Orbita Ingenieria is an automation technology and engineering company specialising in process control and artificial vision, with a significant presence in the container port and terminal market, plus other industrial sectors.

Our GateSuite range of products automates the process of identifying containers and trucks as they pass through key facility access points. By dramatically improving gate and quay performance, and reducing errors in container inventory management, GateSuite ensures a rapid return on investment.

Gate Suite’s modular design, plus the use of standard, highest quality components, allows us to make maximum use of our clients’ existing infrastructure and technology, minimising up-front expenditure.

To learn more about GateSuite, and how Orbita has helped port and terminal clients to improve efficiency, security and safety, read on or contact us today at: info@gatesuite.com
GateOCR

Orbita GateOCR enables users to automatically identify ISO containers as they are carried by truck into and out of a container facility. GateOCR provides fast and highly reliable container identification at truck entry and exit points, thanks to the use of advanced vision capture and data processing technologies. The system also includes a truck licence plate reader and container damage control imaging. Users can opt to add the GateIMO module, which automatically identifies hazardous goods placards.

CraneOCR

Orbita CraneOCR automates container identification in ship-to-shore crane operations. By combining the latest pan, tilt and zoom camera technology with state-of-the-art control algorithms, CraneOCR is able to accurately capture container ID numbers, images and other key data ‘on the fly’ as boxes are handled, at speed, across multiple quay crane lanes. This innovative method of acquiring OCR data in motion allows users to automate container identification on the quayside with minimum infrastructure and no impact on crane cycle times. CraneOCR integrates with Orbita GateOS to provide 100% remote handling of exceptions and events, with full TOS integration for improved user control of the process.

GateOS

The Orbita GateOS gate operating system is a sophisticated software layer that coordinates all GateSuite components. The system captures all relevant GateOCR, GateKiosk and GateTraffic information and displays it in real-time via a simple and easy-to-use graphical interface. GateOS can also integrate TOS events in the same screen as gate events, providing a single management interface to facilitate operations, training, and IT infrastructure and incident resolution. With GateOS, users gain complete command and control over their facility access points.

GateKiosk

Orbita GateKiosk is an ergonomically designed, modular pedestal created to manage interactions between truck drivers and the GateOS access systems. GateKiosk is designed to the highest quality standards to work reliably in harsh conditions such as the marine terminal environment. Its standardised modules can handle multiple methods of driver interaction, including touch screen, RFID cards, VoIP intercom, barcode and QR readers and ticket printers. A wide range of personalisation options are also available.
GateTraffic
Orbita's lane traffic automation system is standardised, modular and adaptable to practically any field environment. GateTraffic effortlessly integrates elements such as entry and exit barriers, traffic signals, information boards and sensors, and incorporates a software layer that enables lanes to be immediately converted from manual to unassisted access.

GateViewer
Orbita GateViewer is a powerful performance analysis tool that works via web access from any authorised computer. GateViewer provides detailed statistics for OCR systems, tracks events and alarms, and includes a fully-searchable archive of OCR images and videos. With its wide range of automated and manually configurable reports, GateViewer gives users the power to proactively measure and manage their gate performance.

GateLPR
The Orbita GateLPR license plate recognition system enhances operational safety and security by providing fast and highly reliable capture of truck and other vehicle registration numbers. GateLPR is used widely as an access control tool for gates, parking areas, tolls and other restricted zones, such as those commonly found at container ports and terminals.
The Orbita GateOCR system enables users to automatically identify ISO containers as they are transported by truck through a controlled access point. The system also includes a truck license plate reader, capture of still images and videos for damage control and optional identification of hazardous goods label with the Orbita GateIMO add-on module.

Thanks to the use of the latest technology in IP cameras, megapixel sensors and sophisticated processing by means of neural networks and other vision technologies, GateOCR delivers a high degree of accuracy and reliability in ISO code verification and damage imaging.

The OCR software is designed to integrate with TOS and other terminal control systems. ISO code readings, images and other data can be transmitted in real time from each gate access log through the most widely-used communications protocols, including SQL and WebServices. Orbita’s XML interface facilitates even greater integration.

Offered as an option to complement GateOCR, the GateIMO module identifies dangerous goods labels and placards mounted on the container. GateIMO is able to detect and identify containers with multiple labels and provide the IMO class and sub-class to which each label belongs. While dangerous goods signs are usually placed on the rear, GateIMO can also detect labels on both sides of the container.
Applications

- Access gates to ports, marine and rail terminals
- Border crossings and customs gates
- Access to logistics parks
- Other premises with controlled access needs

Features and Benefits

- Automatic capture of container ISO codes and truck license plate numbers
- High resolution still images of containers and videos of trucks in transit for inspection and damage control management
- Integrates with TOS software through XML interface and other standard protocols
- Integrates with other GateSuite modules for a complete automation solution
- Dramatically improves gate traffic management and enhances overall terminal efficiency
- Manufactured to the highest quality standards for use in demanding maritime conditions
- Use LED lighting and PoE power supply for reduced energy consumption, more efficient cabling and easier maintenance
- Historical analysis and diagnosis tools for simpler and more effective maintenance

Technical Characteristics

- Container code recognition according to International Standard ISO 6346, including check digit
- Recognises all standard container types (20, 40 and 45ft, twin 20ft)
- Captures images of all visible sides of the container
- Fast response and read times
- Reads and identifies IMO labels (with GateIMO module)
- Captures all information with the truck in motion
- Image and video storage with adjustable compression
- Low consumption LED lighting and PoE power supply to minimise energy consumption
- PoE power supply reduces cables and installation maintenance
- Software incorporates online historical analysis and diagnosis tools for simple and easy maintenance
Orbita CraneOCR automatically identifies container ISO codes during the process of vessel loading and unloading by ship-to-shore (STS) gantry cranes.

By replacing the manual chore of identifying containers at the quay with automated vision technology, CraneOCR helps terminal operators to increase speed, eliminate human errors and enhance the overall process performance of STS cranes. CraneOCR integrates with Orbita GateOS to provide 100% remote handling of exceptions and events, with full TOS integration for improved user control of the process.

Return on investment happens from the first day of operation: in improved container identification accuracy, real-time error detection and resolution, better container damage process control, and removal of checking personnel from the quay area.

Combining the latest pan, tilt and zoom camera technology with state-of-the-art control algorithms, CraneOCR captures container ID numbers, images and other key data ‘on the fly’ as boxes are handled, at speed, across multiple quay crane lanes.

This innovative method of acquiring OCR data in motion allows users to automate container identification on the quayside with minimum infrastructure – as few as 4 cameras are required – and no impact on STS crane cycle times.

With every container movement, CraneOCR stores and sends relevant information to the TOS, performing online manifest validation for container ISO codes. Images and videos associated with individual container movements can also be audited via Orbita GateViewer for damage inspection and statistical reports.

CraneOCR integrates seamlessly with the crane’s control system to record and store other key data such as container weight, container size, spreader position and twistlock position. With easy, graphical configuration using Orbita’s engineering software, the CraneOCR software is suitable for any type of STS crane.
This innovative method of acquiring OCR data in motion allows users to automate container identification on the quayside with minimum infrastructure – as few as 4 cameras are required – and no impact on STS crane cycle times. With every container movement, CraneOCR stores and sends relevant information to the TOS, performing online manifest validation for container ISO codes. Images and videos associated with individual container movements can also be audited via Orbita GateViewer for damage inspection and statistical reports.

CraneOCR integrates seamlessly with the crane’s control system to record and store other key data such as container weight, container size, spreader position and twistlock position. With easy, graphical configuration using Orbita’s engineering software, the CraneOCR software is suitable for any type of STS crane.

**Technical Characteristics**
- Identification of codes according to international standard ISO 6346, including control digit
- Registers spreader position, container size (20, 40, 45, 20/20), twistlock status, twins, etc.
- Minimum identification time, high accuracy and reliability
- Storage of images and video with adjustable compression
- Use of low consumption LED lighting and PoE power supply for greatly reduced energy consumption
- Captures information with the container in motion, no need to change normal crane processes
- Full integration with Orbita GateSuite range of products for complete process automation

**Features and Benefits**
- Automatic real-time identification and validation of container ISO codes during vessel loading and unloading
- Captures data with the container in motion across multiple lanes – no need for STS cranes to slow down
- Captures and stores damage images, videos and other key information including container size, weight, spreader and twistlock position
- Eliminates validation mistakes for more accurate and efficient vessel loading and unloading
- Removes checking personnel from under STS cranes – improved safety
- Remote management, control and supervision of exceptions
- Minimum hardware installation required on cranes
- Full TOS integration via XML, WebServices and other standard protocols
- Statistical analysis of every crane movement available via Orbita GateViewer
- Easy installation and configuration - adapts to almost every STS crane design
- PoE and LED technologies for improved power consumption, more efficient cabling and easier maintenance
Enhance the overall performance of vessel handling operations
Orbita GateOS is a gate operating system (GOS) for real time remote management and completely automated operation of an access control point. GateOS instantly improves performance and costs by centralising the control of multi-lane gate events and incidents, with minimal operator presence required.

GateOS manages and stores information from the truck admission and exit process and effortlessly shares it with the terminal’s TOS through XML interfaces, WEBServices and other common communication protocols. GateOS also includes drivers for communication with similar systems from other manufacturers.

TOS integration includes the management of TOS events inside GateOS, providing a single interface that gives operators control over almost every event related to gate operation from just one screen and software system. The result is a complete command and control centre for gate operations, reducing training, IT infrastructure and event resolution times.

**Features and Benefits**

- Provides real time gate process monitoring and control
- Instantly improves access point performance by centralising event and incident information
- Allows multi-lane gates to be remotely managed with minimal human resources
- Works with any commercially available TOS interface
- Integrates TOS and gate events in a single system for complete command and control

**Technical Characteristics**

- Works with the most common databases, including SQL Server, Oracle and DB2
- Supports various communication protocols, including TCP/IP, OPC, FTP and WebServices
- Interfaces with access control equipment – barriers, traffic signals, information boards, etc
- Built on .NET Framework 4 software development platform
Operator Interface

This application allows the operator to monitor and resolve gate incidents from a remote control location. The system records all truck, container and IMO label registrations and enables work order incidents to be rapidly resolved.

- Facilitates diagnosis of electrical alarms, communications and processes, significantly improving access point reliability and performance
- Status and events display provides detailed information on multiple access point lanes
- Can incorporate a personalised layout of the installation, showing the status of existing systems and equipment in real time
- Enables remote traffic management with full control of gate equipment such as barriers and traffic signs
- Dynamic image and video display of truck registration plates and the visible sides of containers
- Security system manages and controls user access, with option for LDAP authentication
- Web pages can be easily integrated
Orbita GateKiosk is a modular, customisable control cabinet providing a wide range of driver interfaces for managing facility entry and exit. This includes work orders, communication between the driver and terminal staff, document printing and other functions involved in the admission and exit process for controlled premises.

GateKiosk automates logging operations, speeds processing times and reduces the need for terminal staff intervention. The system provides traceability of driver operations, minimises waiting times in the lanes and facilitates incident management by staff or via the TOS.

With multiple interfaces for incoming and outgoing information, GateKiosk allows information to be received from, and sent to, the driver in real time direct from the TOS or other software applications, without the need for any intermediaries.
Technical Characteristics and Modules

- Electrical control cabinet features electrical protection equipment, relays, switches, controllers and communications equipment
- High speed printer with adjustable paper width
- Linear and 2D bar code reader (Datamatrix, QR code etc.)
- Vandal-resistant audio and video VoIP intercom
- High contrast, high brightness, vandal-resistance LCD touchscreen with LED backlighting
- RFID tag reader with biometric recognition
- Other options available on request

Features and Benefits

- Robust cabinet designed for use in extreme humidity, temperature and dust conditions
- Ergonomic design facilitates driver operation from within a truck cab
- Height adjustable to suit the majority of gate infrastructure configurations
- Modular, configurable choice of driver interface systems - bar code, RFID tag, VoIP intercom, LCD touch screen, printer and more
- Side gates simplify maintenance and access to equipment and systems
Your access to advanced container port logistics
Automated traffic management for safer, smoother vehicle flows

GateTraffic is a software and hardware packages that automates access point traffic management, improving the flow of vehicles and reinforcing safety management at the gates. With GateTraffic, vehicle entry and exit operations are more fluid, structured and organised, with faster processing times, less waiting and fewer unnecessary stops.

Bringing together all of the physical elements and information systems needed for robust traffic control, GateTraffic is highly flexible to suit multiple operational requirements. It is the perfect complement to GateOCR and GateOS and, when combined, these three modules provide a total solution for access point automation. GateTraffic includes a fail-safe mode of operation, ensuring that traffic management can be rapidly converted back to manual control in case of need.
GateTraffic offers a wide range of standard control elements, all integrated with the module's software:

- **Barriers**
  - For lanes of various widths
  - Low maintenance
  - Require minimal workforce time
  - Optional swing barrier system
- **Traffic signals**
  - Special LED characteristics
  - Low power consumption
  - High luminosity
  - Enhanced life cycle
- **Displays**
  - Numeric and alphanumeric
  - Graphic boards (cross/arrow, etc.)
  - High brightness LEDs
  - Adjustable number/width of lines and characters, for different reading distances and messaging needs
  - High level of protection
  - Multiple Interfaces: Profinbus, Profinet, DeviceNet, Modbus, Serial, Parallel, Ethernet TCP/IP
- **Vehicle detection systems including photoelectric, inductive loop, etc.**
- **Push-button operated work desks**
- **Vertical and horizontal traffic signals**
- **Other control elements available on request**

**Features and Benefits:**

- Streamlines vehicle flow through entry and exit gates
- Reduces truck waiting times, queues and congestion
- Improves personnel safety
- Reduces operational costs
- Integrates easily with all commercial traffic control equipment

**Technical Characteristics:**

- Communicates and integrates with all commercially available traffic control equipment
- Uses standard communication protocols, including TCP/IP, UDP and OCP, to integrate with the I/O interface
- Scalable and modular I/O interface
- High speed data retrieval from traffic control equipment
- Logical, flexible and configurable control system, adapted to client needs
- Optimises facility electrical design
- Integrates with other present and future equipment at the gates such as RFID systems, weighing stations, gauge systems and scanners
Orbita GateViewer is a web-based application that helps users monitor and measure the performance of their access point operations. The system provides key statistical data, both current and historical, in a range of automated and manually configurable reports, allowing users to analyse every aspect of their gate operations.

With its easy, elegant and intuitive user interface, GateViewer quickly and dynamically accesses KPI data, alarms and incident reports across the whole gate operation. The system also includes a searchable archive of all images and videos, enabling users to check and verify damage issues for containers entering and exiting the facility by land or sea.

GateViewer allows customers to set user access profiles and permission levels for security control and is offered as a data retrieval complement to the GateOS module.
Features and Benefits:

• Provides information from each access log:
  - OCR/LPR/IMO data
  - Images of all visible sides of the container and the front of the cab
  - High resolution videos of trucks in transit through access points
  - Incident and event data
  - Alarms
  - Other process information if recorded - work orders, tickets printed, registration codes, etc.

• Enables GateOS users to audit orders and completed operations for each access log

• Provides statistical reports on key access data including LPR, OCR and IMO data capture reliability, traffic volumes, operational incidents, etc.

• Includes a wide variety of reporting filters and selections such as date, lane, traffic type

• Diagnoses possible degraded equipment including cameras, lighting and code readers for rapid corrective action

• Exports data to any standard format for further analysis, including PDF, CSV and Excel

• Displays images and videos from each access point with the option to save in a configurable route
The GateLPR module automatically reads vehicle license plates. It is widely used as an access control tool in parking areas, toll operations, gate systems and other restricted areas, such as those commonly required in container terminal operations.

GateLPR is a PC-based system that is easily integrated with other software applications and automated systems via the majority of common communication protocols, including WEBServices, SQL Server and XML interface.

Based on artificial neural networks, GateLPR is designed to provide a high level of speed and reliability in the most demanding climatic conditions. The system is complemented by the OrbitaLPR software, a configuration tool that incorporates a display of historical vehicle license plate images and a calibration interface for simpler maintenance.

**Features and Benefits:**

- Automated recognition of vehicle license plate numbers from multiple countries
- Improves facility security, safety and operational effectiveness
- Easy to install, learn how to use and operate
- High reliability, availability and recognition rates under the most demanding climatic conditions
- Adaptable to different inspection distance requirements and physical area layouts
- Allows up to 8 GateLPR systems to be managed from a single PC
- Flexible integration with other software applications and automation systems
- Low energy consumption due to use of latest high resolution camera and LED infra-red technology
## Technical Characteristics

### IMAGE CAPTURE UNIT

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network</td>
<td>IPv4/v6, QoS</td>
</tr>
<tr>
<td>Resolution</td>
<td>1280 x 800 (1 MP)</td>
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<tr>
<td>Horizontal vision angle</td>
<td>72° - 28°</td>
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<tr>
<td>Image processing</td>
<td>30 images/second</td>
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<tr>
<td>Video compression</td>
<td>H.264</td>
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<tr>
<td>Digital entries/exits</td>
<td>1 entry / 1 exit</td>
</tr>
<tr>
<td>Power supply</td>
<td>8-20 VCC o PoE IEEE 802.3af Class 3 max 9.6 W</td>
</tr>
<tr>
<td>Dimensions (W x H x D)</td>
<td>137 x 108 x 331 mm</td>
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### LIGHTING SYSTEM

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<th>Feature</th>
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<tr>
<td>Technology</td>
<td>LED IR</td>
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### PERFORMANCE

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<tbody>
<tr>
<td>Reliability Rate</td>
<td>&gt;98%</td>
</tr>
<tr>
<td>Response time</td>
<td>&lt; 100 ms</td>
</tr>
<tr>
<td>Capture in motion</td>
<td>Yes</td>
</tr>
</tbody>
</table>
| Licence plates                   | - Optimised versions per country  
|                                  | - 2 line licence plates                                                      
|                                  | - Recognition reliability data by licence plate and by individual character  
|                                  | - Allows for wide angles in image capture                                      |
| Remote management                | Yes                                                                           |

### OPTIONS

<table>
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<tr>
<th>Feature</th>
<th>Specification</th>
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<tr>
<td>Double Camera</td>
<td>Yes</td>
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<tr>
<td>Number of lanes per system</td>
<td>Up to 8 lanes per system</td>
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### OPERATIONAL CONDITIONS

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<tr>
<td>Level of protection</td>
<td>IP67</td>
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<tr>
<td>Operational Temp</td>
<td>-30° to 50°</td>
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<tr>
<td>Humidity</td>
<td>0% to 85%</td>
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<tr>
<td>Reader distance</td>
<td>3-10 meters</td>
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### ACCREDITATIONS

<table>
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<th>Feature</th>
<th>Specification</th>
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</thead>
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| Regulations                      | EN 55022 Clase B, EN 61000-3-2, EN 61000-3-3, EN 55024,  
|                                  | FCC Parte 15 Subparte B Clase B, ICES-003 Clase B, VCCI Clase B,  
|                                  | C-tick AS/NZS CISPR 22, EN 60950-1,  
|                                  | NEMA 250 Tipo 4X, IEC 62262 IK10                                             |
The Advantage of a Totally Integrated Platform
RECUERDE
VELOCIDAD MÁXIMA
30 Km/h
Project
TCV is a container terminal located in the Port of Valencia, Spain. Operator TCV Stevedoring S.A. is part of Grup TCB, a leading Spanish marine terminal operator, handling over 3 million TEU around the world.

As part of its policy of continuous facility improvement, TCV decided to relocate and redesign its gate access operations. The goal was to boost traffic capacity without increasing the number of lanes, and to improve service quality overall, by redirecting the flow of trucks for more efficient operations and at the same time introducing gate automation technology. Previously, operations across the terminal’s 5 entry lanes and 3 exit lanes were completely manual.

TCV’s requirements were for a turnkey project covering design, engineering and installation of an automated access system equipped with OCR for containers and vehicles, plus recognition of dangerous goods labels, and fully integrated with the company’s terminal operating system (TOS).

With more than 2,000 vehicle transactions in the terminal each day, the challenge for Orbita was to implement a system that provided extremely high reliability and precision in container and vehicle identification, speed of operation, simple interaction with drivers, ease of use by terminal staff and total integration with the TOS.

Solution
To meet the project requirements, Orbita installed various integrated modules from its GateSuite® range. All have greatly exceeded TCV’s performance expectations.

At the 8 entry and exit gate lanes, Orbita installed its GateOCR and GateIMO systems for automatic reading of container ID numbers, truck license plates and dangerous goods label data. As well as capturing the container’s ISO code, GateOCR identifies the size and type of containers and takes images and videos for damage inspection control. Coupled with these two modules, Orbita installed its GateOS operating system, which provides operators with real-time information regarding the status of each gate lane, as well as managing communications with the terminal TOS.

To manage the interface with the driver, Orbita GateKiosks were installed in each lane, incorporating a bar code reader, ticket printer and easy-to-use touchscreen. Process automation was completed with the GateTraffic module, providing instant integration of all physical traffic control elements and control of all terminal access and exit logistics.
Results

Orbita’s automated terminal access technology has converted TCV into a reference point in the Port of Valencia in terms of gate reliability, efficiency and maintenance simplicity.

The 8 terminal lanes can now operate autonomously with minimal staffing requirements and average facility access times of less than 1 minute.

The Orbita GateViewer module also included in the project has allowed TCV to actively monitor and manage the performance of its gate operations, with detailed analysis of processing times, OCR and LPR reliability statistics for individual lanes, an archive of images and videos for damage control, verification of work order forms for each vehicle and other key historical information related to incidents and events.

Project Summary

- Turnkey design, engineering and implementation of unmanned terminal access system providing automatic identification of containers, vehicles and dangerous goods label across 8 entry and exit lanes
- System designed to manage over 2,000 vehicle transactions a day
- Supply and installation of 8 GateOCR gates incorporating GateIMO for dangerous goods label recognition
- Supply and installation of 8 GateKiosk cabinets equipped with bar code reader, printer and touchscreen for managing driver entry and exit administration
- Supply of GateTraffic module for completely automated traffic management
- Full integration with the terminal operating system via Orbita GateOS gate operating system
- Retrieval of all gate images, videos and statistics on automated access point performance via GateViewer module

Project Results Summary

- Reduced operating costs
- Reduced truck waiting times
- Better overall terminal performance
- Less port congestion
- More satisfied customers
Project

Valenciaport, comprising the ports of Valencia, Sagunto and Gandia, is one of the largest and most important maritime cargo gateways in Spain and the Mediterranean, with an annual throughput of nearly 4.5 million TEU of container traffic and 66 million tonnes of cargo.

The Port Authority of Valencia (PAV) commissioned Orbita Ingeniería to automate operations at Valencia’s Southern Access, the common control point through which all container and bulk cargo trucks pass when entering and exiting the different port terminals.

Allied with the installation of radioactive cargo detection systems as part of the US SLD Megaports programme, the specific brief was to fully automate the exit process at the Southern Access. On average, 1200-1500 trucks leave the port daily through this control point. Before the project, exit processes were manually controlled by means of a document scanning procedure in up to three exit lanes, requiring constant staff presence at the gates.

PAV’s brief covered the design and control engineering of an exit lane automation system, integrated both with the Megaports radiation detection portals and the Spanish Tax Agency Customs office system, so as to eliminate operator intervention in the process.

Solution

In order to meet PAV’s requirements, Orbita developed a customised gate process, sharing information and collaborating with the National Laboratories of the US Department of Energy in order to integrate the Megaports systems with the Valencia Port Community System (PCS) and enable a fully-automated Customs operation.

Orbita carried out all of the electrical and control engineering for the project, as well as managing all of the systems integration for the access system, associated information management and transfer sub-systems.

Siemens PLCs were used to manage the automatic lane system, allowing for fail-safe distributed control. These were combined with tactile HMI systems, such as platforms for operator supervision and intervention, plus an online data retrieval system and a further system for exchanging information with the tax agency.

With the system now successfully in place, any vehicle and cargo load that is approved through the automated Customs system is granted access to Spanish territory without the need for any further administrative processing at the access point itself. Compared with the previous system, requiring staff constantly in attendance in three lanes, five lanes can now be controlled by a single on-site operator focused on managing incidents and exceptions.
Project Summary

- Automation of the port authority truck exit gates at Valencia, allowing for efficient, safe and rapid release of import loads through one of the leading Spanish and Mediterranean trade gateways.
- Integration of automated gate system with Megaports radiation detection programme and Spanish Customs system to create a real-time paperless release process for import traffic.
- Five exit lanes designed to operate both in automated unmanned and manual mode, with the automated option allowing outgoing vehicles be processed in less than 1 minute.
- Design and execution of all processes, electrical and communications systems, plus systems integration, including:
  - Data retrieval system for the truck exit point
  - Information transfer system between the different automation technologies (OCR/LPR/PLC) and Customs data processing systems
  - Tactile interfaces for information processing by port staff
  - Data archive and performance analysis tool
- Decentralised control designed for simpler, easier maintenance.
- Traffic floodgate system to ensure only one vehicle per lane at any time.
- Overall engineering of automated truck exit point.

Project Results Summary

- Reduced traffic congestion.
- Faster release of import cargo.
- Reduced staffing requirements.
- Fully automated Customs authorisation process.
- Paperless integration of business and government processes.
Maintenance of Megaports radiation detection equipment in the ports of Barcelona and Valencia

Client: Pacific Northwest National Laboratory/ Battelle Memorial Institute (U.S. Department of Energy)

Project
In order to protect the US and its international trading partners against the threat of nuclear and radiological materials being illicitly shipped in containers, the Megaports Initiative from the US Department of Energy (DOE) is equipping key seaports around the world with the means to scan as many containers as possible – including import, export and transhipment traffic – for radioactive content, with minimal impact to port operations. Working with customs, port authorities and other relevant entities in partner countries, by 2015 the US DOE intends to have radiation detection equipment and alarm systems installed in 100 seaports, scanning around 50 per cent of global maritime containerised cargo.

Spain is one of 33 countries currently taking part in the Megaports Initiative, with the installation of passive radiation portal monitors (RPMs) to scan cargo entering and exiting container terminals in the ports of Algeciras, Barcelona, Bilbao, Valencia and Vigo.

RPMs and the supporting systems around them create a highly specialised ecosystem in technological and procedural terms, requiring meticulous and expert maintenance in order to ensure that they are fully functioning at all times. The US DOE, through Pacific Northwest National Laboratory and Battelle Memorial Institute, appointed Orbita Ingeniería to carry out RPM maintenance work in Barcelona and Valencia.

Solution
The demands of correctly maintaining Megaports systems are both technical and logistical in nature. On the technical side, the project requires detailed knowledge of the electrical, software and radiation detection components of the system, together with the accompanying OCR container identification hardware and software. On the logistical side, the critical nature of these security systems means that any malfunctions must be addressed with extreme urgency, ensuring that systems return to service as quickly as possible. Alongside corrective maintenance, a continuous programme of preventative maintenance and systems status evaluation is needed to minimise the possibility of malfunctions occurring in the first place.

Finally, precise administrative procedures must be put in place to ensure that the end client, located nearly 6,000 miles away, has full visibility into the functioning of its equipment and systems.

To meet these needs, Orbita’s engineering team underwent extensive specialist training in the Megaports technology, equipping technicians to respond 24/7 to any eventuality that might arise in the fields of radiation detection, artificial vision, SCADA systems, communications and information infrastructure and networks.
Our Technical Support Service (SAT) developed robust procedures to monitor and manage the various types of maintenance involved, whether preventative, corrective or evaluative, plus stock control and other project elements, ensuring that the end client had a complete and trusted record of all activities.

The operating and administrative processes developed by us to retain full functionality of the Megaports equipment and systems at Barcelona and Valencia have satisfied and exceeded client expectations. Under Orbita management, the systems are operating to a very high level of efficiency, reducing to a bare minimum, or even entirely eliminating, any interference with normal port access processes.

**Project Summary**

- **24/7 preventative, corrective and evaluative maintenance services for Megaports radiation detection portals and supporting electrical, equipment and software systems in the ports of Barcelona and Valencia**
- **Preventative and corrective maintenance of accompanying OCR container identification systems**
- **Rapid response engineering team with specialist training in Megaports technology to deal with any incidents**
- **Stringent administrative procedures to collect and provide full reporting data to Pacific Northwest Laboratories/Battelle Memorial Institute and US Department of Energy**
- **Monitoring and pre-analysis of Megaports system health data on behalf of Oak Ridge National Laboratory, using the Desktop Analysis Reporting Tool (DART)**
- **Reporting services to national customs agency, Barcelona and Valencia port authorities and TCB and TERCAT terminals in Barcelona**
Maintenance of Megaports spectrometric detectors in the ports of Algeciras, Barcelona, Bilbao, Valencia and Vigo

Client: Pacific Northwest National Laboratory/ Battelle Memorial Institute (U.S. Department of Energy)

**Project**

In order to protect the US and its international trading partners against the threat of nuclear and radiological materials being illicitly shipped in containers, the Megaports Initiative from the US Department of Energy (DOE) is equipping key seaports around the world with the means to scan as many containers as possible – including import, export and transhipment traffic – for radioactive content, with minimal impact to port operations. Working with customs, port authorities and other relevant entities in partner countries, by 2015 the US DOE intends to have radiation detection equipment and alarm systems installed in 100 seaports, scanning around 50 per cent of global maritime containerised cargo.

Spain is one of 33 countries currently taking part in the Megaports Initiative, with the installation of radiation detection systems at the ports of Algeciras, Barcelona, Bilbao, Valencia and Vigo.

The spectometrical portal monitor (SPM) is the fundamental component in the Megaports system, enabling early detection and analysis of radioactive threats. SPMs provide non-intrusive spectrometric readings of containerised cargo at a radiological level, including detailed classification of the types of isotope detected and the dangers presented.

SPMs require regular preventative maintenance, both monthly and quarterly, to ensure that they are working within the optimal parameters to function correctly and guarantee maximum equipment lifespan. It is vital that this maintenance is carried out by duly certified and qualified technicians with specialist knowledge both of preventative and corrective maintenance.

The US Department of Energy, through the Pacific Northwest National Laboratory and Battelle Memorial Institute, appointed Orbita Ingeniería as its Spanish national contractor for SPM maintenance in the ports of Algeciras, Barcelona, Bilbao, Valencia and Vigo.

**Solution**

Correct maintenance of SPMs requires both specialist technical knowledge and highly effective logistical processes to ensure rapid detection and resolution of any systems malfunctions. Alongside corrective maintenance, a continuous programme of preventative maintenance and analysis is needed to maximise systems health and minimise the possibility of malfunctions occurring in the first place. Detailed administrative procedures are also needed to ensure that the end client, located nearly 6,000 miles away, has full visibility into the functioning of its SPM systems.
To meet these needs, Orbita’s technical team underwent extensive training and certification in SPM maintenance, equipping us to respond 24/7 to any eventuality that might arise. Our Technical Support Service (SAT) developed robust procedures to monitor and manage the various types of maintenance involved, whether preventative, corrective or evaluative, plus stock control and other project elements, ensuring that the end client had a complete and trusted record of all activities, enabling uninterrupted provision of safe, reliable and effective systems.

Thanks to the maintenance management systems developed by Orbita, plus the expert knowledge acquired through the training of specialist SPM system technicians, a high level of efficiency has been achieved in the prevention and correction of SPM incidents, enabling uninterrupted provision of safe, reliable and effective systems.

**Project Summary**

- 24/7 preventative, corrective and evaluative maintenance of spectrometric portal monitors in the ports of Algeciras, Barcelona, Bilbao, Valencia and Vigo
- Supply of trained of specialist SPM system technicians, certified by ThermoFisher Scientific Inc.
- Monitoring and pre-analysis of SPM system health data on behalf of Oak Ridge National Laboratory, using the Desktop Analysis Reporting Tool (DART)
- Reporting services to Spanish customs agency and port authorities
Design and installation of a terminal energy management system in Valencia, Spain

Client: MSC Terminal Valencia

Project

Handling more than 1.5 million TEU per year, including a significant volume of refrigerated containers, MSC Terminal Valencia (MSCTV) is a strategic hub for parent Mediterranean Shipping Company, one of the world’s largest ocean container shipping lines.

MSCTV’s eight super post-panamax ship-to-shore container cranes and 520 refrigerated container power points, plus supporting infrastructure and office buildings, depend on a reliable electricity supply and account for a significant percentage of its energy costs. The company wanted a tool that would allow it to actively monitor and manage the health of its electricity network and provide a better insight into the distribution of energy consumption across STS crane operations, reefer operations and other terminal activities.

Solution

Having worked for many years in providing energy management systems for diverse industrial facilities, including complex operations such as food processing plants, Orbita was able to adapt this experience to meet MSCTV’s needs. The solution proposed and implemented works by harnessing information directly from the power lines by means of decentralised controls using Siemens PLCs.

Data sourced from the power lines includes electricity consumption, power, intensity and voltage, plus distortion and other parameters that affect network quality. All of the information is transferred to Orbita’s energy management software, where MSCTV can display and analyse it using a variety of predetermined or user-configured reports and graphs. The software allows MSCTV to view the status of all its power lines in real time and includes automated alerts and diagnostic information on events and malfunctions.

As a result of the project, MSCTV now has a powerful tool for measuring its electricity consumption and maintaining the performance of its critical power line network.
Project Summary

- Design and installation of real time energy management system
- Information collected from power lines via decentralised controls using Siemens PLCs
- Captures data on electricity consumption levels, power, intensity, voltage, distortion and other key operating parameters
- Graphical software for processing, storage and reporting of information
- Predetermined and user-configurable reports for analysing electricity network performance, energy consumption levels and distribution
- Automated alerts on events and malfunctions
- Reports, alarms and events available via SMS and email
Relocation of Megaports radiation detection portals and supporting equipment in the Port of Barcelona, Spain

Client: Terminal Catalunya, S.A. (Hutchison Port Holdings)

Project
Terminal Catalunya, S.A (TERCAT) operates container handling facilities in the Port of Barcelona, Spain as part of the Hutchison Port Holdings (HPH) global port network. With operations in 52 ports spanning 26 countries throughout Asia, the Middle East, Africa, Europe, the Americas and Australasia, HPH handles over 76 million TEU of container traffic a year.

As part of its development of Barcelona Europe South Terminal (BEST), a state-of-the-art semi-automated terminal designed to handle the latest mega container vessels, TERCAT needed to relocate its existing Megaports radiation detection portals and accompanying OCR automated container identification systems to the new facility.

Solution
Orbita Ingeniería designed a complete solution and instructions for dismantling and reassembling the equipment, and supervised the work. After installing the radiation portals at the BEST truck gates, Orbita realigned and recalibrated the equipment using controlled radioactive samples. OCR and license plate recognition (LPR) systems were also transferred and tested, including the installation of a new communications panel.

Project Summary
• Turnkey solution for dismantling and reassembling Megaports radiation detection portals and associated OCR container identification systems
• Engineering, production and assembly of a new Single Lane Utility Panel
• Calibration and alignment of radiation portal monitors
• Relocation and start-up of OCR/LPR systems, including new communications panel
Ship-to-shore crane maintenance at MSC Terminal Valencia, Spain

Client: Siemens Servicios Industriales

Project Summary

• Maintenance of medium voltage drives in 8 super post-panamax ship-to-shore container cranes at MSC Terminal Valencia
• Preventative, corrective and evaluative maintenance of crane control PLC software
• 24/7 service with 2-hour maximum response time
About our Company

Orbita Ingeniería is dedicated to the design, manufacture and commissioning of technological solutions that improve our clients’ operational processes, management effectiveness and business results.

As a specialist in process control and artificial vision, we bring together the diverse disciplines of automation, computing, mechanics and power supply to provide integrated solutions that add value by improving work flows, reducing costs and simplifying business processes.

Our ethos is to collaborate actively with all of our customers, creating long-term partnerships built on mutual trust, deep understanding and a commitment to the highest quality. Our approach is always to seek practical solutions, using the best technology at the lowest cost possible to deliver the desired outcome. This requires wide product knowledge, the ability to draw actively on past experience and intimate knowledge of our clients’ real needs, sharing their business goals and objectives.

Continuous technical preparation and deep knowledge of the systems available on the market are the foundations for our success in projects for customers in the ports and terminals, automotive, food and beverage, and utilities markets.

We are backed by a strong track record and are proud to have worked with top level international organisations in a range of industrial sectors. Orbita is a Siemens solution partner for industry automation and an HMI (SCADA) certified specialist.

Above all, people are our most important asset. We invest in training, research and continuous improvement to support a highly professional team composed of technical, administrative and project management experts, all united with our executive management around a common goal: to use technology to enable smart management.

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Smart technologies for complete container logistics control

Services
Technology Consulting
Design of integral solutions
Implementation of projects
Education and training
Technical support service
Maintenance Service 24/7

Technologies
Industrial automation
Control Engineering
Process Control
Industrial communications
Remote Control Systems
SCADA systems

Electrical Systems and Instrumentation
Electrical Engineering
Industrial installations
Supply of equipment and instrumentation
Site Certification

Computer and Telecommunication Systems
Industrial Computer Engineering
Customized Industrial Software
Networking
Physical Systems
Machine Vision

Mechanical Engineering
Customized 3D Design
Soil and aerial conveyors
Boxes and pallets conveyors

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