Controlled Access

The Leader in Pedestrian Control Systems
Waist & Full Height Turnstiles and Matching Gates

Beacon Series BE800-R

Service & Installation Manual

Note: Successful turnstile installation depends on reading this manual.

Important Note: Please keep this service manual after installation. If an installation is done by a construction company or outside installer, please pass this book along to the end user. This book is required for maintenance, troubleshooting, and repairs.

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Beacon Series Optical Turnstile

Theory of Operation:

The Beacon barrier optical turnstile lane is designed to control traffic with an intuitive barrier free design. This is accomplished with thru-beam type sensors to detect where a person is inside of the lane. Crossing and uncrossing certain beams at certain times will evaluate a passage to be either authorized or unauthorized.

Within each lane there are two primary zones of sensors. Each zone acts as a "limit". Upon a valid entry (card read, push button, keypad, etc.), the unit recognizes authorization and allows passage through in the direction requested.

Should a user pass in the incorrect direction or has not been authorized for passage, an audible alarm will pulse and red x's will flash on the LED boards. An additional solid state output during alarm scenarios also exists for integration into other security systems.

In addition to the two sensor zones mentioned previously, a third sensor zone exists for crawl-through detection. If anyone attempts to crawl through the lane under the standard sensor zones, the third sensor zone detects them and an alarm goes off.

Beacon lanes are designed to allow heavy flows of traffic. With an adjustable swipe queue, one user can request passage through the lane while another is already inside. This negates the need to wait for the lane to return to a secured status before the next person can pass.

Inside the primary cabinet, a logic controller with a display screen and input buttons allow a variety of settings for the machine to be adjusted to facility preferences.

Physically, the cabinets of a Beacon lane can be positioned to create a variable passage width. A lane size can be anywhere from 22 to 38 inches. It is important to remember that the wider the width of the lane, the easier it would be for two people to pass side by side.

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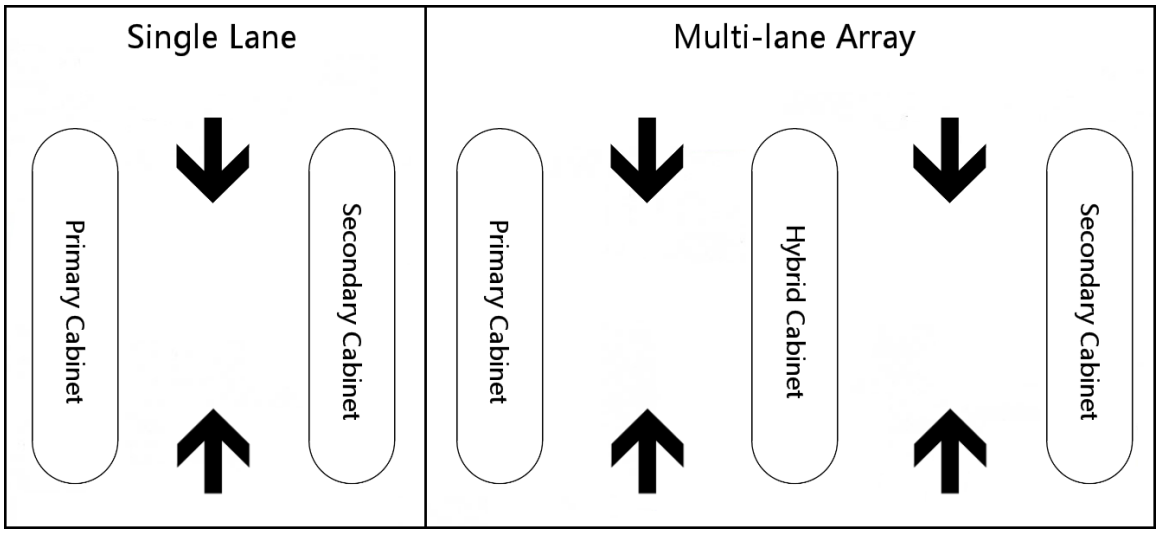
Lane Functionality

Lane configuration:

Each lane consists of two different types of cabinets; a primary cabinet and a secondary cabinet. A third type of cabinet exists which is a hybrid of the two, allowing for an array of lanes with fewer cabinets. In that instance, one side would be primary and the opposite would be secondary.



From the factory, each cabinet in an array is preconfigured to the requested operation and layout. Each lane has two directions of passage, each of which can be configured for controlled passage, free passage or no passage. This configuration can be changed in the field via settings on lane's logic controller located inside of the primary cabinet.

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Lane Functionality (cont.)

Spacing:

Due to the strength of the optical beams, Beacon lanes can be positioned to function at multiple passage widths.

Typical installations for a standard lane run from 22-26 inches. ADA lanes should be a minimum of 36 inches. As long as each cabinet is square and level to the next, the distance between each cabinet can be whatever is needed at the site of installation.

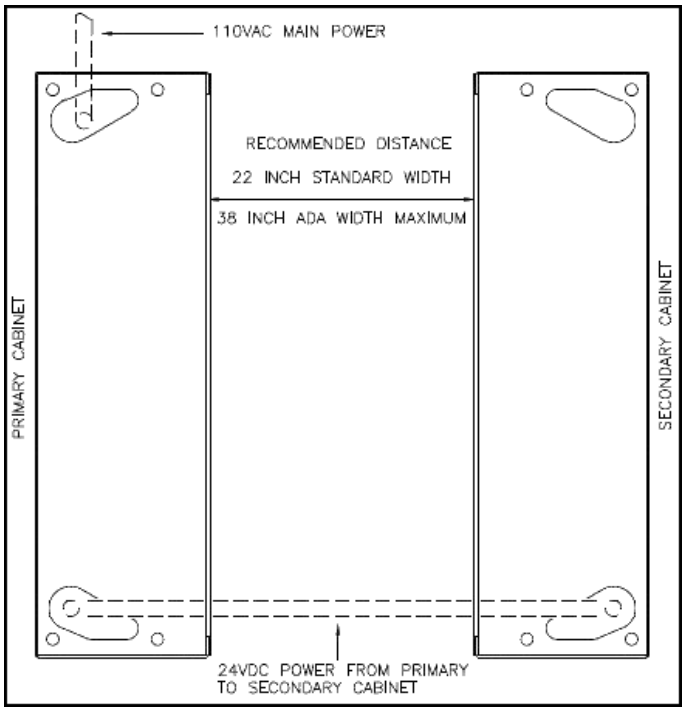
Electrical requirements:

Primary cabinets require 100-240 VAC input voltage. An internal power supply steps the voltage down to 24VDC.

Between the two cabinets in a lane, an 18 gauge 2 conductor cable is necessary in order to operate the secondary cabinet. It will be necessary to provide conduit access between the two cabinets. However, only the primary cabinet requires 100-240VAC. The secondary cabinet will obtain 24VDC from the primary cabinet.

It is recommended that the primary side of a hybrid cabinet receives 100-240VAC and the secondary side recieves the 24VDC from the primary cabinet of the other lane. This is so one lane can be taken offline without affecting the other.

The primary cabinet may also require conduit access from the access control system, this is dependent on the method of installation of access control.



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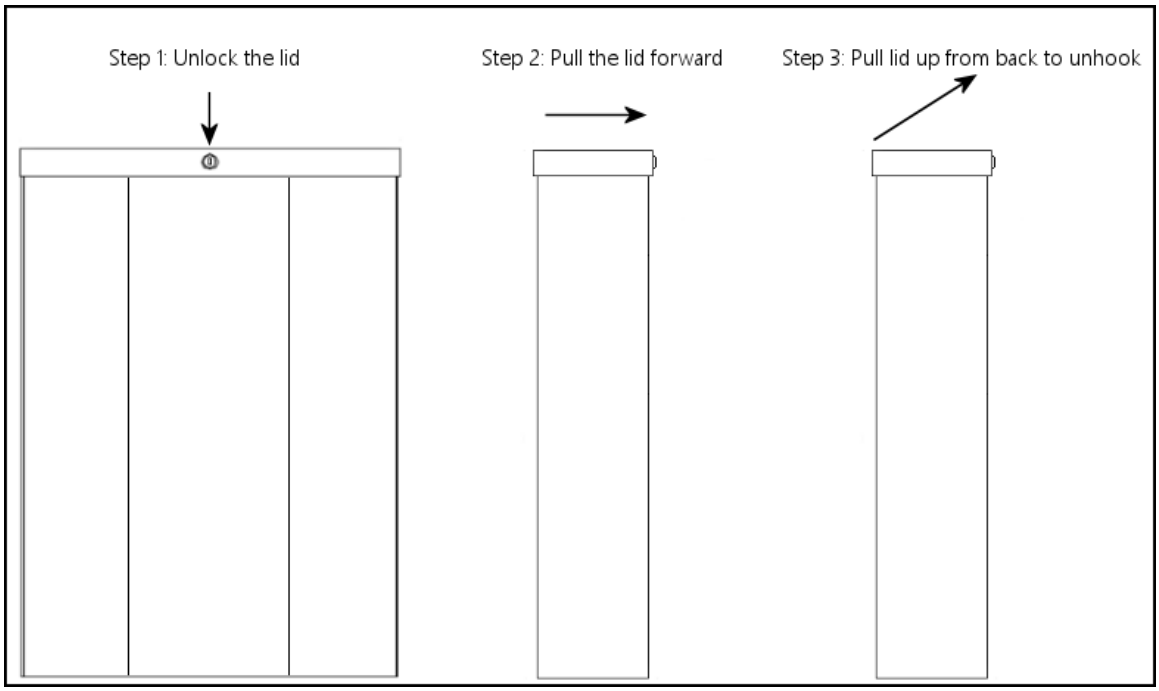
Pre-installation Preparation

Removing the lids:

Before installing a Beacon lane, it is necessary to disassemble the cabinet to reach the floor plate.

The first step is to remove the lids of each cabinet. The lids are secured with a lock on the front and hooks on the back. In order to remove the lid, unlock the front side with the provided keys. Then, pull the lid forward from the back and lift up to unhook the lid from the cabinet.



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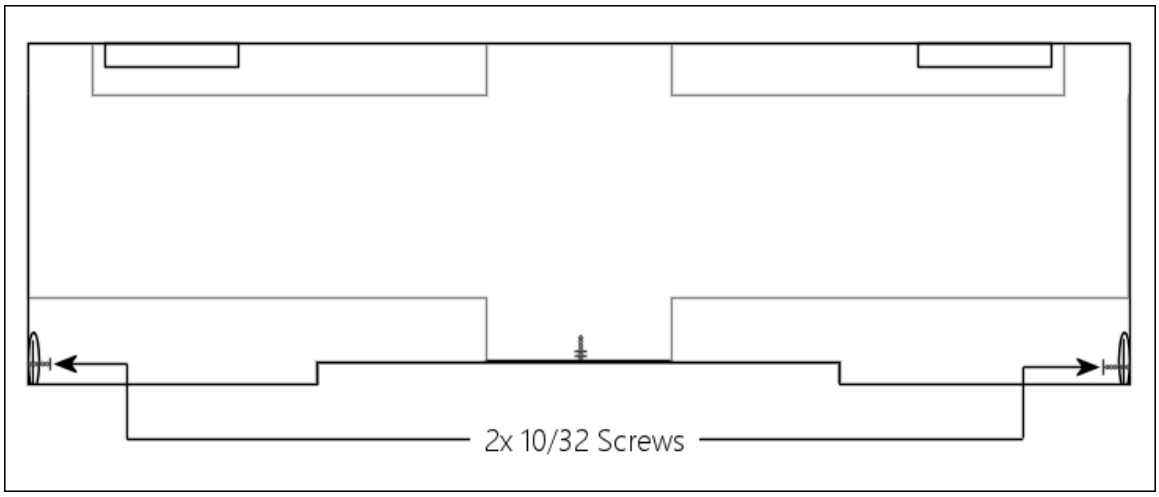
Pre-installation Preparation (cont.)

Removing the front panels:

The next step before being able to access the floor plate is to remove the front panels of the cabinets. With the lid removed, two 10/32 screws are found in the top corners of each panel. Simply remove these screws and the front panel can be removed by tilting it forward and lifting it out of the floor plate



Although it should not be necessary, the sensors can be disconnected from their cables. Each sensor is equipped with an M8 euro style quick disconnect cable. These can be disconnected so that the panels can be completely removed from the area to provide more work space. Simply unscrew the thread on the cable where it connects to the sensor and remove.

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Pre-installation Preparation (cont.)

Pre-installation Alignment:

Before anchoring the cabinets to the floor, we recommend laying out the lane and testing alignment.

Place the cabinets in their approximate end location and connect the 2 conductor cable inside of the primary cabinet to the end in the secondary cabinet. Plug in the primary cabinet to AC voltage to power up the lane.

Inside of the primary cabinet, there is a series of 7 total photo cell sensors. Each of these sensors is equipped with two LED's on the rear. One of them is green and should always be lit. The other should be solid orange while the beam is uncrossed and off while the beam is crossed.

If the orange LED is blinking in any case, you will need to adjust the sensor alignment, shift the cabinets so that they are straight to each other, or shim the cabinets so that they are level.

See the sensor alignment section of this manual for advice on how to ensure the transmitter's light reaches the receiver properly.

Glass Information:

To conceal the sensor array, a sheet of tinted glass is to be installed onto the front panels. This glass can create a dispursion effect to the sensor beams. It is suggested that the lane's function is tested with the glass in place to ensure alignment is sufficient for the final installation.

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Concrete Anchor Instructions

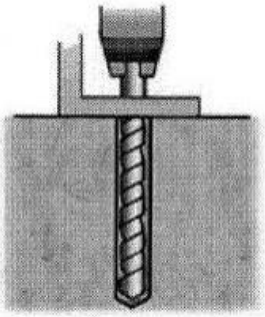
Instructions for Using Wedge Anchors

Determine the appropriate wedge anchor length for your project.

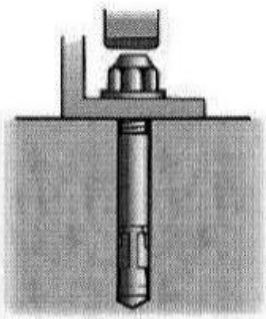
1. 1. Add:
   The thickness of material to be fastened
   -to-
   The minimum embedment required
   -to-
   The thickness of the nut and washer (about one anchor diameter).
2. Once you have determined the appropriate wedge-type-anchor length, drill your hole using a bit with the same diameter, ½" deeper than the anticipated anchor embedment.
3. Clean the drilled hole of any debris.
4. Thread the nut and washer until the nut is flush with the top of the anchor.
5. Hammer it into position (nut and washer flush with the surface of the material).
6. Tighten finger completely and then take an additional 3-5 turns with the wrench.
7. If the anchor spins in the hole, force it up using a screwdriver until the clip binds into the concrete.

Thunderstud® Wedge Anchor Technical Information

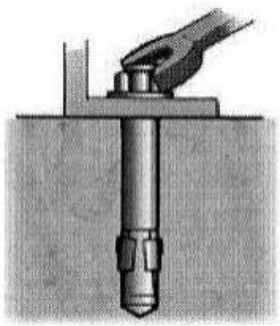
Diam. & Length	Min. Embedment	Thread Length
1/4"	1-1/8"	3/4"
3/8"	1-1/2"	7/8"
3/8"	1-1/2"	1-1/8"
1/2"	2-1/4"	1-1/4"
1/2"	2-1/4"	1-1/4"
5/8"	2-3/4"	2"
5/8"	2-3/4"	2"
5/8"	2-3/4"	2"
3/4"	3-1/4"	2"
3/4"	3-1/4"	2"
3/4"	3-1/4"	2"
7/8"	3-7/8"	2-1/4"
1"	4-1/2"	2-1/4"
1-1/4"	5-1/2"	3-1/4"



1. Drill hole 1/2" to 1" deeper than anchor embedment. Clean hole of debris.



2. With nut threaded past the end of stud, hammer into position.



3. Tighten finger tight plus an additional 3-5 turns with wrench.

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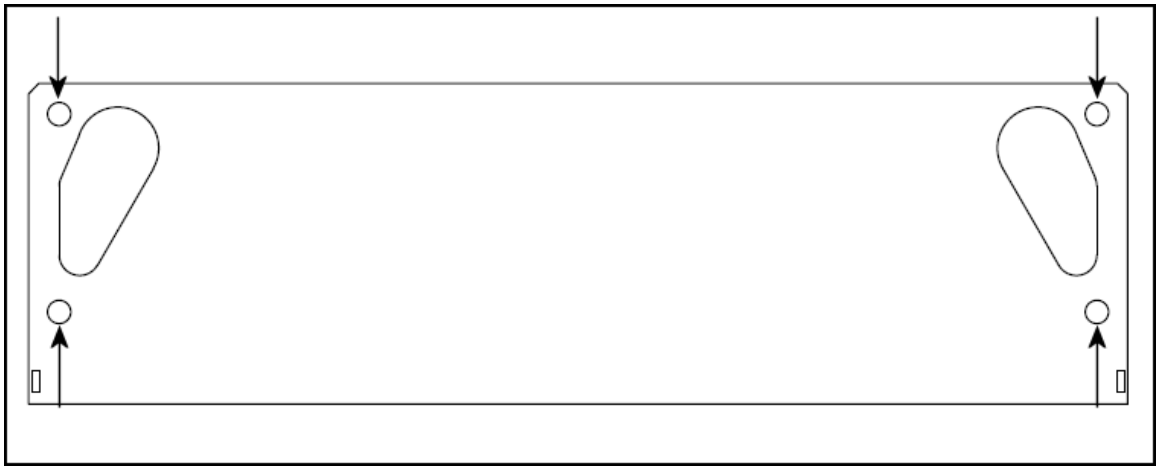
Installation Instructions

1. Floor should be level +/- 1/16”. If not, each cabinet must be shimmed.

Note: Anchoring optical lanes to an uneven ground most likely will cause serious issues in unit operation.

2. Install conduit for 100-240 VAC to primary cabinet, conduit for access control integration (if applicable), and a conduit in between the primary and secondary cabinet for cabling to the secondary cabinet. Lane distance can be varied from 22 to 38 inches.

3. With each cabinet in the exact position to be mounted, use a center punch to mark location of the four holes to be drilled in the floor.



Note: Make sure each cabinet is square to each other, otherwise operation will be inconsistent

3. If necessary, move cabinets out of the way. Drill four 3/8” holes 4” deep per cabinet and remove all concrete dust from the holes.

4. Place cabinet in the correct location and install SS wedge type anchors supplied. Torque the nuts to a minimum of 50 foot pounds.

5. Plug the power supply in the main cabinet into 100-240 VAC (single phase) minimum 3 amp GFI circuit.

6. The sensors we use are a thru-beam type: they require a transmitter and receiver in order to operate. In order to accomplish this, you must connect 24VDC power to the secondary cabinet. This is accomplished with a provided two conductor cable. See the wiring diagram for more information.

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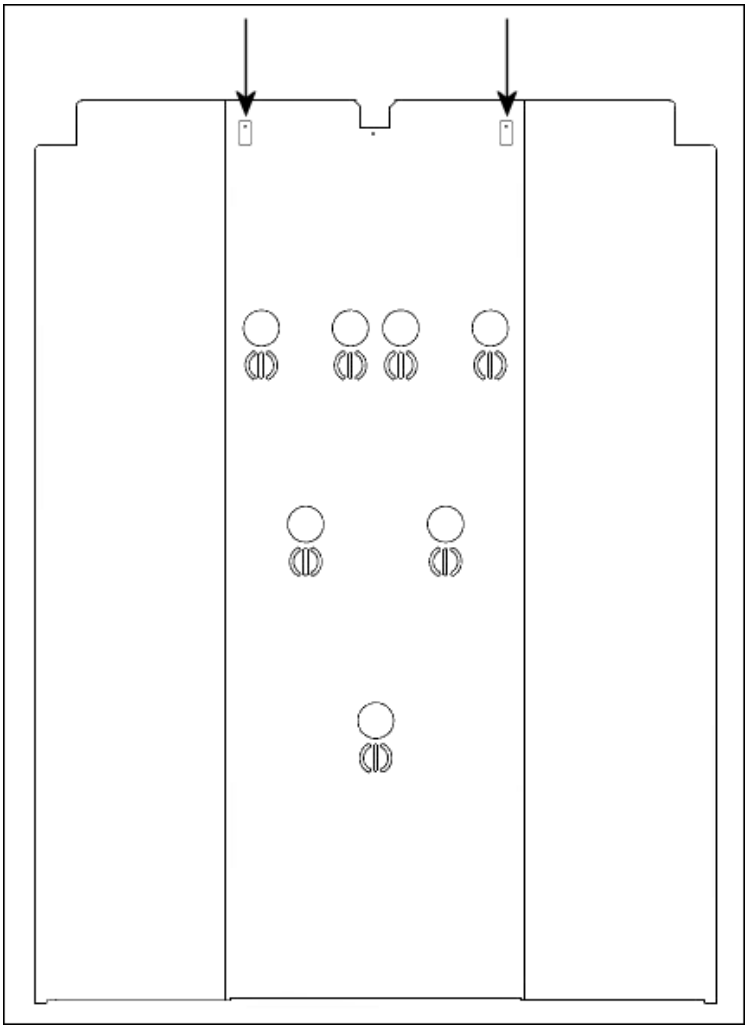
7. Connect access control as required to direction inputs on the logic controller. See wiring diagram for more information.

8. Replace sensor panels and reconnect cables to sensors (if removed). Make any sensor adjustments necessary (see sensor alignment instructions) and test lane to ensure operation is satisfactory before replacing the front panels onto the cabinets.

9. Install the sheets of glass by remove the two screws holding the glass clips onto the front panel. Once the glass is in place, reinstall the glass clip.



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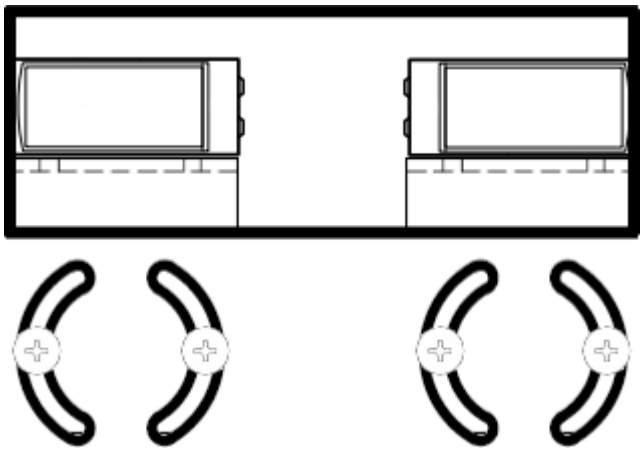
Sensor Alignment

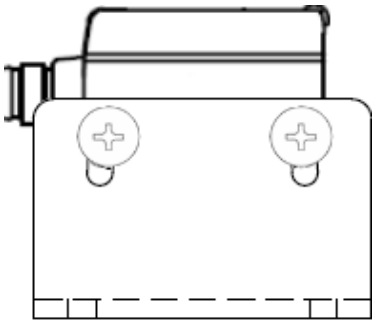
The Beacon series is equipped with visible target laser thru beam sensors. The transmitter sensors (located in the secondary cabinet) shine much like a flash light. The target from the transmitters can be visibly seen by simply placing a piece of white paper onto the target area.

Each photo cell is mounted onto a bracket which is screwed onto a panel.



Loosening the screws holding the bracket to the panel will allow for some range of motion up and down.

The sensors can also be tilted on the brackets themselves to provide a left-to-right alignment adjustment. Simply loosen the screws holding the bracket to the sensor and tilt in the desired direction.



Note that the light from the transmitters will actually be larger than the surface area of the receivers. This makes alignment much easier. Try to center out the targets to the receiver as close as possible.

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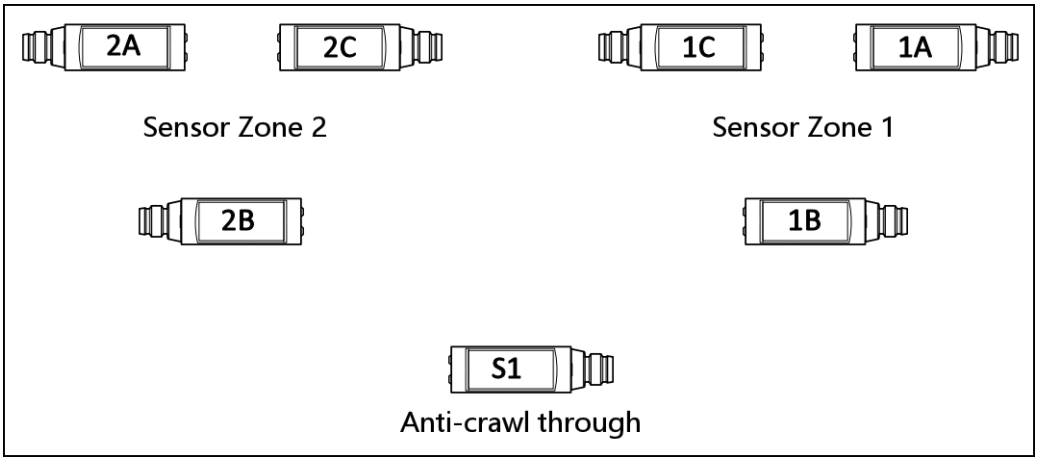
Sensor Designations



Above is a diagram which illustrates each sensor's position. There are 7 sensors on each cabinet total, separated into 3 "zones".

The zone designated as "Sensor Zone 1" is part of the intelligence behind whether or not authorized access has been granted. For example, if the zone 1 sensors have been tripped but direction 2 was the direction that authorization was granted, an alarm will trigger.

The zone called Sensor Zone 2 does the same thing as zone 1, but in the opposite direction.

The sensor zones have another function as well. On free flow mode, when the sensor zone for the appropriate direction is actuated, access is granted for that direction.

The third zone are sensors which prevent the arms from closing on obstruction and also serve as anti-crawl through sensors. These will detect unauthorized people who are attempting to crawl underneath the main zones.

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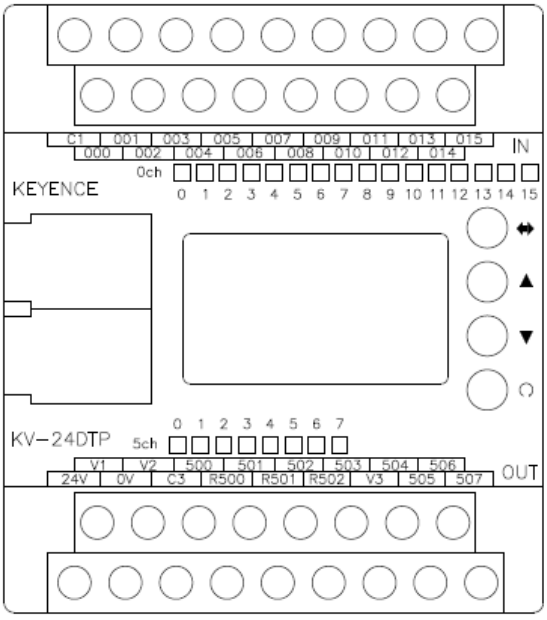
Wiring Legend



KV-24DTP Inputs	KV-24DTP Outputs
C1 - to 24VDC -	24V - 24VDC +
000 - Dir 1 Input	0V - 24VDC -
001 - Dir 2 Input	C3 - to 24VDC +
002 - Sensor 1A	500 - Dir 1 Yellow
003 - Sensor 2A	501 - Dir 1 Green
004 - Sensor 1B	502 - Dir 1 Red
005 - Sensor 2B	503 - Dir 2 Yellow
006 - Sensor 1C	504 - Dir 2 Green
007 - Sensor 2C	505 - Alarm (Pulsing)
008 - Sensor S1	506 - Dir 2 Red
009 - Not Used	507 - Alarm (Solid State)
010 - Not Used	
011 - Not Used	R500, R501 and R502
012 - Not Used	are all not used.
013 - Not Used	V1, V2, & V3 are connected
014 - Not Used	internally and can be used
015- Fire Alarm Input	as a terminal block.

All inputs are PNP (24VDC+)
Access control & fire alarm should be dry relay
Input relays: Common to 24VDC+, Normally Open to input
Direction inputs should be momentary pulses
Fire alarm contacts dhould be closed for duration

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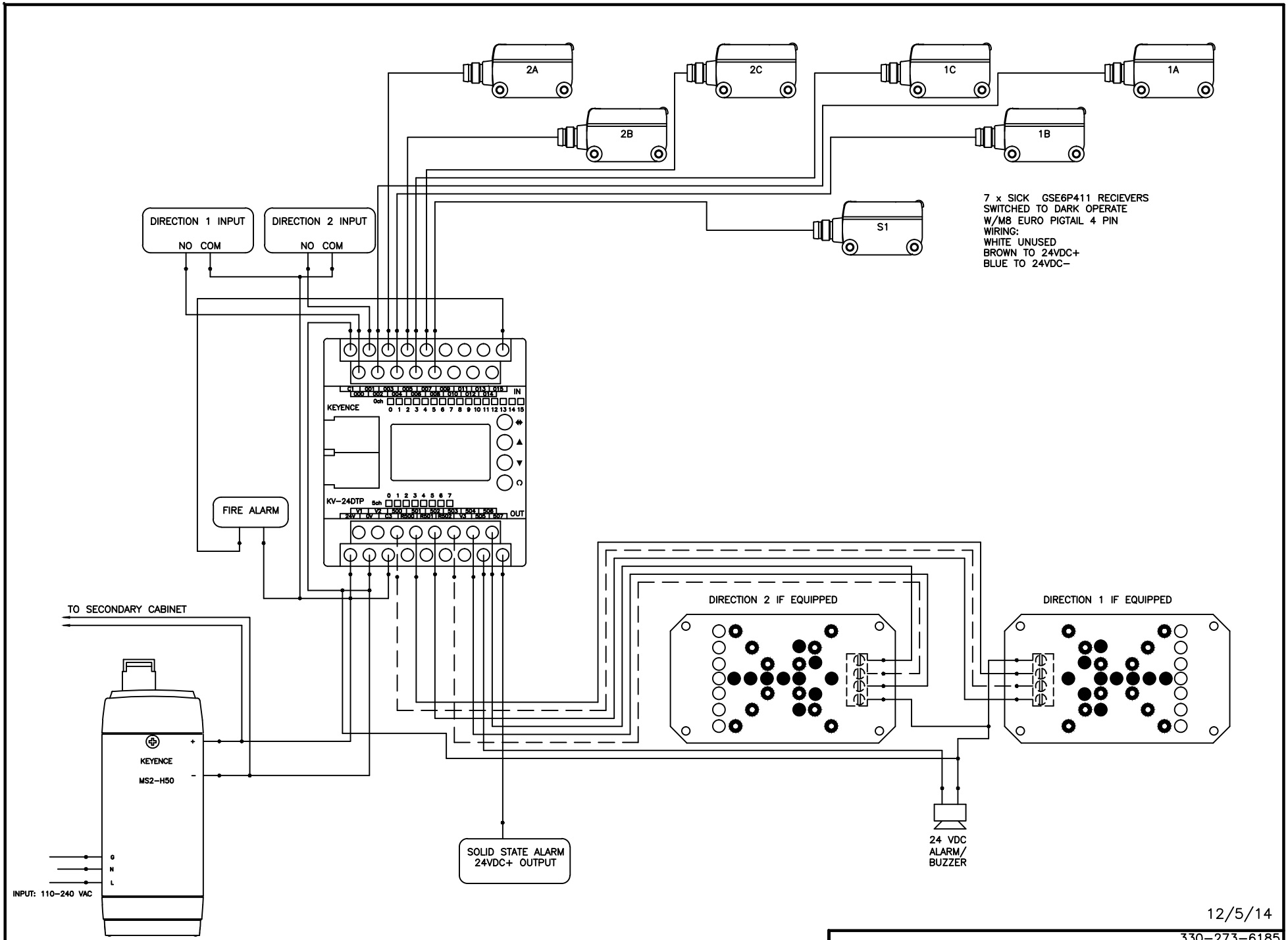

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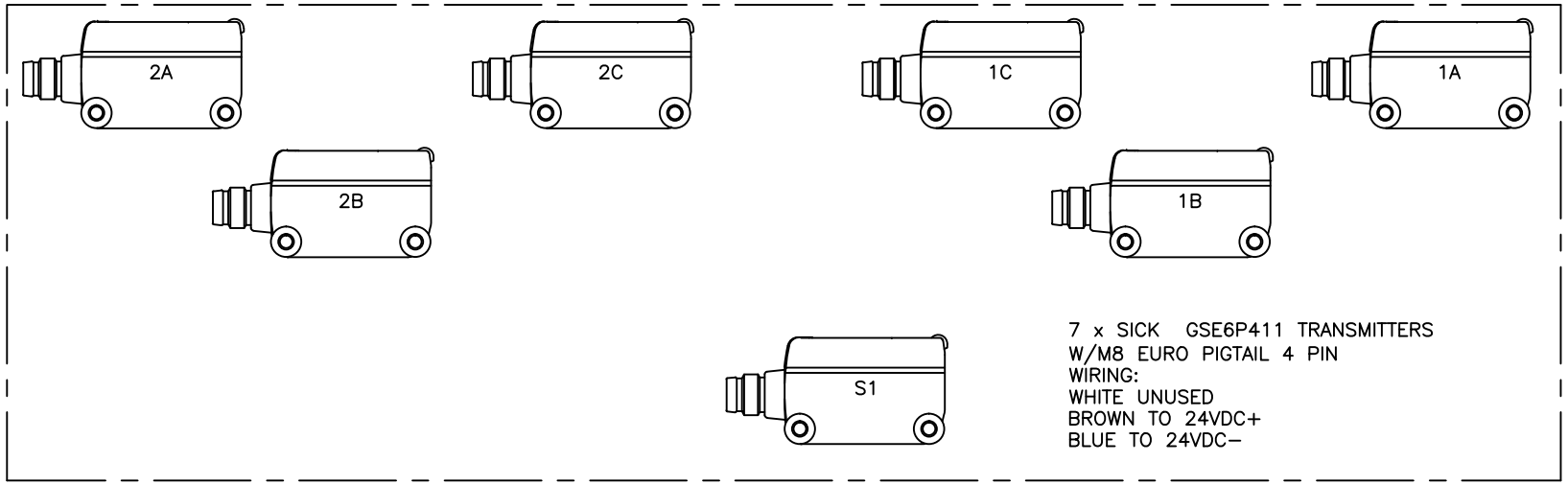
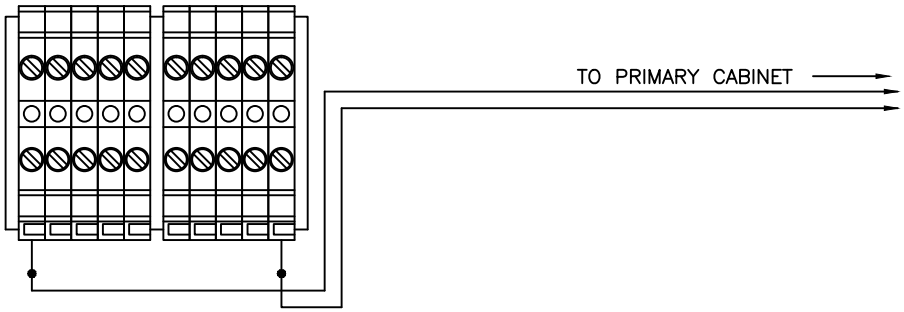
BEACON PRIMARY CABINET WIRING





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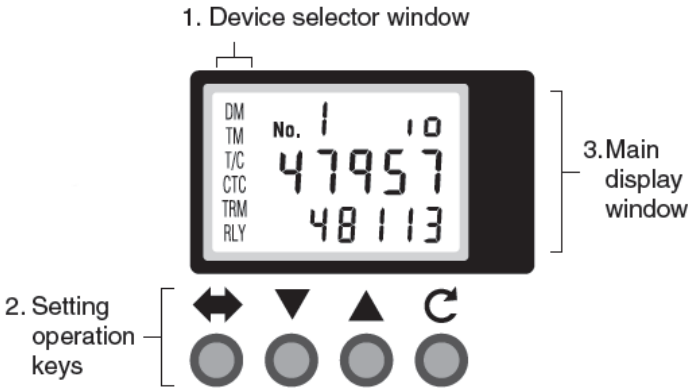
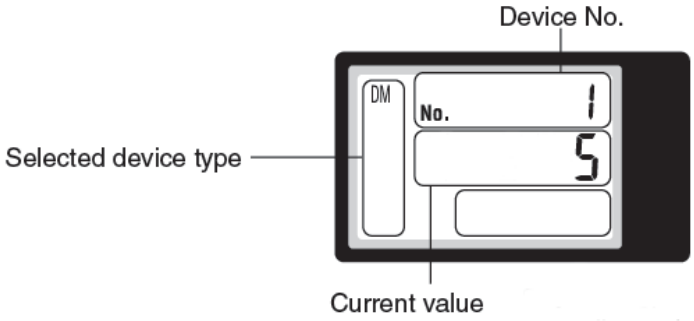
BEACON SECONDARY CABINET WIRING

Overview of the Access Window

On the logic controller, an access window is available to change and adjust many different values. Each value is referred to as a "device". The window comprises of 3 primary areas: The device selector window, operation keys, and the main display window.



Although the logic controller is capable of many functions, all of the devices that the control head operates from are accessed in "Device Mode". When device mode is active, the display screen will show DM in the top left corner.



That being said, it is possible to stray from the device mode settings. In the selected device type section of the access window, DM, TM, T/C, CTC, TRM, and RLY are all possible selections to load. Again, we are only using DM (device mode) with the Beacon series.

Should you find that you accidently have loaded any other selected device type, simply press ⬌to scroll until you have once again loaded the DM type.

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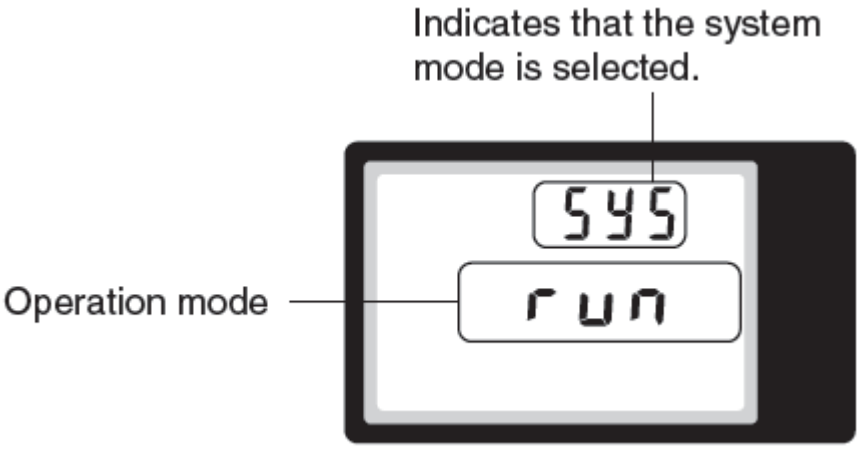
In addition to the device mode window, system mode can be accessed as well.



Although under normal circumstances you should never encounter this window, if by accident you should happen to come across it, simply press the up or down arrow until the window reads "run". Press and hold the ↻ button for 3 seconds, and the display will return to device mode.

Additionally, should for any reason the display lettering become red instead of green, you will need to access system mode to run the program in this fashion. Holding the ⇔ key while pressing up and down allows you to change between system mode and device mode. A third mode, which will display TRM on the left side of the screen, can also be accessed. Cycle through until the appropriate mode is displayed.

Finally, it is possible to lock the keypad. Should you inadvertently do so, press and hold the ⇔ button and an arrow key together for 3 seconds to unlock the keypad again.

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Device Settings of the Beacon Series

While working within device mode, two primary values should be considered. On the top of the display, the selected device is shown. The Beacon series settings can be adjusted with devices 0 – 9.

Pressing the up or down arrows allow you to select which device you wish to modify. Pressing and holding the ↻ key for 3 seconds loads the modification window. While modifying, the digits on the window begin to flash. Pressing ↔ will move the cursor in a digit. Select the correct digit to modify, then use the arrows to change the value. Once finished, hold the ↻ button for 3 seconds and your adjustment will save.

Should a value inputted not fall within the specified range of the device being modified, the value will automatically adjust to the highest possible value. A description of each device setting is:

- **DM0:** Timer value for Direction 1. The range of this setting is 1 – 60 seconds. This is how long the direction will remain open for if a user does not pass through the direction. The default setting is 7 seconds.
- **DM1:** Timer value for Direction 2. The range of this setting is 1 – 60 seconds. This is how long the direction will remain open for if a user does not pass through the direction. The default setting is 7 seconds.
- **DM2:** Alarm Timer – This setting allows for an adjustment to the duration of the alarm timer once the cause of the alarm has cleared.
- **DM3:** Direction 1 One Shot. This setting determines whether or not the access control input length is ignored and converted to a .1 second pulse internally. Enabling this allows the turnstile to ignore access control from allowing too many users pass through the turnstile. Disabling it allows access control to hold the direction open. 0 means the one-shot timer is inactive & 1 means the one-shot timer is active.
- **DM4:** Direction 2 one-shot timer: This setting determines whether or not the access control input length is ignored and converted to a .1 second pulse internally. Enabling this allows the turnstile to ignore access control from allowing too many users pass through the turnstile. Disabling it allows access control to hold the direction open. 0 means the one-shot timer is inactive & 1 means the one-shot timer is active.
- **DM5:** Direction 1 Mode: This setting determines the mode of operation for direction 1. A setting of 0 is set for controlled passage. A setting of 1 is set for free-flow passage. A setting of 2 is set for no passage. This setting is not affected by factory reset.
- **DM6:** Direction 2 Mode: This setting determines the mode of operation for direction 2. A setting of 0 is set for controlled passage. A setting of 1 is set for free-flow passage. A setting of 2 is set for no passage. This setting is not affected by factory reset.
- **DM7:** Direction 1 multi-swipe: This setting allows more than one access control request to be processed at a time to allow a faster flow of traffic. The range is 1-3. As each access control request is processed, each rotation subtracts from the total, allowing a constant flow of traffic. Most installations would benefit from a value of 2, which is the default setting.

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- **DM8:** Direction 2 multi-swipe: This setting allows more than one access control request to be processed at a time to allow a faster flow of traffic. The range is 1-3. As each access control request is processed, each rotation subtracts from the total, allowing a constant
- **DM9:** Anti-crawl through: This setting allows or disallows the anti-crawl through function, which detects objects on the lower section of the lane while neither direction is active. In facilities where users drag objects low to the ground behind them frequently (such as gyms with rolling luggage), it may be beneficial to disable this setting. A value of 0 is disabled and a value of 1 is enabled. A factory reset enables this feature.

Additionally, scrolling downward past DM0 will allow you access to **DM1999**, which resets all settings to factory defaults. Choose any value greater than 0 to perform the factory reset.

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Seller warrants the goods against defective workmanship and materials provided that Buyer notify Seller within one (1) year after receipt by Buyer of the goods of any claim under this Warranty. The liability of Seller shall be limited to replacing or repairing defective goods returned by Buyer and delivered to the factory of the Seller, transportation charges prepaid.

Replaced or repaired goods will be redelivered freight repaid to the address of Buyer shown hereon. Except for the Warranty contained herein, there shall be no other warranties, such as warranties of fitness and merchantability or otherwise express or implied, written or verbal, and Seller shall not be liable for consequential damages in any event.

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