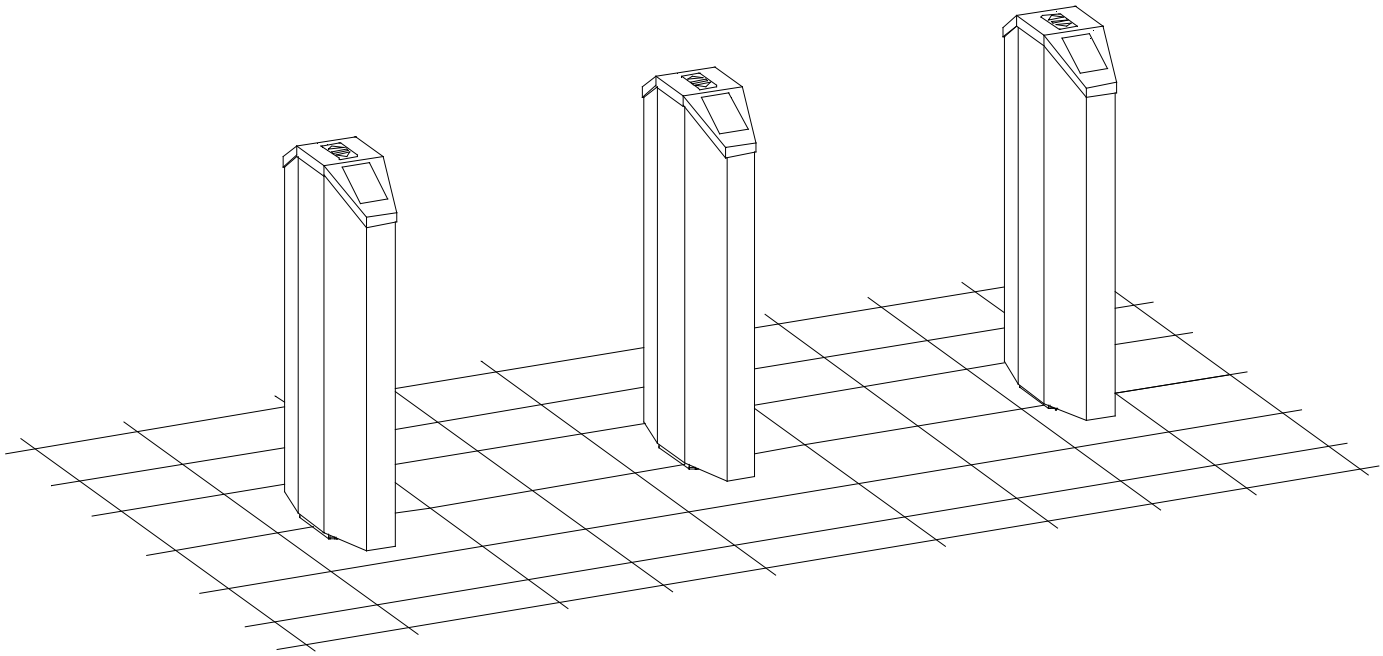
DESIGNED SECURITY, INC.

A Detex Company

ES8500



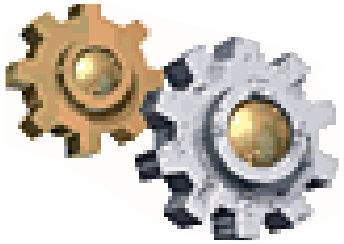
Mid-Sized Optical Turnstile

Installation of the Optical Turnstile System involves three stages.

Site Preparation

Installation

Operation



Installation Package Includes:

- This installation manual
- Connector Hardware Package w /WAGO Tool
- Crated Optical Turnstile Components

DS!

SITE PREPARATION

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LANE PLACEMENT AND USER CONSIDERATIONS

- Prior to laying out the lanes, some information regarding effective traffic flow, placement of the pedestals and minimizing nuisance-alarms need to be understood in order to make your installation effective at providing access control with the least amount of intrusion into the user's daily routine. This may be considered the "psychology" of lane placement, and from our experience is worthy of consideration prior to finalizing your installation parameters.

- Though small, the ES8500 does provide a psychological barrier to the user. Through careful placement, the ES8500 can provide positive traffic flow through the area of the access control threshold.

- DSI recommends placing the ES8500 so that the access threshold will encourage users to continue through the area rather than loitering there. The unobtrusive appearance of the units may encourage users to overlook their purpose as access control devices.

- If a queuing environment exists which encourages users to linger or accumulate due to lane placement, (I.e.: near Pull Doors, Elevators or Lobby areas) people may obstruct flow through the lanes, lean on the pedestals, or they may stand so as to block the I.R. Beams in the lane. These conditions can cause nuisance alarms, disruption of pedestrian traffic flow, and possible optical misalignment or other damage to the pedestal.

- A turnstile placed in a long, straight corridor may encourage the "swinging" of personal items by fast walkers or by those users in a hurry. A rapidly moving user swinging a large item can generate a tailgate violation, if a large item swings through the beam before or after the user has completed passage. (the large item may be sensed as a user passing through)

- In a Free Exit configuration, an exiting user may be moving rapidly through the lane swinging a large item. A back-swing or a large item into the beams could be interpreted as a user coming from the other direction, thus producing a nuisance alarm.

PRE-INSTALLATION PREPARATION

- ## Lane Width

  Lanes should be 24 to 38 inches wide. We recommend making the walking lanes 30 inches and making any A.D.A. required lanes 38 inches wide. This 30 inch suggested lane spacing will reduce the possibility of multiple persons gaining side-by-side access on a single “valid read” input, as could more easily occur with wider lane spacing.

- ## A.D.A. (Americans with Disabilities Act of 1990)

  This federal act requires that A.D.A. lanes should be spaced a minimum of 36 inches apart in order to allow adequate clearance for accessibility. These DSI Optical Turnstile models have been designed to allow the use of the lanes by those persons with mobility-assisting .

  A separate lane with wider spacing (36-38” instead of 30”) is often set up near the guard station for A.D.A.-type applications.

- ## Wiring

  Determine the number of lanes, their positions/spacing and the number of wiring connections required for the installation using the Planning Worksheet included in this section.

DEFINING “A” AND “B” GRAPHICS AND CARD READERS
[VERY IMPORTANT]

Each Graphic Array has two arrows and a bar which illuminate under different conditions.

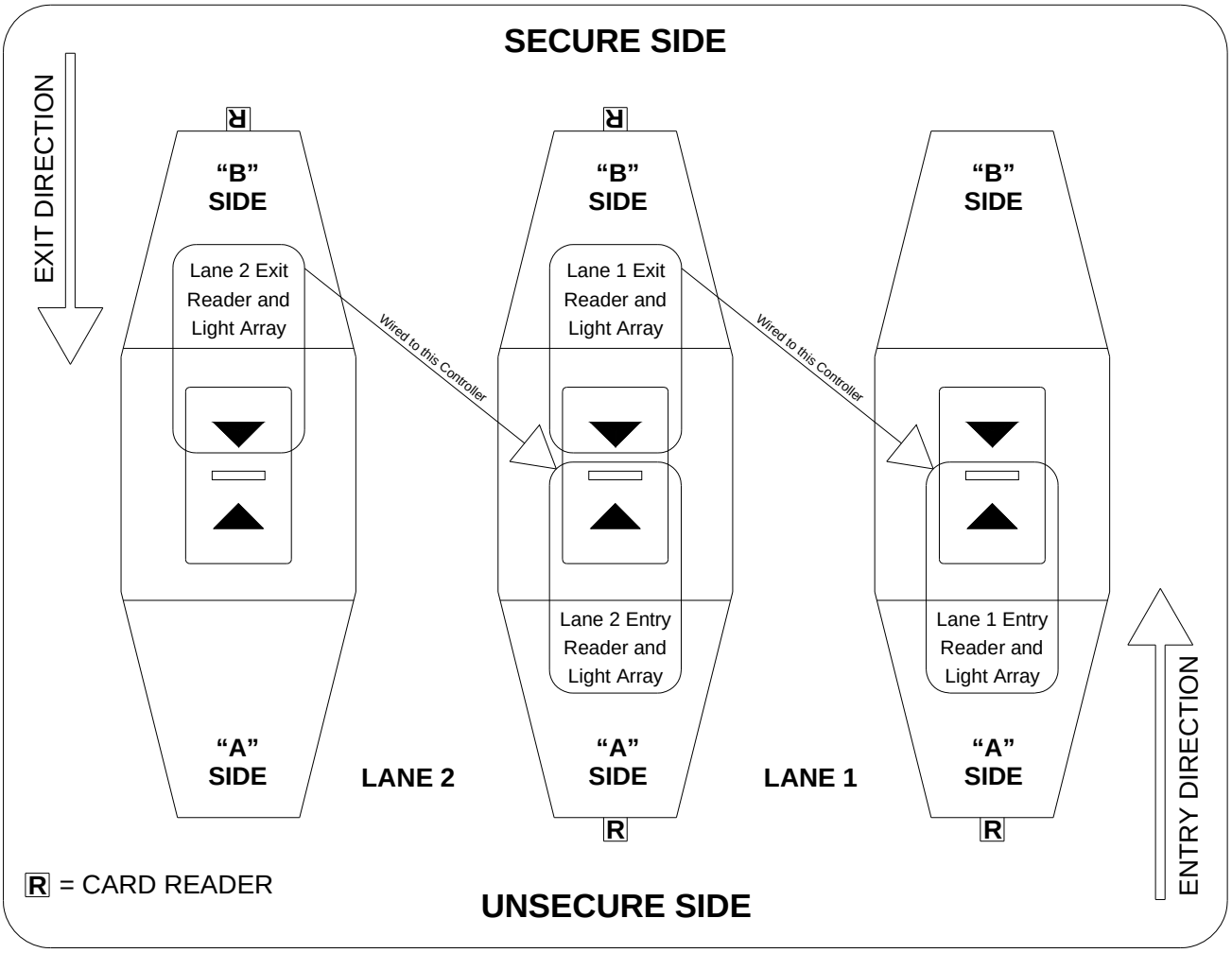
The **“A” side Array** consist of the ***Entry Green Arrow***, ***Red Bar*** **and the** ***Entry Buzzer***.

The **“B” side Array** consist of the ***Exit Green Arrow*** **and** ***Exit Buzzer*** only.

The Array and it’s associated Card Reader are always on the Right-hand side of the lane, when viewed by the user.

Although mounted in different pedestals, **Each Graphic Array wiring and Card Inputs go to the same Controller connection to control each individual lane.** (See Diagram)

The “A” side Array and Card Reader is **Local,** and the “B” side Array and Card Reader for the same lane is **Remote** to that lane’s Control Board. (See Diagram)



INSTALLATION

DS!

PLANNING WORKSHEET

			EXAMPLE
Inputs (from Power Supply and Access Control System)			
Power - Main	- 18 awg 2 conductor, shielded	____	2
Remote Reset/Bypass	- 22 awg, 2 conductor, shielded	____	2
Valid A Card	- 22 awg, 2 conductor, shielded	____	2
Valid B Card	- 22 awg, 2 conductor, shielded	____	0
Graphics Wiring (runs between pedestals in each lane)			
Exit Horizontal Graphic Array Wiring	- Cable Provided (allow for its size)		
Outputs (To Monitoring Equipment)			
Alarm Status	- 22 awg, 2 conductor	____	2
Valid Passage A	- 22 awg, 2 conductor	____	0
Valid Passage B	- 22 awg, 2 conductor	____	0
Access Reader Wiring	- See Manufacturer's specifications	____	4
TOTAL		____	12

EXAMPLE: **A single lane set up as Free Exit monitoring Alarm output.**

In the example column the application calls for Power (2); Valid A Cards (2); Alarm Status will be monitored (2); using a single Access Reader (4).

NOTE:

The wiring for Power may require a larger gauge of wire, depending upon the length of the wire run. The longer the wire run, the more the voltage drop will be. The **DSI Power Wire Gauge calculator** in the Appendix of this document will help to determine the appropriate gauge for the length of run based upon the voltage needed at the Power Input.

PHYSICAL MOUNTING OF THE PEDESTALS

- Determine the necessary spacing and layout, and mark locations of each pedestal on the floor with chalk or tape. Verify that all aspects of the layout have been considered, including Lane Spacing, Traffic Flow, Ergonomics, A.D.A. applications, and Wire Runs.

- Remove the steel bases from the units and use the base as a template to mark and pre-drill mounting and wire access holes. Standard lane spacing should be 30". A.D.A. lane spacing should be 36"-38" between pedestals to meet compliance standards on applicable lanes.

- Attach the bases to the floor using a 1/2" bolt in each mounting hole (4 total per pedestal).

- Pull all cables through the wire access hole in the base of each pedestal.

- The pedestal needs to be level horizontally, plumb vertically and square to adjacent pedestals to insure proper optical alignment. If the floor is not level, shim pedestals as necessary to achieve proper alignment.

ALIGNMENT OF PEDESTALS

Due to the optical nature of this device, the accuracy of the physical alignment is a consideration for trouble-free set -up and operation of these Optical Turnstiles. Careful attention to alignment during the installation stage will lead to better calibration and a more aesthetically pleasing set of lanes.

There are several techniques that may be used to verify alignment which will be outlined here.

"X" Squaring Technique -

- Determine common points on each end of the long side of the pedestal base which faces the adjacent pedestal.

- Measure between these points across, in an "X" pattern, to the same points on the other pedestal base.

- This is a carpenter's technique used to check "square" in framing. If there is a difference between these two measurements, then one, or both of the bases will need to be adjusted until the measurement is the same. (Or within 1/8" or less)

Floor Tile Technique -

- The close-fitting seams of tile squares may be used as a reference, if the pedestal bases are installed with the sides paralleling the seams. You may measure from the seam to each end of the long side of the base. A Carpenter's Square would be ideal as a measurement device for this, by aligning the long end with the seam and measuring to the base with the short side of the square. Like in the "X" Technique, these measurements should be the same from each end of the side of the base, in reference to the seam.

Laser-Level Alignment Technique -

- If you have access to a Laser Level, or other Laser alignment device, it may be used to verify alignment by shooting the beam along the narrow side of the bases of all the pedestals in the installation.

- The beam should touch, but not be eclipsed by the side of the pedestal. This works best with two or more lanes and should still be verified with the "X" Technique if there is any doubt regarding the alignment.

ACCESS SYSTEM READER - Mounting & Orientation
(*IMPORTANT*)

- **Each reader should be mounted on or near each lane's Right-hand Pedestal *when approaching the lane* in either direction of travel.**

- The Entry and Exit readers installed on any single lane should be located across the lane on a diagonal from each other.

- By placing each reader on the User's right, the user presenting their I.D. will associate the reader with the correct Graphic Array, also on their right, so that there will be little confusion as to whether permission has been granted to proceed through that lane.

- On the ES8500, the Reader is generally mounted on the sloped panel or on the vertical end of the pedestal.

- This system is designed so that the appropriate Graphic Array Arrow will always be on that right-hand pedestal. This promotes ease of use because the user will already be looking in the general direction of the Graphic Array due to the Access Reader's mounting location being near it in either direction of travel.

NOTE: Mounting the readers opposite the appropriate Graphic Array may lead to a user misunderstanding where to look for the Proceed Arrow. This can reduce traffic flow and result in alarms. Make your Installation consistent with the design and operation, in order to prevent users generating unnecessary alarms.

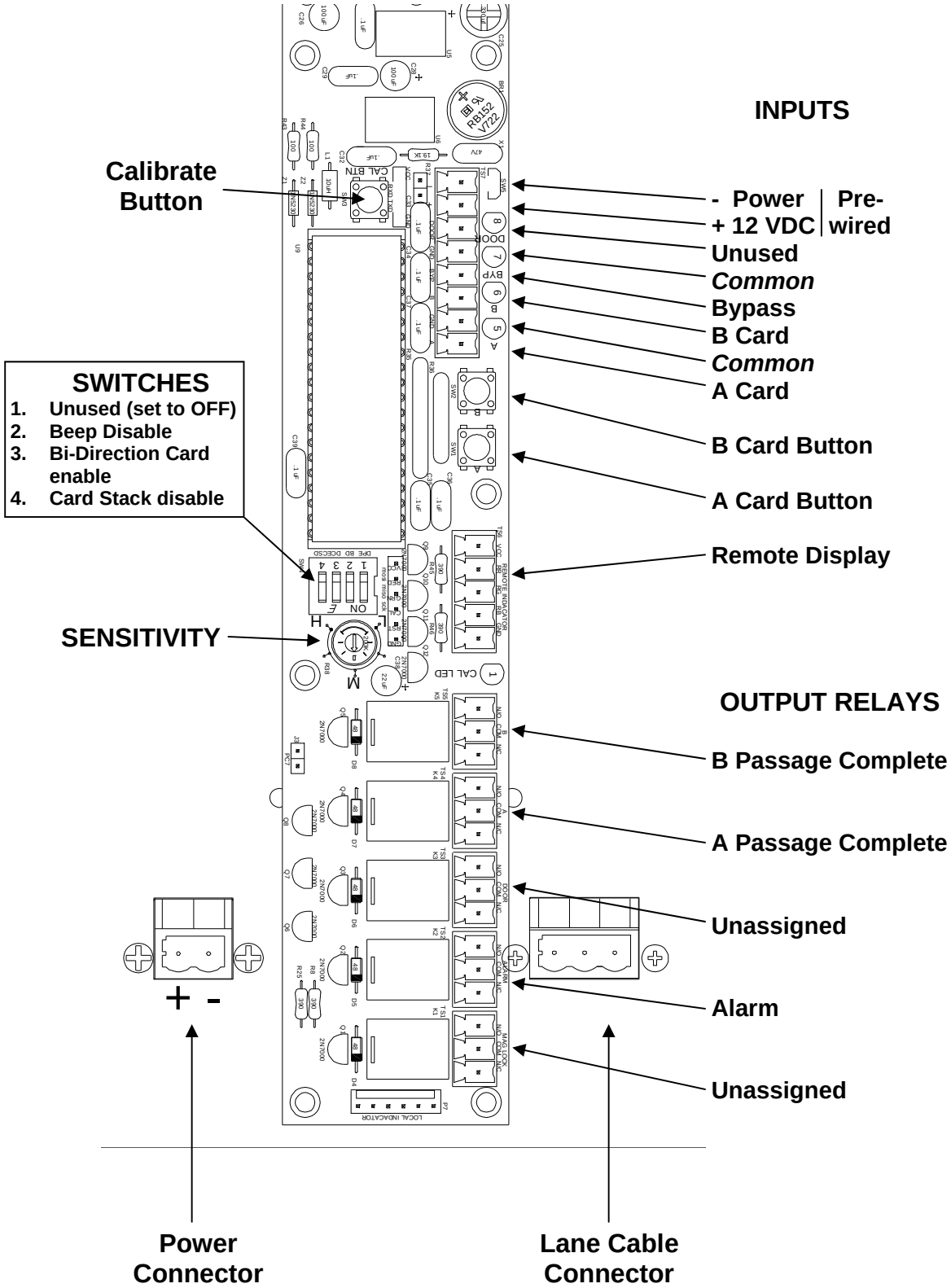
LANE INTERCONNECT CABLE

A cable (included) must be installed between the two adjacent pedestals to carry power and exit Graphic Array control to the Transmitter side of the lane.

This cable is usually run in conduit that terminates in the Baseplate's center access hole at each pedestal.

Reader and control wiring can share the conduit with the Lane Interconnect cable.

SETTINGS & INPUT/OUTPUT LOCATIONS



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WIRING

Reference the Drawings in the back of this manual for additional wiring information.

The included cable, with Green, Orange and Gray connectors, is used to pass Exit Graphic Array control to adjacent pedestal. Match connector colors. See drawing in appendix for additional information.

Attach the following wires to the appropriate Inputs and Outputs.

LANE INPUTS

- **Power** **-** Use appropriate gauge for power run length. (See Power Wire Gauge Calculator) Connect power from a 12*VDC only** @ 1 Amp/walkway power supply to these terminals. If multiple supplies are used, make all grounds common. (use Power Wire Gauge Calculator in Appendix to determine wire size)

- **Bypass**
  Connect to remote N/O switch to provide remote reset/bypass operation.

- **Valid A Card**
  Connect N/O (dry contact) Valid Entry output from Access Control System.
  To enable **Free "A"** operation (no validation required) short this input.

- **Valid B Card**
  Connect to N/O dry contact Valid Exit output from Access Control System.
  To enable **Free "B" operation,** short this input.

NOTE: The Access System's Valid A and B inputs should be a momentary closure of less than 1 second (0.5 seconds is recommended) to allow proper operation with multiple reads/ users during peak traffic periods. If either Valid input is closed longer than 12 seconds **Free Passage Mode** is enabled for that direction.

LANE OUTPUTS

- **Alarm Status**
  Dry contact, (N/O or N/C) relay changes when Alarm condition exists.

- **Valid A & B Passage**
  Dry contact, (N/O or N/C) relay that Opens momentarily after a Valid Passage has occurred for the appropriate direction.

Other Relays are reserved for custom applications.

SENSOR CALIBRATION

Bypass Method

- **Enable Bypass**
- **Press Calibrate Button.**
- **Install covers.**
- **Verify clear beam path.**
- **Disable Bypass, keeping the beam path clear until Graphic Array stops flashing.**

Calibrate Timer Method

- **Press Calibrate Button**
- **Install Cover and clear beam path within 15 seconds.**
  (Graphic Array will beep and flash during countdown. Rate will double in last 5 seconds)
- **Keep beam path clear until Graphic Array stops flashing**

FREE A or B PASSAGE SELECTION

- Enable FREE PASSAGE for either direction by shorting the Valid A or Valid B Input.
- Free Passage is operational after twelve seconds.

SWITCHES

- **1 - Unused** (set to OFF position)
- **2 - Beep Disable** (set to ON to silence Valid Card Beep)
- **3 - Bi-Direction Card Enable**
  (set to ON to allow A card to validate passage in either direction)
- **4 - Card Stacking Disable**
  (require each user to pass through the lane before next valid card will be accepted)

SENSITIVITY

- Please contact DSI Customer Support (800 272 3555) prior to adjusting Sensitivity

OPERATION

DS!

Optical Turnstile System (OTS) Overview

- The DSI ES8500 series Optical Turnstile monitors pedestrian traffic flow through an access control point and helps assure that only one individual will pass for each valid card presented.

- The ES8500 utilizes sensing pedestals to form passageways at the entrance to an access-controlled area. An individual must be granted ACCESS by the facility's Access Control System in order to pass between the pedestals without triggering an ALARM.

- The ES8500 is compatible with any reader system that provides N/O dry contact outputs and can be field configured for **CARD-IN/CARD-OUT** or **CARD-IN/FREE EXIT** operation.

- Inputs to the ES8500 OTS allows the lane to be bypassed remotely and Outputs can be monitored to remotely indicate alarm status for each lane.

- The ES8500 OTS comprises a small footprint for applications where space is a limiting factor without sacrificing high throughput.

SYSTEM OPERATIONAL DESCRIPTION

When an user presents his card an audible tone sounds and a green arrow flashes to indicate that access has been granted. When the user walks through the passageway the system is reset for the next user. If an individual attempts to walk through the passageway without being granted access, an audible alarm is sounded and an alarm output contact will be triggered and can be used to initiate appropriate security response.

The **ES850 Series Optical Turnstile System / OTS** will utilize the Access Control System to grant or deny access to the facility or a secured area.

The OTS will insure that only one pedestrian enters a secured passageway for each valid card read.

The OTS senses and processes pedestrian direction through the sensing arrays on a cycle basis. The system is designed to store **multiple valid card reads** (card count) thus allowing the next card to be read before the previous user has completed passage.

The Optical Turnstile System / OTS consists of two separate components, the Transmitter assembly and the Control/Receiver assembly. These are mounted in pedestals so that the active sensing arrays are mounted across a doorway or passageway. These sensing arrays are used to monitor the entrance by determining pedestrian direction as the individual moves through the passageway and prevent multiple passages on a single card read.

- ## Control/Sensor Assembly

  This is the circuit board mounted on the Control/Sensor-side of the Pedestal.

  The **Control Board** monitors the IR sensors and inputs from the access control system to determine and annunciate the status of a controlled passageway. The Control Board is the data-processing and system-interface board. All I/O connections are made to the Control Board.

  The **Sensor Arrays** use infrared Graphic and setup is accomplished with an easy pushbutton calibration routine.

GRAPHIC ARRAY CONNECTION

- The Graphic Array may accept inputs from the local and the adjacent pedestal, to accommodate Entry and Exit processing. Arrays on an end pedestal will have only an Entry or Exit function as appropriate.

- The local (Entry function) Graphic Array is wired directly to the circuit board.

- The remote (Exit function) Graphic Array is wired to the adjacent pedestal via the supplied cable. This cable has color coded connectors that are matched to the ones on the pedestals.

GRAPHIC ARRAY OPERATION

- The Graphic Array, and Audible sounder located on each pedestal unit indicates the operational status of the system.

- A Green arrow flashes to indicate that a Valid "Entry Card" has been received, and a user may proceed through the lane.

- When a Green arrow is constantly illuminated this indicates that the lane is in the Bypass mode.

- The Red array bar is on when the OTS is armed.

- The Red bar flashes to indicate that the OTS is in ALARM.

- An Audible sounder beeps when a Valid "Entry Card" has been received, providing an audible indication that the card has been accepted. The buzzer is also turned on when an alarm condition exists. (this feature can be disabled via the Control Board Switch)

ES8500 OPTICAL TURNSTILE - USER INSTRUCTIONS

-copy and distribute this page to users-

OVERVIEW

The ES8500 establishes a threshold allowing only one passage per validated user.

The Detection Area senses the presence and direction of travel of each user.

Any intrusion into the Detection Area by an non-validated user will generate an alarm.

The ES8500 can accept multiple valid inputs, the next validated user can immediately follow the person in front of them. The door may remain open between each user access.

	INDICATION	CONDITION	ACTION
BARS	Red	Armed	Do Not Proceed
	Flashing Red	In Use, Alarm/Tamper	Wait
ARROWS	Green	Bypassed	Free Access
	Flashing Green	Valid User Access	Proceed
AUDIBLE	Single Beep	Valid User Access	
	Continuous	Alarm/Tamper	

STEP BY STEP

- When approaching the ES8500 avoid intruding into the Detection Area **prior** to being granted access. Violating the Detection Area without access having been granted results in an Alarm, and may summon Security personnel.
- Present your User Identification (Card, Badge, Biometric, etc.) as per the Access Control System manufacturer's instructions.
- After validation is received**,** the ES8500 will **Beep** and the **Green Arrow will flash**. You may **proceed**.
- Proceed directly through the doorway, Avoid loitering as this could cause an Alarm.
- Should no completed passage be detected the system will reset after a short time out period. You will need to re-validate with your User Identification to be granted passage after a time out.
- When Free Passage is enabled (Green Arrow always on) you may pass through the doorway in that direction without presenting User Identification.

APPENDIX

DS!

SPECIFICATIONS

INPUTS (N/O - Shared Ground)		# of Wires
Valid “A” Card		2 (22 ga.)
Valid “B” Card		2 (22 ga.)
Bypass		2 (22 ga.)
Power 12 Vdc @ 700mA	Sender	2
	Receiver/Control	2
OUTPUTS Form C 1 Amp @ 30VDC		
Alarm Relay		2
“A” Passage Complete		2
“B” Passage Complete		2

Output Relay Detail

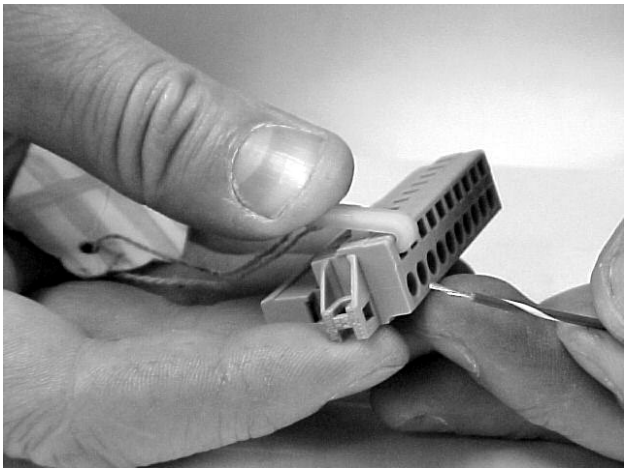
All relays are normally powered . When a power loss occurs relays will change state.

- **Alarm** relay changes state whenever an alarm condition exists at the lane. An Alarm condition occurs when a person passes through the sensing area in the secured direction without previously presenting a valid card. An alarm condition also occurs when the sensor beams have been blocked for an extended time period.

- **Valid A & B Passage** relays change state whenever a valid user passes through a lane in either direction after a card read. This is often used in a time and attendance system to verify that a user who carded in has also entered the secure area.

ATTACHING WIRING TO WAGO™ CONNECTOR

- Inputs and Outputs are connected using a WAGO(tm) tool, which is included.
- The photo illustrates the method of operation of the tool for inserting wires into the connector.

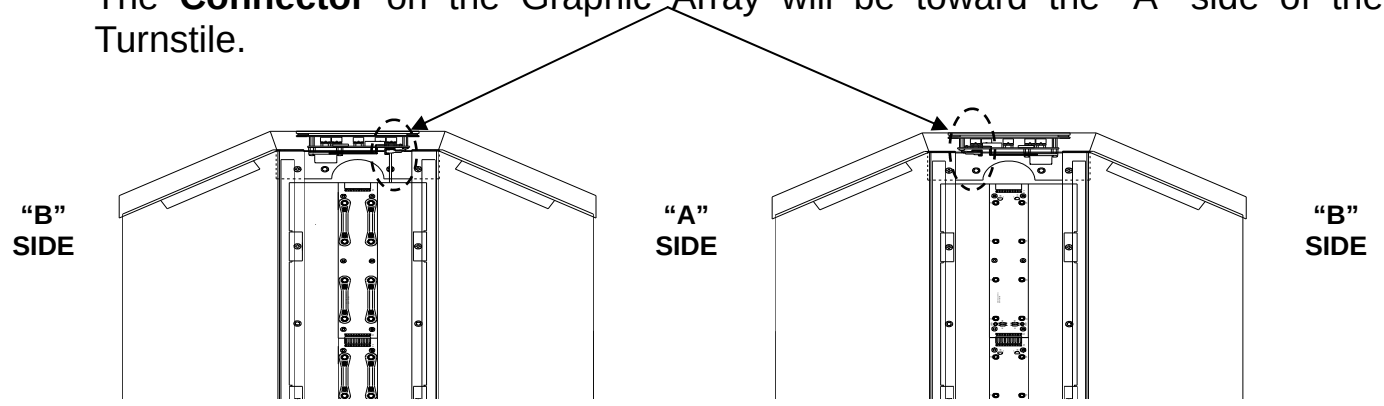


USING WAGO INSERTION TOOL

GRAPHIC ARRAY ORIENTATION

When installing the Graphic Array into the top of the pedestal, reference the drawing for proper orientation.

The **Connector** on the Graphic Array will be toward the “A” side of the Turnstile.



CONTROLLER VIEW **TRANSMITTER VIEW**

DSI Power Wire-Run Gauge Calculator

Use this form to determine the wire gauge of the power trunk for DSI equipment.

If used to calculate a:

- **DAISY CHAIN** application - one where all equipment is attached to the same trunk, you will need to calculate the total load and the total distance in wire run to the last load on the chain.
- **HOME RUN** application - where each piece of equipment is on a separate trunk returning to the central power supply, you use this form to determine the gauge for each run.

1. Specify total Current load of all devices sharing this trunk, in Amps.
2. Specify Distance of actual Wire Run (in feet) from power supply to most remote load.
3. Multiply figures from line 1 and line 2
4. Match final number to Table below to determine Wire Gauge needed to provide adequate Voltage.

TABLE

up to 17	22AWG
18 to 42	18AWG
43 to 63	16AWG
64 to 100	14AWG
101 to 157	12AWG

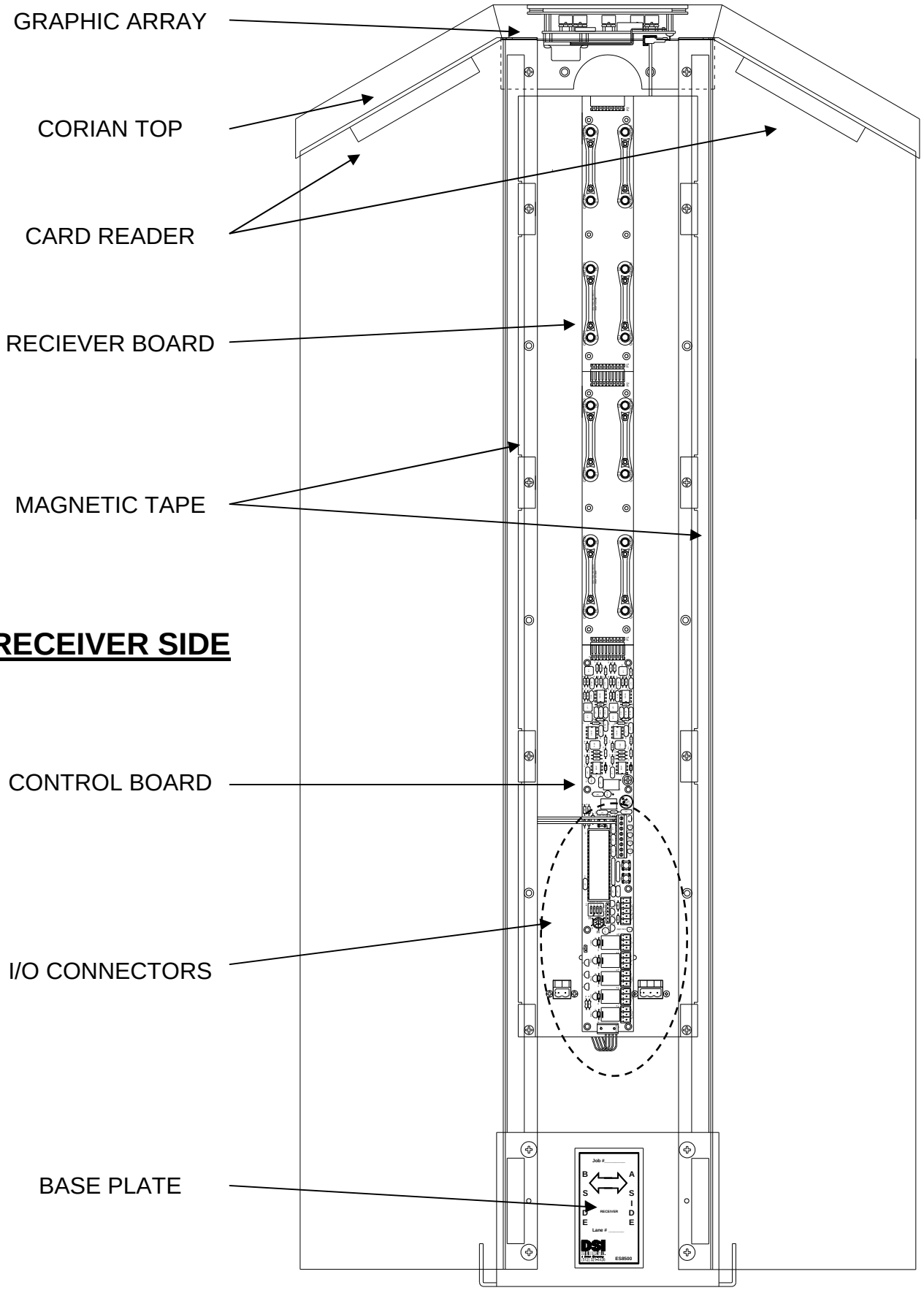
If your result is greater than 157, make individual supply runs to each lane that are within the above table.

EXAMPLE: 3 devices @ .250, .500, .125 amps - total amps of .875

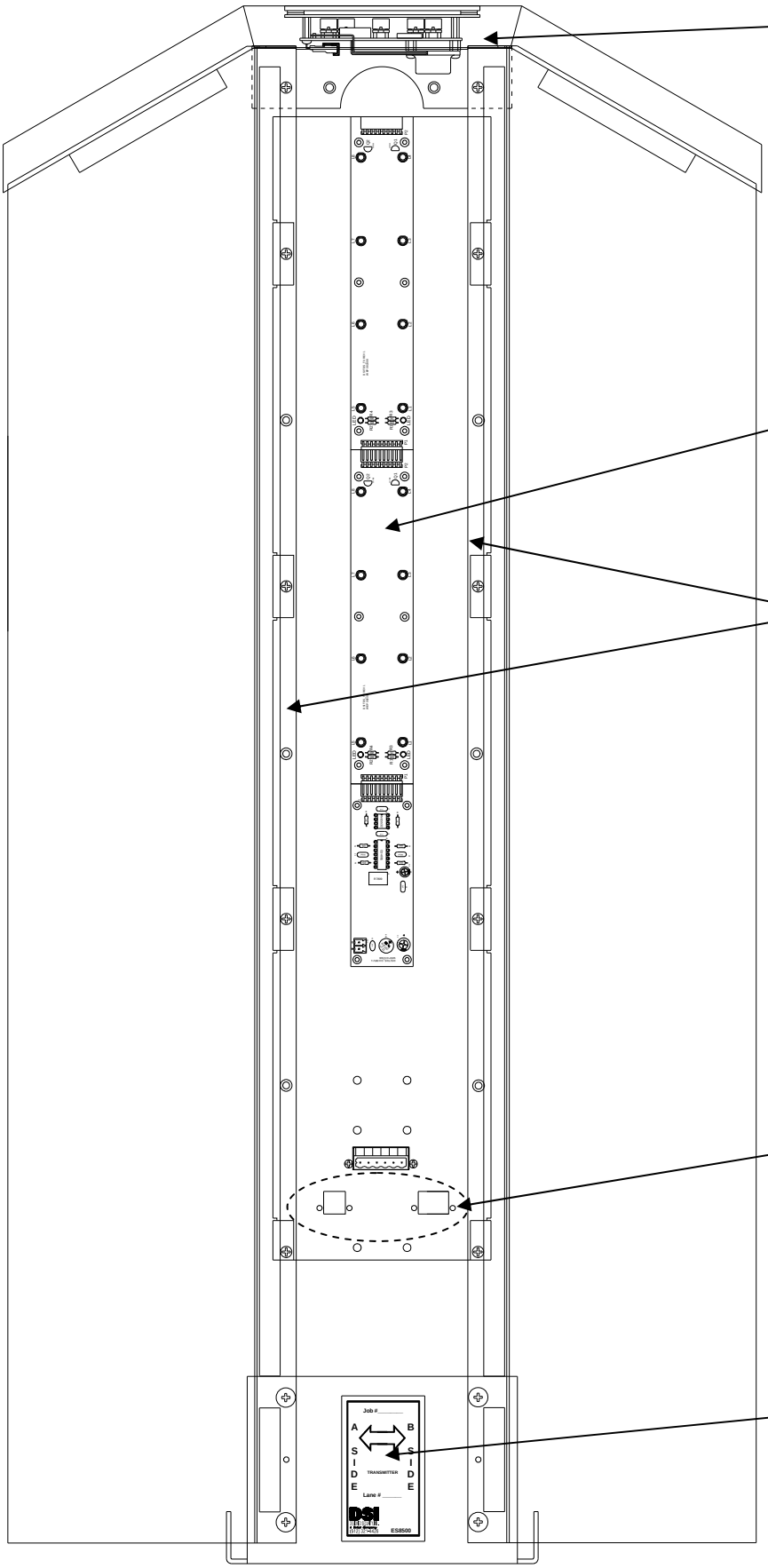
Distance of 150 ft.

150 times .875 = 131.25

131.25 falls into the category of 12 AWG wire.



RECEIVER SIDE



GRAPHIC ARRAY

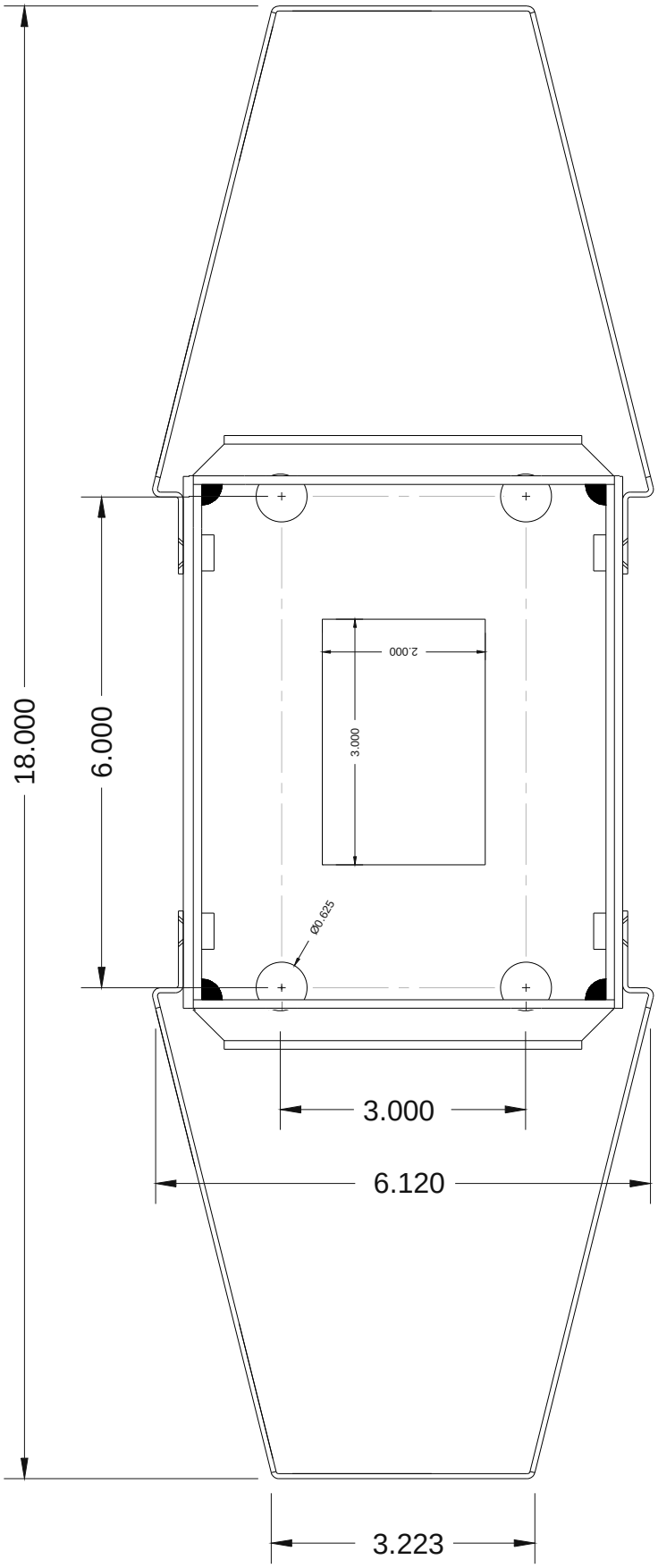
TRANSMITTER BOARD

MAGNETIC TAPE

TRANSMITTER SIDE

LANE INTERCONNECT

BASE PLATE



ES850 Base Plate Dimensions

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INSTALLATION NOTES:

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.**