



ClearPass Series CP1000-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.

Table of Contents

Theory of Operation	3
Pre-installation	4
Concrete Anchor Instructions	7
Installation Instructions	8
Mechanical Adjustments	10
ClearPass Mechanism Diagram	11
Sensor Alignment	12
Sensor Positions	13
Wiring Legend	14
Primary Cabinet Wiring Diagram	15
Secondary Cabinet Wiring Diagram	16
Overview of the Access Window	17
Device Settings of the ClearPass	19
Warranty Information	21
Appendix: Spec. Sheets, Options, Etc.	

ClearPass Series Barrier Optical Turnstile

Theory of Operation:

The ClearPass series barrier optical turnstile lane is designed to control traffic with an intuitive motorized barrier 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. This sensor zone also serves to prevent the arms from closing if the passage is obstructed.

ClearPass 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 the closed position 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.

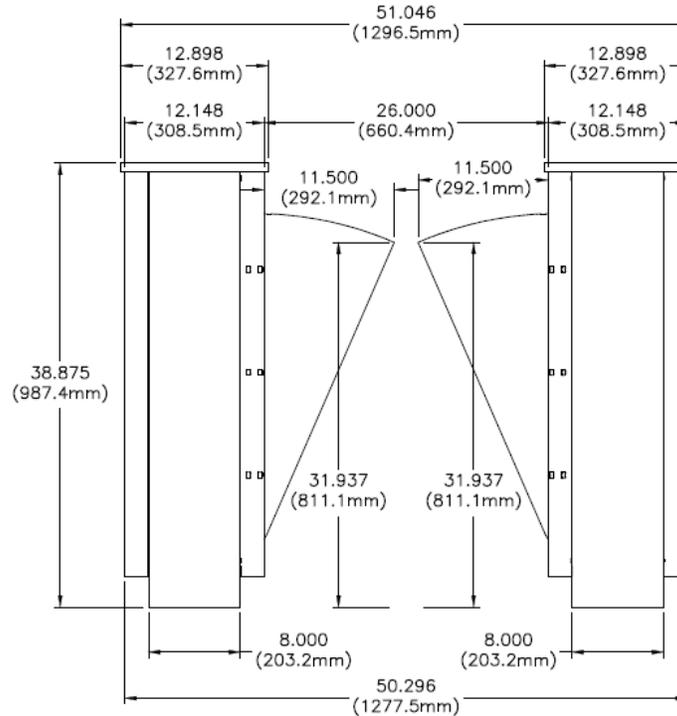
Mechanically, the arms of the ClearPass can be adjusted to extend out lesser or further to provide a variable passage width. Hydraulic shocks act as a physical hard stop for the arms while proximity sensors digitally stop the motor.

Pre-installation Preparation

Spacing:

ClearPass lanes can be adjusted to function at multiple widths.

A standard passage width would be 26" - each arm extending 11.5" from the cabinet with 3 inches of space in between.



ADA accessible width would be 36" – each arm extending 16.5" from the cabinet with 3 inches of space in between.

Adjusting the physical stroke of the arm and the motor stops (proximity sensors), a lane can comfortably be set for anywhere between 24 and 38 inches.

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 multiple lanes with fewer cabinets. In that instance, one side would be primary and the opposite would be secondary.

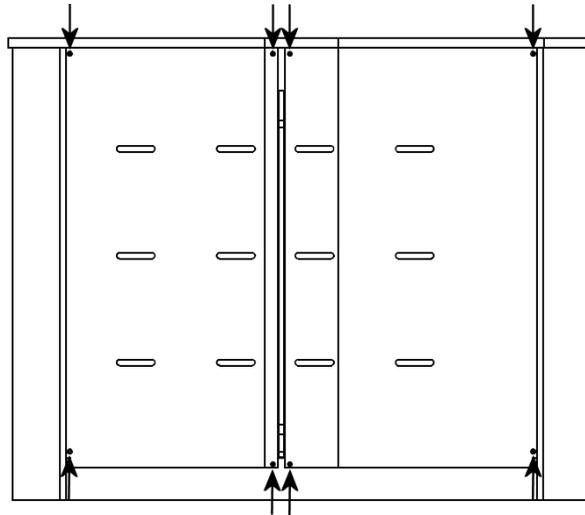
Between the two cabinets in a lane, an 18 gauge 8 conductor cable is necessary in order to operate the secondary cabinet. It will be necessary to provide conduit access between the two cabinets. However, only the primary cabinet requires 100-240VAC. The secondary cabinet will obtain 24VDC from the primary cabinet.

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

Removing panels:

Before installing a ClearPass lane, it is necessary to remove panels. Both the rear of the cabinet and the front have removable panels. It is only necessary to remove either the front or the back. It is easier to work on the lane with the back removed, but if it is against a wall, the front will suffice.

In each corner of the panels, a hole provides access to a 8/32" socket head cap screw. Insert an allen key and remove each screw.



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 8 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.

Once powered, the arms should extend out to the requested passage width. Inside of the primary cabinet, there is a series of 8 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.

Removable sensor panels:

If rear access is not possible, the sensor panels will need to be removed before installation. Similar to the front panels, the sensor panels are fastened to the cabinet with 8/32 socket head cap screws.

Instead of removing each sensor bracket from the sensor panel, each sensor is equipped with an M8 euro style quick disconnect cable. Unscrew the thread on the cable where it connects to the sensor and remove.

Concrete Anchor Instructions

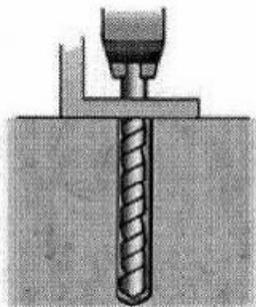
Instructions for Using Wedge Anchors

Determine the appropriate wedge anchor length for your project.

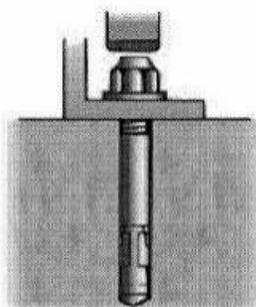
1. Add:
 - to-
 - The thickness of material to be fastened
 - to-
 - The minimum embedment required
 - to-
 - The thickness of the nut and washer (about one anchor diameter).
2. Once you have determined the appropriate wedge-type-anchor length, drill your hole using a bit with the same diameter, 1/2" 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

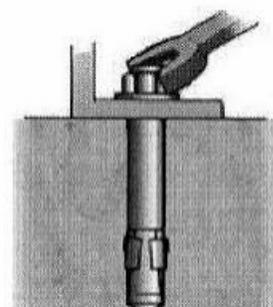
Diam. & Length	Min. Embedment	Thread Length
1/4"	1-1/8"	3/4"
3/8"	1-1/2"	7/8"
3/8"	1-1/2"	1-1/8"
1/2"	2-1/4"	1-1/4"
1/2"	2-1/4"	1-1/4"
5/8"	2-3/4"	2"
5/8"	2-3/4"	2"
5/8"	2-3/4"	2"
3/4"	3-1/4"	2"
3/4"	3-1/4"	2"
3/4"	3-1/4"	2"
7/8"	3-7/8"	2-1/4"
1"	4-1/2"	2-1/4"
1-1/4"	5-1/2"	3-1/4"



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.

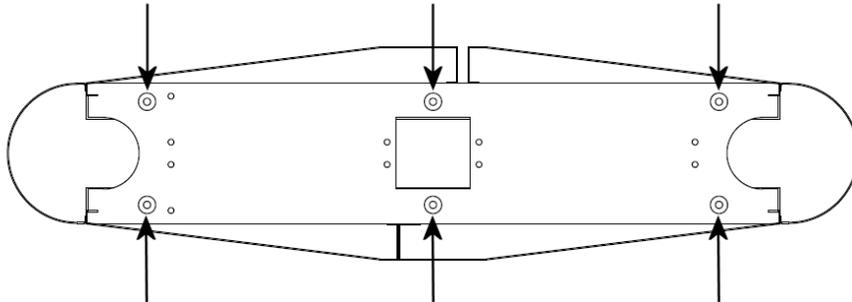
Installation Instructions

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 26 to 38 inches, assume a 3" gap in between the two arms.
3. With each cabinet in the exact position to be mounted, use a center punch to mark location of the six 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 six 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 two of the eight conductors in the provided cable. See the wiring diagram for more information.
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. Make any sensor adjustments necessary and test lane to ensure operation is satisfactory before replacing the front panels onto the cabinets.

Mechanical Adjustments

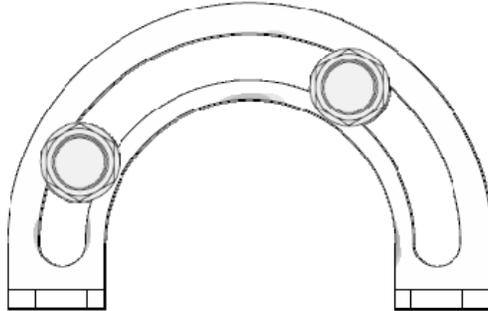
The ClearPass mechanism itself has several components to allow for field adjustment in the travel of the arm. Each arm mechanism has two physical hard stops (which are hydraulic shock absorbers) and two proximity sensors which act as inputs to the logic controller to stop the motor.

By loosening the nut securing each shock to the base, the hydraulic shock absorbers can be threaded in or out to adjust the physical range of motion of the arm.

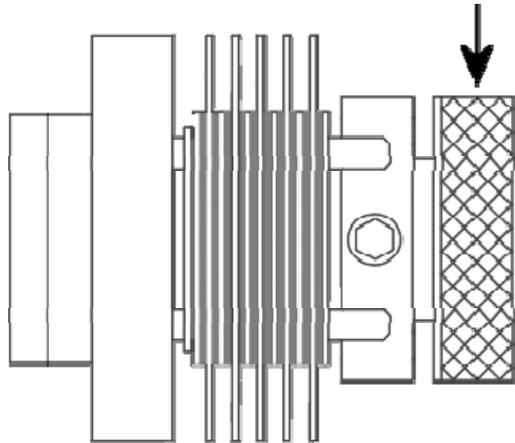
Once physical adjustments are made, the proximity sensors should be adjusted as well.

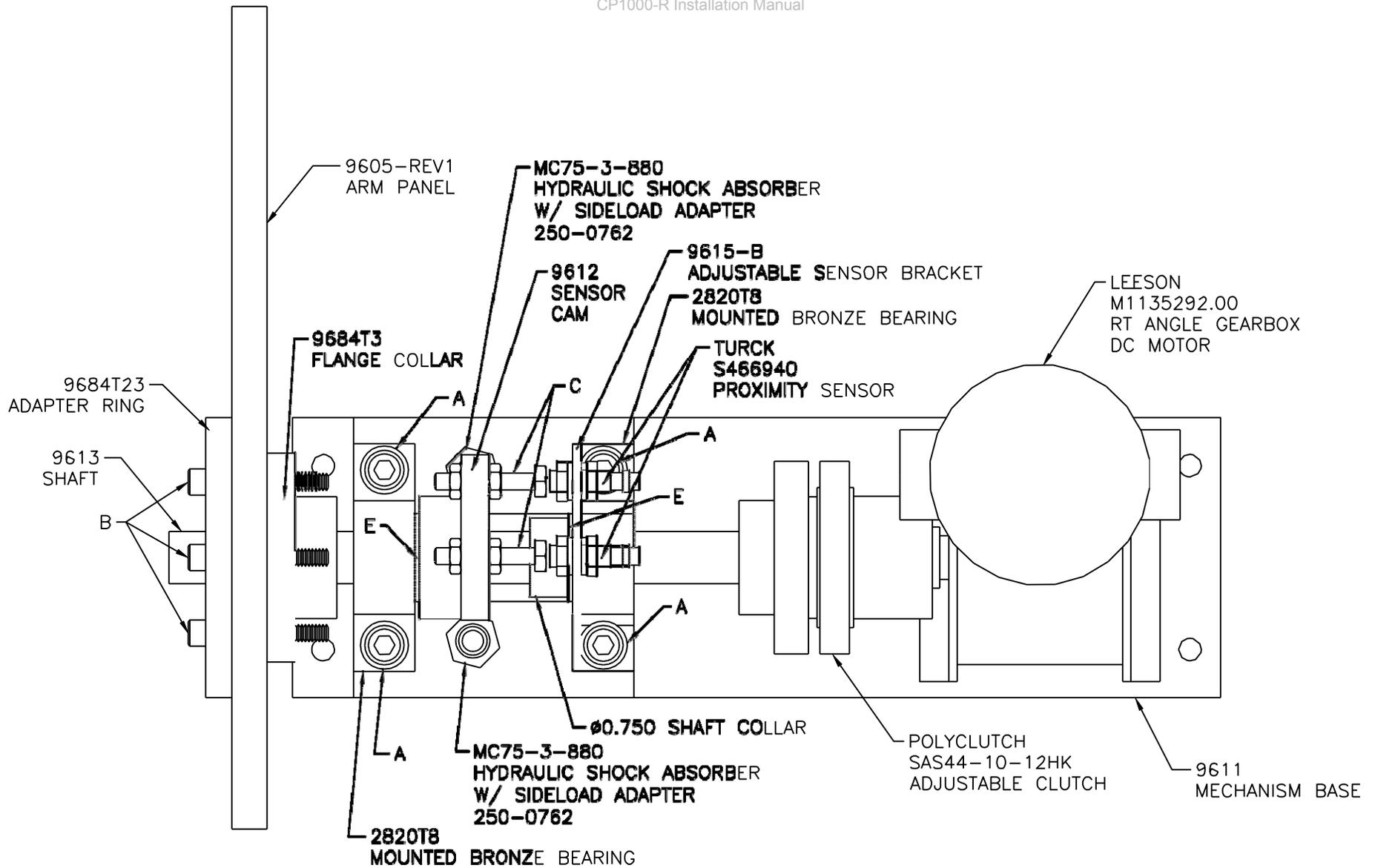
Loosening a nut on the proximity sensor and slide it to the new position.

The proximity sensor should be set to disable the motor just before the physical stop. If the arm seems to be crashing, move it to a slightly early position. If the arm is not making it to the desired position, move it closer to the stop.



In addition, a slip clutch is mounted near the motor. This clutch is adjustable as well. To increase pressure to the clutch, thread the knob in. To decrease pressure, thread the knob out.





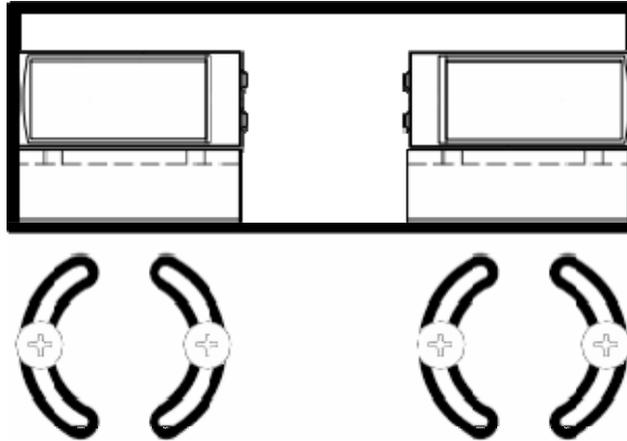
FASTENERS:

- A - 5/16-18 x 1.000 SOCKET HEAD CAP SCREW, 5/16 LOCK WASHER, 5/16 WASHER QTY 4
- B - 1/4-20 x 1.250 SOCKET HEAD CAP SCREW QTY 3
- C - 1/4-20 x 1.500 HEX HEAD BOLT QTY 2, 1/4-20 NUT QTY 4
- D - 1/4-20 x .500 SOCKET HEAD CAP SCREW, 1/4 WASHER QTY 4
- E - 3/4 x 1 1/4 OD x 1/8 THK. BRONZE THRUST BEARING QTY 2

Sensor Alignment

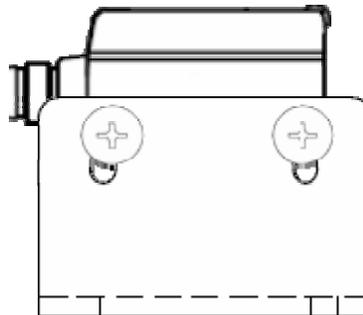
The ClearPass is equipped with visible target laser thru beam sensors. The transmitter sensors (located in the secondary cabinet) shine much like a flash light. The target from the transmitters can be visibly seen by simply placing a piece of white paper onto the target area.

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



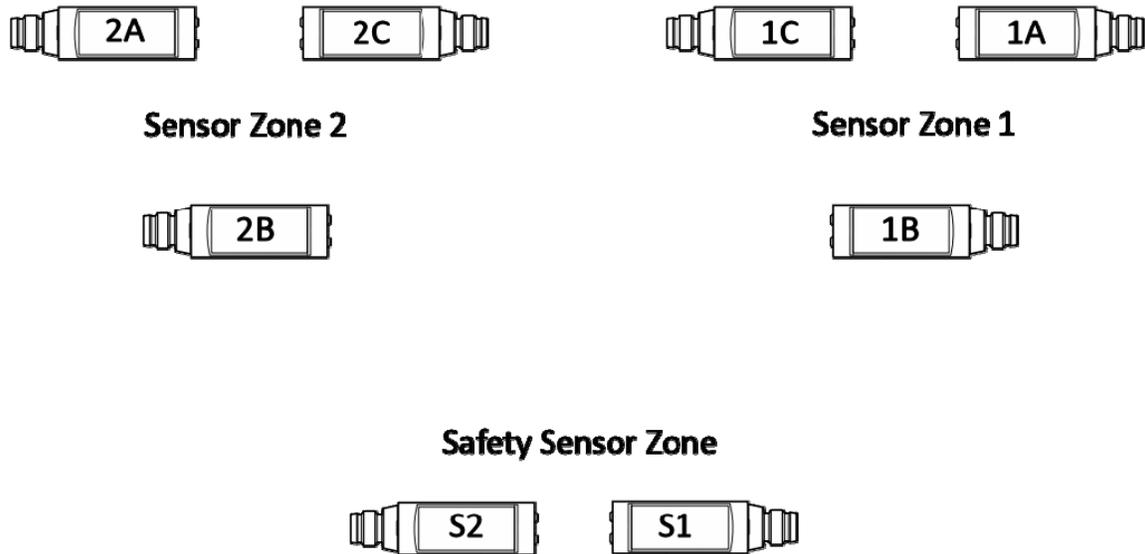
Loosening the screws holding the bracket to the panel will allow for some range of motion up and down.

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.

Sensor Positions



Above is a diagram which illustrates each sensor's position. There are 8 sensors on each cabinet total, separated into 3 "zones".

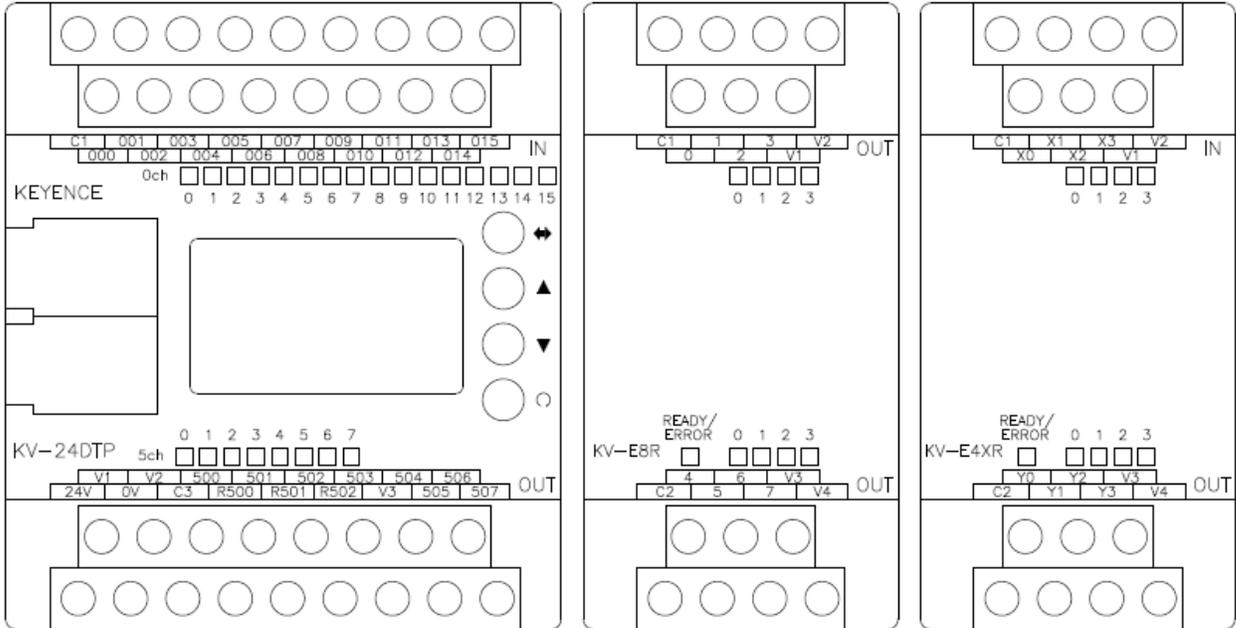
The zone designated as "Sensor Zone 1" is part of the intelligence behind whether or not authorized access has been granted. For example, if the zone 1 sensors have been tripped but direction 2 was the direction that authorization was granted, an alarm will trigger.

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.

Wiring Legend



KV-24DTP Inputs

- C1 - to 24VDC -
- 000 - Dir 1 Input
- 001 - Dir 2 Input
- 002 - Sensor 1A
- 003 - Sensor 2A
- 004 - Sensor 1B
- 005 - Sensor 2B
- 006 - Sensor 1C
- 007 - Sensor 2C
- 008 - Sensor S1
- 009 - Sensor S2
- 010 - Arm 1 Home
- 011 - Arm 2 Home
- 012 - Arm 1 Open
- 013 - Arm 2 Open
- 014 - Cancel / Return
- 015 - Fire Alarm Input

KV-24DTP Outputs

- 24V - 24VDC +
- 0V - 24VDC -
- C3 - to 24VDC +
- 500 - Dir 1 Yellow
- 501 - Dir 1 Green
- 502 - Dir 1 Red
- 503 - Dir 2 Yellow
- 504 - Dir 2 Green
- 505 - Alarm, Pulse
- 506 - Dir 2 Red
- 507 - Alarm, Solid
- V1, V2, V3, R500, R501, R502 are all not used.

KV-E8R Top Outputs

- C1 - to 24VDC+
- 0 - Motor 1 Red
- 1 - Motor 1 Black
- 2 - Motor 2 Red
- 3 - Motor 2 Black

KV-E8R Bottom Outputs

- C2 - to 24VDC -
- 4 - Motor 1 Black
- 5 - Motor 1 Red
- 6 - Motor 2 Black
- 7 - Motor 2 Red

KV-E4XR Inputs

Not Used

KV-E4XR Outputs

- C2 - to 24VDC +
- Y0 - Arm Glow Red
- Y1 - Arm Glow Green
- Y2 - Not Used
- Y3 - Not Used

All inputs are PNP (24VDC+)

Access control / Fire Alarm should be dry relay (Form C)

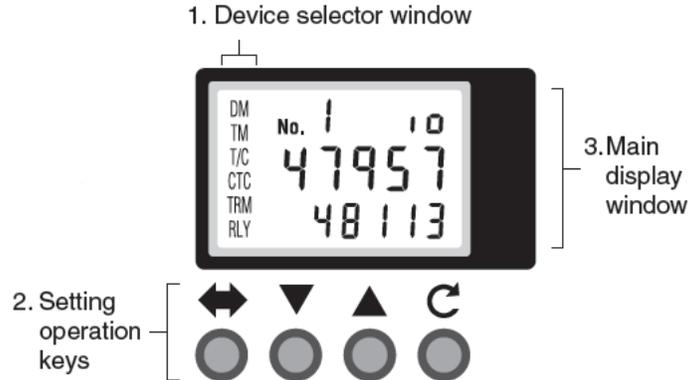
Input relays - common to 24VDC+ and Normally Open to input

Direction inputs & cancel / return to be pulsed

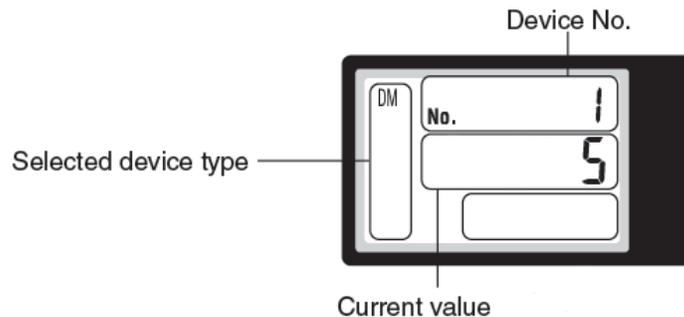
Fire alarm input contact closed for duration

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.

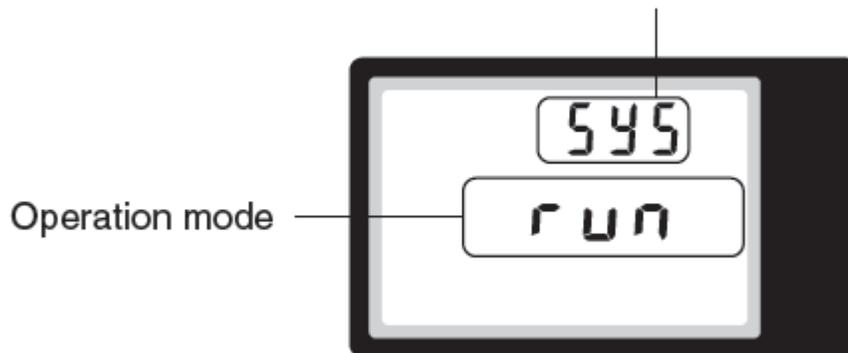


That being said, it is possible to stray from the device mode settings. In the selected device type section of the access window, DM, TM, T/C, CTC, TRM, and RLY are all possible selections to load. Again, we are only using DM (device mode) with the ClearPass.

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

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

Indicates that the system mode is selected.



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 **C** 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.

Device Settings of the ClearPass

While working within device mode, two primary values should be considered. On the top of the display, the selected device is shown. The ClearPass series settings can be adjusted with devices 0 – 8.

Pressing the up or down arrows allow you to select which device you wish to modify. Pressing and holding the **C** 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 **C** 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.

- **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

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

Warranty Information

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.