ASSET MANAGEMENT SYSTEM

SILENT
DIG

Equipment

Data Interface

PROTECTION SETTINGS MANAGEMENT

MANAGEMENT OF BUSINESS PROCESSES

Protection Devices

Document Library

Processes

Calendar

Multi-User

Protection Settings

Authentication

Tasks

Tools

Reports and Scripts

Settings Converters

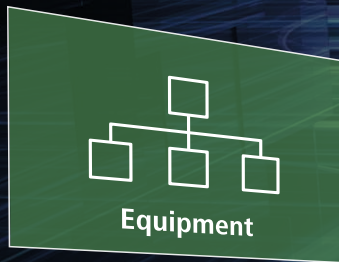**STATION**WARE

StationWare 2020

INNOVATIVE DATA WAREHOUSE
SOLUTION

ASSET MANAGEMENT SYSTEM
PROTECTION SETTINGS MANAGEMENT
MANAGEMENT OF BUSINESS PROCESSES

SW2020

POWER SYSTEM SOLUTIONS
MADE IN GERMANY

BE A PART OF THE ENERGY SUPPLY OF THE FUTURE

CONTENTS

SYSTEM PURPOSE

DIgSILENT StationWare is a centralised asset management system for primary and secondary equipment. The large number of individual settings for numerical relays nowadays requires careful management in order to function reliably.

Handling data from networks containing devices from various manufacturers can be problematic from an IT perspective, with each manufacturer requiring installation of its own software. StationWare is a user-friendly, multi-user web application that combines asset management of primary and secondary equipment, protection settings management and business process management. The electrical equipment is represented in a hierarchical structure. All settings are stored in a manufacturer-independent format, traceability of settings changes is provided, document management functionality is included, and settings data is exchanged between manufacturer-specific relay settings software and PowerFactory. In order to cater for business processes related to electrical equipment and protection settings, StationWare allows the definition of company-specific workflows.

WEB-INTERFACE CLIENT

StationWare is a multi-user web application. It requires no installation on the client side, but can be accessed using a standard internet browser.
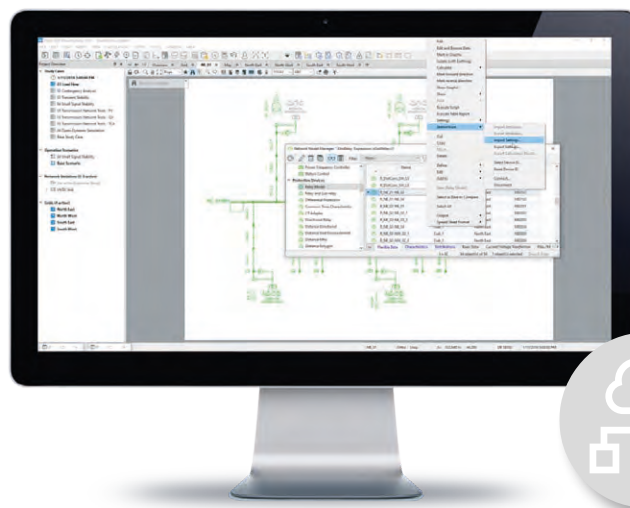
POWERFACTORY CLIENT

The interface between StationWare and PowerFactory enables the exchange of calculation-relevant parameters for validation and calculation of settings values in the corresponding network model.

MOBILE CLIENT

StationWare offers the ideal solution for mobile working with fully flexible data access from anywhere, using the web application.

WEB SERVICE CLIENT

StationWare can be integrated seamlessly into existing IT environments using web services. The web service methods can be invoked from a local computer or over the network and therefore facilitate the automation of processes and communication with other IT systems.

MULTI-USER DATABASE

The multi-user application StationWare manages assets, protection settings and business processes. This management is based on company-specific lifecycles and includes the tracability of changes on specific objects. Access to objects and functions can be defined based on user roles.

Additional features such as document management, searching, reporting and scripting are provided.

STATIONWARE HIGHLIGHTS

StationWare uses state-of-the-art technology to provide users and administrators with a powerful multi-purpose tool. StationWare manages protection data for all fields of application: generation, transmission, distribution, and industrial systems. Web services provide an easy way to extend StationWare and integrate it into an existing IT ecosystem. No client-side installation is required, ensuring predictable maintenance costs.

SOME HIGHLIGHTS

Multi-user web application

No client-side installation required

Converters for 30+ manufacturer-specific file formats

Central storage for power system equipment data

Web services for seamless IT ecosystem integration

User-defined workflows for settings and process management

User-definable Python scripts and reports

Document library for effective file storage and management

Validation of settings data

Precise access rights management

Support of Oracle and MS SQL Server databases

**Historic view mode to review data for a specific point in time**

PRODUCT APPLICATION

ASSET MANAGEMENT

All kinds of network equipment can be stored in StationWare. The assets are managed in a completely user-definable hierarchy consisting of locations and devices. It is possible to display locations and location-relevant information in a geographic map.

Location and device information can be defined as custom attributes for any type, depending on company requirements. Assets can be identified by a unique key, to link StationWare to other asset management systems. Access rights can be granted on the asset hierarchy according to a user's field of responsibility. The StationWare topology for primary and signal connections provides the possibility to connect electrical devices to form a network.

Source network data from https://data.gov.au, licensed under CC_4.0
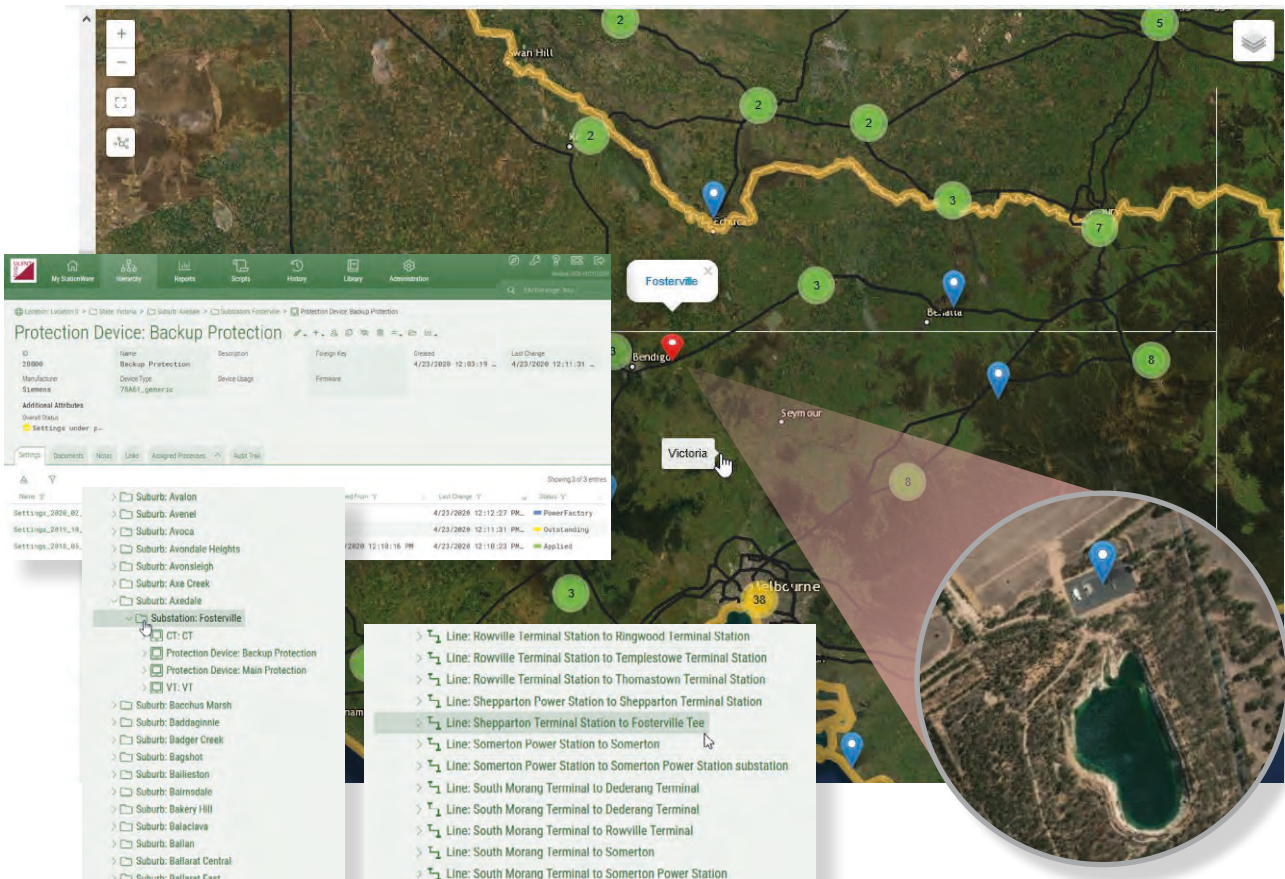
PROTECTION SETTINGS MANAGEMENT

StationWare stores and records all settings associated with protection devices. A vast selection of device models is supported. User-defined device models can be created and imported with ease. Device models include multiple settings groups, range checks, descriptions, and units of measurement. The presentation of settings values faithfully reflects the original software.

The management of the protection settings bases on lifecycles. These lifecycles represent the workflows in the company and are completely configurable. Email notifications can be triggered on workflow events.

All changes regarding settings, devices, and locations are stored in an audit trail. Storing the data in a tamper-proof manner is essential for traceability and accountability.

FEATURES

Management of protection settings, according to a company-specific workflow

Management of protection devices and their attributes

Comprehensive protection device model library

Models including range checks and multiple settings groups

Management of manufacturer-specific settings files

Management and definition of settings templates
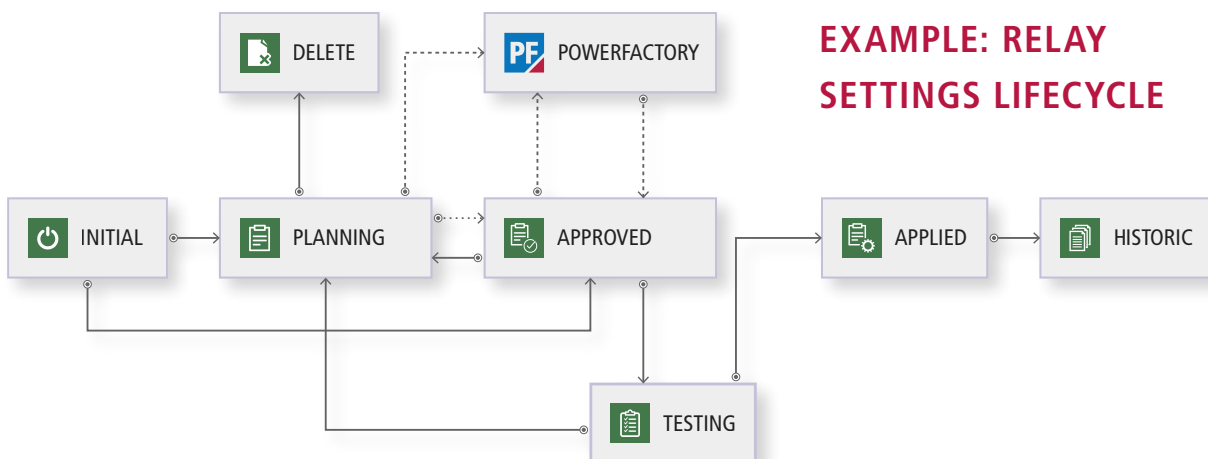
EXAMPLE: RELAY SETTINGS LIFECYCLE

BUSINESS PROCESSES

Business processes in StationWare represent company-specific workflows related to the network equipment such as maintenance, commissioning or testing. Processes contain several tasks which map the steps that have to be processed during the execution of a process.

Every process type can be equipped with a fully-configurable workflow lifecycle. Processes and tasks can be connected to devices and settings to indicate correlation. Examples of processes include maintenance, commissioning, cyclic protection tests, and arc-flash label creation. The latter process can be carried out in StationWare using specific arc-flash process lifecycles, reports, and scripts. Calculated arc-flash label parameters can be imported into StationWare from PowerFactory. Business process management contains the same features as settings management including email notifications and audit trail support.

FEATURES

Management of business processes for primary and secondary equipment

User-definable process types

Assignment of devices and settings

Definition and management of process lifecycles with customer-specific lifecycle phases and transitions

Audit trail

STATIONWARE STRUCTURE

StationWare is a multi-user web application. The application is installed on a web-application server with access to a database with the requirements described below.

Users can access StationWare via a common internet browser without the need for any additional installations. The web interface on the local computer or mobile device, allows the user to access, edit and add data based on their rights level.
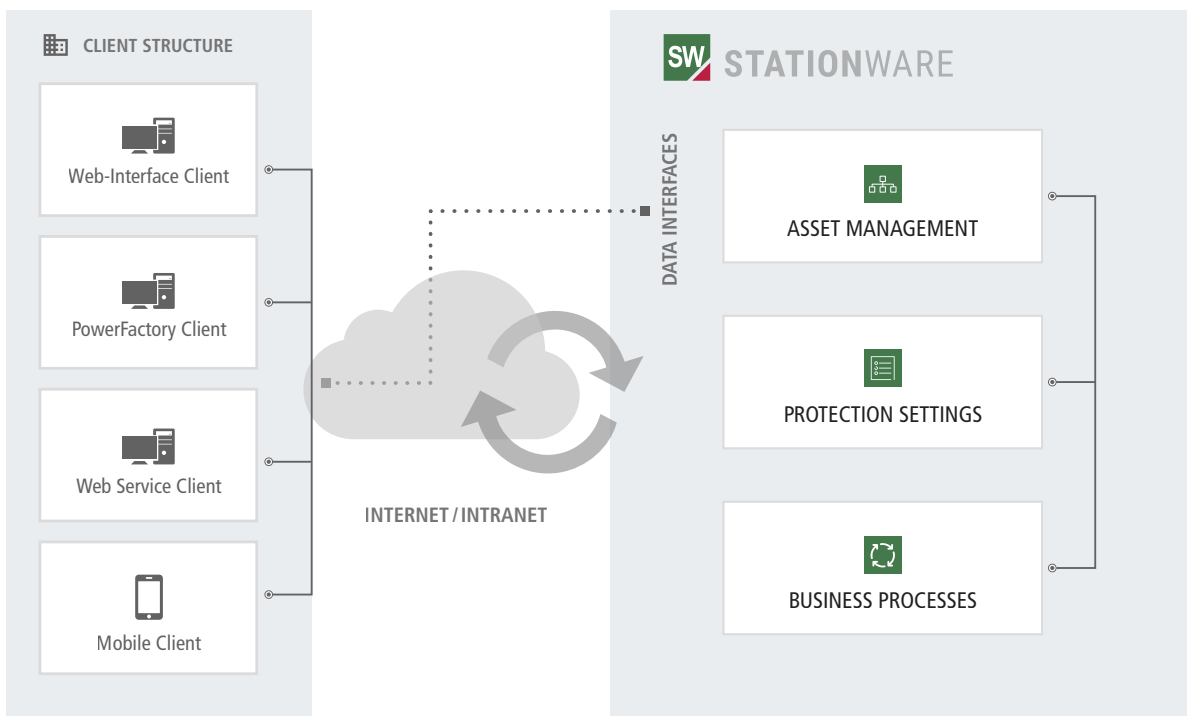
Minimum hardware requirements:

- 4-Core 2.5 GHz
- 16 GB RAM
- Hard drive 500 MB
- Additional hard drive capacity for user data is required based on the usage

Software Requirements:

- Recommended Server operating system: Windows-Server 2019 (Minimum: Windows-Server 2012)
- Microsoft .NET Framework 4.8, Microsoft IIS
- Recommended Database: Microsoft SQL Server 2019 (Minimum: Microsoft SQL Server 2012) or Oracle 19c (Minimum: Oracle 12c)

SETTINGS CONVERTERS

In StationWare, settings files can be viewed and managed independently of their manufacturer software. Converters provide the ability to import and export settings files directly to and from StationWare for further processing.

In general, the settings converters support manu-facturer-specific file formats; this means that one converter can be used for various different device types and firmware configurations. The ever-growing range of converters contains 30+ import and 15+ export converters.

DIgSILENT accepts requests for the development of converters for not yet supported file formats. Expert users also have the option to develop their own, custom converters.
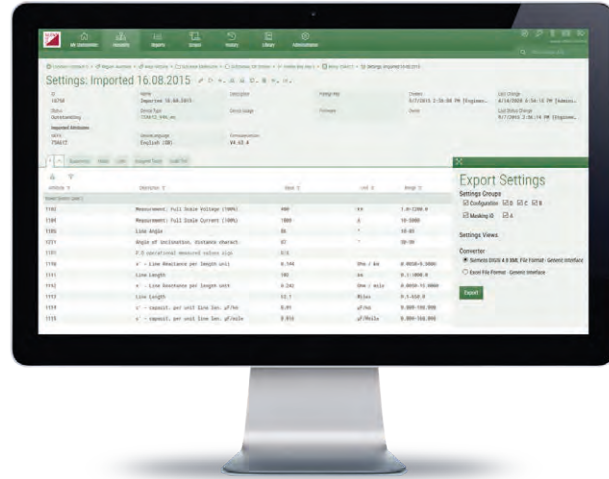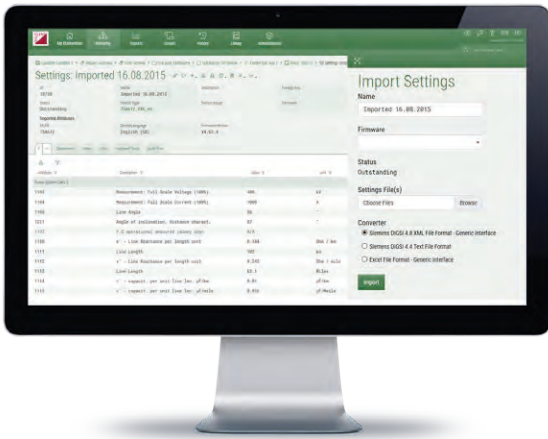
MANUFACTURER-SPECIFIC INTERFACES

Import Converters[1]

- ABB: CAP540, PCM600, MCUSetup, WinECP 7
- Basler: Bestcoms
- Beckwith: IPScom M-3425
- Eberle: WinREG, WinTM, Toolbox
- GE: various Enervista software versions
  – MII, MM2, MM300/MM200, SR3
- Nari Electric: PCS-Explorer
- Nulec: WSOS 4.4
- Reinhausen: TAPCON 240/260
- Reyrolle: Reydisp Evolution, Reyrolle 8/9
- Schneider Electric: Micom S1 (S&R103 IEC, S&R Modbus, S&R Courier), SEPAM converter, WSOS 5
- SEL: AcSELerator 4, AcSELerator 5
- Siemens: DIGSI 4, DIGSI 5
- Thytronic: ThySetter
- VAMP: VAMPSET
- ZIV: ZivercomPlus

Export Converters[1]

- ABB: CAP540, PCM600 (XRIO)
- Eberle: WinREG, WinTM, Toolbox
  GE: various Enervista software versions
- Nulec: WSOS
- SEL: AcSELerator, SEL-5010
- Siemens: DIGSI
- VAMP: VAMPSET
- ZIV: ZivercomPlus
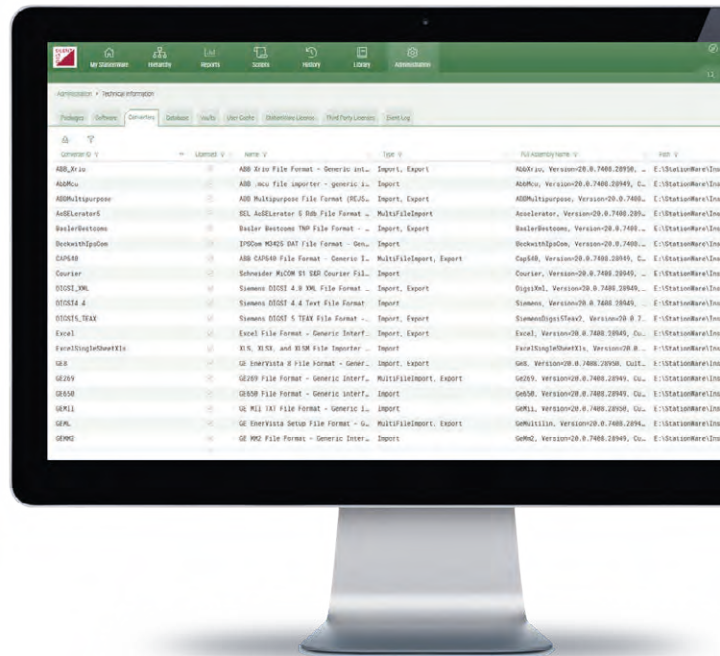
1) Import/Export converters may refer to specific versions of manufacturer settings file formats. Data validation by the manufacturer-specific software is assumed. Please contact stationware@digsilent.de for more details.

StationWare

RELAY CONFIGURATION SOFTWARE

PROTECTIVE RELAY

SETTINGS

TRIPPING /
ALARM SIGNALS

VOLTAGE / CURRENTS

RELAY TEST SET

SETTINGS

**POWER SYSTEM ANALYSIS TOOL
POWERFACTORY**

SIMULATED EVENTS
(COMTRADE)

DATA EXCHANGE
STATIONWARE DATA EXCHANGE
HARDWARE-LINKS
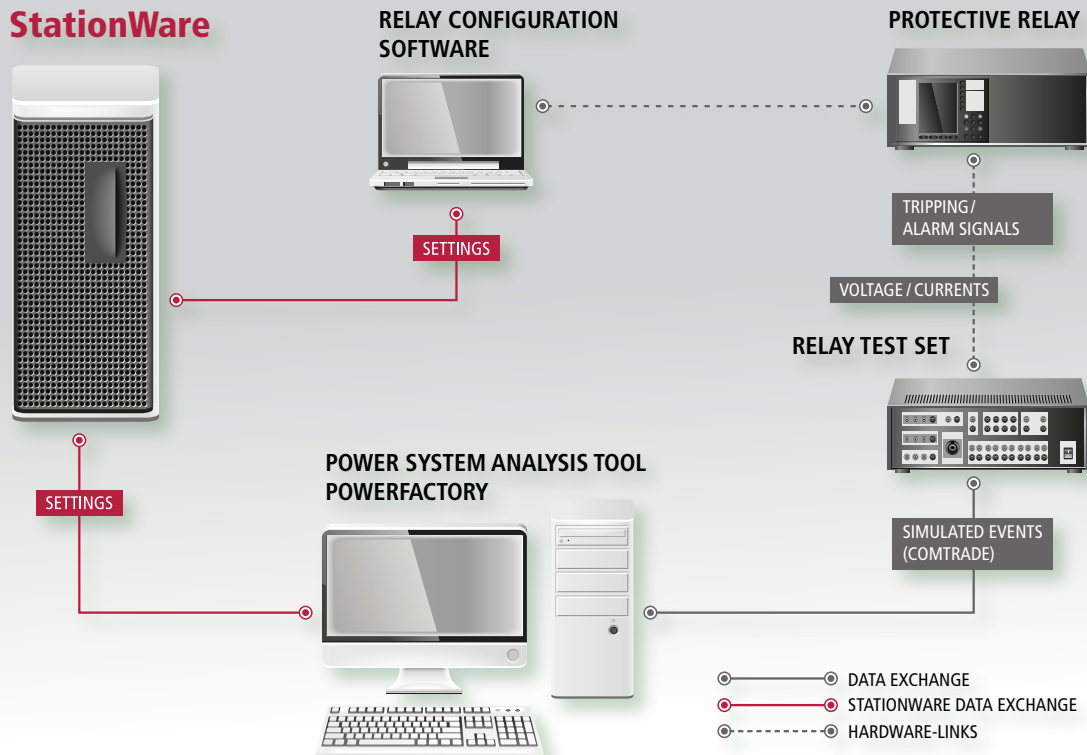
DATA INTERFACES

WEB SERVICE / POWERFACTORY INTERFACE

Web services provide a remote interface to StationWare. Web service methods can be invoked from a local computer or over the network to provide functionality for automated processes.

This allows StationWare to integrate seamlessly into existing IT systems. One example of the StationWare web service integration with another application is the PowerFactory link. This connection allows the exchange of calculation-relevant settings values between StationWare and PowerFactory.

DATA EXCHANGE FACILITIES

Import/export of numerical protection settings files

Import/export of task attributes

Exchange of calculation-relevant parameters to/from PowerFactory

Excel import/export capabilities

Web service interface

POWERFACTORY PROTECTION

DIgSILENT PowerFactory provides comprehensive analysis functions for protection coordination, such as overcurrent, differential and distance protection and signalling.

The extensive relay library with generic and manufacturer-specific relay models supports steady state and dynamic protection studies.

USER MANAGEMENT

StationWare specific user accounts

Concurrent read-only guest account pools

Individual user page
- – Assigned settings
- – Assigned tasks

Windows authentication using local or domain accounts (LDAP)

Anonymisation of personalised data

Access rights management for user groups
- – Location-dependent rights
- – Lifecycle-dependent rights
- – Library-dependent rights
- – Functional rights

DATA MANAGEMENT

AUTHORISATION /
AUTHENTICATION

StationWare authorisation is based on roles. Authorisations can be granted on an object hierarchy level, individual lifecycle phases/transitions, and administrative functionality.

The user rights management allows the administrators to precisely, yet easily, control the access rights of the individual users. StationWare can define user accounts with a specific username/password combination. Alternatively, StationWare can be configured to use Windows domain users (LDAP) for authentication.

DOCUMENT LIBRARY

Documents and software packages can be stored in a central area: the document library. Examples of files stored in the library include manuals, brochures, software packages, firmware packages, and inspection templates.

All file formats are supported and documents can be assigned user-definable document categories, which can be used for filtering. A full-text search is available for documents contained in the library. The folder structure is customisable, and access rights can be defined for each individual library folder.

FEATURES

Central storage area for documents and software

User-definable folder structure

Access rights on library folders

Full-text search

DOCUMENT MANAGEMENT SYSTEM

A built-in document management system supports easy access to object-specific documents, such as test reports, native settings files or substation diagrams. Document categorisation for filter functionalities can be used. A full-text search is available for additional documentation.

FEATURES

Document attachments for assets

Links to web pages or StationWare assets

Custom notes on assets

Full-text search

DATA MANAGEMENT

REPORTS AND SCRIPTS

Reports are a tool to analyse, collate and present StationWare data in a clear manner. Scripts provide administrative users with the ability to automate common processes in StationWare. StationWare is delivered with an extensive set of quickly accessible built-in reports. Users also have the option to develop custom scripts and reports using the Python programming language via well-documented interfaces.

FEATURES

Various localised built-in reports available

Python scripting language for user-definable reports and scripts

User-definable layout formats: XML, HTML, PDF, EXCEL

Automated trigger for Python reports and scripts

Access rights management for reports and scripts

AUDIT TRAIL

The audit trail provides StationWare with a safe and tamper-proof way of logging events. Detailed audit trail reports can provide users with data regarding modifications to settings, devices, and locations. This is essential for traceability and accountability.

FEATURES

Safe logging of StationWare events

Read-only (tamper-proof)

Detailed reports

MAINTENANCE & SUPPORT SERVICES

- Continuous product maintenance and development
- Free version upgrades as well as regular software updates
- Professional support via customer portal or hotline
- Detailed manual and comprehensive demo examples
- Application examples and demonstration videos
- Newsletter containing information about StationWare releases

TRAINING & SEMINARS

User training:
- StationWare concept
- General handling

Administrative training:
- System configuration
- Device and Process modelling
- Creating reports and scripts

PowerFactory interface:
- Development of mapping tables
- User-specific workshops

Training courses and seminars are offered at DIgSILENT offices as well as at user's site.

SALES CONTACT

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Web: www.digsilent.de

Availability of support services depends on existing licence agreement.

ABOUT DIGSILENT

DIgSILENT was founded in 1985 and is a fully independent and privately owned company located in Gomaringen close to Stuttgart, Germany. DIgSILENT continued expansion by establishing offices in Australia, South Africa, Italy, Chile, Spain, France, the USA and Oman, thereby facilitating improved service following the world-wide increase in usage of its software products and services. DIgSILENT has established a strong partner network in many countries such as Mexico, Malaysia, UK, Switzerland, Colombia, Brazil, Peru, China and India. DIgSILENT services and software installations are used in more than 150 countries.

POWERFACTORY

DIgSILENT produces the leading integrated power system analysis software PowerFactory, which covers the full range of functionality from standard features to highly sophisticated and advanced applications including wind power, distributed generation, real-time simulation and performance monitoring for system testing and supervision. For various applications, PowerFactory has become the power industry's de-facto standard tool, due to PowerFactory models and algorithms providing unrivalled accuracy and performance.

STATIONWARE

StationWare is a central asset management system for primary and secondary equipment. In addition to handling locations and devices in a user-definable hierarchy, the system allows manufacturer-independent protection settings to be stored and managed in line with customer-specific workflows. It facilitates the management of a wide variety of business processes within a company and centralises the storage of documents. StationWare can be integrated seamlessly into an existing IT environment and the interface with PowerFactory enables the transfer of calculation-relevant data for protection studies.

MONITORING SYSTEMS

Our Power System Monitoring PFM300 product line features grid and plant supervision, fault recording, and power quality and grid characteristics analysis. The Grid Code Compliance Monitoring PFM300-GCC system also offers compliance auditing of power plants with respect to grid code requirements. This monitoring and non-compliance detection provides the complete transparency and assurance required by both plant operators and utilities.

TESTING AND CERTIFICATION

The DIN EN ISO/IEC 17025 accredited DIgSILENT Test Laboratory for NAR Conformity carries out measurements in accordance with FGW TR3 on the operational type 1 generation plant (directly coupled synchronous machines). These measurements are carried out in accordance with the "individual verification procedure" as required by the German grid connection guidelines VDE-AR-N 4110/20/30. DIgSILENT has many years of international expertise in the field of generation-and consumption/load systems testing. The in-house developed and produced measuring systems enable the testing laboratory to offer customised measuring solutions for a wide range of power plants and applications.

SERVICES

DIgSILENT GmbH is staffed with experts of various disciplines relevant for performing consulting services, research activities, user training, educational programs and software development. Highly specialised expertise is available in many fields of electrical engineering applicable to liberalised power markets and to the latest developments in power generation technologies such as wind power and distributed generation. DIgSILENT has provided expert consulting services to several prominent PV and wind grid integration studies.

SERVING MORE THAN 150 COUNTRIES

DIgSILENT customers
DIgSILENT offices
Partners and representatives
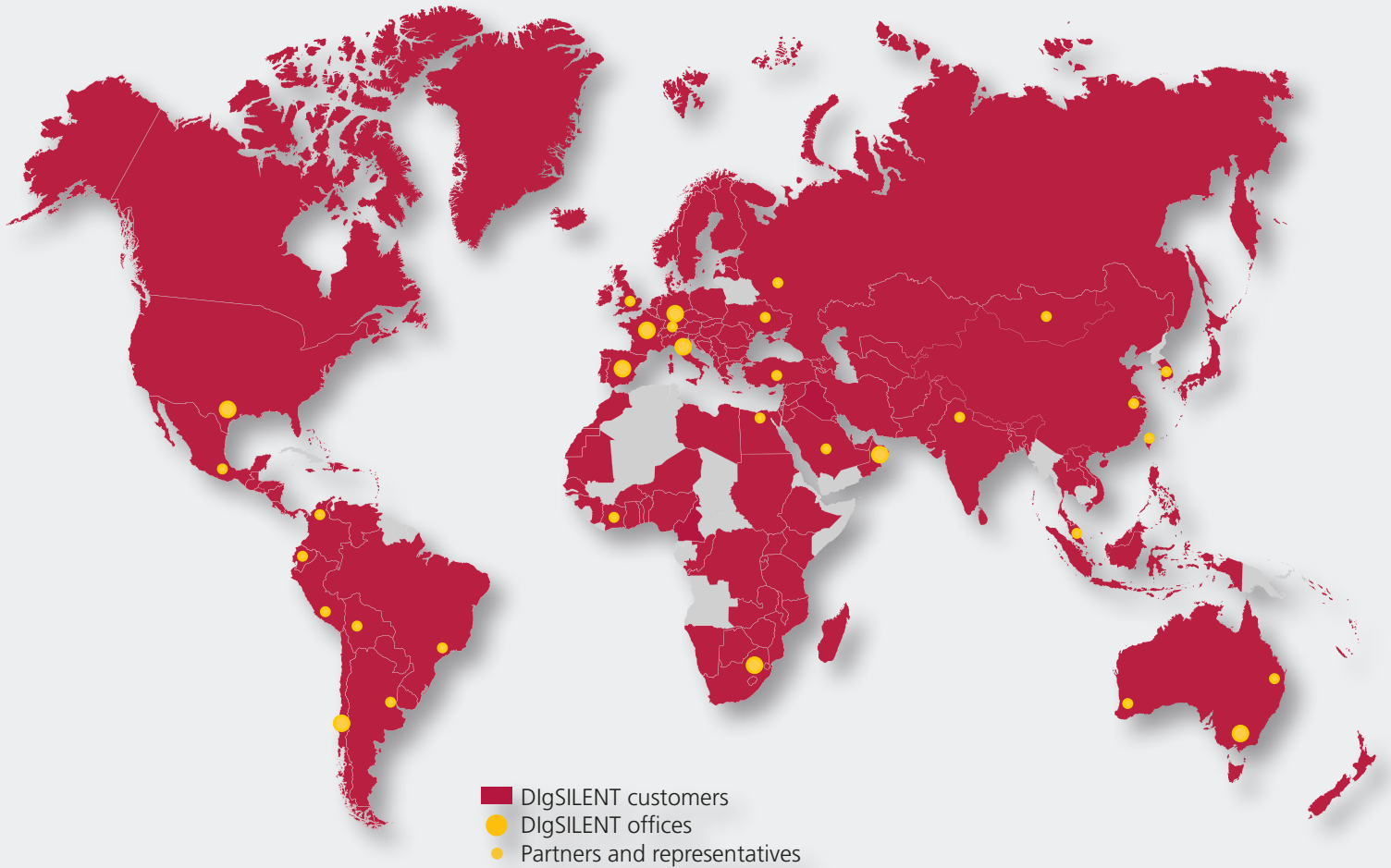
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