

smart

Smart Facility Solution

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





Smart Facilities are characterized by the integration of technology and automation to improve building comfort, efficiency and security. TERRA 4D is the vendor-agnostic integration platform that addresses all key characteristics of Smart Facilities and ensures staying on top of new innovations.

Using TERRA 4D, you can start and accelerate the digital transformation of smart facilities, which offer a variety of benefits for companies, employees, external service providers and customers. These include, for example, increased efficiency, significant cost savings, improved and integrated security and a simpler user experience.

TERRA 4D aggregates multiple technologies and services to create unbeaten advantages by data correlation:

- Single platform for Internet of Things (IoT) technologies making 24/7 operations simple by reducing complexity
- Apply Artificial Intelligence (AI) algorithms to continuously lower energy consumption
- Gather big data and share relevant information with different organizations and stake holders to lower response times
- Connect subsystems, sensors and data bases for data unification and recording
- Provide Digital Twins of buildings and campuses for common operating pictures and superior situational awareness
- Manage complex process according to company guidelines (SOPs), local laws and European GDPR

Challenge

Constantly new challenges in the implementation of smart facilities require a maximum of flexibility for the TERRA 4D platform. These include, for example, the integration of various systems from different manufacturers, regular software updates/patches for legacy systems, organizational changes, increasing requirements for data security and data protection as well as financing and resource planning.

Solution

TERRA 4D integrates, manages, automates and visualises un-structured information from connected subsystems and data bases. The TERRA 4D solution for Smart Facilities offers a scalable and highly flexible platform which completely covers all application areas of Smart Facilities. These include, for example, building automation, energy management, maintenance and repair, security and monitoring, health management and more.

Outlook

Smart Facilities are evolving. New technologies and applications are constantly being added. With the open and vendor-agnostic TERRA 4D platform, you can ensure that all challenges will be met in the future.



- | | | |
|-----------------------|----------------------------------|--|
| 1 Visitor Management | 7 Wireless Communication System | 13 Optical Character Recognition |
| 2 Identity Management | 8 Video Surveillance System | 14 Video Analytics, Facial Recognition |
| 3 Yard Management | 9 Building Management System | 15 Gates, Bollard, Barriers |
| 4 Parking Management | 10 Smart Lights | 16 Perimeter Intrusion Detection |
| 5 Asset Management | 11 GPS Tracked Devices | |
| 6 Intercom System | 12 Fire & Smoke Detection System | |

Digital Twin

TERRA 4D presents real-world facilities as Digital Twins based on a 3D geographical information system (GIS). These Digital Twins are a powerful tool for improving efficiency, reducing costs and making informed decisions in smart facilities by providing a digital mirror of physical assets and systems. They facilitate better understanding, control and optimization of real-world processes and assets.

Building Automation

Building Automation for Smart Facilities realized on the TERRA 4D platform is a comprehensive approach to managing and controlling building systems and services to create more efficient, comfortable and secure environments. It plays an essential role in energy efficiency and the resulting operational cost savings are fundamental.

Energy Management

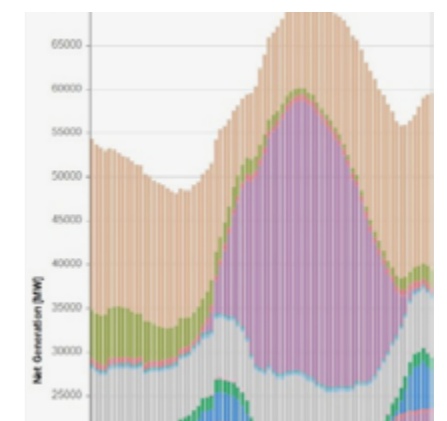
TERRA 4D offers a holistic approach for Energy Management in Smart Buildings. The platform leverages technology, data analytics and automation to optimize energy consumption, reduce costs and create more sustainable and comfortable indoor environments.

Safety and Security Management

Safety and Security Management in Smart Facilities is based on advanced and interconnected technologies, real-time monitoring and automation to provide a safer and more secure environment. The TERRA 4D platform is designed to detect and respond to threats quickly and efficiently while minimizing risks for building occupants and assets.

Maintenance and Repair

TERRA 4D adopts latest strategies and technologies like remote monitoring, IoT, data analytics, Augmented Reality (AR), Artificial Intelligence (AI), inventory management and cloud-based solutions for advanced Maintenance and Repair.



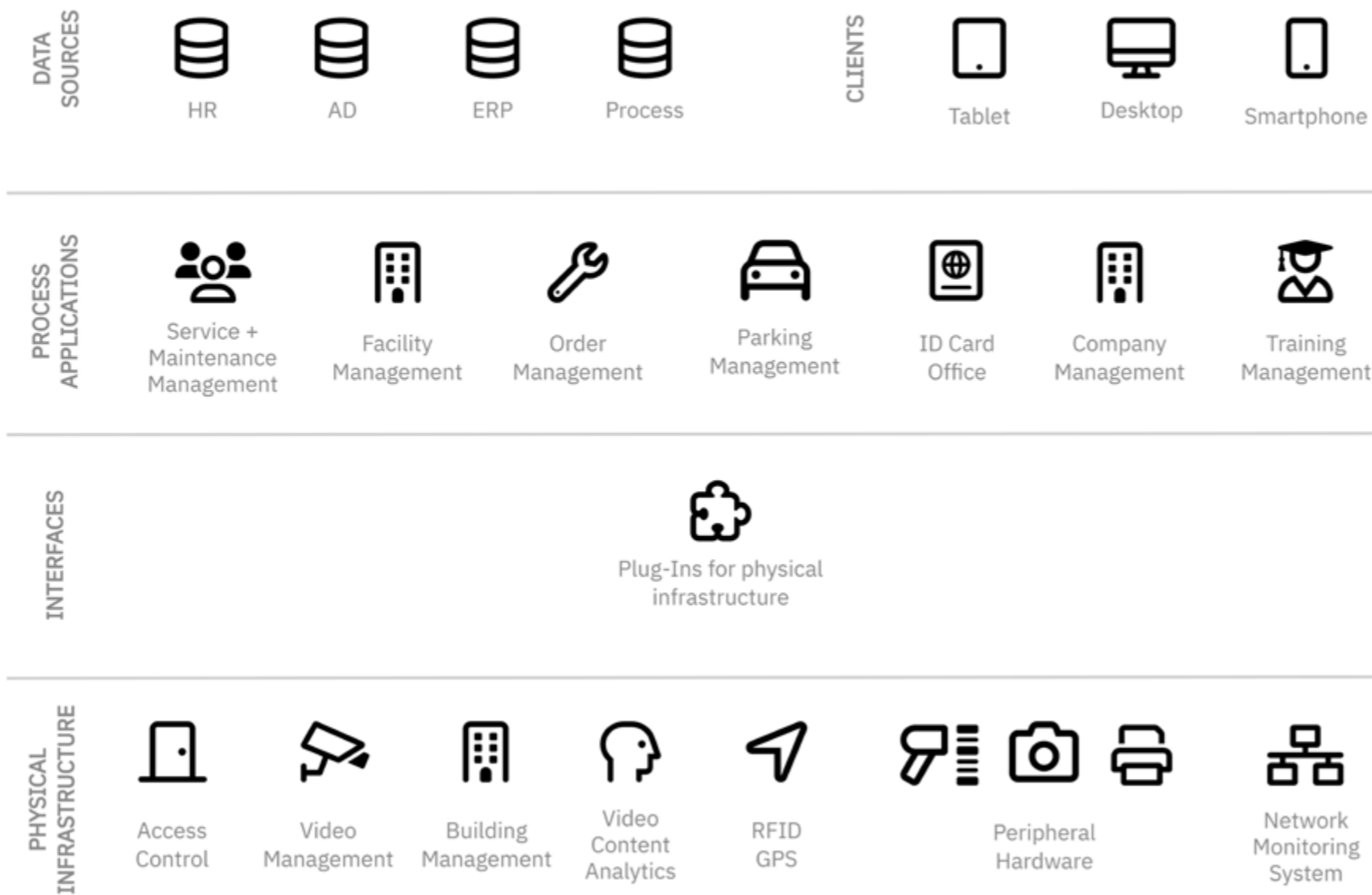
Fire Extinguisher Inspection Show

ID:	292
Source:	Fire Extinguisher
Owner:	292
User group:	292
Status:	Created
Incident date:	15.09.2022
Incident time:	11:53:43
User:	Yes

- Confirm the extinguisher is in its designated location
- Confirm the extinguisher is visible
- Confirm the extinguisher is unobstructed

Forward to mobile unit Next

Screenshots TERRA 4D Interface



Data Sources

Various Data Sources like MS AD, HR, SAP, CRM and ERP are integrated into the TERRA 4D platform allowing facility managers and building operators to access, analyse and act upon the data in real-time. The platform also guarantees data accuracy via schedules or event triggered synchronization between different sources.

Process Applications

Process applications within the TERRA 4D platform reduce operational costs but also enhance the

overall experience for occupants and visitors while meeting sustainability and safety goals:

- Maintenance and Asset Management
- Security and Access Control
- Identity Management
- Visitor and Parking Management
- Energy and Waste Management
- Space and Resource Management
- Data Analytics and Reporting
- Cyber Security and Data Privacy

Interfaces

3rd party subsystems, sensors and data bases are connected to the TERRA 4D platform using a modular plug-in infrastructure. These interfaces are realized through supplier SDK/API, industry protocols and/or proprietary interfaces.

Clients

Each of the TERRA 4D user clients has unique requirements and priorities within Smart Facilities and their collaboration is essential for the successful planning, implementation and ongoing

operation of these advanced buildings. Effective communication and coordination among all stakeholders is realized under the premise of data privacy and GDPR.

Physical Infrastructure

TERRA 4D connects to 3rd party subsystems, sensors and devices through dedicated plug-ins. The interface to the TERRA 4D platform allows uni- or bi-directional communication depending on the subsystem capabilities and desired use cases.

Data Sources

AD, HR	Importing, synchronization and management of personal information for user management
SAP, CRM, ERP	Importing, synchronization and management of customer and supplier information
GIS Server, BIM	Import of GIS layers and BIM models for 3D visualization
Process Library	Process library incl. SOPs, local laws, company rules and GDPR requirements
External DB	Import and synchronization of external data sources, e.g. black/white lists, device lists

Clients

Web Client	Dedicated web based clients that are tailored to specific use cases, user groups and responsibilities; Accessible from an web browser (Chrome, Edge, Firefox, etc.)
Mobile Client	Send and receive text messages, pictures, videos and locations; Get current positions of all units in the field and send units to target coordinates; Available for Android and iOS
Thick Client	Indoor and outdoor visualization; Buildings are shown in the 3D GIS model, CAD plans can be imported to enable visualization; Track object movements, complete historical track is visualized in the 3D GIS model
External Portal	Web based portal for external users for data exchange

Process Applications

Identity Management	Management of all relevant identities including rollout into several integrated access control systems
Maintenance and Asset Management	Manage booking of assets and maintenance cycles and tasks
Visitor and Parking Management	Schedule visits including parking space assignment and rollout into access control systems
Energy and Waste Management	Smart usage of resources, cost reduction and planning of recurring task
Facility Booking and Resource Management	Book office spaces, meeting rooms and technical equipment including cost calculations
Company and Contract Management	Manage external companies through working contracts including self service portal for externals

Interfaces

SDK/API	VMS, ACS, PIDS, BMS, 3rd party systems
Standard Protocols	MODBUS, BacNet, KNX, ONVIF, OPC, SIP, MAVLINK
Proprietary Interfaces	Vendor agnostic integration of any 3rd party system utilizing the TERRA 4D plugin infrastructure

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