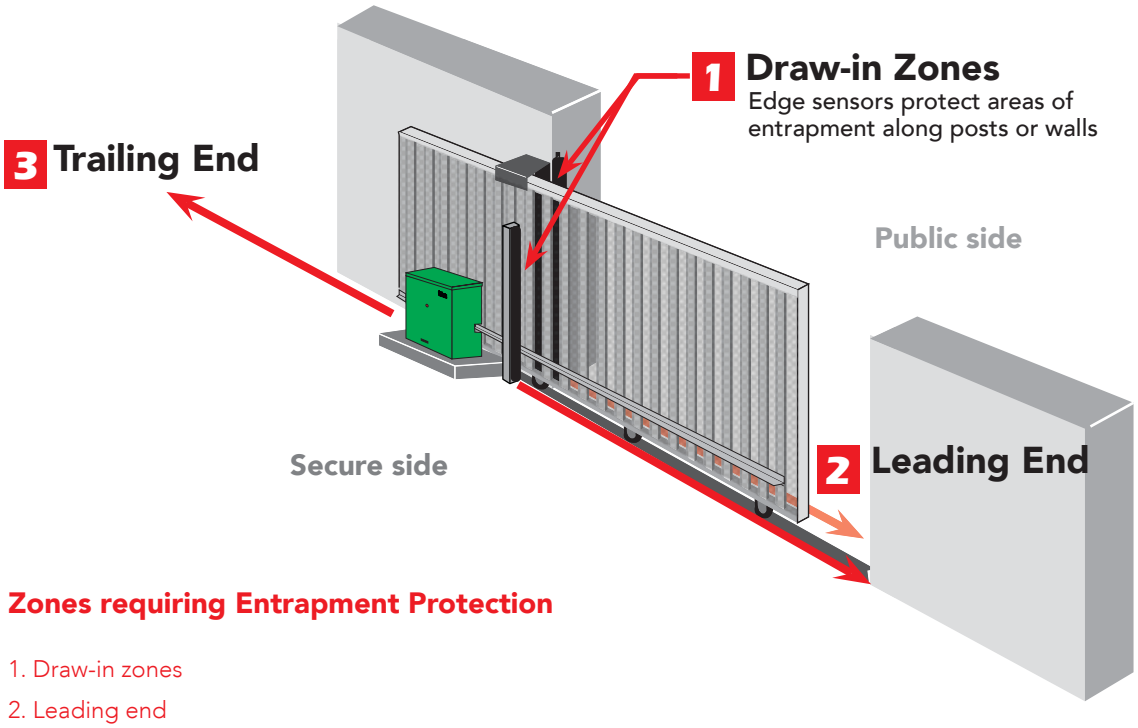
UL 325 Standard For Safety
Protection Against Entrapment

HySecurity Gate Operators
UL 325 – 2016



Zones requiring Entrapment Protection

1. Draw-in zones
2. Leading end
3. Trailing end

Quick Start - Supplement

Revision C

This document supplies *site planning scenarios and reference tables* that help explain the UL 325-2016 requirements for monitoring of external entrapment protection sensors. HySecurity is monitoring Normally Closed (NC) sensors to conform to UL 325 monitored entrapment protection requirements.

Approved sensors recommended for use with HySecurity gate operators are specified in this document.

For more information regarding UL 325-2016, refer to the HySecurity website section: www.hysecurity.com/gatesafety

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Important Safety Information

WARNING

A moving gate or barrier arm, bollard, or wedge can cause serious injury or death. It is therefore incumbent on the site designer, installer, and property owner to ensure that these hazards are mitigated and the public is warned of the existence of a potential hazard. Read all the product safety information prior to installation. Verify the gate operator is installed to comply with all safety standards and local and federal regulations and is designated for its proper usage class. For more information, refer to your gate operator's product manual.

To reduce the risk of injury or death:

1. READ AND FOLLOW ALL INSTRUCTIONS. Read the gate operator's product manual and review all the product labels and literature prior to installing, operating, or maintaining the automatic gate operator.
2. Never let children operate or play with gate controls. Keep all remote controls, especially radio transmitters, away from children. Do not allow children to play on or around the gate or gate operators.
3. Always keep people and objects away from the gate. NO ONE SHOULD CROSS THE PATH OF THE MOVING GATE. Start the gate operator only when a gate's travel path is clear.
4. Test the gate operator monthly. The gate MUST reverse on contact with a rigid object or stop when an object activates the non-contact sensors. After adjusting the force or the limit of travel, retest the gate operator. Perform routine tests of the entrapment protection sensors, such as photo eyes and edge sensors. Failure to adjust and retest the gate operator properly can increase the risk of injury or death.
5. Use the emergency release only when the gate is not moving.
6. KEEP GATES PROPERLY MAINTAINED. Read the product manuals. Have a qualified service person make repairs to gate hardware and replace batteries in accessory or entrapment protection sensory devices on a regular basis.
7. The automated gate entry is for vehicle use only. Pedestrians must use a separate entrance. Make sure a separate walk-through entrance is nearby. Make certain a clear pedestrian path is designated and signs direct pedestrians to the walk-through gate.
8. Install the supplied WARNING signs on the inside and outside of the gate or barrier gate/operator so they are clearly visible from both the secure and public sides. Installing the signs is a requirement for UL 325 compliance.
9. Use monitored sensors for protection against entrapment as specified in the current UL 325 Standard for Safety. See "General Entrapment Protection Provisions per UL 325, Table 31.1" on page 12.

NOTICE: Extensive safety information exists in the gate operator product manuals. Be aware and read all safety information, labels and signage that is shipped with your gate operator to ensure quality site design, proper set up for functional gate operation and pedestrian safety. This document is a supplement, and as such, focuses on the differences in monitoring external entrapment protection sensors and the application of external sensors. Be sure to read all the information provided with your product manuals.

Safety Information Specific to Monitored Entrapment

The following is found in HySecurity *Programming and Operations Manuals*, but re-iterated here. Before installing the gate operator:

Mount access control devices beyond reach of the gate. The control devices that operate the gate must:

- Be located in a clear line of sight to the gate. Locate controls (Open, Close, Stop/Reset) where a user will have a clear view of the gate.

  NOTE: An exception for Emergency Access Control devices exists. An EAC device accessible by authorized personnel only (e.g. fire, police, EMS), may be placed at any location within the line-of-sight.

- Be mounted beyond 6 feet (183 cm) of the gate to prevent users from touching or accessing the gate while operating the controls. People attempting to access the controls by reaching through or around the gate can be seriously injured or killed by the moving gate.
- Connect radio and other remote access (non-resetting controls) to the RADIO OPTIONS terminal.

Install an automatic operator only on gates that comply with ASTM F2200 Gate and Fence Standards and the usage class of the gate. Screen or enclose openings in the gate per UL 325 Standards for Safety which include:

- All horizontal slide gates must guard or screen openings from the gate's base support to a minimum height of 6 feet (183 cm) above the ground. This must prevent a sphere of 2¼-inches (57 mm) in diameter from passing through an opening in the gate or the adjacent fence that is covered in the gate's open position.
- All exposed pinch points are eliminated or guarded.
- Physical stops must exist in the gate construction to prevent over-travel in both directions and, for slide gates, guide posts must be installed to prevent the gate from falling in the event of a roller failure. Guarding must be supplied for exposed rollers.
- External entrapment protection sensors must be used wherever the risk of entrapment exists. Refer to page 5.

SAVE THESE INSTRUCTIONS

Contents

HySecurity Gate Operators

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

- **Normally Closed (NC) sensors** - Before gate movement occurs, the gate operator verifies that the external entrapment protection sensor is connected and fully functional.
- **Build Year (BY)** - An added menu item distinguishes between pre-2016 manufacturing dates and post-2016 manufacturing dates. Build Year (BY) is a factory-setting. Build Year 2 (BY 2) is the default for all HySecurity gate operators indicating a manufacturing date of 2016 in the serial number. Replacement controller boards for existing sites allow for a Build Year setting of 1 (BY 1) (pre-2016).
- **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 sensor configuration and normally closed outputs. See page 6.

Table 1: HySecurity Gate Operators requiring External Monitored Entrapment Protection Sensors

HySecurity Gate Operators (includes Modular, Correctional, and UPS models)	**Build Year post-2016** (set at the factory)	**UL 325 Entrapment Protection Device Monitoring Required** Normally Closed (NC) sensors tested & approved.* Three SENSOR Inputs on Controller. Installer Menu configurable.* Build Year (BY) factory-set to post-2016.
SlideDriver 15, 40, 30F, 50VF 2/3, 80, 200	2	●
SlideDriver 50VF series	2	●
SlideSmart DC 15 & DCS 15	2	●
SlideSmart DC 10F & DCS 10F	2	●
SwingRiser 14, 14-Twin, 19, 19-Twin, 30, 30-Twin	2	●
SwingSmart DC 20 & DCS 20	2	●
HydraSwing 40, 40F, 40-Twin, 40F-Twin, 80F, 150	2	●
HydraLift 10, 10F, 20, 20F	2	●

***NOTE:** Refer to tables on page 5 and page 9.

Table 2: HySecurity Gate Operators maintaining Object Detection

Table 2 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 post-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	●

Table 3: External Entrapment Protection Sensors Approved for Use with HySecurity Gate Operators

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.

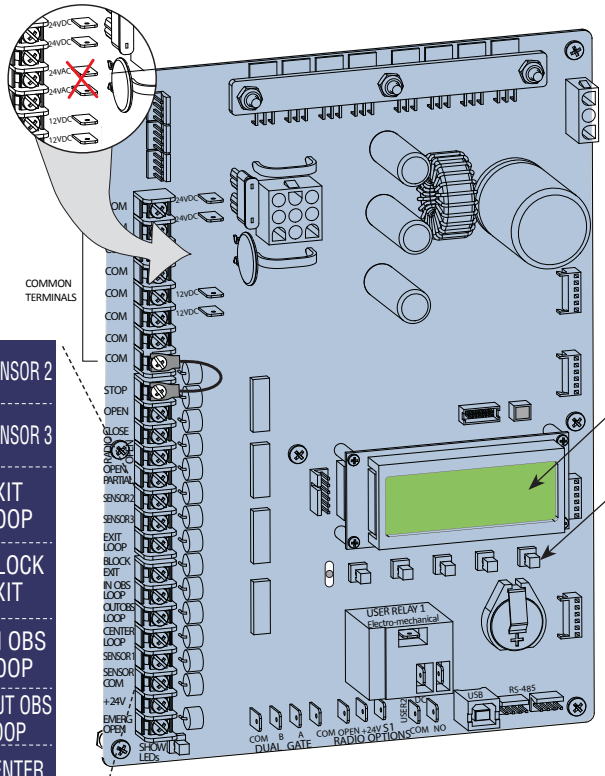
NOTE: Table 3 provides the list of sensors that are approved for use with HySecurity gate operators using the monitoring capabilities found in software versions h4.50 or h5.50 (or higher). These sensors are ETL listed or UL recognized to UL 325 and have been tested and approved by Intertek for use in HySecurity gate operators.

External Entrapment Protection Sensors: Normally Close Contact, Compatible with HySecurity Gate Operators					
P/N	**2016 Monitored Sensors**	**Sensor Type**	**Output**	**Manufacturer**	**UL 325 Recognized**
MX3981	**Wired Gate Edge Sensor** MGR20-2U-05-T2, Round	Wraparound edge (5 ft for 2" round post)	10K Resistor	Miller Edge	Type B2
MX3983	**Gate Edge Module (GEM -104)**	Edge Interface Module	Normally Closed		
MX3982	**Wired Gate Edge Sensor** MGS20-2U-05-T2, Square	Wraparound edge (5 ft for 2" square post)	10K Resistor	Miller Edge	Type B2
MX3983	**Gate Edge Module (GEM -104)**	Edge Interface Module	Normally Closed		
MX4037	**KIT: Wired Gate Edge Sensor** MGO-2E-05-T2, Square and Channel mount	Edge (3-sided activation Slide In Style) (5 ft, 1½" width)	10K Resistor	Miller Edge	Type B2
MX3983	**Gate Edge Module (GEM -104)**	Edge Interface Module	Normally Closed		
MX3985	Reflecti-Guard (RG-R)	Photo eye, reflective	Normally Closed	Miller Edge	Type B1
MX4015	**KIT: MGL-K20 (includes MX3986 and MX4013)**	Wireless Gate Link	Normally Closed	Miller Edge	Yes
MX3986	**Wireless Gate Link** MGL-TX20	Transmitter (battery-operated, radio control)	N/A	Miller Edge	Yes
MX4013	**Wireless Gate Link** MGL-RX20	Receiver (24VDC, radio control)	Normally Closed		
MX3987	The Solution, MIM-62	Multi-Input Module	Normally Closed	Miller Edge	Yes
MX3990	IRB-MON (Dist.~ 100 ft)	Thru-beam photo eye	Normally Closed	EMX Industries	Type B1
MX000846	KIT: IRB-325 (Dist.~ 50 ft)	Thru-beam photo eye	Normally Closed	EMX Industries	Type B1
MX000999	KIT: E3K-R10K4-NR-P (Dist. ~ 10 m)	Photo eye, reflective	Normally Closed	Omron	Type B1

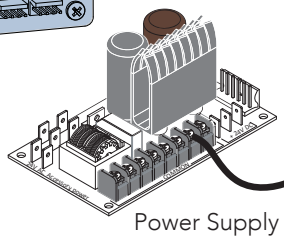
NOTE: Bold type indicate sensors or accessories that must be installed together for external entrapment protection to be properly monitored.

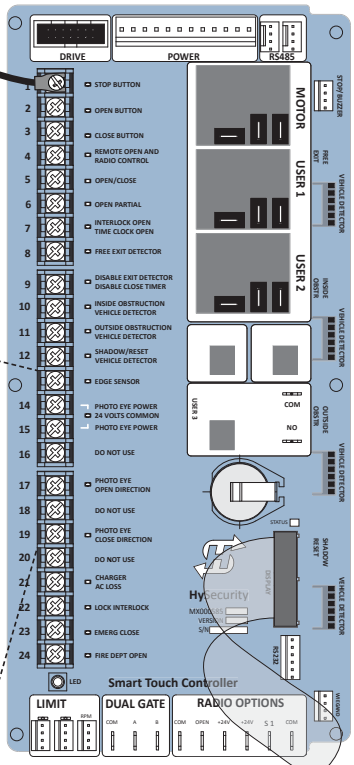
Label Changes to Controller Inputs

Labels are available and may be overlaid to cover the silk screened text on the controller inputs.



Smart Touch Controller





EYE OPEN	SENSOR 2
EYE CLOSE	SENSOR 3
EXIT LOOP	EXIT LOOP
BLOCK EXIT	BLOCK EXIT
IN OBS LOOP	IN OBS LOOP
OUT OBS LOOP	OUT OBS LOOP
CENTER LOOP	CENTER LOOP
EDGE	SENSOR 1
EYE COM	SENSOR COM

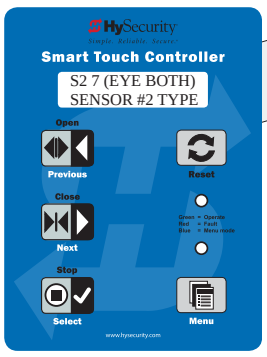
Post 2016 Label
Build Year (BY 2)
MX3978-01
Temporary use on existing inventory.

Pre-2016
Build Year (BY 1)
MX3978-02
Used on replacement boards for gate operators manufactured prior to 2016.

EDGE SENSOR	SENSOR 1
PHOTO EYE POWER 24 VOLTS COMMON PHOTO EYE POWER	SENSOR COM
DO NOT USE	DO NOT USE
PHOTO EYE OPEN DIRECTION	SENSOR 2
DO NOT USE	DO NOT USE
PHOTO EYE CLOSE DIRECTION	SENSOR 3

Pre-2016
Build Year (BY 1)
MX3979-02
Used on replacement boards for gate operators manufactured prior to 2016.

Post 2016 Label
Build Year (BY 2)
MX3978-01
Temporary use on existing inventory.



Keypad and Display

How Software Handles Monitored Entrapment

Since HySecurity gate operators use software to control gate movement, contacts, and accessories, the changeover to monitored sensors is simple. In fact, the ability to monitor sensors has always been an available Installer Menu item. (Refer to "Table 6: Setting the Sensor Logic" on page 10.) Instead of an option, it now becomes the default standard.

- Build Year is a new Installer Menu item in Smart DC and Smart Touch Controllers versions h5.50 and h4.50 (and higher).
- New labels show where Edge, Photo Eye Open and Photo Eye Closed have changed to "SENSOR" inputs. You can program the type of sensor wired to one of those inputs. See illustrations on page 6 and Table 4 below.
- Installer Menu items, PC and GC (Photo eye output and edge sensor output) which used to default to Normally Open (NO) have been converted to Normally Closed (NC) contacts so the software can detect the presence and proper operation of entrapment protection sensors.

Table 4: Changes to Sensor Inputs on the Controller

Location of Sensor Inputs on Controller			Installer Menu Item Codes	
Smart Touch Controller (STC): Hydraulic gate operators			**Smart Touch Display:**	
Input #	**Current Silk Screen Label**	**2016 Silk Screen Label**	**OLED - two line, 32 character**	**LCD - 7 segment text**
13	EDGE SENSOR	SENSOR 1	S1 SENSOR 1	S1
17	PHOTO EYE OPEN DIRECTION	SENSOR 2	S2 SENSOR 2	S2
19	PHOTO EYE CLOSE DIRECTION	SENSOR 3	S3 SENSOR 3	S3
Smart DC Controller (SDC): Electromechanical gate operators			**Smart DC Display: 32 character LCD**	
No numerical input number appears on Smart DC	EYE OPEN	SENSOR 2	S2 SENSOR 2	
	EYE CLOSE	SENSOR 3	S3 SENSOR 3	
	EDGE	SENSOR 1	S1 SENSOR 1	

NOTE: Three inputs for external entrapment protection sensors are available on the HySecurity gate operator controller. New silk screen controller boards are on order, but until they are ready for shipment, labels will be overlaid on the board to indicate terminology adaptations.

Table 4 indicates how the edge and photo eye inputs have been renamed to generic "sensor" inputs. They are interchangeable and configurable. The software must know what type of sensor is wired to SENSOR 1, 2, and 3 ***BEFORE*** it will allow gate travel. Refer to page 9.

What the Installer Needs to Do

NOTE: All HySecurity gate operators, indicating a manufacturing date of 2016 in the serial number, will have the Build Year set to 2. A Build Year of 2 (BY 2) indicates that your gate operator is prepared to monitor for external entrapment protection sensors. The Build Year setting appears in the system scroll on the gate operator display. **The gate operator will not automatically cycle the gate unless an indication that the appropriate number of external entrapment protection sensors are connected and operational.**

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

Table 5 illustrates what options are available for the HySecurity Controller's configurable inputs. What used to be inputs labeled: Edge, Photo Eye Open, Photo Eye Close, and Edge COM now become:

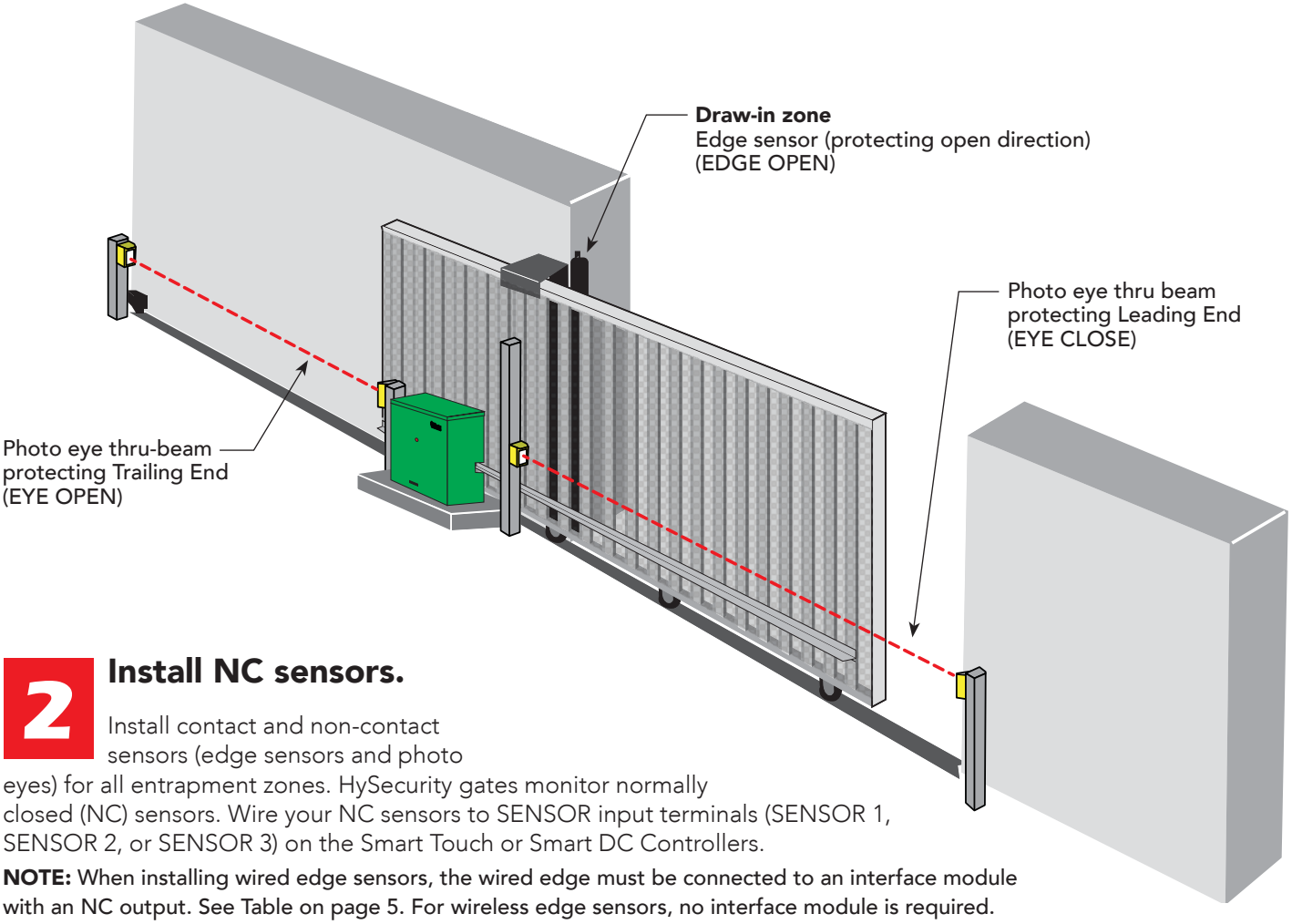
SENSOR 1 SENSOR 2 SENSOR 3 SENSOR COM

CAUTION

All external entrapment protection sensors must be wired to the SENSOR COM terminal for power and monitoring purposes. The three SENSOR inputs are interchangeable and configurable. For example, it doesn't matter whether you wire a normally closed photo eye sensor or edge sensor to the SENSOR 1, 2, or 3 input. However, due to monitoring requirements, each SENSOR input (1, 2, and 3) can only accept one NC sensor output connection.

1 Assess Your Gate Site.

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

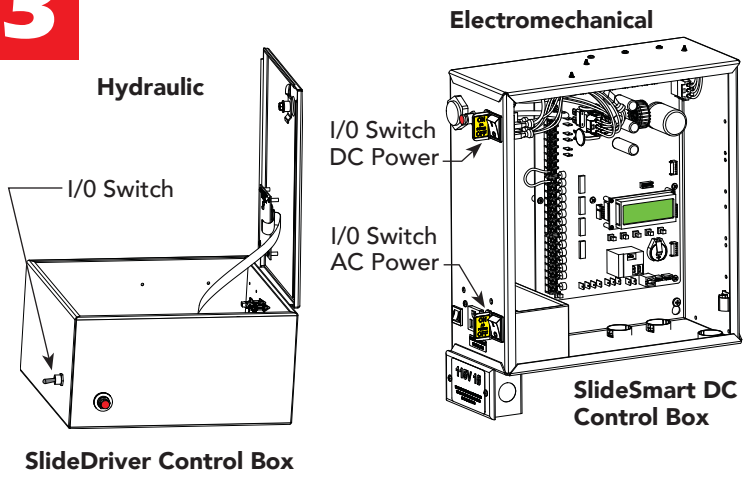


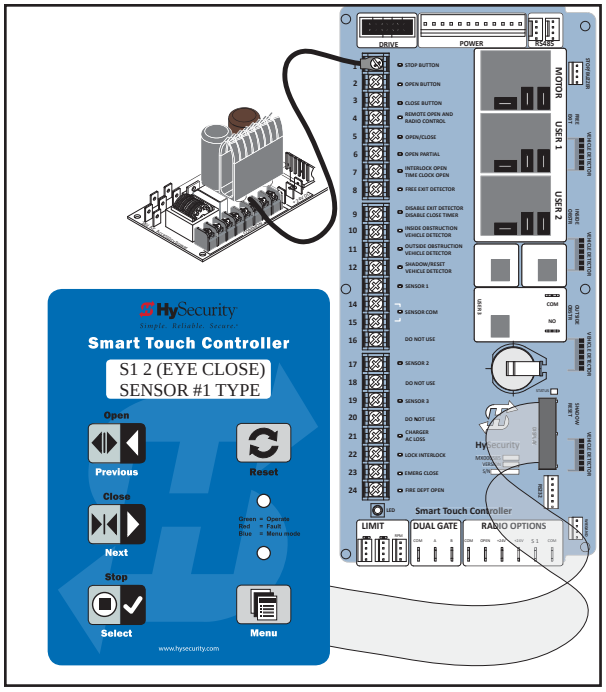
2 Install NC sensors.

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

NOTE: When installing wired edge sensors, the wired edge must be connected to an interface module with an NC output. See Table on page 5. 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.

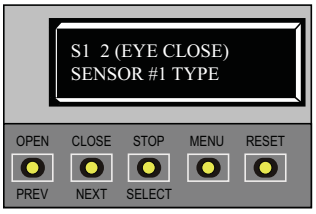




4 Answer Initial Setup Prompts.

For slide gates you will be prompted for USAGE CLASS, GATE HANDING, 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. At minimum, external entrapment protection sensors must be used to protect both open and close directions of gate travel.



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 5: Installer Menu Settings for SENSOR Inputs

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

NOTE: HySecurity does not update software for SlideWinder models. Refer to "Table 2: HySecurity Gate Operators maintaining Object Detection" on page 4 for an overview of HySecurity gate operators not requiring monitoring of external entrapment protection sensors to meet the 2016 UL 325 Standard of Safety regulations.

Table 6: Setting the Sensor Logic

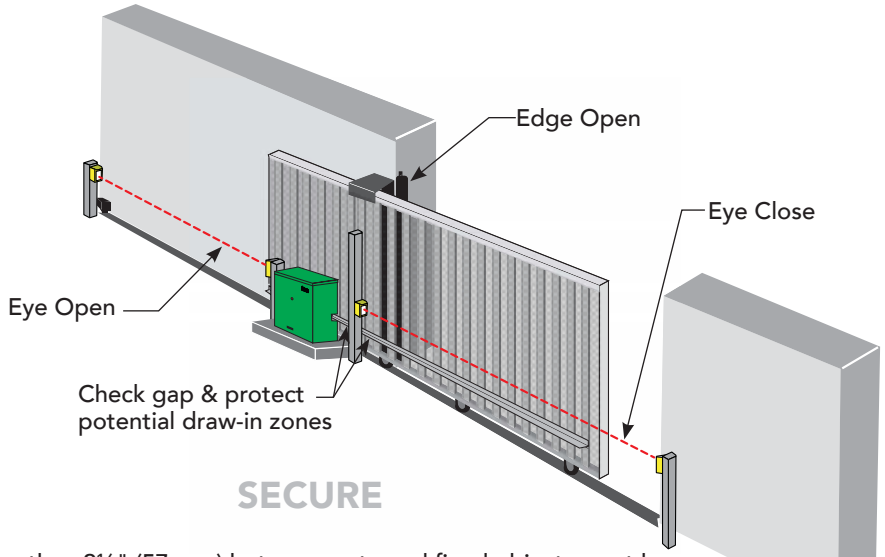
External entrapment protection sensors can be wired to any one of the three sensor inputs on the HySecurity Controller. The sensor logic, such as Eye Close Logic (EC), Eye Open Logic (EO) and Gate Edge Logic (GR) remain accessible in the Installer Menu, if the corresponding sensor type is installed, and determines how the gate operator will react when a monitored sensor is activated.

NOTE: Default settings shown in **Bold**.

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. When triggered, with the optional setting of EC 1, 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.	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	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
PC 0 NO INPUT PHOTO EYE OUTPUT	0 = Normally Open NO input **1 = Normally Closed NC input (monitored)**	Changes occurring in 2016. 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 (FAL2) alert. Press the Stop or Reset button to clear. See **NOTE**.	EYE Close EYE COM *4 wires total:* COM +24V COM PHOTO EYE CLOSE
GC 0 NO INPUT GATE EDGE OUTPUT	0 = Normally Open NO input **1 = Normally Closed NC input (monitored)**	Changes occurring in 2016. The default setting is edge sensor with Normally Closed (NC) output. The optional setting of 0 requires an (NO) output. See **NOTE**.	EDGE SENSOR COM *4 wires total:* COM +24V COM EDGE

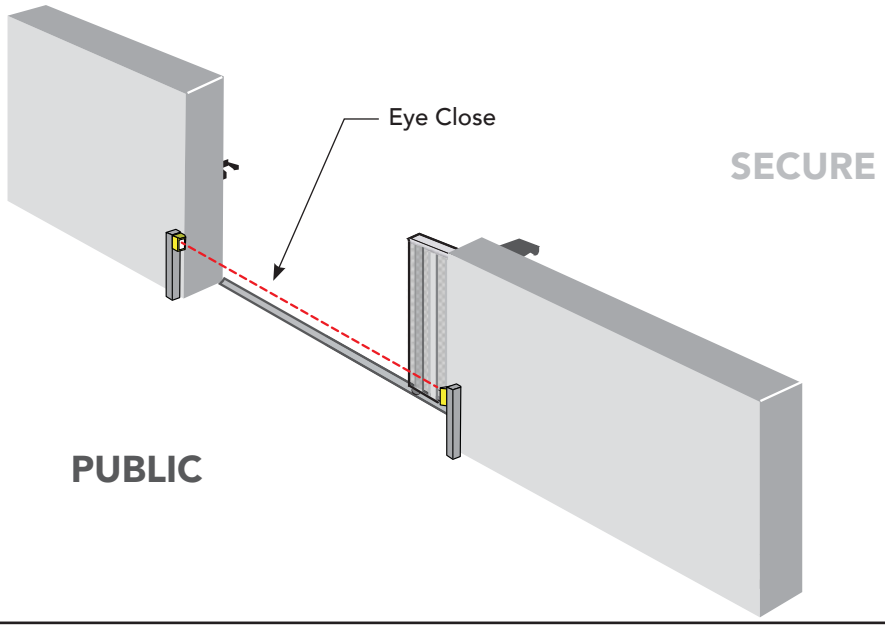
NOTE: The shaded Installer Menu items do not appear when Build Year is set to 2 (BY 2), post-2016. Exceptions exist for barrier arms, CRASH products, operators set to pre-2016 and Usage Class 4 provisions.

Site Assessment & Gate Design for Monitored Entrapment



NOTE: Any gap larger than 2¼" (57 mm) between gate and fixed objects must be protected. Install edge sensors where gap between post and gate creates a draw-in zone.

Slide Gate: Monitored Entrapment Site Scenario (Viewing from SECURE side)



Slide Gate: Monitored Entrapment Site Scenario (Viewing from PUBLIC side)

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.

General Entrapment Protection Provisions per UL 325, Table 31.1

Effective January 12, 2016, Table 31.1 General Entrapment Protection Provisions for gate operator categories.

The following chart is a copy of UL 325 Standard of Safety, Table 31.1

Gate Operator Category	
Horizontal Slide, Vertical Lift and Vertical Pivot	**Swing and Vertical barrier (arm)**
Entrapment protection types: A, B1, B2, D	Entrapment protection types: A, B1, B2, C or D
NOTE: The same type of device shall not be utilized for both entrapment protection means. Use of a single device to cover both the opening and closing directions is in accordance with the requirement; however, a single device is not required to cover both directions. A combination of one Type B1 for one direction and one Type B2 for the other direction is the equivalent of one device for the purpose of complying with the requirements of either entrapment protection means.	
Type A – Inherent entrapment protection system. **Type B1** – Non-contact sensor (photoelectric sensor or the equivalent). **Type B2** – Contact sensor (edge device or the equivalent). **Type C** – Inherent force limiting, inherent adjustable clutch or inherent pressure relief device. **Type D** – Actuating device requiring continuous pressure to maintain opening or closing motion of the gate.	

The changes that occurred to HySecurity software and discussed on the previous pages are based on compliance with the UL 325 -2016 Standard of Safety.

An exception for vehicular barrier arms exists. As stated in UL 325 Standard of Safety:

An operator for a vehicular barrier (arm) that is not intended to move toward a rigid object closer than 16 inches (406 mm), and does not have a pinch point between moving parts by virtue of the operator's design or as a result of installation in accordance with instructions supplied with the operator as specified in UL 325 Standard of Safety is not required to be provided with means to protect against entrapment.

A provision also exists for Usage Class 4 and is described below.

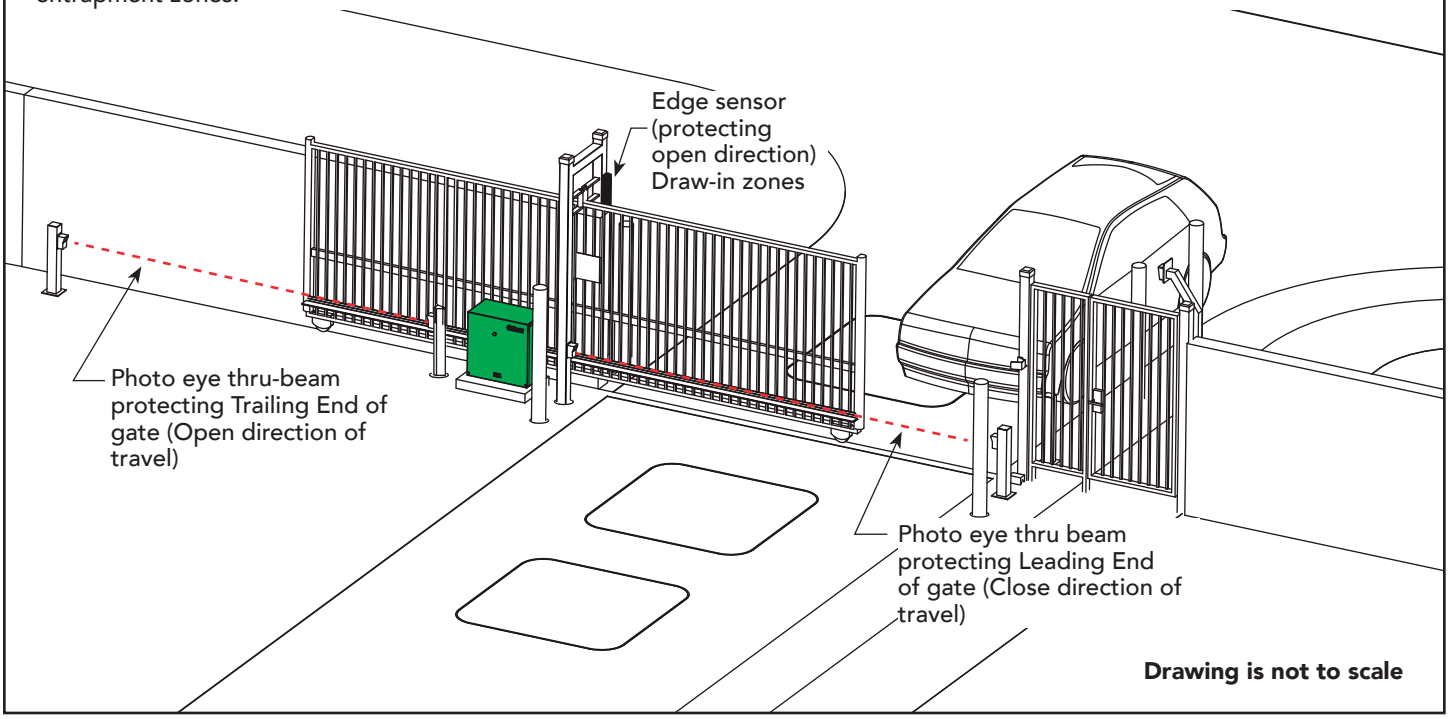
Usage Class 4 Designated Gate Operator Provisions

Usage Class 4 sites must have a guard house or CCTV gate monitoring to verify credentials of vehicles entering or exiting the facility and to ensure safe gate operation in the rare occurrence where pedestrians may be present. HySecurity handles the UL 325 - 2016 gate operator provisions for Usage Class 4 in the following manner:

- SENSOR inputs default to 0 and must be set to a non-zero number before automatic gate operation is allowed. Normally Closed (NC) sensors become the default for monitoring if external entrapment protection sensors are connected. However, the gate operator can be configured through the Installer Menu to accept either Normally Closed (NC) or Normally Open (NO) outputs from sensors.
- When SENSOR 1, 2, and 3 are set to 1 (NOT USED) or when the software detects a programmed monitored sensor fault, a Warn-Before-Operate buzzer automatically sounds 3 seconds before movement and throughout gate travel.
- If a sensor input is held tripped, the gate operator can move the gate in the same manner as other usage classes with a simple constant hold input (Push button Open, Push button Close, Open Partial or Keypad Open/Close activation). Refer to "Troubleshooting" on page 23.
- Note that Alerts, Faults, and Errors used for troubleshooting are handled in the same manner as other HySecurity gate operator usage classes.

Diagram 1: Typical Slide Gate Site Assessment

NOTE: This scenario shows a possible configuration with the minimum recommended external entrapment protection sensors. Other sensor configurations are valid. Each gate site is different. It is the installer's responsibility to assess and protect all entrapment zones.



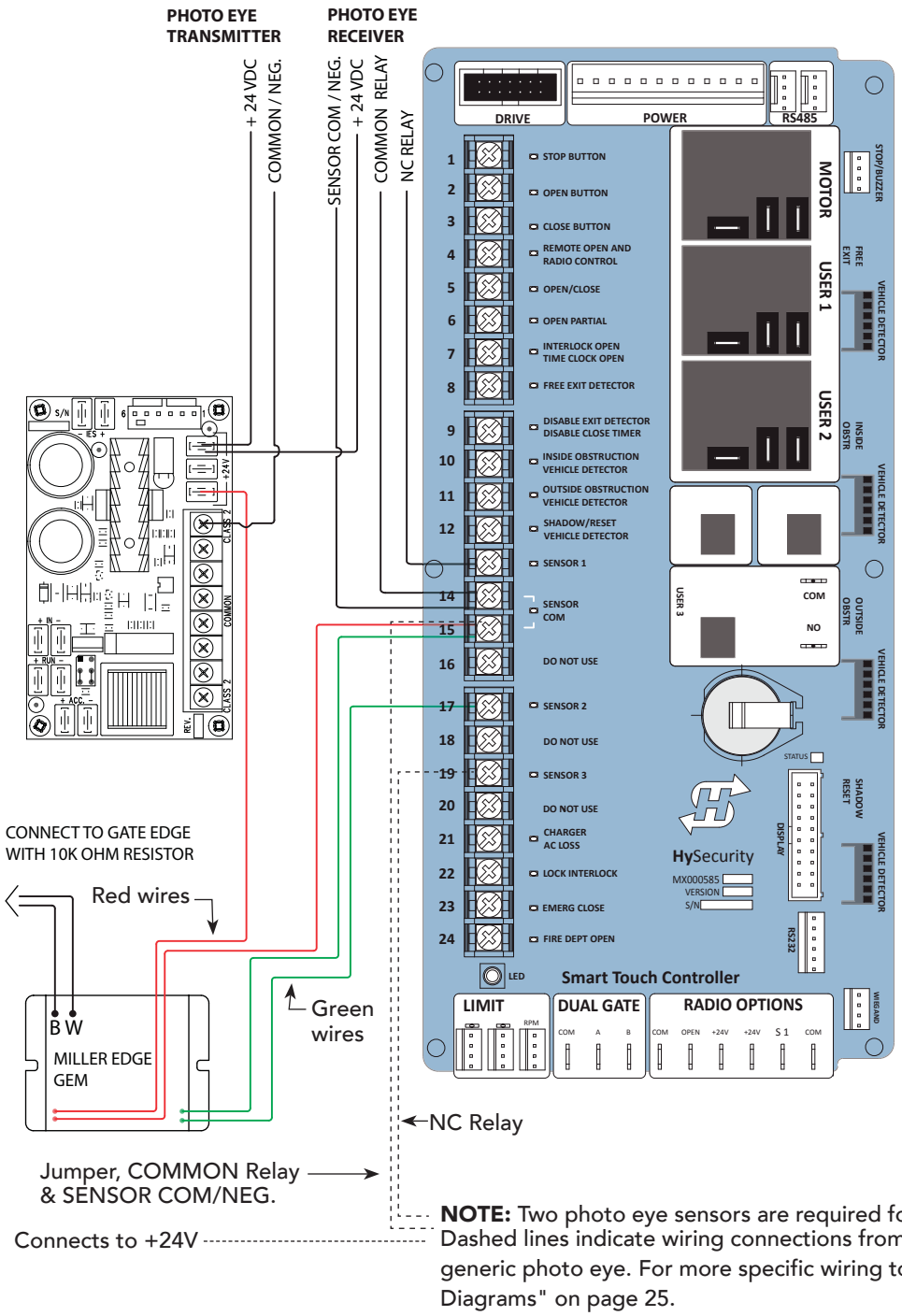
NOTICE: HySecurity slide gates are equipped with a Type A inherent entrapment sensor (IES) that complies with UL 325. Any impediment to gate travel causes the gate to stop and reverse.

Monitored external entrapment protection sensors, which can be used in this site scenario and are compatible with HySecurity slide gates, appear in the following chart. For a full list, see page 5.

EXAMPLE: External Entrapment Protection Sensors: Normally Close Contact, Compatible with HySecurity Gate Operators					
P/N	**2016 Monitored Sensors**	**Sensor Type**	**Output**	**Manufacturer**	**UL 325 Recognized**
MX3981	**Wired Gate Edge Sensor** MGR20-2U-05-T2, Round	Wraparound edge (5 ft for 2" round post)	10K Resistor	Miller Edge	Type B2
MX3983	**Gate Edge Module (GEM -104)**	Edge Interface Module	Normally Closed		
MX3990	IRB-MON Dist.~ 100 ft	Thru-beam photo eye	Normally Closed	EMX Industries	Type B1
MX3990	IRB - MON Dist.~ 100 ft	Thru-beam photo eye	Normally Closed	EMX Industries	Type B1

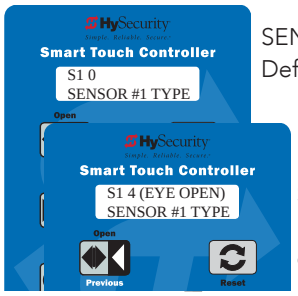
NOTE: At minimum, external entrapment protection sensors must be installed to protect both open and close directions of gate travel. Note that every site is different. All potential entrapment zones should be protected with contact or non-contact sensors. HySecurity gate operators detect NC output sensors and monitor them to comply with UL 325 Standard of Safety.

Diagram 2: SlideDriver Inputs & Programming



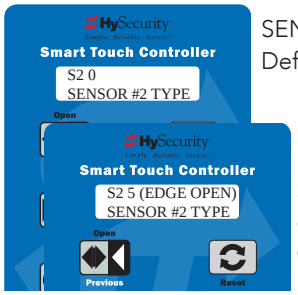
NOTE: Two photo eye sensors are required for the site scenario shown on page 13. Dashed lines indicate wiring connections from second photo eye. Diagram 2 shows a generic photo eye. For more specific wiring to HySecurity approved sensors, see "Wiring Diagrams" on page 25.

Smart Touch Programming Sequence based on site scenario, page 13.



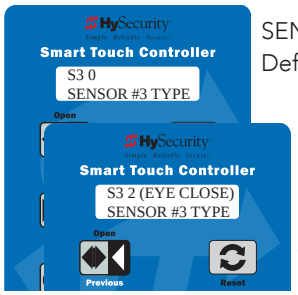
SENSOR 1
Default = 0

Program SENSOR 1 to Photo EYE OPEN direction



SENSOR 2
Default = 0

Program SENSOR 2 to contact EDGE OPEN direction



SENSOR 3
Default = 0

Program SENSOR 3 Photo EYE CLOSE direction

All three sensor inputs must be configured to a non-zero number.

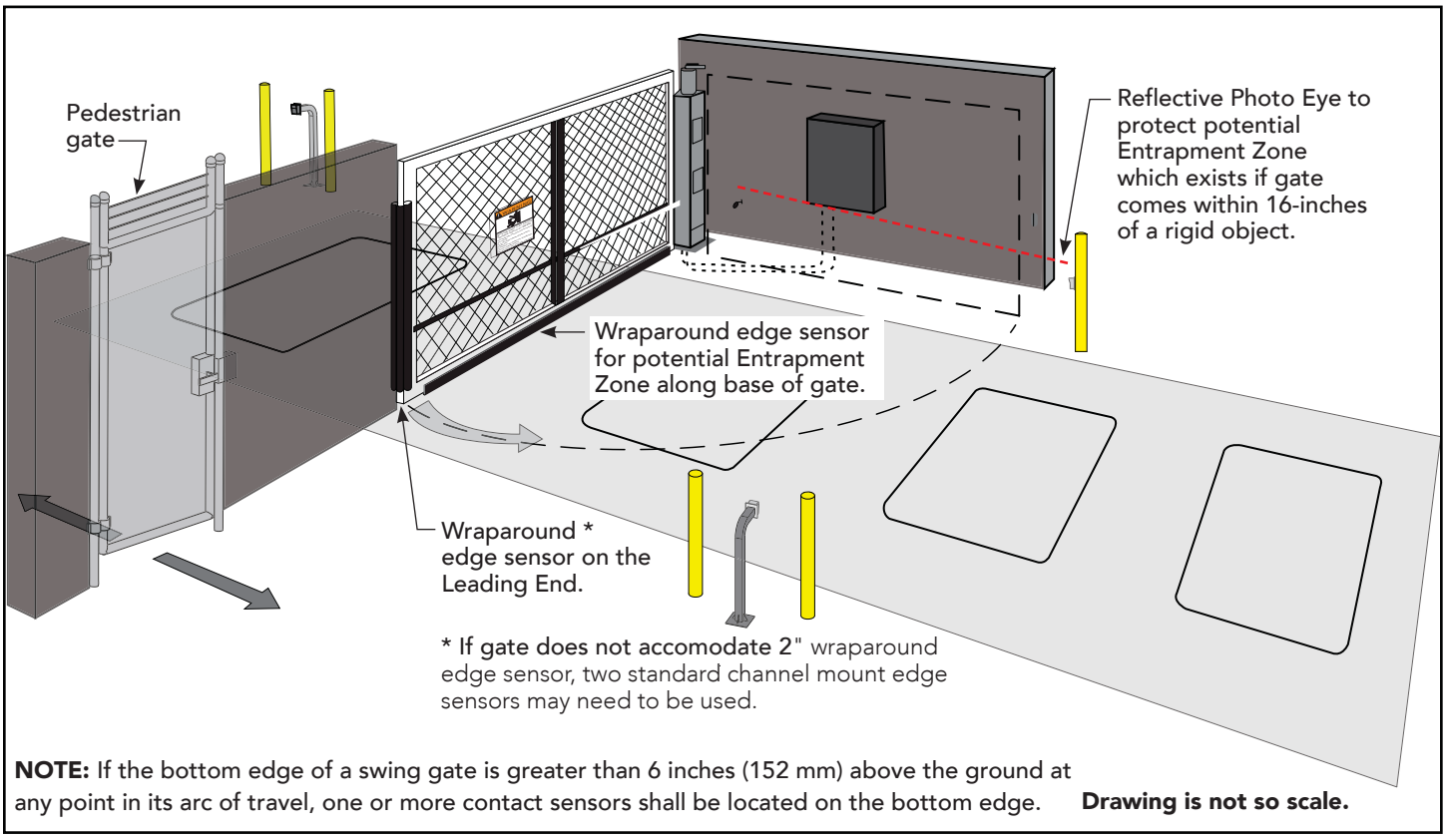
NOTE: The software requires confirmation of all 3 monitored SENSOR inputs before allowing the gate to move.

An example of the connections for an Edge and a Photo Eye (monitored "sensors") and the Installer Menu settings for the Smart Touch Controller (STC) are shown in Diagram 1. The wiring in Diagram 2 shows a generic photo eye. For wiring specific to HySecurity approved sensors, see "Wiring Diagrams" on page 25.

Smart DC Controller (SDC) inputs are similar to the STC. See page 7. The SDC has a different display, but needs to be programmed in a similar fashion as the STC.

NOTE: Your site requirements may differ from Diagram 1. At minimum, monitored external entrapment protection sensors must be used to protect both open and close directions of gate travel.

Diagram 3: Swing Gate Site Assessment



NOTE: If the bottom edge of a swing gate is greater than 6 inches (152 mm) above the ground at any point in its arc of travel, one or more contact sensors shall be located on the bottom edge. **Drawing is not so scale.**

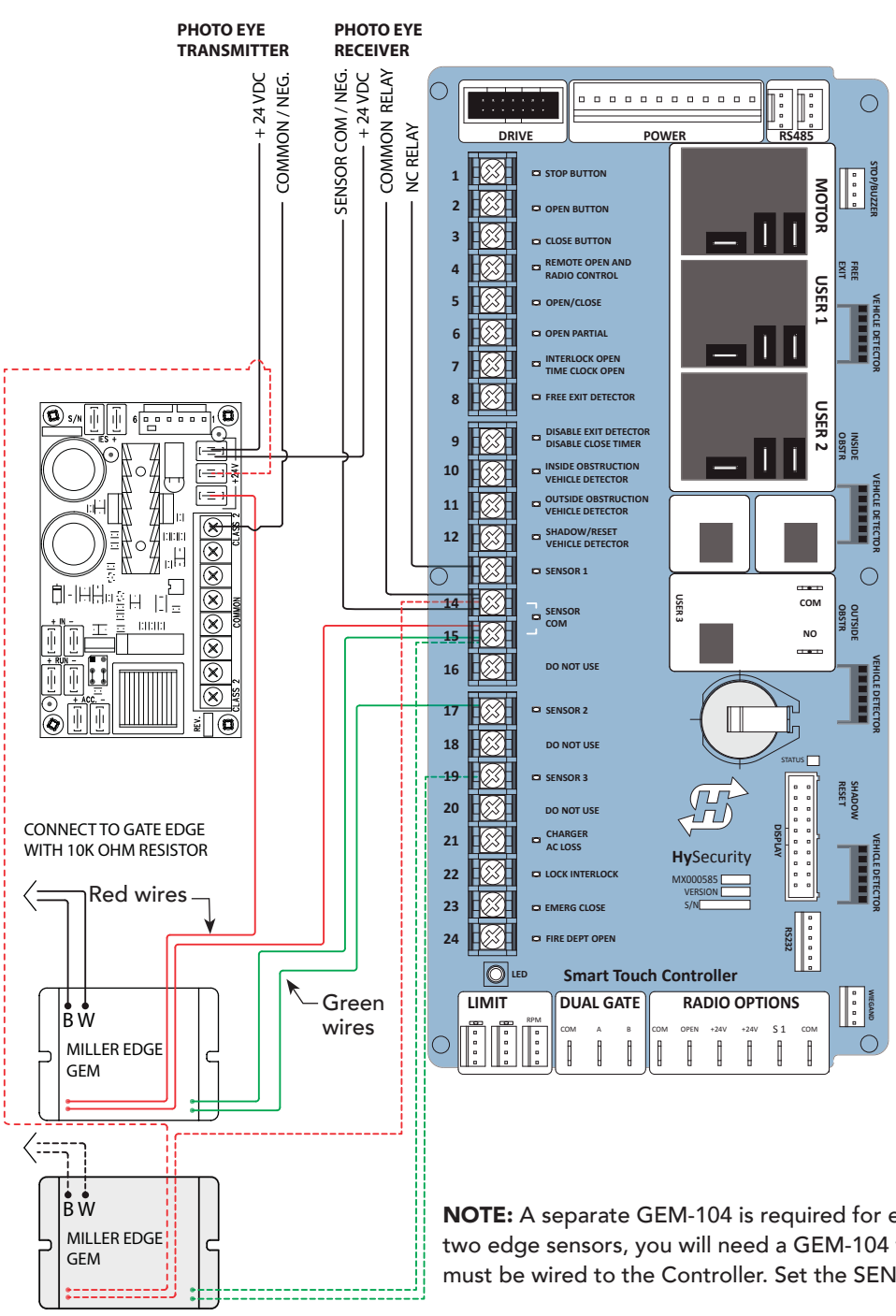
NOTICE: HySecurity swing gates are equipped with a Type A inherent entrapment sensor (IES) that complies with UL 325. Any impediment to gate travel causes the gate to stop and reverse.

Monitored external entrapment protection sensors, which can be used in this site scenario and are compatible with HySecurity swing gates, appear in the following chart. For a full list, see page 5.

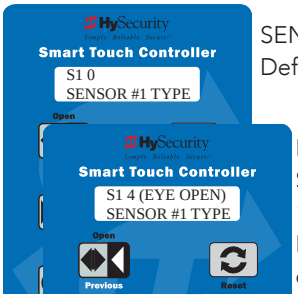
EXAMPLE: External Entrapment Protection Sensors: Normally Close Contact, Compatible with HySecurity Gate Operators					
P/N	**2016 Monitored Sensors**	**Sensor Type**	**Output**	**Manufacturer**	**UL 325 Recognized**
MX3981	**Wired Gate Edge Sensor** MGR20-2U-05-T2, Round	Wraparound edge (5 ft for 2" round post)	10K Resistor	Miller Edge	Type B2
MX3983	**Gate Edge Module (GEM -104)**	Edge Interface Module	Normally Closed		
MX3985	Reflecti-Guard (RG-R)	Photo eye, reflective	Normally Closed	Miller Edge	Type B1

NOTE: At minimum, external entrapment protection sensors must be installed to protect both open and close directions of gate travel. Note that every site is different. All potential entrapment zones should be protected with contact or non-contact sensors. HySecurity gate operators detect NC output sensors and monitor them to comply with UL 325 Standard of Safety.

Diagram 4: SwingRiser Inputs & Programming

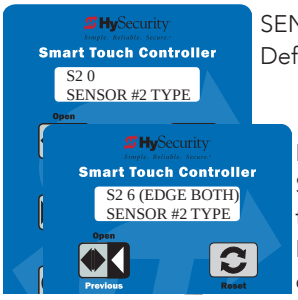


Smart Touch Programming Sequence based on site scenario, page 15.



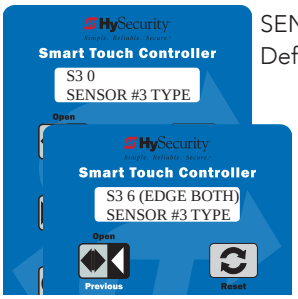
SENSOR 1
Default = 0

Program SENSOR 1 to Photo EYE OPEN direction



SENSOR 2
Default = 0

Program SENSOR 2 to contact EDGE BOTH directions



SENSOR 3
Default = 0

Program SENSOR 3 to contact EDGE BOTH directions

All three sensor inputs must be configured.

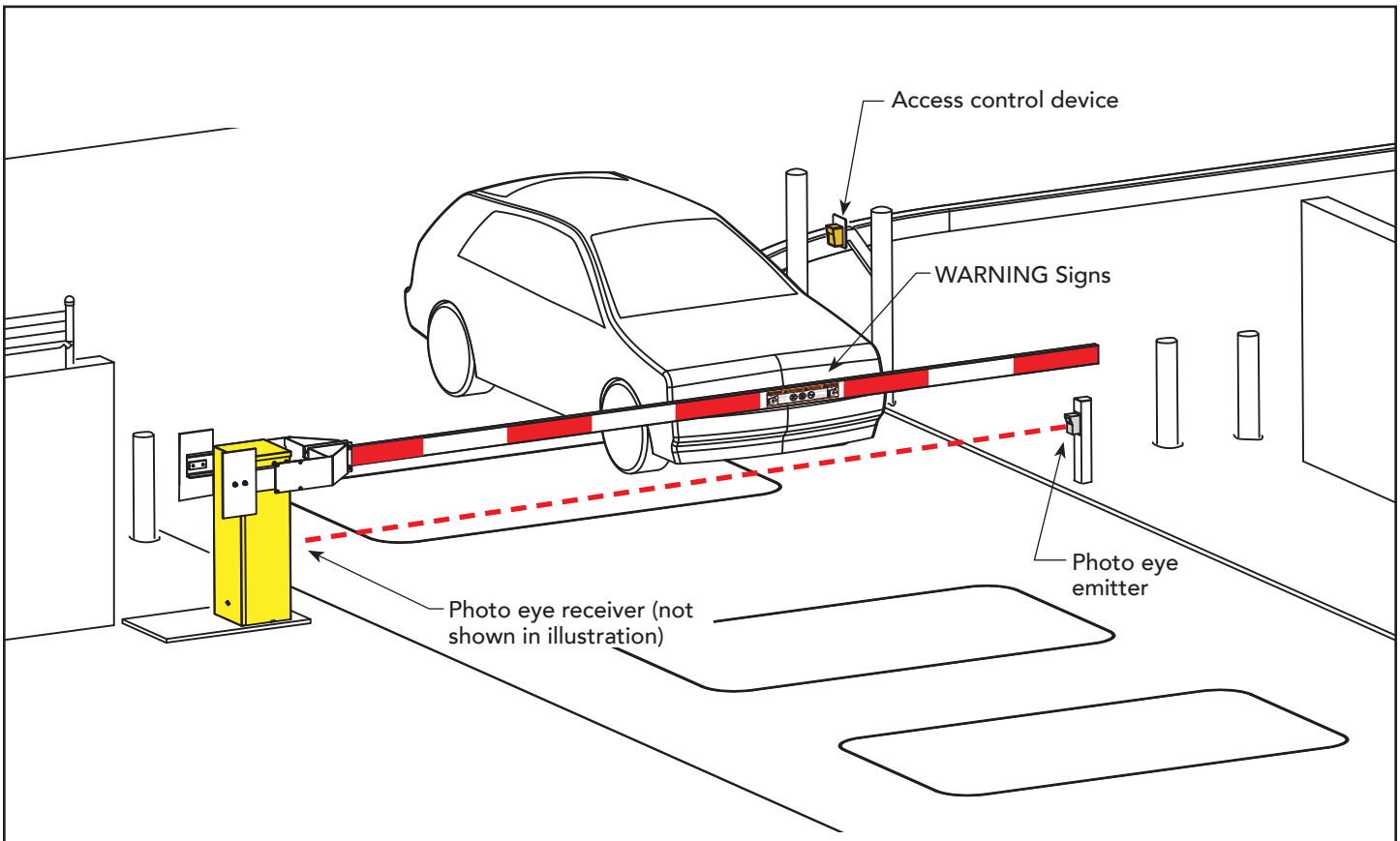
NOTE: A separate GEM-104 is required for each edge sensor. If you have, for example, two edge sensors, you will need a GEM-104 wired to each edge sensor and each GEM must be wired to the Controller. Set the SENSOR types in the Installer Menu accordingly.

An example of the connections for an Edge and a Photo Eye (monitored "sensors") and the Installer Menu settings for the Smart Touch Controller (STC) are shown in Diagram 4. The wiring in Diagram 4 shows a generic photo eye. For wiring specific to HySecurity approved sensors, see "Wiring Diagrams" on page 25.

Smart DC Controller (SDC) inputs are similar to the STC). See table on page 7. The SDC has a different display, but needs to be programmed in a similar fashion as the STC. An example of a site overview for the SwingSmart DC is shown on page 15.

NOTE: Your site requirements may differ from Diagram 3. At minimum, monitored external entrapment protection sensors must be used to protect both open and close directions of gate travel.

Diagram 5: Barrier Arm Site Assessment



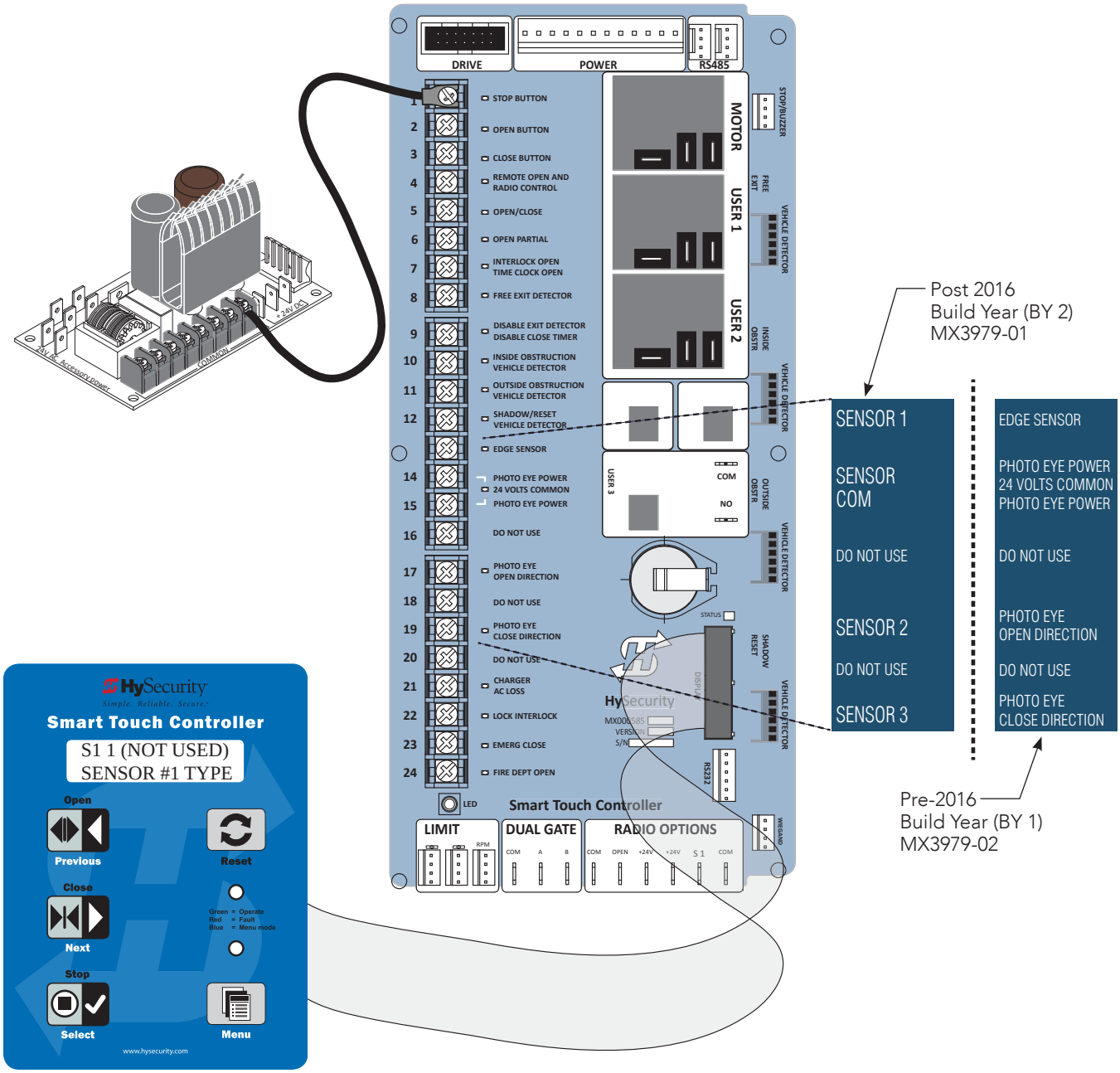
NOTICE: Site design considerations: Any rigid object such as, bollards, photo eye mounting posts, fencing and walls cannot be within 16 inches of barrier arm travel. If a potential exists for a barrier arm to travel within 16 inches of a solid, rigid object, the potential entrapment zone must be protected with a monitored external entrapment protection sensor.

UL 325 Exception: An operator for a vehicular barrier (arm) that is not intended to move toward a rigid object closer than 16 inches (406 mm), and does not have a pinch point between moving parts by virtue of the operator's design or as a result of installation in accordance with instructions supplied with the operator as specified in UL 325 Standard of Safety is not required to be provided with means to protect against entrapment.

HySecurity barrier arms provide features for object detection. For more information, refer to the gate operator's product manual.

Diagram 6: StrongArm Inputs & Programming

Since the StrongArm falls in the exception classification for monitored entrapment, your options for accessory connections and programming vary depending on your site requirements.



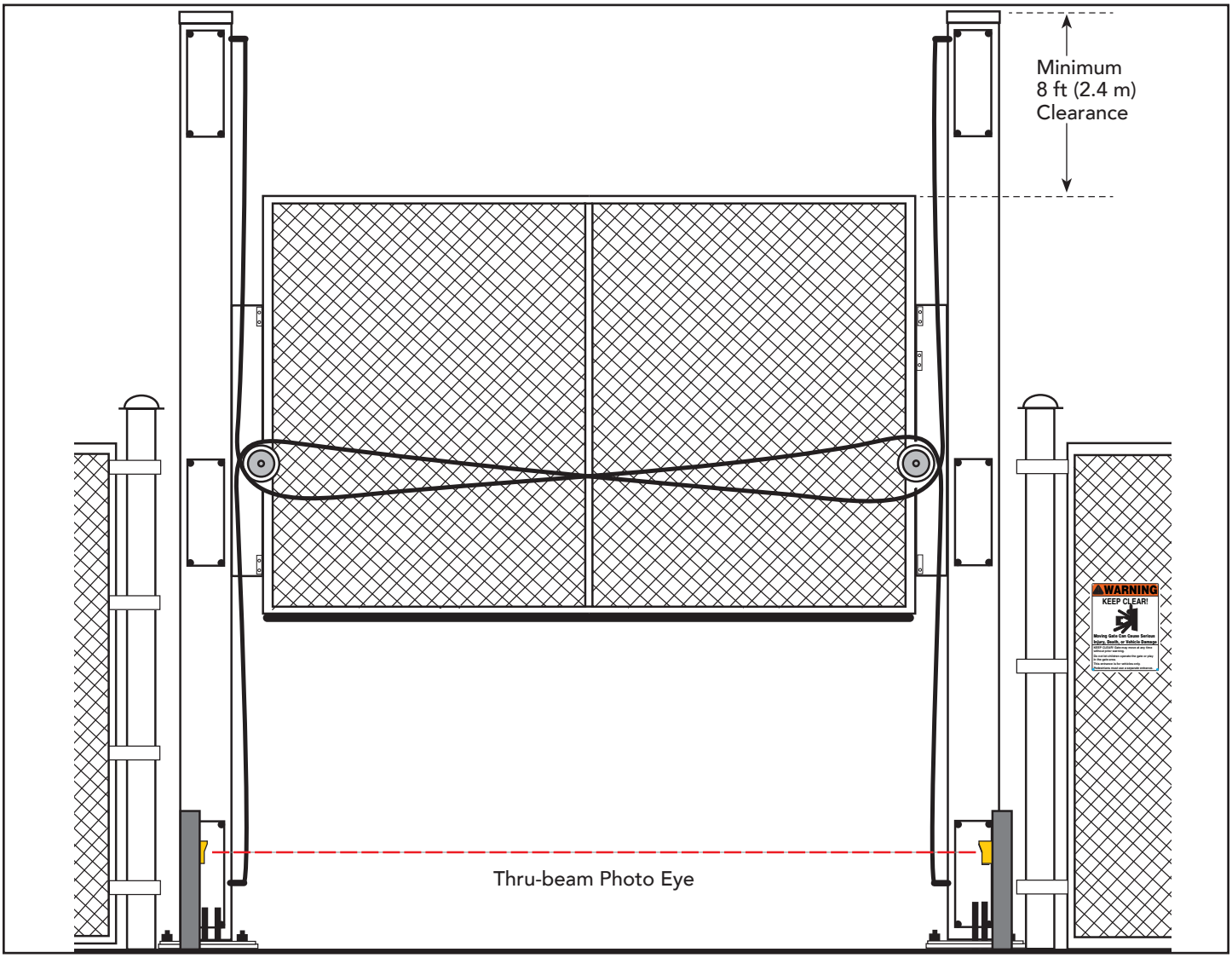
If your StrongArm uses version h4.50 software or higher:

- Build Year (BY) is set to 2
- SENSOR inputs default to normally closed contacts
- SENSOR input configuration defaults to “NOT USED”
- Gate will run with all SENSOR inputs set to “NOT USED”

All three sensor inputs can be re-configured.

NOTE: Even though no wires are attached to a SENSOR input, it must be “set” to NOT USED. The software requires confirmation of all 3 monitored input designations before allowing the gate to move.

Diagram 7: Vertical Lift Site Overview



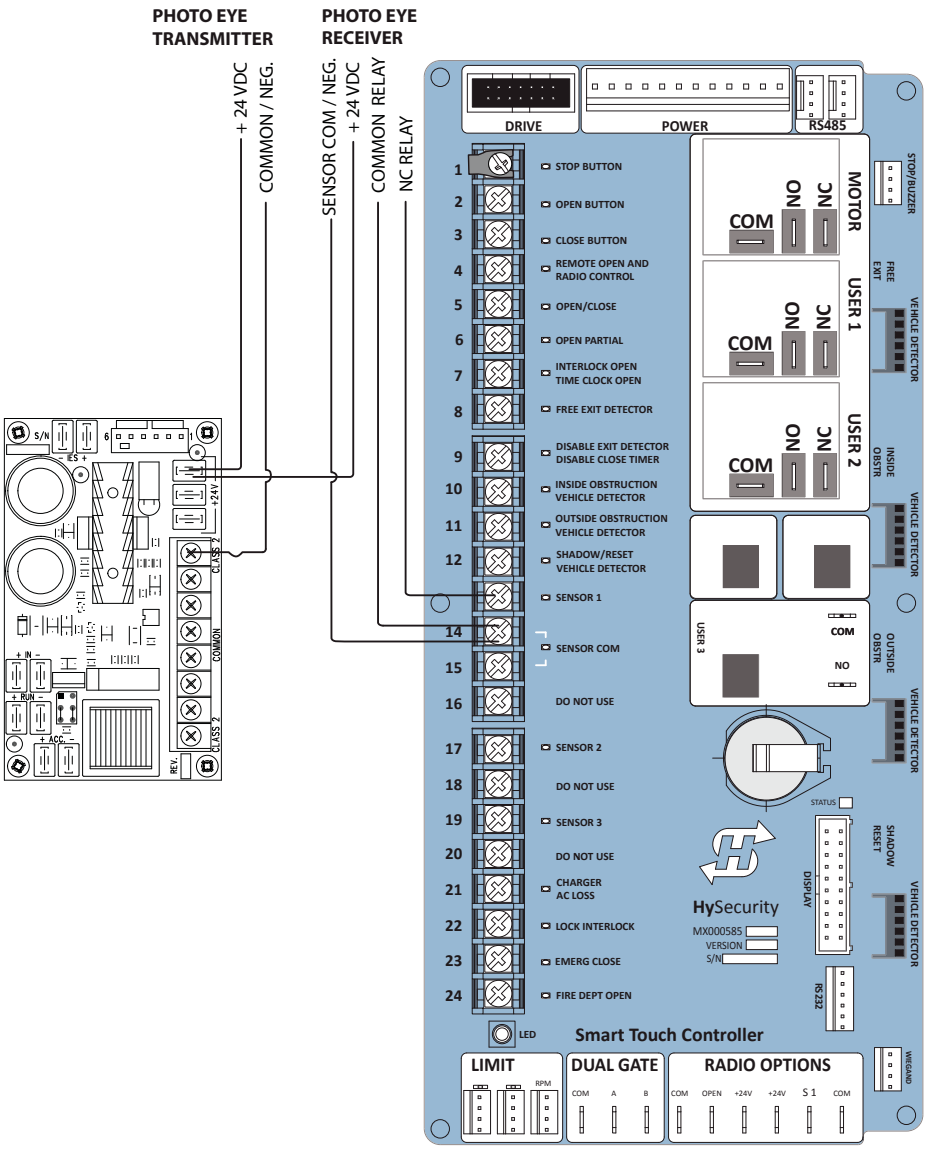
NOTICE: HySecurity vertical lift gates are equipped with a Type A inherent entrapment sensor (IES) that complies with UL 325. Any impediment to gate travel causes the gate to stop and reverse.

Monitored external entrapment protection sensors, which can be used in this site scenario and are compatible with HySecurity vertical lift gates, appear in the following chart. For a full list, see page 5.

EXAMPLE: External Entrapment Protection Sensors: Normally Close Contact, Compatible with HySecurity Gate Operators					
P/N	**2016 Monitored Sensors**	**Sensor Type**	**Output**	**Manufacturer**	**UL 325 Recognized**
MX3990	EMX (IRB-MON)	Thru-beam photo eye	Normally Closed	EMX Industries	Type B1

NOTE: A Thru-beam Photo Eye is recommended in this site scenario. A monitored wireless edge sensor is a viable option, though it is not called out in the site scenario, chart above, or wiring diagram. Every site is different. On vertical lift gates, one monitored sensor must be installed to protect the close direction of travel. However, all potential entrapment zones should be protected with contact or non-contact sensors. HySecurity gate operators detect NC output sensors and monitor them to comply with UL 325 Standard of Safety.

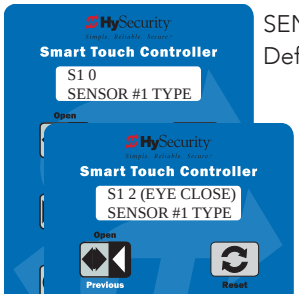
Diagram 8: HydraLift Inputs & Programming



EMX IRB MON (Thru Beam Photo Eye)

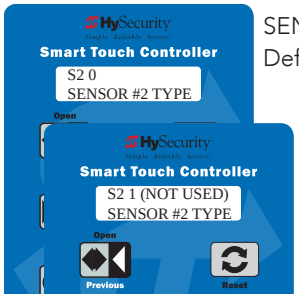
NOTE: Drawing is Not to Scale D0712 Rev. A

Smart Touch Programming Sequence based on site scenario, page 19.



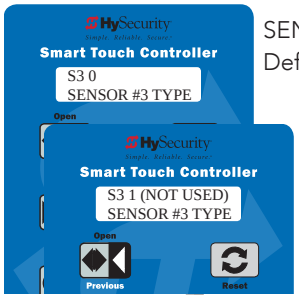
SENSOR 1
Default = 0

Program SENSOR 1 to Photo EYE CLOSE direction



SENSOR 2
Default = 0

No wiring is attached to SENSOR 2 so program it to 1, NOT USED.



SENSOR 3
Default = 0

No wiring is attached to SENSOR 3 so program it to 1, NOT USED.

All three sensor inputs must be configured.

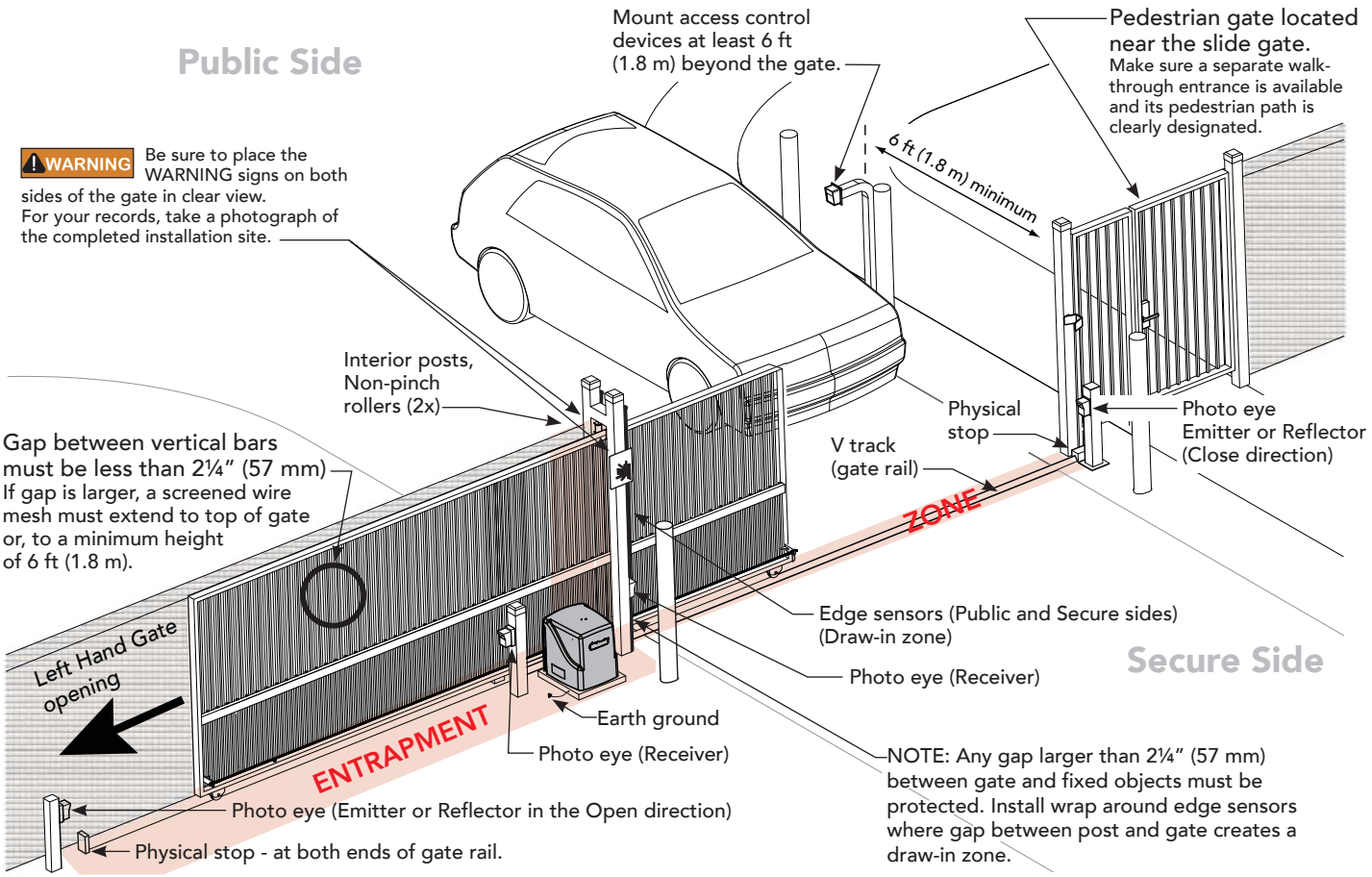
NOTE: Even though, in this scenario, no wires are attached to SENSOR 2 or SENSOR 3 inputs, both must be "set" to NOT USED. The software requires confirmation of all 3 monitored SENSOR inputs before allowing the gate to move.

An example of the connections for a Photo Eye (monitored "sensors") and the Installer Menu settings for the Smart Touch Controller (STC) are shown in Diagram 8. The wiring in Diagram 8 shows a generic photo eye. For wiring specific to HySecurity approved sensors, see "Wiring Diagrams" on page 25.

Smart DC Controller (SDC) inputs are similar to the STC. See page 7. The SDC has a different display, but needs to be programmed in a similar fashion as the STC.

NOTE: Your site requirements may differ from Diagram 7. At minimum, monitored external entrapment protection sensors on vertical lift gates must be used to protect the close direction of gate travel.

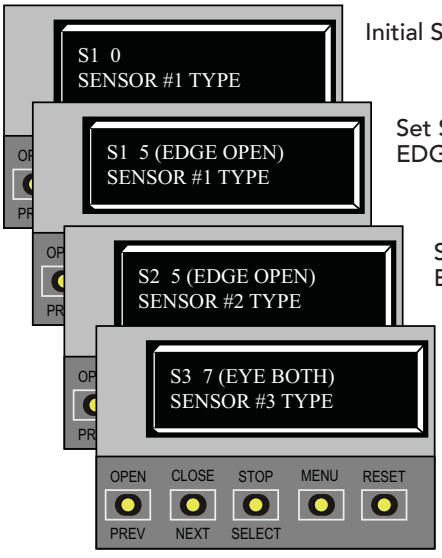
Diagram 9: SlideSmart DC Site Assessment



NOTE: To use monitored entrapment protection sensors for all four areas called out in this site scenario, The Solution multi-input device would be required. See page 5.

After wiring your external entrapment protection sensors to the Controller's sensor inputs, access the Installer Menu. Set sensors S1, S2, and S3 for this example of a site scenario, as follows:

GATE OPERATOR: SlideSmart DC and SlideSmart DCS using multi-input device.



Initial SENSOR setting = 0

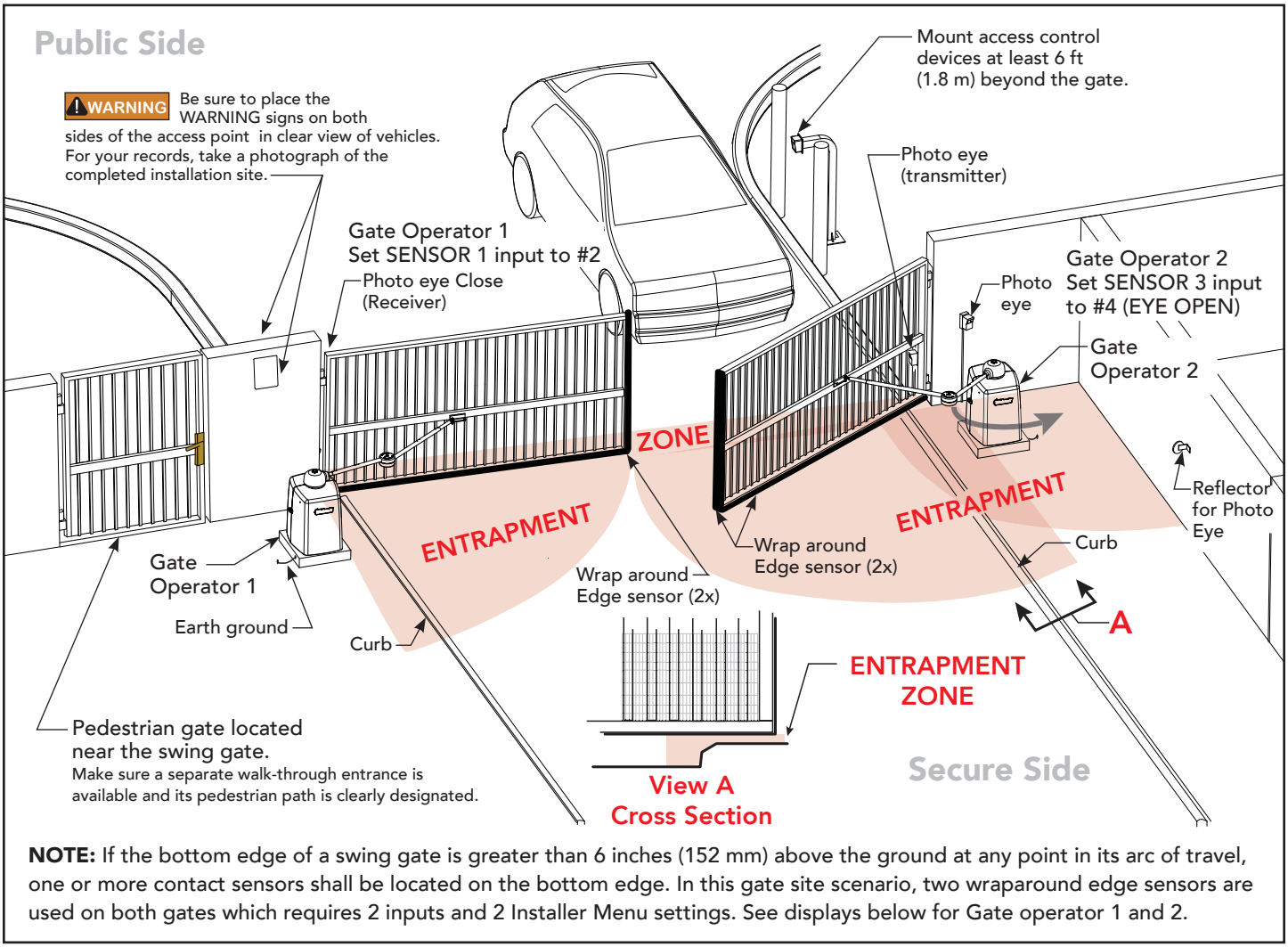
Set SENSOR 1 = #5
EDGE OPEN (public side)

Set SENSOR 2 = #5
EDGE OPEN (secure side)

Set SENSOR 3 = #7
EYE BOTH **

**Since in the site scenario there are two monitored photo eye sensors protecting open and close directions of travel and only one input remaining, you could use a Multi-input device (The Solution). Connect sensors to two separate inputs on The Solution, set to NC contact (not Pulse) and wire The Solution output to Sensor 3 on the Controller. In the Installer Menu, set SENSOR #3 TYPE to EYE BOTH. Another option? Use a long range photo eye and wire as a singular SENSOR input.

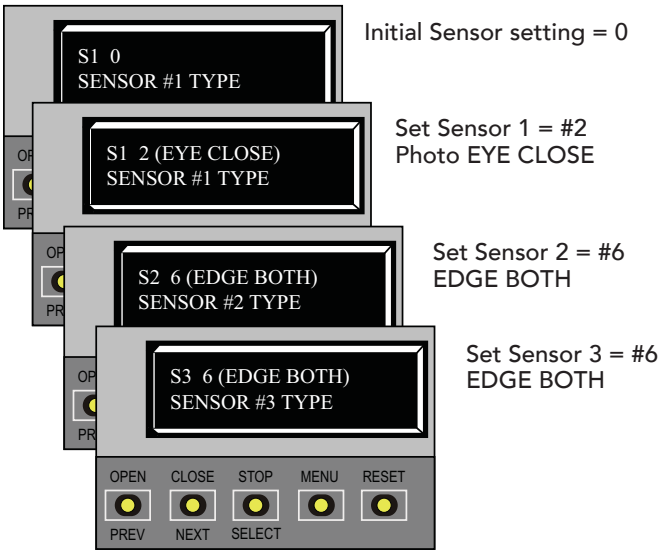
Diagram 10: SwingSmart DC Site Overview (Dual Gate)



NOTE: If the bottom edge of a swing gate is greater than 6 inches (152 mm) above the ground at any point in its arc of travel, one or more contact sensors shall be located on the bottom edge. In this gate site scenario, two wraparound edge sensors are used on both gates which requires 2 inputs and 2 Installer Menu settings. See displays below for Gate operator 1 and 2.

After wiring your external entrapment protection sensors to the Controller's sensor inputs, access the Installer Menu, Set sensors S1, S2, and S3. (Refer to "Table 5: Installer Menu Settings for SENSOR Inputs" on page 9.)

GATE OPERATOR 1: SwingSmart DC or DCS



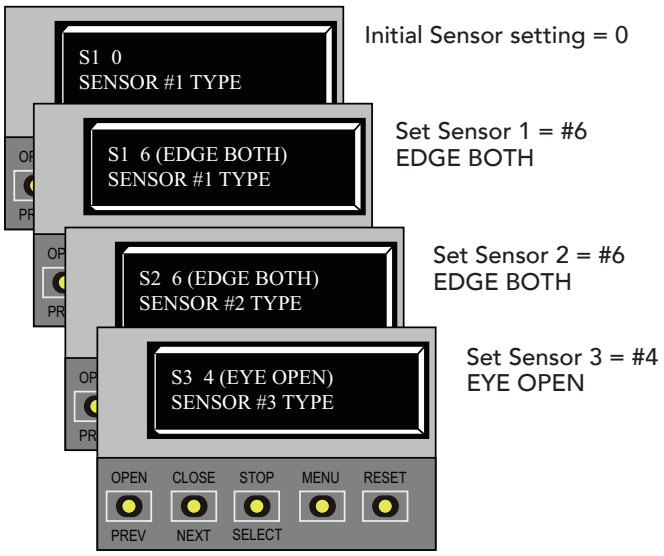
Initial Sensor setting = 0

Set Sensor 1 = #2
Photo EYE CLOSE

Set Sensor 2 = #6
EDGE BOTH

Set Sensor 3 = #6
EDGE BOTH

GATE OPERATOR 2: SwingSmart DC or DCS



Initial Sensor setting = 0

Set Sensor 1 = #6
EDGE BOTH

Set Sensor 2 = #6
EDGE BOTH

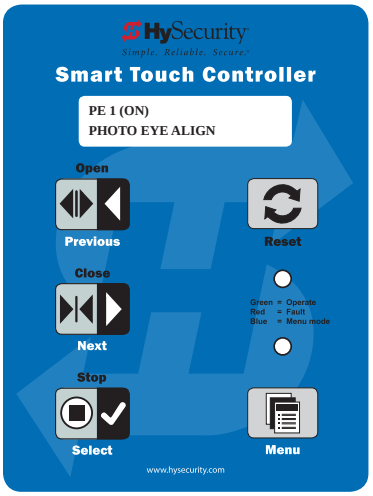
Set Sensor 3 = #4
EYE OPEN

Photo Eye Alignment

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

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

1. Move the gate off (away from) the close limit.
2. Access the User Menu and select PE. (To access the User Menu, press the Menu button twice. For a refresher on using the Menu Mode navigational buttons, see the chart on page 9.)
3. Set the menu item PE 0 to PE 1.
4. Move the photo eyes (up/down, side to side) to align the emitter beam. The buzzer will chirp once when the beam is broken and twice when remade.
5. When the buzzer chirps once, 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.
6. Close the gate. When the close limit is triggered, the User Menu item PE resets to 0.

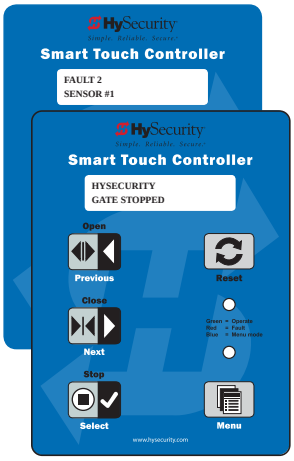


NOTE: Mount photo eyes approximately 21 to 27½ inches (53 to 70 cm) above the ground and as close to the gate as possible, preferrably within 5 inches (13 cm). For more information, refer to *ASTM F2200 Gate and Fence Standards* and your gate operator product manual.

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)



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.

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

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

A short list of codes appears on the next page and provides additional troubleshooting solutions. For a complete list of troubleshooting codes, refer to the Troubleshooting Codes table in your gate operator's *Programming and Operations* manual.

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.

Table 7: Troubleshooting Codes

Type	Display	Buzzer Chirp Sequence	Possible Cause & Suggested Corrective Action
ALERT	HYSECURITY ENTRAPMENT MODE EntE	2 chirps per second every 2s while control input is active	An IES has been tripped twice. An emergency close with constant hold or an emergency open has caused the entrapment code to appear. When a command of this nature is received, the operator stops and moves into ENTRAPMENT mode. Clear the code and return to run mode operation by pressing 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	!ACTION BLOCKED PHOTO EYE CLOSE PEC	5 chirps indicating that the command cannot be initiated	Operator received command to run, but movement is prevented. Photo eye is blocked or battery is dead. Clear photo eye path and realign photo eye. Replace photo eye battery if needed.
ALERT	!ACTION BLOCKED PHOTO EYE OPEN PEO	5 chirps indicating that the command cannot be initiated	Operator received command to run open, but movement is prevented. Photo eye is blocked or battery is dead. Clear photo eye path and realign photo eye. Replace photo eye battery if needed.
ALERT	!ACTION 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.
FAULT	FAULT 2 FAL2	2 chirps per second once per minute	"Monitored" means the Controller must see the photo-eye NC contact change from open to close after receiving the command to move, but before starting. (FAULT 2, FAL2) indicates the Smart Touch did not see this sequence at start.) Be sure the photo-eye is capable of, and set to, provide this function. Be sure the eye "common" wire is wired properly to the SENSOR COM terminal.
ERROR	ERROR 7 MENU CHECKSUM Err7	3 chirps per second once per minute	Contact HySecurity.
ERROR	ERROR 2 IES DISCONNECT	3 chirps per second once per minute	The IES sensor could be bad, check to see that the NC contact is intact. Check that you have the most current sensor; visit our website and view the technical bulletins in the Tech Support area. The sensor wire could be loose; you may want to tighten the female connectors with some pliers. The software may need to be updated. Make sure the brake valves aren't set too tightly by asking, "How fast does the gate panel stop when the limit switch is tripped?" (Tight brake valves will raise the system pressure.)
FAIL	FAIL PROGRAM DATA ERR FAIL	3 chirps per second once per minute	1. Try turning off the power to the operator and having the customer re-seat all of the various connectors and cables. 2. Upload the latest software release. If the fail does not go away, contact Technical Support.

NOTE: For a more extensive list of error codes, refer to your gate operator's product manual.

Wiring Diagrams

Wiring diagrams are provided on the following pages. Each diagram provides an example on how to wire the sensors that are shown in the following chart.

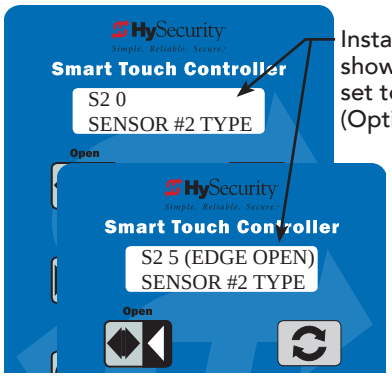
The site designer or installer must determine which external entrapment protection sensors will be installed with the gate operator to create a UL 325 compliant installation site.

NOTE: The table below provides the list of sensors that are available for use with HySecurity gate operators using the monitoring capabilities found in software versions h4.50 or h5.50 (or higher). These sensors are ETL listed or UL recognized to UL 325 and have been tested and approved by Intertek for use in HySecurity gate operators. Bold type indicates sensors or accessories that must be installed together for external entrapment protection to be properly monitored.

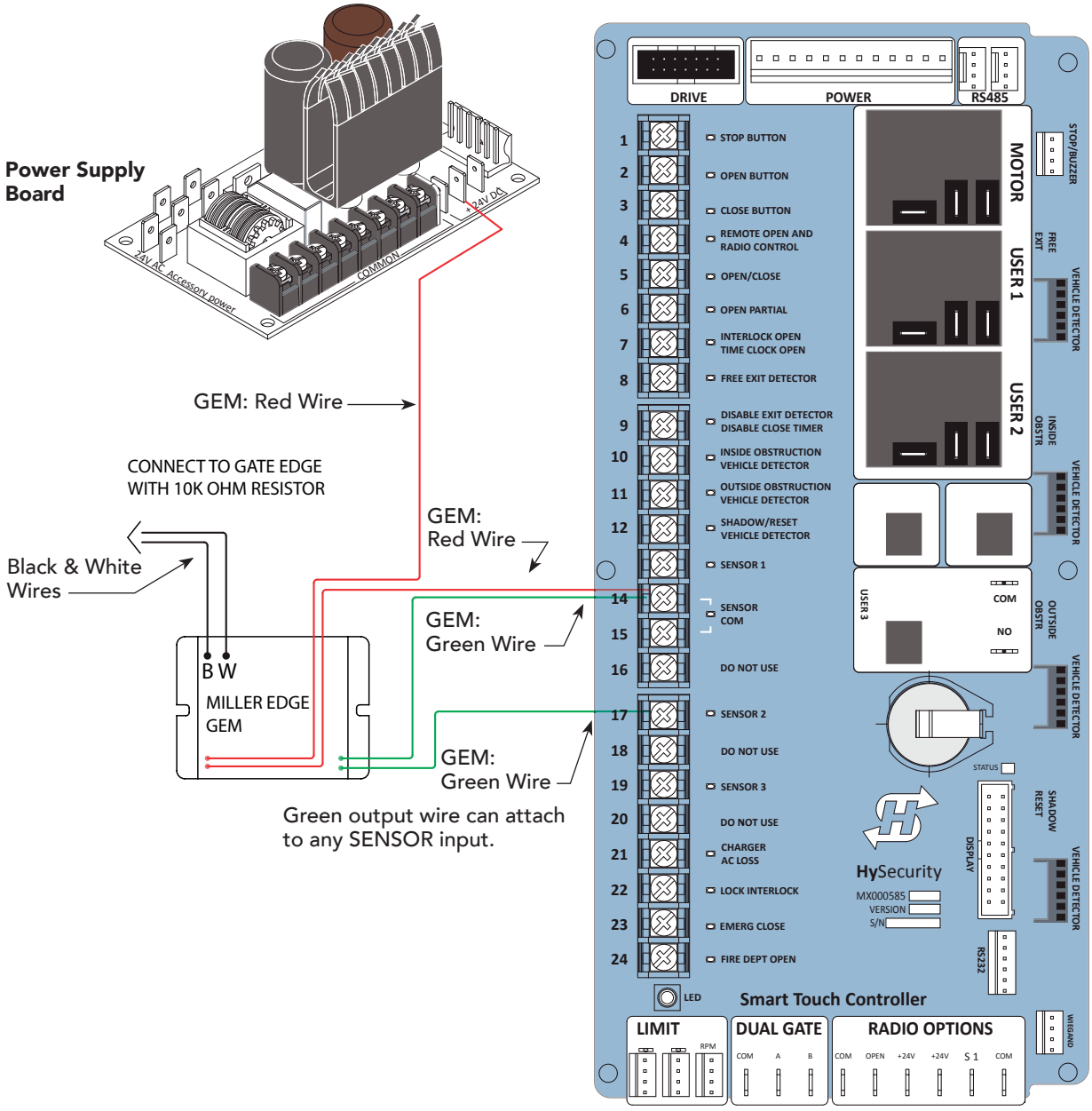
External Entrapment Protection Sensors: Normally Close Contact, Compatible with HySecurity Gate Operators					
P/N	**2016 Monitored Sensors**	**Sensor Type**	**Output**	**Manufacturer**	**UL 325 Recognized**
MX3981	**Wired Gate Edge Sensor** MGR20-2U-05-T2, Round	Wraparound edge (5 ft for 2" round post)	10K Resistor	Miller Edge	Type B2
MX3983	**Gate Edge Module (GEM -104)**	Edge Interface Module	Normally Closed		
MX3982	**Wired Gate Edge Sensor** MGS20-2U-05-T2, Square	Wraparound edge (5 ft for 2" square post)	10K Resistor	Miller Edge	Type B2
MX3983	**Gate Edge Module (GEM -104)**	Edge Interface Module	Normally Closed		
MX4037	**KIT: Wired Gate Edge Sensor** MGO-2E-05-T2, Square and Channel mount	Edge (3-sided activation Slide In Style) (5 ft, 1½" width)	10K Resistor	Miller Edge	Type B2
MX3983	**Gate Edge Module (GEM -104)**	Edge Interface Module	Normally Closed		
MX3985	Reflecti-Guard (RG-R)	Photo eye, reflective	Normally Closed	Miller Edge	Type B1
MX4015	**KIT: MGL-K20** (includes MX3986 and MX4013)	Wireless Gate Link	Normally Closed	Miller Edge	Yes
MX3986	**Wireless Gate Link** MGL-TX20	Transmitter (battery-operated, radio control)	N/A	Miller Edge	Yes
MX4013	**Wireless Gate Link** MGL-RX20	Receiver (24VDC, radio control)	Normally Closed		
MX3987	The Solution, MIM-62	Multi-Input Module	Normally Closed	Miller Edge	Yes
MX3990	IRB-MON (Dist.~ 100 ft)	Thru-beam photo eye	Normally Closed	EMX Industries	Type B1
MX000846	KIT: IRB-325 (Dist.~ 50 ft)	Thru-beam photo eye	Normally Closed	EMX Industries	Type B1
MX000999	KIT: E3K-R10K4-NR-P (Dist. ~ 10 m)	Photo eye, reflective	Normally Closed	Omron	Type B1

Wired Edge Sensor with GEM (Gate Edge Module)

1. Turn OFF power.
2. Connect the Green NC relay wire from GEM to Sensor 1, 2, or 3.
3. Connect Red & Green wires from GEM to SENSOR COM on Controller (or Power Supply Board, STC).
4. Connect Red wire from GEM to +24V on Controller (or Power Supply Board, STC).
5. Connect Black & White wire from GEM 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). See table on page 9.



Installer Menu showing Sensor 2 set to Edge Open (Option #5)*



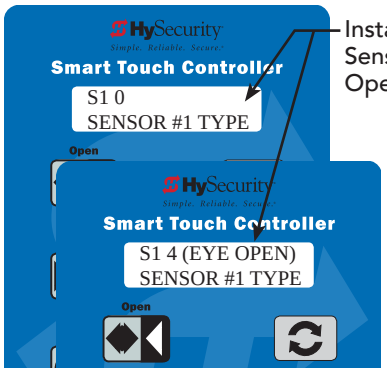
***NOTE:** Make sure whichever wired input used (SENSOR 1, 2, or 3) is the same Sensor # configured through the Installer Menu.

NOTE: Drawing is not to scale. D0711, Rev. A

Photo Eye Thru Beam (EMX IRB MON)

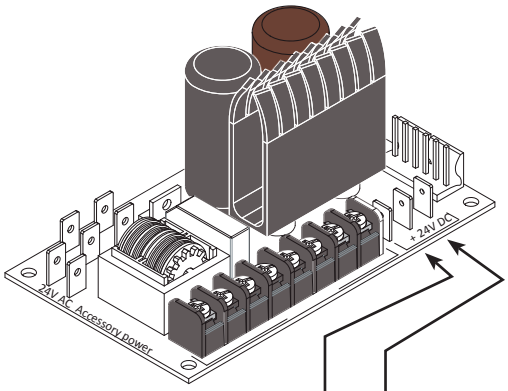
1. Connect photo eye wiring.

   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. See table on page 9.

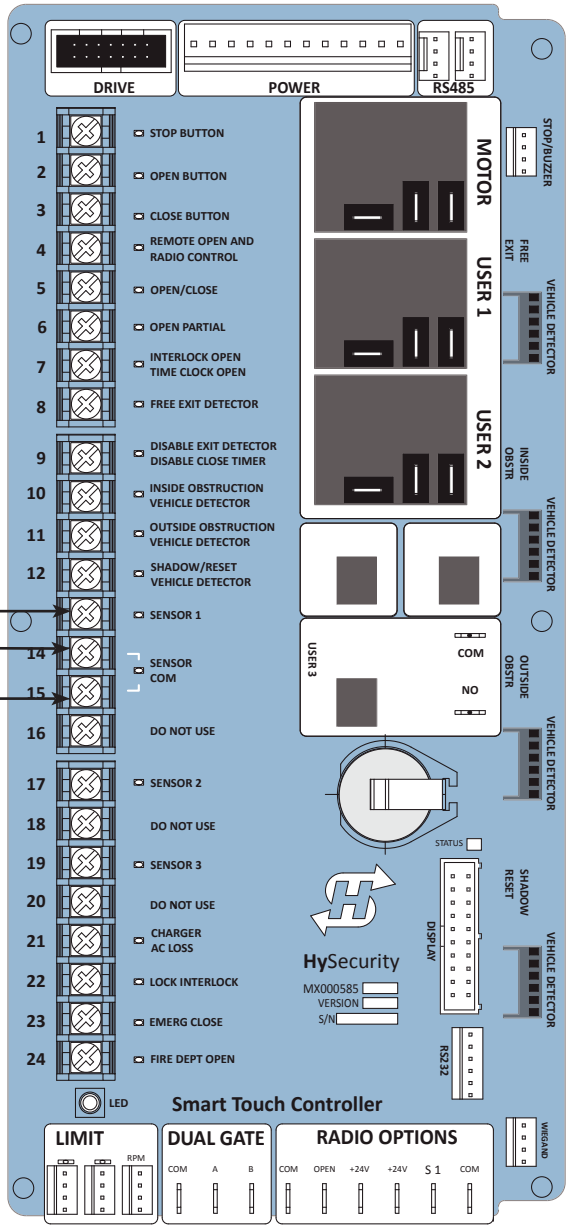


Installer Menu showing Sensor 1 set to Eye Open (Option #4)

EMX IRB MON Photo Eye Transmitter



Power Supply Board



+24V

COMMON / NEG. to SENSOR COM

EMX IRB MON Photo Eye Receiver

COMMON / NEG. to SENSOR COM

NC Relay

+24V

Jumper POWER INPUT - 24V to COM

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

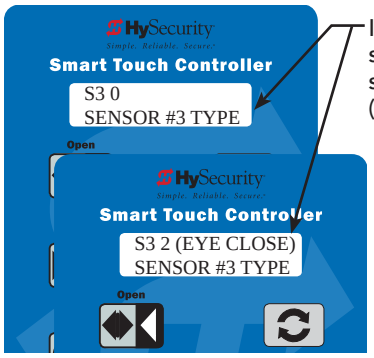
For easy photo eye alignment, see page 23.

NOTE: Drawing is not to scale.

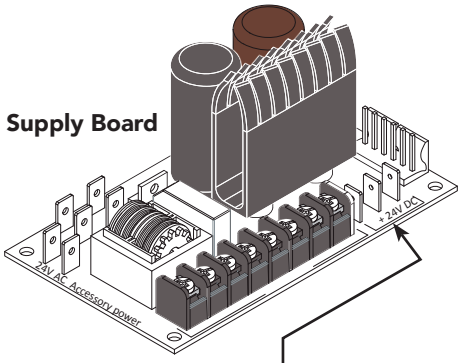
Photo Eye Transmitter / Reflective (E3K R10K4)

1. **Set Photo Eye switch to LIGHT ON. See NOTE.**
1. Connect photo eye wiring.

   NOTE: Run a jumper between photo eye -24V and Relay COM (C2) 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. See table on page 9.



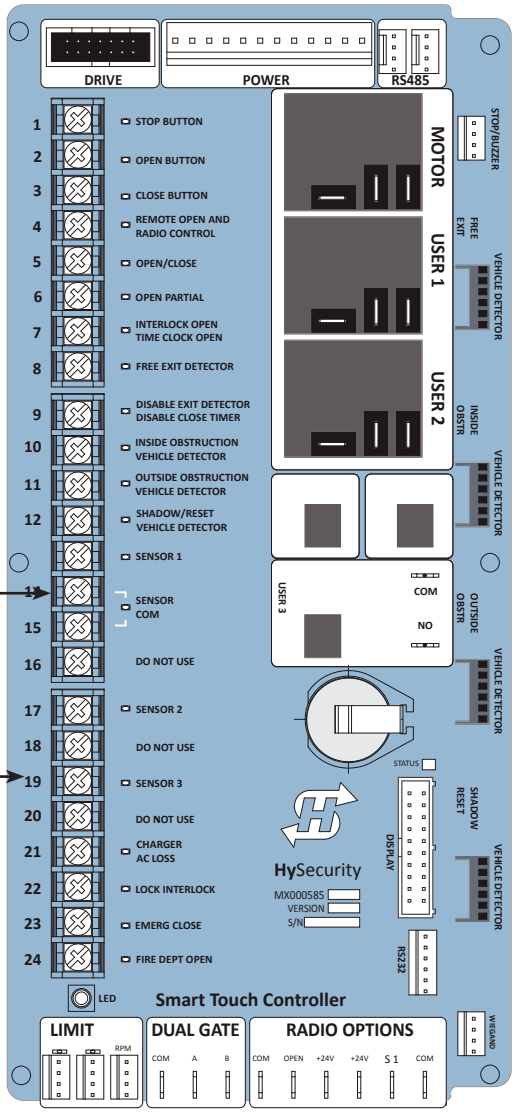
Installer Menu showing Sensor 3 set to Eye Close (Option #2)



Power Supply Board

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

Omron (E3K R10K4) Reflective Photo Eye



COMMON / NEG. to SENSOR COM

+24V

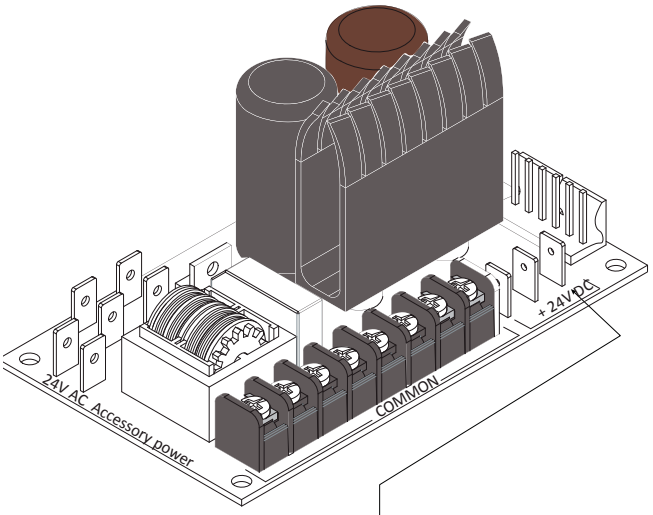
Jumper -24V to Relay COM (Terminal 6, C2)

Relay NO (Terminal 5, NO2)

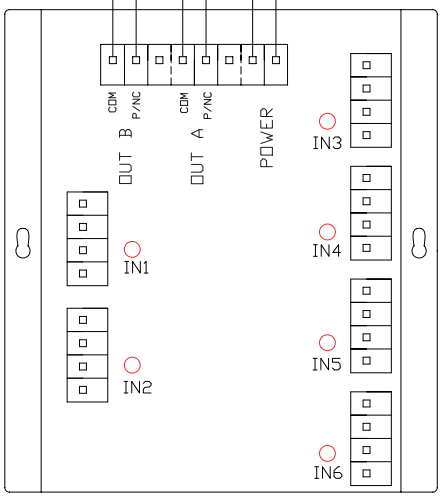
NOTE: Drawing is not to scale. D0713, Rev. A

Multi-input Module (The Solution, MIM-62)

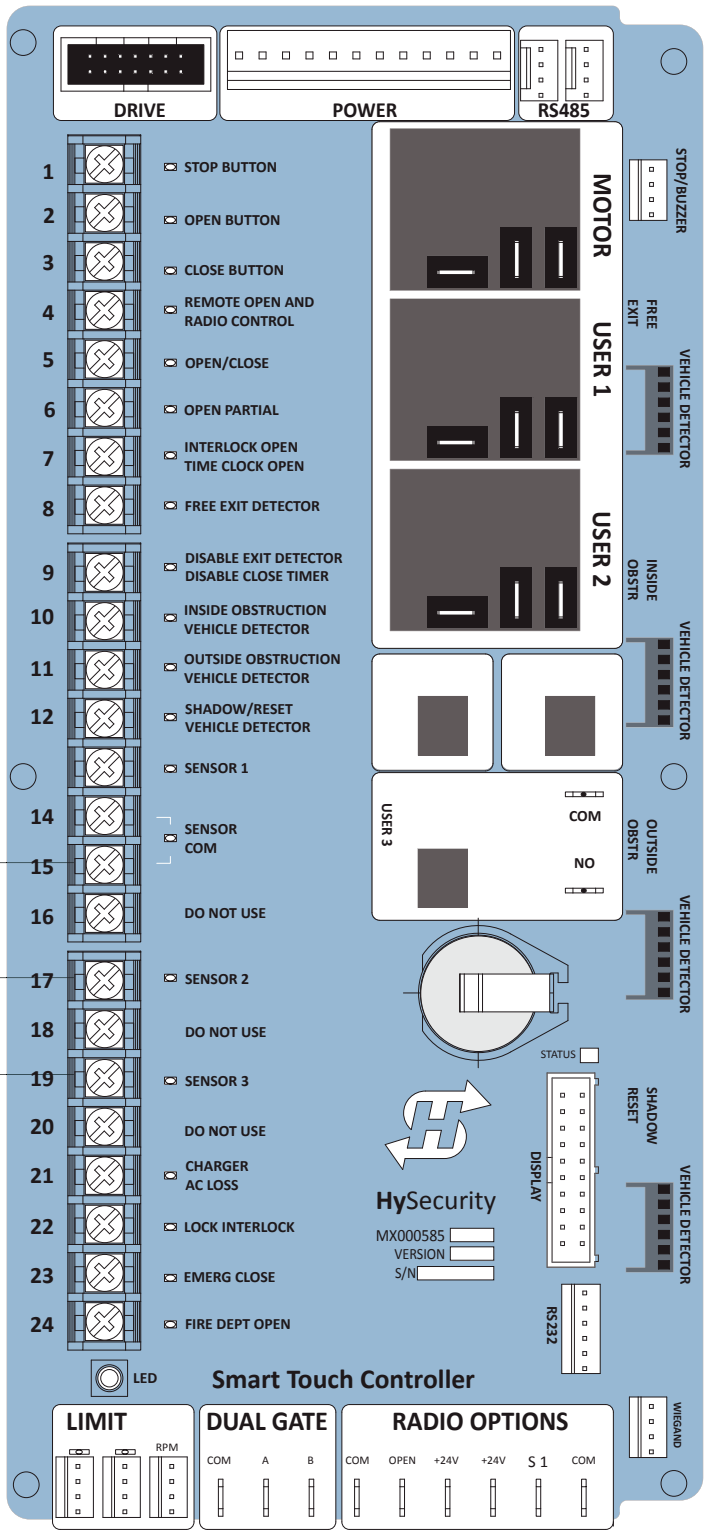
An example site scenario where The Solution might be useful is found on page 21.



Power Supply Board



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



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

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

NOTE: Drawing is not to scale. D0714, Rev. A

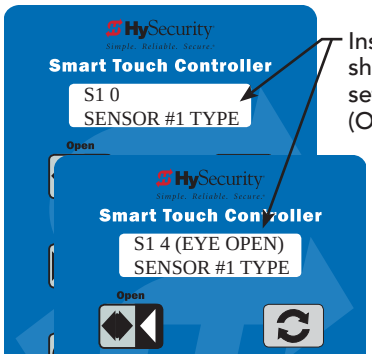
Photo Eye Transmitter / Reflecti-Guard (RG-R)

1. Connect photo eye wiring.

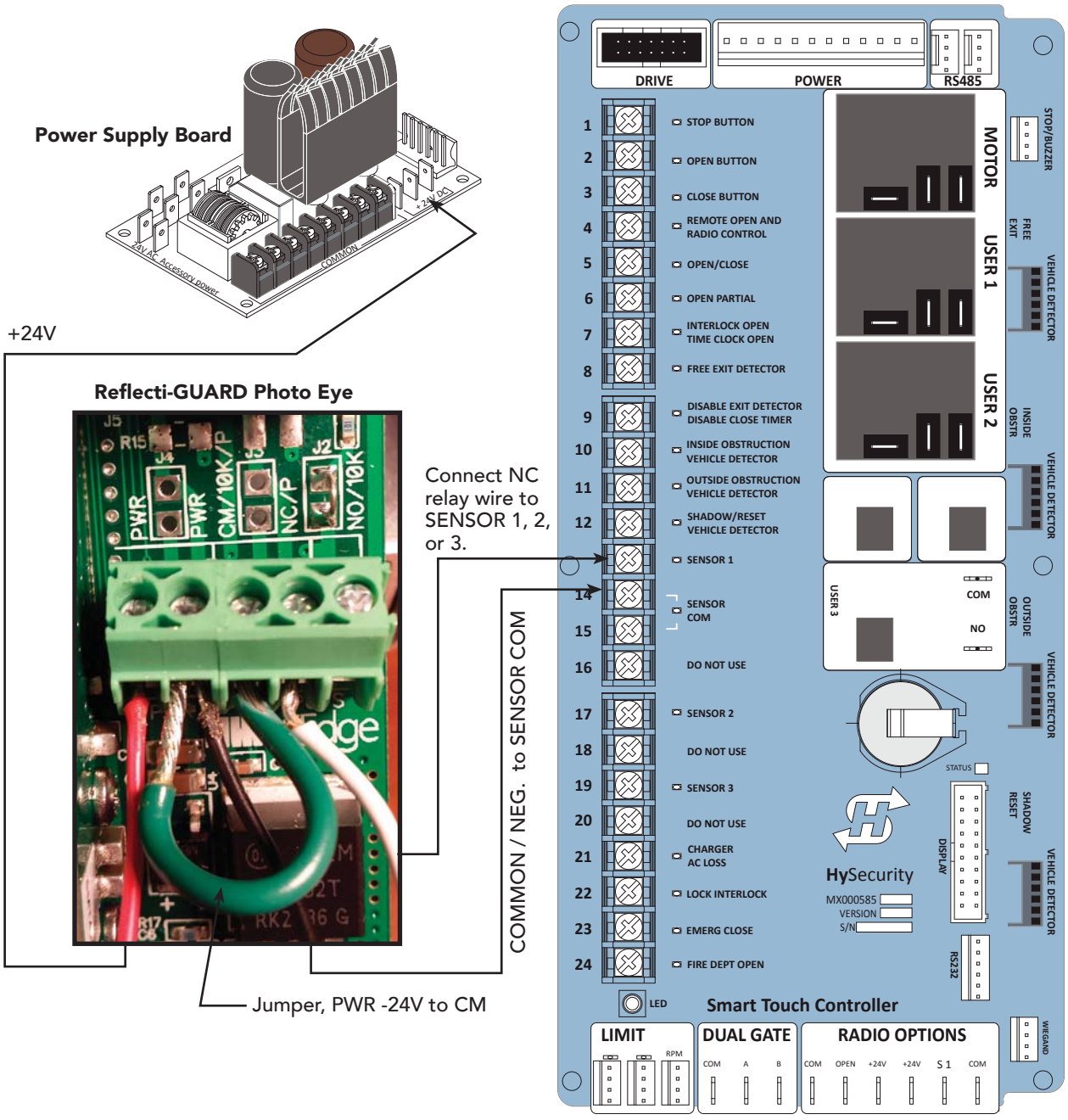
   NOTE: Run a jumper between photo eye -24V and CM terminals.

2. Turn ON power.

3. Access the Installer Menu and configure SENSOR setting according to the entrapment area that the photo eye is monitoring. See table on page 9.



Installer Menu showing Sensor 1 set to Eye Open (Option #4)



NOTE: Drawing is not to scale.

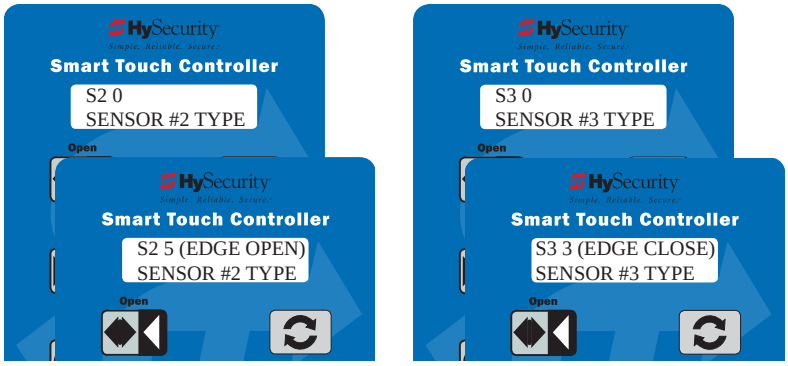
Wireless Edge, Wireless Gate Link

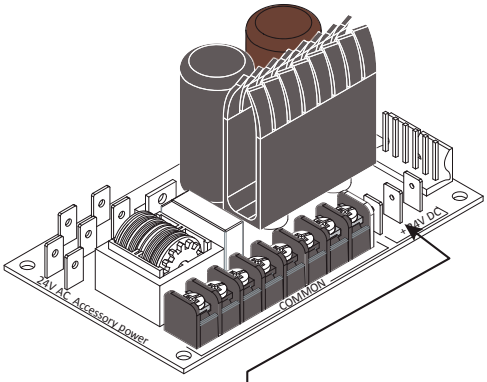
A transmitter (MGL-TX20) and receiver (MGL-RX20) are required. See table on page 5.

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). See table on page 9.

Refer to site scenarios on page 15 and page 22.

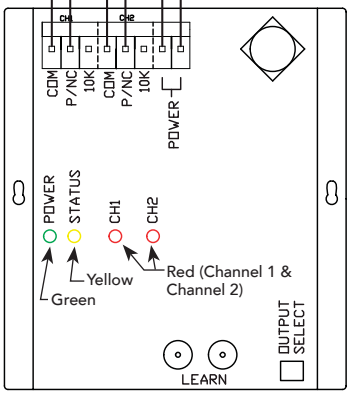
Installer Menu showing SENSOR 2 set to EDGE OPEN (Option #5) and SENSOR 3 set to **EDGE CLOSE (Option #3)**



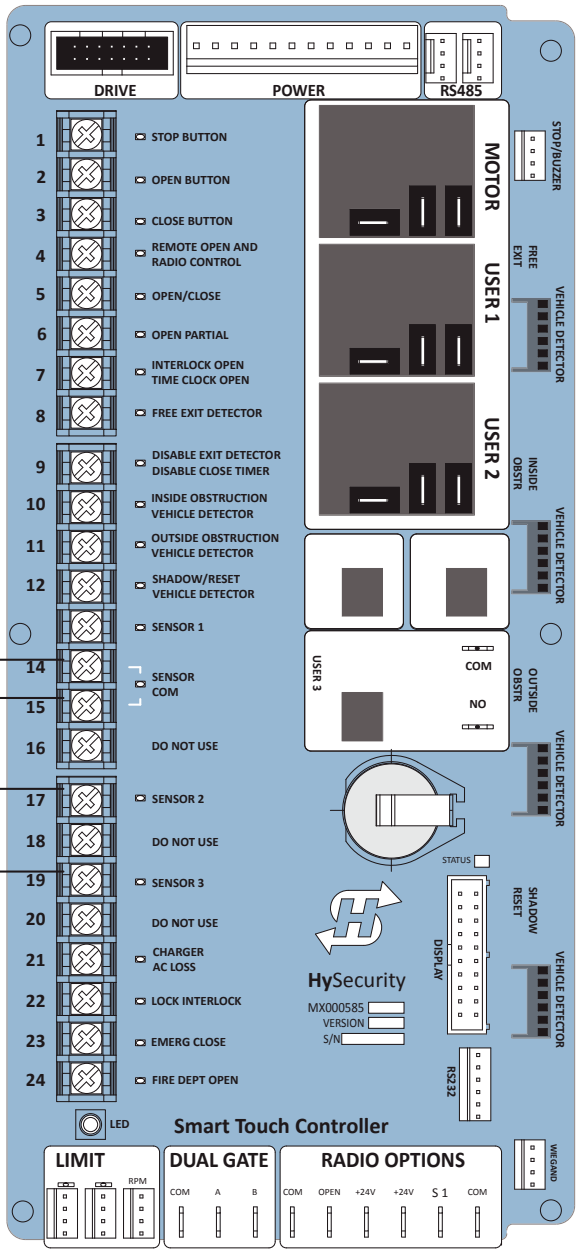


NOTE: One wireless edge receiver has the P/NC connections for up to two wireless edge transmitters.

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



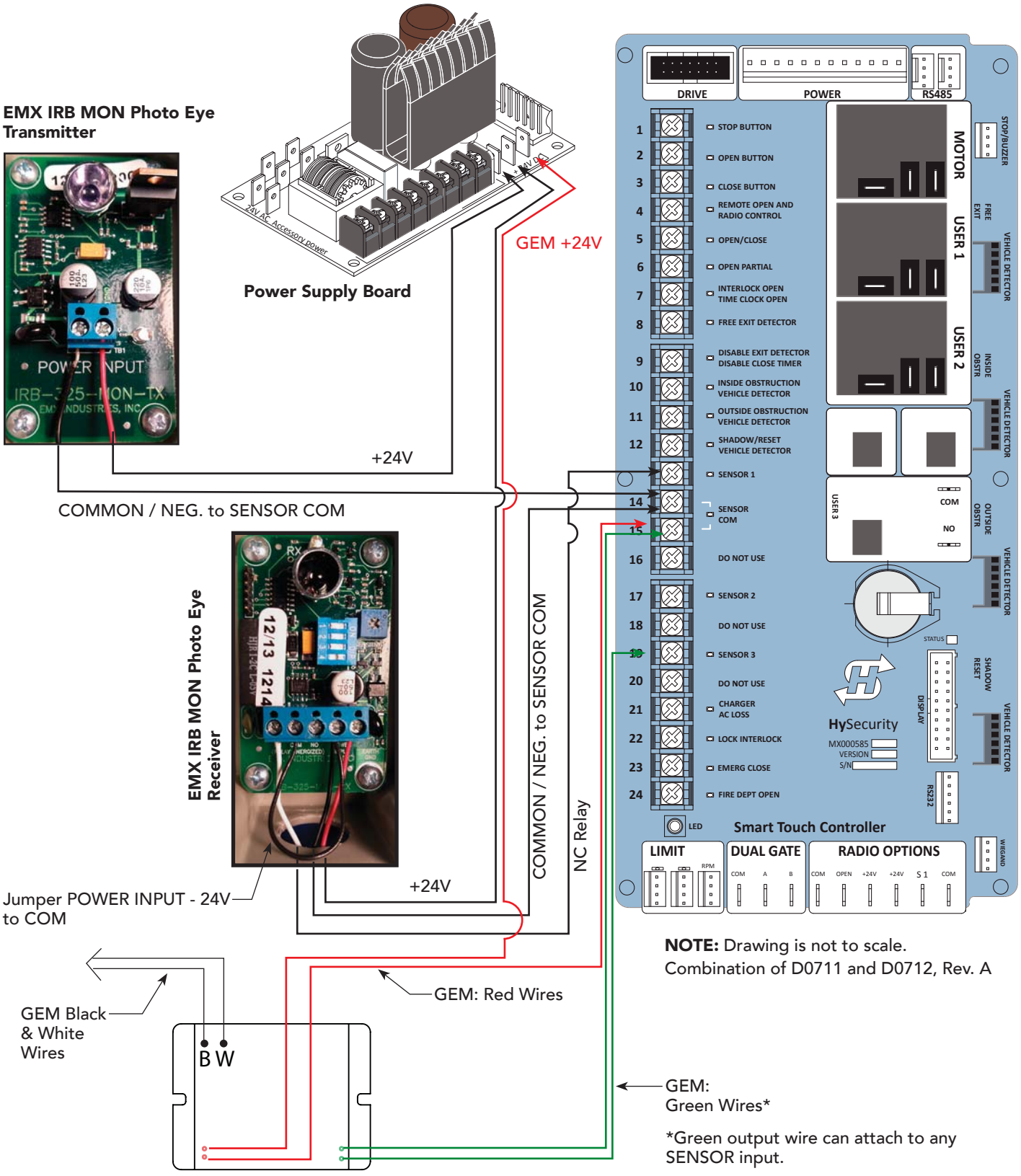
Wireless Edge Link (Receiver)
MGL - R20
Signal received from battery-powered Transmitter (MGL - TX20)



NOTE: Drawing is not to scale. D0716, Rev. A

Wired Edge with GEM-104 and Photo Eye Sensor

The wiring diagram illustrates a wired edge sensor with GEM-104 interface module and a photo eye connection. An example of the connections for an Edge sensor and a Photo Eye and the Installer Menu settings for the Smart Touch Controller (STC) are shown in Diagram 1 and Diagram 2 on page 13 and page 14.



NOTE: Drawing is not to scale.
Combination of D0711 and D0712, Rev. A

*Green output wire can attach to any SENSOR input.

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1. Warranty.

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

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 www.hysecurity.com), 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/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 Operators: Five Years or 500,000 gate cycles (whichever occurs first) after the date of installation,
b. Electromechanical Slide and Swing operators: Five Years after the date of installation—unless installed in a single family residential application, in which case the warranty term shall be Seven Years after the date the product is shipped from HySecurity,
c. Electromechanical Barrier Arm Operators: Two Years or 1,000,000 gate cycles (whichever occurs first) after the date of installation,
d. Hydraulic Wedge Operators and Electromechanical Surface Mount Wedge Operator: Two Years or 500,000 gate cycles (whichever occurs first) after the date of installation;

provided that the preceding 5-year warranty period in (a) and (b) will not extend beyond seven years from the date that the product was shipped from HySecurity, and the 2-year warranty period in (c) and (d) 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 (e-h), which have a shorter warranty period.

e. Hydraulic Gate Operator Drive Wheels including XtremeDrive™ wheels and rack: Two Years from date of installation.
f. AC and DC power supplies, chargers and inverters and HyNet module: Two years from date of installation, except batteries.
g. Batteries: One Year from date of shipment from HySecurity.
h. 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 60 days of the date of purchase, the following One-Year Limited 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 module: 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 product 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, 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 IMPLIED WARRANTIES OTHERWISE ARISING FROM COURSE OF DEALING, COURSE OF PERFORMANCE, OR USAGE OF TRADE.

3. Buyer's Exclusive Remedies for Any Nonconformity.

If a HySecurity product fails to conform to the warranties in Section 1, Buyer must notify and order replacement parts from the Distributor through which the product was purchased within a reasonable time and in no event more than thirty (30) days after the discovery of the nonconformity. HySecurity will investigate and, in the event of a breach, will provide, within a reasonable period of time, one of the following: (1) repair or replacement of any nonconforming products or components or (2) refund of the price upon return of the nonconforming items. 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.

HySecurity Contact Information

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

- Qualified HySecurity distributors are experienced and trained to assist in resolving any problems. For the name of a qualified distributor near you, contact us at www.hysecurity.com.
- HySecurity Technical Support 800-321-9947.

For information about HySecurity training for installers, maintenance personnel, and end users, refer to the company website at www.hysecurity.com.

D0726 Rev. C