Horton Automatics
Platform Screen Doors
Table of Contents

- Introduction
- The case for platform screen doors
- Key project considerations
- Technology and design highlights
- Horton products, services and solutions
- Project management
- Horton experience
Who is Horton Automatics?

- North America’s leader in custom automatic entrances
- North America’s leader in PSD applications
- Worldwide locations
  - Corpus Christi - North and South America & Far East
  - Telford - Europe and Africa

Corpus Christi, TX
Telford, England
Background

* First U.S. patent for automatic sliding door
  - Founded in 1960
  - Over 250,000 installations worldwide

* Leading market position
  - No. 2 North America automatic doors
  - No. 5 global position in automatic doors
  - Leader PSD and industrial/security provider

* Two ISO 9001:2000 manufacturing facilities
  - US Headquarters: Corpus Christi, Texas, USA
  - Europe Division: Telford, England

* Parent Company: Sanwa Shutter Corp. (Japan)
  - $3 Billion Annual Sales
INDUSTRY FIRSTS

• First to gain nationwide building code acceptance for the automatic sliding door

• First internal shockproof checking in sliding door operator design (patented)

• First U.L. listing of the swing/slide breakaway feature on an exit (patented)

• First to market the automatic pass-through window

• First automatic door manufacturer to catalogue a motion detector with safety beam

• First U.S. manufacturer to develop the automatic Folding door and receive U.L listings on the operator, folding door system and breakaway mechanism

• Industry’s broadest commercial product line

Division of Overhead Door Corporation, A Sanwa Shutter Company
A sister division of Germany’s Novoferm and tormatic GmbH
Table of Contents

★ Introduction
★ The case for platform screen doors
★ Key project considerations
★ Technology and design highlights
★ Horton products, services and solutions
★ Project management
★ Horton experience
PSD Experience

- First installation -1973
  - DFW airport APM (120) PSDs

- Multiple worldwide installations
  - No. 1 in North America

- Certified supplier to
  - Bombardier
  - Siemens
  - Dopplemayr
  - Poma-otis
  - IHI
  - Mitsubishi

- Member ASCE APM Standards Committee
Platform Screen Door Advantages

- Enhanced safety
- Additional convenience
- Improved reliability and punctuality
- Increased train frequency
- Higher economic efficiency
- More space on the platforms
- Enhanced aesthetics
Enhanced Safety

- Separates platform and the track
- Protection from arriving or passing trains
Additional Convenience

- Passengers not exposed to pressure waves
- Air conditioning operates more efficiently
- Information/advertising surfaces
Improved System Reliability and Punctuality

- Efficient control of pedestrian flow
- Reduces train dispatch times
- Shorter intervals between arriving trains
- Increased system capacity
Higher Economic Efficiency

- Lower energy costs and consequential costs caused by accidents
- Passengers feel more secure so they will use the entire platform width, increasing system capacity
Enhanced Aesthetics

✦ Promotes a feeling of well being

✦ Unlimited interior design possibilities

✦ Wide range of color and material options
  ☼ Stainless Steel Clad
  ☼ Anodize Aluminum
  ☼ Full Glass
  ☼ Unlimited Powder-coat options
Table of Contents

✦ Introduction
✦ The case for platform screen doors
✦ Key project considerations
✦ Technology and design highlights
✦ Horton products, services and solutions
✦ Project management
✦ Horton experience
Key Project Consideration
Owner’s Perspective

★ Results
  ☀ Successful installations worldwide

★ Project Management
  ☀ Factory Support
  ☀ On-site support
  ☀ Post sale support

★ Products
  ☀ Proven Products
  ☀ Reliable system interface
  ☀ Designed for new and existing metro systems

★ Supplier Capacity
  ☀ Relevant Experience
  ☀ Ability to handle multi-year, large projects
# Table of Contents

- Introduction
- The case for platform screen doors
- Key project considerations
- Technology and design highlights
- Horton products, services and solutions
- Project management
- Horton experience
PSD Component Overview

- Emergency Egress Door (Swing)
- Upper Structure
- Info Panel
- Header / Drive Mechanism
- Access door to tracks
- Train Door
- PSD Sliding Door (Shown Open)
- Speaker
- Train
PSD Technology and Design Highlights

- Custom-fit design meets every project / client requirement
  - Each system is unique in design and function
  - Eases maintenance and reduces downtime

- Seamless interface with Train Control

- Customizable obstruction response/recovery
  - Obstacle detected when door is closing

- Lowest possible cost of ownership
PSD Technology and Design Highlights

✔ Monitoring door status
   ☉ Door signal (ATC, Master Panel) when closed and locked

✔ Display and control elements
   ☉ Display units supply information on operational status of door
   ☉ Provides self-diagnostics feedback

✔ Installation
   ☉ Modular design easily installs in new or existing systems

✔ Operation and Maintenance
   ☉ Maintenance done on platform side
   ☉ Minimum maintenance costs
   ☉ Minimum down-times
PSD Technology and Key Design Considerations

[*] Structural design
   - Supporting structure
   - Anti-seismic design
   - Windload requirement
     - Piston effect in underground systems
     - Wind pressure in elevated systems

[*] Electrical Design
   - Train ↔ PSD interface
   - Electromagnetic interference

[*] Crowd management and control
   - Ability to contain a crowd in case of a panic stampede or simply a peak-hour station overload
   - Ability to manage flow on the system platform

[*] Ventilation and HVAC
PSD Technology and Design
Train Interface Considerations
Train Interface Considerations

MISALIGNMENT WITH TRAIN
VIEW FROM ABOVE
Table of Contents

★ Introduction
★ The case for platform screen doors
★ Key project considerations
★ Technology and design highlights
★ Horton products, services and solutions
★ Project management
★ Horton experience
Horton Products

- Platform screen doors (PSD)
  - Full Height
  - Greater level of safety and energy conservation
  - Modular system for heavy and light rail systems

- Emergency Egress Doors
  - Swing door
  - Multi-point latching
  - Flush panic devices for superior aesthetics
Automatic Sliding Doors
PSD Drive Mechanism

★ Belt drive – Series 2001 HD-Slide
★ Belt drive – Series 2500 Elegant®
☀ Ideal for Heavy-Duty Applications

► Heavy-duty motor
► 1” steel reinforced belt
► 6” x 8” header
  – Single slide door up to 500lbs (non-breakout)
  – Bi-part door up to 325lbs (non-breakout)
  – Elegant® all glass doors
Drive Mechanism
Schematic

ELECTRICAL/CONTROLS

FAIL-SAFE AUTOBLOCK

DRIVE COMPONENTS
Typical PSD / Train Signaling Interface

- Platform Length
- Vehicle Length
- Platform to Guideway
- PSD Centerline
- Vehicle Spacing
- Guideway Centerline

ATC Train Control

Optional Master Panel
PSD Automatic Sliding Doors

Stiles
- Narrow 2” standard
- Medium stile – 3 ¾”
- Wide stile – 5”

Medium Stile Vertical Rails

C323

3 3/4” (95)

C363

3 3/4” (95)
PSD Automatic Sliding Doors

🌟 Bottom Rails
- ☯ Taller rails used on medium and wide stile doors
- ☯ 10” available

🌟 Muntins
- ☯ Divides glass in door panel
- ☯ Options to match adjacent construction
- ☯ Houses panic exit devices
- ☯ French door
Anatomy of a more durable door

★ Door Panel Construction

◊ Horton-Exclusive Corner Block Design

- Cut to length Corner Blocks add strength
- Massive bottom rail web for superior strength
- Grade 8 ¼ - 20 Bolts
- (4) 10-24 X ¾” self threading FHMS secure corner block to horizontal rail
Horton PSD Panel
Competitive Comparison

* Horton Corner Block Panel  * Mass-Produced Thru Bolt

Horizontal Rail  Vertical Rail

Steel Back Up Plate

Concave steel back-up plate engineered as built-in self locking device for the Grade 8 Bolts

Thin steel stamping hold rods  ¼” Flimsy through rods

Bottom rail
The Result: Structural Integrity and Longevity

Through Bolt Construction
After Wear at Installation

Rails Can Twist and Misalign
Panel Becomes Damaged

This will not happen to a Horton door
 gypsum Automatic Sliding Doors
PSD Mounting/Design Options

 Also available Elegant® Full Glass Design
 ⊕ Ideal for upscale applications
 ⊕ ½” tempered glass panels
 ⊕ 2001 Series heavy duty operator

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PSD Typical Platform Configuration

Fully customizable / modular platform configuration designed to meet architectural and flow needs.
Emergency Exit Doors (EED)
Horton Aesthetics
PSD Typical Finishes

Full Glass Elegant® Design  Clear Anodize Aluminum  Dark Bronze Anodize

Full Glass Elegant® Design  Stainless Steel Clad  Woodgrain (Unlimited Options)
Table of Contents

★ Introduction
★ The case for platform screen doors
★ Key project considerations
★ Technology and design highlights
★ Horton products, services and solutions
★ Project management
★ Horton experience
Key inter-relations
Overview

43 Successful
PSD projects Worldwide

Civil Work
Other Systems
Traffic Mgm
Operations
Power
Train
Maintenance
Architect
Culture Of Execution

Engineering & Design
- R&D
- Mechanical
- Electrical
- Electronics
- Software
- Industrial Design
- Safety & Security

Testing
- Cycle test
- Windload
- EMC
- Acoustics
- FMEA

Fabrication
- Procurement
- Scheduling
- Storage
- Quality Control
- Customer First Article Approval

Installation
- Shipping & logistics
- On Site erection
- 24-Hr Cycle Test
- PICO / SAT Test
- Commissioning
- User Training

Post Sales Support
- Warranty
- Preventive Maintenance Program
- Off-Site/On-Site Support

Installation
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Testing
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Engineering & Design
- Industrial Design
- Safety & Security
- Software
- Electronics
- Electrical
- Mechanical
- R&D

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Horton’s Capabilities

★ Design
  ☉ Internal engineering group
  ☉ Third-party consultants for design verification
  ☉ Rigorous FAI (First Article) and cycle testing
  ☉ Simple designs easily adapts to project requirements

★ Project management
  ☉ In-house management team and legal support
  ☉ PERT-CPM project management

★ Sourcing
  ☉ Worldwide sourcing capability
    ► Internal purchasing group
    ► Sanwa Shutter (parent) support
Horton’s Capabilities

★ Manufacturing
  ☀ Fully owned sites in U.S. & U.K.
  ☀ Iso 9001 certified
  ☀ Kanban & flow-line provide higher output
  ☀ Lean manufacturing

★ Installation
  ☀ Horton typically installs all PSDs
  ☀ Installation management available
  ☀ Field consulting available

★ Testing
  ☀ State of the art testing and verification services

★ Training
  ☀ On-site and classroom training available
Horton’s Capabilities

⭐ Documentation
   ☼ Operation & Maintenance Manuals
   ☼ Comprehensive Quality Management

⭐ Support
   ☼ On-site, internet, and phone support available

⭐ Sales
   ☼ Worldwide dedicated network team
# Table of Contents

- **Introduction**
- **The case for platform screen doors**
- **Key project considerations**
- **Technology and design highlights**
- **Horton products, services and solutions**
- **Project management**
- **Horton experience**
### Horton Selected Projects

<table>
<thead>
<tr>
<th>COMPLETED PROJECTS</th>
<th>LOCATION</th>
<th>DATE</th>
<th>DESCRIPTION</th>
<th>CUSTOMER</th>
<th>STATIONS</th>
<th>PLATFORMS</th>
<th>PSDs</th>
</tr>
</thead>
<tbody>
<tr>
<td>DFW Airtran Fokker 50</td>
<td>Dallas/Fort Worth Intl Airport, USA</td>
<td>Jun-03</td>
<td>50-X-X-SO, Aluminum Frame Panels</td>
<td>LTV</td>
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<td>American Airlines A319</td>
<td>Dallas/Fort Worth Intl Airport, USA</td>
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<td>50-X-X-SO, Aluminum Frame Panels</td>
<td>Airtran Airlines</td>
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<tr>
<td>Los Angeles Flight Center AGTS</td>
<td>Los Angeles, California, USA</td>
<td>Nov-08</td>
<td>X610, X8-X-X, 500,000 Aluminum Frame Panels</td>
<td>Airtran Airlines</td>
<td>4</td>
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<tr>
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<td>Denver, Colorado, USA</td>
<td>Oct-05</td>
<td>X8-X-X, 500,000 Aluminum Frame Panels</td>
<td>Airtran Airlines</td>
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<td>Kansas City, Kansas, USA</td>
<td>Sep-07</td>
<td>X610, X8-X-X, 500,000 Aluminum Frame Panels</td>
<td>Airtran Airlines</td>
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<td>Orlando, Florida, USA</td>
<td>May-09</td>
<td>X8-X-X, 500,000 Aluminum Frame Panels</td>
<td>Airtran Airlines</td>
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<tr>
<td>Miami International Airport AGTS</td>
<td>Miami, Florida, USA</td>
<td>Jun-03</td>
<td>X8-X-X, 500,000 Aluminum Frame Panels</td>
<td>Airtran Airlines</td>
<td>4</td>
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</table>

<table>
<thead>
<tr>
<th>Projects in Progress</th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Miami Airport – North Terminal APM</td>
<td>Miami, Florida, USA</td>
<td>Ongoing</td>
<td>X8-X-X, 500,000 Aluminum Frame Panels</td>
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<td>Dulles Airport APM</td>
<td>Washington, DC, USA</td>
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<td>Mitsubishi</td>
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<tr>
<td>Nashville International Airport APM</td>
<td>Nashville, Tennessee, USA</td>
<td>Ongoing</td>
<td>X8-X-X, 500,000 Aluminum Frame Panels</td>
<td>Mitsubishi</td>
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</tr>
<tr>
<td>Houston International Airport APM</td>
<td>Houston, Texas, USA</td>
<td>Ongoing</td>
<td>X8-X-X, 500,000 Aluminum Frame Panels</td>
<td>Mitsubishi</td>
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<tr>
<td>Salt Lake City Int’l Airport APM</td>
<td>Salt Lake City, Utah</td>
<td>Ongoing</td>
<td>X8-X-X, 500,000 Aluminum Frame Panels</td>
<td>Mitsubishi</td>
<td>4</td>
<td>14</td>
<td>112</td>
</tr>
<tr>
<td>Orlando International Airport APM</td>
<td>Orlando, Florida, USA</td>
<td>Ongoing</td>
<td>X8-X-X, 500,000 Aluminum Frame Panels</td>
<td>Mitsubishi</td>
<td>4</td>
<td>10</td>
<td>22</td>
</tr>
</tbody>
</table>

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Selected Project Location
Horton PSD Advantages

✶ 30+ Years PSD Experience Worldwide

✶ Flexible Design and Manufacturing

✶ Unique door design unlimited train interface capabilities

✶ Impeccable Record of Safety And Reliability

✶ Worldwide Reach
  ☯ Sanwa Shutter Support - Asia
  ☯ Overhead Door Corp - North America
  ☯ Novoferm / Horton UK – Europe, Middle East

◆ Experienced Project Team
The Transit Team
Key Personnel

🌟 George Reed

☀ Mr. Reed is the President of Horton Automatics. He has extensive marketing, operations, sales and private equity experience with the likes of Dana Corp. and Warner Electric.

🌟 Rey Salinas

☀ Mr. Salinas is a 35-year Horton veteran of the automatic door industry. He’s a pioneer of the PSD application. His experience ranges from project design, project management, and customers relations. Mr. Salinas is fluent in Spanish.

🌟 Paul Britton

☀ Mr. Britton is Horton Director of Manufacturing and is responsible for sourcing, scheduling, manufacturing and quality.

🌟 Joy L. Ribble

☀ Ms. Ribble is Horton Vice President of Finance and Administration. Ms. Ribble is a 10-year Horton veteran and an accomplished accounting professional. She oversees the financial and contract administration aspect of the Transit business.
The Transit Team

Key Personnel

🌟 **J. Elias Campos**
- Mr. Campos is Horton’s Vice President of Marketing. He’s also responsible for transit project management. Mr. Campos has extensive experience in infrastructure project management, marketing and international sales. Mr. Campos’ experience include stints with PDVSA-Citgo, Emerson Electric and Overhead Door Corporation. Mr. Campos is fluent in Spanish.

🌟 **William S. Liles**
- Mr. Liles is a 20 year veteran of Horton and holder of several patents. As the Vice President of Engineering, he is responsible for resource allocation, new concept development and project management and quality. Mr. Liles is also responsible for Horton Manufacturing engineering function.

🌟 **Fred Romero**
- Mr. Romero is an 9-year Horton veteran. He is the lead design engineer for transit and manages the development process. Mr. Romero is currently pursuing a master degree in Mechanical Engineering and is also fluent in Spanish.
The Transit Team

Key Personnel

♦ Mark Molina
  ✪ Mr. Molina is a 25-year Horton veteran. He is responsible for the quality function as it pertains to PSDs and Transit. Mr. Molina is bilingual Spanish-English.

♦ Tyler Edward
  ✪ Mr. Edward is responsible for overall Transit quality and logistics. His 8 year quality experience spans a broad range of industries, including Thomson Consumer Electronics, Philips Electronics, and Photonis. Mr. Edward has extensive experience in maquiladora and is also fluent in Spanish.

♦ Bryan Bailey
  ✪ Mr. Bailey has more than 20 years of experience in the defense industry, metrology, and telecom including design and construction. He serves as a special application designer.

♦ Richard George
  ✪ Mr. George is a electrical engineer and is responsible for Transit electrical and electronic design. Mr. George’s experience include cellular communications, motor speed controls, high precision inkjet printers, material handling with companies like Motorola, Curtis Instruments and Mitsubishi.