



*Software solutions for
the energy markets*

PSI 



Energy management

Efficient, safe and sustainable energy supply

For more than thirty-five years, PSI has been developing intelligent control systems for the management of large-scale energy grids. These high availability systems provide optimised management of energy transmission and distribution and thus make an important contribution to the safe and reliable supply of electricity, gas, oil, heat and water.

Ready to meet the future demands of the energy markets, PSI's solutions provide comprehensive functions for energy management, network operations, workforce management, energy trading and portfolio management.

Among the special features of PSI's systems are the outstanding scalability and higher functions for calculation, simulation and optimisation of network operations. Intuitive graphical interfaces ease the control of difficult network situations and the management of the largest networks. PSI's solutions are particularly suitable for the management of multinational super grids and smart grids. This allows flexible load control at the distribution network level and decentralised power generation coming from renewable energy sources.

Integrated solutions for management of gas grids as well as oil and water pipelines incorporate diverse monitoring, planning and simulation functions. PSI's certified leak detection and location system supports the safe transportation of various products. Trading, sales and planning systems for the liberalised energy market complete the range of software applications PSI brings to customers.

Electricity and combined energy

Oil and gas

Energy trade and sales

Electricity and combined energy

PSI implements network control systems for well-known customers in the energy supply sector. The systems manage huge electricity networks of all voltage levels as well as pipeline networks. Simple functions like SCADA and complex functions such as fault analysis, dynamic network simulation, network calculations and switching sequences have been successfully implemented for all energy networks.

Network control technology

PSI network control systems powered by *PSIcontrol* stand out due to unique dialog technology and excellent scalability for distributed network control centres. The special network control system architecture guarantees an exceptional level of system availability and offers very dynamic system capabilities for electricity and integrated energy providers.

With industry leading technology, *PSIcontrol* offers extensive functions for the new operational demands from injections from renewable energy into electrical network. During congestions in transmissions or distributions networks, intelligent control functions provide optimised management of renewable energy injections.



Network utilisation

For the requirements of the liberalised energy market PSI offers the *PSIpassage* product line. *PSIpassage* provides solutions for network utilisation management and energy management, as well as transmission and distribution grid operators.



Workforce management

The workforce management system *PSIcommand* supports network operations, including troubleshooting, preventive maintenance and crisis management. *PSIcommand* can be integrated seamlessly into existing IT infrastructures using available data from Enterprise Resource Planning software and network control systems. Mobile wireless technology and onboard mobile devices are used to manage the maintenance fleet.



In focus: energy supply networks

PSIcontrol

- Highest supply quality and supply efficiency
- Productivity increases through
 - Support of network operations especially during fault situations by fault localisation and indication
 - Fastest and most comprehensive power restoration
 - Switching proposals
 - Automatically generated switching sequences
- Integration and control of renewable energies
 - Overhead line monitoring
 - Generation management and congestion correction
 - Prognosis (including wind and solar forecast)
 - Network calculations for all voltage levels

- Electricity transmission networks
- Regional power distribution networks
- Networks for integrated supply of electrical power, gas, district heating and water
- Railway electricity networks
- Industrial networks

PSIpassage

- Assignment of primary and secondary control power as well as request and allocation of minutes reserve power
- Management of auctions of congestion transmission capacity
- Management of network operator balance groups e.g. renewable energy balance groups, network loss balance groups
- Automated balance group calculation at the transmission network level
- Energy data and network usage management for distribution network operators

- Control power management
- Congestion and auction management
- Network trading management

PSIcommand

- Coordination of field personnel
- Multi-criteria optimisation of personnel dispatching
- Support of field personnel by providing direct access to all relevant information
- Integration of mobile devices: order transmission, navigation and feedback
- Display of jobs in network control centre
- Seamless documentation of job data beginning on-site
- Automatic summary of information
- Seamless integration into PSIcontrol

- Multi-criteria optimisation



Oil and gas

PSI is a world leading system provider of integrated gas and pipeline management solutions. Operators of gas and liquids pipeline systems have been running the reliable and robust solutions to monitor and control gas and liquids pipeline systems for decades. PSI solutions ensure the best operating performance while reducing operating costs and safeguarding the environment. In addition, the solutions meet the highest industry and regulatory standards.

Gas management solutions

The transmission, distribution, storage and supply of natural gas requires outstanding solutions to operate the entire gas chain. In order to transport gas in a safe, reliable and sustainable way, PSI's gas management solutions include a complete suite of integrated, full-featured modules.

Solutions for energy data management cover all gas-specific processes from calibrated transmission of measurements to data processing, contract management and invoicing.

Pipeline management solutions

The transportation of crude oil, gas, condensate, NGL and products from production plants to terminals and refineries requires proactive, safe and efficient support of all pipeline operations.

PSI provides a complete suite of real-time applications for leak detection and location, pipeline integrity monitoring, tracking of multiple products through single pipelines, planning and execution of critical activities and scheduling and optimisation of operations.

For both new and experienced operators PSI provides a comprehensive training system for conducting off-line simulations of real-world process conditions.



Solutions for gas, oil and liquids pipelines

Monitoring and control

- Full-featured SCADA system for gas and liquid pipelines
- Integrated data historian
- Virtually unlimited scalability
- High security and availability
- Platform independent
- Highly customisable

PSIcontrol V7

Gas management solutions

- Leak detection and location
- Real-time, predictive and what-if simulations
- Model-based calorific value calculation
- Scheduling and dispatching
- Contract management and monitoring
- Capacity management, nomination and allocation
- Shipper management
- Gas demand forecasting
- Storage management
- Gas transport optimisation
- Business data communication
- Metering solutions

PSI*ganesi*
PSI*transport*
PSI*fetch*
PSI*metering*
PSI*comcentre*

Pipeline management solutions

- Leak detection and location
- Batch and scraper tracking
- Real-time, predictive and what-if simulations
- Pipeline integrity management
- Velocity monitoring
- Corrosion forecast
- Pump optimisation
- Pipeline scenario analysis
- Roughness wall monitoring
- Pipeline stress monitoring
- Inventory calculations
- Tank management
- Operation optimisation
- Scheduling and planning

PSI*pipelines*



Energy trade and sales

PSI provides intelligent, practical and economical solutions for energy providers along the entire process chain of production, transportation distribution, trading and sales in the liberalised energy market. PSI's customer base includes many national electricity and gas suppliers, regional distributors, public utilities and producers.

Integrated energy trade and sales

PSI*market* covers all processes in energy sales and energy trading in a modular, integrated solution for electricity, gas and other relevant commodities. The modular design allows flexible implementation of independent or integrated systems for different functionalities or commodities.

Gas business analysis and planning system

The Analysis and Planning System (GAPS) allows an integrated management of the gas purchase and sales process including associated contracts and time lines. Complex relationships can be modelled by an integrated formula editor. This allows optimised handling of contract modifications.

Revision of gas metering stations

PSI's standard system R-Win® covers all revision tasks as well as calibration of gas metering stations. The system provides many functionalities in an integrated system environment. R-Win® is available as a centralised server-based version or as a decentralised version for mobile devices.

Allocation and invoicing for gas sale and trade

For gas sales and trading, DAISY I und II (Downstream Allocation/Accounting and Information System) systems provide allocation and billing for special contract customers in gas sales and trading. These systems effectively support the downstream sector in the liberalised gas market.



Integrated solutions for energy providers



- Forecast management
- Portfolio management and hedging
- Fair value and risk management
- Nomination
- Balancing group management
- Billing
- Optimal unit commitment
- Optimal trading strategy

- Contract and forecast management
- Planning and scenario
- Time series
- Formula editor
- Optimisation and reporting

- Revision of gas metering stations
- Reproducible test results
- Support of calibration and audit

- Billing and accounting
- Transport and storage contracts
- Auditing
- Monitoring of contracts
- Volume and demand allocation
- Automated correction procedures
- Completeness checking

Worldwide service through a worldwide presence

PSI supplements its network of own locations with sales and service partners. This guarantees worldwide customer support. PSI's software complements many of the products offered by its export partners.

PSI locations

Germany

| | |
|--------------------------|-----------|
| Aachen/Würselen | Essen |
| Aschaffenburg | Hamburg |
| Berlin (headquarters) | Hanover |
| Dortmund | Karlsruhe |
| Düsseldorf | Munich |
| | Stuttgart |

International

| | | |
|--------------|---------------|----------------|
| Bahrain | Istanbul | Pittsburgh |
| Bangkok | Jekaterinburg | Posen |
| Beijing | Kuala Lumpur | Rio de Janeiro |
| Brussels | Leoben | Shanghai |
| Buenos Aires | Linz | Wels |
| Calcutta | London | Zurich |
| Chennai | Moscow | |

PSI group

Since 1969 PSI has developed and integrated complete solutions, on the basis of its own software products, for the management of energy networks, cross-company production management and infrastructure management.

PSI customers worldwide



| | | |
|----------------|-------------|--------------|
| Argentina | Hungary | Romania |
| Austria | India | Russia |
| Belarus | Indonesia | Saudi Arabia |
| Belgium | Ireland | Singapore |
| Brazil | Italy | Slovakia |
| Canada | Kuwait | Slovenia |
| China | Luxembourg | South Africa |
| Czech Republic | Malaysia | South Korea |
| Denmark | Malta | Spain |
| Egypt | Mexico | Sweden |
| Finland | Netherlands | Switzerland |
| France | New Zealand | Thailand |
| Germany | Oman | Turkey |
| Great Britain | Poland | USA |

PSI at the stock exchange

Market place: TecDAX of the
Frankfurt stock exchange
ISIN: DE000A0Z1JH9
Security Code Number: A0Z1JH
SE Code: PSAN

Energy markets customers

Many European and Asian energy suppliers are among PSI's customers.

24/7 Netze
50Hertz Transmission GmbH
Allgäuer Überlandwerke GmbH
Amprion GmbH
AWP GmbH (Adria-Wien-Pipeline)
Bayerngas AG
BEB Erdgas und Erdöl GmbH
BEWAG Netz GmbH
BKW FMB Energie AG
Creos Luxembourg S.A.
Deutsche Bahn AG
E.ON
E.ON Avacon
E.ON Gastransport GmbH
E.ON Ruhrgas AG
EDF Electricité de France
Elektro Ljubljana d.d.
ELE Emscher Lippe Energie GmbH
EnBW Regional AG
Enexis B.V.
envia Mitteldeutsche Energie AG
ExxonMobil Central Europe Holding GmbH
Federal Grid Company of Unified Energy System (JSC FGC UES)
GASAG Berliner Gaswerke Aktiengesellschaft
Gasunie Deutschland GmbH & Co. KG
Gasversorgung Thüringen GmbH
OAO Gazprom
GVS GasVersorgung Süddeutschland GmbH
Interregional Distribution Grid Companies (IDGC)
KEVAG Koblenzer Elektrizitätswerk und Verkehr Aktiengesellschaft
Kuwait Oil Company

LEW Lechwerke AG
OAO Lukoil
NRM Netzdienste Rhein-Main GmbH
MITGAS GmbH
NBB Netzgesellschaft Berlin-Brandenburg mbH & Co. KG
N-Ergie Netz GmbH
OMV Aktiengesellschaft
Pfalzwerke Aktiengesellschaft
Provincial Electricity Authority
REWAG Regensburger Energie- und Wasserversorgung AG & Co KG
RheinEnergie AG
RWE
Salzburg AG
Schweizerische Bundesbahnen SBB
SEAS-NVE
Shell Energy Europe
Stadtwerke Düsseldorf Netz GmbH
Stadtwerke München GmbH
Steweag Steg GmbH
Süwag Energie AG
SWISSGAS
Tenaga Nasional Berhad
TenneT TSO GmbH
Trafikverket
OAO Transneft
transpower stromübertragungs GmbH
Trianel GmbH
VNG Verbundnetz Gas AG
Wienstrom GmbH
WINGAS GmbH & Co. KG

(excerpt from customer list)



Publication details

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Pictures

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Page 6 middle: Roland Horn

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