UNPACK TURNSTILES

1. Remove the bolts at the ends of the turnstiles to separate from the skids and place turnstiles on the floor. With a box knife cut the cardboard flaps at the front of the housing next to the wood base. Cut the cardboard along the long side of the board just above the staples. Be careful not to damage the turnstile housings. Lift off the cardboard, the turnstile is protected by plastic and surrounded by foam. Refer to Figure 1.

2. Insert the keys into the key cylinders located in each side panel. Rotate the keys inward to release the latch holding the side panels to the frame. The side panels are also attached with Velcro.

3. To remove the side panels, slowly pull the panels from the bottom left and right corners utilizing enough force to separate the corners of the side panel from the frame approximately ¾ of an inch.

4. Pull the side panel from the bottom middle until it separates from the Velcro. Lift the side panel up and pull off. Keep track of the side panels as they relate to each turnstile. The panels are interchangeable but minor factory adjustments were made to ensure proper fit.

5. With the side panels removed, locate the lag bolts or carriage bolts that are used to attach the turnstile frame to the wood base. Remove these and discard the wood base.
TURNSTILE MOUNTING

CAUTION: The units weigh approximately 280 pounds.

6. Position the units at the installation location using a chalk line to ensure proper alignment. If the units were custom designed for a specific application then space turnstile as required for application. If the units are not custom we recommend that spacing between the turnstiles be 30 to 32 inches for standard walkways and for ADA designated walkways 36 to 38 inches. Please take into consideration that at least one walkway should accommodate ADA requirements. Mark the position of each turnstile.

ATTENTION: ½ inch anchor bolts are provided. Each of the housings require 8 anchor bolts to sufficiently attach the housings to the floor. DO NOT USE SMALLER ANCHOR BOLTS TO MOUNT THE HOUSINGS. Failure to use the correct size and number of anchor bolts will void the manufacturer’s warranty.

7. Remove the nuts and washers that attach the frame to the sub-mounting base. Do not remove the leveling washers and nuts from the sub-mounting base.

8. Drill the anchor bolt holes using the sub-mounting base as the template. Be careful not to move the sub-mounting base while drilling the anchor bolt holes.

9. Set the anchor bolts through the sub-mounting base, install the washers and nuts, and then tighten until sub-mounting base is secured to the floor.

10. Position a level length wise and cross wise across the leveling washers and adjust until all washers are level with the adjacent washer. Once all washers are level with each other reinstall the housing and tighten.

WIRE REQUIREMENTS

Refer to the system level-wiring diagram for cabling requirements. The housings with the lane electronics and card readers will require:

- 3 conductor 14 AWG minimum for 120 VAC Power to each housing
- 16 conductor 22 AWG minimum for interface to the access control system
- 16 conductor shielded 22 AWG minimum housing to housing
- 14 conductor 22 AWG minimum to interface with the annunciator
- Card Reader cable from Card Access System to each housing

WIRE TERMINATIONS

Refer to the system wiring diagrams for exact terminations and signal definitions. The valid card signal is to be connected to the card reader lock output relay. The lock output relay must be configured for 1 second maximum contact duration or to automatic relock when the door is opened. The door-input circuit of the card reader system should be connected to the “entry acknowledge” or “exit acknowledge” relay output on the lane control panel. The “entry acknowledge” or “exit acknowledge” relay output operates as a door mimic operation. The relay closes when a person walks through the lane, and re-opens when the lane is clear. The card reader system detects that relay cycle as a normal door unlock and open sequence. If a person walks through the lane without a valid card, then the relay closes. The card reader system detects that relay closing as a forced door.
Inputs:

- **Entry Card (momentary) Input** – this input is activated by the access control system to allow a valid entry passage through the lane. The access control system lock relay should be configured to provide a maximum 1 second pulse to this input.

- **Exit Card (momentary) Input** – this input is activated by the access control system to allow a valid exit passage through the lane. The access control system lock relay should be configured to provide a maximum 1 second pulse to this input.

- **Invalid Card (momentary) Input** – this input is activated by the access control system to notify the card holder that their badge was read but access is denied. The card holder is alerted to the status by the flashing red LED arrays mounted under the glass and a distinctive chime.

- **Bypass / Fire Alarm (maintained) Input** – this input can be activated by the fire alarm system, access control system or from a remote switch. When activated the wings retract and both LED arrays mounted behind the glass illuminate green. In this condition the unit will not alarm if individuals pass through the lane.

- **Wing Disable – Optical Only (maintained) Input** – this input when activated retracts the wings and allows the turnstile to operate as an Optical Turnstile without barrier.

Outputs:

- **Entry Alarm Relay** – activates when an invalid entry through the lane occurs.

- **Exit Alarm Relay** – activates when an invalid exit through the lane occurs.

- **Wing Fault Relay** - activates when the wing is out of position or is retracted due to a fire alarm or bypass input.

- **Bypass Status Relay** – activates when a fire alarm or bypass input is activated.

Desktop Control Panel

The lane desktop control panel is provided to annunciate the lane operation at a guard desk. Five LED’s are provided, Red = alarm, Green = bypass, Yellow = invalid card, Green = Normal, and Yellow = Wing Fault. An alarm sounder activates on either lane alarm, and an invalid card chime activates when either lane receives an invalid card signal from the card reader system. The keyswitch and pushbutton can be terminated to the lanes bypass input to provide for a momentary bypass or maintained bypass of the lanes.

**OPERATION VERIFICATION**

1. **INITIAL POWER UP:** Apply 120 VAC to the power input; this will power up the control board and the sensors. The wings will begin to move automatically extending out, returning back in and then out again before stopping. This is the homing sequence and it should not be interfered with. If the wings are stalled prematurely from someone or something stopping them, the sequence will have to be restarted by a power off and on sequence. Once both wings are extended the unit is ready to test.

2. **SENSOR TEST:** Each infrared sensor has a red and green LED. When adjusted properly the green LED should be illuminated only. The red and green LED should illuminate if the sensor is blocked.
3. FIRST WALK TEST: The Red PRESENT CARD LED array on the top should be illuminated. Walk into the sensing area from the entry side. The unit should provide an audible sounder and the entry alarm relay should activate. Walk through the unit in the exit direction. The unit's barrier should open and allow a person to walk through the unit. An audible sounder and the exit alarm relay should activate.

4. SECOND WALK TEST: Present a valid card at the reader and ENSURE the valid card input contact is CLOSED. The Green PROCEED LED array on the display should illuminate and the barrier wings should open. Walk through the unit and the LED arrays should return back to illuminating red and the barrier should close. Repeat this procedure but in the exit direction. The unit should allow passage without creating an alarm.

5. THIRD WALK TEST: Present a valid card to the reader, and have two people walk through the sensing area close together. An alarm should be generated. Repeat this several times varying the distance between the two people. At some point of closeness, an alarm will not be generated. The tailgate sensitivity adjustment is provided to set the alarm distance between people.

6. ADJUSTMENTS - Refer to the photo of the control board for the location of the adjustment delays. The Tailgate sensitivity adjustment is used to allow purses, bags, umbrellas, etc to be carried through the sensing area without generating a false alarm, while maintaining a valid level of tailgate monitoring. This adjustment can be set for very sensitive tailgate detection, which can cause false alarms when bags and other objects are carried through the sensing area. Or this adjustment can be set for loose tailgate detection, which can allow someone to follow a person through the sensing area without generating an alarm. Maximum sensitivity is with the pot set toward the programming jumpers or counterclockwise. Minimum sensitivity is with the pot set away from the jumpers. The pot has a 180-degree turn.

FINAL ASSEMBLY

After the turnstiles are mounted and system operation is verified, remove the remaining protective covering from the side panels and install back on the corresponding turnstiles. The panels may be interchanged but it is recommended that the side panels be placed back on their original positions and housings.

CLEANING

The lanes may be kept clean by using any household or industrial grade stainless steel and window cleaner.

ELECTRICAL CHARACTERISTICS

System power requirements:
Input Voltage 120 VAC, 60 HZ, 20 Amp dedicated circuit for each group of lanes (consisting of up to three walkways). A 500 Watt UPS backup for each lane is recommended to maintain operation during power grid faults. If building backup electric generators take longer than 30 seconds to provide stable 120 VAC/60 HZ power during an outage, then the UPS backup wattage will need to be increased.

Internal power:
The PLC is powered directly from 120 VAC. Sensors and indicators are powered from an internally mounted enclosed switching 12 VDC 40 Watt power supply with built in EMI filter. Stepper motor is powered from an internally mounted enclosed switching 48 VDC 300 Watt power supply with built in EMI filter. Power supplies are UL listed for industrial control applications.
Control system:
The control system is PLC based. The control program is in non-volatile memory and is retained during power loss. The operational variables including time delays, operational status, wing position, sensor conditions are in random access memory, and are not retained during power loss. The PLC system has UL, CUL, and CE agency approvals.

Presence and direction sensors:
The sensors are long range diffuse scan active infrared sensors or through beam active infrared sensors or can be a combination of both. The sensors are provided with automatic interference prevention. The sensing range is up to 2 meters. The sensitivity is factory preset to 28 inches for non-ADA lanes, and 36 inches for ADA lanes. Response time is 2 ms or less. Operating voltage is 12 VDC @ 50 mA max. The sensors are UL listed for industrial control applications.

Wing position sensor:
The wing position sensor is a light industrial grade 1000 step per revolution, two phase quadrature output optical encoder. Operating voltage is 12 VDC @ 50 mA max. The optical encoder is UL listed for industrial control applications.

Stepper Motor Drive:
The stepper motor drive is a 4 phase bi-polar pulse width modulated chopper drive with optoisolated command interface. Maximum output current is 5 AMP. It is manufactured by Pacific Scientific. The motor drive is UL recognized for industrial control applications.

Stepper Motor:
The stepper motor is a NEMA 34 bipolar micro stepping motor manufactured by Pacific Scientific. Max rated current 4.3 AMP. Output torque range 10.16 – 15.39 Nm. The stepper motor is UL listed for industrial control applications.
LANE POWER
SUPPLY 120 VAC @
20 AMPS PER EVERY
GROUP OF
HOUSINGS NOT TO
EXCEED 3
WALKWAYS

WING EXTENDED

WALKWAY 1

ANNUNCIATOR

14 CONDUCTOR 22 AWG TO ANNUNCIATOR

16 CONDUCTOR 22 AWG HOUSING TO HOUSING

16 CONDUCTOR 22 AWG and 3 CONDUCTOR 14 AWG
CARD READER CABLE

3 CONDUCTOR 14 AWG
CARD READER CABLE

16 CONDUCTOR 22 AWG and 3 CONDUCTOR 14 AWG
CARD READER CABLE

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Adjacent housing terminations.
Sub-Base & Housing Installation Instructions
For Optical Turnstile System

1. Mark squaring line on floor 3 inches back from actual location of turnstile end.

2. Square base to marked line, long edges perpendicular to squaring line.

3. Remove 1 top nut, 1 lock washer, and 1 flat washer from attached bolts. (Leaving 1 flat washer)

4. Drill 3/8” diameter hole AT LEAST 3 inches deep in the four corner slots, and the four slots in the center of the base.

5. Clean out drilled holes thoroughly and hammer provided anchor bolts into holes. Tighten nuts. DO NOT SHIM SUB-BASE. ANCHOR FLAT TO THE FLOOR.
6. Slightly loosen lower nuts. This helps the bolts align with frame holes.

7. If the turnstile is mounted against a wall, level bolts on wall side first. To level, place level across washers and adjust top nuts as necessary.

8. Place provided blocks across sub-base as shown. Blocks should be 2” high.

9. Unbolt the steel shipping blocks from the turnstile frame.

10. Place the turnstile frame on the sub-base on top of the wooden blocks as shown. Align frame holes with the respective bolt underneath. DO NOT DAMAGE THREADS ON SUB-BASE BOLTS.

11. Remove the wooden blocks and set frame onto base one end at a time. DO NOT DAMAGE THREADS ON SUB-BASE BOLTS.
12. Center all bolts in slots and tighten all lower nuts onto the sub-base.

13. Lower the top leveling nut until it makes contact with the bottom nut. This begins the leveling process.

14. Level all four corners of stainless housing vertically.

15. Tighten remaining leveling nuts. Make sure not to distort the turnstile base frame.

16. Finish leveling by assembling top hardware (remaining washer, lock washer, and nut).