



# DIGSILENT StationWare 2016

# DigSILENT | StationWare 2016

## The Innovative Data Warehouse Solution



### 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. Networks consisting of devices from various manufacturers can be burdensome to an IT department; each manufacturer requires an installation of their own software. StationWare is a user-friendly, multi-user web application that requires no client-side installation. 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 with 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.

The screenshot shows the StationWare 2016 interface with a settings page for a relay. The page includes a navigation menu, a breadcrumb trail, and a settings form. Below the form is a table of parameters.

Attribute	Description	Value	Range	Unit	Assigned
Relay ID	Relay Identifier	1089403			(S)
TSD	Terminal Identifier	auDIGen PT LEWIS C BU			(S)
CTR	Current Transformer Ratio	400	1-6000		(S)
CTRN	Neutral (0N) Current Transformer Ratio	400	1-10000		(S)
PTN	Phase (VA, VB, VC) Potential Transformer Ratio	1000	1.00-10000.00		(S)
PTNS	Neutral Voltage (VN) Potential Transformer Ratio	1	1.00-10000.00		(S)
VNCHK	Phase PT Nominal Value (kV) (OFF 23.00-200V, ON)	64	20.00-200.00;OFF-99999999		(S)
Z1MAG	Positive-Seq. Line Impedance Magnitude	0.2	0.10-910.00	Ohms	(S)
Z2MAG	Negative-Seq. Line Impedance Magnitude	79.67	0.10-910.00	Degrees	(S)
Z0MAG	Zero-Sequence Line Impedance Magnitude	0.74	0.10-910.00	Ohms	(S)
Z0ANG	Zero-Sequence Line Impedance Angle	81.3	0.00-90.00	Degrees	(S)
LL	Line Length	0.68	0.10-999.0		(S)
ESDP	Phase Element Levels	3	1-6;99999999		(S)
ESDN	Enable Number of Reciprocal Instantaneous Measurements (0=NO)	N	1-6;99999999		(S)
CSG	Control Group Element Levels	1	1-6;99999999		(S)

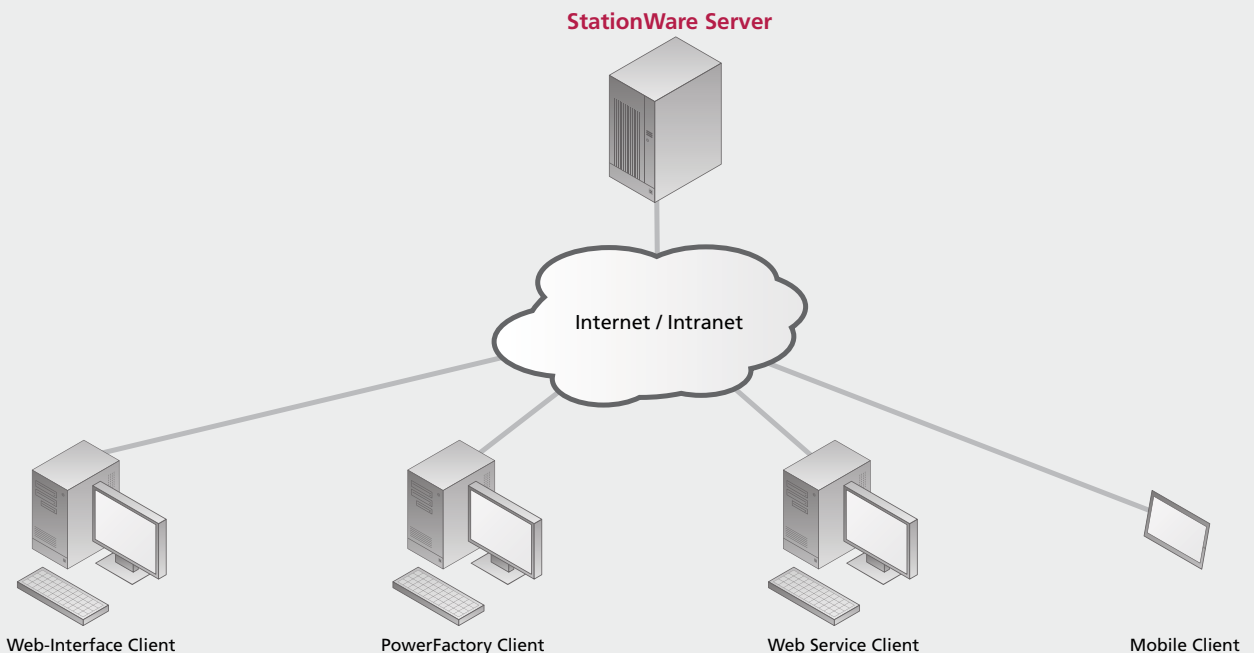


### ASSET MANAGEMENT

In StationWare, assets can be managed in a completely user-definable hierarchy consisting of location and devices. Custom attributes can be defined for any asset 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.

### STATIONWARE STRUCTURE



# DIgSILENT | StationWare 2016 Applications

## 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.

Workflows handling protection settings are company-specific and the definition of this workflow is 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.

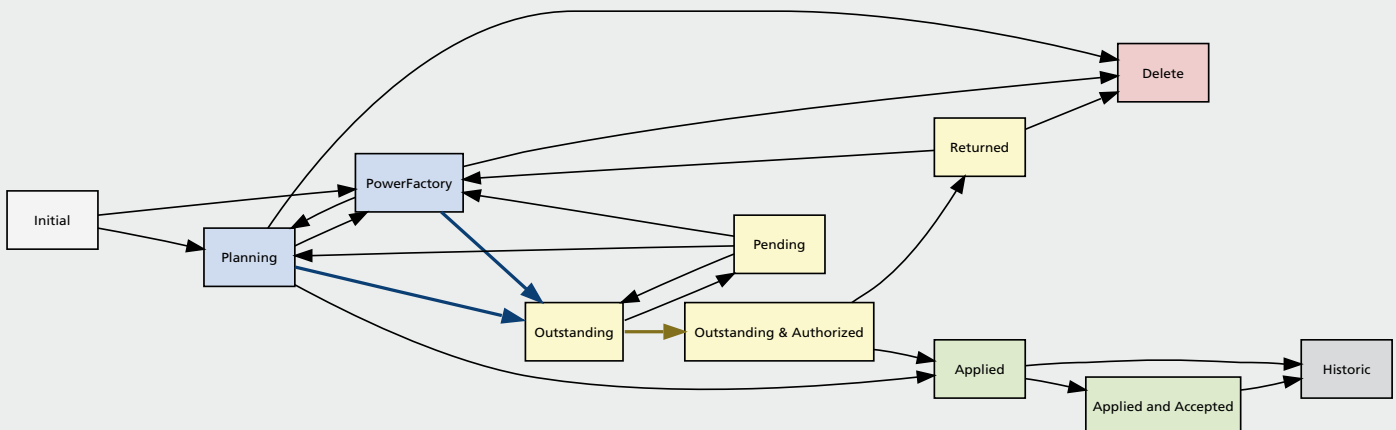


## BUSINESS PROCESSES

Business processes can be defined in StationWare. These processes can contain several individual tasks to create a detailed workflow representation. 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.

WARNING	
ARC FLASH HAZARD	
APPROPRIATE PPE REQUIRED	
Equipment Name	North 1_Bay1
Working Distance	910 mm
Hazard Risk Category	1
Incident Energy (working distance)	10.56 J/cm <sup>2</sup>
Flash Protection Boundary	1961.68 mm

## EXAMPLE RELAY SETTINGS LIFECYCLE

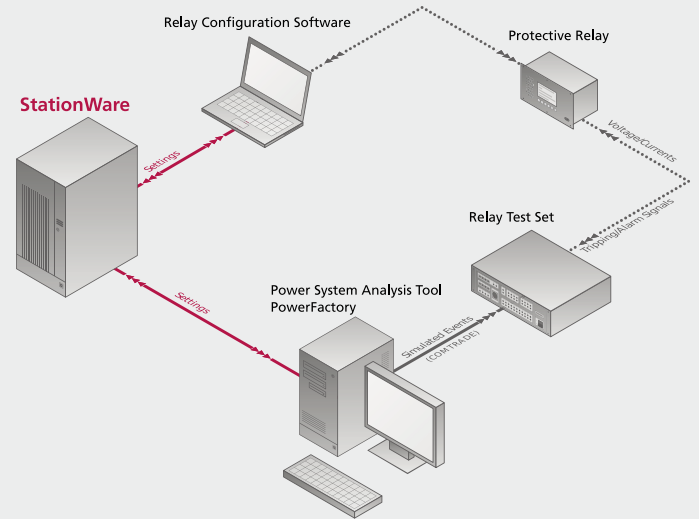


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## Data Interfaces and Data Management

### 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, settings converters support manufacturer-specific file formats; this means that one converter can be used for various different device types and firmware configurations. The ever-growing selection of converters contains 30+ import and 15+ export converters. DIgSILENT accepts requests for the development of not yet supported file formats. Expert users also have the possibility to develop their own, custom converters.



### WEB SERVICE/POWERFACTORY INTERFACE

Web services provide a remote interface to StationWare. 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 already-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.

### AUTHORIZATION/AUTHENTICATION

StationWare authorization is based on roles. Authorizations can be granted on an object hierarchy level, individual lifecycle phases/transitions, and administrative functionality. This gives administrators the ability to precisely, yet easily, control the access rights of 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 MANAGEMENT SYSTEM

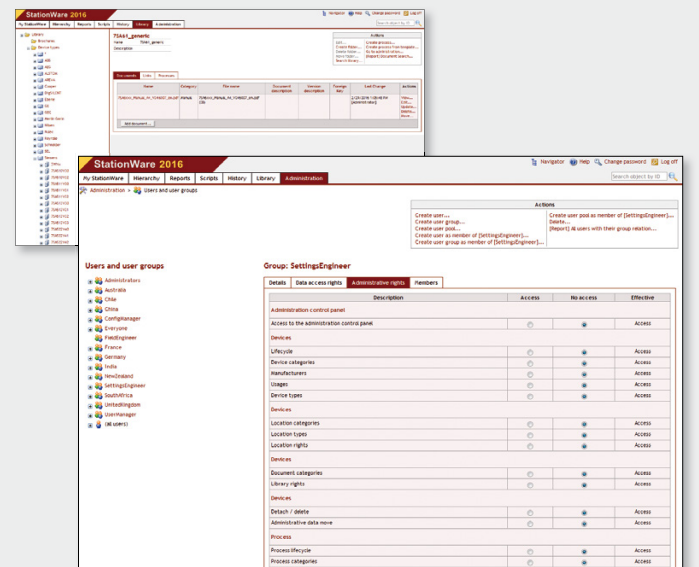
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### REPORTS AND SCRIPTS

Reports are a tool to analyse, accumulate and present StationWare data in a clear manner. Scripts provide administrative users with the ability to automate common processes in StationWare. StationWare is shipped 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.

### 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, inspection templates. All file formats are supported. 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.

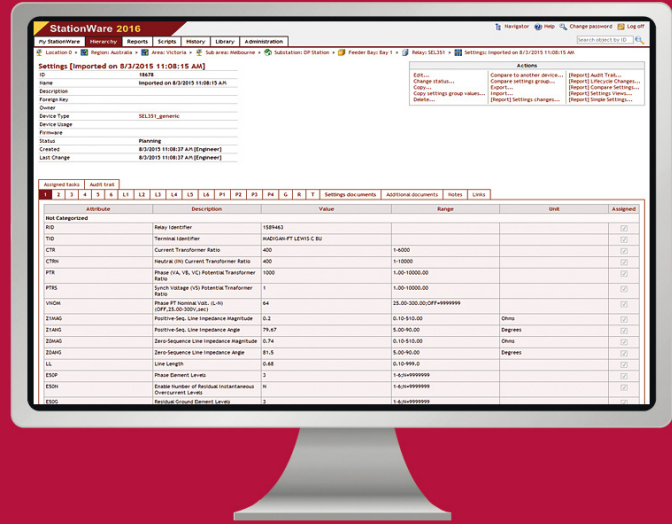


### AUDIT TRAIL

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.

# DigSILENT | StationWare Highlights

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



## SOME HIGHLIGHTS:

Multi-user web application

No client-side installation is 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

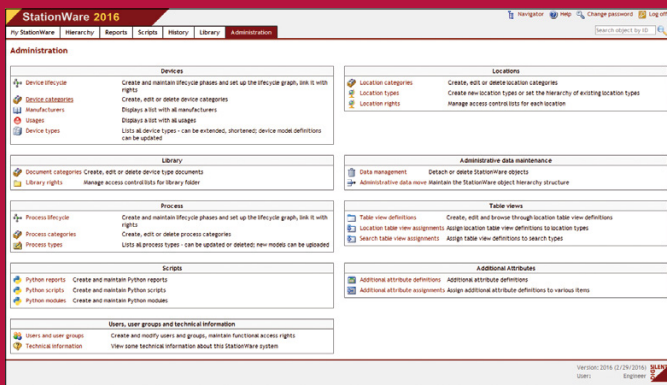
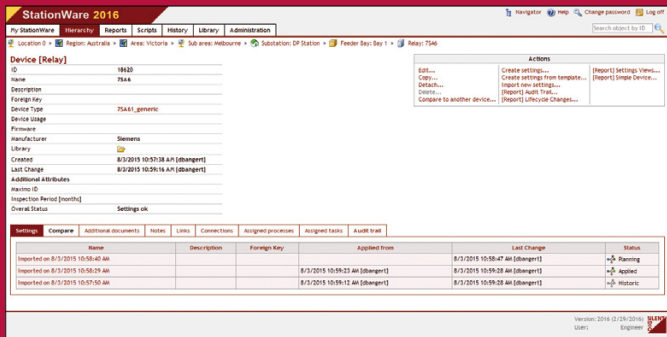
Document library for effective file storage and management

Data validation on settings values

Precise access rights management

Support of Oracle and MS SQL Server databases

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



# DIGSILENT | StationWare 2016

## Feature Overview

### ASSET MANAGEMENT

- Asset Management for primary and secondary equipment
- User-definable location management
- User-definable asset types and asset attributes
- Topology model for primary and signal connections

### PROTECTION SETTINGS MANAGEMENT

- Management of protection settings
- 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

### PROTECTION SETTINGS AND PROCESS LIFECYCLE

- Customer-specific phases and transitions
- Interactive lifecycle graph
- Access rights per phase and transition
- Audit trail
- Trace of historic settings records depending on lifecycle transitions
- Transition-triggered scripts and email notification
- User-definable checklists
- Multiple definable process lifecycles

### REPORTING AND SCRIPTING

- Various **localised NEW** built-in reports available
- Python scripting language for user-definable reports and scripts
- User-definable layout formats: XML, HTML, PDF, **EXCEL NEW**
- **Automated trigger for Python reports and scripts NEW**
- Access rights management for reports and scripts

### AUDIT TRAIL

- Safe logging of StationWare events
- Read-only (tamper-proof)
- Detailed reports

### BUSINESS PROCESSES

- 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

### DOCUMENT LIBRARY

- Central storage area for documents and software
- User-definable folder structure
- Access rights on library folders
- Full-text search

### DOCUMENT MANAGEMENT

- Document attachments for assets
- Links to web pages or StationWare assets
- Custom notes on assets

### HISTORIC VIEW MODE

- Snapshot of the StationWare system at a previous point in time
- Trace of historic settings records

### USER MANAGEMENT

- StationWare specific user accounts
- **Concurrent read-only guest account pools NEW**
- Individual user page
  - Assigned settings
  - Assigned tasks
- Windows authentication using local or domain accounts (LDAP)
- Access rights management for user groups
  - Location-dependent rights
  - Lifecycle-dependent rights
  - Library-dependent rights
  - Functional rights

### DATA EXCHANGE FACILITIES

- Import/export of numerical protection settings files
- Import/export of task attributes
- Exchange of calculation-relevant parameters from/to PowerFactory
- Excel import/export capabilities
- Web service interface

### MANUFACTURER-SPECIFIC INTERFACES

- Import Converters
  - ABB: CAP540, WinECP, PCM600, **MCUSetup NEW**
  - Areva: Micom S1: S&R103 IEC, S&R Modbus, S&R Courier
  - Basler: Bestcoms 851G/951
  - Eberle: WinREG, WinTM, Toolbox
  - GE: various Energvista software versions
    - MII, MM2, MM300/MM200, SR3
  - Nari Electric: PCS-Explorer
  - Nulec: WSOS
  - Reinhausen: TAPCON 240/260
  - Reyrolle: Reydisp Evolution, **Reyrolle 8/9 NEW**
  - Schneider Electric: SEPAM converter
  - SEL: AcSELerator 4, AcSELerator 5
  - Siemens: DIGSI
  - VAMP: VAMPSET
  - ZIV: ZivercomPlus
- Export Converters
  - ABB: CAP540
  - Eberle: WinREG, WinTM, Toolbox
  - GE: various Energvista software versions
  - Nulec: WSOS
  - SEL: AcSELerator, SEL-5010
  - Siemens: DIGSI
  - VAMP: VAMPSET
  - ZIV: ZivercomPlus

## SYSTEM REQUIREMENTS

### Minimum

- CPU: 1.3 GHz (64-bit processor) or faster for multi-core
- Memory (RAM): 2 GB
- Operating System: Windows Server 2008
- Database: Microsoft SQL Server 2008 or Oracle 10g

### Recommended

- CPU: 3.1 GHz (64-bit processor) or faster multi-core
- Memory (RAM): 16 GB
- Operating System: Windows Server 2012 R2
- Database: Microsoft SQL Server 2012 or Microsoft SQL Server 2014 or Oracle 11g

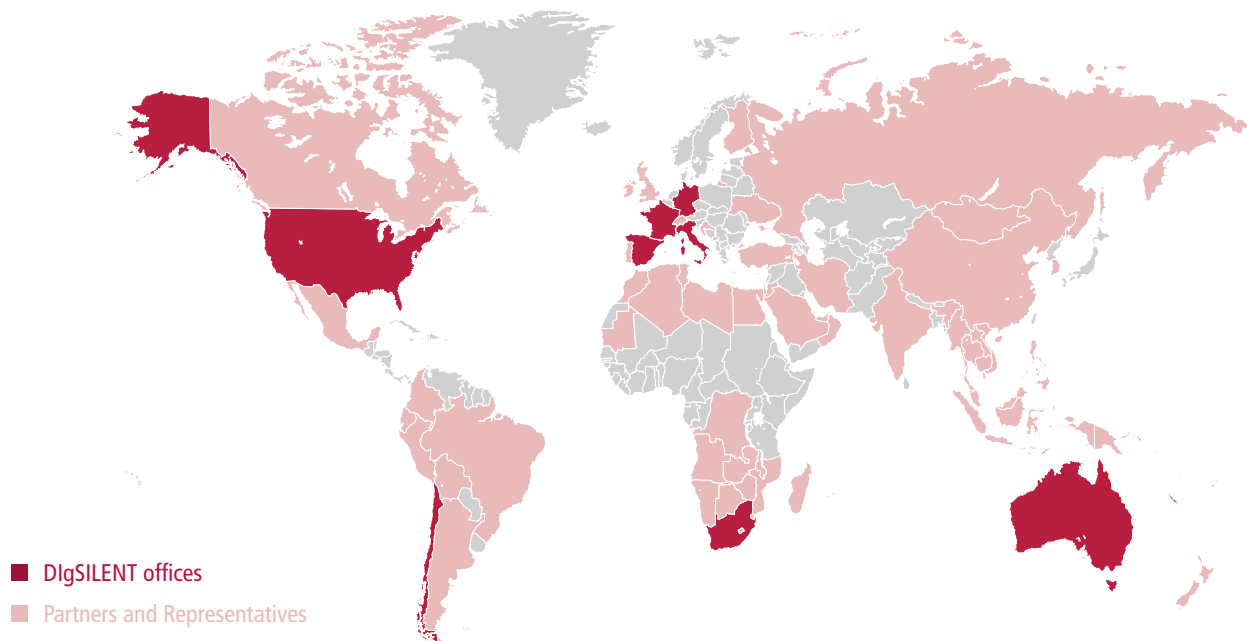
### General System Requirements

- Microsoft Internet Information Services (IIS)
- Microsoft .NET Framework 4.5.2

## SUPPORT

- Professional support via customer portal or hotline
- Continuous product maintenance and development
- Detailed manuals

## DIGSILENT WORLDWIDE



## SALES CONTACT

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# DIGSILENT | Company Profile



**DIGSILENT** is a consulting and software company providing engineering services in the field of electrical power systems for transmission, distribution, generation and industrial plants.

**DIGSILENT** was founded in 1985 and is a fully independent, privately owned company located in Gomaringen/Tübingen, Germany. DIGSILENT continued expansion by establishing offices in Australia, South Africa, Italy, Chile, Spain, France and the USA, 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 have been conducted in more than 130 countries.

## **DIGSILENT PowerFactory**

DIGSILENT develops 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 wind power applications, PowerFactory has become the power industry's de-facto standard tool, due to PowerFactory models and algorithms providing unrivalled accuracy and performance.

**DIGSILENT StationWare** is a reliable central protection settings database and management system, based on the latest .NET technology. StationWare stores and records all settings in a central database, allows modelling of relevant workflow sequences, provides quick

access to relay manuals, interfaces with manufacturer-specific relay settings and integrates with PowerFactory software, allowing powerful and easy-to-use settings coordination studies.

**PowerFactory Monitor** is a flexible performance recording and monitoring system that copes easily and efficiently with the special requirements for system test implementation, system performance supervision and the determination and supervision of connection characteristics. Numerous monitoring systems installed at various grid locations can be integrated into a Wide-Area-Measurement-System (WAMS). PowerFactory Monitor can be fully integrated with PowerFactory software.

## **DIGSILENT Consulting**

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.



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