

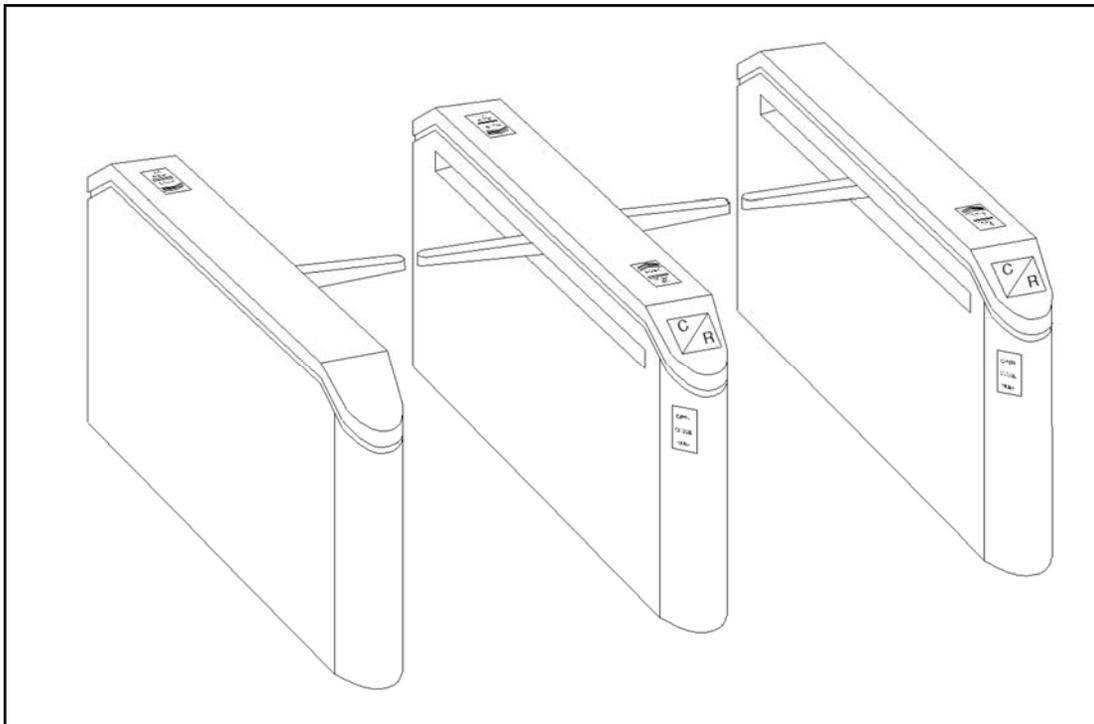
DS!

DESIGNED SECURITY, INC.

A Detex Company

ES831

BARRIER ARM OPTICAL TURNSTILE



INSTALLATION AND OPERATION INSTRUCTIONS

CUSTOM NOTES

SITE PREPARATION



Refer to LANE PLACEMENT ERGONOMICS in the Appendix for information regarding planning considerations which can maximize efficient traffic flow and minimize nuisance alarms. Taking into consideration any installation from the perspective of providing access control while minimizing the impact on the user's daily routine may allow security goals to be met more effectively.

PRE-INSTALLATION REQUIREMENTS

Conduit or other cableway:

1. From Access Control System to Each Lane's Electronics for Input and Output connections.
2. From each Lane's Electronics Side to opposite Arm for Motor and Encoder control cabling.

Mounting Anchors or Floor Plate:

A solid, stable mounting point for each bollard is necessary to maintain proper optical alignment. Refer to information included for Specifications, and Layout, Squaring, and Leveling techniques.

See Base Plate Template or Dimensional drawing for access and mounting detail

PRE-INSTALLATION CONSIDERATIONS

*The **DSI Barrier Arm Optical Turnstile**, although "high-tech", is really a very straight-forward installation when a little time is taken to prepare before you begin.*

You may choose to take the time now to read and understand the installation and operation instructions in order to gain an understanding of what the system does and what is required from you to install your system. Experienced installers will find in this manual everything needed for trouble-free installation.

We are available to assist you by calling **800 272 3555** for Customer Support.

- Treat the units as you would any fine furniture or delicate instrument. Keep them out of harsh environments. Do not store or install them where they will be exposed to inclement weather, or extremes of humidity, dust, or temperature. This will insure that they will keep their appearance and functionality for many years to come.
- When installing the wiring, be certain to strain-relief the cables to some hard point in the bollard and leave enough service loop on each cable for any future repairs, component removal or upgrade. In other words, take the time to route your wires in such a way that they will not be damaged, or in the way, should the unit require servicing in the future.
- Precautions should be taken to properly ground the units to a known "Earth Ground", during the mounting process, to prevent any ESD (electro-static discharge) damage to the electronics during installation and operation.

INSTALLATION



INITIAL LAYOUT

Placement :

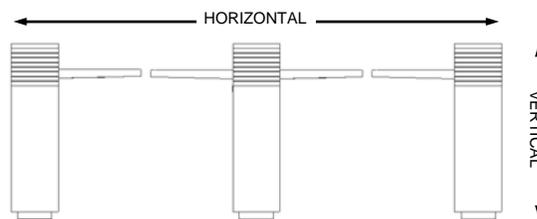
- The bollards are designed to be placed in a parallel arrangement, *not to exceed 48 inches* between bollards.
- Spacing of *37" between bollards is our standard.*
(Custom ordered lane spacing may differ from standard)
- Mounting should *leave a 2" gap* between extended arms.
- Verify the design specification for each lane prior to attachment. Refer to architectural plans, or set the bollards up in proper order, with arms extended to determine appropriate spacing.

Ergonomics :

- The number of lanes required is determined based upon the peak traffic volume and available space. Contact the DSI Sales team for additional information.
- The placement of the lanes should compliment the natural flow of traffic and not impede the flow any more than necessary to achieve access control goals.
- Care should be taken in placing the bollards to ensure that the user may easily access the Reader System* (I.E.: Mag. Card, Proximity, Biometric, etc. [*provided by installer/integrator]) while maintaining a reasonable flow of pedestrian traffic. (Readers may be pre-installed on some applications) If you have any questions regarding Reader mounting, contact the DSI Support team.

Function :

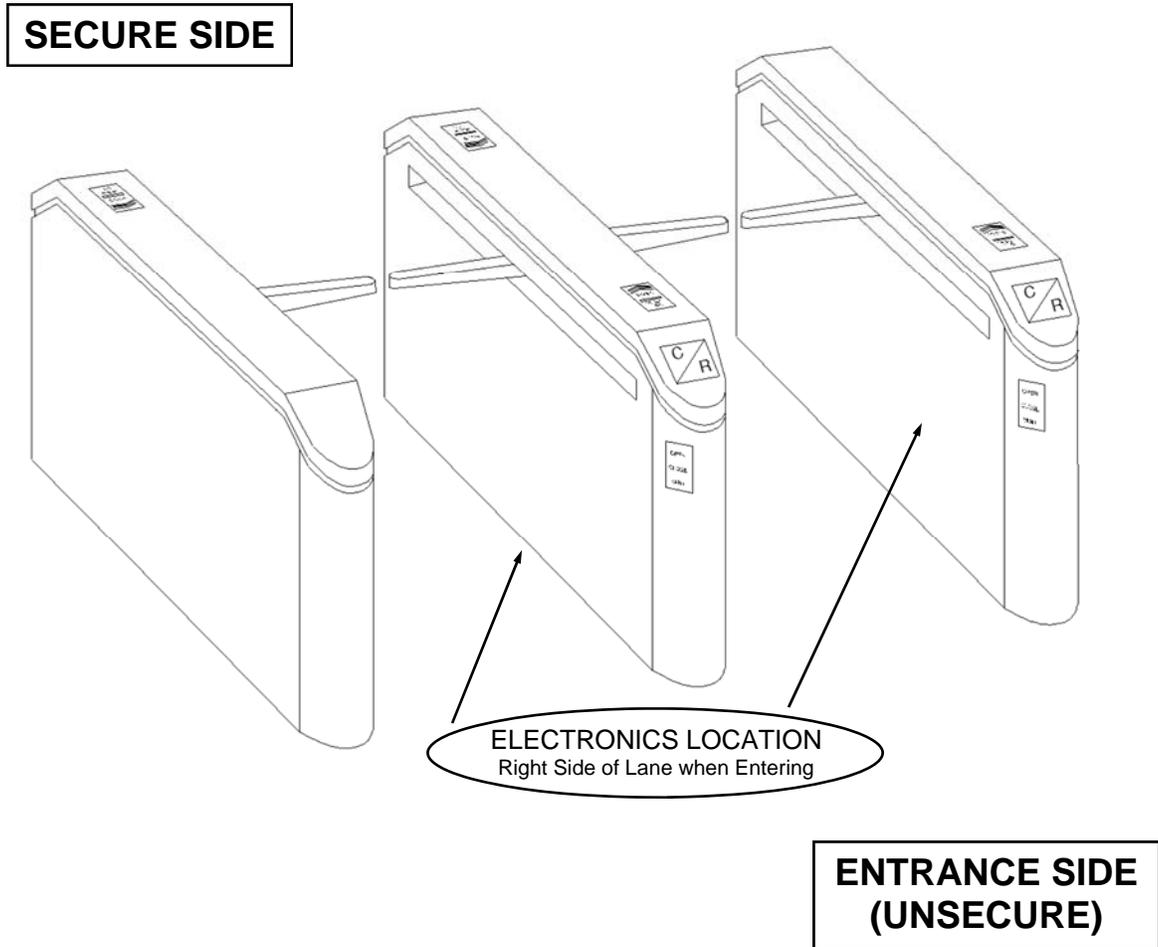
- For technical and aesthetic reasons *it is very important to insure that the bollards are installed level and plumb (horizontal and vertical), and in alignment with one another (parallel).* Obviously the installation will look better, and more importantly it will make the setup and adjustment of the optical sensors much easier. More about this will be covered in the "Leveling and Aligning" section.



Quality Installation :

- ***Experienced installation crews have found how attention to detail during layout, anchoring, and performing the leveling techniques will save valuable time and prevent having to spend much more time later correcting optical alignment issues.***
- Verify the surface you are installing upon is not bowed or crowned. Shim Bollard to compensate for uneven surfaces.

BOLLARD ORIENTATION



SECURE (EXIT)/UN-SECURE (ENTRY) SIDES—DEFINED

In the above illustration the orientation of the bollards is shown to help installers understand the proper placement of the Turnstiles in reference to the direction of traffic.

When entering the lane from the Un-Secure side, or Entrance Side, the Electronics Package for that lane will be located, facing into the lane, in the bollard on the right.

NOTE: Be certain of this orientation prior to bolting the bollard to the surface and running cables!

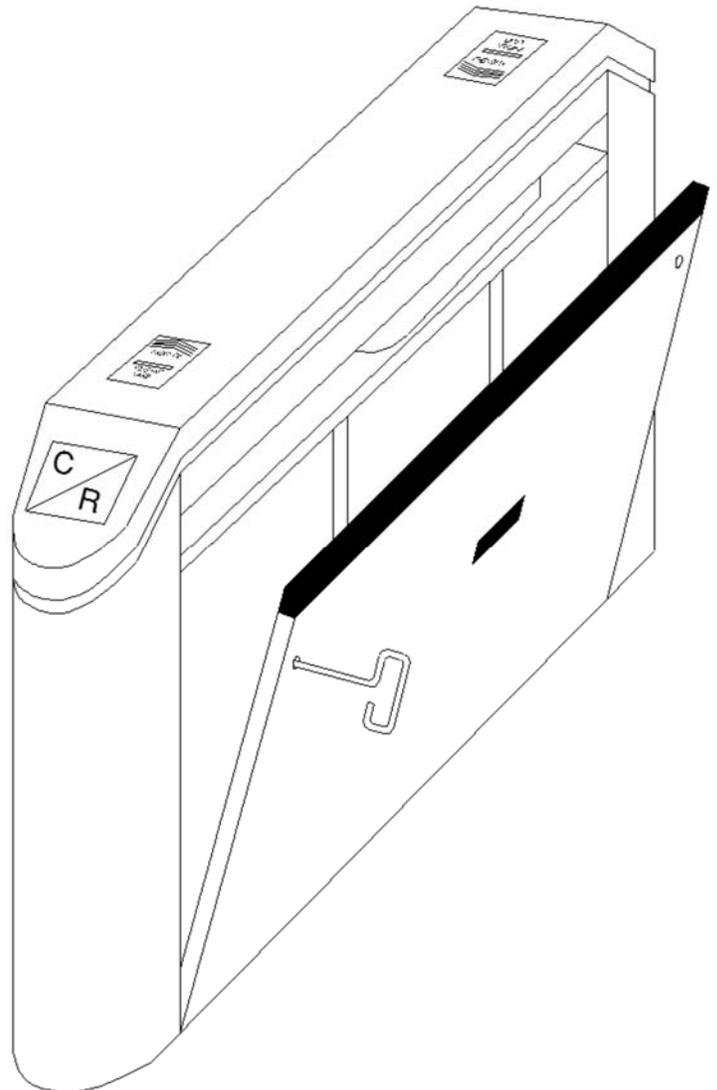
BOLLARD INTERNAL ACCESS

PANEL REMOVAL STEPS

- Insert "T-Handle" Hex-key wrench into small hole near the top, side edge of panel.
- Turn 3/4 turn Counter-Clockwise to release latch.
- Repeat above steps for other small hole at opposite side of panel. Be ready to catch panel.
- Tilt panel away from the Bollard, then lift up to remove from bollard. If necessary, apply slight pressure to the top edge of the panel simultaneously. (minimal force)
- Place removed panel in safe location. Take care to avoid creating a hazard to pedestrian traffic.

PANEL INSTALLATION STEPS

- Place panel on Hinge Points.
- Tilt into place in Bollard.
- Insert "T-Handle" Hex-key wrench into small hole near the top, side edge of panel.
- Turn 3/4 turn Clockwise to latch.
- Repeat for other small hole on opposite side of panel



LAYOUT AND MOUNTING

BOLLARD LAYOUT

- Using a chalk line, or equivalent method, lay out the bollard arrangement. Bollard's positions should be parallel and square with each other.
- Verify the "on centers" measurement to accommodate the bollard width and clearance for barrier arm operation prior to setting anchors or drilling for conduit.

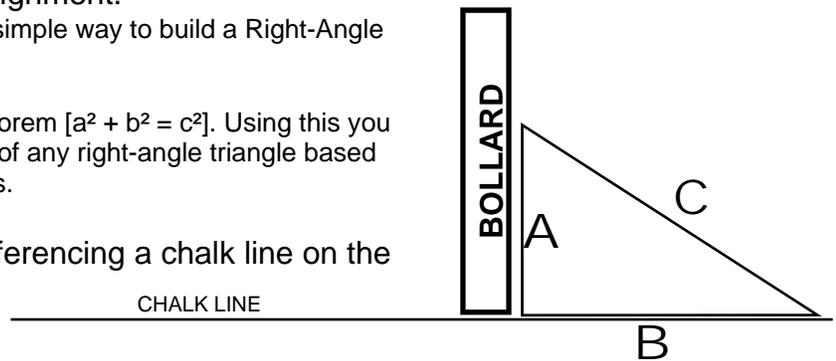
After going over the details of the installation with the architect or designer and you have determined planned spacing and orientation of the system, you may have some questions regarding how to lay out the array of bollards with the most accuracy in regard to alignment.

Here are two alignment tips which may be helpful:

Tip 1- Determining a "Right Angle" for alignment.

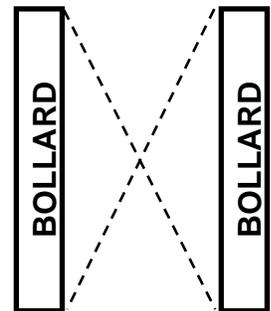
- Without getting into a lot of math, there is a simple way to build a Right-Angle Triangle by using sides of 3', 4' and 5'.
- This method is based upon a geometric Theorem [$a^2 + b^2 = c^2$]. Using this you can calculate the length of the long side (C) of any right-angle triangle based upon the known length of the other two sides.

Use this device to verify alignment by referencing a chalk line on the floor.



Tip 2 - Alignment Check

- Once you have established a known right-angle to the initial chalk-line, you will want to verify that each bollard is aligned to the adjacent bollard.
- You may do this by choosing a point on each end of a bollard, (for instance the center of a mounting hole or a corner of a pedestal), you can measure in an "X" pattern from one point to it's opposite in the "X".
- When the bollards are the correct distance apart and both lengths of the "X" are equal, the bollards are in alignment.



VERTICAL ALIGNMENT

- Check level of the bollards vertically using a plumb or spirit level, use shims to make final adjustments.

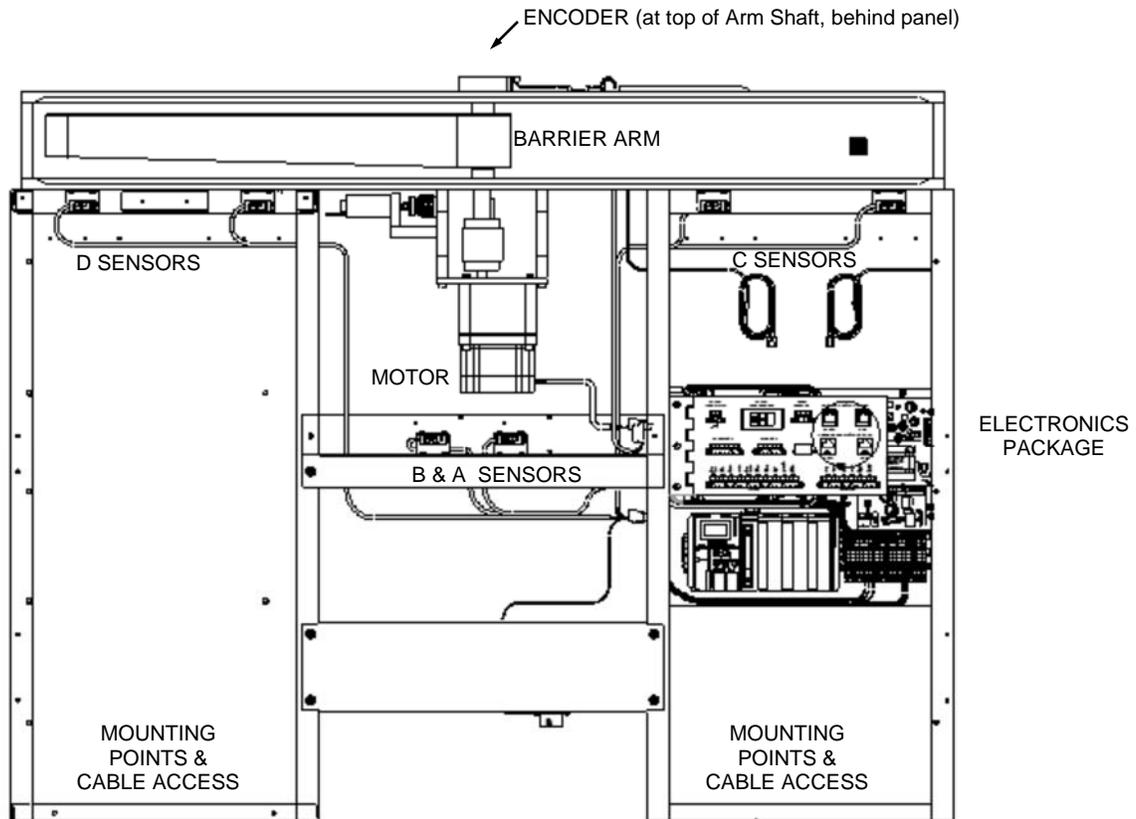
LEVEL

- Level the bollards horizontally using a straight edge and/or a spirit level that will span two or three bollards at once.

ANCHORS

- Use appropriate anchors for the mounting surface. Tighten securely to prevent any movement of the bollard.
- Some custom models may have special mounting requirements. Additional information will have been provided when necessary.

COMPONENT LOCATION



B-SIDE SHOWN

The **A-Side** of each Bollard will have either;

- A **Motor/Arm Assembly and Reflectors**, or
- Will be blank if it is on the Right-most end of a set of lanes when viewed from the Entrance (Un-secure) side.

ELECTRONICS PACKAGE

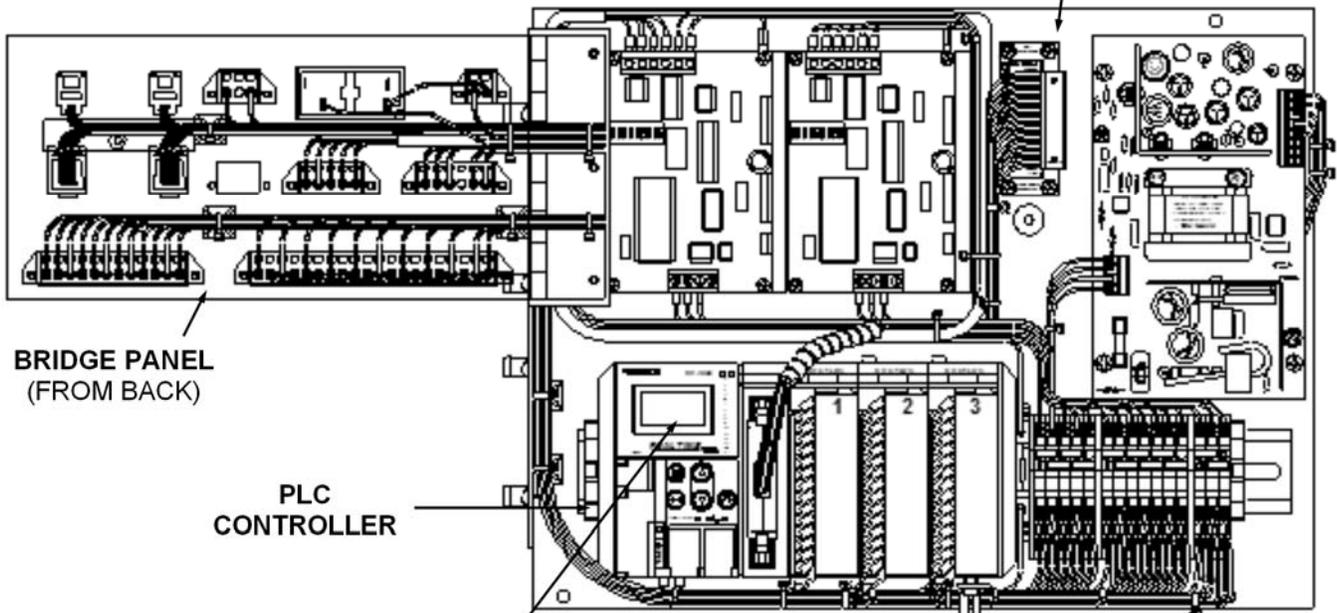
N/O OR N/C OUTPUT JUMPER

JUMPER LOCATED BESIDE EACH OUTPUT RELAY MAY BE CONFIGURED FOR N/O OR N/C OPERATION (DEFAULT IS N/O)

Move Jumper to cover center and lower pins for N/C Output.

Default-Jumper covers upper and center pins for N/O Output

GATE FORCED
BYPASS
VALID PASSAGE
TIMEOUT
ALARM



Start Screen	Project Name BA120000	<p>SET TRIMMERS (setting of "10" = 1 second)</p> <ul style="list-style-type: none"> To reach top menu press "M" key 3 times . Use down arrow to highlight "3. Trimmers". Press "Return" ↵ Display will show "TRM0 Direct". This is the Card Access Delay. Use Left-Right Button to set Increment Value Use Up and Down Buttons to change Current setting value To move to next setting press "Return" ↵ Display will show "TRM1 Direct". This is the Auto Reset Time. Use up arrow to increase value from "0" to "50". To return to "TRM0" press "Return" ↵ 7 times To return to top menu press "M" key.
Version #		
Top Menu	1.DeviceMode 2.ErrorClr 3.Trimmer 4.I/O TEST	
Trimmer 0 <small>Card Access Dly</small>	TRM0 Direct 50 L 300 1	
Current (default 50 = 5 sec) Max Limit (300=30 sec) Increment		
Trimmer 1 <small>Auto Reset Time</small>	TRM1 Direct 50 L 300 1	
Current Maximum Increment		

COMPONENT DESCRIPTION

Electronics Package

The Electronics are found in the right-hand pedestal as seen when facing the B-Side of the bollard. (A-side holds the #2 Motor and reflectors for the lane.)

The **Motor Controllers** control the local arm and the remote arm. These are mounted in the upper left-hand corner of the Electronics Package.

The **PLC (Programmable Logic Controller)** is the Module mounted on the **DIN Rail** and below the Motor Controller(s). The PLC controls the arms by reading the **Encoder** position information and communicating arm movement information to the Motor Controllers in response to PLC inputs.

Sensors

The **C1 & 2 Sensors** are used to detect objects present in the arm path on the un-secure side of the lane. If something is blocking these beams, the arms will not move to allow a user to exit from the secure side (although the arms may always be pushed open in an emergency).

The **D1 & 2 Sensors** work similarly for users exiting from the secure side (IE: blocking this beam will prevent the arms from moving) and, in addition these sensors will detect the presence of an exiting user, when in "Free Exit" mode, and tell the PLC to move the arms to allow egress.

PLC Controller

The **PLC** (Programmable Logic Controller) is made up of several modules. All Inputs terminate here and all Outputs originate here. The operating software runs on the PLC.

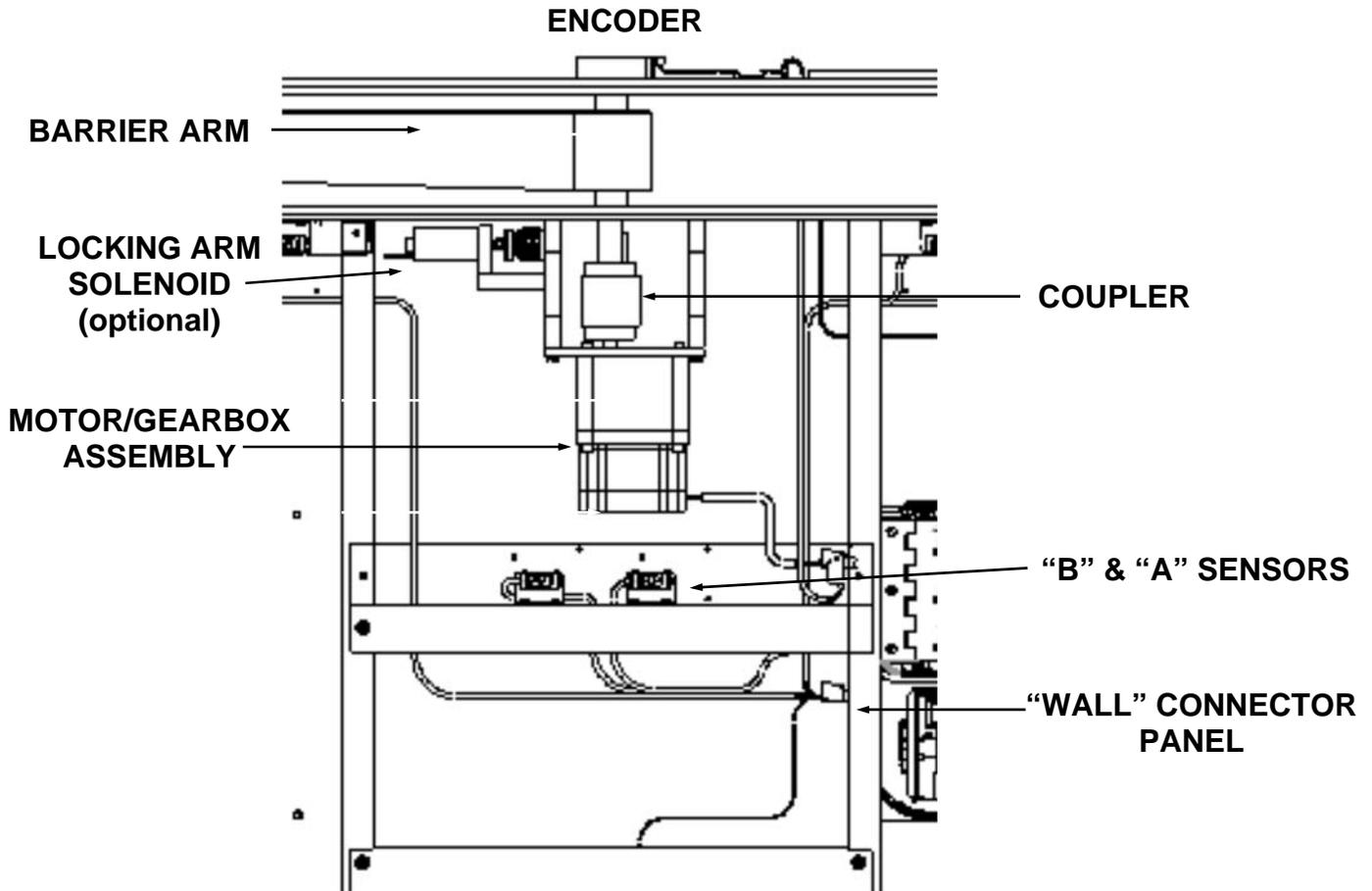
Wall and Bridge Connection Panels

The **Wall** is a panel located beside the Motor Controllers, on the left side of the Electronics Package. All wiring for the lane's local components goes through the Wall panel; including **Motor 1**; **Encoder 1**; optional Lock Solenoid; and all **Sensor** connections.

The **Bridge** is a hinged panel located in front of the Electronics Module. All Input and Output wiring and Remote; Motor 2, Encoder 2, optional Lock Solenoid, and Graphic Array cabling terminates on the Bridge.

Additional detail regarding the Bridge panel and connectors is found in the Wiring section.

BARRIER ARM DRIVE ASSEMBLY



The **Motor/Arm Assembly** is the center section of the bollard, located between the two pedestals.

Located above the Barrier Arm housing is the **Encoder**. This is a very sensitive encoder used to detect Barrier Arm position and provide this information to the Indexer. It is attached to the end of the shaft that drives the Arm.

Below the Encoder is the **Barrier Arm**. Located on the same shaft.

(Units with optional Locking Arm will have Locking Solenoid hardware mounted on this shaft.)

This shaft goes into a shaft **Coupler** that allows quick removal of the Motor/Gearbox assembly for maintenance and repair.

Beneath the Coupler is the **Motor/Gearbox Assembly** that drives the Barrier Arm.

Below the Arm Housing will be located either the **B & A Sensors** (below the Motor 1) or the **B & A Retro-reflectors** (below the Motor 2). These are the sensor beams that detect direction of travel, tailgating violations, and passage-complete for valid users.

WIRING



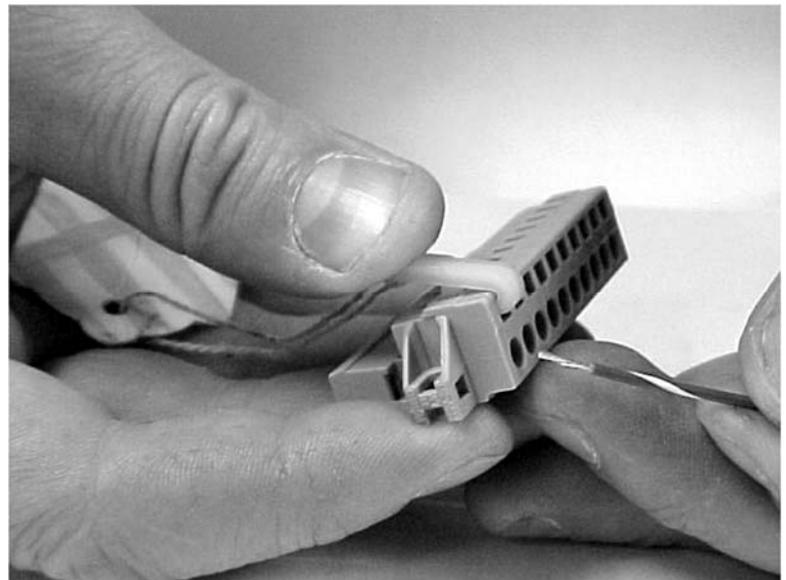
WIRING

CABLE ROUTING

- The **Motor 2 and Encoder 2 cables must be routed** between the “A” and “B” Sides of each lane. (15 ft. cables included)
- Optional Locking Arm: Additional Locking Solenoid cable is required to be pulled along with the standard Motor 2 and Encoder 2 control cables.
- If you are installing multiple lanes, you may want to use the next lane’s cable as reference when reconnecting the cable to the connector to assure correct wire placement. Reference wire color/pin-out information in this document.
- **Begin wiring from the Right-most bollard** when facing from the Entrance (un-secure) side. This bollard should have the Electronics Package in the side facing into the lane.
- Leave adequate service loop in cables. Route cables neatly in pedestal.
- **Check conduit or cableway for airflow** using a strip of tissue paper. If airflow is detected, use paper or foam material to block airflow through conduit access hole. *Airflow through chassis may result in rapid dust accumulation on sensor optics which can lead to false alarms and frequent cleaning requirements.*
- **Power Cable must be of sufficient Gauge** to provide 24VDC under load, measured at the Power Input Connector. **(See Power Wire Gauge Calculator in Appendix)**

CABLE TERMINATION

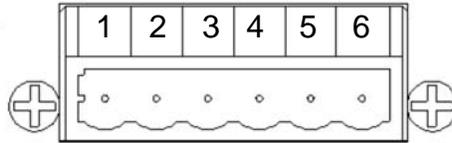
- Use the included **WAGO™** tool to remove and connect the wires on each of the **WAGO™** connectors.
- Photo shows **WAGO™** tool in use. **Hook over edge and press tab into connector to release spring holding each wire.**



ENCODER 2 CONNECTOR DETAIL

ENCODER 2

PIN-1 TAB ↙

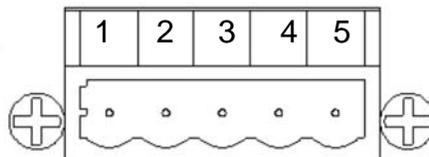


PIN	COLOR
1	Shield
2	Black
3	Vacant
4	Red
5	White
6	Green

MOTOR 2 CONNECTOR DETAIL

MOTOR 2

PIN-1 TAB ↙



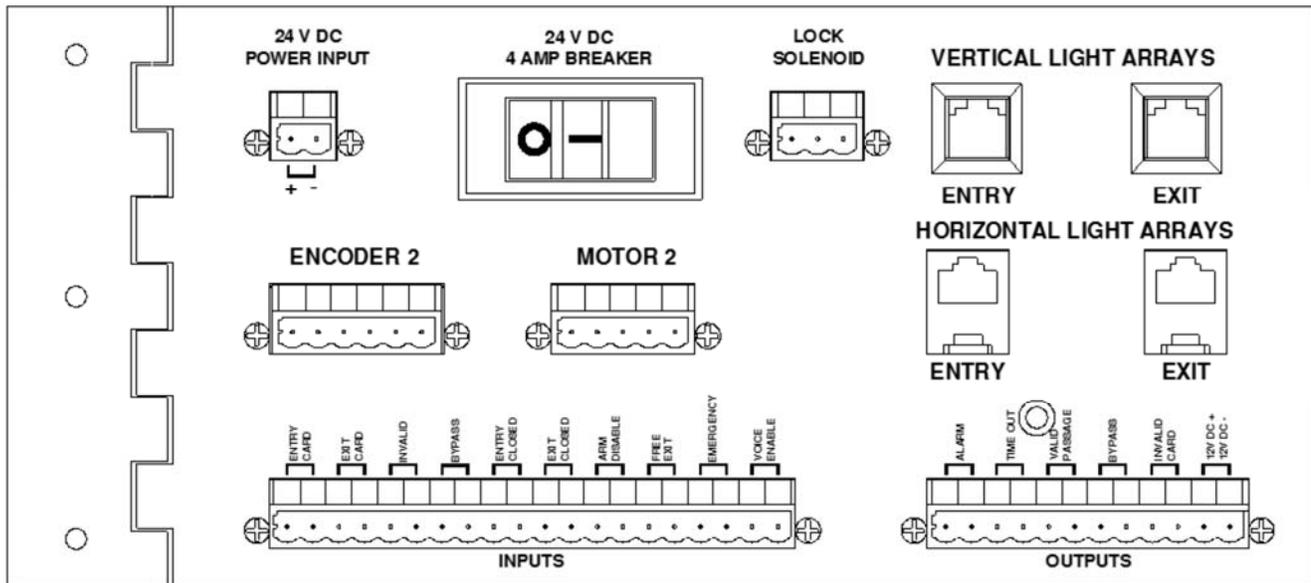
PIN	COLOR
1	White
2	Black
3	Shield
4	Green
5	Red

INPUT AND OUTPUT CONNECTION REQUIREMENTS

Inputs from Access Control System include:			
<i>Entry Valid Card Read</i>	1-2	Dry contact closure indicating valid Entry card read (Momentary Closure of .5 Second or Less recommended)	N/O
<i>Exit Valid Card Read</i>	3-4	Dry contact closure indicating valid Exit card read (Momentary Closure of .5 Second or Less recommended)	N/O
<i>Invalid Card</i>	5-6	Dry contact closure when an invalid card has been presented.	N/O
Inputs for Remote Control include:			
<i>Reset/Bypass</i>	7-8	Dry contact closure to reset alarms or to bypass the lane, stow the arms and allow unrestricted traffic flow.	N/O
<i>Entry Closed</i>	9-10	Dry contact closure disables Entry mode.	N/O
<i>Exit Closed</i>	11-12	Dry contact closure disables Exit mode.	N/O
<i>Arm Disable</i>	13-14	Dry contact closure which stows arms.	N/O
<i>Free Exit</i>	15-16	Dry contact closure enables the "Free Exit" function.	N/O
<i>Emergency</i>	17-18	Dry contact closure, moves Arms to Exit, activates alarm graphics, and alarm relay output.	N/O
<i>Voice Enable/ Horn Disable</i>	19-20	Dry contact closure, only on models with Voice Annunciation Option. Disables Alarm horn when shorted.	N/O
Outputs for Remote Monitoring include:			
<i>Alarm</i>	1-2	Indicates that unit is in Alarm Mode.	N/O*
<i>Timeout</i>	3-4	Indicates that the valid read timed out before passage was completed. Closes for .3 sec when triggered.	N/O*
<i>Valid Passage</i>	5-6	Indicates that a passage was completed. Closes for .3 sec when triggered.	N/O*
<i>Bypass</i>	7-8	Indicates when unit is in Bypass Mode.	N/O*
<i>Invalid Card</i>	9-10	Indicates an Invalid Card input has occurred.	N/O*
* Default. (N/C Outputs available via Jumper Setting. See page 16 for detail)			
<i>+/- 12 Volt DC</i>	11-12	Accessory 12 VDC Max Current 2 Amps	

WARNING: Multiple lanes sharing a common Input Source must be isolated through a unique relay contact for each lane input. Wiring common inputs in a daisy-chain (parallel) can cause damage to electronics.

BRIDGE PANEL DETAIL



POWER CONNECTOR

- Connect 4 Amp 24 VoltDC Power Supply to the “24VDC POWER INPUT” connector. Pin 1 is “+”.
- See *Power Wire Gauge Calculator* in Appendix to determine proper gauge for your application.
- Use WAGO™ Tool to install wire in removable connector (provided).

ON/OFF CIRCUIT BREAKER

- This thermal circuit breaker will trip if current rating is exceeded. Allow to cool before resetting.
- Voltage Drop over long cable run from Power Supply may create a high current condition that trips the breaker. Use appropriate gauge wire for your installation.

LIGHT ARRAY CONNECTIONS

- Entry (local) and Exit (adjacent) Horizontal and Vertical Light Array connections.

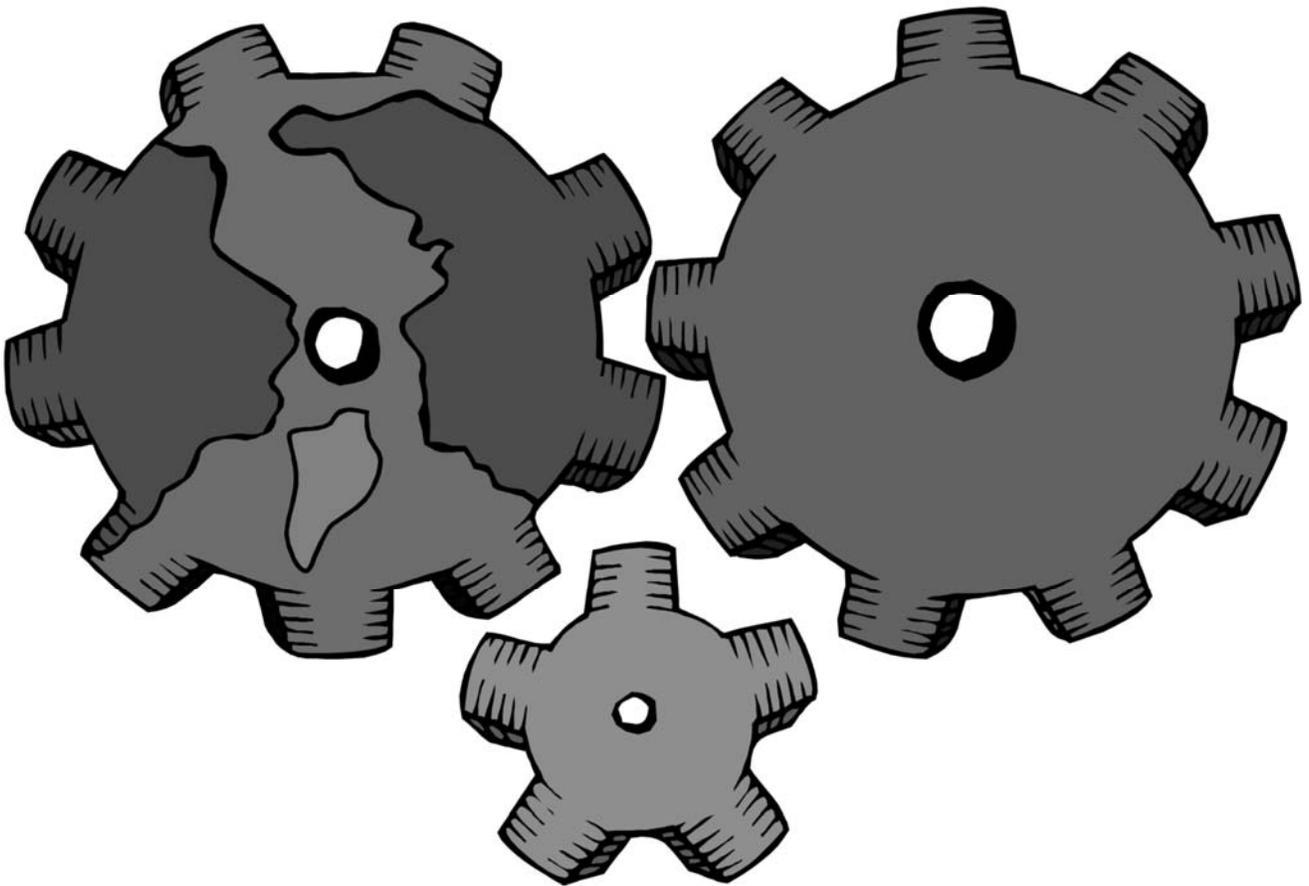
INPUT AND OUTPUT CONNECTIONS

- Install all Input and Output wiring to WAGO™ Connectors (provided).
- Use WAGO™ Tool to install wire.
- **WARNING:** Multiple lanes sharing a common Input Source must be isolated through a unique relay contact for each lane input. Wiring common inputs in a daisy-chain (parallel) can cause damage to electronics.

ADJACENT BOLLARD INTERCONNECTIONS

- MOTOR 2
- ENCODER 2
- EXIT LIGHT ARRAYS (Horizontal and Vertical)
- LOCKING ARM SOLENOID CONNECTION (optional)

SETUP & OPERATION

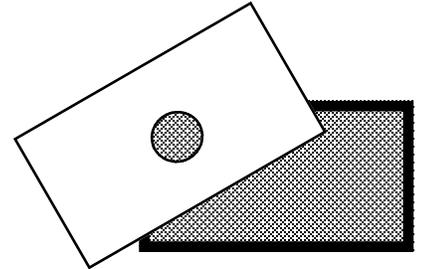


SENSOR ALIGNMENT

If necessary, you may adjust Sensor alignment by applying a slight twist and/or bend to the sensor bracket until the sensor reflects directly off the opposing reflector.

Check for Alignment by following these steps:

- Enable Bypass mode by shorting the Bypass Input terminals.
- Apply Power to the lane. Arms should remain stowed when powered in Bypass mode.
- Cover any Reflector which may be mounted beside the one you are aiming for. Primarily on "A" and "B" Sensors.
- Adjust Sensor bracket for a good signal lock. **LED Off** indicates the Sensor is in alignment with the Reflector and in a stable operating state. (Lock indication)
- For fine tuning, cut a penny-sized hole in a card and center the hole on the Reflector you are aligning to.
- Green-only indicates good signal lock state.
- For proper operation, each sensor must detect the light from its opposite reflector.
- Using the above method will allow you to verify that you are not sensing a signal from another reflector due to misalignment.
- Repeat for each Sensor. (6 total)
- Remove the Bypass Input. Arms should Cycle and stop extended across the lane. If the Arms do not move, or if there is an Alarm, replace the Bypass Input, and repeat the above steps.



FINAL TESTING PROCEDURE

Provide Input or State from Left Column, Look for responses marked with

INPUTS	OUTPUTS						ARM POSITION			
	ALARM	TIMEOUT	VALID PASSAGE	BYPASS	INVALID CARD	AUDIBLE	ENTRY	EXIT	CLOSED	
ENTRY CARD		<input type="radio"/> OR <input type="radio"/>					<input type="radio"/>			
EXIT CARD		<input type="radio"/> OR <input type="radio"/>						<input type="radio"/>		
INVALID CARD					<input type="radio"/>	<input type="radio"/>			<input type="radio"/>	
RESET/BYPASS				<input type="radio"/>			<input type="radio"/>			
ENTRY CLOSED									<input type="radio"/>	
EXIT CLOSED									<input type="radio"/>	
ARM DISABLE							<input type="radio"/>			
FREE EXIT							EXIT WHEN "D" SENSOR IS BROKEN BY USER			
EMERGENCY	<input type="radio"/>							<input type="radio"/>		
VOICE ENABLE/HORN DISABLE	SILENT WHEN IN ALARM									
ARM AND SENSOR STATES										
FORCED ARM	& PASSAGE	<input type="radio"/>					<input type="radio"/>	ARMS WILL PROVIDE RESISTANCE AGAINST ATTEMPTS TO FORCE PASSAGE		
	NO PASSAGE									
TAILGATE		<input type="radio"/>					<input type="radio"/>			

WARNING: Multiple lanes sharing a common Input Source must be isolated through a unique relay contact for each lane input. Wiring common inputs in a daisy-chain (parallel) can cause damage to electronics.

GUIDELINES FOR EVERYDAY USE

(PROVIDE COPIES TO ALL TURNSTILE USERS)

Optical Turnstiles are provided for greater security in your workplace. They help ensure that only authorized individuals will be allowed into the secure areas of your facility. You may find daily use of Optical Turnstiles becomes routine as you follow these basic guidelines:

APPROACHING THE LANE

- **Look** at the lighted **Vertical Graphic Display** at the front of the bollard on the right-hand side of the lane you will enter in order to **determine the status of the lane**.

The Messages you will see are;

OPEN	– lane is available
CLOSED	– lane is unavailable
WAIT	– lane is in use

USER VALIDATION

“ID” for access control can be of many types, from card readers to biometric systems.

Please refer to instructions provided for reader operation by the manufacturer, or by your security director.

- **Look** at **HORIZONTAL DISPLAY** status, then **PRESENT ID** to the Reader mounted on, or in, the right-hand bollard of the lane you are using. It may beep to indicate your ID was read.
- **Listen** for a **BEEP** after the **ID has been validated** and/or **watch** the Horizontal Graphic Display on the top of the right-hand bollard to indicate authorization.
- Next **Look** for a **PROCEED** message and/or **Green Arrows** to indicate that **you are now authorized** to pass through the lane. **The arms will automatically swing out of the way** allowing passage.
- **MOVE THROUGH THE LANE PROMPTLY**. Avoid stopping or moving backward, as this will trigger the alarm.

TIP: During passage through the lane, swinging items (purses, briefcases, etc) could be interpreted by the turnstile as a person tailgating you, or moving in the other direction, thus causing an alarm. To avoid delays caused by false alarms, hold items high and close to your body, or at your side as you pass through the lane.

- **IF ALARM SOUNDS**, exit the lane, **STOP** and wait for security personnel to respond.
- Once through the lane, continue moving ahead to clear the lane for other users.

FREE EXIT MODE

Some turnstiles may be configured for “Free-Exit,” meaning there is no requirement to present ID when leaving the secured area. The **Graphic Displays** will indicate both **OPEN** (vertical display) and **PROCEED** (horizontal display) on the right-hand side of the lanes which are set up for Free-exit.

- **As you enter the lane, the turnstile will sense your presence and direction** allowing you to exit the secured area of the building. **Barrier Arms will automatically open for Free Exit**. Pass through turnstile as outlined above.
- Keep in mind that the sensors are active during Free-exit mode. Keep any bags or packages high and close to your body, or at your side, and avoid swinging them, as this may cause an alarm, even in Free Exit mode.

GUARD/OPERATOR - OPTICAL TURNSTILE GUIDELINES

(LEAVE COPY AT GUARD OR OPERATOR DESK FOR REFERENCE)

Making an optical turnstile installation work well depends upon a number of factors being present.

- **Users must be provided adequate instruction.** *Written, and First-hand / One-on-one.*
- **Users must know that a consequence to them exists for improper use, in order to avoid abuse of the access control system.** *Without consequence, abuse will continue.*
- **Guards must be knowledgeable in proper operation of the turnstiles, and be able to effectively provide training to new or errant Users.**
- **Guards must have an established policy and the authority to act on any Security violation.**

TRAINING USERS

- Optimally, all Users need to be provided with a written instruction, and, be shown at least one time, one-on-one, how to properly use the turnstile.
- Instruction should include having the User identify the Reader location and be asked to explain to the instructor what is expected of the User as they approach and use the lane.
- The Users need to know that they are to **always AVOID touching the arms**, except in an emergency. This is a violation. **IF THE USER TOUCHES THE ARMS, THEY SHOULD VISIT THE GUARD.**

NOTE: The single most frequent violation, and cause of abuse, results from Users “pushing through” the arms. It is important that the User be trained to NEVER touch the barrier arms, they are automatic.

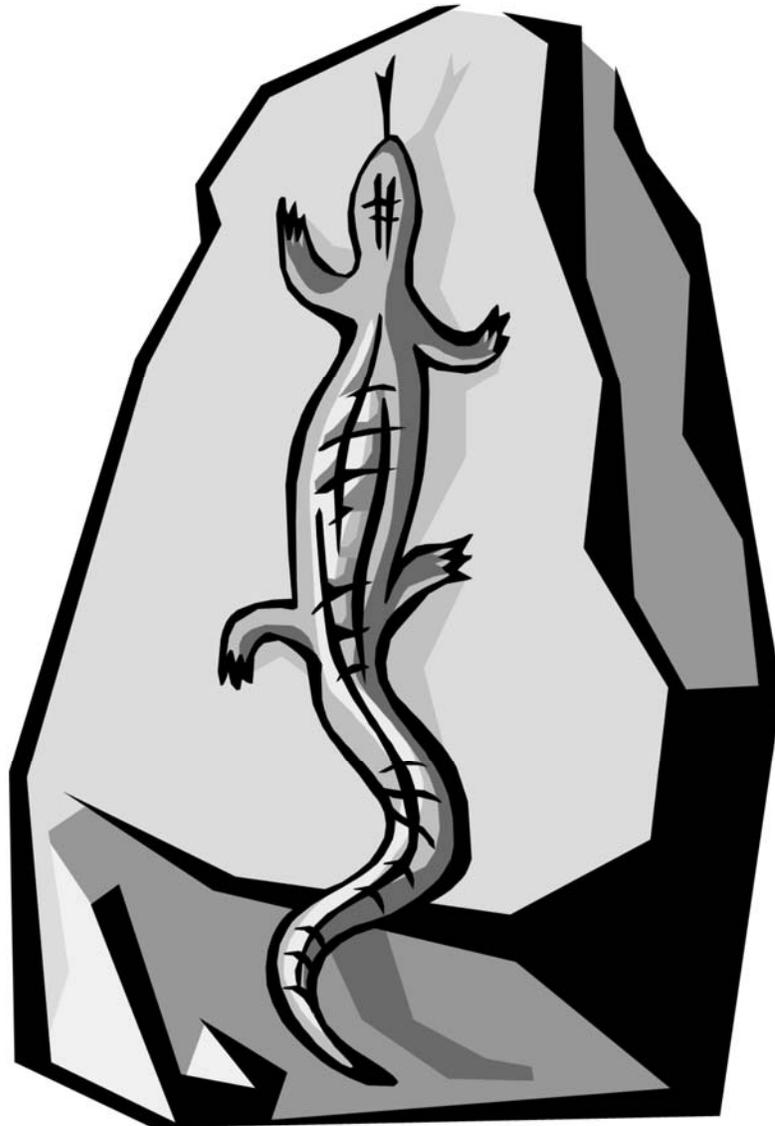
GUARD TRAINING AND AUTHORITY

- The Guard **MUST** have the authority to stop Users who have violated a lane. Even Free Exiting Users who cause an alarm should be encouraged to use the lane properly through some consequence to their action after causing a violation. Without consequence, the User will continue to abuse the Security system.

TIP: Some of our customers get good results by having their Guard call an errant User over to the desk and verify the User’s ID. This inconvenience to the User’s routine encourages them to use the lane properly and to avoid causing alarms. This also provides the Guard an opportunity to help the User learn how to use the turnstile.

- It is important that the Guard deal with the User from a frame of mind of *“What can I do to help you learn how to use the Security system and avoid causing alarms?”*
- Having copies of the User Instructions available to give users is suggested. Taking time to lead the user through the process will also help build rapport and reinforce that the relationship between the Guard and the User is complementary rather than adversarial.
- If you have questions, or would like further assistance drawing from over a decade of experience with Optical Turnstiles, please contact DSI Customer Support at 800 272 3555.

APPENDIX



SPECIFICATIONS

Power:	24-26 VDC @ 4 Amps per walkway		
Wiring:	Power-	Less than 50 feet;	-14 Gauge
		50 to 100 feet;	-12 Gauge
		(See Power Wire Gauge calculator on page 34 for detail)	
	Signal-	50 to 200 feet;	-22 Gauge
Inputs:	N/O Dry Contact for		- Valid Entry Card (from Access Cntrl)
	N/O Dry Contact for		- Valid Exit Card (from Access Cntrl)
	N/O Dry Contact for		- Invalid Card (from Access Cntrl)
	N/O Dry Contact for		- Bypass/Reset/Override
	N/O Dry Contact for		- Entry or Exit Closed
	N/O Dry Contact for		- Arm Disable
	N/O Dry Contact for		- Free Exit
	N/O Dry Contact for		- Emergency (Fire Alarm)
N/O Dry Contact for		- Voice Enable (Factory Option)	
Outputs:	Output relays are rated for 1A @ 5-30 VDC		
	Output relays may optionally be N/C, see Page 16		
	N/O Dry Contact for		- Alarm
	N/O Dry Contact for		- Time Out
	N/O Dry Contact for		- Valid Passage
	N/O Dry Contact for		- Bypass
	N/O Dry Contact for		- Invalid Card
Accessory Power		- 12 Vdc @ 2Amps	
Audible Alarm:	80db at 3 feet	(Disable by shorting Voice Enable input)	
Timing Adjustments:	Card Access	(0-30 Seconds timeout if no passage)	
	Alarm Auto-Reset	(0-30 Seconds timeout for Alarm sounder)	
Dimensions:	10"W X 33"H X 64.5"L		
Walkway Spacing:	Standard / A.D.A.	- 36" between Bollards	
	Custom Lane Widths may differ from Standard		
Mounting:	12 Gauge Steel base (2 pedestals) with (8) 7/8" (.875") Mounting Holes and (2) 5" X 5" Cable Access Holes per Bollard		
Interconnect Cables:	Encoder2	15'	
	Motor2:	15'	
	Exit Light Arrays:	15' ea.	
	(2 Exit Light Array cables, 1 Horizontal and 1 Vertical array cable)		
	Locking Solenoid (optional):	15'	

POWER WIRE GAUGE CALCULATOR

STEP BY STEP		WORKSPACE COLUMN	EXAMPLE
<ul style="list-style-type: none"> Specify total Current load, in Amps, of all devices sharing this trunk. 			4 Amps
<ul style="list-style-type: none"> Specify Distance (in feet) of actual Wire Run from power supply to the most remote load. 			125'
<ul style="list-style-type: none"> Multiply figures from above two lines. 			
<ul style="list-style-type: none"> Match final number to Table below to determine Wire Gauge needed to provide adequate Voltage. 			500
<p>IF YOUR FIGURE EXCEEDS 680, YOU MAY;</p> <ul style="list-style-type: none"> BREAK THE LOAD UP INTO SEPARATE WIRE RUNS, OR CONSULT YOUR POWER CABLE SUPPLIER FOR THEIR RECOMMENDATION FOR YOUR APPLICATION. 	FINAL NUMBER	WIRE GAUGE	
	up to 45	22 AWG	
	45 to 90	18 AWG	
	90 to 170	16 AWG	
	170 to 275	14 AWG	
	275 to 415	12 AWG	
	415 to 680	10 AWG	

OPTICAL TURNSTILE ERGONOMICS

Prior to laying out the lanes, some information should be understood, regarding efficient placement of the bollards, traffic flow and minimizing nuisance-alarms, in order to make your installation effective at providing security with the least amount of intrusion into the user's daily routine.

This is what we consider the psychology of lane placement, and from our experience is worthy of consideration prior to finalizing your installation parameters.

The ES831 provides a physical and psychological barrier to the user. People will behave differently, and be more aware of entering secure areas when they feel they are being guided and/or monitored into the secure zone. Through careful placement, the ES831 is very effective at promoting positive traffic flow through the area of the security threshold.

DSI recommends placing the ES831 in areas that encourage users to "move through" the area rather than in a place where people may congregate.

If an environment exists that encourages users to congregate due to lane placement, people may tend to stop in the lanes, lean on the bollards or they may simply encroach into one of the lanes IR Beams. These behaviors can lead to nuisance alarms, disruption of pedestrian traffic flow, and possible optical misalignment or other damage to the bollard. With this in mind, we'll look at some possible installation scenarios to better understand how best to place the lanes to maximize utility and minimize trouble calls.

Pull Doors

It is a good idea not to place the bollards immediately before a pull door. The action of pulling the door open may cause the user to back into the lane. This could generate a nuisance alarm.

Even if the bollards are placed further back from the door, the scenario of two or more users passing through the lane, with the first user opening a pull door, may cause a following user to back into the lane.

Allow adequate space between the turnstile and the pull door for users to easily open the door without interrupting the traffic flow through the lane behind them.

Queuing Areas

It is recommended that the ES831 lane not be placed near any type of queue. After passing through the lane, the user should be encouraged to move out of the area by either the architecture or layout arrangement of the Optical Turnstile lanes. Promoting positive traffic flow through the lanes and across the security threshold should be kept in mind during the planning stage.

Elevator Lobbies

An elevator lobby has both positive and negative attributes for a turnstile application. If the bollards are placed in such a way that a user is facing the bank of elevators, this will encourage a moderate pace through the turnstile.

However, should the elevator's doors be closed, then a queue may be generated beyond the turnstiles. This could create nuisance alarms similar to those mentioned previously regarding the "Pull Door," due to the congregation of users blocking the lane, leaning on the bollards, or encroaching into the I.R. Sensor's light path.

Placing the turnstiles before each elevator could be beneficial from a security standpoint, and creates the possibility of having each user card-in before entering the elevator which may in some applications significantly slow down the traffic flow into the elevator itself.

When planning for an elevator lobby consider the maximum number of users that may need to be accommodated while waiting for the elevator. Allow adequate space for the users to congregate beyond the turnstiles while not restricting traffic flow through the lane(s).

The Ideal Application

The ideal placement will encourage users to approach slowly, enter, and pass through the lane, but discourage rushing through or stopping either in, or just after, the lane. One example of ergonomics designed with this in mind would be a “T”-type traffic pattern, with the entrance traffic flowing into the base of the “T”.

If the ES831 were placed in the corridor just before the “T”, users would not be prone to rush through the lane because they will see a wall or other barrier (rope, chain, etc.) before them. After passing through the lane, there should also be some incentive to encourage moving on. An inviting, open space like a lobby or waiting area or some place which is perceived as less confining than the security entryway would be ideal.

Slowing traffic through the lanes minimizes false alarms generated through beam interruption by briefcases, bags, umbrellas, coats, etc. A rapidly moving user could be swinging these items and this has been known to generate a tailgate violation.

Placing the turnstile in a long straight corridor may encourage this “swinging” of personal items by fast walkers or those users in a hurry, especially on free-exit applications.

A free-exit user does not have to pause to present a card, he may be moving more rapidly. A back-swing into the beams could be interpreted as an entry attempt by the electronics, thus producing a nuisance alarm.

Naturally there will be a balance to be reached, in that the security entryway must also allow smooth traffic flow during peak traffic periods each day while still serving the purpose of limiting access to valid users of the system.

With this knowledge of turnstiles, traffic flow and turnstile operational parameters in mind, a little planning beforehand could prevent conflicts later between users, operators, the integrator, and the customer’s original security plan.

Moving the users through a psychologically “restrictive” area into an “inviting” open space, while also providing a security threshold large enough to allow smooth traffic flow during peak periods, would exemplify the ideal installation.

CARE AND CLEANING

Congratulations on your purchase of a DSI Optical Turnstile system.

This guide provides information for cleaning and maintaining the finishes, materials and optical paths of DSI's standard finishes on our turnstile line. Including ES810, ES811, ES831, ES840, ES850, and ES860,

DSI recommends the following information be distributed to appropriate personnel to preserve long lasting appearance of the finish, and to maintain clear optical paths for the Infrared beams.

Stainless Steel - CAUTION: Avoid getting polish or solvents on the Plexiglas panels to prevent contaminating the optical path.

The suggested polish is a light household polish/oil.

Holloway House Lemon Oil is what we use at the factory. <http://www.hollowayhouse.net>

Soap and water may be used to clean stains, then use polish to preserve the finish.

Corian and Laminates-

Soapy water or ammonia-based cleaners will remove most dirt and stains from Corian and Laminate finishes.

Additional Corian information is available from the DuPont Corian website: <http://www.corian.com>

Brass -

These finishes are clear-coated and should be polished with any product labeled as appropriate for a clear-coat finish. Automotive clear-coat polishes work well for this application. (Turtle Wax's Clear Coat Polish and Restorer is what we use at the factory)

Powder Coat Painted -

Clean with mild soap, water and a soft non-abrasive cloth. A periodic use of a non-ammonia based cleaning solution (Formula 409) can be used for oils or stubborn stains. Always apply by hand using a circular motion.

Plexiglas - CAUTION: Never use ammonia-based glass cleaners, abrasive cleaners, or paper towels to clean Plexiglas.

These surfaces should be cleaned with a soft cloth dampened with soap and water, or use a spray cleaner such as Chemtronics® ES1668; at <http://www.chemtronics.com/> or you may call Chemtronics at 800-645-5244 for more information.

Optics - The Plexiglas over the sensors and reflectors must be kept optically clear for the Infrared Beams to function properly. Cleaning personnel need to be instructed to avoid wiping any oils or other polishes on these panels. Use of alcohol or ammonia based cleaners may leave a static charge which will attract dust, the Chemtronics® ES1668 is an anti-static cleaner that works well. Any similar anti-static cleaner approved for use on Plexiglas should work.

Dust accumulation on the inside of these Plexiglas panels, and on the Sensors/Reflectors themselves, can impair the optical path which may lead to false alarms. A periodic inspection after initial installation may help determine the appropriate interval for cleaning the inside surfaces, based upon the environment at the site.

TROUBLESHOOTING TIPS

The following are a few of the most common questions the Customer Support group answers.

Symptom: Erratic Arm Behavior

The Barrier Arms bump several times at the end of travel, or do not line up with one another properly when centering.

Solution:

This usually indicates that a set screw holding the coupler to the arm shaft is loose. Being a mechanical device, it is not uncommon for this to occur after several days or weeks of initial operation. We suggest using a ratchet-driven Allen to tighten. If you have a torque wrench, the requirement is 55 inch-pounds. Re-application of a thread-locking compound is recommended.

Symptom: Circuit Breaker Trips

Solution:

This is an indication that the current through the circuit breaker is high, usually due to the Supply Voltage being low (less than 24 VDC) as a result of using too small a gauge of wire for Power. Check for loose connections and verify the proper gauge wire is installed per the Wire Gauge Calculator in the Appendix (Pg. 34). If necessary, replace the power wire with a larger gauge (smaller number) or increase the Supply Voltage in order to deliver 24 VDC at the Power Input Connector, while the ES831 is operating under load.

Symptom: Numerous False Alarms

These Alarms may occur spontaneously, or after passage of a valid user (even in Free Exit mode).

Solution:

The optical path has become partially obstructed by dust accumulation, or by application of cleaners/polish/etc. on the Infrared Plexiglas covers over the sensors and reflectors. Clean the Sensors, the I.R. Plexiglas, and the Reflectors with a mild soap and water solution. Instruct the Cleaning Staff to avoid using any cleaners or polish on the Plexiglas. When handling the Plexiglas, hold it by the edges to avoid getting oils and fingerprints on the surface which would distort the beam and may attract dust. (See Care and Cleaning info on Page 37)

Symptom: Multiple users card in, only first user allowed to pass.

Solution:

The Access Control System is holding the Valid User (Entry or Exit) Input for subsequent users. The Access Control System needs to be adjusted to provide a shorter cycle time (preferably less than half a second contact closure) in order to provide a discrete input cycle to the ES831 for each valid card read. Because many Access Control Systems are built to control door locks, their default setting is five seconds, and the system simply holds the lock for each subsequent user rather than providing a unique input cycle (Open/Close/Open) for each valid user.

DSI!

DESIGNED SECURITY, INC.

WARRANTY

The DSI Optical Turnstile Product you have purchased is warranted to be free of defects in material and workmanship when properly installed, used and maintained according to instructions. DSI will, for a period of three (3) years from date of purchase, repair or replace any part which, upon our examination, proves to be defective under normal use. **DSI/DETEX SHALL NOT BE LIABLE FOR ANY DIRECT, INCIDENTAL OR CONSEQUENTIAL LOSS OR DAMAGE ARISING OUT OF THE FAILURE OF THIS DEVICE.**