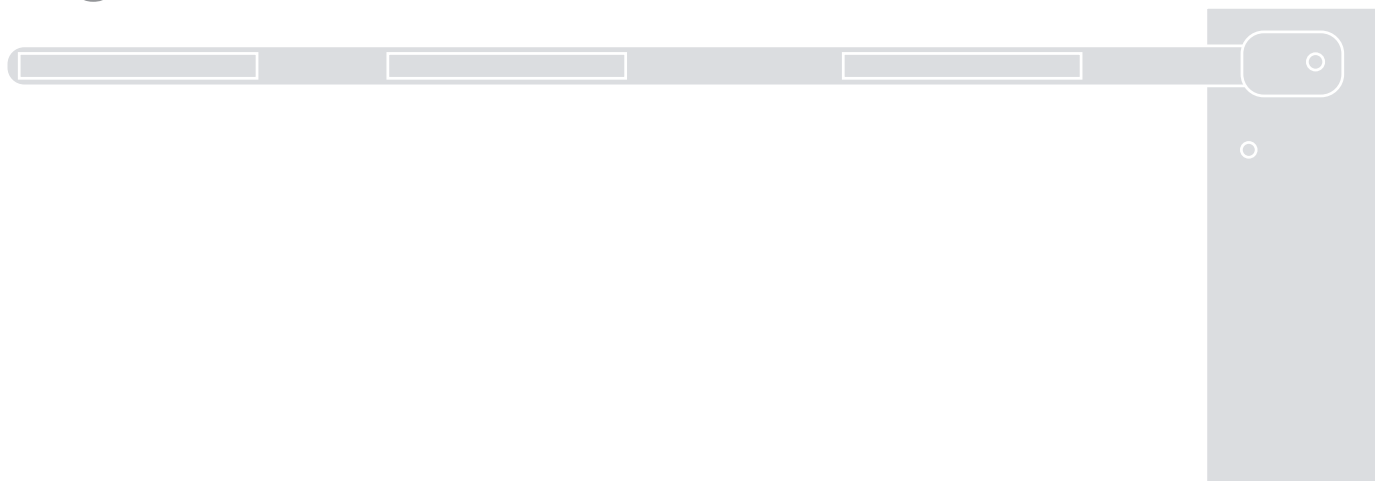
StrongArm 14F

StrongArm 20

StrongArm 28

StrongArm 36

StrongArmDOT 28



Barrier arm

EN - Programming and operations manual

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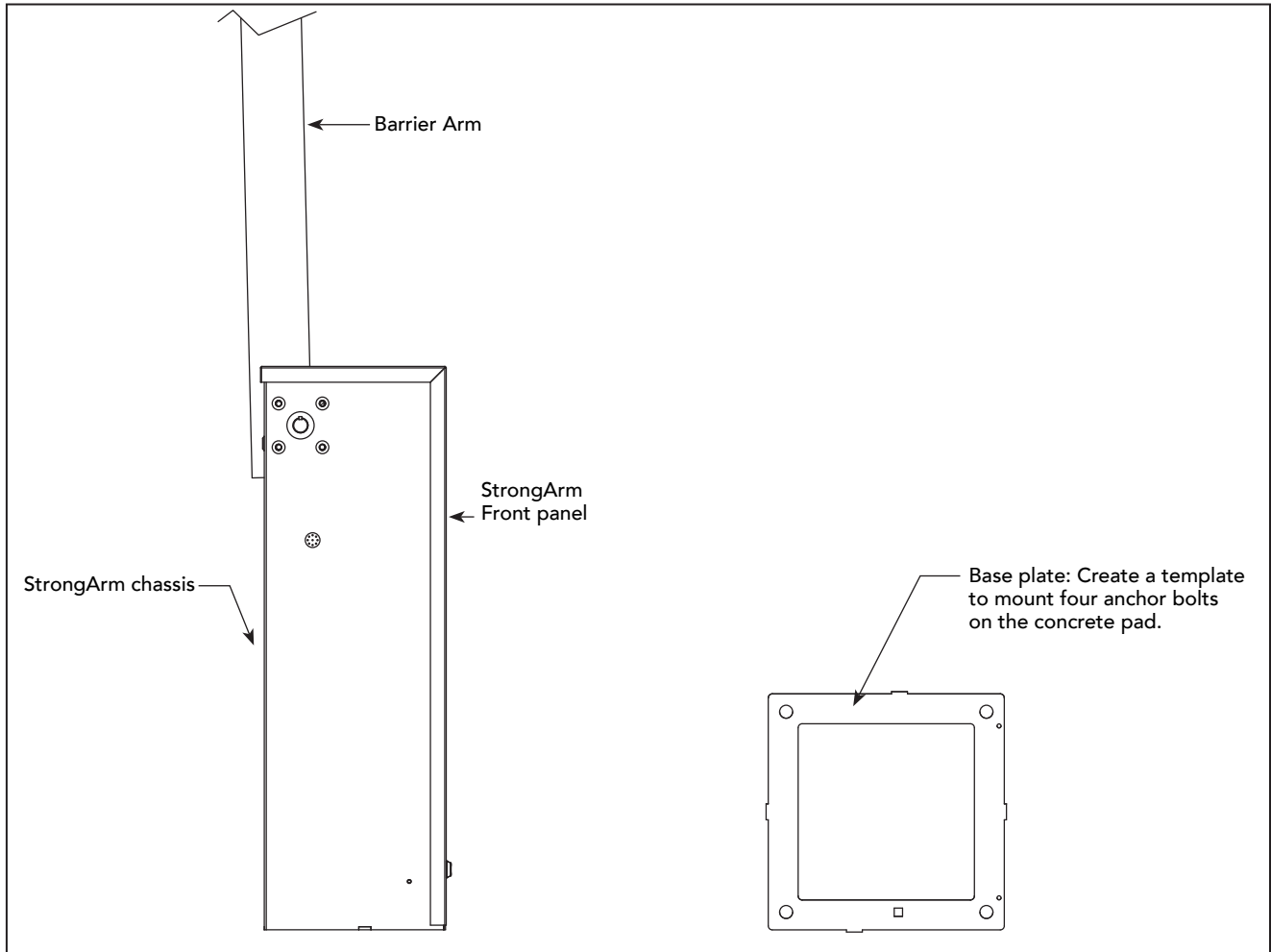
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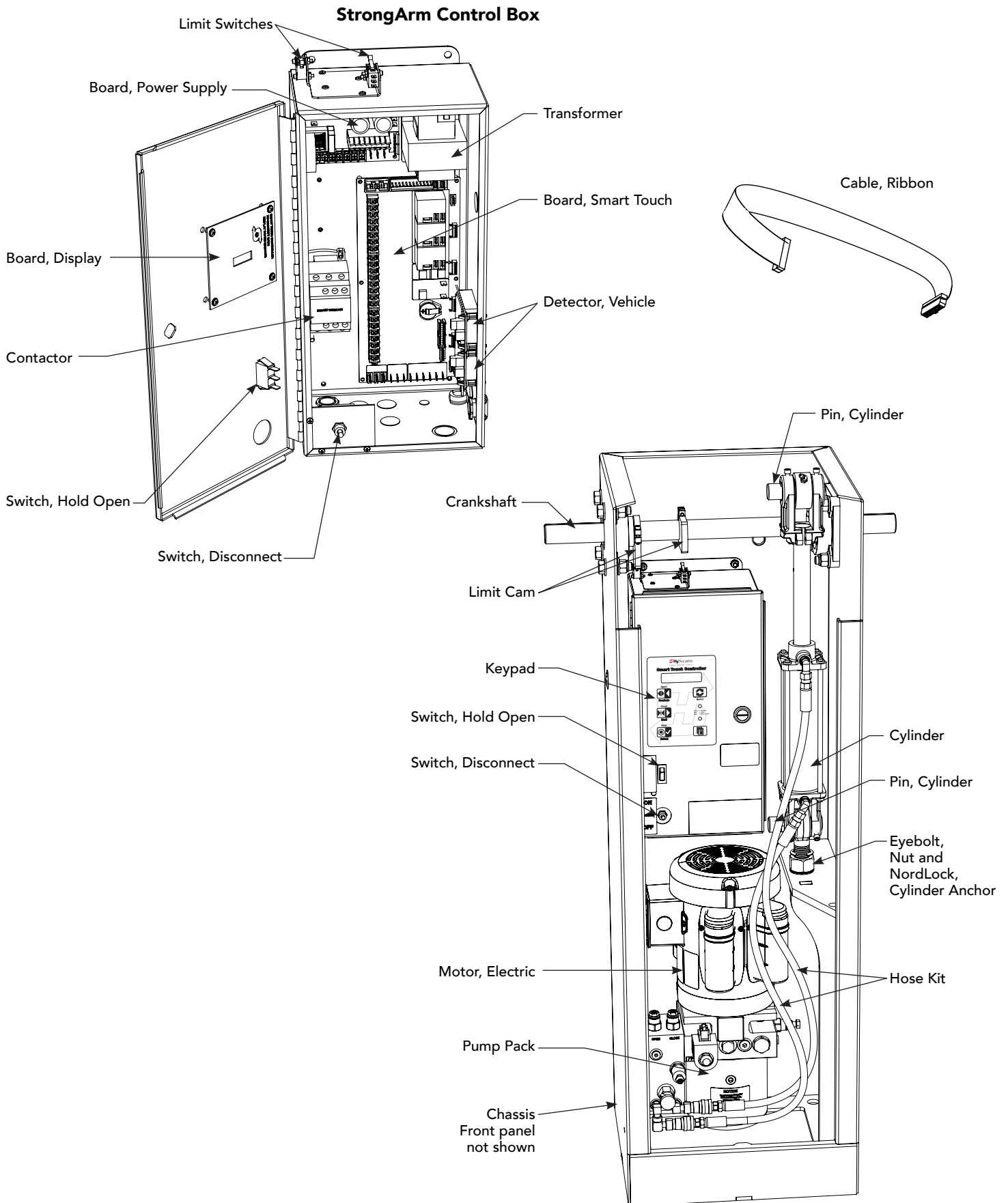
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NOTICE
Visit <https://hysecurity.com/technical-support/> for installation manuals, replacement part instructions, part diagrams and more.

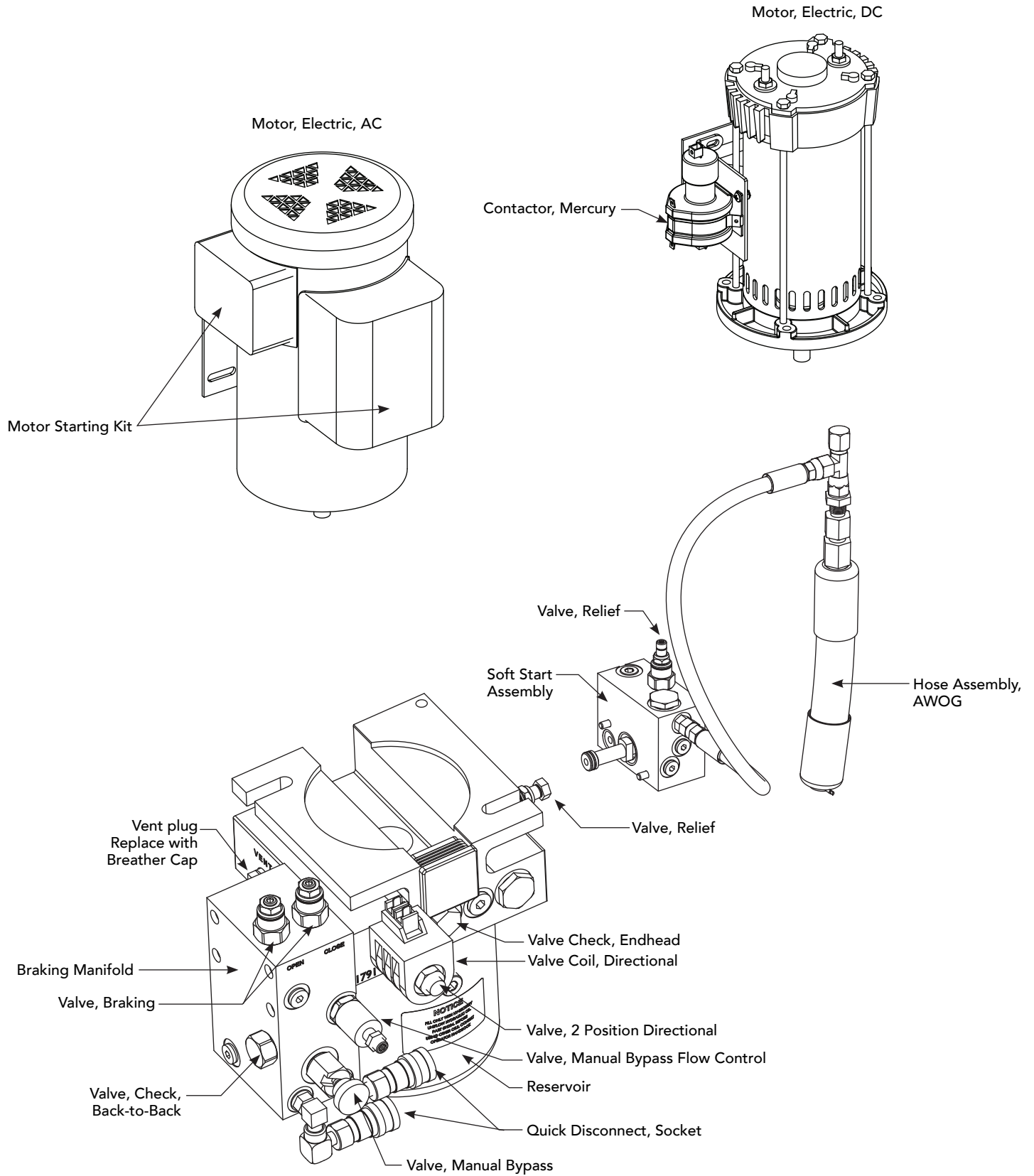
StrongArm Site Installation Overview



StrongArm Components



StrongArm Pump Pack Components



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Important Safety Instructions

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**.



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



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



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.

IMPORTANT SAFETY INFORMATION



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 barrier arm. **NO ONE SHOULD CROSS THE PATH OF THE MOVING ARM.**
4. Test the gate operator monthly. The barrier arm **MUST** reverse on contact with a rigid object or stop when an object activates the non-contact sensors. After adjusting the force of travel, retest the gate operator. Failure to adjust and retest the gate operator properly can increase the risk of injury or death.
5. **KEEP BARRIER ARM GATES PROPERLY MAINTAINED.** Read the installation and operating manual. Have a qualified service person make repairs to gate hardware.
6. The entrance is for vehicles only. Pedestrians must use a separate pathway that prevents contact with the barrier arm.
7. **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



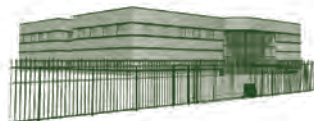
Class I: Barrier arm gates are **NOT** Intended for use in a location of one to four single family dwellings or a parking area associated with one to four single family dwellings.

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.

IMPORTANT SAFETY INFORMATION

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.

Install this gate operator only when:

- The operator is appropriate for the construction of the gate and the usage Class of the gate.
- All exposed pinch points are eliminated or guarded.

The operator is intended for installation only on barrier arms 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 barrier arm during the entire path of travel of the barrier arm.

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

EXCEPTION: Emergency access controls should be only accessible by authorized personnel (e.g. fire, police, EMS) and 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. HySecurity provides two warning signs already applied to barrier arms and two signs for attachment to both sides of the operator chassis.

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 obstruction exists, such as just below the barrier arm.

USE OF VEHICLE DETECTORS

Use of vehicle detectors (loop detectors) is strongly encouraged to prevent damage to vehicles caused by barrier arms 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>.

IMPORTANT SAFETY INFORMATION

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.
- 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 pathway shall be provided. The pedestrian pathway shall be installed in a location such that a pedestrian shall not come in contact with a moving vehicular barrier arm.
- 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.

EXTERNAL ENTRAPMENT PROTECTION SENSORS

It is highly recommended that the site designer or installer use photo eyes as the primary safety device. Edge sensors are not appropriate for barrier arms as described below.

PHOTO EYES: One or more non-contact sensor (photo eyes) shall be located where the risk of being hit exists, such as across the path below the barrier arm.

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

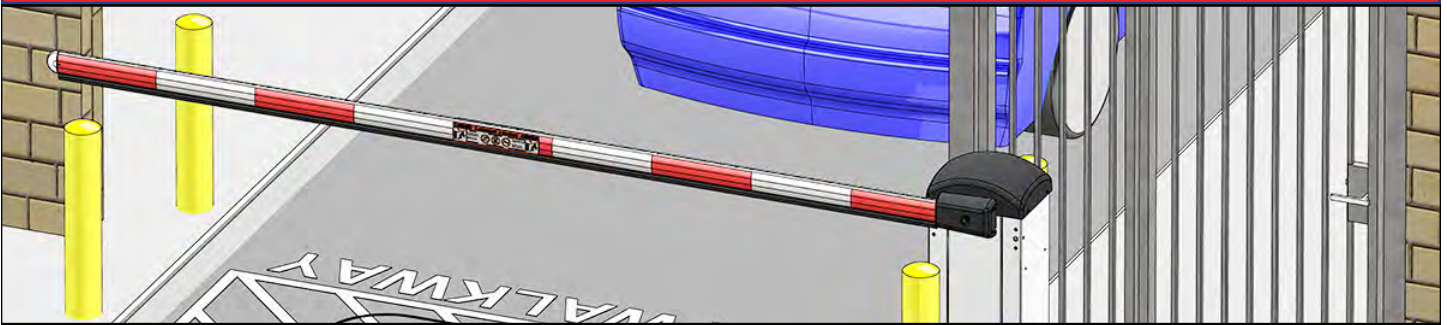
EDGE SENSORS: Edge sensors are not appropriate for use with a barrier arm as the contact sensor must make physical contact to function, and so cannot prevent a barrier arm from striking a person or object.

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: Barrier arms are not categorized as needing many of the requirements under UL that slide and swing gates require, but 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 barrier arm gate operator. Study Important Safety Instructions and consider your specific installation to determine where greatest risks exist. Locate photo sensors accordingly. Be certain that a sufficient number of sensors are used so that pedestrians are protected from entrapment in arm 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.

IMPORTANT SAFETY INFORMATION

HySecurity Vertical Barrier Arm Safety and Traffic Control



ARM INSTALLATION

Do not install the operator where arm moves within 16 inches of a rigid object or within 10 feet of high power wires when the barrier arm is raised.

TRAFFIC SPEED

The acceptable speed through the gate entry or exit is 5 MPH. To help regulate traffic, speed limit signs, hazard stripes, and speed bumps may be utilized.

USER RESPONSIBILITY

The user is responsible for gate safety and should familiarize themselves with all aspects of gate operation, including:

- hardware operation
- entrapment protection
- electrical and mechanical safety
- arm reversing functions and testing
- edge contact sensors
- photoelectric eye sensors
- gate operator accessories (alarms, radio, etc.)



WARNINGS FOR BARRIER ARM SAFETY

- **Arm barriers are meant ONLY for vehicles; bicycles, motorcycles, and pedestrians are NOT permitted through the barrier arm gate system.**
- **The gate system should be installed so that the person operating the gate can observe the entire movement of barrier arm.**
- **The gate operator controls should be located at least 6 feet away from the barrier arm to prevent controls being used by an operator while in contact with the barrier arm.**
- **Emergency access controls must be protected from unauthorized use and placed so that emergency personnel can access them.**
- **Keep all persons and children away from the gate entry/exit and all hazard areas.**
- **A separate and clearly marked entry/exit pathway must be provided for pedestrian traffic to prevent contact with the barrier arm.**
- **All electrical connections must be made in accordance to local electrical codes.**
- **To avoid unauthorized use of the controls, install security features on the barrier arm operator, such as a lock.**
- **When manually operating the barrier arm, ensure that no vehicles or pedestrians are in the gate area.**

IMPORTANT SAFETY INFORMATION

HySecurity Vertical Barrier Arm Safety and Traffic Control

High levels of force are generated by moving traffic barrier arms. Ensure arm installation, warning signs and safety devices are properly installed and operated to address the following hazards:

- Pinch points
- Overhead power lines
- Arm striking persons or vehicles
- Entrapment areas
- Traffic speed
- Restriction of motorcycles, bicycles, pedestrians, etc.

Refer to the list below for safety features available for the installation of a barrier arm gate system. Refer to the drawings on the next page for a visual reference of these features.

WARNING!

The primary hazard for barrier arms is the barrier arm striking a person as it is lowered, so any measures to prevent persons from entering the area under the arm will be most effective in ensuring safety. A non-contact photo-eye sensor (see below) is recommended for maximum protection as it will prevent the arm lowering if the beam is interrupted by the presence of a person under the arm.

1 Non-Contact Sensor (Photo Eye)

Located directly below the arm, this sensor will minimize the potential for a barrier arm to impact a vehicle not sensed by a ground loop.

2 Loop Sensor

Loop sensors sense the presence of moving vehicles ONLY and prevents the barrier arm from impacting vehicular traffic. Configuration and placement depends on application. Loops do not sense persons.

3 Traffic Light

Traffic lights help control traffic flow through the gate.

4 Separate Pedestrian Walkway

A pedestrian walkway separate from gate entry is REQUIRED, and serves to prevent pedestrians from coming into contact with the arm.

5 LED Lights on Barrier Arm

Arm mounted LED lights allow the arm and its position to be easily seen in dark environments.

6 Speed Bump

A speed bump may help regulate traffic speed through the gate.

7 Pedestrian Warning and Hazard Stripes

This warning indicates pedestrians are not allowed to enter through the gate where they may come into contact with the barrier arm. Warnings should be positioned to be seen from both sides of the gate.

8 Arm Warning Sign (Both Sides of Arm)

This warning indicates the hazards of standing in the way of a barrier arm and should be applied to both sides of the arm.

9 Speed Limit Sign

A speed limit sign may help regulate traffic speed through the gate opening.

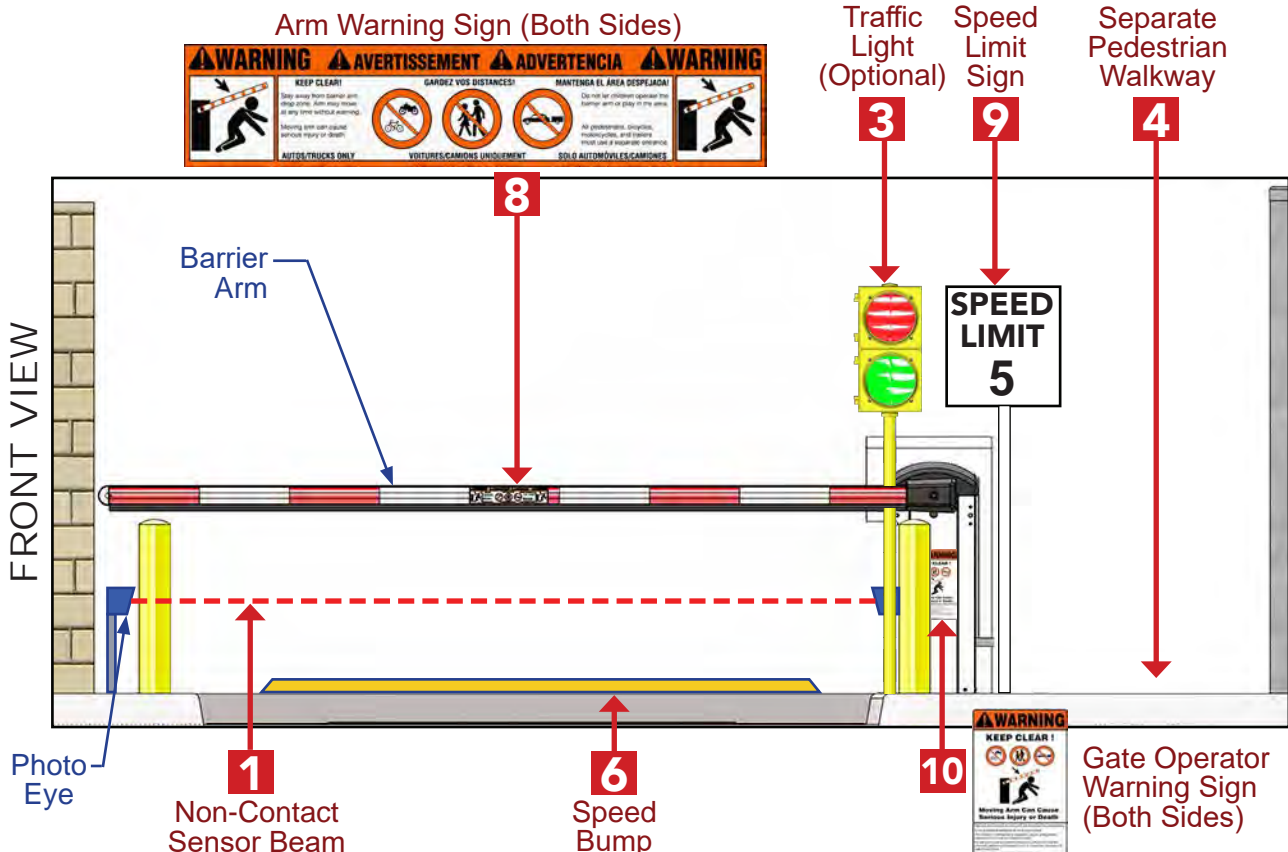
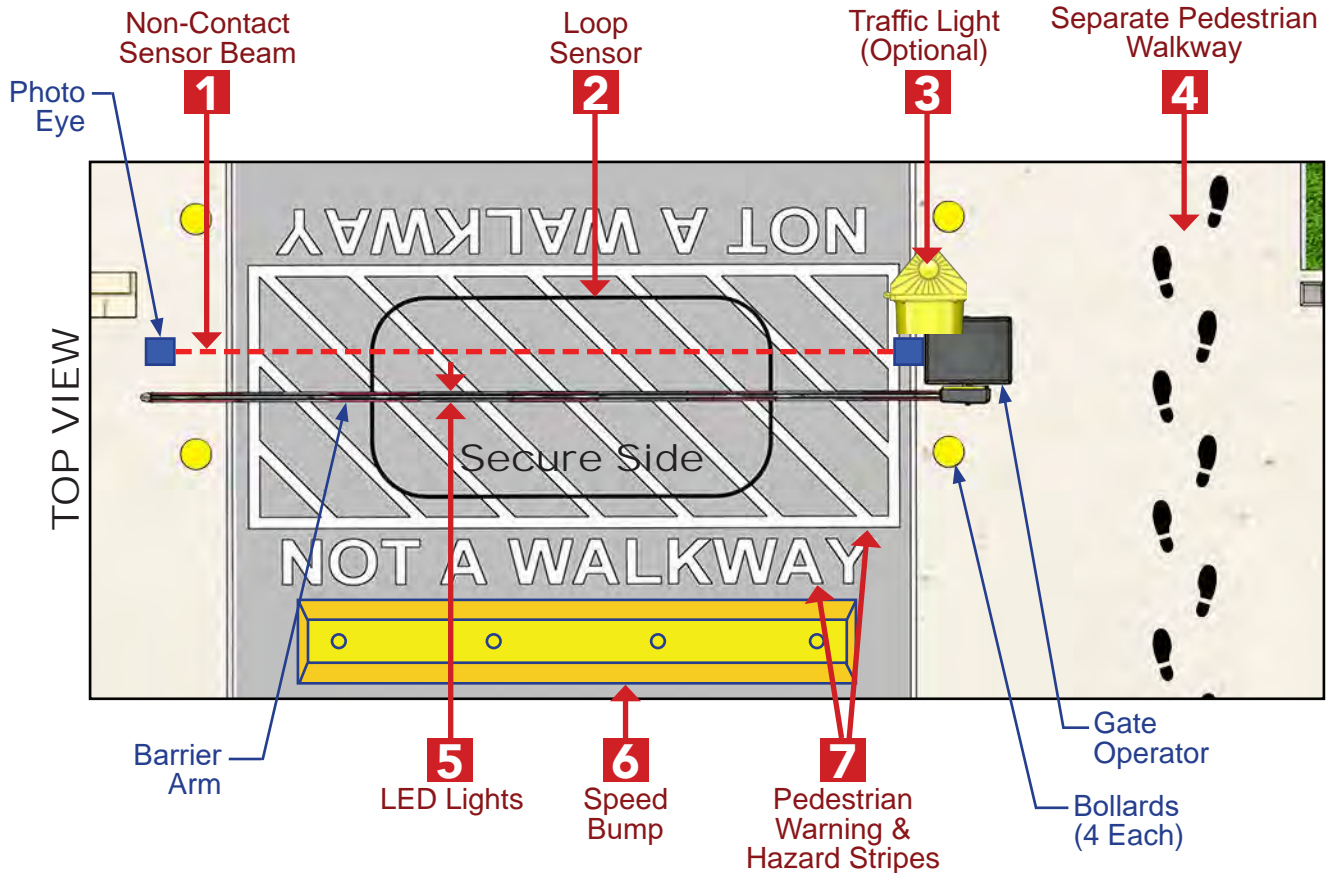
10 Gate Operator Warning Sign

This warning indicates the hazards of standing in the way of a barrier arm and should be applied to both sides of the gate operator chassis so it is visible to traffic in both directions.



IMPORTANT SAFETY INFORMATION

HySecurity Vertical Barrier Arm Safety and Traffic Control



IMPORTANT SAFETY INFORMATION

HySecurity Vertical Barrier Arm Safety and Traffic Control

The following photo eye sensors have been shown in testing to provide the best performance when installed with HySecurity operators. HySecurity supports installers who install recommended sensors. "Compatible Sensors" are still certified to meet UL 325 6th edition installation with HySecurity operators. Contact the sensor manufacturer for specific recommendations for use.



All 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 Compatible Photo Eye Sensors

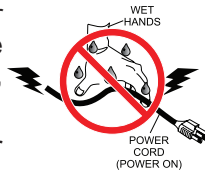
	Mfg. Part #	Mfg.	Details	Hysecurity Part #
Photo Eyes (Retroreflective)	E3K-R10K4-NR	Omron	40 ft max range limit	MX000999
	NIR-50-325	EMX	45 ft max range limit	
	IRB-RET	EMX	53 ft max range limit	
	E-931-S50RRGQ	Seco-Larm	46 ft max range limit	
Photo Eyes (Thru-Beam)	IRB-MON	EMX	65 ft max range limit	MX3990
	E-960-D90GQ	Seco-Larm	90 ft max range limit	

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

IMPORTANT SAFETY INFORMATION

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 unreparable 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.

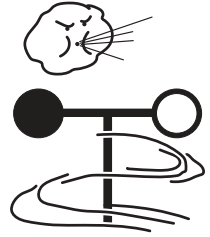
Recyclers and manufacturers alike promote the process of recycling metal and plastic. Using a metal and plastic recycling center promotes energy cost savings.

IMPORTANT SAFETY INFORMATION

WIND LOAD FACTORS

Wind load is not as much of a factor when considering using a barrier gate for a particular site instead of a slide or swing gate. However, when installing a barrier arm gate in a high wind area, Hysecurity suggests the following:

- Gate arms should be lowered during high wind conditions to avoid damage to the arm.
- Metal hardware (rather than nylon) should be used to affix the arm to the operator.



MAINTENANCE OF GATE SYSTEMS

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

At least monthly:

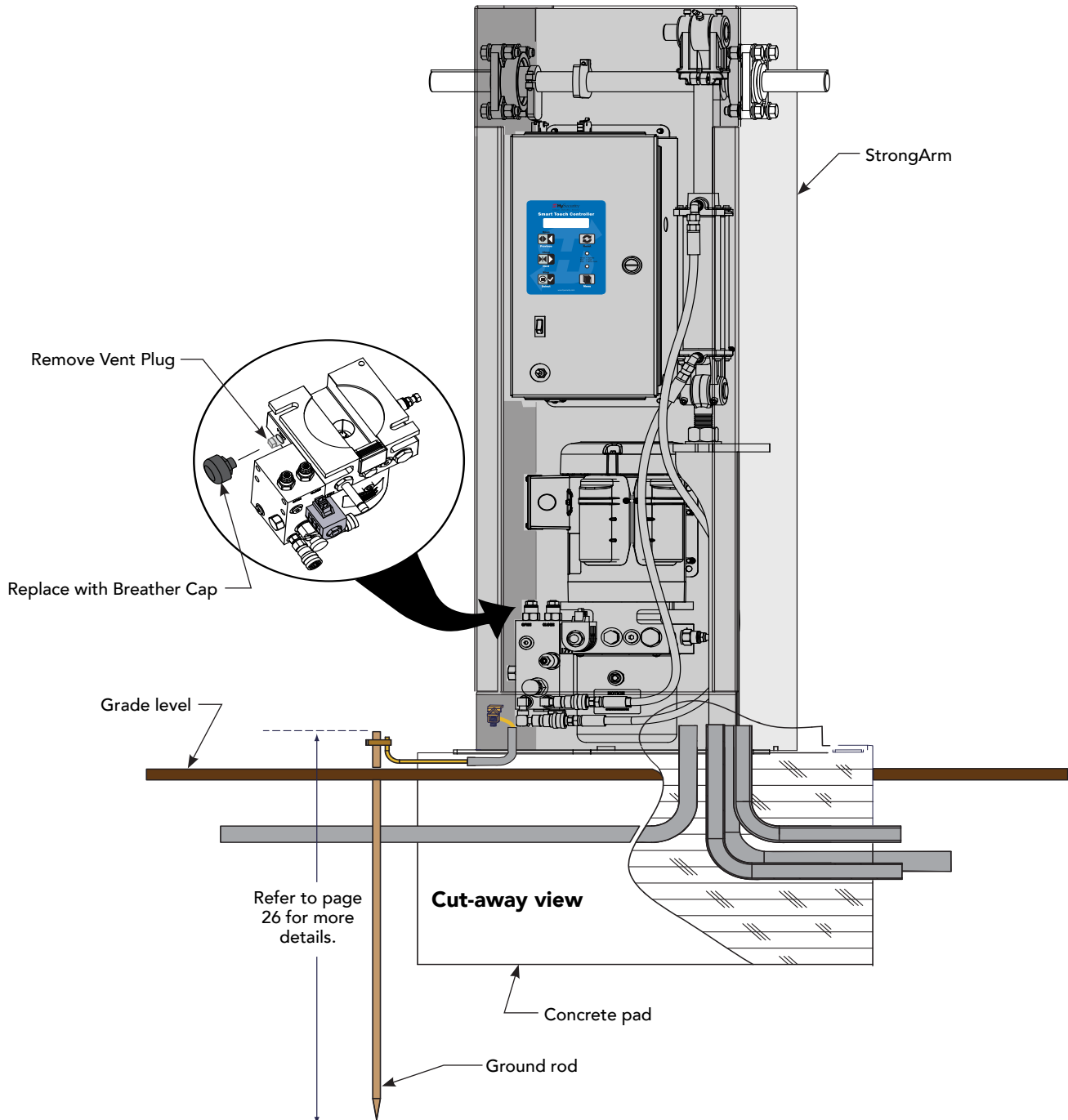
- Disconnect the gate operator and manually move the barrier arm through its range of travel. Note any unusual noises or areas of binding. The arm should travel smoothly and quietly throughout its range. If it does not, contact a gate professional to correct the problem.
- Reconnect the gate operator and perform the following tests:
 - With the arm closing, block any photo eyes used to protect the arm lowering direction. The gate should stop and reverse direction.
 - Using a suitable obstruction in the path of the arm (a solid, immovable object), close the arm until it contacts the obstruction. The arm should stop and reverse direction.

PROPER GROUNDING AND BREATHER CAP INSTALLATION

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

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

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



MANUAL RELEASE: MANUAL BYPASS VALVE

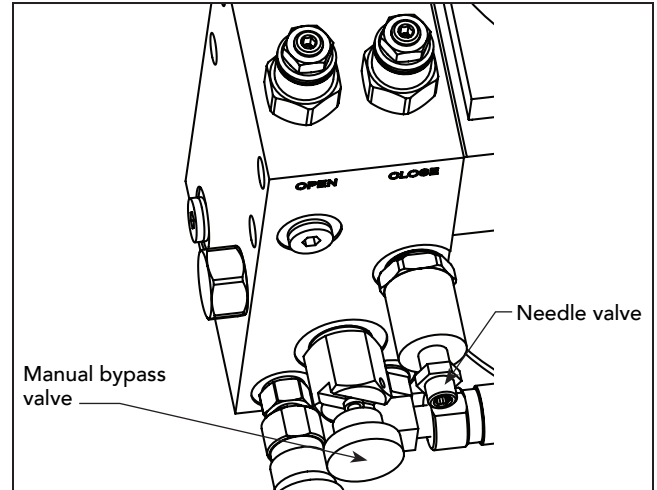


Before attempting a manual release, make sure the gate is not in motion and power is disconnected (turned OFF).

Make sure and teach all users how to turn off electric power and how to move the barrier arm manually.

Know the weight of the barrier arm that you are moving. Even with the proper counter weights, an excessively heavy arm can be difficult to move and may cause serious injury to those involved in moving it. Take the necessary precautions when manually moving any gate or barrier arm.

1. Press **Open** or **Close** to place the arm at a 45° angle.
2. Press **Stop** when the arm reaches a 45° angle.
3. Close the Needle valve. Loosen the lock nut and turn the valve CW until it stops.
4. Pull the black Manual Bypass knob out and lock it open by twisting it ¼ turn before releasing it.
5. Slowly turn the Needle valve CCW until the arm lowers slowly and smoothly.
6. Twist the black Manual Bypass knob so it re-seats itself in the closed position.



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

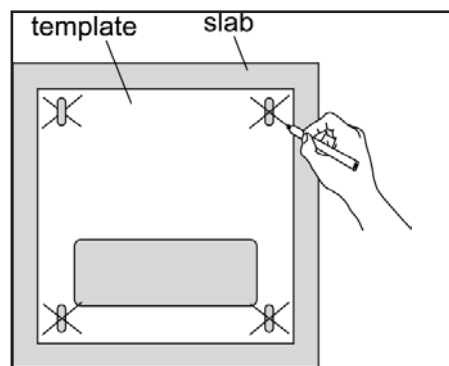
INSTALLATION PREPARATION CHECKLIST

1. Read all of the instructions, especially the Important Information in Section 1 at the beginning of this manual, before you attempt installation. This section is focused upon mechanical installation.
2. Pour a concrete mounting slab that is a minimum of 20" x 20" x 20" with the electrical conduits located correctly to enter the chassis. Keep in mind that a space of 7 X 11" just inside of the operator door is where the conduits must enter into the operator. HySecurity recommends a slab reaches below the local frost line. See the footprint plan and elevation view.

INSTALLATION

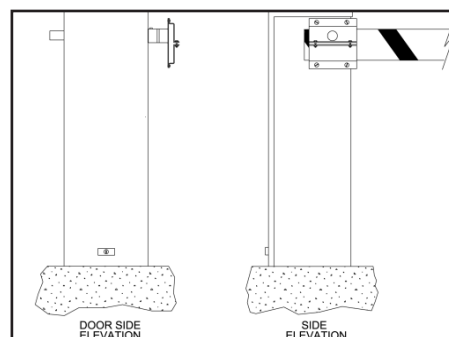
1. Drill four holes for concrete anchors

The operator must be mounted with four anchor bolts. These will be 12.5" on center with a square pattern to match the chassis base. Line up the operator so that the end of the barrier arm is in the intended position. Place the operator over the conduit and mark the mounting holes. Once marked, remove the operator and drill for ½" min. anchor bolts. 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.



2. Line up the operator

Set the operator over the mounting bolts, align the operator and securely tighten the bolts.

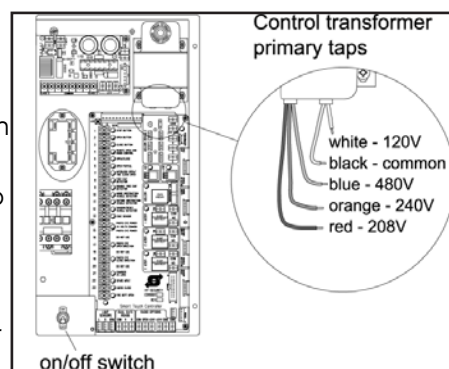


3. Special two part operators

DC powered operators come with a separate power enclosure. This enclosure should be mounted within 20 feet of the operator. We recommend wall mounting or using two 4" posts, with horizontal mounting strut to create a support for this enclosure. See also step 6 and section 8 on two part operators.

4. Electrical power Connection

This operator is intended for permanent installation, so all electrical conduits must be properly connected to the control box. The entry for the primary power is a ½ - ¾" knockout on the left side of our control box next to the on/off switch. This operator was built to run on a specific voltage and phase for line power. Make sure the available line voltage and phase matches the nameplate on this machine. Also be certain that the wire size of the branch circuit vs. the distance of the run from the main panel is large enough to avoid excess voltage drop. At a minimum, a 20 amp circuit (protected with a 20 Amp Inverse Time Breaker) should be provided. Also be sure the operator is electrically well grounded per NEC Article 250 and local codes. See the Appendix section for correct wire sizes and detailed electrical wiring information.



5. Primary tap of Control Transformer (not on DC battery powered operators)

Check to make sure that the primary tap on the control transformer matches the line voltage you have connected to the operator. Measure the line voltage carefully to distinguish between 208V and 230V branch circuits. A label on top of the transformer identifies the various taps.

6. Power Connection for Two Part Battery Operators

The primary AC power must be routed to the DC power supply enclosure, but there must be conduits between the gate operator and the DC supply enclosure. Note: AC power is not needed in the gate operator enclosure, unless there is an optional heater. Three separate DC circuits are required between the battery supply and the gate operator. Heavy gauge wires to supply the motor and two 14-gauge circuits for the controls. The heavy gauge wire must be at least 6-gauge if the DC supply is within 20 feet of the operator, but must be increased to 2-gauge if the DC supply is located farther from the operator. For full details, review the section titled "Two Part Operators".

7. Replace the Vent Plug!

Remove the ½" steel or plastic shipping plug on the pump manifold (left rear corner) and replace it with the supplied black breather cap.

8. Configuring the Smart Touch Controller

The operator controls will not allow the gate to function until the Smart Touch Controller has been configured. Wait to connect the external controls until you have reviewed the Smart Touch Controller instructions, and tested the basic functions of the operator.

Attaching Barrier Arms to the Operator

1. Bolt arm(s) to operator. The maximum length for a single wood board is 14' length. Wood arms that are longer than 14' must be twin arms bolted together near the tip.
2. Counterweights must be used for all arms over 18' in length, to assure proper performance. Verify proper balance by following step #2 on StrongArm (HTG 320) adjustments page.
3. Tubular aluminum arms may be single side mounted up to 18' in length. All arms over 18' must be mounted into a center yoke adapter. Arms longer than 24' are aluminum/fiberglass and include cables to make the arm more rigid, see the arm drawings for their proper location and installation.

Basic Testing

Test the operator for smooth control of the barrier arm. The arm should stop smoothly at each end of travel. If any adjustments are necessary, carefully review the StrongArm (HTG 320) adjustments page. Do not leave the job site without correcting an operator that is stopping abruptly on its limits or damage to the mechanical drive components may occur.

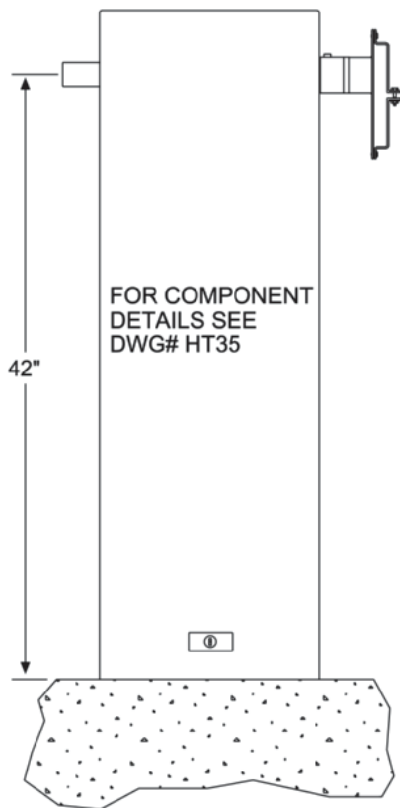
If your operator is equipped with vehicle detectors, be certain that they are either unplugged or connected to a loop so that they do not cause interference with the function of the machine. If the motor turns, but nothing moves, reverse two poles of a three-phase power source, and/or verify that the bypass valve is closed. To check the bypass valve, verify that the round black knob near the hydraulic hose connection point on the pump is not toggled to the bypass position.

Install Accessory Items

1. After all basic functions are verified, and adjustments made, connect any accessory or external control wiring.
2. Vehicle detectors: If vehicle detectors are to be used, review the section pertaining to detector loop sizing and layout.
3. Button station operation: Install the push button control within sight of the gate arm. Be certain the opening is clear before closing gate. Mount a sign, which advises that the area be clear before operation, adjacent to button station.
4. Protection: Mount a photo eye below the arm and/or an edge sensor to the leading edge of gate according to its manufacturers specifications.

Install Warning Signs And Safety Information Labels

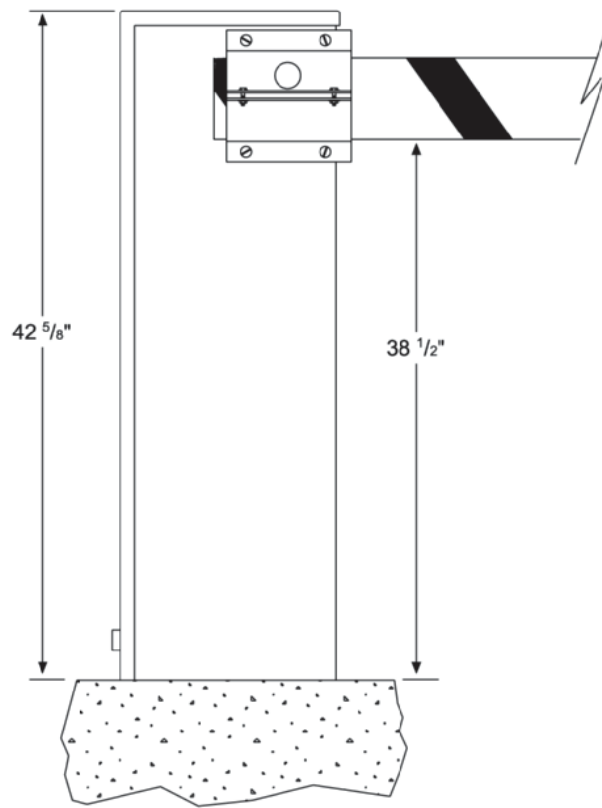
1. Be sure to install all of the warning signs or labels that were supplied with this operator. If these labels have been misplaced or lost, call your local distributor or the factory for replacements.



FOR COMPONENT
DETAILS SEE
DWG# HT35

42"

DOOR SIDE
ELEVATION

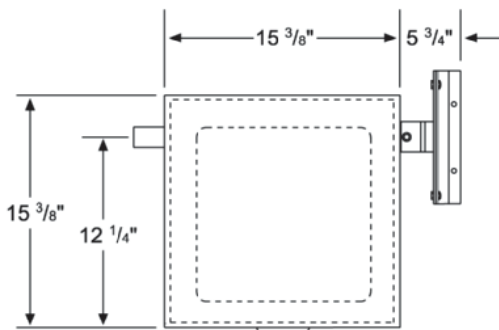


42 ⁵/₈"

38 ¹/₂"

SIDE
ELEVATION

ROAD SIDE



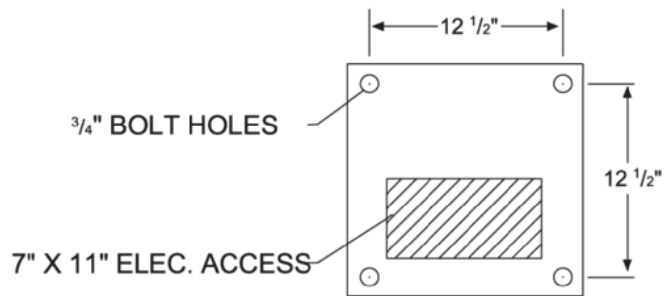
15 ³/₈"

12 ¹/₄"

15 ³/₈"

5 ³/₄"

PLAN VIEW
DOOR SIDE
(COVER IN PLACE)



³/₄" BOLT HOLES

7" X 11" ELEC. ACCESS

12 ¹/₂"

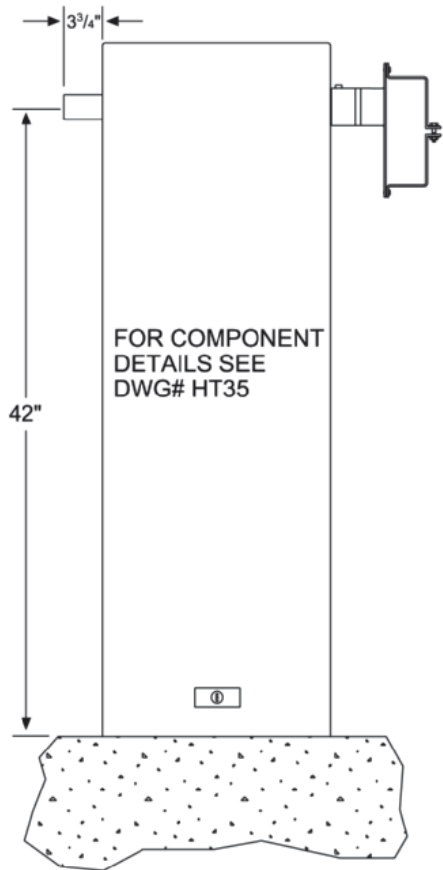
12 ¹/₂"

NOTE:

ARM BRACKET CAN ATTATCH
ON LEFT OR RIGHT SIDE.

NOTE:

MINIMUM RECOMMENDED SLAB
20" X 20" X 20" OR TO THE
FROST LINE, IF DEEPER.

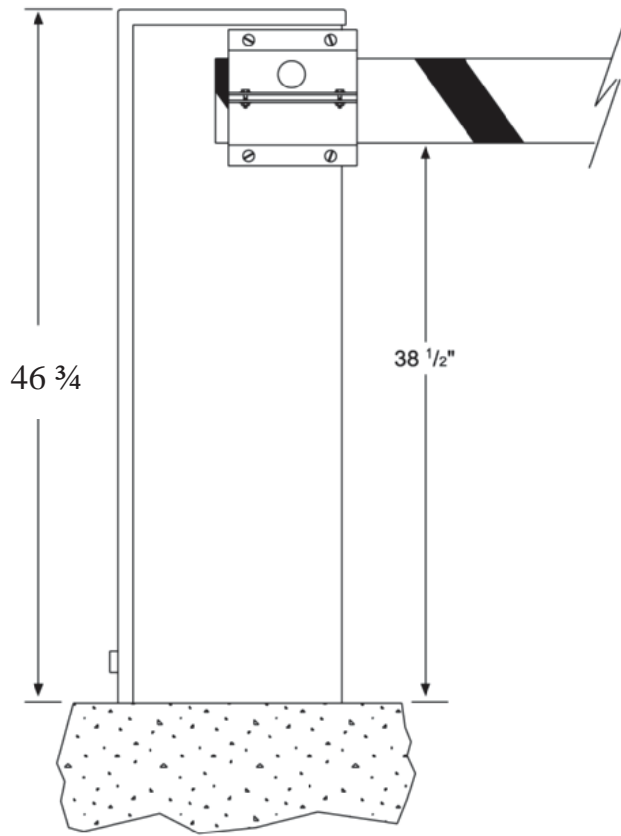


FOR COMPONENT
DETAILS SEE
DWG# HT35

42"

3 3/4"

DOOR SIDE
ELEVATION

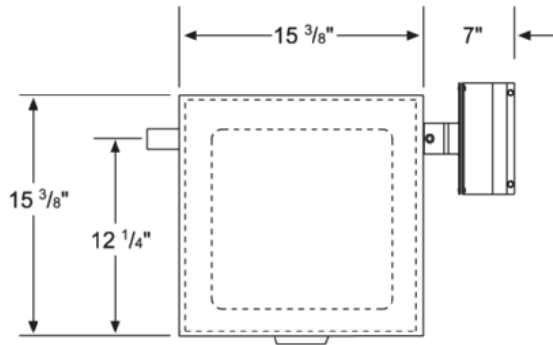


46 3/4"

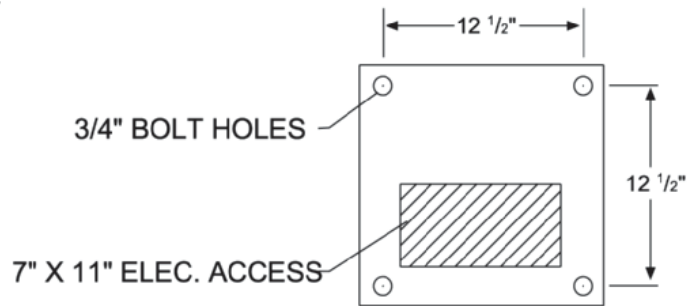
38 1/2"

SIDE
ELEVATION

ROAD SIDE



PLAN VIEW
DOOR SIDE
(COVER IN PLACE)



3/4" BOLT HOLES

7" X 11" ELEC. ACCESS

12 1/2"

12 1/2"

NOTE:

ARM BRACKET CAN ATTATCH
ON LEFT OR RIGHT SIDE.

NOTE:

MINIMUM RECOMMENDED SLAB
20" X 20" X 20" OR TO THE
FROST LINE, IF DEEPER.

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.



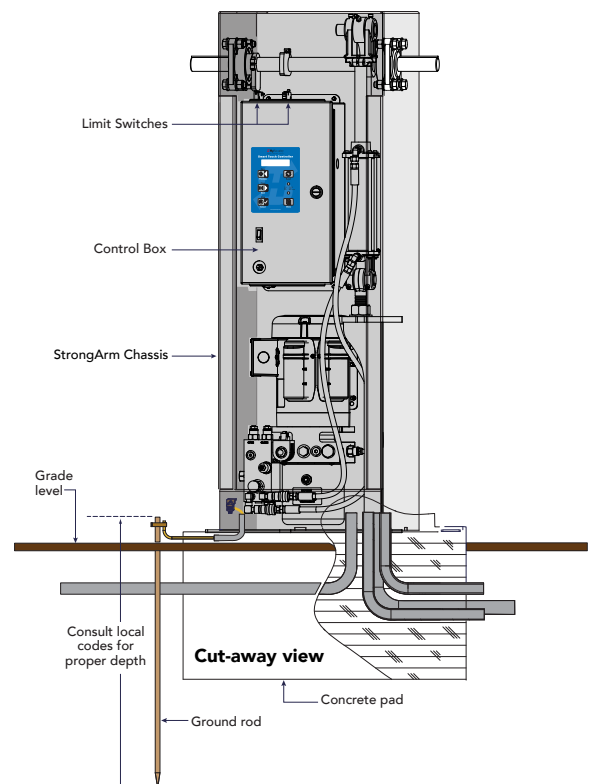
The potential for lightning discharge exists with all gates, fences and gate operators. National Electric Code (NEC) - Article 250 requires a separate earth ground in addition to the required equipment ground.

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: $\frac{5}{8}$ 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:

- 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 30.
- Make sure the available power source matches the electrical requirements specified on the voltage nameplate.



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

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

WIRING AC POWER

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

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

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

Size the primary wires (see page 33). Consider the voltage, horsepower, and length of the wire run from the main power panel.

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

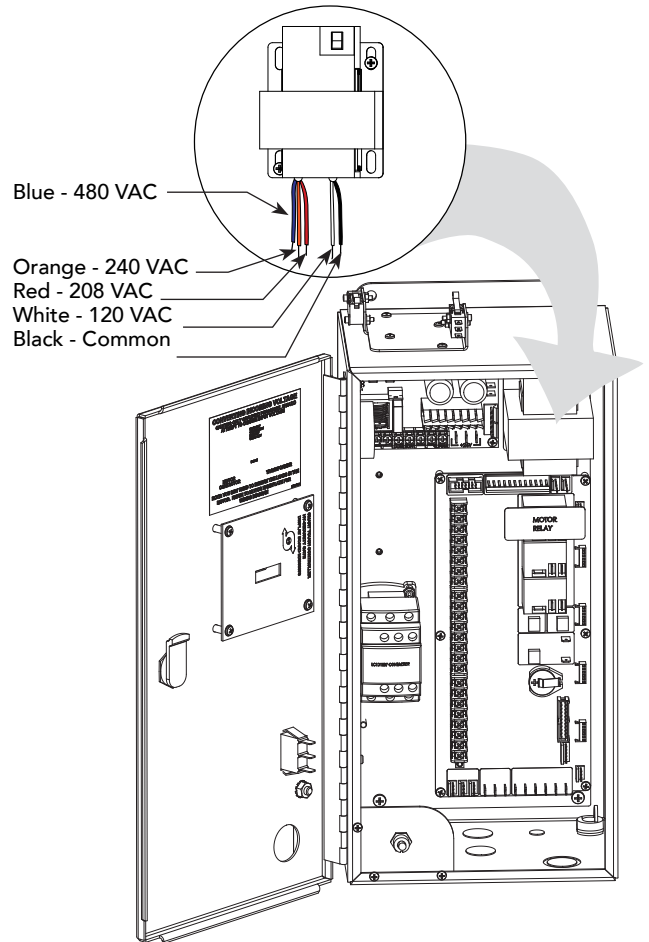


Turn OFF AC power at the source (circuit breaker panel) before accessing the wires in the StrongArm. Follow facility Lock Out/Tag Out procedures. Make sure all power switches are in the OFF position. Follow all electrical code standards and regulations.

1. **Connect to Power:** Entry for primary power is a knockout on the left side of the control box next to the ON/OFF toggle switch. Before connecting to main power, review the *Site Considerations* on page 28.
2. **Connect AC Power:** Crimp or wire tie the incoming power wires to the appropriate transformer wires. Make sure the connection wires match the voltage found on the operator's nameplate. Attach the ground wires to the chassis. A wiring diagram is provided in *StrongArm Wiring Diagram* on page 54.



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

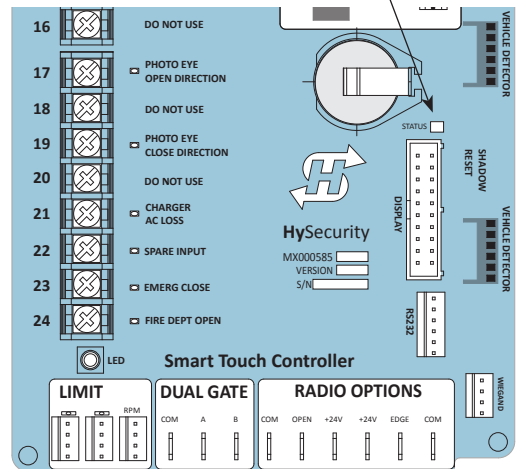


Turning the Power Switch ON

The AC power disconnect switch is located on the same enclosure (control box) where the electrical components, Smart Touch Controller, transformer, power 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 *Smart Touch Controller Inputs* on page 76.

Green LED flashes indicating processor is receiving power.



WIRE SIZING AND RUNS

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

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

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)

StrongArm Wiring Charts (Incoming Power)

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

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

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

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

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

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

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

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

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

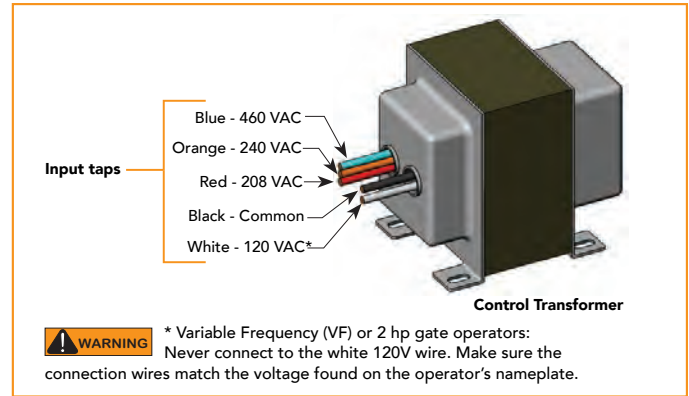
CONTROL TRANSFORMER CONNECTIONS (NON-UPS)

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

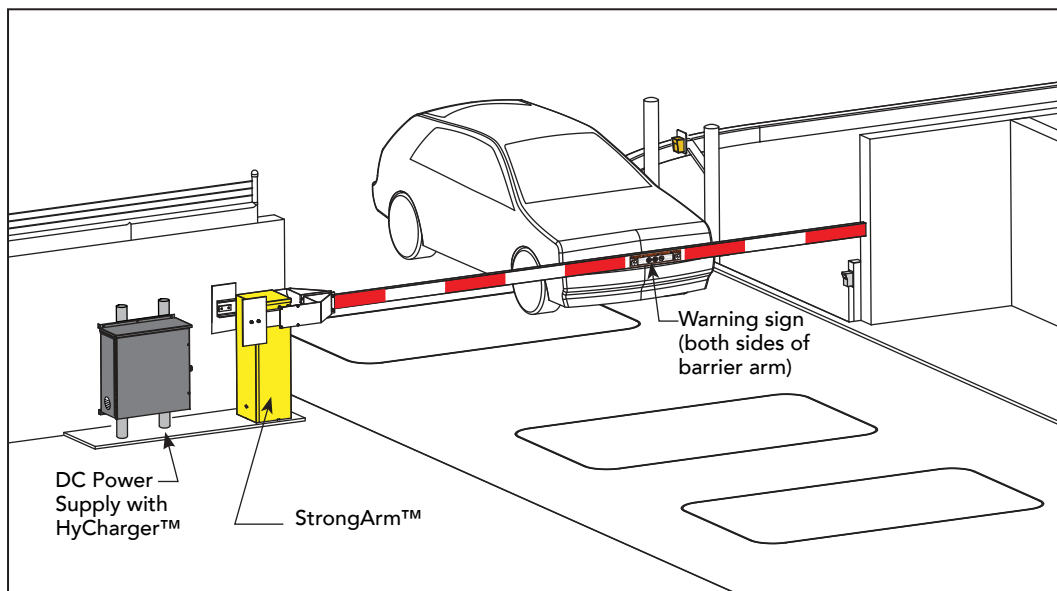
1. Ensure that the primary tap on the control transformer matches the line voltage and frequency connected to the gate operator.
2. Measure the line voltage carefully to distinguish between 208V and 230V branch circuits.

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

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



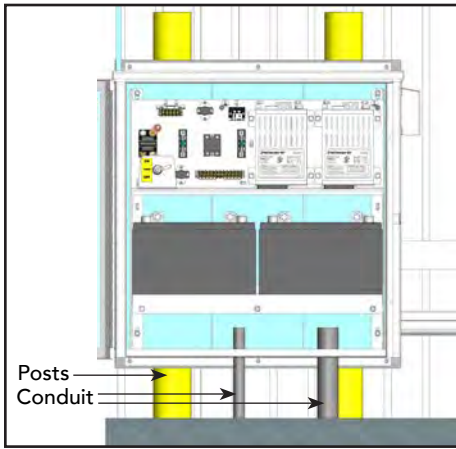
GATE OPERATOR CONNECTIONS (MODULAR UNIT)



If you have the modular unit, additional conduit is needed to house the hydraulic hoses and electrical wiring. You need a 2-inch (5 cm) diameter conduit for hydraulic hoses and a ¾-inch (19 mm) conduit for electrical wiring. AC input power is connected to the hydraulic pump and electrical components enclosure (HydraSupply).

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

DC POWER SUPPLY (UPS) CONNECTIONS



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

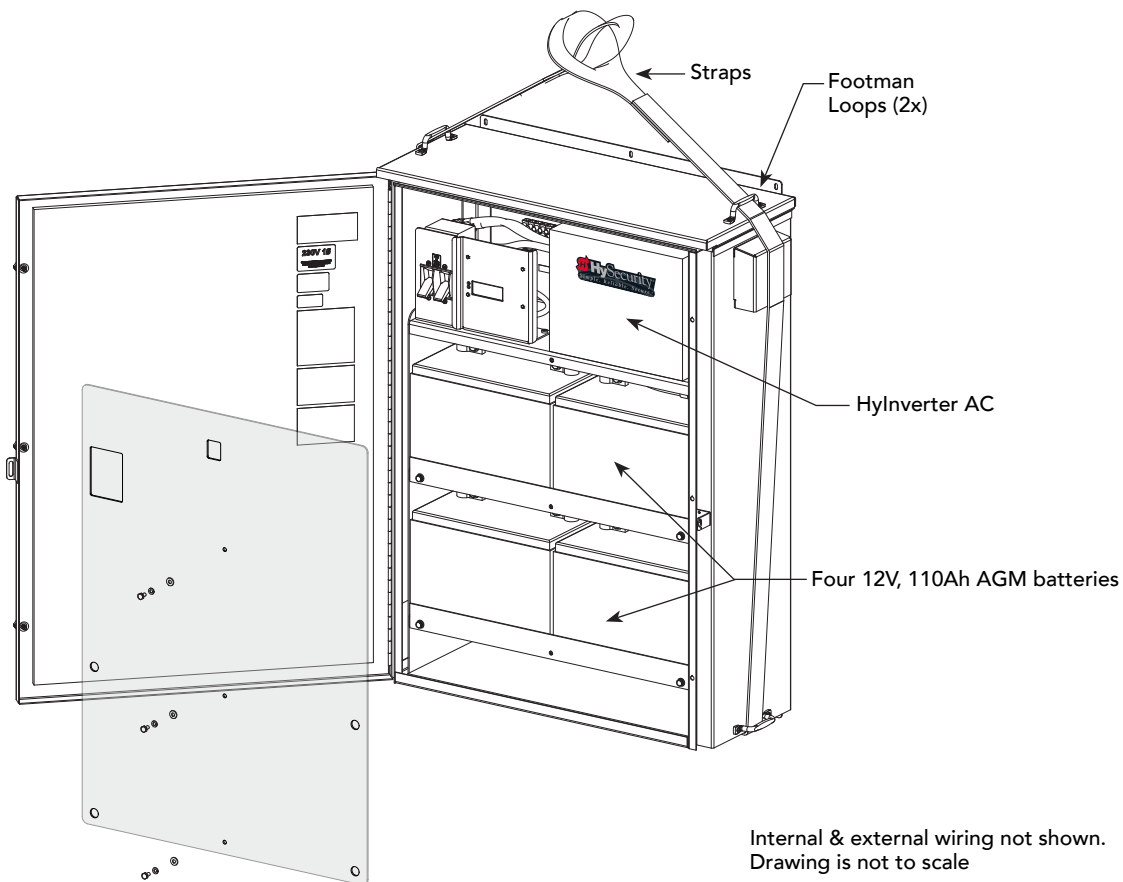
Additional ¾-inch (19 mm) conduit is needed for electrical wiring interconnections between the gate operator and DC Power Supply Cabinet. AC input power is connected to the electrical components in the chassis, and additional wiring is run through conduit to the DC Power Supply Cabinet.

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

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).



Internal & external wiring not shown.
Drawing is not to scale

Initial Setup

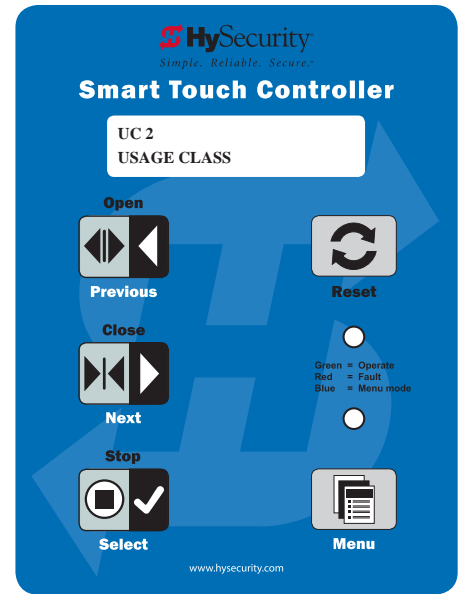
When you first apply power to the operator, it is locked in Menu mode and prompts appear on the display. The gate will not move and the controls will not function until the prompts have been answered. The prompts include:

- Usage Class setting



Before turning the power switch to ON, be sure to replace the vent cap with the breather cap. Refer to page 2. 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 *Display & Menu Options* on page 57 for more information. To answer the initial prompts, use the Previous, Next, and Select buttons as described in the chart below:



Smart Touch Controller: Menu Mode Navigation Buttons

To change that data appearing in the display	To navigate through the Selections	To choose what appears on the display	To navigate between menu items
Press 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 5. It explains the different usage site classifications for UL 325.

REPLACE THE RED VENT PLUG WITH THE BREATHER CAP

NOTICE: Replace the red vent plug with the breather cap before using the operator. If you do not, premature pump shaft failure will occur and you will void the Limited Warranty.

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

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

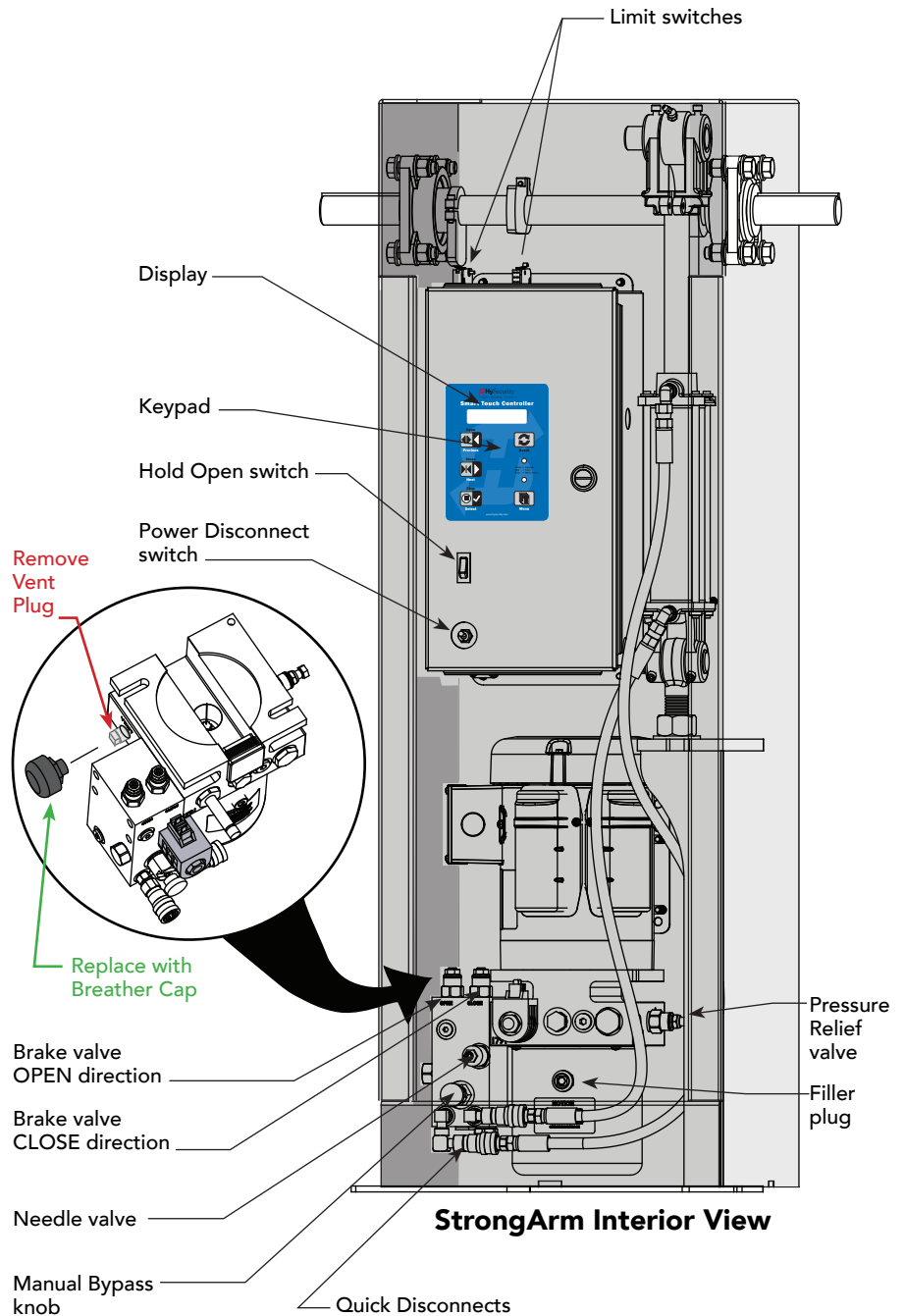
LEARN WHEN AND WHAT TO ADJUST

The StrongArm is pre-adjusted at the factory before shipment. If the arm length changes, it may be necessary to re-adjust the arm and gate operator. To level the arm and properly adjust the StrongArm, perform all adjustments in the sequence listed:

1. Arm Leveling and Balancing
2. Valve Adjustments: Pressure and Brake
3. Adjust Limit Switches
4. Emergency Override: Manual Bypass

Recognize when you need to adjust the valves:

- Slamming or rocking arm
- Open arm drifts down
- Operator pressure builds, but arm does not move
- Arm moves slowly (indicates high pressure)
- Premature battery drain on DC operators



Brake valves are factory-set to midpoint, two turns. This should be sufficient for most applications.

LEVELING AND BALANCING ARM

The StrongArm gate operator is pre-adjusted at the factory to perform correctly with the barrier arm shipped. If the arm length, or weight is changed, it may be necessary to re-adjust the gate operator to perform correctly. To properly adjust the StrongArm gate operator, perform all adjustments in the sequence listed. **Be certain to disconnect the power before performing any adjustments!**

Arm Leveling: To adjust the gate arm with the threaded eyebolt at the base of the hydraulic cylinder take the following steps:



DO NOT remove the pin from the eyebolt. Neither the hydraulic cylinder nor the eye bolt needs to be removed to adjust the gate arm height.

1. With the gate in the closed position, use a needle-nose pliers to remove the top and bottom safety C-clips from the eye bolt.
2. Use a 1½-inch wrench to loosen the top nut to release tension on the eye bolt.
3. Move the gate arm and stabilize it at a level position.
4. To maintain the level position, hand-adjust the bottom nut up or down.

NOTICE: You may initially need to unscrew the bottom nut to allow the gate arm to reach a level position.

5. To lock the gate arm's level position, tighten the top nut. Nut torque should be at least 100 ft-lbs to prevent loosening during extended operation.
6. Re-insert the top and bottom safety C-clips so a gap (less than 1/8 inch) is between the nut and C-clips.
7. Run a gate test by cycling the gate arm open and closed.
8. If the arm height needs further adjustment, repeat steps 1 through 7.

Balance: Before adjustments can be performed correctly, the operating weight of the arm must be verified to be within the proper range for this machine.

NOTE: A ¾-inch lock nut secures each adjustment valve; pressure relief, brake, and manual bypass. The lock nut must be loosened before you can adjust the valve. Leave the lock nuts loose until you complete all the adjustment steps.

1. Pull and twist release the manual bypass valve, then manually lift the arm from a position ten feet distant from the operator.
2. The arm should appear to weigh forty pounds, or less, regardless of the length or actual weight of the arm.
3. If the operating weight of the arm is heavier than our maximum specification, the operator is overloaded which adversely affects both automatic and manual operation.
4. The only remedy for an arm that is too heavy is to reduce the length of the arm, or add additional counterweight which is described in the next section.

STRONGARM COUNTERWEIGHTS INSTALLATION

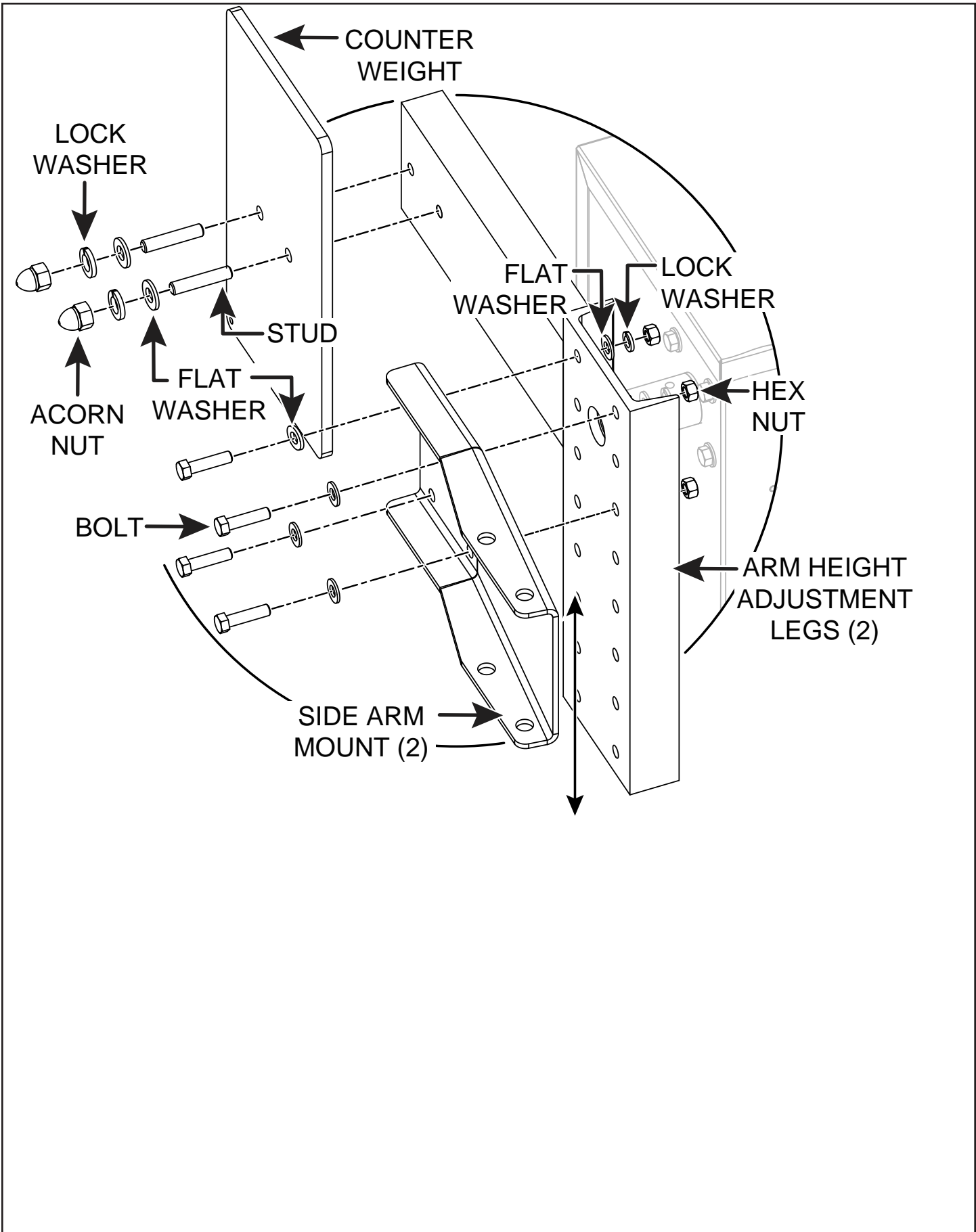
NOTE: Maintain tagged service nut on breakaway king pin during installation. Remove service nut after installation is complete and breakaway bracket is fully secure.

1. If necessary, reposition operator side arm mounts on arm height adjustment legs to adjust operator arm height. **See StrongArm CounterWeight Installation, A, on the next page.**
2. See **Arm Length and Counterweights table** below for operator arm length and counterweight options for ideal operator performance.
3. Using a socket and ratchet, secure conversion bracket to two Gate Saver Yokes using four bolts, eight flat washers, four lock washers, and four nuts. **See StrongArm CounterWeight Installation on the next page.**
4. Using an open-ended wrench, remove the bolt, lock washer, and flat washer from the breakaway king pin head attached to the cast adapter. See Figure 1, C.
5. Rotate breakaway king pin so alignment pin aligns with cast adapter shear brass bolt mounting locations (3). See Figure 1, C.
6. Align cast adapter and breakaway king pin with the forward panel of the conversion bracket. Use an open-ended wrench to resecure bolt, lock washer, and flat washer to breakaway king pin head. See Figure 1, C.
7. Using a socket and ratchet, secure three brass shear bolts, lock washers, and hex nuts to the cast adapter and conversion bracket. See Figure 1, D.

NOTE: For initial installation, install two brass shear bolts and hardware. Number of brass shear bolts used is dependent upon arm length and anticipated wind load. Shorter arms may require one brass shear bolt. Longer arms in windy areas may require three brass shear bolts.

8. Using a socket and ratchet, secure the gate saver sleeve arm to cast adapter, and gate saver barrier arm to gate saver sleeve arm using six bolts, flat washers, and nylon locknuts. See Figure 1, E.

Arm Length and Counterweights				
Arm Length (feet)	Standard StrongArm		StrongArm DOT	
	No. of Counterweights per side	Stud Length (inches)	No. of Counterweights per side	Stud Length (inches)
12	0	2.5"	1	2.5"
14	0	2.5"	1	2.5"
16	0	2.5"	1	2.5"
18	0	2.5"	1	2.5"
20	1	2.5"	2	2.5"
22	2	2.5"	3	2.5"
24	3	3.5"	4	3.5"
26	5	3.5"	6	5.0"
28	6	5.0"	7	6.0"
30	8	6.0"	-	-
32	9	7.5"	-	-
34	11	7.5"	-	-
36	12	7.5"	-	-



StrongArm CounterWeight Installation

STRONGARMDOT 28 BREAK-AWAY ARM INSTALLATION

The following instructions are intended to assist users installing StrongArmDOT 28 operator. StrongArmDOT operator differs from standard StrongArm models by inclusion of a breakaway arm bracket, adjustable arm height, and quantity of counterweights used. Please read all assembly instructions before installing the kit.

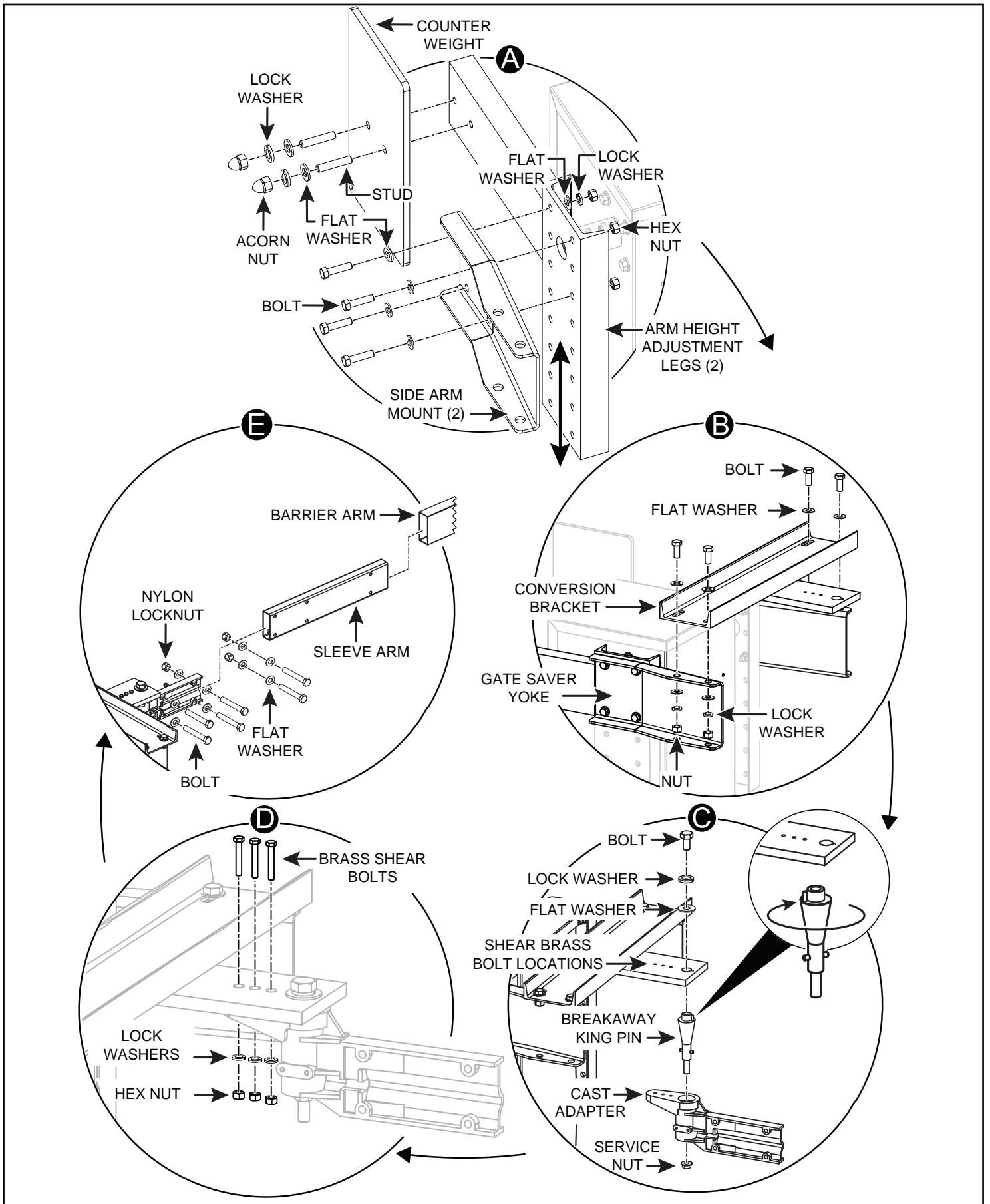
NOTE: Maintain tagged service nut on breakaway king pin during installation. Remove service nut after installation is complete and breakaway bracket is fully secure.

1. If necessary, reposition operator side arm mounts on arm height adjustment legs to adjust operator arm height. **See "A" in drawing on next page.**
2. See **Arm Length and Counterweights Table** (on previous page) for operator arm length and counterweight options for ideal operator performance.
3. Using a socket and ratchet, secure conversion bracket to two Gate Saver Yokes using four bolts, eight flat washers, four lock washers, and four nuts. **See "B" in drawing on next page.**
4. Using an open-ended wrench, remove the bolt, lock washer, and flat washer from the breakaway king pin head attached to the cast adapter. **See "C" in drawing on next page.**
5. Rotate breakaway king pin so alignment pin aligns with cast adapter shear brass bolt mounting locations (3). **See "C" in drawing on next page.**
6. Align cast adapter and breakaway king pin with the forward panel of the conversion bracket. Use an open-ended wrench to resecure bolt, lock washer, and flat washer to breakaway king pin head. **See "C" in drawing on next page.**
7. Using a socket and ratchet, secure three brass shear bolts, lock washers, and hex nuts to the cast adapter and conversion bracket. **See "D" in drawing on next page.**

NOTE: For initial installation, install two brass shear bolts and hardware. Number of brass shear bolts used is dependent upon arm length and anticipated wind load. Shorter arms may require one brass shear bolt. Longer arms in windy areas may require three brass shear bolts.

8. Using a socket and ratchet, secure the gate saver sleeve arm to cast adapter, and gate saver barrier arm to gate saver sleeve arm using six bolts, flat washers, and nylon locknuts. **See "E" in drawing on next page.**

Arm Length and Counterweights				
Arm Length (feet)	Standard StrongArm		StrongArm DOT	
	No. of Counterweights per side	Stud Length (inches)	No. of Counterweights per side	Stud Length (inches)
12	0	2.5"	1	2.5"
14	0	2.5"	1	2.5"
16	0	2.5"	1	2.5"
18	0	2.5"	1	2.5"
20	1	2.5"	2	2.5"
22	2	2.5"	3	2.5"
24	3	3.5"	4	3.5"
26	5	3.5"	6	5.0"
28	6	5.0"	7	6.0"
30	8	6.0"	-	-
32	9	7.5"	-	-
34	11	7.5"	-	-
36	12	7.5"	-	-



StrongArm Break-Away Arm CounterWeight Installation

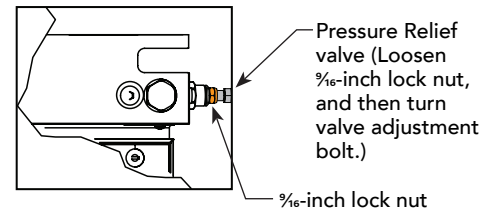
VALVE ADJUSTMENTS

1. Start with the arm in the closed position.
2. Make adjustments while the pump is operating.

NOTE: All arms longer than 18' require counterweight. If this is a new installation using a factory supplied arm, and no additional components have been added, this test is not required because the factory has already provided the correct counterweight for the arm as ordered.

Adjust Pressure Relief Valve

1. Check that the arm is closed and loosen the lock nut on the pressure relief valve.
2. Turn the pressure relief valve CCW 3 or 4 turns.
3. Press **Open** and, while the pump is operating, turn the relief valve CW until arm moves smoothly through its entire length of travel.



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

Pressure relief valves differ depending on the model.

Tools Needed: 5/32" hex key, 1/2" and 3/16" box end wrenches.

CAUTION ATTENTION INSTALLERS!

When placing the operator into service, pressure relief valve adjustments are required!

Pressure relief valves differ depending on the model.

Tools Needed: 5/32" hex key, 1/2" and 3/16" 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.

CAUTION: Never exceed the maximum psi setting.

Model	Motor hp	Maximum PSI
SlideDriver 15, 40	1 hp	1000 psi
SlideDriver 30F, 60, 50VF	2 hp	1350 psi
SlideDriver 200	5 hp	2000 psi

To make adjustments, review the steps on the reverse of this tag. The same steps are also available in the operator's manual. When the installation and pressure relief valve adjustment is complete, remove this tag.

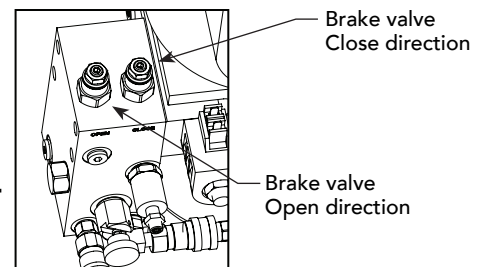
M0001853, Rev. C



Never exceed the maximum psi setting.

Adjusting Brake Valve

1. Start with the arm in the **down** position and the limit switches set to trip approximately ten degrees before full close and ten degrees before full open:
 - a. Loosen the **relief valve** by turning the adjuster screw **counter-clockwise** three turns.
 - b. Loosen the **brake valves** by turning each adjustment screw clockwise until it bottoms out then turn the same adjuster back **counter-clockwise** one full turn.
2. Gives the operator an "Open" command and slowly turn the relief valve adjuster screw **clockwise** until the arm begins to rise smoothly. (If the operator times out, you will need to reset and start over.) This is your relief setting; tighten the lock nut, there is no more adjustment to this valve.
3. The next valve to be adjusted is the close brake valve; which is the first valve to the left of the relief valve. At this time the arm is now in the open position.
 - a. To adjust the **close brake valve** you will first need to turn the adjuster **counter clockwise** to the top of its adjustment.
 - b. Give the operator a "Close" command and slowly begin turning the **close brake valve** adjuster screw **clockwise** until the arm begins to move smoothly at the same speed as it did when you raised it to the open position. As the arm lowers and trips the limit switch, it should smoothly drift to



full close position. (You may need to turn the **close brake valve clockwise** later to make a smooth drift from limit contact to full position.)

4. The next valve to be adjusted is the **open brake valve**; which is the second brake valve to the left of the relief valve. At this time the arm is now in the closed position.
 - a. To adjust the **open brake valve** you will first need to turn the adjuster **counter clockwise** to the top of its adjustment.
 - b. Give the operator an "Open" command and slowly begin turning the **close brake valve** adjuster screw **clockwise** until the arm begins to move open smoothly and at the same speed as it did when you lowered it to the close position. As the arm raises and trips the limit switch, it should smoothly drift to full open position. (You may need to turn it clockwise later to make a smooth drift to stop.)
5. Adjust the **manual bypass valve** by raising the arm approximately 45 degrees and press the "Stop" button.
 - a. Turn the **bypass needle valve**, adjuster screw **clockwise** until it bottoms out.
 - b. Pull out on the **manual by-pass** knob and lock it open by twisting it 45 degrees to the right.
 - c. Slowly turn the **needle valve** adjuster screw **counter clockwise** until the arm begins to drift close at a smooth slow speed. Tighten the lock nut for the **needle valve adjuster screw** and turn the manual bypass knob 45 degrees to the left to lock it in place.
6. Cycle the operator open and close several times to verify settings and tighten the **brake valve** lock nuts.

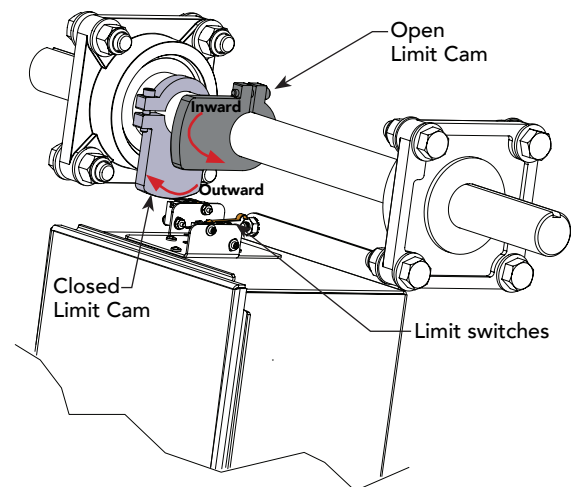
NOTE: The brake valves do not control the closing of the arm when the manual bypass knob is pulled.

NOTE: Careful adjustment of the open limit switch and brake valve may be especially important in installations where there is truck traffic and the gate operator is close to the edge of the road. Be aware that the later the open limit switch trips when the gate is opening, the sooner the open circuit will be able to accept a safety reverse when the arm is closing. The best adjustment requires a rapid, but smooth, stop of the arm at the end of the open cycle.

LIMIT SWITCH ADJUSTMENTS

For the arm to stop smoothly, when opening or closing, the limit switches must trip approximately ten degrees before the arm achieves full travel.

1. Press **Close** and observe whether arm stops horizontal and level.
 - To lower arm, adjust Close Limit Cam outward (toward the StrongArm access door panel).
 - To raise arm, adjust Close Limit Cam inward (toward the rear panel).
2. Press **Open**. Position the arm so it stops within 10° of vertical.
 - To raise arm, adjust Open Limit Cam outward.
 - To lower the arm, adjust Open Limit Cam inward.

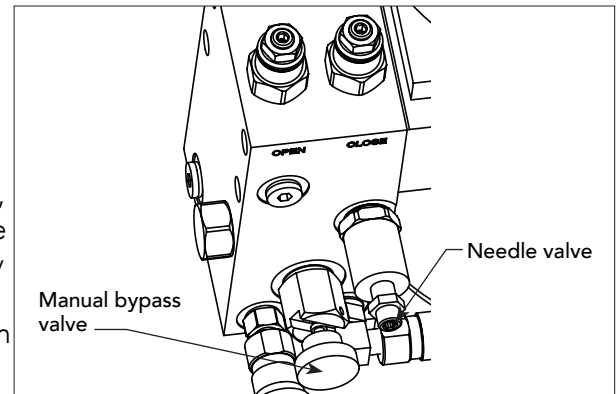


EMERGENCY OVERRIDE

Manual Bypass Valve

A bypass valve has been provided that can override the hydraulic lock that normally secures the arm from being lifted. In the event of a power failure, manual operation is achieved through the following procedure.

1. Find the manual bypass valve with the black round knob, which is located on the hydraulic pump just above where the hoses connect. The barrier arm can now be manually lifted, beginning from the tip, by moving “hand over hand” while walking towards the operator. When the arm is open, be certain to close the bypass valve to prevent the arm from drifting down.
2. Place the arm at a 45° angle.
3. Close the Needle valve. Loosen the lock nut and turn the valve CW until it stops.
4. Pull the black Manual Bypass knob out and lock it open by twisting it ¼ turn before releasing it.
5. Slowly turn the Needle valve CCW until the arm lowers slowly and smoothly.
6. Twist the black Manual Bypass knob so it re-seats itself in the closed position.



Cycle Test the Arm

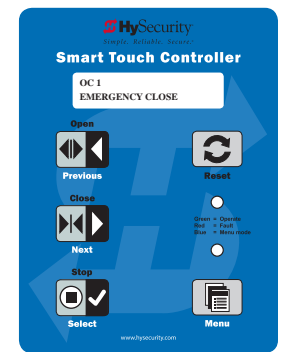
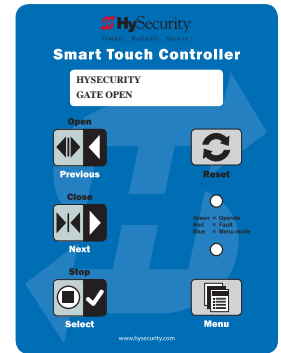
1. Tighten all lock nuts on the adjuster valves.
2. Cycle the arm **Open** and **Close** a few times. If adjustments are needed, follow the steps above.

EMERGENCY FAST CLOSE

The Emergency Close setting in combination with a constant hold to close, overrides vehicle detectors, photo eyes and edge sensors and closes the barrier arm. To enable the Emergency Close option:

NOTE: When you are in programming mode the buttons on the keypad change from Open, Close, and Stop to Previous, Next, and Select. Refer to *Menu Mode Navigation* on page 58.

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



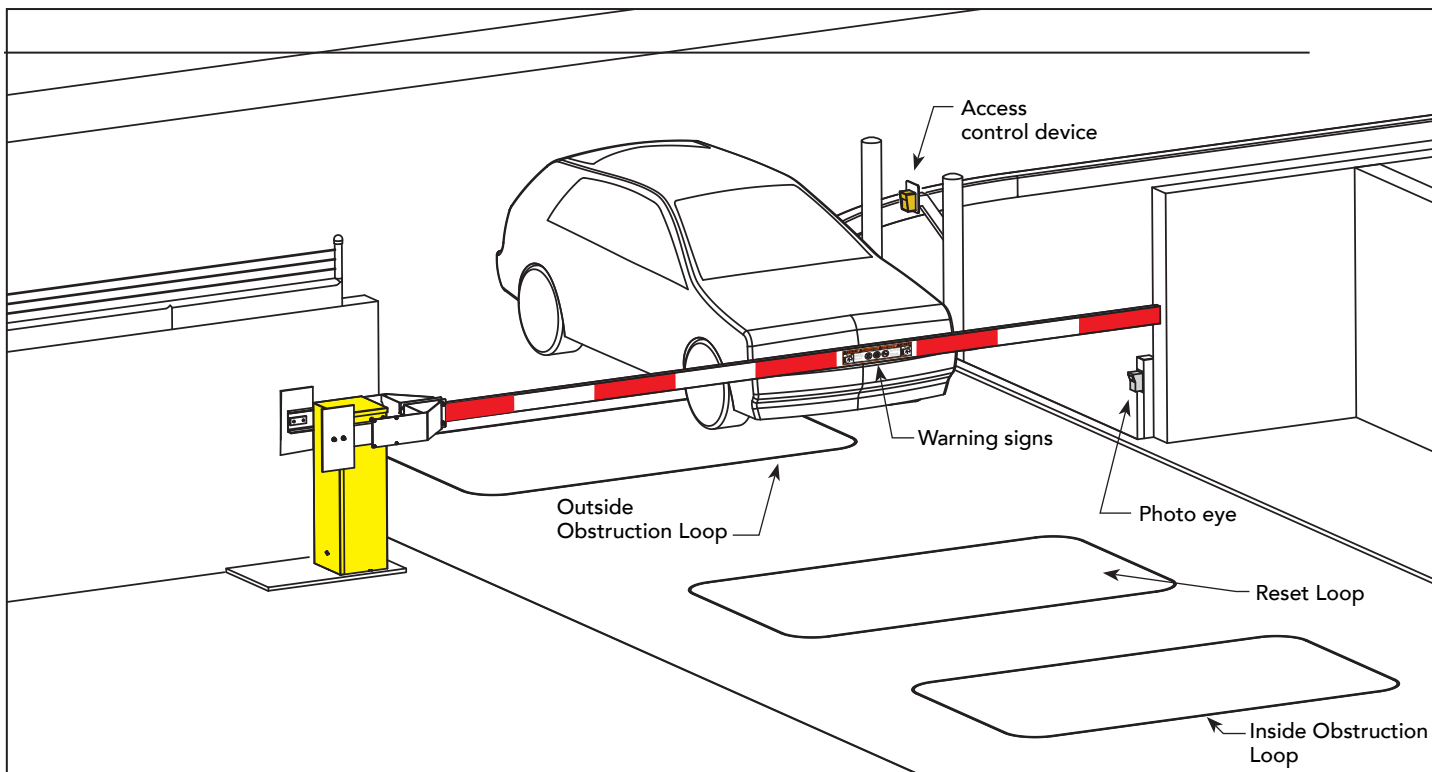
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Entrapment Protection

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.



2 Install NC sensors.

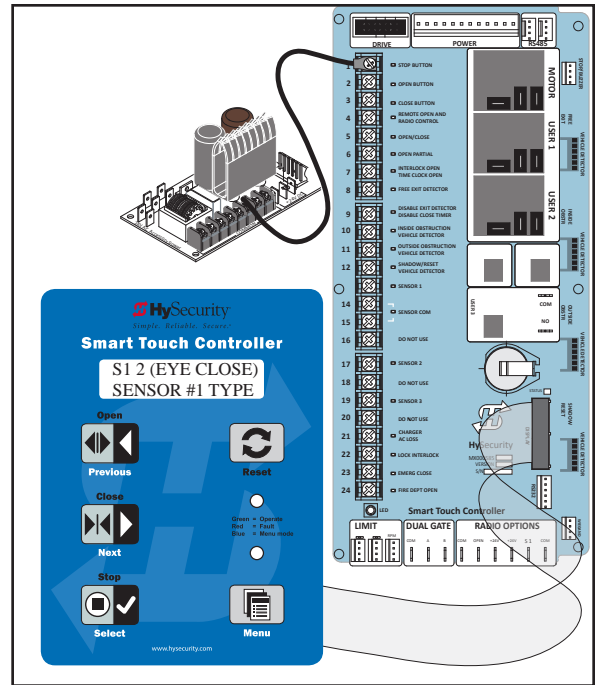
Install non-contact sensors (photo eyes) beneath the barrier arm to help prevent the barrier arm from lowering on a person if standing under the raised arm. HySecurity gates monitor normally closed (NC) sensors. Wire your NC sensors to SENSOR input terminals (SENSOR 1, SENSOR 2, or SENSOR 3) on

the Smart Touch Controllers.

NOTE: When installing wired edge sensors, the wired edge must be connected to an interface module with an NC output. See *Wiring HySecurity Sensors: Smart Touch* on page <?>. For wireless edge sensors, no interface module is required. Wireless edge sensors need the wireless gate links which include a transmitter and receiver.

3 Turn Power ON.

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



4 Answer Initial Setup Prompts.

For barrier arms, you will be prompted for USAGE CLASS and SENSOR 1, SENSOR 2, and SENSOR 3.

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.

NOTE: 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. If your site does not require three sensor inputs, a setting of S1 (NOT USED) must be designated through the Installer Menu for each sensor input (SENSOR 1, SENSOR 2, and SENSOR 3)

Smart Touch and Smart DC Controller: Menu Mode Navigation Buttons

To change 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 or Previous . Continue pressing Next to view all selections.	Press Select . Blinking characters become static.	Press Next or Previous . Advance - press Next Previous - press Previous

Table 4: HySecurity Gate Operators maintaining Object Detection

Table 4 indicates those HySecurity gate operators that may be within the exception parameters of UL 325 or comply with standards other than UL 325, but continue to maintain object detection capabilities. HySecurity strongly recommends that you assess every site for entrapment zones and provide the necessary protection to guard against entrapment.

HySecurity Gate Operator's with Obstruction Protection (Object Detection)	Build Year UL 325 - 2016	Sensor Inputs automatically set to "NOT USED" Installer has option to change settings as site design dictates.
StrongArm (HTG) 14, 20, 28, 36	2	●
StrongArmCRASH (M30/M50)	2	●
StrongArmPark DC 10 & DCS 10 StrongArmPark DC 14 & DCS 14	2	●
WedgeSmart DC 10 & 10 DCS	2	●
WedgeSmart DC 14 & 14 DCS	2	●
HydraWedge SM50	2	●

SUPPLY POWER TO THE SENSORS



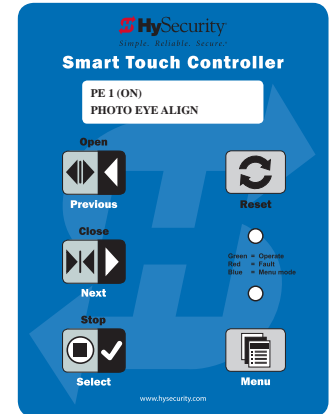
All external entrapment protection sensors must be wired to the SENSOR COM terminal for monitoring purposes.

Review sensor wiring diagrams found in *Wiring HySecurity Sensors: Smart Touch* on page 119.

Until the gate operator receives a command to run (open or close command), the sensors are not receiving power. 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 *Menu Mode Navigation Buttons* 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.



NOTE: The Photo Eye Align mode turns OFF with the next limit contact. For more information, see *Photo Eye Alignment Feature* on page 102.

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. See CAUTION on page 38.
Smart DC (electro-mechanical 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.

EXTERNAL ENTRAPMENT PROTECTION

Consult a photoelectric sensor manual for wiring details. Make all electrical connections to Smart Touch Controller.

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 Touch 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.

NOTE: Sensor & +24V is the recommended way to connect monitored photo eyes to Smart Touch Controller.

NOTE: 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.

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.

Alignment:

Most photo eyes require careful optical alignment in order to aim the emitter beam to the receiver or reflector center. In order to avoid false triggering, it is important to carefully align system, especially with retroreflective photo eyes. The best way to assure true beam centering is with some trial testing where the emitter is shifted to move 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 LEDs for this setup, but they can be hard to see. HySecurity provides a unique feature that turns power on to photo eyes and causes buzzer to chirp when the photo eyes enter and exit alignment. 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.

Notes about retro-reflective 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.

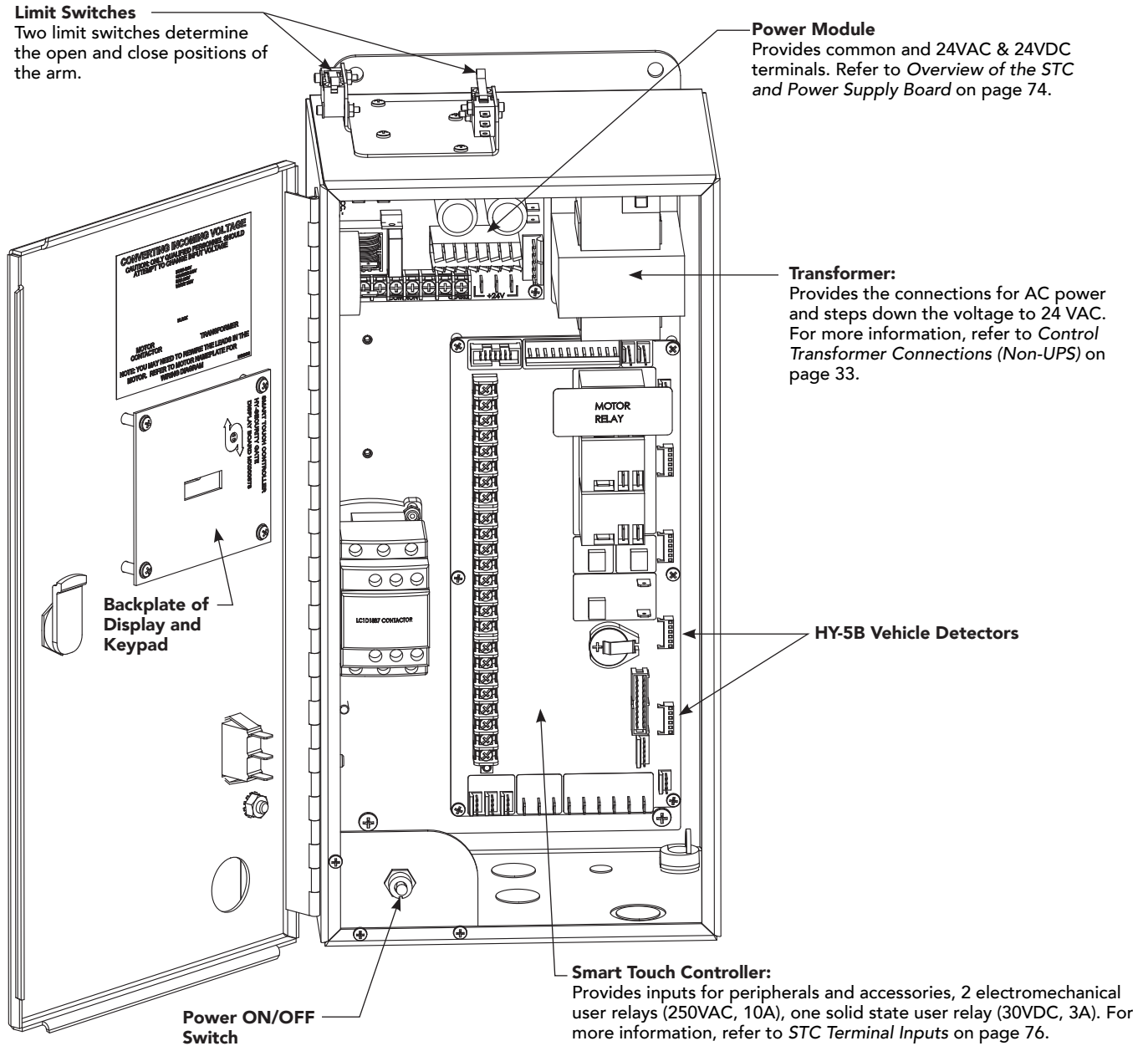
The ideal reflector mounting suspends it inside a 12-inch long piece of 3-inch PVC conduit. Cut the opening of the PVC conduit at a 45-degree angle to act as a drip shield. Hold the reflector against the backside of the PVC conduit by attaching a 3-inch male connector. Do not cement the connector. This 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.

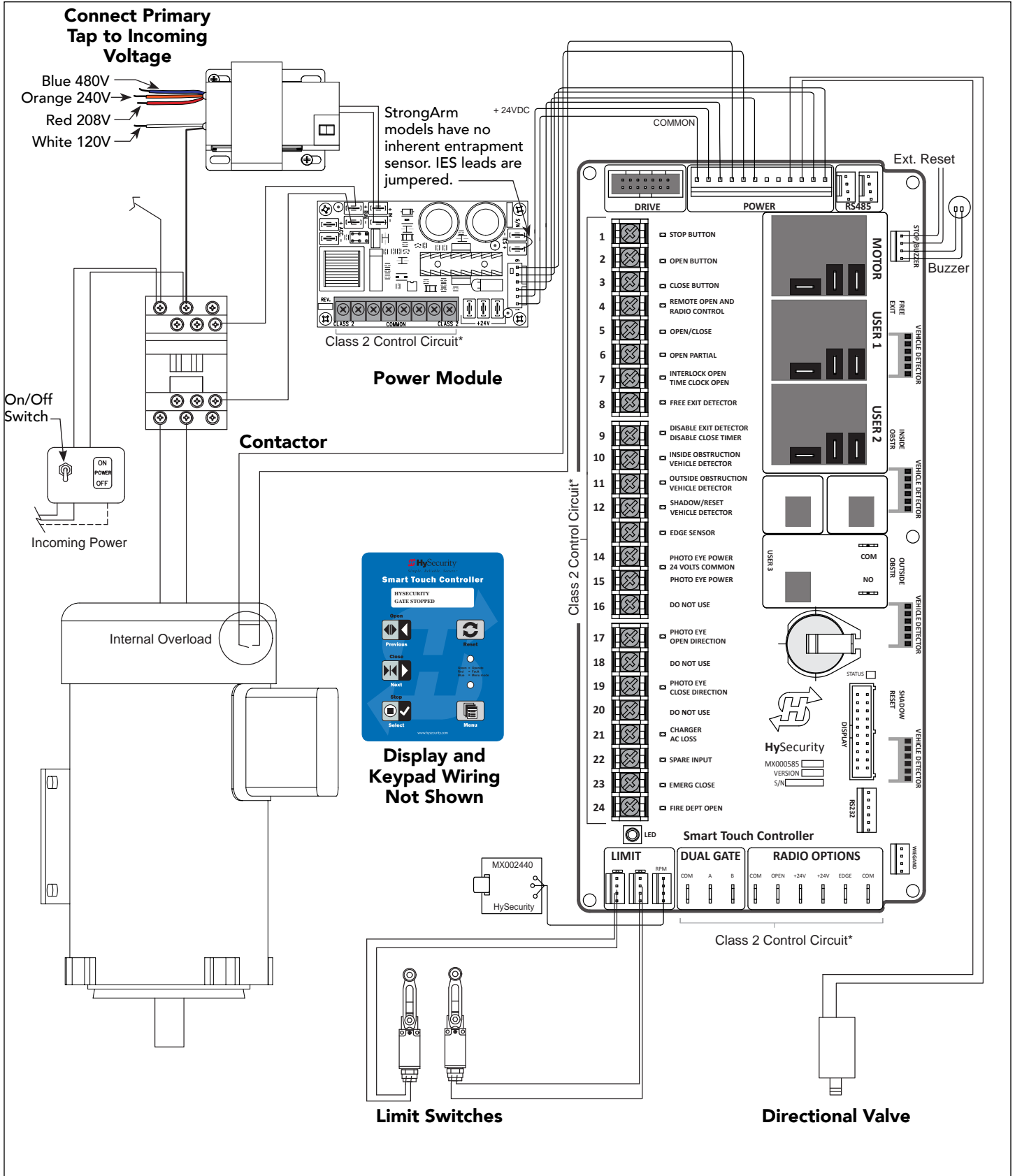
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Control Panel Overview

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



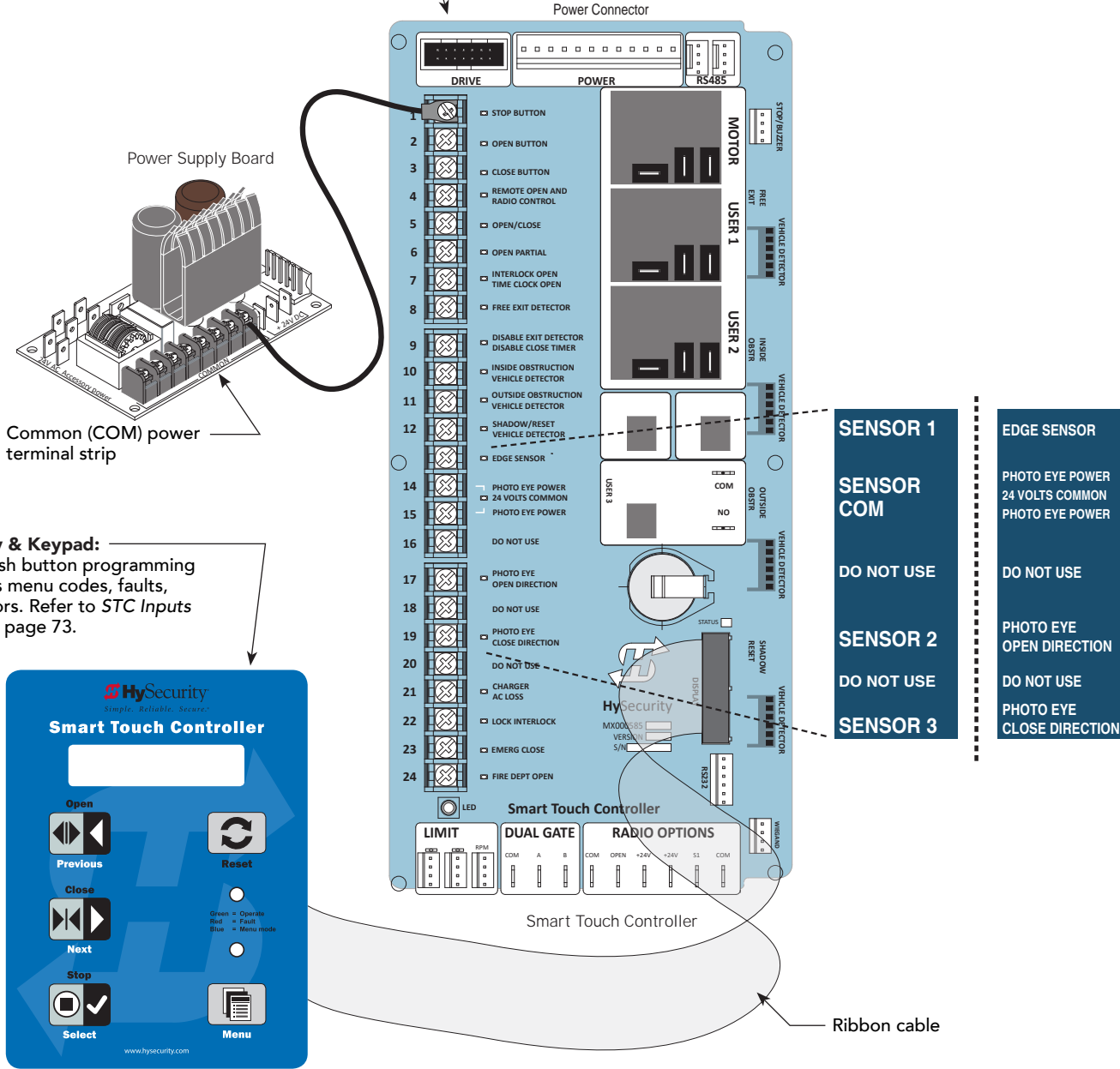
STRONGARM WIRING DIAGRAM



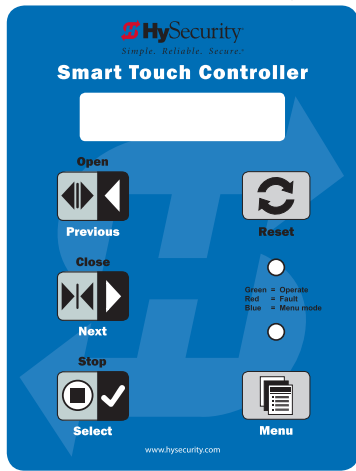
STC BOARD, POWER SUPPLY BOARD AND DISPLAY

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 73. For more information about the display programming, operator modes and keypad navigation, refer to *Display & Menu Options* on page 57.

Smart Touch Controller:
Provides inputs for peripherals & accessories, 2 electro-mechanical user relays (250VAC, 10A), one solid state user relay (30VDC, 3A). For more information, refer to *STC Inputs & Wiring* on page 73.



STC Display & Keypad:
Provides push button programming and displays menu codes, faults, alerts & errors. Refer to *STC Inputs & Wiring* on page 73.



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Display & Menu Options

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



Keep your operator current with the latest software version. 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.

INITIAL SETUP

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

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

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

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



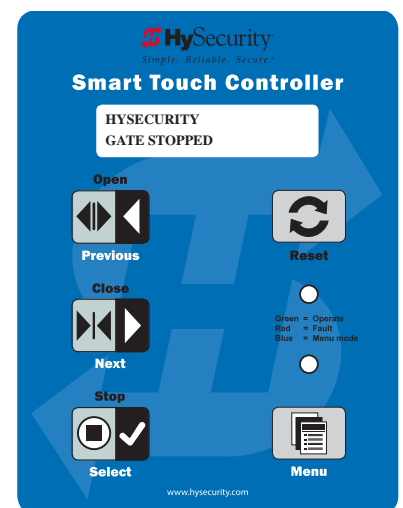
UNDERSTANDING THE DISPLAY AND KEYPAD

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

Three different operational modes exist:

- Run Mode – gate is operational, awaiting commands.
- 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 103.

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

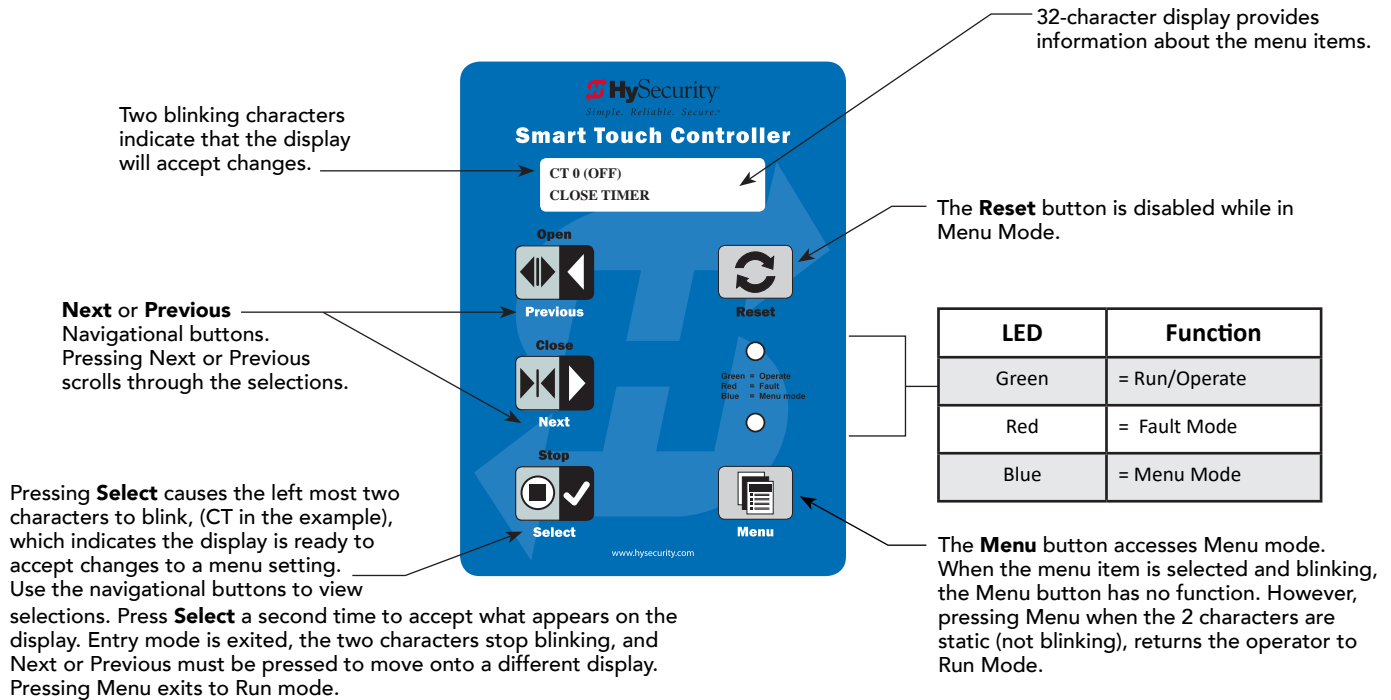


Gate Status Display in Run Mode

MENU MODE AND THE STC KEYPAD

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

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



MENU MODE NAVIGATION

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

Smart Touch Controller: Menu Mode Navigation Buttons

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

RUN MODE AND THE STC KEYPAD

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

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

32-character display identifies operator status.

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

Pressing Reset clears alerts or faults and returns to Run Mode. **NOTE:** Press Reset at any Run mode status display to view the software version. For example: **h4.53**

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

Run Mode Displays

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

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

Example of Operator Status Displays

The following chart describes the scrolling status displays in the StrongArm models.

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.
Dual Gate or Sequenced Gate	This display only appears when the operator is used in interlocked or sequenced gate systems and indicates the function of the operator. See <i>Bi-Parting & Dual Gate Systems</i> on page 83 and <i>Integrating with Security Systems and HyNet™ Gateway</i> on page 75.	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)	OT 1 = StrongArm OT 7 = StrongArm 50VF series	Indicates and identifies the operator.
Set Handing (SH)	L = Left and R = Right	Indicates gate handing.
Usage Class (UC)	1, 2, 3, or 4	Displays the operator's Usage Class designation per UL 325 standards.
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 the number of cycles the gate operator has incurred. Similar to an odometer, it resets to zero after 999,999 cycles.
Close Timer (CT)	The first menu item in the User Menu.	Displays the number of seconds before the open gate initiates. NOTE: You can also access the Installer Menu from this display.

Stop the Status Display Scrolling

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

Change the Contrast on 7 Segment Displays

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

While the operator status displays are scrolling, you can change the 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, refer to *Smart Touch Analyze and Retrieve Tool (S.T.A.R.T.)* on page 113.

Check Time and Date

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

1. While in Run mode (gate status appears in the display), press and hold the STOP button.
The date appears DD/MM, and then the time HH:MM.
2. If you need to change the time zone, refer to the Set Clock "CL" item in the User Menu. Refer to *User Menu: Table 5* on page 62.

USER MENU

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

Access:

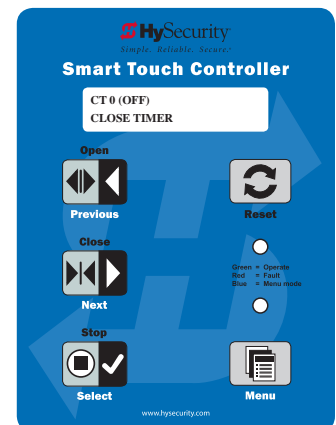
Pressing the Menu button, at one of the static gate status displays, causes the operator status displays to scroll past, stop and display the first user menu item.

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

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

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 58.

Table 5 describes the User Menu items and supplies the factory defaults. (Factory default settings shown in bold.)



USER MENU: TABLE 5

User Menu	Setting Options	Menu Tasks & Explanations	STC Wire Connections
CT 0 (OFF) CLOSE TIMER	0 = Timer disabled (OFF) 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: CLOSE TIMER display does not appear when HOLD TO CLOSE is set to 1.	Not applicable (N/A)
HC 0 (OFF) HOLD TO CLOSE	0 = off 1 = on	Set to 0 to produce a gate closure when a momentary signal is transmitted. Set to 1 if a constant hold to close signal, such as a push button control, is being used. A setting of 1 also deactivates the automatic close timer and causes its menu to disappear. The Hold to Close replaces the Close Timer display as the User Menu entry display. NOTE: To comply with UL 325 Type D protection, set HC to 1. Type D UL 325 compliance means no automatic closing device, such as a timer, loop sensor, or similar device shall not be employed.	COM Close
HO (OFF) HOLD TO OPEN	0 = off 1 = on	Similar to Hold to Close, but configures the Open inputs for a constant-hold function. 0 = Momentary open signal 1 = Constant hold open push button required To comply with UL 325 Type D protection, you must set HO to 1.	COM Open
AP 0 AC LOSS	0 = UPS FAIL OPEN 1 = UPS FAIL CLOSE 2 = AUTO OPEN 3 = NO CLOSE TIMER	This menu item only appears if the operator is DC powered. The setting configures how the gate functions when AC power fails. For more information, refer to the supplemental documentation. See page 2.	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	A setting of zero, configures radio input for open only. Setting 1 adds the capability for radio input to close the gate, but only when it is fully open.	COM RADIO Open
BF 2 (ON 2 SEC) WARN BEFORE OPER	0 = off 1 = warning buzzer on throughout gate travel 2 = warning buzzer on for 2 seconds of gate travel 3 = warning buzzer on during gate travel	Controls the warn-before-operate buzzer and can be configured three ways: Set to 0: Buzzer is disabled. The buzzer will still beep if alerts, faults, errors, or entrapment occur. Set to 1: Buzzer beeps for 3 seconds before gate moves and continues through entire length of travel. Set to 2: Buzzer beeps for 3s before gate moves and continues for 2s of travel. Set to 3: 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.	Not applicable (N/A)

User Menu	Setting Options	Menu Tasks & Explanations	STC Wire Connections
FA 0 (OFF) FORCE OPEN ALERT	0 = off 1 = on	Intended for highly secure facilities. Set to 1, the operator sounds the 3-second "warn before operate" buzzer alarm and initiates a closure if the gate is forced open and the closed limit switch disengages. The motor starts to secure the gate. If the gate does not fully close within 4s, the motor turns off and the buzzer sounds for 30 seconds. The display shows ALERT 1 - FORCED OPEN.	N/A
DA 0 (OFF) DRIFT CLOS ALERT	0 = off (standard) 1 = on (detailed)	Set to 1, the operator sounds the 3-second "warn before operate" buzzer alarm and initiates an open command if the gate is forced, or drifts, off the open limit switch. The motor starts to reopen the gate. The motor runs for a maximum of 4s and, if the gate is not fully open at the end of this period, the buzzer sounds for 10s. The display shows ALERT 2 - DRIFT CLOSED.	N/A
PE 0 (OFF) PHOTO EYE ALIGN	0 = off 1 = on	Set to 1, the operator serves as an aide in photo eye transmitter/receiver alignment. See <i>Supply Power to the Sensors on page 49</i> . NOTE: If the operator doesn't run when the power switch is initially turned ON, check the alignment of the photo eye and all the photo eye connections.	Sensor 1, 2 or 3 Sensor COM
CL 0 SET CLOCK	0 = off 1 = on	To adjust the hour, minute, day, or month to a different time zone, select 1. Use menu navigational keys to select and change the date and time. When your selections are complete, press Menu to return to User Menu mode.	N/A
LD 5 LCD CONTRAST	5 0 through 9	Adjusts the contrast of the display. Available settings from low contrast 0 to 9 high contrast, with a factory default setting of 5. NOTE: Not used or available with the 32 character OLED display.	N/A
LG 0 (OFF) VIEW EVENT LOG	0 = off 1 = on	With v4.53 (or higher) software, you can set LG to 1 and view abbreviated event logs on the display. These messages are helpful for diagnostic purposes and reviewing the gate operator's event history. Over 300 events can be logged before the software begins overwriting the existing history. Refer to <i>Access the Event Log through the User Menu on page 110</i> .	N/A
DS 0 (OFF) DIAGNOSTIC LOGS	0 = off (standard) 1 = on (detailed)	Set to 0, the STC records pertinent operator events such as faults, errors, or menu manipulation. When experiencing intermittent problems, set this item to 1 to record all operator open and close events, in addition to the normal alert, fault and error logs. This parameter automatically resets to the default 0 (off) after 24 hours.	To read the log file, an RS-232 cable and PC laptop loaded with HySecurity free S.T.A.R.T. software is required. Visit www.hysecurity.com
PD 0 SET PASSWORD	0 = Off 1 = On (Set Password)	NOTE: A System Address (SA) value in the installer Menu must be set before the Set Password display appears in the User Menu. To enter a password (up to 80 characters) for network connectivity, select 1. You can use the menu navigation buttons to enter the password. When the password is set, the 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 *Menu Mode Navigation* on page 58.

Access:

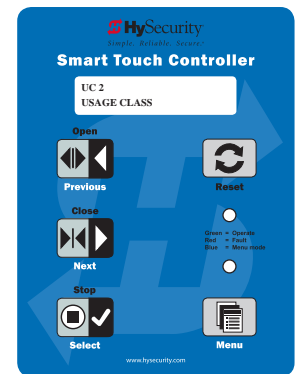
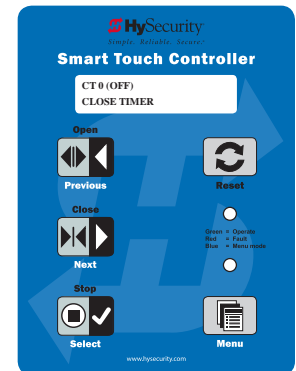
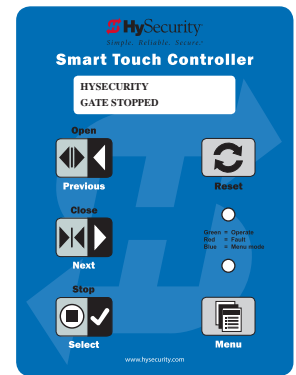
While a static gate status is being displayed, press the Menu button twice. (Bypasses the operator status displays.)

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

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

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

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



INSTALLER MENU: TABLE 6

Installer Menu	Setting Options	Menu Tasks & Explanations	STC Wire Connections
OT 0 <model name>	0 = Operator Type 1 = StrongArm (HSG) all models except 50VF series 2 = SwingRiser (HRG) 3 = HydraLift (HVG) 4 = StrongArm (HTG) 5 = SlideWinder 24 6 = SlideWinder 38 7 = StrongArm 50VF 8 = StrongArm CRASH 9 = HydraSwing 10 = HydraSupply XL	Select the appropriate number for the 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)

Installer Menu	Setting Options	Menu Tasks & Explanations	STC Wire Connections
AD 0 AC/DC GATE	0 = gate disabled 1 = AC (alternating current) 2 = DC battery-power 3 = HyInverterAC – Power Supply	Select the type of power that the gate operator uses and is appropriately wired for.	Not applicable (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.	Set the maximum speed for the gate. NOTE: This menu item only appears if the StrongArm operator is part of the 50VF series. It does not appear with any other operator type. CAUTION: Slow Down extended limit ramps must be installed on the drive rails! See <i>StrongArm Slow Down Limit Ramps</i> on page <?>.	N/A
UC 0 USAGE CLASS	0 = gate disabled 1 = single family dwelling 2 = multi-family 3 = industrial * 4 = guarded location * *not serving the general public	Designates the UL 325 Usage Class (UC). The installer sets the usage class for the operator to function. NOTE: The usage class setting does not appear on Crash products.	N/A
SH 0 GATE HANDING	0 = gate disabled R = viewed from the secure side, the gate moves right to open L = viewed from the secure side, the gate moves left to open	Handing only appears on slide gate operators. On slide gates, the installer sets the operator's handing before the operator will function, so an R or L appears in the display. See <i>Gate Handing</i> on page <?>.	N/A
BU 0 LOUDEST BUZZER	0 = buzzer not set 1 = Frequency 1 * (on) 2 = Frequency 2 * (on) *Select the loudest buzzer	If menu item appears, select either buzzer 1 or 2. Make sure to choose the loudest audible buzzer sound for your operator type.	N/A
FD 0 (OFF) FACTORY DEFAULTS	0 = user settings (custom) 1 = reload factory settings	Select setting 1 to return the operator to factory defaults which globally restores all menu settings back to new operator status. NOTE: If factory defaults are restored, any customized menu settings will need to be reprogrammed. You can save your customized menu settings using a PC laptop & S.T.A.R.T.	N/A
DG 0 (OFF) DUAL GATE	0 = solo operator (off) 1 = Secondary unit 2 = Primary unit 3 = Sally Port A 4 = Sally Port B	Establishes communication after wiring dual gate connections between two operators in Primary/Secondary or Sally Port site configurations. This menu item appears if the sequenced gate menu item (SG) is set at 0 (off).	Dual Gate COM (Gate 1) to Dual Gate COM (Gate 2) A to A B to B
SG 0 (OFF) SEQUENCED GATE	0 = off 1 = Loop Layout/Site #1 2 = Loop Layout/Site #2 3 = Loop Layout/Site #3 4 = Loop Layout/Site #4	Establishes communication after wiring two or more gate operators as sequential gates. This SG menu item only appears if the 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 the Close Timer (CT) setting.	Connect Dual Gate COM (Traffic Gate) to Dual Gate COM (Security Gate) A to A B to B

Installer Menu	Setting Options	Menu Tasks & Explanations	STC Wire Connections
CH 0 (AC) CHARGER TYPE	0 = AC powered charger 1 = Solar powered charger	Does not appear on an AC-powered operator. The menu item only appears when using the DC Charger unit and designates the charger type.	
FO 0 (DISABLED) FIRE DEPT OPEN	0 = disabled 1 = enabled	Provides the Fire Dept. Open input. When set to 1, the open signal received by the operator overrides all photoelectric eyes and edge sensors, and opens the gate. Pressing the Open or Reset button is required before the gate can be closed.	+24V Fire Dept Open (#24)
OC 0 (DISABLED) EMERGENCY CLOSE	0 = disabled 1 = enabled	Enables the Emergency Close input. When set to 1, the constant hold close overrides vehicle detectors, photo eyes and edge sensors, and closes the gate. Pressing the Reset button once or the Open button twice is required before the gate will open.	+24V EMERG CLOSE (#23)
SE 2 IES SENSITIVITY (Not used in StrongArm models)	1 = maximum sensitivity 2 = moderate (default) 9 = lowest sensitivity	Adjusts the sensitivity of the inherent entrapment sensor. Available settings are 1-9 with 9 being the least sensitive.	N/A
SS 0 IES STOP ONLY (Not used in StrongArm models)	0 = (off) Stop and reverse for 2s 1 = (on) 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.	N/A
LC 0 LEAF DELAY CLOSE	0 = none 1 to 7	Only appears if the gate operator is set up as a Primary or a Secondary. Available settings are 1 to 7. Each numerical increment adds ½ second, to a maximum of 3 ½ seconds time delay, before the operator activates when commanded to close.	
LO 0 LEAF DELAY OPEN	0 = none 1 to	Only appears if the gate operator is set up as a Primary or a Secondary. Available settings are 1 to 7. Each numerical increment adds ½ second (with a maximum of 3 ½ seconds) time delay following a command to open before the operator activates.	
RT 0 (60 SECS) MAXIMUM RUN TIME	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 the maximum run timer default setting of 60 seconds.	N/A
PO 0 (OFF) PARTIAL OPEN	0 = none 7 to 99 seconds	Activates the partial open input and allows an adjustable distance by setting the open duration. The available time settings are 7 to 99 seconds. The default setting [PO 0] leaves this input inactive.	Open Partial #6 COM

Installer Menu	Setting Options	Menu Tasks & Explanations	STC Wire Connections
EC 0 STOP ONLY EYE CLOSE LOGIC	0 = Close eye stops only 1 = Two second reversal to open on swing, slide, or vertical gates. Reverse to full open with barrier gates, StrongArm M30 and StrongArm M50. 2 = Reverse to full open.	If the close photo eye is triggered, the default setting is non-reversal while the gate is traveling in the close direction. If the obstruction is cleared within 5 seconds, gate travel continues. If you set the gate operator to optional setting EC 1, when the close photo eye is triggered, the gate pauses and reverses it's direction for a 2-second interval, and then resumes moving in the close direction if the photo eye clears within 5 seconds. (See exception for barrier arms.) A setting of EC 2 causes the gate to reverse and travel full open when triggered. NOTE: In software versions h5.56 and h4.55 or higher the following changes occurred: Swing Gates: When photo eye close is active, the open command is operational. All Usage Class 3 or 4 gate operators: As in swing gates, an active photo eye close will no longer prevent an Open command.	Sensor 1, 2, or 3 Sensor COM COM +24V
EO 0 STOP ONLY EYE OPEN LOGIC	0 = Open eye stops only 1 = Two second reverse to close	If the open photo eye is triggered, the default setting is non-reversal while the gate is traveling in the open direction. When triggered, with the optional setting of EO 1, the gate pauses and reverses it's direction for a 2-second interval, and then resumes moving in the open direction if the photo eye clears within 5 seconds.	Sensor 1, 2, or 3 Sensor COM COM +24V
GR 0 FULL OPEN GATE EDGE LOGIC	0 = Edge reverses fully open 1 = Two second reversal only	The default setting is to reopen fully if the edge sensor is triggered while closing. The optional setting of GR 1 sets the gate to a 2-second reversal if triggered while closing.	Sensor 1, 2, or 3 Sensor COM +24V 10K resistor (Edge)
SR 1 REVERSE 25 REVERSAL LOGIC (Not used in StrongArm models)	0 = IES reverses fully open 1 = Two second reversal only	If the inherent sensor is triggered, the default setting reverses the gate travel for a 2-second duration. The optional setting of SR 0 will cause the gate to reopen fully if triggered while closing.	N/A
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 - 2016 sensor input setting for external entrapment protection sensor monitoring. All three sensor types must be configured to a non-zero number before the gate operator will move the gate. See <i>External Entrapment Protection Sensors: What the Installer Needs to Do</i> on page 27.	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

Installer Menu	Setting Options	Menu Tasks & Explanations	STC Wire Connections
PC 0 NO INPUT PHOTO EYE OUTPUT	0 = Normally Open NO input 1 = Normally Closed NC input (monitored)	Changes occurring in 2016. See NOTE . The 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 (FRL2) alert. Press the Stop or Reset button to clear.	COM +24V COM PHOTO EYE CLOSE DIRECTION
GC 0 NO INPUT GATE EDGE OUTPUT	0 = Normally Open NO input 1 = Normally Closed NC input (monitored)	Changes occurring in 2016. See NOTE . 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
TC 1 (INTLOCK) TIME CLK/INTLOCK	0 = TIME CLK (Select Time Clock) 1 = INTLOCK (Select Open Interlock)	Configures the input at Terminal No. 7 on the STC to be either for the gate interlock function, or for an external time clock to open input. The default setting is (TC_1) for the interlock function.	INTERLOCK OPEN (#7) COM
DT 0 FREE EXIT DISABLE FUNCTION	0 = Disable Free Exit 1 = Disable Close Timer	Configures Terminal #9 input to disable either the Free Exit Detector function or, alternately, the Close Timer function. The default setting disables the free exit detector. NOTE: When set to 0, the free exit is disabled while the gate rests on it's closed limit. If the closed limit is not tripped, the free exit continues to work normally.	DISABLE EXIT DETECTOR (#9) COM
OR 1 REVERSE OUTSIDE OBS LOOP	0 = Pause closing only 1 = Enable reversing to open 2 = Ignore and continue closing*	The default (1) is for full reversal when the Outside Obstruction Loop is triggered. A setting of 0 causes the gate to only pause when triggered. The gate closure begins as soon as the loop is clear again. *A setting of 2 is only available on CRASH barriers and provides for the most secure facilities where it is essential that the loop trigger is completely ignored and the barrier arm continues closing without pause or reversal.	OUTSIDE OBS LOOP (#11) COM or connection to HY-5A detector
IR 1 REVERSE INSIDE OBS LOOP	0 = Pause closing only 1 = Enable reversing to open 2 = Ignore and continue closing*	The default is for full reversal when the Inside Obstruction Loop is triggered. A setting of 0 causes the gate to only pause when triggered. Closure begins as soon as the loop is clear again. *A setting of 2 is only available on CRASH barriers and provides for the most secure facilities where it is essential that the loop trigger is completely ignored and the gate continues closing without pause or reversal.	INSIDE OBS LOOP (#10) COM or connection to HY-5A detector
CR 0 REVERSE CLD Pause Open	0 = Reopen if center loop triggers 1 = Pause only	The default allows the barrier arm to reopen if the Reset (Center) Loop detector is triggered during closure of the barrier arm. A setting of 1 causes the barrier arm to only pause when triggered. Closure begins as soon as the loop is clear again.	Reset (Center) Loop COM or connection to HY-5A detector

NOTE: The shaded Installer Menu items do not appear when Build Year is set to 2 (BY 2). Exceptions exist for barrier arms, CRASH products, operators set to pre-2016 and Usage Class IV provisions.

Installer Menu	Setting Options	Menu Tasks & Explanations	STC Wire Connections
CB 0 (OFF) CLD Disable ELD	0 = Normal operation of Free Exit 1 = Disable Free Exit	Setting 1 allows an CLD input to disable the Free Exit Detector (ELD) until the barrier arm is fully closed. Used in bi-directional traffic situations.	Reset (Center) Loop COM or connection to HY-5A detector
EB 0 (OFF) ELD Backoff	0 = Normal operation of Free Exit 1 = Back off close function	The default allows normal latch open operation of the Free Exit detector. The optional setting of 1, creates an automatic close function if a vehicle triggers and then backs off the Free Exit Loop detector.	Free Exit Loop COM or connection to HY-5A detector
DL 1 STANDARD DETECTOR LOGIC	1 = Standard 2 & 3 = Quick Close 4 = Full anti-tailgate	Determines how the operator responds to a tail gate notification. See <i>Anti-TailGate Mode (Closing Logic)</i> on page 91. NOTE: Does not appear in barrier gate operators.	
RL 1 CLOSE LIM RELAY 1 LOGIC	0 = Disabled 1 = Close limit active (1 to 29 available)	Configures the function of the User 1 output relay. It has the capacity to switch both AC and DC loads and can be used for high voltage and/or high current loads. Connect devices directly to the top of the relay: COM and either NO and/or NC contacts. Multiple logic function options exist. Refer to <i>User Relays – Programming Procedure</i> on page 79.	User 1 Relay
R2 6 GATE LOCK RELAY 2 LOGIC	0 = Disabled 1 to 29 available	Configures the function of the User 2 output relay. It has the capacity to switch both AC and DC loads and can be used for high voltage and/or high current loads. Connect devices directly to the top of the relay: COM plus NO and NC contacts. Multiple optional logic function options exist. Refer to <i>User Relays – Programming Procedure</i> on page 79.	User 2 Relay
R3 1 CLOSE LIM RELAY 3 LOGIC	0 = Disabled 1 to 29 available	Relay 3 configures the function of the User 3 output relay, which is an electronic relay with the capacity for switching a DC load only. In the StrongArm M30/M50, Relay 3 is connected to the gate LED lighting and does not appear as an option in the Installer Menu.	User 3 Relay
R4 through R11 RELAY <n> LOGIC	0 = Disabled 1 to 29 available	Similar to Relay 1 Logic. NOTE: The Hy8Relay™ module option can be purchased to provide an additional 8 relay terminals. 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	Lets you specify when the relay activates. The relay turns ON when the software detects that the gate operator has been off its close limit for the specified period of time. With updated software versions, TL appears in the Installer Menu even without the User Relay option 8 being utilized.	User Relay 8

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	Lets you specify when the relay activates. The relay turns ON when the software detects that the gate operator has been off its close limit for the specified period of time. With updated software versions, LT appears in the Installer Menu even without the User Relay option 8 being utilized.	User Relay 8
SA 0 (OFF) STC ADDRESS	0 = No network 1 to 99 = Network "drop" address	Sets the system address for network communication. 1 – 99 sets individual poling addresses. Refer to HyNet™ literature for more information.	RS-485. Involves additional hardware & software.
NE 0 (OFF) NETWORK SETUP	0 = No network (off) 1 = Network address (on)	Menu item appears when SA is not set to zero (0). If a system address exists a setting of 1 opens the network configuration menu. 0 = no network communication 1 = allows configuration of network addresses.	RS-485. Involves HyNet™ & software.
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 the display. With a setting of 1, you can access the AC Power Supply with HyInverter AC diagnostic mode. Use the Next or Previous buttons, on the gate operator's keypad, to view the diagnostics on the STC display. NOTE: These same diagnostics appear on the 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.)
ELD0 RUN MODE EXIT LOOP SET	0 = Run mode 1 = Show frequency 2 = Show call level 0-7 3 = Set Frequency	Controls the HY-5B Free Exit loop detector.	HY-5B
ILD0 RUN MODE IND OBS LOOP SET	0 = Run mode 1 = Show frequency 2 = Show call level 0-7 3 = Set Frequency	Controls the HY-5B Inside Obstruction Loop detector.	HY-5B
OLD0 RUN MODE OUT OBS LOOP SET	0 = Run mode 1 = Show frequency 2 = Show call level 0-7 3 = Set Frequency	Controls the HY-5B Outside Obstruction Loop detector.	HY-5B
RLD0 RUN MODE RESET LOOP SET (Shadow Loop Set)	0 = Run mode 1 = Show frequency 2 = Show call level 0-7 3 = Set Frequency	Controls the HY-5B Shadow/Reset Loop detector.	HY-5B

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.
NOTE: If you want gate personnel to operate the gate with the Hold to Close feature found in some push button stations, then set the Hold to Close menu item to 1. When the Hold to Close menu item is active (set to 1), the Close Timer menu item is unavailable.
2. Use the Select, and then Next or Previous buttons to navigate and change the number of seconds appearing on the display. Refer to *Menu Mode Navigation* on page 58.
3. To exit the User Menu, press the Menu button. The gate status appears in the display indicating you have returned to Run Mode.

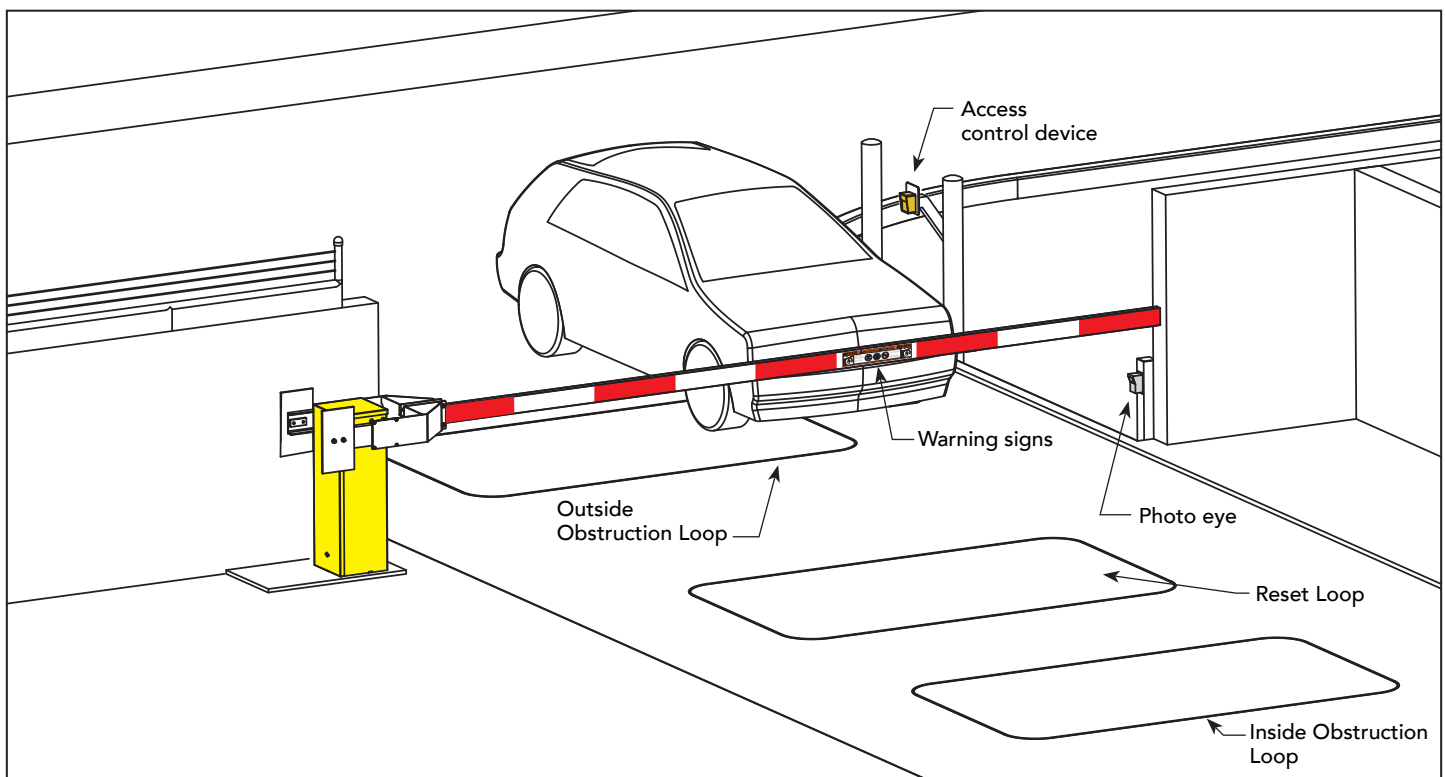
TEST THE OPERATOR

Complete the installation by testing the operation of the gate.

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

1. Press Open to open the gate.
2. Test the operator.
 - Cycle the gate a few times by pressing the Close and Open buttons.
 - Test the EMERGENCY CLOSE using the constant hold device. The gate will ignore any photo eye, vehicle loop, or other safety sensor inputs.

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

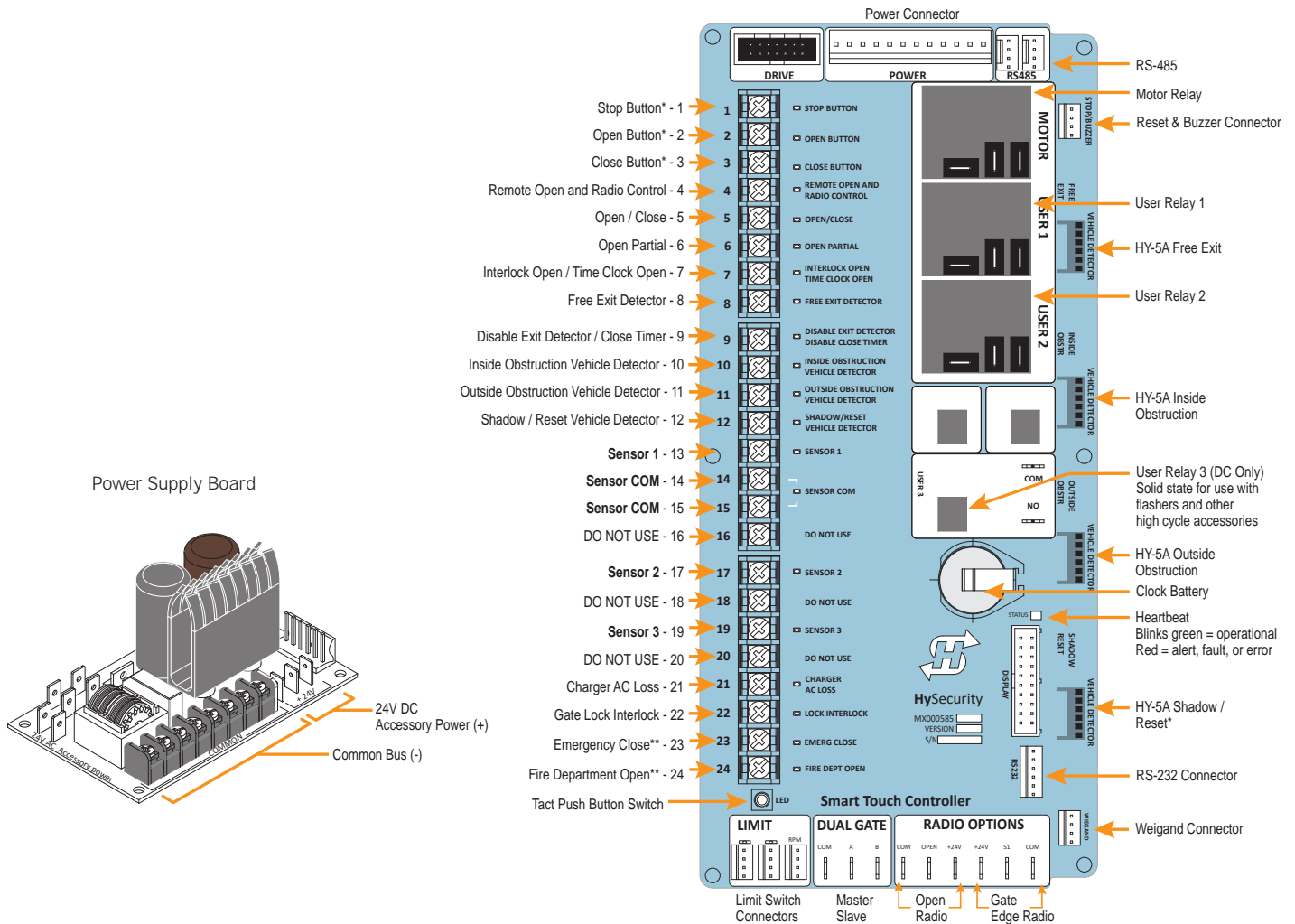
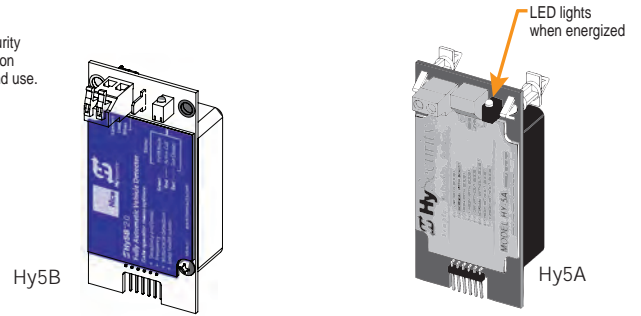


STC Inputs & Wiring

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

- Make Connections on the Smart Touch Controller
- Integrate with Security Systems
- Adapt User Relays for your Gate Site

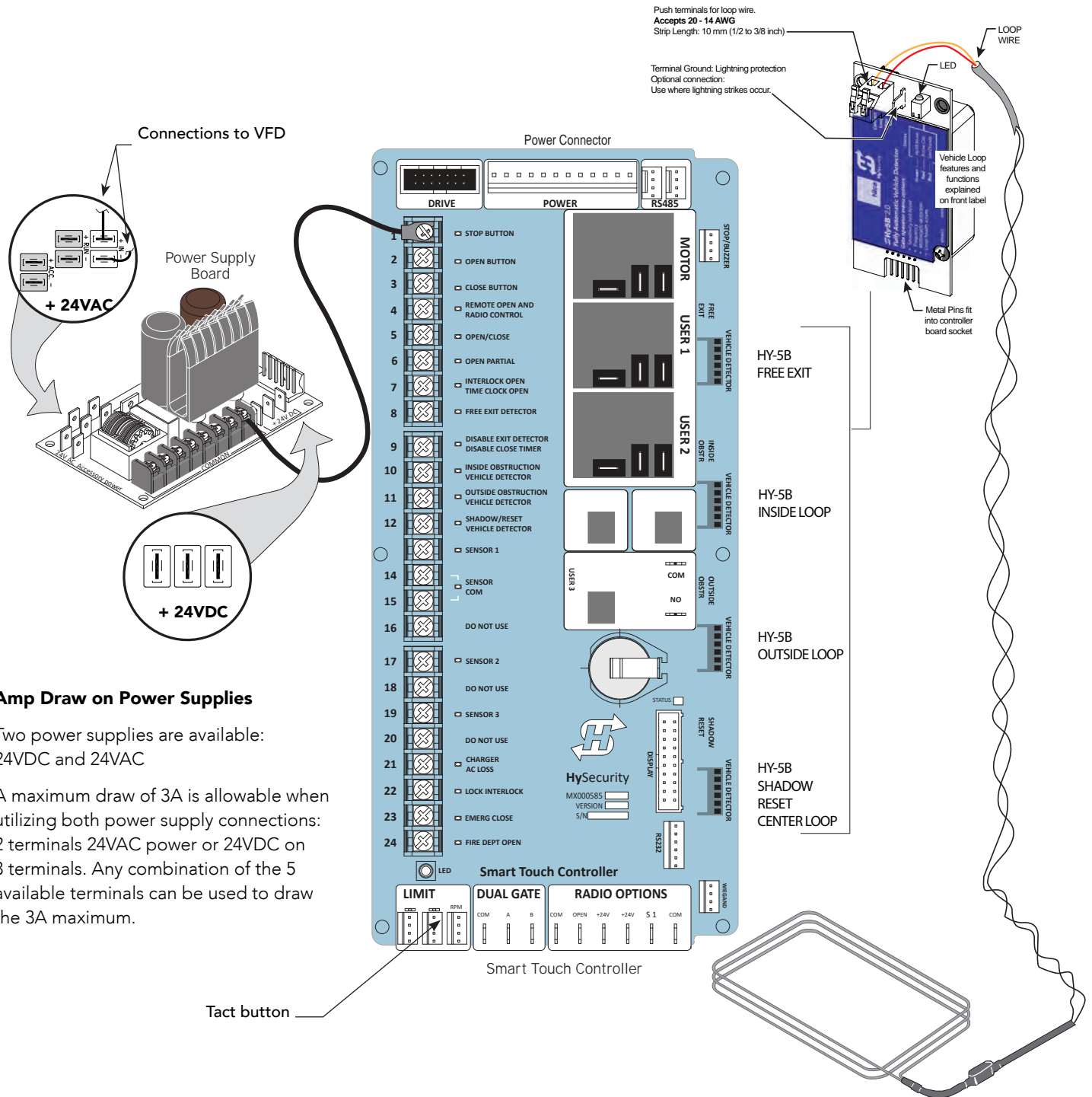
Hy5B Refer to the HySecurity website for more information about Hy5B installation and use.



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 103.



Amp Draw on Power Supplies

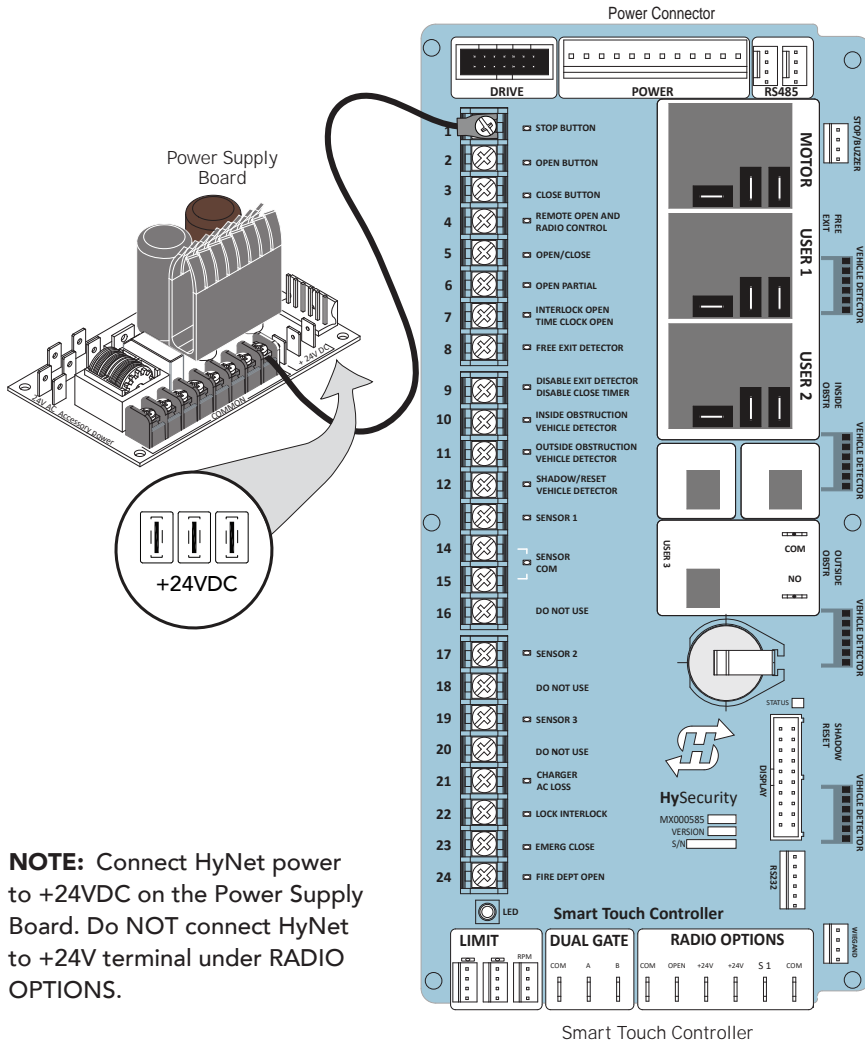
Two power supplies are available: 24VDC and 24VAC

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

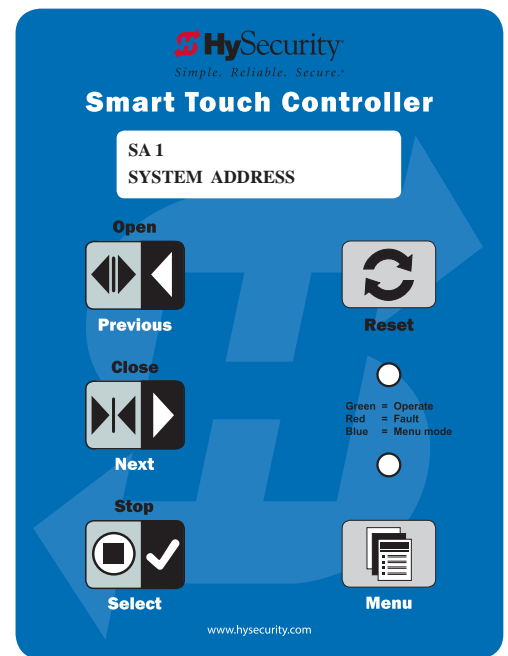
INTEGRATING WITH SECURITY SYSTEMS AND HyNET™ GATEWAY

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](#).



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



SA Display in the Installer Menu

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

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

SMART TOUCH CONTROLLER INPUTS

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

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

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

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

NOTE: 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 illustration on previous page.

STC TERMINAL INPUTS



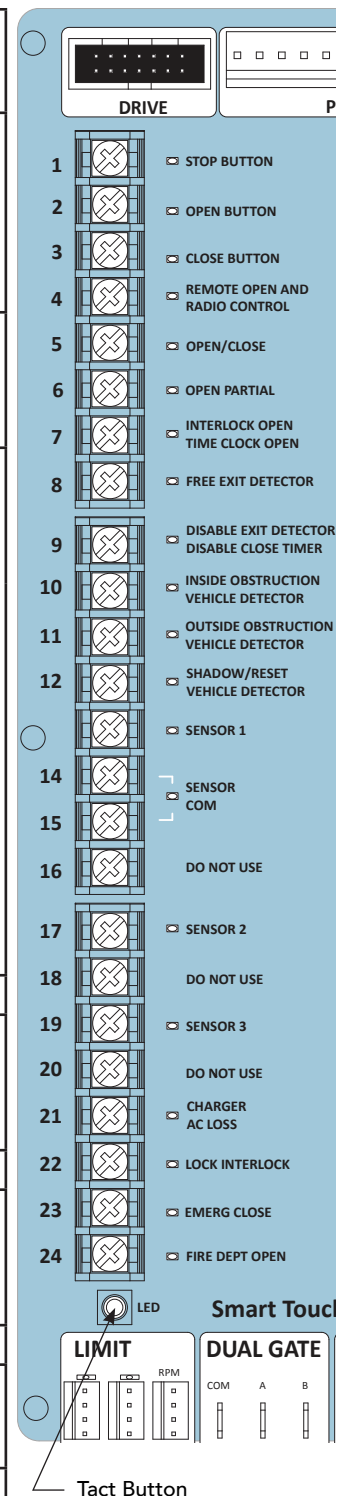
Use Terminal Inputs 4, 5, 6, and 7 for external control devices. DO NOT connect an external control device to Input Terminals, 1, 2, or 3 unless the controls are located in clear view of the entire gate area and are being constantly monitored and supervised.

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

Smart Touch Controller Inputs Chart

No.	Smart Touch Terminal UL 325 - 2016	Smart Touch Terminal pre-2016	Wire Connections	Commonly used for...
1	Stop Button	Stop Button	Normally Closed input. Jumper to Common if input is not being used.	Line of sight, external stop button or 3-button station.
2	Open Button	Open Button	Do not use for radio or remote access controls. Normally Open Input	Line of sight, external open button or 3-button station.
3	Close Button	Close Button	Do not use for radio or remote access controls. Normally Open Input	Line of sight, external close button or 3-button station.
4	Remote Open & Radio Control	Remote Open & Radio Control	For radio/remote open device: Access the RO from the User Menu and set to 1. NO Input	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	Open Partial	Open Partial	NOTE: NOT USED on StrongArm. Terminal is only used in slide gates. Adjustable through the Installer Menu from 7 to 99.	Monitored access controls

No.	Smart Touch Terminal UL 325 - 2016	Smart Touch Terminal pre-2016	Wire Connections	Commonly used for...
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 the Time Clock Open (TC 0) input.	When set to TC1, terminal used for interlocked gate input. Set to TC0, this input provides a connection to a timer to open (7-day timer).
13	SENSOR 1	Edge Sensor	Refer to <i>Installer Menu: Table 6</i> on page 64.	Connection to external entrapment protection sensors. (Example: photo eyes or gate edges.)
14	Sensor COM	Photo Eye Power - 24 Volts Common	All devices used for entrapment protection that require monitoring must be wired to SENSOR COM.	Device common power
15	Sensor COM	Photo Eye Power - 24 Volts Common	Refer to <i>How Software Handles Monitoring External Entrapment Protection Sensors</i> on page 37 and <i>Wiring HySecurity Sensors: Smart Touch</i> on page 119.	Connect external entrapment protection sensors to these terminals. The 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 24 Volts Common.
16	DO NOT USE	DO NOT USE		
17	SENSOR 2	Photo Eye Open direction	Refer to <i>Installer Menu: Table 6</i> on page 64.	Connection to external entrapment protection sensors. (Example: photo eyes or gate edges.)
18	DO NOT USE	DO NOT USE		
19	SENSOR 3	Photo Eye Close direction	Refer to <i>Installer Menu: Table 6</i> on page 64 used for Break Away Switch if BA is set to 1 in installer menu.	Connection to external entrapment protection sensors. (Example: photo eyes or gate edges.)
20	DO NOT USE	DO NOT USE		
21	Charger AC Loss	Charger AC Loss	Connection from battery cabinet.	DC battery cabinet supplied gate 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 <i>Installer Menu: Table 6</i> on page 64.	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	Activate with +24. See the <i>Installer Menu: Table 6</i> on page 64.	Enable Installer Menu FO & input +24V to trigger. Overrides photo eyes and gates edges.



STC Inputs

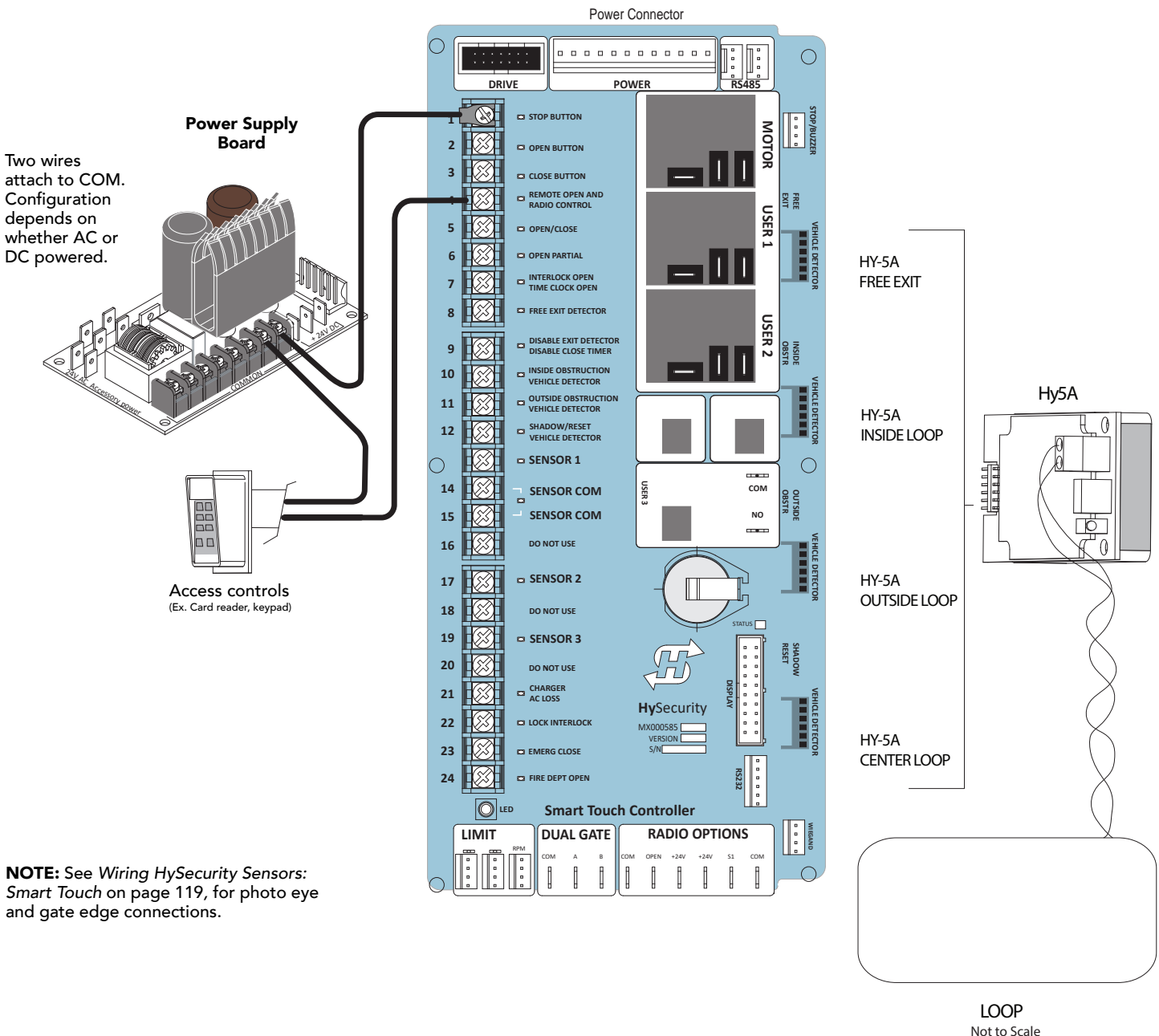
CONNECTING ACCESSORY DEVICES

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 2016 revision to UL 325 Standard of Safety.

NOTE: Always check your local area codes and comply with all regulations. External Entrapment Protection Sensors must be connected to SENSOR COM for power and monitoring purposes.

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)



NOTE: See *Wiring HySecurity Sensors: Smart Touch* on page 119, for photo eye and gate edge connections.

USER RELAYS – PROGRAMMING PROCEDURE

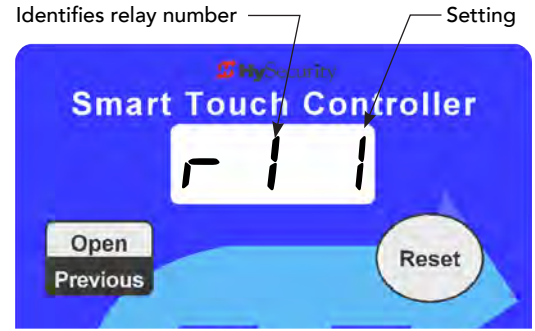
The Smart Touch Controller is able to interface with many types of external devices through the use of three user programmable output relays: two mechanical relays (User Relay 1 and User Relay 2), and one solid state relay (User 3) which is used most often for connection to flashing devices.

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.

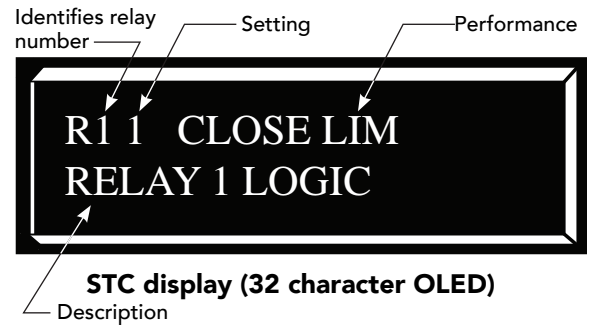
NOTE: A setting of zero disables a User Relay. The User Relays will operate normally to 18VDC. Below 18VDC, alert notification occurs. On Crash products User 3 relay is unavailable. It is pre-wired for the LED lights.

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

1. Select the relay you wish to use through the Installer Menu. See *Installer Menu: Table 6 on page 64*. For example:
R1 13 (RELAY LOGIC 1) or R2 15 (RELAY LOGIC 2).
2. Select the appropriate function (1 through 42) by changing the display to the associated number listed in the table. Use the Select, Next and Previous buttons to make your selection. Refer to *Menu Mode Navigation on page 58*.



STC display (7-segment)



STC display (32 character OLED)

Programmable User Relays: Table 7

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

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

Setting	Performance	Description	Wire Connection
19	Flasher Relay	Flashes lights once per second. The relay is constantly pulsing except when the open limit switch is triggered. * Preferred connection is Relay 3, a solid state relay (except on Crash). On Crash gate operators, Relay 3 is unavailable because it is hard-wired for the LED barrier arm lights.	Relay 1 or 2* (Relay 3)
20	Free Exit Loop Vehicle Detector output	Active when the Free Exit Loop is tripped.	Relay 1, 2 or 3
21	Inside Obstruction Vehicle Detector output	Active when the Inside Obstruction loops is tripped.	Relay 1, 2 or 3
22	Center Loop Detector output	Active when the Reset/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 the partial open position is reached or exceeded. Not used in StrongArmCrash.	Relay 1, 2 or 3
25	DC Power OK Alert	Deactivates when the software detects a low battery voltage (below 21VDC, but greater than 18VDC) for a duration of 2 seconds or more. To slow battery drain, accessory power loads are shed.	Relay 3
26	Free Exit Vehicle Detector Pulse	Activates when the Exit Loop Detector is tripped and causes a 250mS pulse output to occur.	Relay 1, 2 or 3
27	Not Open (requires AC power)	When AC power is detected, this relay activates when the gate is NOT on the open limit. If AC power fails, or the gate is on the open limit, the relay is deactivated.	Relay 1, 2 or 3
28	Flasher (requires AC power)	Controls flashing lights that pulse 500ms per second. The relay is constantly activating except when the open limit switch is triggered or AC power fails.	Relay 1, 2 or 3
29	Set aside for Factory Use	HySecurity Testing Only	Do not use
30	Arm Breakaway	Only used on StrongArm and StrongArmPark DC and activates if the breakaway arm switch is tripped.	
31	Warn Operate Run	Relay is active while warn before and motor running.	Relay 1 or 2
32	Partial Open Pulse	Relay pulses when partial open activated and when partial open limit reached. Often used at a sequential gate site.	Relay 1 or 2
33	Inbound Transient/Lot Output	N.O. Input. The relay outputs a 250ms pulse used to increment the transient and total vehicle counts. Refer to the HySecurity Parking supplement for more detailed information.	R1 and R2, R4 through R11 TRANSIENT USER
34	Outbound Transient/Lot Output	N.O. Input. The relay outputs a 250ms pulse used to decrement the transient and total vehicle counts. Refer to the HySecurity Parking supplement for more detailed information.	R1 and R2, R4 through R11 TRANSIENT USER
35	Inbound Tenant Output	N.O. Input. The relay outputs a 250ms pulse and increments the tenant counter when the Tenant User input is activated and OALD, then CLD, are tripped and released. This activity signals a prepaid customer has entered the facility.	R1 and R2, R4 through R11 TENANT USER

Setting	Performance	Description	Wire Connection
36	Outbound Tenant Output	N.O. Input. The relay outputs a 250ms pulse and decrements the tenant counter when the Tenant User input is activated and IALD, then CLD, are tripped and released. This activity signals a prepaid customer has exited the facility.	R1 and R2, R4 through R11 TENANT USER
37	Inbound Special Output	N.O. Input. The relay outputs a 250ms pulse and increments the special counter when the SPECIAL USER input is activated and OALD, then CLD, are tripped and released. This activity signals a customer has entered the facility.	R1 and R2, R4 through R11 SPECIAL USER
38	Outbound Special Output	N.O. Input. The relay outputs a 250ms pulse and decrements the tenant counter when the SPECIAL USER input is activated and IALD, then CLD, are tripped and released. This activity signals a customer has exited the facility.	R1 and R2, R4 through RC11 SPECIAL USER
39	Set aside for Factory Use	HySecurity Testing Only	Do not use
40			
41	<i>Test Open Pulse</i>	<i>Output pulses five seconds after close limit is activated. Typically used for cycle testing.</i>	N/A
42	<i>Break-Away Switch Output</i>		
43			
44			
45			

HY8RELAY MODULE OPTION

The Hy8Relay (extended relay module) provides 8 numbered mechanical relays. RELAY 4 through, RELAY 11 LOGIC can be accessed through the Installer Menu. Set the number for the relay based on the information found in *Programmable User Relays: Table 7*.

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.



Bi-Parting & Dual Gate Systems

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

NOTE: RS-485 communication is available for networked security systems. For additional information, refer to *Connecting Sequenced Gates* on page 86.

CONNECTING AN INTERLOCKED PAIR (DUAL GATE)

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

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



Dual StrongArms

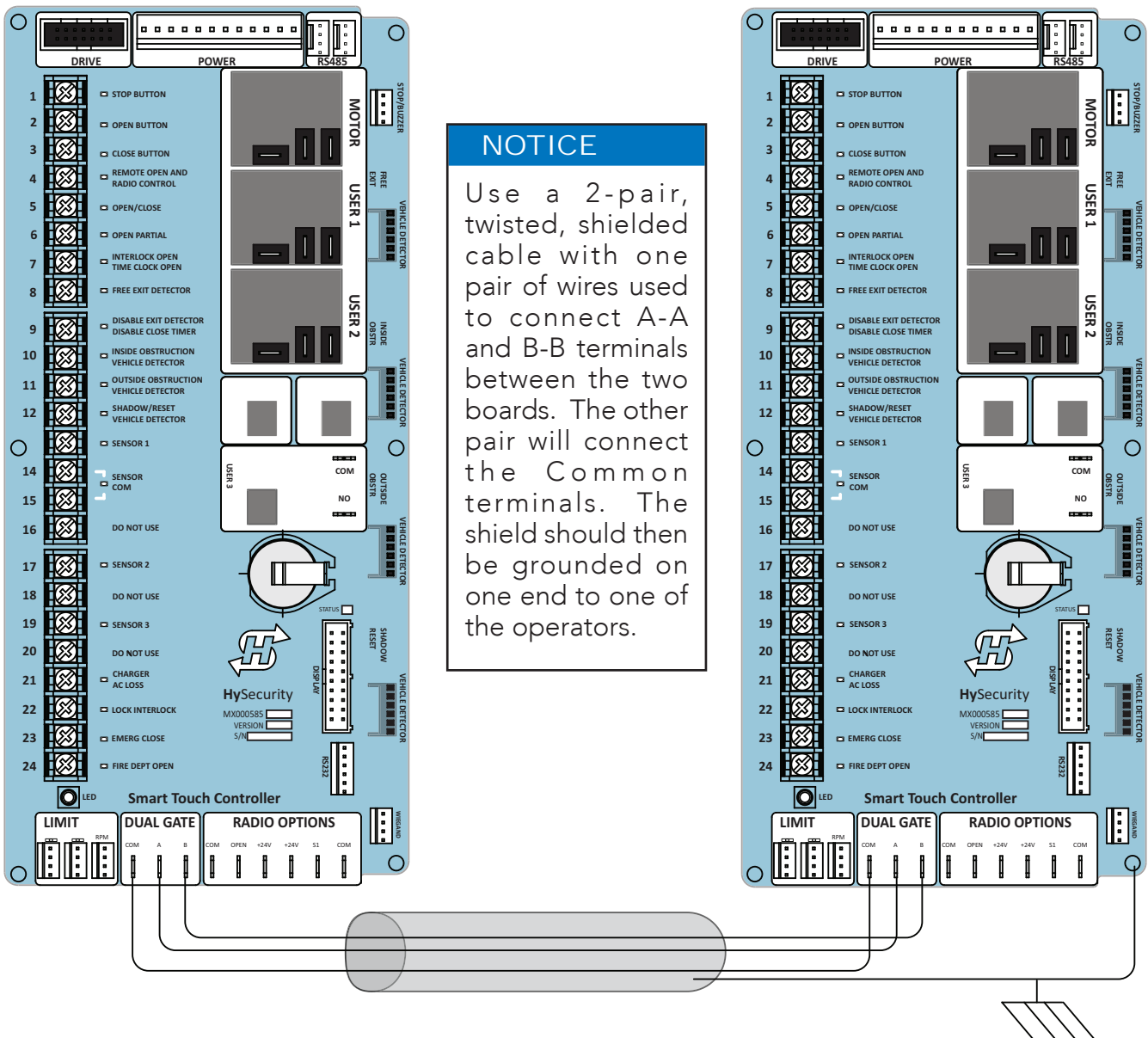
Dual Gate Wiring Connections

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

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



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



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

Dual or Sequenced Gates: Power, Software & Accessory Requirements

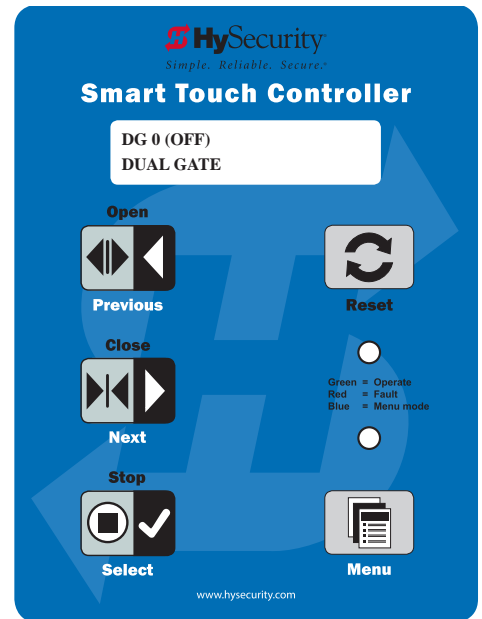
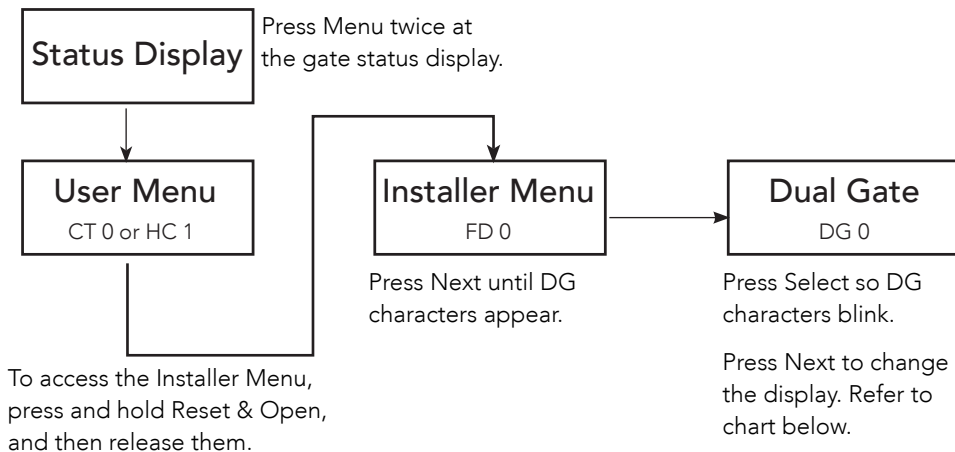
When installing an interlocked pair, the following must be adhered to:

- An electrical conduit for interconnecting wires must span between the two operators. The interlock (dual gate) communication wires and any low voltage control wires must be installed in a conduit that is separate from the high voltage power cables.
- Complete the installation of both operators as separate machines and verify that their basic functions are correct as solo operators before interconnecting them.
- Be sure both operators are running the same software. The software version can be viewed on the display by pressing the RESET button.
- For up-to-date features, keep the most current software loaded on both gate operators. 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, but in a Sally Port configuration, the external control inputs must be connected to each operator as operation commands will not be shared across the dual gate wiring. Be sure to designate Sally Port A in the dual gate menu item as 3 (DG 3) and Sally Port B as 4 (DG 4).

NOTE: If using the Hy8Relay, connect it to the dual gate spades on either 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:



Refer to the table below to set 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.

**Interlocked Gate type	Operator 1 (Primary)	Operator 2 (Secondary)
Primary / Secondary	<ol style="list-style-type: none"> 1. Press Next until DG 2 appears on the display. 2. Press Select to establish the operator as Primary. 	<ol style="list-style-type: none"> 1. Press Next until DG 1 appears on the display. 2. Press Select to establish the operator as Secondary.

CONNECTING SEQUENCED GATES

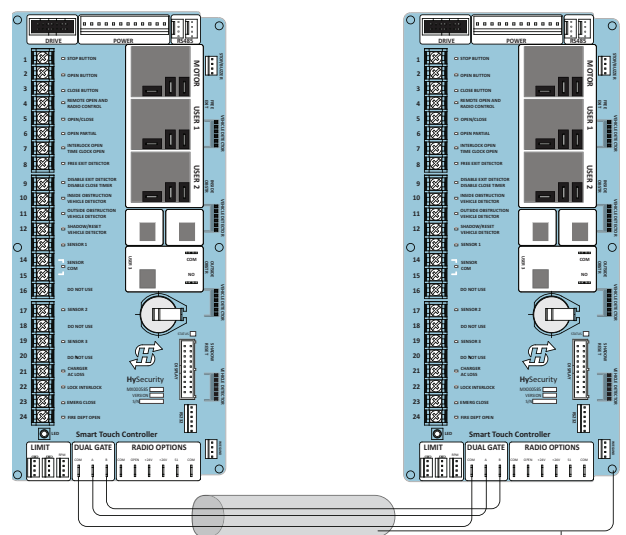
Sequenced gates are slightly different than dual or interlocked gates. When two gate operators are connected as sequenced gates, a faster “Traffic Control Gate” operator (i.e. barrier arm or crash wedge) and a slower “Security Gate” operator (slide, swing, or vertical lift gate) operate in sequence to help prevent tailgating 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.

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

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



The operators do not have to be of the same type, but both need to have identical software versions installed on the Smart Touch Controller. For example, a StrongArmCrash M30 can be sequenced with a StrongArm 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 75 for additional information.



Wire Diagram: Sequenced Pair of Operators wired to DUAL GATE Inputs

NOTICE

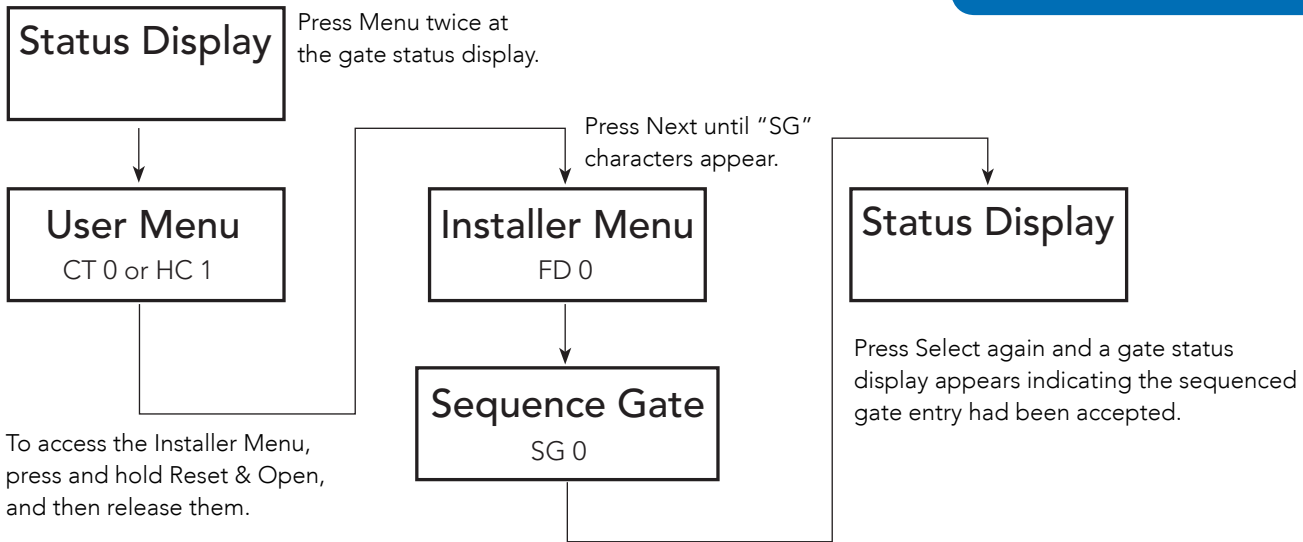
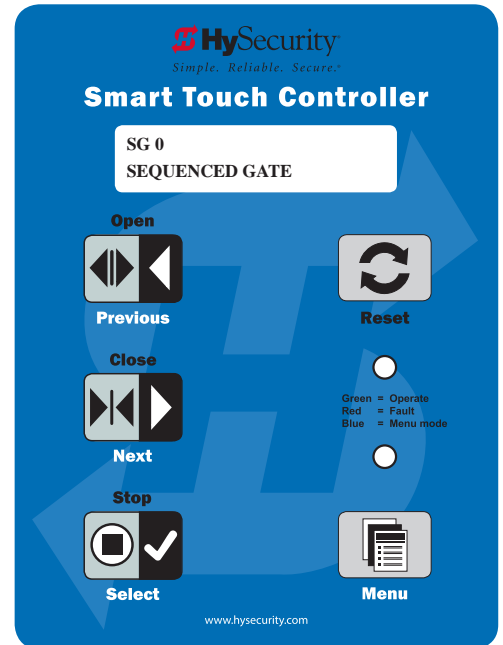
Use a 2-pair, twisted, shielded cable with one pair of wires used to connect A-A and B-B terminals between the two boards. The other pair will connect the Common terminals. The shield should then be grounded on one end to one of the operators.

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

1. As shown in the wire diagram on page 86, connect a shielded communications cable to the DUAL GATE inputs in each operator. The inputs are located near the base of the Smart Touch Controller. Be sure to connect the wires in pairs to the same terminal ports (A-A, B-B, COM-COM) on both operators.
2. Attach a ring terminal to the shield wire and connect it to the Smart Touch Controller's convenient ground screw.

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

Sequenced gates are very similar to dual gates (interlocked pair) in their Power, Software, and Accessory Requirements. To review the installation site requirements, refer to *Dual or Sequenced Gates: Power, Software & Accessory Requirements* on page 85.



Press Next to change the display:

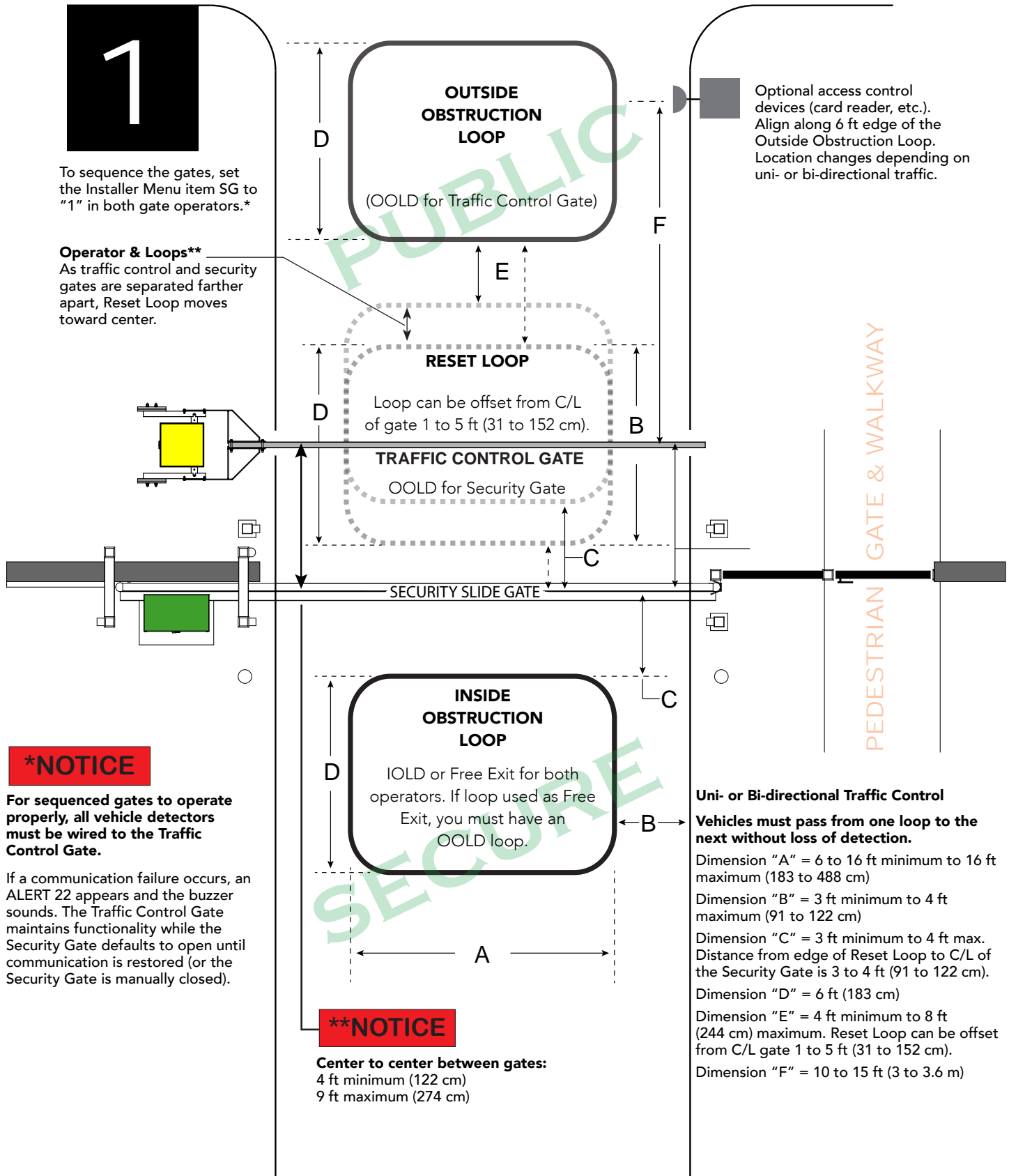
- SG 1 = Sequenced Gate #1 configuration
- SG 2 = Sequenced Gate #2 configuration

- SG 3 = Sequenced Gate #3 configuration (only used with HydraSupply XL)
- SG 4 = Sequenced Gate #4 configuration (only used with HydraSupply XL)

NOTE: Set gate operators on the site to the uniquely paired number. Refer to the site designs on the following pages.

SEQUENCED GATE: CONFIGURATION #1

Vehicle Loop Layout StrongArm with Slide Gate

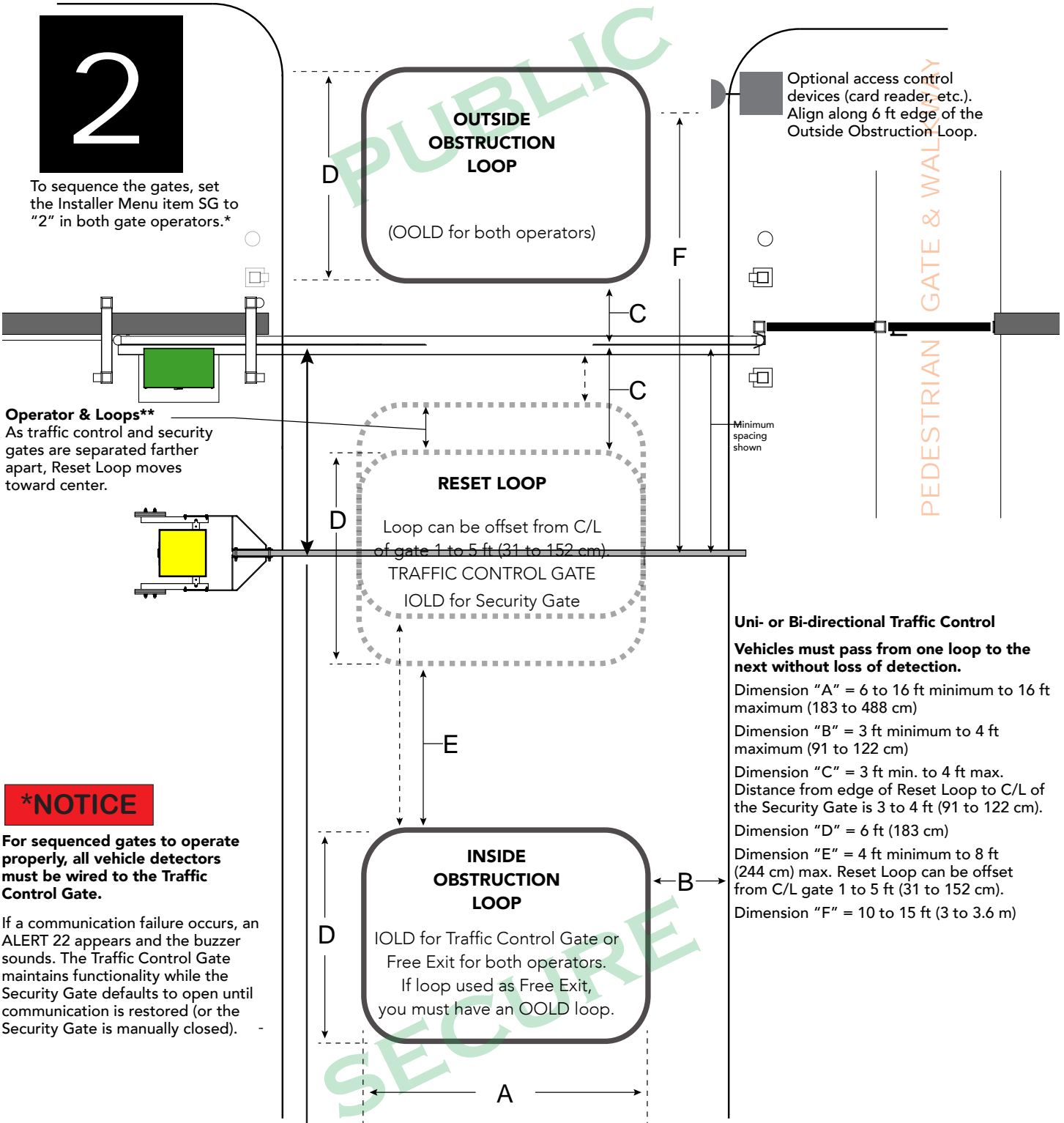


SEQUENCED GATE: CONFIGURATION #2

Vehicle Loop Layout StrongArm with Slide Gate

2

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



Operator & Loops**
As traffic control and security gates are separated farther apart, Reset Loop moves toward center.

Optional access control devices (card reader, etc.). Align along 6 ft edge of the Outside Obstruction Loop.

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" = 3 ft minimum to 4 ft maximum (91 to 122 cm)

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

Dimension "D" = 6 ft (183 cm)

Dimension "E" = 4 ft minimum to 8 ft (244 cm) 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)

Loop can be offset from C/L of gate 1 to 5 ft (31 to 152 cm).
TRAFFIC CONTROL GATE
IOLD for Security Gate

IOLD for Traffic Control Gate or Free Exit for both operators.
If loop used as Free Exit, you must have an OOLD loop.

***NOTICE**

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

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

****NOTICE**

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

Drawings not to scale.

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Vehicle Detector Installation

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

Vehicle detector functions (OR, IR, HD, DL) are configurable through the *Installer Menu: Table 6* on page 64.

NOTICE

Anti TailGate Mode does not pertain to barrier arms. Refer to Installer Manual, Page 70, CR for barrier arm options. 0 = Center/Reset Loop allows arm to reopen if triggered. 1 = Allows arm to pause when triggered. Loop must be cleared for closure to complete or valid open input received.

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, Inside Obstruction Loop, or the Center Loop will hold the gate open, reset the close timer, and ignore all close inputs. The close timer begins to count down only after all vehicle detectors are clear and no other open command is present.

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

Mode 3: When both inside and outside obstruction loops are simultaneously active, the gate will close immediately (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 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.

VEHICLE DETECTOR INSTALLATION: Hy5B

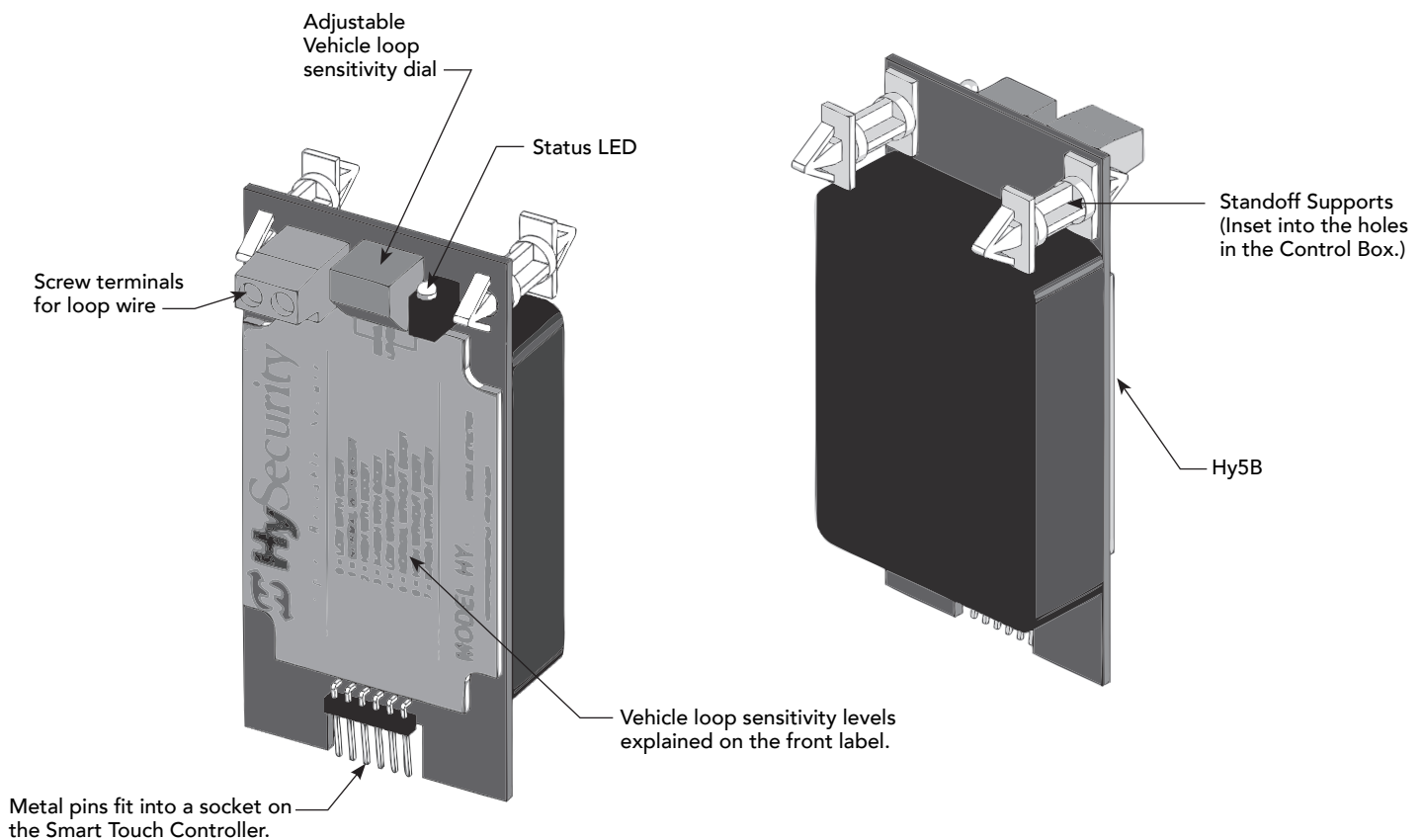
The Smart Touch Controller provides an interface for up to four different vehicle detector functions.

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

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

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

NOTE: It is not mandatory to use two separate vehicle detectors for inner and outer obstruction detection; however, the benefits of using the two Hy5B detectors are great. Several new features are possible, such as second vehicle tailgating detection, loitering alert, and selectable non-reversing options.



Hy5B Vehicle Detector Module

Four vehicle detector inputs (terminals: 8, 10, 11, and 12) exist on the Smart Touch Controller, as well as the four direct plug ins (FREE EXIT, INSIDE OBSTR, OUTSIDE OBSTR, SHADOW/RESET) for the Hy5B modules. Refer to *Overview of the STC and Power Supply Board* on page 74.

The vehicle detector input functions are as follows:

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

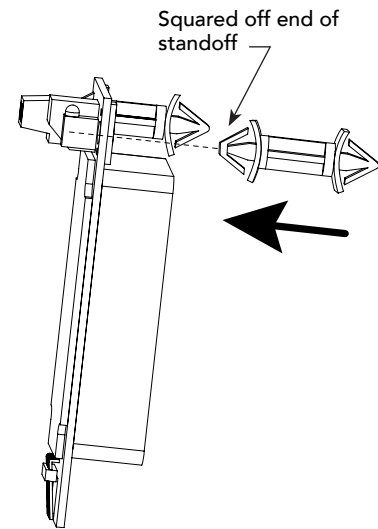
NOTE: Use of any combination of Hy5B detectors and box detectors is acceptable. On occasion, multiple obstruction detectors may be mandatory. For example, an area greater than 200 square feet (61 square meters) of vehicle loop cannot be connected to any one detector because the sensitivity becomes inadequate.

CONNECTING Hy5B VEHICLE DETECTORS

NOTE: For illustrations and detailed instructions, refer to the literature supplied with the Hy5B vehicle detectors. The installation instructions are also available online at www.hysecurity.com

Install each Hy5B vehicle detector module, one at a time using the following steps:

1. Turn off the AC power switch on the Control Box.
2. Insert the locking end of the two white plastic standoffs into the mounting holes on the detector.
3. Plug the detector into the appropriate socket along the right edge of the Smart Touch Controller. Be careful to align the six detector pins into the socket correctly (the screws for tightening the terminals should face toward the board), and then snap the standoffs into the holes in the control box.
4. Route the loop wires through the holes provided in the control box and connect the loop leads to the two terminals on the Hy5B detector. Tighten the terminal screws securely.
5. To enable the detector, turn on power. The detector will immediately tune if it is connected to a vehicle loop. Make sure no cars or other metal objects are over the loop.
6. Repeat Steps 1 through 5 for each Hy5B detector.
7. If the detector module is unplugged after it is enabled, a communications alert (ALERT 10) will be triggered. If the fault is not resolved, an error message, ERROR 3 "Detector Failed" is displayed.



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

Pressing the RESET button:

- Clears any errors
- Tunes the detectors on connected loops
- Un-installs any detectors that have been removed

8. The Smart Touch Controller automatically governs frequency selection for all Hy5B detector modules. This simplifies installation and guarantees that there is no cross-talk between multiple loops. The frequency and call level can also be manually selected; if this is required, refer to the appropriate loop set (ELD, ILD, OLD, RLD) in the *Installer Menu: Table 6* on page 64.

9. Sensitivity is the only adjustment available on the detector itself. Generally, sensitivity does not need to be increased unless the loop is large or there are multiple loops connected to one detector.

NOTE: Do not exceed more than 200 square feet (61 square meters) of loop area to one detector. The detection height is roughly 2/3's the size of the shortest side of the loop.

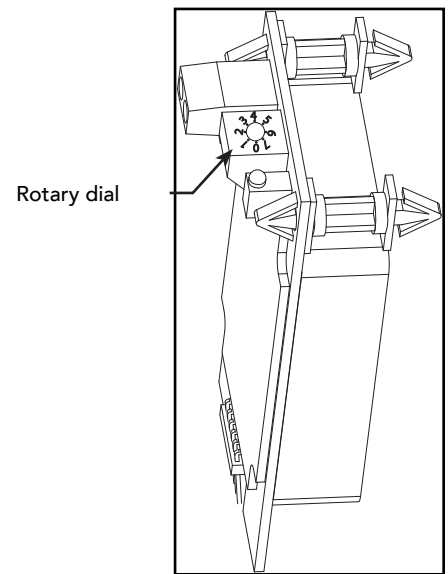
If required, adjust the sensitivity using the rotary dial. The factory default setting is 1.

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

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

10. Set the loop configurations in the Installer Menu. Display settings include, DT, OR, IR, DL.

11. Set the vehicle detector logic (DL).



View Call Level in Real Time

1. Enter the Installer Menu and access the loop menu item associated with the Hy5B detector:
Exit=ELD, Inside=ILD, Outside=OLD, or Reset/Shadow/Center=SLD/CLD).
2. Press SELECT and change the menu item to 2, Call Level. For example:
ILD2
CALL LEVEL
3. To exit the Installer Menu and return to Run mode, press Menu.

Knowing the strength of a vehicle detector (call level) is valuable because it provides information about how well the vehicle loop is actually "seeing" a passing vehicle. The Hy5B detector has the ability to read call levels in real time on a scale of 1 to 7. A call level of 7 indicates the loop is detecting the passing vehicle extremely well and is highly sensitive. If you receive a call level reading of 0 to 2, when a vehicle passes over the loop, you'll want to test the loop to make sure it is functioning correctly. If the test outcome is good and all the loops are operating properly, you may need to adjust the Hy5B sensitivity dial, so the call level reads in the 5 to 6 range.

INSTALLING STANDARD 11-PIN BOX TYPE VEHICLE DETECTORS

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

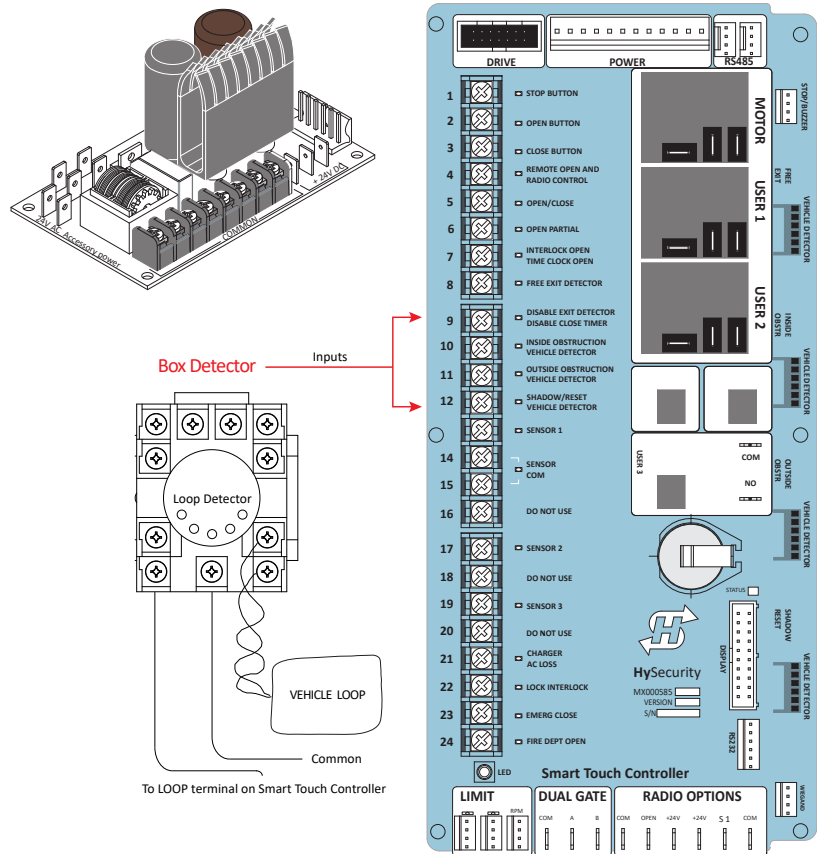
If there is sufficient space, install the sockets in the control box; if not, then install them in a separate external housing. Carefully consider your peripheral connections. Any peripheral device required for safe gate operation should be attached to 24VDC in case of an AC power outage.

NOTE: 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. Connect 24 Volt power to the detector. Connect Pin No. 1 to a 24VAC or 24VDC terminal and Pin No. 2 to common.
2. 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.

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.

Always keep the detector loop wires well twisted beyond the area of the loop. The lead in portion sealed in a saw cut does not need to be twisted so long as the wires are encapsulated in loop sealant and cannot move.



STRONGARM HTG LOOP LAYOUT

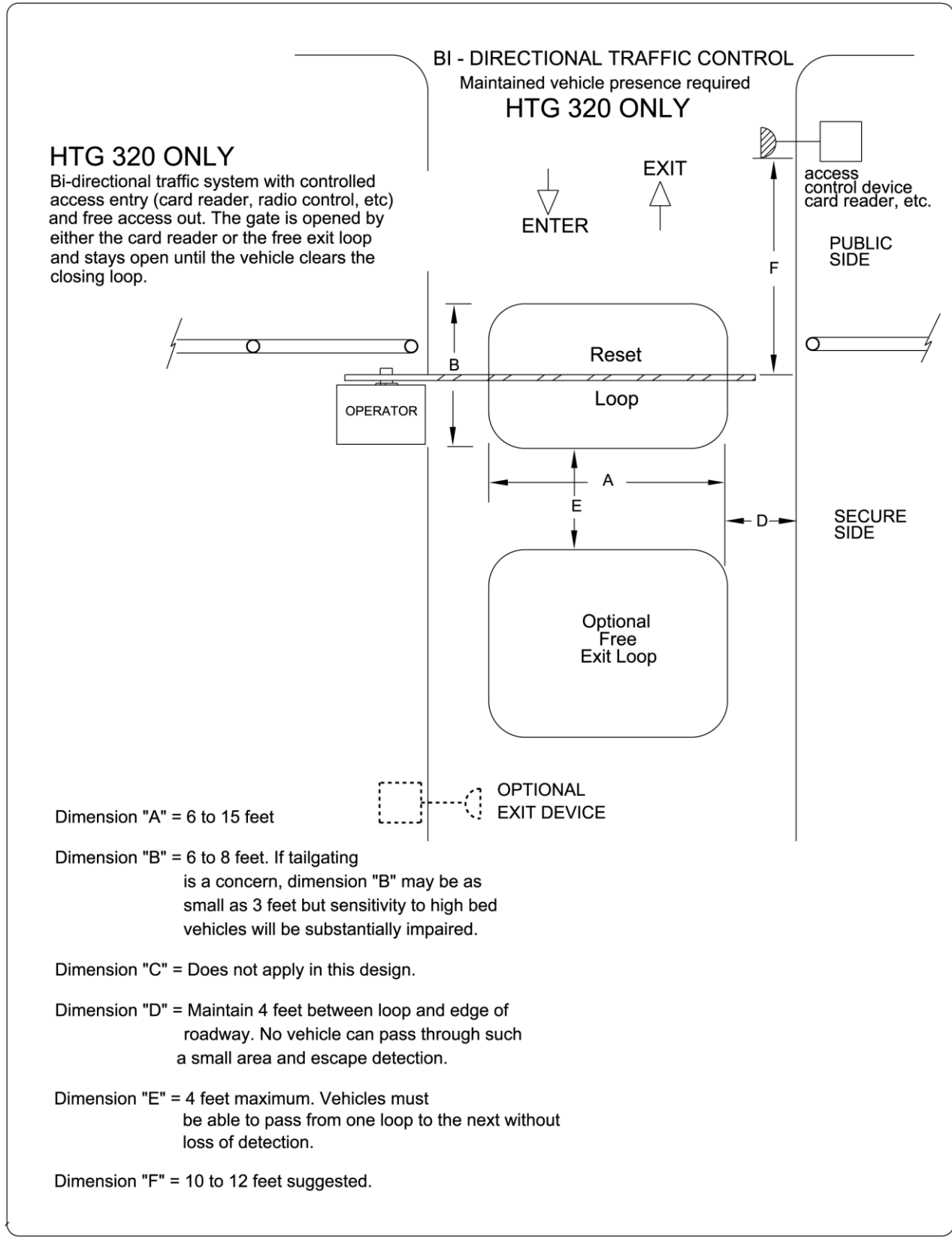
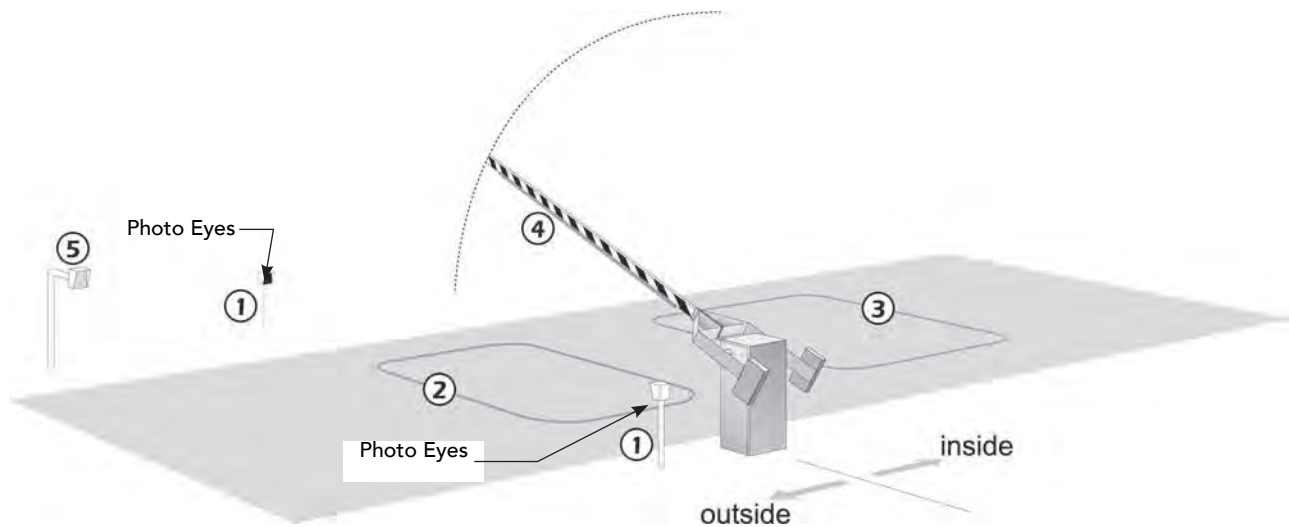


Photo Eye Installation

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 2016, UL 325 Standard of Safety (6th Edition).

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.



NOTE: 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.

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 27 and *Supply Power to the Sensors* on page 49.

PHOTO EYES (NON-CONTACT) INSTALLATION

Plan to integrate photo eyes (photoelectric sensors) in your site plan. Photo eyes are wired to the Controller and require low voltage conduit to the operator and power supply. Refer to *Independent Sensor Inputs – The edge, photo eye and photo eye COM inputs on the Smart Touch and Smart DC Controllers (STC and SDC) have been re-labeled. The same wiring connections become three independent methods for easy entrapment protection sensor configuration and normally closed outputs* on page v.

Understand your site requirements and use the layout diagrams available to determine the most appropriate mounting positions for additional photo eyes. The Controller has three sensor inputs.

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

The two common photoelectric sensor types are thru-beam and retro-reflective; each has its advantages.

- A thru-beam sensor is generally more powerful and able to function more reliably in inclement weather.
- A retro-reflective sensor (generally less reliable in inclement weather or low visibility) provides convenience due to minimal wiring.

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

Compatibility

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

In addition to the table, a label containing a list of tested and approved external entrapment protection sensors (normally closed contacts) that are compatible with HySecurity gate operators is affixed to every gate operator box shipped from the factory and can be found online at the following public site:
www.hysecurity.com/gatesafety

Installation

Install photo eyes according to the following steps.

1. Locate the photo eye in line of sight to the receiver or reflector that is mounted to protect zones of potential entrapment. Refer to site layout on 97.
2. Mount the receivers on the left or right side of the gate operator.
3. Mount the emitters just beyond the travel of the gate.

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

Configuration

Configure photo eyes attached to gate operators manufactured in 2016 or beyond according to *Wiring HySecurity Sensors: Smart Touch* on page 119.

NOTE: 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 *Independent Sensor Inputs – The edge, photo eye and photo eye COM inputs on the Smart Touch and Smart DC Controllers (STC and SDC) have been re-labeled. The same wiring connections become three independent methods for easy entrapment protection sensor configuration and normally closed outputs* on page v.

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

NOTE: 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.



1. If the photo eye has an internal switch for setting Light Operate versus Dark Operate, select Light Operate.
2. If the photo eye has a relay output and has both N.O. and N.C. terminals, some experimentation may be required to determine the proper connection because, when its in the Light Operate mode, the output relay is normally energized and releases when the beam is blocked.
3. If the photo eye has a solid-state output, you must choose a sinking-type connection.

Photo Eye Connections: Smart Touch & Smart DC Controllers



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.

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

A. Supply power to the sensor.

1. Obtain the +24 Volt source power at one of the three spade-terminals on the STC Power Supply Board.
2. Obtain the 24 Volt Common from SENSOR COM on the Controller.

B. Wire connection so the controller recognizes the sensor device.

3. Obtain the COM from the STC Power Supply Board.
4. Connect the N.C. output to SENSOR 1, 2, or 3.
5. Configure the Installer Menu according to your site sensor set up. Refer to *Table 4: HySecurity Gate Operators maintaining Object Detection* on page 40.

NOTE: Jumper between terminals on Photo Eye sensor so you don’t need to pull a fourth wire to the Controller terminal. For examples of wiring diagrams, refer to page 119. To test Photo Eyes, refer to *Supply Power to the Sensors.* on page 49.

Photo Eye Function

If the gate is stationary, a tripped photo eye will prevent the gate from starting in either direction. If tripped while in motion, the standard function is to pause the gate motion and then automatically restart again if the photo eye is clear within five seconds. Optional settings exist in the Installer Menu. Refer to Eye Close Logic and Eye Open Logic (EC and EO) in *Installer Menu: Table 6* on page 64 for more information.

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.

NOTE: 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.

Ideally the reflector mount suspends the reflector 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 as doing so makes it difficult to reach the reflector for future cleaning.

To create a mounting base, attach a 3-inch aluminum flange (for example, an 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:

1. While holding the reflector in your hand, slowly raise it until the beam is no longer returned and the photo eye trips.
2. Mark this maximum height.
3. Lower your hand and determine the lower limit of the infrared beam by watching for the trip point. Mark this position.
4. Repeat the same procedure for left and right at the center elevation of the beam.

When the four parameters are marked, either:

- Mount the reflector in the center of the area outlined

or

- Realign the eye for the position of the reflector.

NOTE: If the photo eye is realigned, be sure to perform the 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.

NOTE: 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 47.

Smart Touch Controller

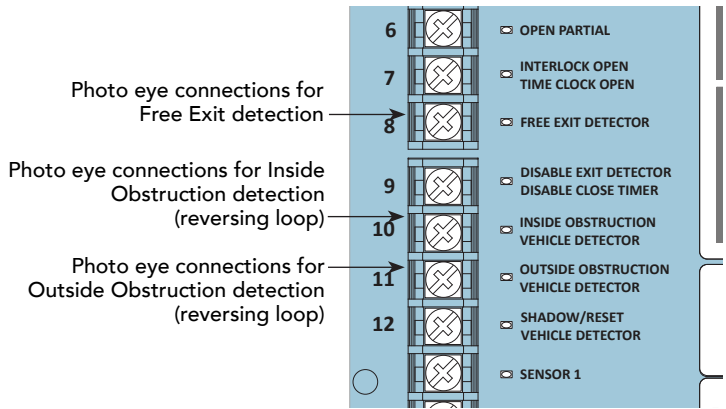


Photo Eye sensor terminal connections when PE sensors used in place of vehicle loops

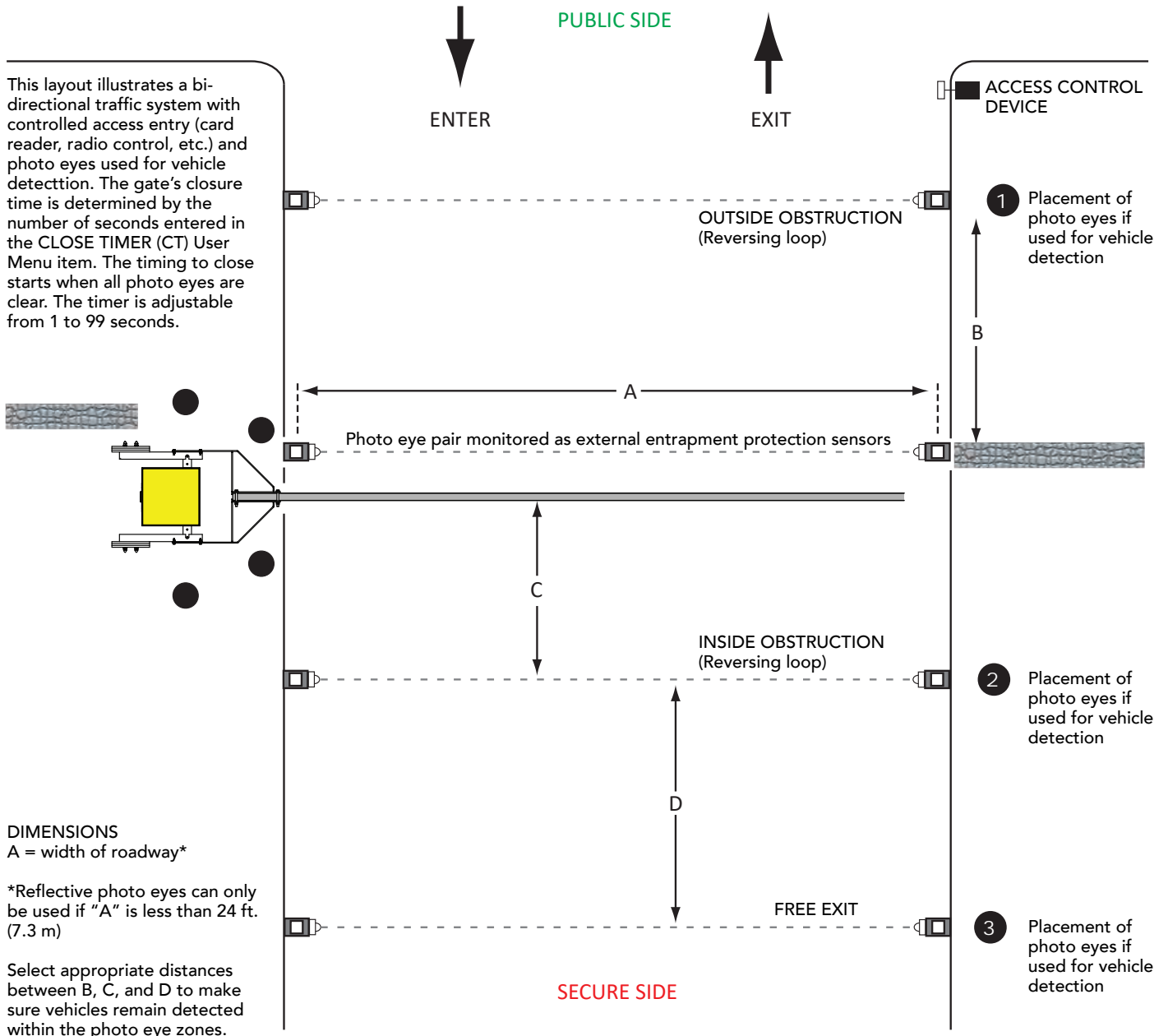
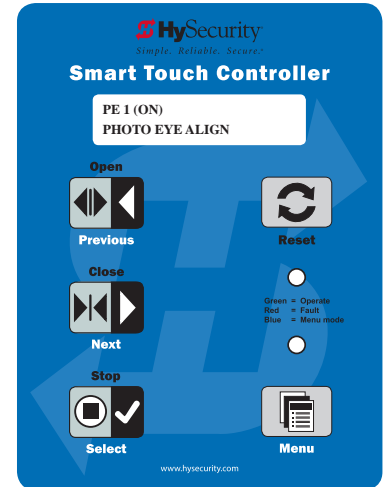


PHOTO EYE ALIGNMENT FEATURE

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.
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).

NOTE: To cover the potential entrapment areas, mount photo eyes preferably within 5 inches (13 cm) of the gate face. Refer to *Installation* on page 98. To learn how to temporarily power external entrapment protection sensors using the PE User Menu item, refer to *Supply Power to the Sensors* on page 49.

Smart Touch Controller: Menu Mode Navigation Buttons

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

Troubleshooting

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

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

Refer to *Troubleshooting Codes: Table 8* on page 105 for details concerning identification 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.



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

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 49.

SYSTEM DIAGNOSTIC MESSAGES

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

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

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

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

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 103. To check the status of all inputs on the terminal strip, the LED tact button must be pushed.

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

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

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

PROBLEM 3: The gate only opens or only closes.

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

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

1. Check that the photo eye is not blocked. If it is, remove the blockage and realign the photo eye. Refer to *Photo Eye Alignment Feature* on page 102 and *Eye Close Logic (EC)* in *Troubleshooting* on page 103.
2. If you have a battery-powered photo eye, check that the batteries are viable and the batteries are fresh.

Troubleshooting Codes: Table 8

Type	Alert/Fault/Error Display	Buzzer Chirp Sequence	Possible Cause & Suggested Corrective Action
ALERT	HYSECURITY Entrapment Mode ENTR	2 chirps per second every 2s while control input is active	An IES has been tripped twice within a specific period of time. Check the gate site for obstructions and clear the gate area. To return to run mode operation, press the Reset button.
ALERT	HYSECURITY Safe Mode SAFE	2 chirps once when in Safe Mode	A gate "edge" or IES has been tripped or the operator has exited entrapment mode. Refer to the description above. NOTE: Gate will operate, if it receives a RUN command.
ALERT	Low 24VDC DC BUSS < 21V	No chirps; LCD flashes for 1s every 5s	Only occurs in DC powered operators.
ALERT	Critical Low Power	No chirps; LCD steady and controls disabled	The system monitors the 24V control voltage in lieu of line voltage. Low incoming line voltage will cause low control voltage. Verify that the control transformer is connected properly, (white – not used, red for 208V, orange for 230V and blue for 460V). Refer to <i>Control Transformer Connections (Non-UPS)</i> on page 33. As the motor starts, check the line voltage with a meter that has min/max hold capability. If the line voltage drops more than 10% below nominal (187 on 208 VAC, 207 on 230 VAC, or 416 on 460 VAC) the voltage is dropping too much and must be corrected. Generally, this requires larger wire size. On 3-Phase operators, check each leg to ground to make sure it is balanced. If the line voltage is not dropping below these limits, check the 24V AC and DC power at the power supply. Voltages less than 20V indicate an overloaded or failing transformer or power supply board. Remove the loads until the fault is found.
ALERT	Dead Battery DC BUSS < 21V	3 chirps upon any operating command entry	DC operators only. Appears when the 24 VDC power drops too low, disabling the operator which helps prevent damage to the batteries from excessive discharge. Verify the AC power is present at the charger, the charger is on and charging (Red LED is illuminated). The charger should shut off (Green LED) when the batteries charge to 29.0 VDC. If the batteries cannot "hold a charge" replace them.
ALERT	No AC POWER	Chirps once whenever the gate reaches the close limit	AC power is shut off at the source (breaker) or is not connected. The operator's AC power switch is turned off or the main circuit breaker has tripped. <ul style="list-style-type: none"> • Have a licensed electrician check the wiring. • Connect AC power to the operator. • Reset circuit breaker at the electrical panel. • Reset the operator circuit breaker. • Turn AC power switch on.
ALERT	!ACTION BLOCKED PHOTO EYE CLOSE PEC	5 chirps indicating that the command cannot be initiated	Photo eye is not recognized as active. <ul style="list-style-type: none"> • Clear photo eye path • Realign photo eye. Refer to <i>Photo Eye Alignment Feature</i>. on page 102. • 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 <i>External Entrapment Protection Sensors: What the Installer Needs to Do</i> on page 27.
ALERT	!ACTION BLOCKED PHOTO EYE OPEN PEO	5 chirps indicating that the command cannot be initiated	Photo eye is not recognized as active. <ul style="list-style-type: none"> • Clear photo eye path • Realign photo eye. Refer to <i>Photo Eye Alignment Feature</i>. on page 102. • 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 <i>External Entrapment Protection Sensors: What the Installer Needs to Do</i> on page 27.

Type	Alert/Fault/Error Display	Buzzer Chirp Sequence	Possible Cause & Suggested Corrective Action
ALERT	IACTION BLOCKED GATE EDGE (Open or Close) GEO	5 chirps indicating that the command cannot be initiated	Operator received command to run open, but movement is prevented. Gate edge blocked or disconnected and causes operator to enter SAFE mode. Gate edge is not recognized as active. <ul style="list-style-type: none"> • Replace sensor batteries • If using Miller Monitored Edge Link, be aware. Issues with radio interference cause false trips. Placing the antenna high and reducing environmental "noise" is critical to proper wireless transmission. Avoid placing the receiver sets within 100 feet of each other as crosstalk may occur. Use receivers & transmitters Version 1.02 or higher. • Verify wired edges are using a gate edge converter-type module. Miller Edges must have a wire with blue tape. The 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. Refer to <i>External Entrapment Protection Sensors: What the Installer Needs to Do</i> on page 27.
ALERT	ALERT 1 Forced Open	2 pulses per second for 30s	Set FA 1 in the User Menu, to enable this option. The operator will attempt to re-close itself if forced off the close limit switch, the buzzer sounds for 30 seconds. Check for attempted unauthorized access, external pressure trying to open the gate or a mis-adjusted/failed closed limit switch.
ALERT	ALERT 2 Drift Closed	2 pulses per second for 10 seconds	Set F0 1 in the User Menu, to enable this option. If a gate should begin to drift closed it automatically reopens (for up to 4s) once it leaves the full open limit. If it is not back on the open limit at the end of 4s, an audible alert occurs. Check for mis-adjusted/failed open limit, mis-adjusted brake valve, outside pressure (wind, fallen trees) or cylinder leakage affecting drift issue.
ALERT	ALERT 3 EXCESS DRIFT	Gate drift in transit - Advisory only. The alert appears and is being prevented from re-opening.	Will self-clear after an open or close input.
ALERT	ALERT 4 THERMAL Overload	2 chirps per second every 15 seconds	The motor windings have exceeded a preset temperature generally due to excessive current. Verify: <ul style="list-style-type: none"> • The motor connections are correct for the supply voltage • Running voltage is within 10% of rated • High starting currents last 2 seconds or less; if not and voltage during start is correct, on 1Ø units you can replace the start switch/capacitor • Motor running current (all phases) is at or below rated (at normal pressures) • When the motor is cool, open the motor connection box, disconnect the 2 small wires going into the motor, and use an ohmmeter to check continuity of these wires. They should be a short circuit; if not, replace the motor.
ALERT	ALERT 5 Both Lim ACTIVE	2 chirps per second every 15 seconds	The STC is seeing both limits tripped at the same time. For HydraWedge SM50, check for a stuck limit switch or debris caught in limit switch area and repair any wiring issues. On electromechanical gate operators and StrongArmCrash, reset the limits through the Installer Menu item, LL Learn Limits.
ALERT	ALERT 6 Lim not released	2 chirps per second every 15 seconds	Is the pump developing pressure? Are the brake valves set properly? Is there hardware holding the gate? <ul style="list-style-type: none"> • Check fluid levels and brake valve settings.
ALERT	ALERT 7 Freq SHIFT FAULT	2 chirps per second every 15 seconds	HY-5A detector has detected a frequency change outside the normal range. Check the loops and the integrity of the loop installation.
ALERT	ALERT 8 LOOP SHORTED	2 chirps per second every 15 seconds	HY-5A detector has detected a short circuit in the loop. Temporarily switch detector to be sure the loop is at fault and then repair it.
ALERT	ALERT 9 LOOP OPEN	2 chirps per second every 15 seconds	HY-5A detector has sensed that the loop has become an open circuit. Check all connections and/or use an ohmmeter to find out where the break is.
ALERT	ALERT 10 I2C BUS ERROR	2 chirps per second every 15 seconds	Communication issue between the HY-5A and the Smart Touch Controller; reset and try again. Replace the HY-5A if the problem continues.

Type	Alert/Fault/Error Display	Buzzer Chirp Sequence	Possible Cause & Suggested Corrective Action
ALERT	ALERT 11 DETECTOR FAULT	2 chirps per second every 15 seconds	Unknown fault; perform the megaohm test and fix the loop if necessary. Replace the HY-5A if the problem continues.
ALERT	ALERT 12 ON TOO LONG	2 chirps per second every 15 seconds	The detector believes there has been a vehicle on the loop for more than 5 minutes. <ul style="list-style-type: none"> • Is there something metal on (or near) the loop? • Is the sensitivity adjustment set too high? • Is the roadway solid? If the underground loop moves it will give false readings. • There may be a problem with the loop itself. Check with a megohm meter. New loops should read 100 mega-ohms or better, between 50 and 100 operation are generally OK, below 50 mega-ohms install a new loop.
ALERT	ALERT 13 STIFF GATE	2 chirps per second every 15 seconds	The STC detects a gate that, over time, is requiring more power to move it. Usually caused by degrading gate hardware or debris in a slide gate track. This alert appears in the history log. It does not affect opening or closing the gate. <ul style="list-style-type: none"> • Check and correct gate hardware as required. • Check motor brushes for excessive wear.
ALERT	ALERT 14 STUCK GATE	2 chirps per second every 15 seconds	The STC detects that it cannot move the gate because of possible broken gate hardware or ice/snow buildup. <ul style="list-style-type: none"> • Manually move the gate. Verify that it moves easily and is unobstructed throughout gate travel. • Check and correct gate hardware, as required.
ALERT	ALERT 17 BAD COIN BATTERY	2 chirps per second every 15 seconds	Turn off AC power and replace the 3V coin battery that controls the internal clock. Use a CR2032 coin battery.
ALERT	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. NOTE: The buzzer will chirp every minute until the UPS batteries are replaced.
ALERT	ALERT 19 FALSE SLOWDOWN	2 chirps per second every 15 seconds	Appears only on gate operators with VFD. Slowdown switch tripped and released (less than 1 second) in middle of run. Check for loose wires, limits and misaligned rails or limit ramps.
ALERT	ALERT 20 EXT LOCK FAILED	2 chirps per second every 15 seconds	An interlock contact is closed, indicating that the gate latch (lock) is engaged, preventing the operator from starting. Check the interlock terminal and wiring.
ALERT	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.
ALERT	ALERT 22 INTLOCK FAILURE	2 chirps per second every 3 seconds	Appears when the RS-485 communication connection is lost for more than 5s between interlocked (dual gate) or sequenced gate operators. Check cable connections and wiring. Make sure both operators are working properly and have compatible software versions. The alert auto clears when communication between the two operators is restored. If the operator on site is a singular gate and the display code ALERT 22 appears, access the Installer Menu. Verify the Installer Menu items: DG (Dual gate) and SG (Sequential gate) are both set to zero.

Type	Alert/Fault/Error Display	Buzzer Chirp Sequence	Possible Cause & Suggested Corrective Action
ALERT	ALERT 24 EXT RELAY FAULT	2 chirps per second every 15 seconds	The Hy8Relay (extended relay module) is not being recognized. Alert noted in diagnostic log. Check the wiring: <ul style="list-style-type: none"> • 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	ALERT 25 LOW COIN BATT (HyNet)	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.
ALERT	ALERT 26 LIM NOT REACHED	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.
ALERT	ALERT 27 ACCUMULATOR LOW	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 is low, 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.
ELD OOLD IOLD SLD RLD	"Vehicle Loop Detectors"		Appears in sequence with another display code which pertains to the loop issue. Refer to the other display code for more information. ELD = Exit Loop Detector OOLD = Outside Obstruction Loop Detector IOLD = Inside Obstruction Loop Detector SLD = Shadow Loop Detector RLD = Reset Loop Detector
FAULT	FAULT 1 MOTOR RUN TIME	1 chirp once every 15 seconds	The STC has detected the motor is on longer than the maximum run time selected. <ul style="list-style-type: none"> • Check and replace drive belt on applicable gate operators. • Increase Max Run Timer in the Installer Menu.
FAULT	FAULT 2 PHOTO EYE FAL2	2 chirps per second once per minute	"Monitored" means the Controller must see the photo eye N.C. contact change from open to close after receiving the command to run, but before starting the motor. FAULT 2 indicates the controller did not see this sequence when the gate received a run command. Check the wiring. Refer to the wiring diagram associated with the attached sensor. See <i>Wiring HySecurity Sensors: Smart Touch</i> on page 119. Be sure the eye "common" wire is properly connected to the SENSOR COM terminal.
FAULT	FAULT 3 LOW VOLTAGE SAG	2 chirps per second once per minute	The 24V control voltage is monitored in lieu of line voltage. Low incoming line voltage will cause low control voltage. Verify that the control transformer is connected properly, (white – not used, red for 208V, orange for 230V and blue for 460V). Check the line voltage as the motor starts with a meter that has min/max hold capability. If the line voltage drops more than 10% below nominal (187 on 208VAC, 207 on 230VAC, or 416 on 460VAC) the voltage is dropping too low and must be corrected. This condition is often caused by loose connections or the wire size being too small. If the wire is too small, it must be replaced.

Type	Alert/Fault/Error Display	Buzzer Chirp Sequence	Possible Cause & Suggested Corrective Action
FAULT	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. <ul style="list-style-type: none"> • 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	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.
ERROR	ERROR 1 Direction Error	3 chirps per second once per minute	Close Limit tripped after running Open or Open Limit tripped after running Closed. Assess cables and wire connections. <ul style="list-style-type: none"> • Make sure wires are connected to the proper terminals. Make sure gate handing is appropriate. • Swap connections of hydraulic hoses, if necessary.
ERROR	ERROR 2 IES Disconnect	3 chirps per second once per minute	<ul style="list-style-type: none"> • 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 h4.53 or h5.54 (or higher). • If necessary, update the software using a PC laptop and S.T.A.R.T. Register and login in at www.hysecurity.com
ERROR	ERROR 3 HY5A COMM ERROR	3 chirps per second once per minute	One or more detectors are not communicating properly. Remove detectors, reset the controller, and re-install detectors one at a time until faulty detector or loop is found.
ERROR	ERROR 4 DUAL GATE	3 chirps per second once per minute	Indicates a problem with the communication between the two gate operators in a bi-parting (primary/secondary) gate system. Check the software versions by pressing Reset or cycling power. The version number flashes on the display (examples, h4.54 or h5.56). The software versions on the Primary and Secondary gate should be the same. If not, upload current software version using S.T.A.R.T. and a PC laptop computer. <ul style="list-style-type: none"> • Verify the Installer Menu item DG (DUAL GATE) is set to DG2 in Primary and set to DG1 in Secondary gate operator. • Make sure the wires are twisted and shielded. Refer to <i>Dual Gate Wiring Connections</i> on page 84. • Be sure the low voltage wire runs, which include the bi-parting gate communication wires, are separate from any high voltage wires runs. Interference occurs if wire runs are mixed or too close to each other. The error automatically clears when the communication fault is resolved.
ERROR	ERROR 6 DRIVE BOARD	3 chirps per second once per minute	Internal error between the STC board and the VFD. Check cable connections and wiring. Make sure both units are working properly.
ERROR	ERROR 7 MENU CHECKSUM ERR7	3 chirps per second once per minute	Contact HySecurity.
ERROR	ERROR 8 RPM SENSOR	3 chirps per second once per minute	Check wiring from the hydraulic cylinder to the STC.
ERROR	ERROR 9 BATT DISCONNECT	3 chirps per second once per minute	Only applies to DC Power Supply connection. Contact HySecurity.

Type	Alert/Fault/Error Display	Buzzer Chirp Sequence	Possible Cause & Suggested Corrective Action
ERROR	ERROR 10 SLOWDOWN SWITCH	3 chirps per second once per minute	VFD only. The operator tripped the fully Open or Close limit before the Slowdown limit tripped. Check: <ul style="list-style-type: none"> • Slowdown limit wiring and adjustment • Adjustment of the limit ramps to verify that the limit switch is being tripped. Manually trip the slowdown limit. OPEN SLOWDOWN or CLOSE SLOWDOWN should appear on the display which indicates that it is working properly.
FAIL	FAIL PROGRAM DATA ERR F A I L	3 chirps per second once per minute	<ul style="list-style-type: none"> • 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

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

NOTE: Hold down Next or Prev to scroll quickly toward the top or bottom of the 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		

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



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. Refer to *Wiring HySecurity Sensors: Smart Touch* on page 119.

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.

NOTE: Primary taps do not exist on battery operators.

4. Verify the 24VAC is present at the Red and Green wires from the control transformer to the Power 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 29. 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 *Troubleshooting Codes: Table 8* on page 105 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 115.

On site gate movement issues can usually be resolved in the short term by manually moving the gate open and close. Refer to *Manual Release: Manual Bypass Valve*. 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.



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

NOTE: 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.

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

General Maintenance

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

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

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



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

What You Need

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

- Laptop computer with Windows PC operating system (XP, Vista, Win7, Win8, or Win 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 S.T.A.R.T. User Manual, and then take the following steps to download S.T.A.R.T. software:



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

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

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

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

SOFTWARE MAINTENANCE

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

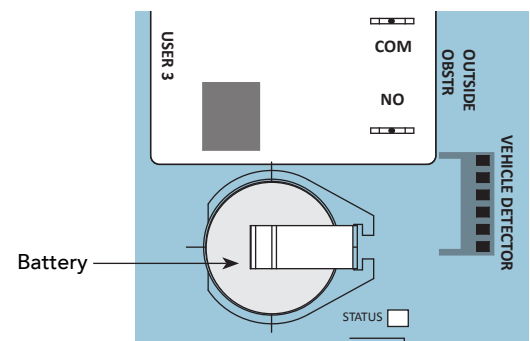
ELECTRICAL CONTROLS

NOTICE: Before servicing, turn off all power switches.

No routine maintenance is needed for the electrical system or controls. If the environment is very sandy or dusty, or has many insects, be certain to seal all holes in the electrical enclosure. Blow the dust out of the electric panel with compressed air. Use the *Troubleshooting Codes: Table 8* on page 105 to assess and fix error, alert, and fault codes. If it is necessary to call a distributor for assistance, be sure to have your model and serial number ready. Other helpful information includes the name of the job, approximate date of installation, and the service record of the operator, especially if any work has been done recently.

Clock Battery Replacement

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



MECHANICAL CONTROLS

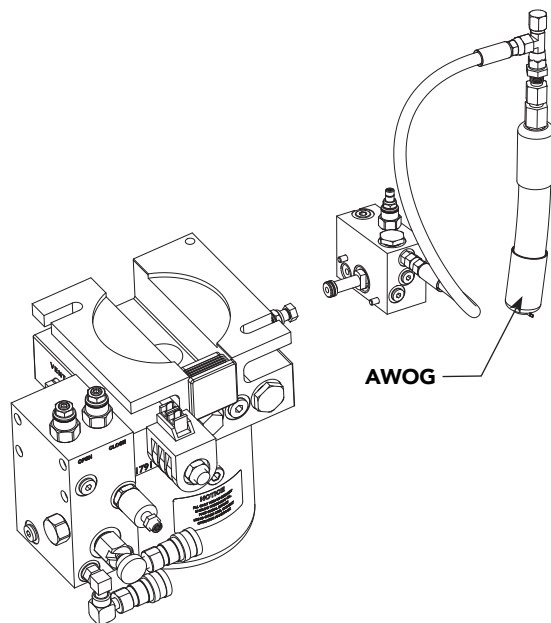
Stopping the Gate

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

Starting the Gate

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

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



MECHANICAL MAINTENANCE

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

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

Schedule regular maintenance:

- ❑ Check for signs of rust. The operator chassis is zinc plated which is corrosion-resistant, but some environments may increase the rate of corrosion. If any areas of rust are found, reduce the spread of corrosion by treating the areas with a rust inhibitor.
- ❑ Grease the hydraulic cylinder every 50,000 cycles. Use NLGI #2 Grade Moly EP (Extreme Pressure) lithium base grease only and apply it with a standard grease gun. Grease other main shaft bearings every 100,000 cycles.
- ❑ Check the motor. DC motors contain carbon brushes which wear over time and must be replaced. Failure to replace the brushes will result in damage to the DC motor. Brushes should be inspected every year in high usage applications or every 100,000 cycles and replaced as needed.
- ❑ Replace worn-out batteries. Refer to *Clock Battery Replacement* on page 114.

eliminated which reduces drive wheel wear and drag in misaligned gate installations. Additionally, the no-

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. Use a funnel to fill to within ½ inch of the plug level. 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.

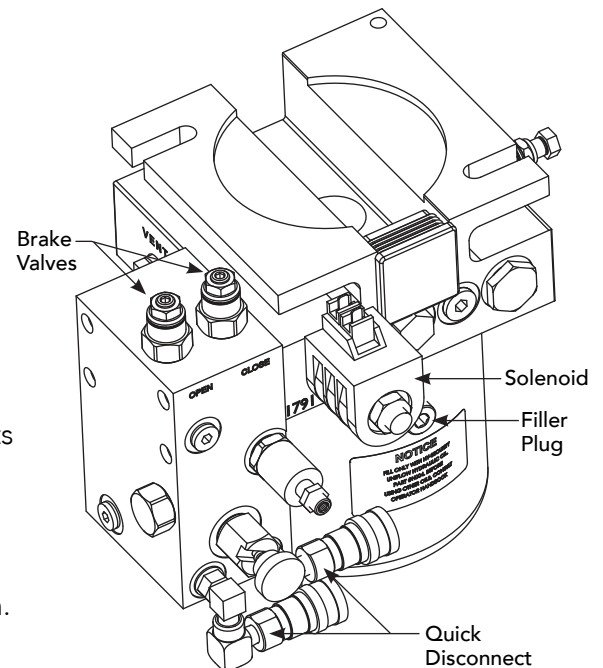
To change the hydraulic fluid,

1. Remove the reservoir from the pump pack.
2. Completely empty it.
3. Wipe the reservoir clean and clean the debris screen.
4. Re-assemble the pump unit and refill it with new Uniflow hydraulic fluid.
5. To avoid overfilling, slowly pour the fluid through the filler port near the reservoir's top until the fluid is within ½ inch of the port's opening.
6. Replace the plug and wipe up any spilled fluid. Spilled fluid dries to a sticky and messy consistency.

Cold Weather Issues:

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

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



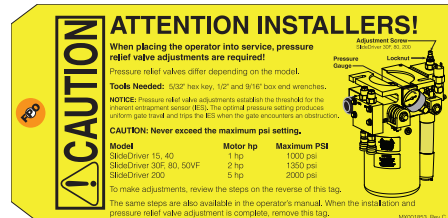
Brake Valve Adjustments

Proper adjustment of the brake valves is important for smooth operation of the gate.

See *Adjusting Brake Valve* on page 42.

Pressure Relief Valve Adjustments

The Pressure Relief Valve governs the maximum system hydraulic pressure. It is located on the backside of the pump. The pressure relief valve is factory set and may need to be adjusted depending on the gate weight. See *Adjust Pressure Relief Valve* on page 42 or refer to the yellow tag wire tied to the unit and follow the instructions.



Open Valve

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

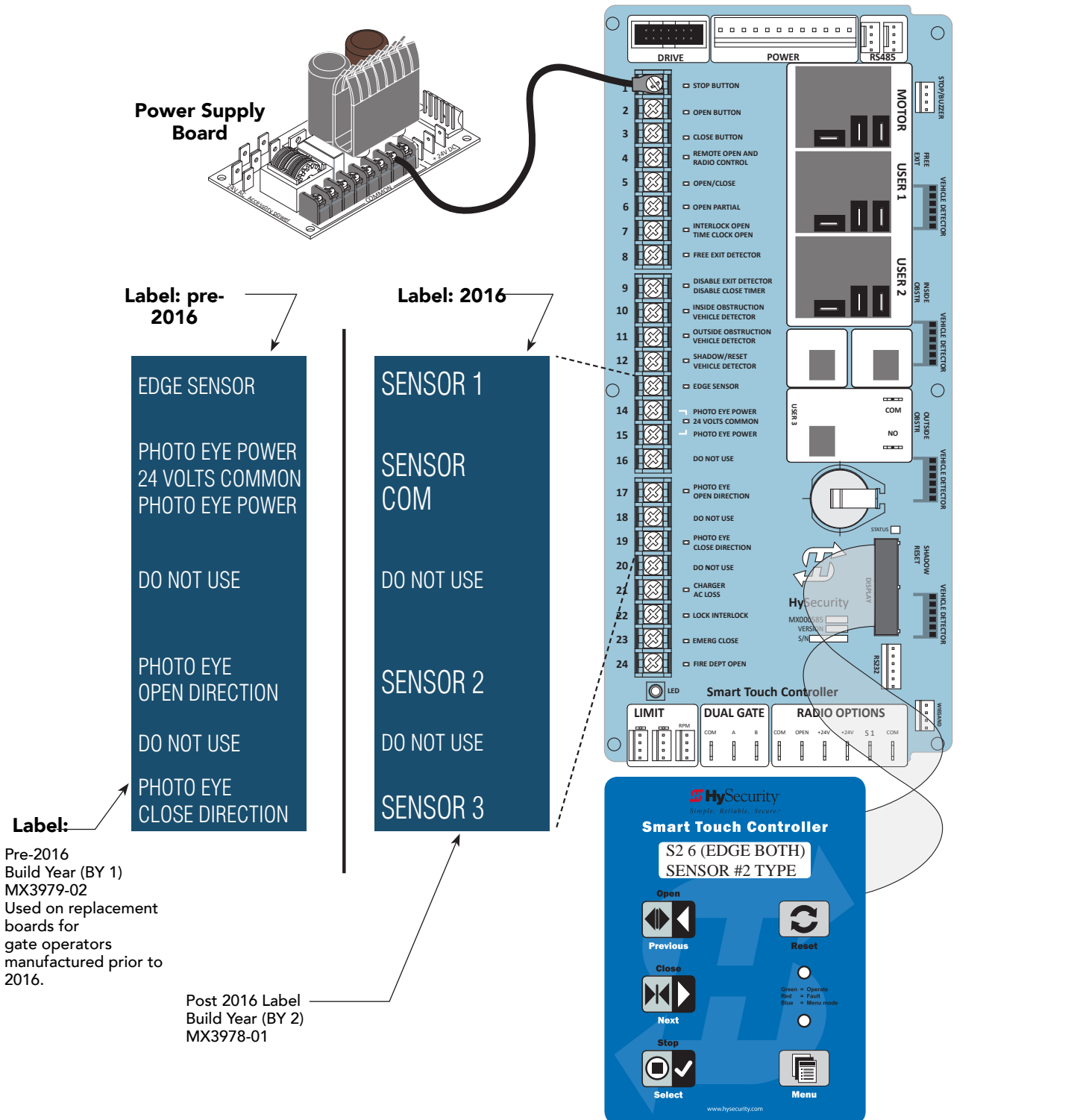
STRONGARM OPERATOR MAINTENANCE NOTES

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

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 - 2015 Standard of Safety using software version h4.50 (or higher).

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](#).

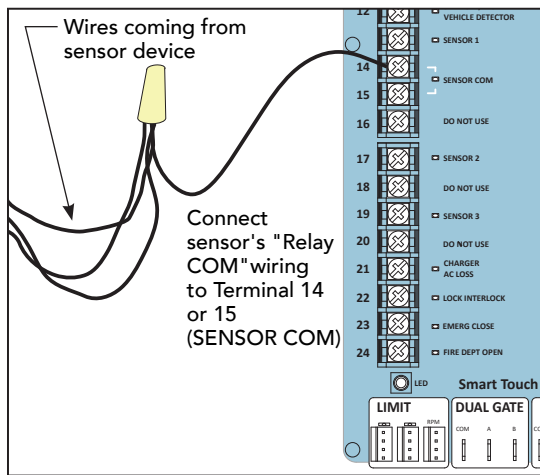


WIRING TIPS FOR SENSOR COM TERMINAL: SMART TOUCH

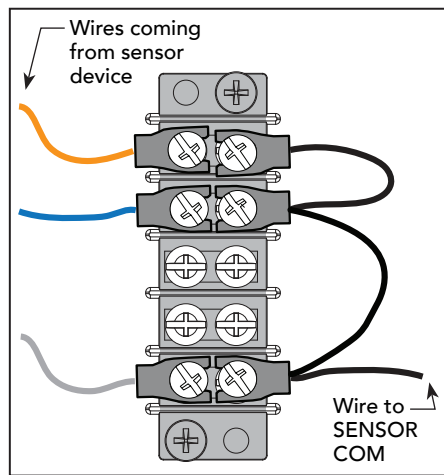
Two SENSOR COM terminals exist (Terminal 14 and Terminal 15). If using multiple sensor devices, use a wire nut as a junction and pigtail to SENSOR COM. Or, install a separate terminal block and jumper outputs to one lead for either SENSOR COM terminal.



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.



Wire nut and pigtail to SENSOR COM



Add terminal block

NOTE: LEDs next to the sensor connections will be lit when NO POWER is being applied. To temporarily supply power to the sensors. Refer to *Photo Eye Alignment Feature* on page 102. 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. Refer to *Supply Power to the Sensors* on page 49.

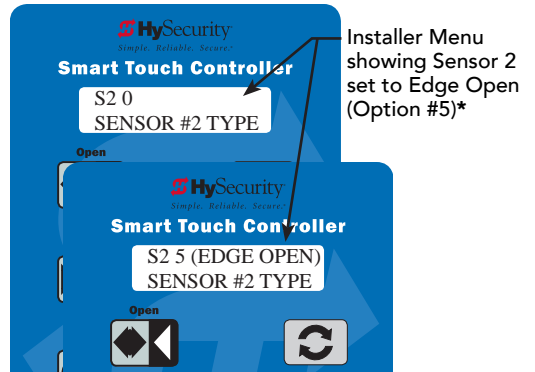
MENU MODE NAVIGATIONAL TIPS

The buttons on the display keypad perform certain functions while in Menu Mode. Refer to the chart.

To change 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 or Previous . Continue pressing Next to view all selections.	Press Select . Blinking characters become static.	Press Next or Previous . Advance - press Next Previous - press Previous

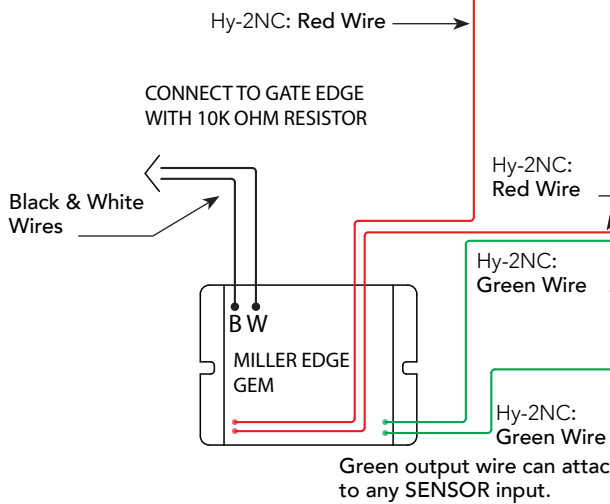
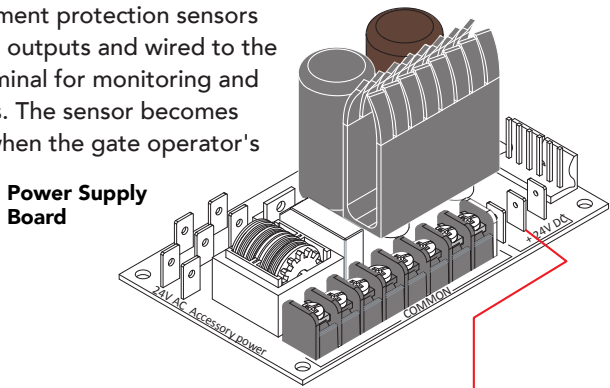
SMART TOUCH: WIRED EDGE SENSOR WITH HY-2NC

1. Turn OFF power.
2. Connect the Green NC relay wire from Hy-2NC to Sensor 1, 2, or 3.
3. Connect Red & Green wires from Hy-2NC to SENSOR COM on Controller (or Power Supply Board, STC).
4. Connect Red wire from Hy-2NC to +24V on Controller (or Power Supply Board, STC).
5. Connect Black & White wire from Hy-2NC to 10K resistor in edge sensor.
6. Turn ON power and access the Installer Menu. Configure SENSOR setting accordingly (i.e. Edge Open, Edge Close, or Edge Both). Refer to *Table 4: HySecurity Gate Operators maintaining Object Detection* on page 29.

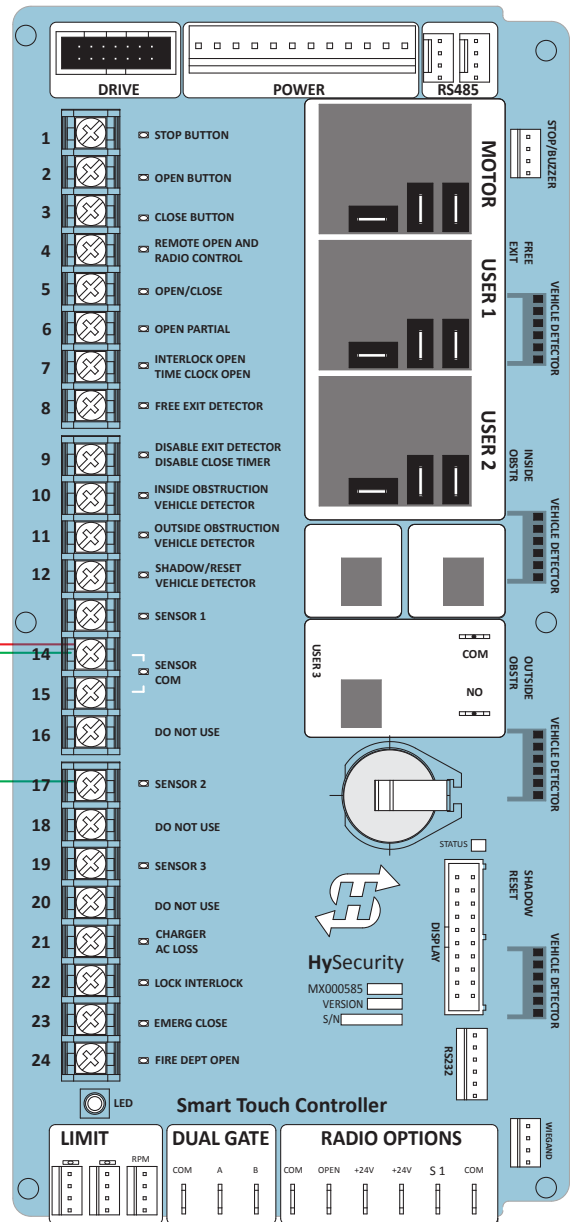


All external entrapment protection sensors must be NC sensor outputs and wired to the SENSOR COM terminal for monitoring and powering purposes. The sensor becomes actively powered when the gate operator's motor runs.

Power Supply Board



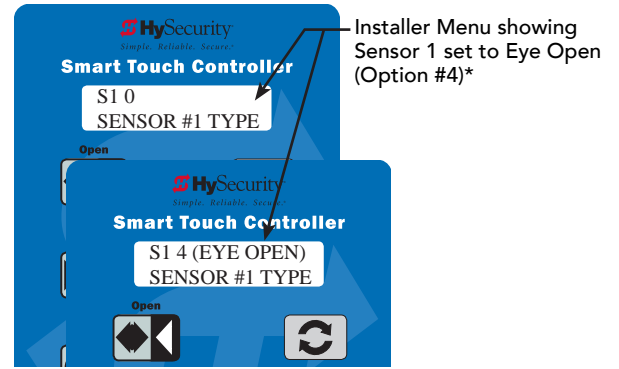
***NOTE:** Make sure whichever wired input used (SENSOR 1, 2, or 3) is the same Sensor # configured through the Installer Menu.



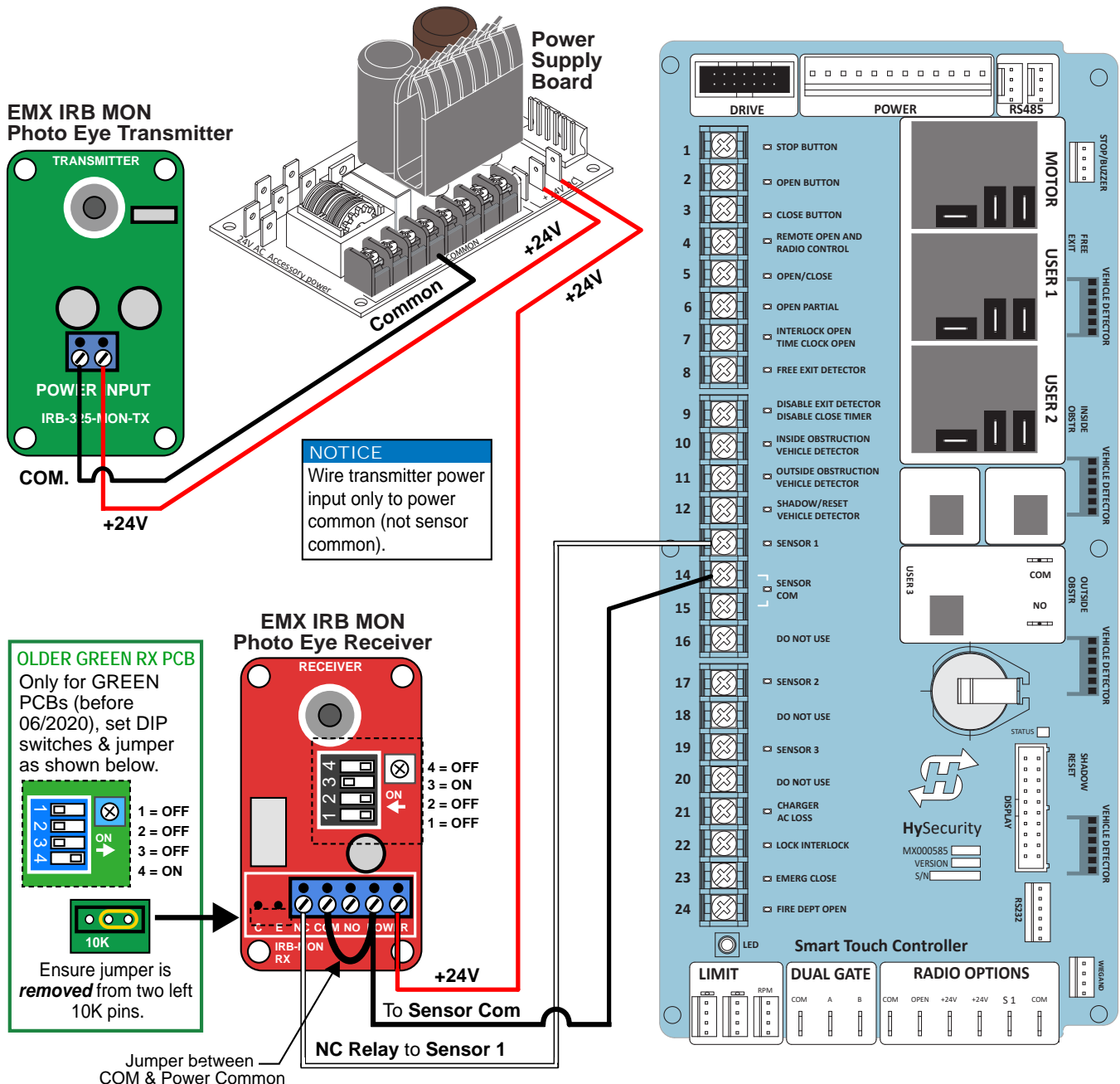
SMART TOUCH: PHOTO EYE THRU BEAM (EMX IRB MON)

1. Connect photo eye wiring.
NOTE: Run a jumper between photo eye -24V (POWER INPUT) and COM terminals on the Receiver.
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 29.

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

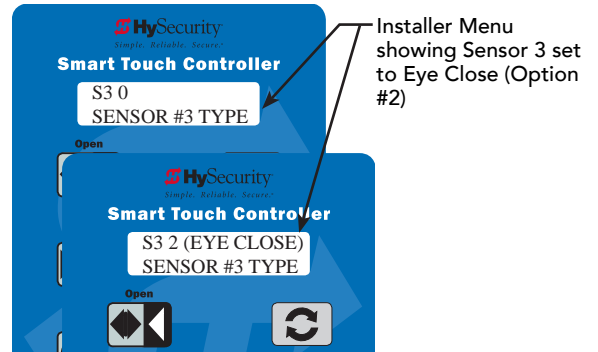


NOTICE
 DIP switches must be set as shown, otherwise the photo eye will not operate correctly. Note that older green receiver PCBs are set differently from the newer red PCBs. If you receive an Alert, "ACTION BLOCKED" "Photo Eye Open" PEO or "Photo Eye Close" PEC, take steps to align the photo eye. See Photo Eye Alignment Feature on

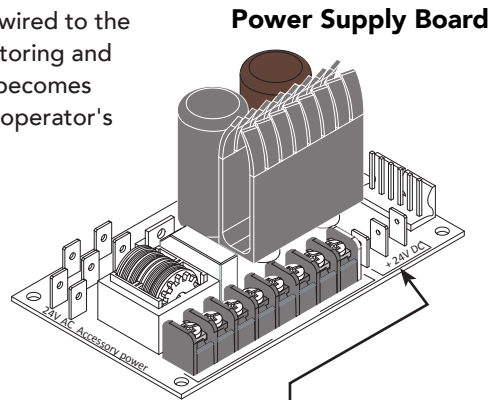


SMART TOUCH: PHOTO EYE / REFLECTIVE (E3K R10K4)

1. Set Photo Eye switch to LIGHT ON. See NOTE.
2. Connect photo eye wiring.
NOTE: Run a jumper between photo eye -24V and Relay COM (C2) terminals. See photo.
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 29.



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.



Omron (E3K R10K4)

Reflective Photo Eye

NOTE: Light/Dark switch must be set to LIGHT ON.



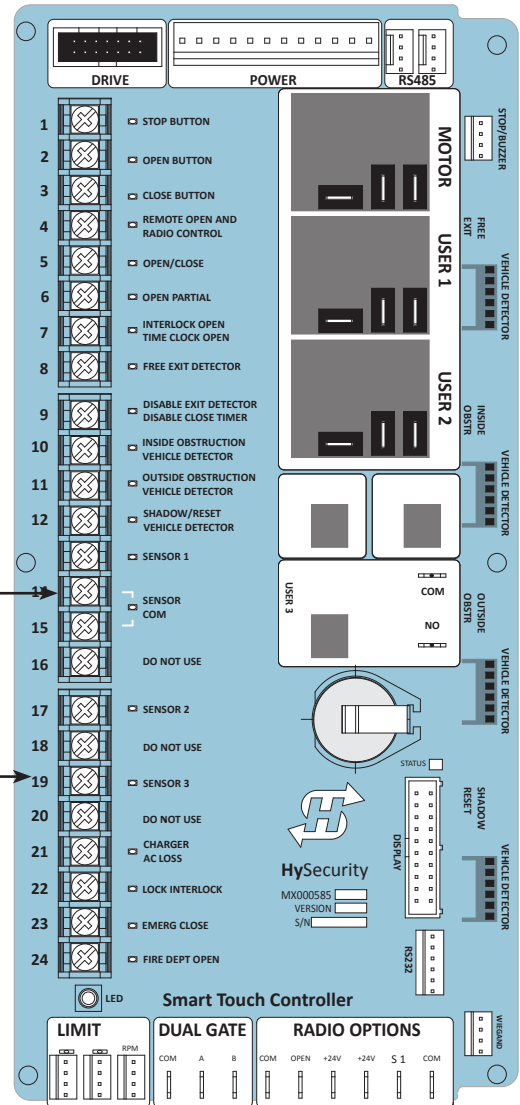
Do NOT connect the 10K resistor to HySecurity gate operators. Follow the instructions on this sheet to avoid FAULT 2.

+24V

Jumper -24V to Relay COM (Terminal 6, C2)

Relay NO (Terminal 5, NO2)

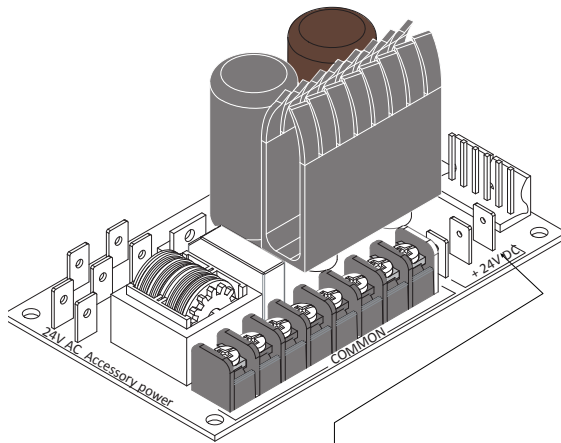
COMMON / NEG. to SENSOR COM



NOTE: If you receive an Alert, "!ACTION BLOCKED" "Photo Eye Open" PEO or "Photo Eye Close" PEC, take steps to align the photo eye. Refer to Photo Eye Alignment Feature on page 102.

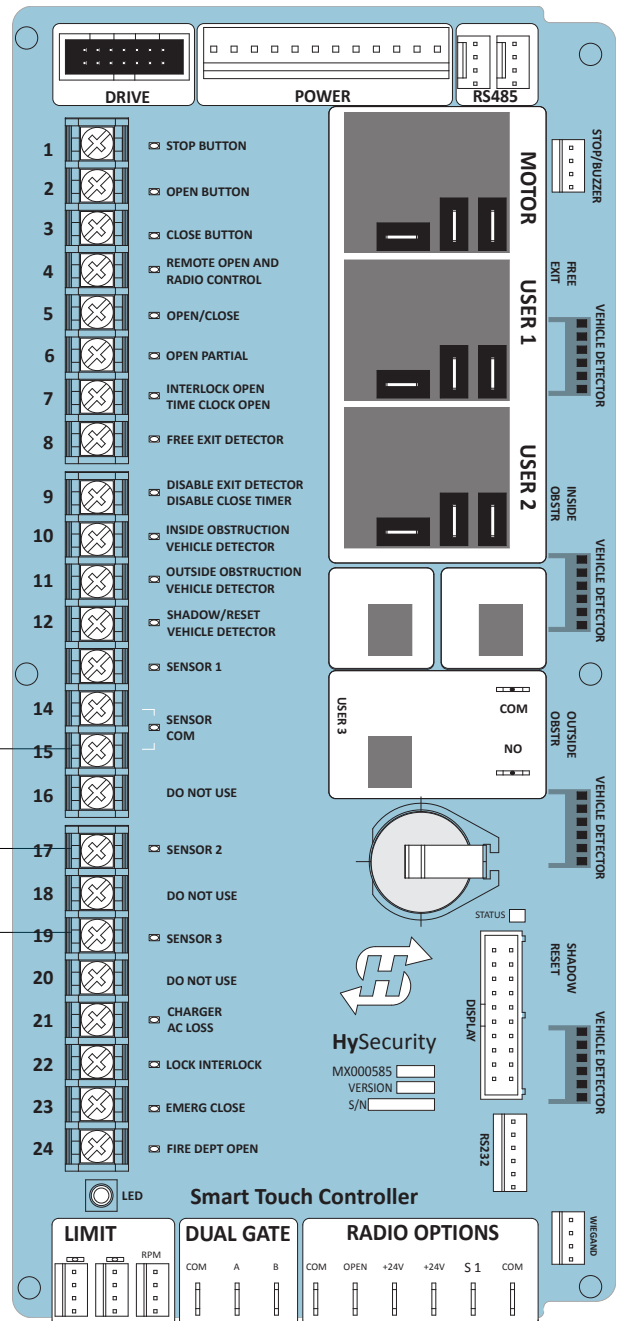
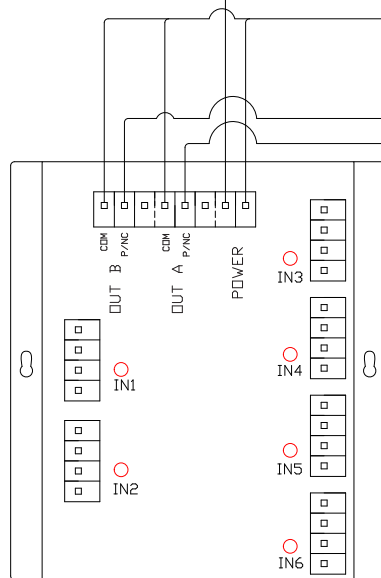
SMART TOUCH: THE SOLUTION, MIM-62 (MULTI-INPUT MODULE)

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.
NOTE: 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.



Power Supply Board

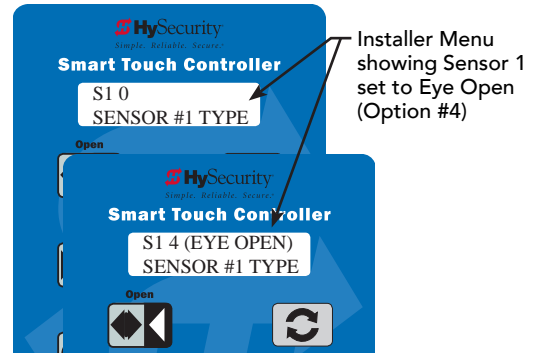
Connect either output (P/NC wire) to SENSOR 1, 2, or 3.



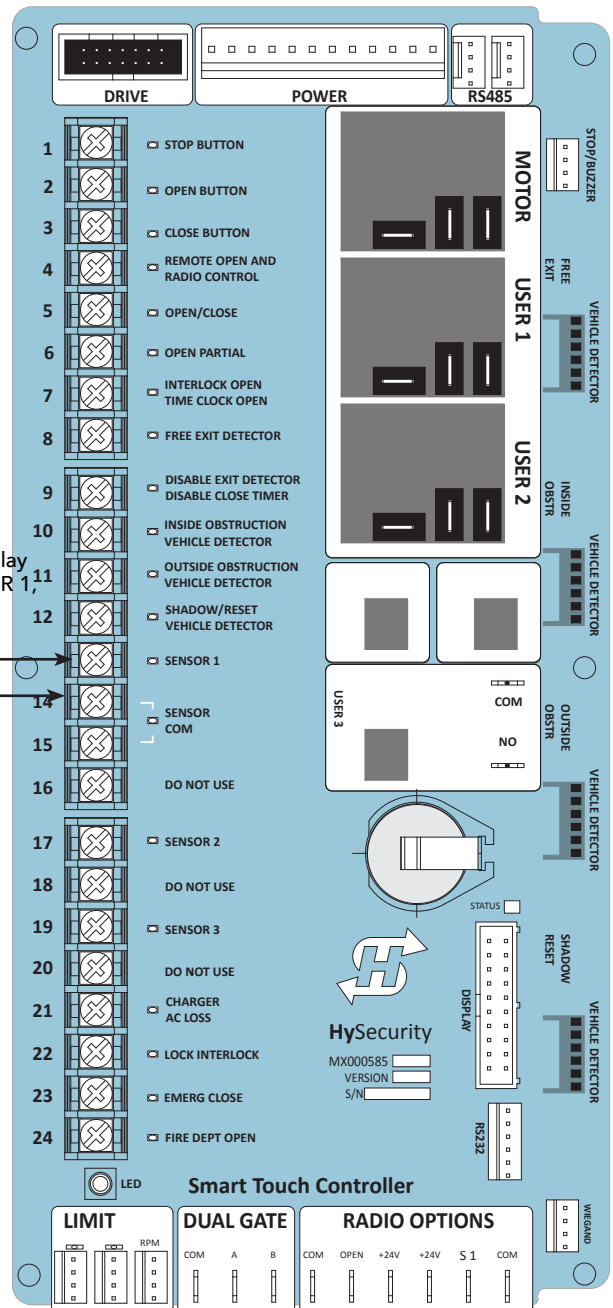
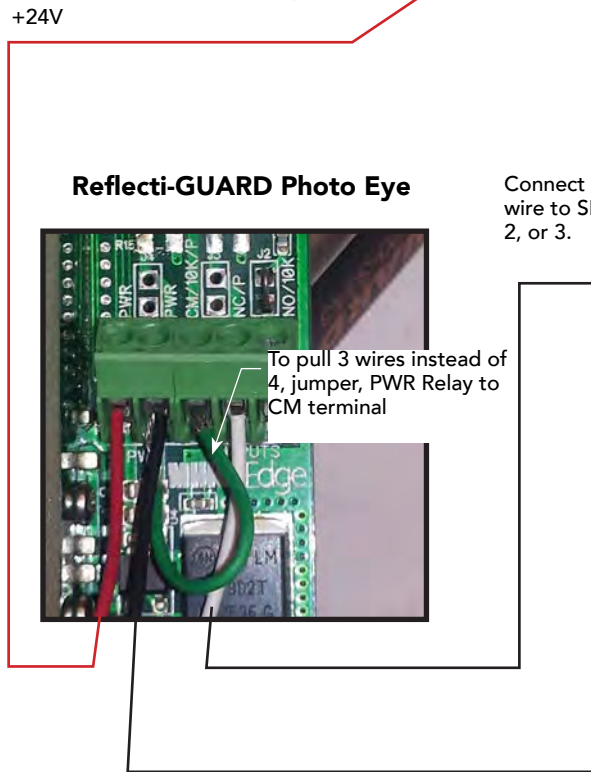
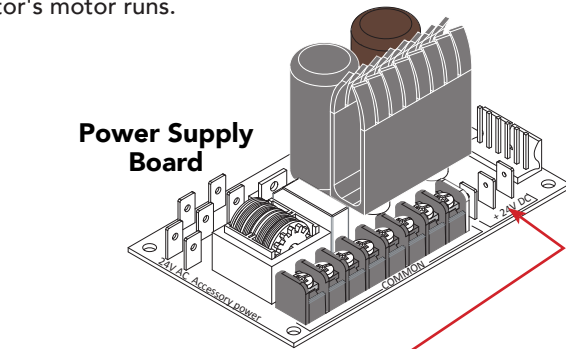
All external entrapment protection sensors must be NC sensor outputs and wired to the SENSOR COM terminal for monitoring and powering purposes. The sensor becomes actively powered when the gate operator's motor runs.

SMART TOUCH: PHOTO EYE / REFLECTI-GUARD (RG-R)

1. Connect photo eye wiring.
NOTE: Run a jumper between photo eye -24V and CM terminals.
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 29.



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.



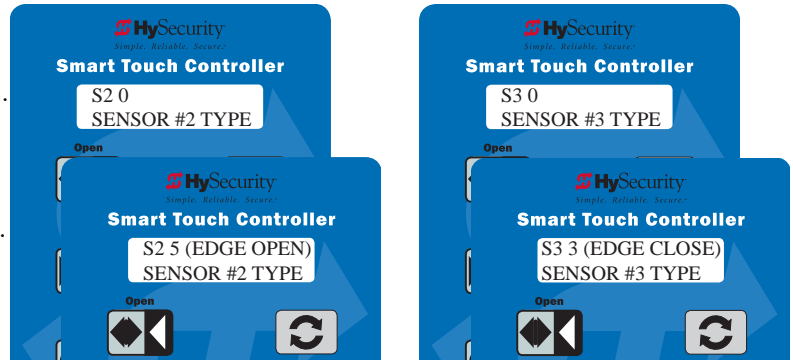
NOTE: If you receive an Alert, "!ACTION BLOCKED" "Photo Eye Open" PEO or "Photo Eye Close" PEC, take steps to align the photo eye. Refer to *Photo Eye Alignment Feature* on page 102.

SMART TOUCH: WIRELESS EDGE, WIRELESS GATE LINK

A transmitter (MGL-TX20) and receiver (MGL-RX20) are required.

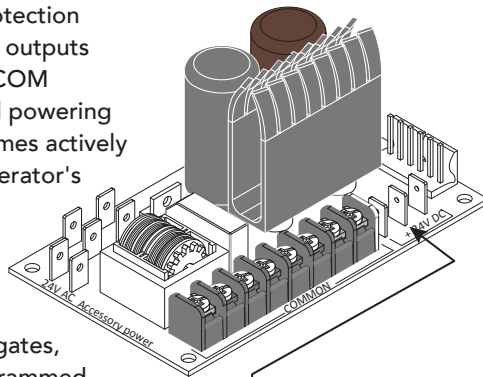
1. Turn OFF power.
2. Connect the wiring per the diagram shown.
3. Turn ON power and access the Installer Menu.
4. Configure SENSOR setting accordingly (i.e. Edge Open, Edge Close, or Edge Both). Refer to table on page 29.

Installer Menu showing SENSOR 2 set to EDGE OPEN (Option #5) and SENSOR 3 set to **EDGE CLOSE (Option #3)**



Power Supply Board

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.

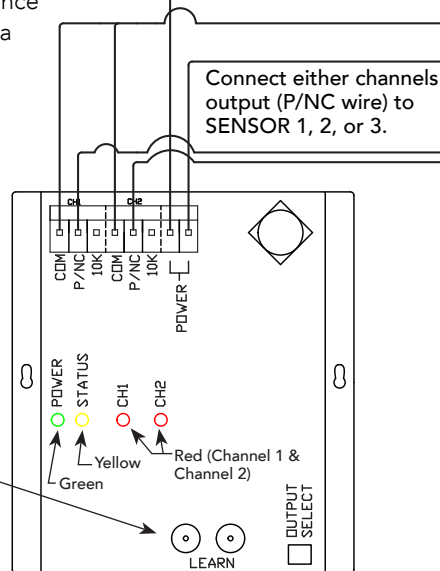


NOTE: In bi-parting swing gates, CH1 and CH2 may be programmed to the same SENSOR # TYPE on one controller, but each CH must be connected to separate SENSOR inputs. Always make sure that a gate edge is installed on each bi-parting swing gate.

Be aware. Issues with radio interference cause false trips. Placing the antenna high and reducing environmental "noise" is critical to proper wireless transmission. Avoid placing the receiver sets within 100 feet of each other as crosstalk may occur.

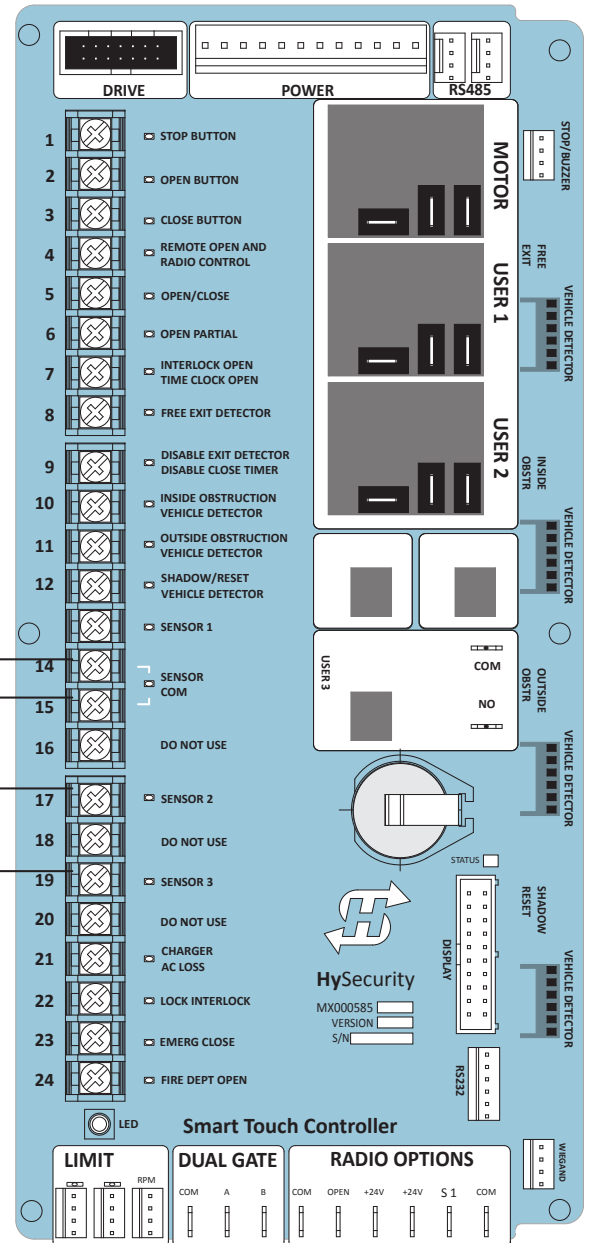
NOTE: Use Miller Gate Edges that have a wire marked with **Blue Tape**. The **Blue Tape** indicates a resistor is built in. Use receivers and transmitters, labeled Version 1.02 or higher.

Miller Edge LEARN mode. Press the LEARN button on the Receiver for 2 seconds until the amber light blinks continuously. Press the Edge or Test button on the Transmitter to complete the LEARN mode process and sync the receiver and transmitter.



Wireless Edge Link (Receiver) MGL - RX20

Signal received from battery-powered Transmitter (MGL - TX20)



SMART TOUCH: WIRED EDGE WITH GEM-104 & PHOTO EYE

The wiring diagram illustrates a wired edge sensor with GEM-104 interface module and a photo eye connection. Don't forget to set the Installer Menu settings for the Smart Touch Controller (STC). See example on the next page. Refer to *Photo Eye Alignment Feature* on page 102.

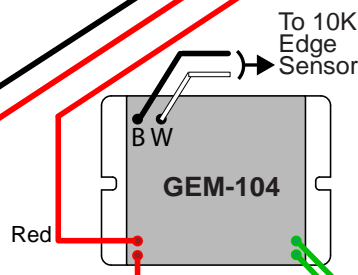
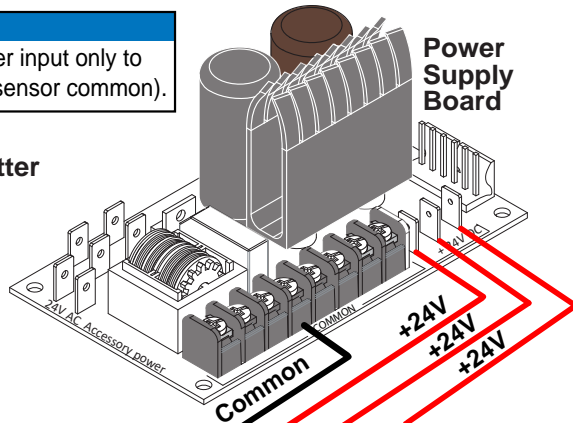
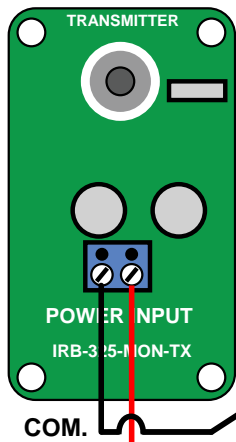
NOTICE

DIP switches must be set as shown, otherwise the photo eye will not operate correctly. Note that older green receiver PCBs are set differently from the newer red PCBs. 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 Feature on

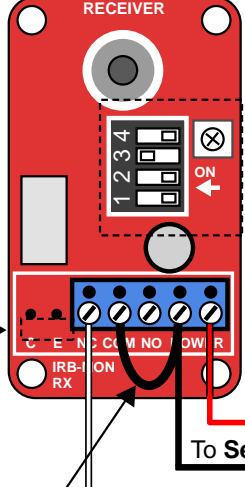
NOTICE

Wire transmitter power input only to power common (not sensor common).

EMX IRB MON Photo Eye Transmitter

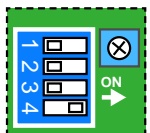


EMX IRB MON Photo Eye Receiver



OLDER GREEN RX PCB

Only for GREEN PCBs (before 06/2020), set DIP switches & jumper as shown below.



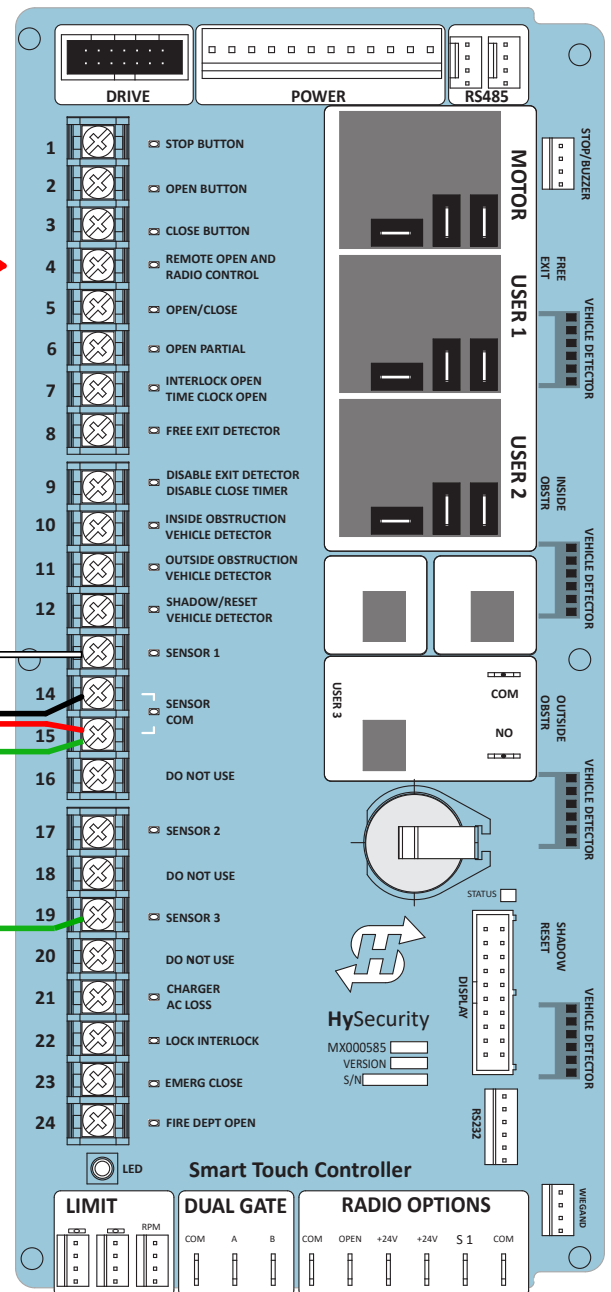
- 1 = OFF
- 2 = OFF
- 3 = OFF
- 4 = ON



Ensure jumper is removed from two left 10K pins.

Jumper between COM & Power Common

NC Relay to Sensor 1



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.

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STRONGARM INSTALLER CHECKLIST

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

1. Before checking the items in this list, make sure power is turned OFF at the main power disconnect and the operator's control box power switch is also in the OFF position.
2. Check the following:
 - Electric motor and transformer wired properly.
 - Incoming power supply voltage matches the label on the motor.
 - Gate operator barrier arm is level.
 - Operator is labeled as appropriate for both the type and UL usage class of the gate.

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

- 1 Ø 3 Ø 50 Hz 60 Hz
- DC-24V 115 VAC 208 VAC 230 VAC 480 VAC ____V
- Power cable run to the operator is of sufficient wire size to handle starting current.
- NEC/NFPA ground rod is installed.
- All wires and cables are clear of moving parts (limits, valves, power, etc.).
- Breather cap has been installed, replacing the Vent Plug in the pump.
- Oil level checked.
- All chassis bolts are tight.
- Pinch points protected.
- 6 foot (1.8 m) minimum distance to access controls.
- Pedestrian gate exists.
- Necessary loops are in place and properly connected to vehicle detectors.

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

3. Cycle test the barrier arm by pressing the CLOSE and OPEN buttons. Allow the arm to continue traveling throughout its entire range while you or your assistant check the following:
 - Gate handing is set correctly. See product literature for information on gate handing.
 - Limit switches are adjusted properly.
 - Pressure relief valve is properly set. Refer to the yellow tag inside the operator or refer to the product literature, *Adjust Pressure Relief Valve* on page 42.
4. External entrapment protection sensors, accessories, and options have been installed tested and comply with UL 325 Standard of Safety.

5. Check all those that apply:

- Free exit
- Inside Obstruction Loop
- Outside Obstruction Loop
- Open edge
- Close edge
- Open photo eye
- Close photo eye
- Stop input (1)
- Local Open (2)
- Close timer set (3)
- Radio open (4)
- IES sensor
- Fire Dept. Open
- Emergency Close
- Solenoid lock
- WARNING placards mounted on both sides of the barrier arm within sight of vehicle and pedestrian traffic per UL 325 standards.

6. Sensors programmed properly.

7. If installed, arm lights working properly.

Date: _____

Operator Serial Number: _____

Installer Name (please print): _____

End user's name (please print): _____

Site address: _____

Notes: _____

WARRANTY

1. Warranty.

HySecurity 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.

Specifications

StrongArm[®] models

	FAST	STANDARD	LONGEST ARMS		DOT
Model	StrongArm 14F	StrongArm 20	StrongArm 28	StrongArm 36	StrongArmDOT 28
Part#	HTG 320-2 ST	HTG 320-3 ST	HTG 320-6 ST	HTG 320-8 ST	HTG 320-6 DOT ST
Duty Cycle	2,000 cycles/day				
Horsepower	3/4 hp				
Drive	Hydraulic				
Open/Close Time	2 seconds to open; 3 seconds to close	3 seconds to open; 4 seconds to close	5 seconds to open; 6 seconds to close	8 seconds to open; 8 seconds to close	5 seconds to open; 6 seconds to close
Arm Length Max.*	Up to 14 ft (4.3 m)	Up to 20 ft (6 m) * Side mount available for arms up to 18 ft (5.5 m)	Up to 28 ft (8.5 m)*	Up to 36 ft (11 m)**	Up to 28 ft (8.5 m)*
Arm Design	Side mount, lighted aluminum arm with HyProtect™ breakaway arm bracket and kill switch, up to 14 ft (4.3 m)	Side mount, aluminum arm up to 18 ft (5.5 m), fiberglass arm up to 16 ft (5 m) or wood arm up to 14 ft (4.3 m). Center yoke mount, aluminum arm up to 20 ft (6 m)	Center yoke mount, aluminum arm up to 24 ft (7 m), fiberglass arm up to 16 ft (5 m), or aluminum-fiberglass arm 26+ ft (8+ m)	Center yoke mount, aluminum-fiberglass arm up to 36 ft (11 m)	Center yoke mount with breakaway arm bracket. Aluminum arms up to 24 ft (7 m) or aluminum-fiberglass arms 26 and 28 ft (8 and 8.5 m) *
Full Open Angle	90°; Arm will remain vertical when held open.			Adjustable 86° ± 2°	90°; Arm will remain vertical when held open.
Temperature Rating	-40° to 158° F (-40° to 70° C)				
1 Phase Power	115/208/230V 60 Hz, 110/220V 50 Hz †				
3 Phase Power	208/230/460V 60 Hz, 220/380V 50 Hz †				
Communication	RS-232, RS-485				
User Controls	Smart Touch Controller with 70+ configurable settings, programmed via the 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 plated with yellow powder coating				Hot dipped galvanized with stainless steel cover
ETL Listed (UL 325)	Usage Class I, II, III, IV				
Warranty	5 year w/product registration				

UPS Battery Backup Power Options***

DC Power Supply †† with HyCharger DC	StrongArm 14F UPS	StrongArm 20 UPS	StrongArm 28 UPS	StrongArm 36 UPS	StrongArmDOT 28 UPS
AC Power Supply with HyInverter AC	StrongArm 14F with HyInverter AC	StrongArm 20 with HyInverter AC	StrongArm 28 with HyInverter AC	StrongArm 36 with HyInverter AC	StrongArmDOT 28 with HyInverter AC

* Arms 20 ft (6 m) or longer require counterweights.

** Arms 30 ft (9 m) or longer require cable tensioner and arm stabilizer kit and additional counterweights.

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

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

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.