

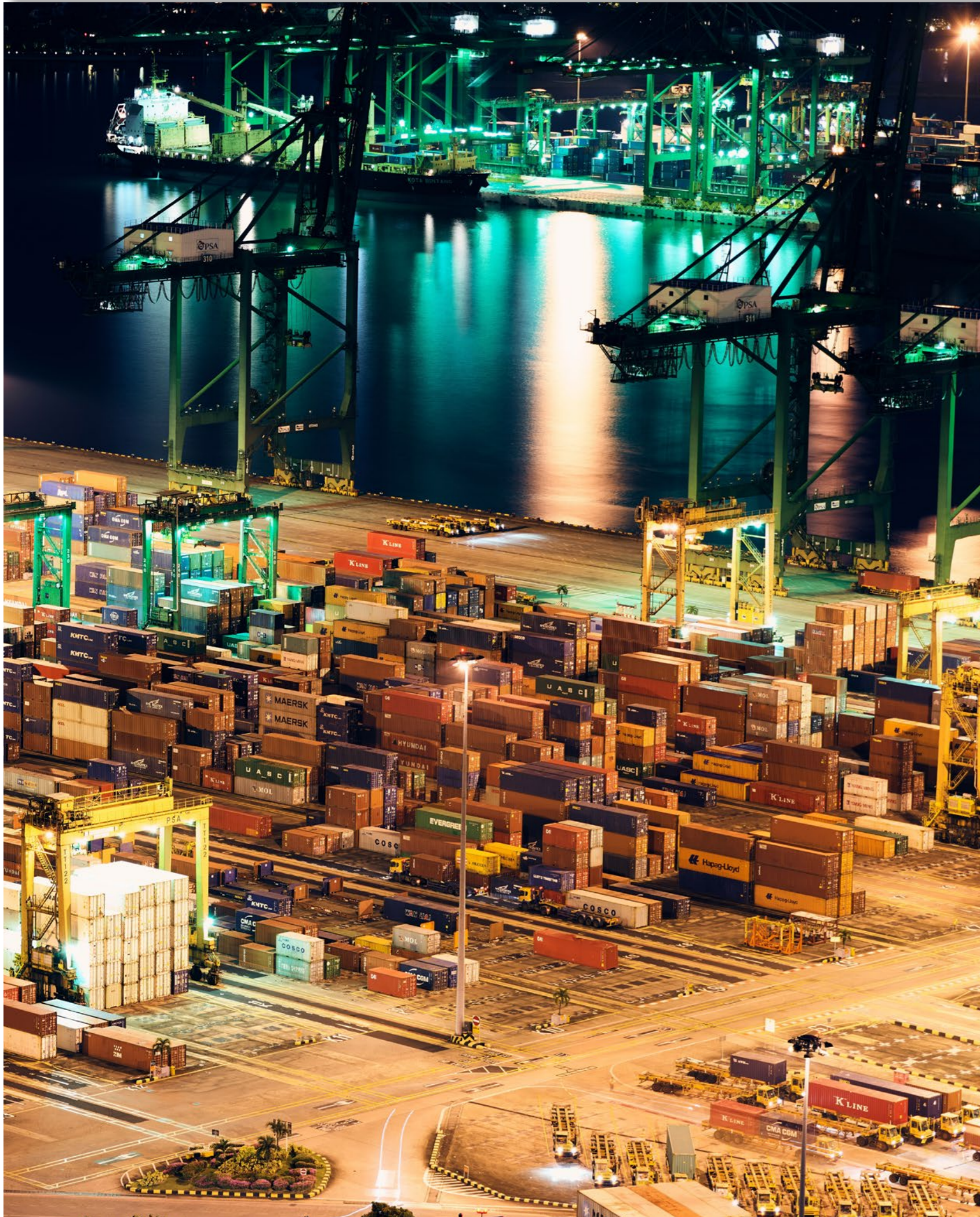
Protect
FAST

smart port

Smart Port Solution

extend your view **4+**
T E R R A





Managing complexity and maximising operational efficiency, safety and security in smart ports. TERRA 4D is tailor-made to address these requirements and provides its clients with an integrated vendor agnostic geo-spatial command and control centre solution.

TERRA 4D, an open Software Integration, Management and Visualisation platform, integrates and links data in real time from various subsystems. The solution offers sophisticated features that support operators in all departments in smart ports, to assess and resolve incidents and to manage daily tasks efficiently.

TERRA 4D helps smart ports to:

- Integrate operations applications into a single platform to reduce complexity
- Improve situation response times and minimize risk
- Provide a common operating picture enabling superior situational awareness, management and real-time resolution
- Geo-reference and correlate information from multiple security, safety and operational subsystems to manage and resolve immediate tasks
- Intuitive workflows guide operators and remove randomness, reduce stress and enforce compliance for legal and company guidelines

Challenge

New challenges for smart ports include adaption of advanced technologies and complying with expanding regulations and policies in the command

and control centre. The availability of un-structured data is increasing dramatically and operators are forced to manage complex situations and daily tasks under extreme time pressure. Accidents, theft, sabotage, spying, pollution and terrorist attacks on land, sea and from air become increasingly serious problems for ports around the world together with yearly rising of goods & personal handling.

Solution

TERRA 4D integrates, manages and visualises unstructured information from physical sensors and data bases. The solution presents structured data in a geographical context offering superior situation awareness in real-time to all stakeholders in a smart ports. TERRA 4D reduces costs of service by increasing efficiency and avoidance of human errors.

3D GIS Model

TERRA 4D is based on a 3D geographical information system (GIS). The model offers seamless navigation throughout the entire area of a smart port incl. inside structure of buildings. It supports multiple GIS layers, e.g. satellite imagery of the harbour, street maps, blocked roads, alarm zones, water supply, and presents all connected subsystems and data points in a virtual 3D environment.



Land Security

Marine & Air

Facilities

Operations

Community Systems

Land Security Systems: Fencing, PID, CCTV, Thermal (EO/IR), LPR, Facial Recognition, Video Analytics, ACS, Barrier, Gate, X-Ray Screening, UAV, Mobile Comm.

Marine & Air Security Systems: Radar, Sonar, AIS, Thermal - EO/IR, Metrological, VHF Radio, UAV Detection, Environmental Sensors

Facilities: Building Mgmt., Fire & Smoke Alarm, Lighting / Power, Communication, ACS, Facial Recognition, Video Analytics, X-Ray Scanning, Waste & Water Mgmt.

Operations: Terminal Planning, Container Mgmt., Yard / Gate Planning

Community Systems: Vessel Mgmt., Maritime Transport, Berth Reservation, Notifications, Service Ordering, Import / Export, Balast Mgmt., Waste Mgmt.

Traffic Management

As global transportation of goods and people is increasing on a yearly basis, traffic in sea ports continuously grows. TERRA 4D provides a flexible platform to include different operational systems to management and track traffic in the harbor (people, vehicles and trains) and on sea (vessels). It provides tools to analyse current conditions and predict future traffic situations.

Container Management

TERRA 4D creates profiles for every container entering and leaving the smart port. All data gathered by different systems like CCTV, optical character recognition, video analytics, x-ray images and GPS tracking information and manual data entry (e.g. via mobile device) is stored in a single data record for later analysis or investigations.

Safety and Security Management

TERRA 4D geo-references and correlates information from smart fences / perimeter, CCTV, access control system, fire / smoke detection systems, intrusion systems and others in real-time. Any exceptional situation will automatically raise an alarm as the system permanently analysis actual data based on pre-configured rules.

Environmental Monitoring

TERRA 4D correlates information from environmental sensors and services to detect pollution. It provides guided workflows / reporting to operators and emergency teams based on predefined procedures and legal requirements.

Centralized Platform

TERRA 4D is a vendor agnostic integration and management platform which connects all existing and future systems, subsystems, sensors and

data bases in one common and easy-to-use user interface. It allows management, coordination, correlation, escalation and sharing of all data through a single platform. Command and control centres, field staff and connected external resources benefit from the centralized platform as re-occurring tasks, responses on alarms and incidents are handled more efficient and without operator randomness.

Transportation and Operation

TERRA 4D allows tracking of vessels, trucks, trains and containers. The system uses all connected subsystems to provide operators in the command and control centre a complete picture of all ongoing activities in a smart port. All data is recorded time-synchronized offering real-time viewing, rewind and replay history and visualization of historical tracks in the 3D GIS model.

Selective Data Sharing

TERRA 4D ensures everybody in the operational chain is correctly informed and knows the appropriate action to take. Structured data can be accessed and shared, subject to relevant authorisation levels and privileges to information.

Use Cases

TERRA 4D can help to manage operations in a smart port:

- TERRA 4D tracks trucks, trains, vessels and containers from arrival until departure from the smart port and stores all data in the database
- TERRA 4D controls an UAV in case of a perimeter intrusion alarm (UAV is send to target coordinate and transmits a live video stream to the command and control centre)
- TERRA 4D guides users through workflows that comply to operational and legal requirements



Event and Alarm Management

Incident reporting	Support of interactive incident forms. Videos, map views and resources can be linked. Customized design supported.
Time machine	Use the player control to navigate and see all recorded data (video, tracked objects, PTZ positions, ...) time-synchronized.
Workflow automation	Intuitive workflows remove operator randomness and reduce stress during an incident.
Escalation and delegation	Escalate alarms to super visor user groups or delegate alarms to other operators for work balancing.
Spacial data correlation	Any sensor can be used to control additional sensors. Example: A radar detects an object. System allocates cameras with line of sight to the target and initiates automated multi camera tracking.
Procedure enforcement	Workflows enforce company's or legal compliance guidelines.
Layout Independent Program (LIPO)	Keep system maintenance up to date: removing, adding or moving a sensor needs only a deletion, add on or correction of sensor coordinates. No system reprogramming required!
Audit trail	Logging of all user actions for for later analysis
Alarm notifications	Sends alarm notifications to remote systems via SMS or Email.
Operator alarm	Operator can select alarm templates and fire alarms at specific locations on the map or directly in the video
Flexible GUI layouts	GUI layouts changing automatically or driven by operator. User and situation specific layouts are possible.

3D Visualization

Multi Layer GIS with real-time rendering engine	Digital Terrain Model (DTM), Ortho imagery (aerial or satellite images), Street map, 3D buildings.
Geocoder	Address search, Forward: type address and GIS shows location, Backward: show address for any clicked location in GIS model.
In- and outdoor visualization	3D buildings and constructions are shown in the 3D GIS model. 2D CAD floor plans can be imported to visualize indoor environments.
Geospatial document library	Enables organisation of the document library (document is placed at geographical location) and access according to user privileges.
Object track visualization	Trace the start of an object's movement. Complete historical track is visualized in 3D GIS model.
Video wall	Live or time synchronized playback video is "projected" on virtual video walls in 3D GIS model. Sensor orientation and view area is also shown.
Avatar	Represents a detected object and its class in the 3D space.
AIS, ADS-B, GPS meta data	Shows meta data and historical track attached to an Avatar.

Video

Supported cameras	Analog (with encoder), IP, fixed, PTZ, 360, mobile or airborne.
Position dependent salvo	Shows closest cameras to a static or dynamic object location.
Direct PTZ control	Video latency compensating method to control any PTZ device fast and precise.
PTZ auto presets	Automatic configuration of all interesting locations in PTZ camera's field of view as PTZ preset positions.
Geo-referenced video	Determine object location (latitude, longitude, height), speed, direction and size from video image.
Meta data recording	PTZ head data are recorded.
Multi camera tracking	Follow a moving "tagged"(GPS, RFID, AIS, ADS-B) or "untagged" object even in crowded environments using one or more fix or PTZ cameras simultaneously. If altitude information is available even airborne objects can be tracked from the ground or an airborne position.
Augmented reality	Augmented reality layer on top of video image display including context sensitive interactions.

Mobile Interception & Tracking

Tracker App for iOS and Android	Share camera images and GIS views. Report incidents from mobile client. Chat messenger integrated in incident handling.
Dispatching	Get current positions of all units in the field and send units to target coordinates.
Geo fencing	Define geographical alarm or warning zones to receive alarms when tracked objects enter or leave such zones.

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