SMPnet

Autonomous power grid management software

kiwa certified ISO 27001:2022

SMPnet

Who are we?

SMPnet delivers cutting-edge power grid management solutions built on advanced technical expertise. Complementary and accessible, our Omega suite integrates seamlessly with existing network systems and is designed with precision for grid optimisation. Knowing utilities are focused on the future, we've developed products that boost network capacity, cut costs and enable greater integration of renewable energy assets.

With accreditation to ISO/IEC 27001:2022, the global standard for Information Security Management Systems, we recognise the critical importance of security in our sector. We are committed to the highest standards in the evolving digital landscape, developing technology to kickstart the revolution in power grid management.

Mission

We seek to catalyse the global energy transition and grid digitalisation by deploying our highly advanced software technology, Omega. We have harnessed years of research and technical expertise into a suite of products that are shaping a future of clean energy integration and efficient grid management. Our mission is to continue to develop and provide utilities with the tools to transform their power grid operations through analytics, advanced optimisation, and real-time control. We create advanced software technology to transform operations for a stronger, greener energy future.

Omega

A suite of products designed to transform power grid management at any voltage level.

We have developed leading edge power grid management software to revolutionise the energy industry. The Omega suite of products integrates with existing systems to unlock grid capacity, integration of 100% renewable assets and significant cost reductions. From fully digitised, daily reporting to complex millisecond control, each product within the Omega suite offers utilities a new level of insight and confidence to operate their systems in a net zero world.

Defer network reinforcements

Omega helps utilities maximise asset utilisation by intelligently managing existing resources, delaying the need for costly grid reinforcements.

Enhanced network availability

Omega offers better visibility and control over network assets, enabling utilities to prevent overloads and ensure higher network availability and reliability.

Seamless integration

Omega is technology-agnostic, enabling seamless integration with all vendors and technologies, using a digital interface compatible with legacy systems and no need for additional equipment. By leveraging utility API connections and all communication protocols and standards, Omega enables network management down to the asset level.

Omega suite: An advanced, holistic approach

Each product within the Omega suite can be operated as a standalone solution to the needs of grid operators within networks of any voltage level. In combination they offer an innovative, holistic package designed to address the full spectrum of grid operation challenges, from enhancing operational efficiency, security and reliability to integrating renewable energy sources.

Aware

Optisys

Control

Aware

TECHNOLOGY FEATURE

Data analytics for grids at any voltage level

Gain comprehensive insights into your grid performance with advanced analytics such as substation headroom, CO2 projections, and renewables projections.

Aware is a reporting and data visualisation software tool which sits in the cloud or the edge and creates highly customisable, real-time monitoring dashboards and automated reports, alarms and notifications. Offering data analytics, Aware complements existing systems by streamlining data from across the grid, at any voltage level and from any platforms that integrate various data sources (e.g., SCADA, ADMS, etc.).

Widen your visibility across the network allowing:

- Automated reports: Generated daily or as needed, these would cover substation activities, distribution grid performance, voltage profiles, power profile of assets, and the status of Intelligent Electronic Devices (IEDs).
- Real-time grid monitoring dashboards: Visual interfaces showing live data about the grid status, activities, and performance metrics.
- Data analytics insights: Extracted patterns, trends, or anomalies from the operational data to help in decision-making.

Seamlessly integrate data streams, streamline operations, and achieve sustainability targets accurately.

Optisys

TECHNOLOGY FEATURE

Adaptive optimisation for grids at any voltage level

Minimises costs and maximises efficiency by optimising DERs, meeting diverse grid demands, and managing voltage levels.

Optisys is a highly adaptive software engineered to optimise grids and give utilities the tools to make data-driven decisions for an efficient, reliable, and secure power grid.

With a powerful ability to adapt to the conditions of the grid, at any voltage level, the benefits of Optisys for grid management include:

- Defer CAPEX by maximising the use of the current grid infrastructure.
- Enhance grid stability and scalability to evolving grid requirements.
- Reduce OPEX via network loss minimisation and augmented efficiencies.
- Guarantee uninterrupted system operation.
- Meet regulatory compliance.
- Allow for maximum renewables penetration & real-time decision making.

When it comes to network operation, Optisys gives you the power to keep energy flowing and the lights on, no matter the grid conditions and constraints.

Control

TECHNOLOGY FEATURE

Real-time control, whatever your grid voltage level

Achieve unparalleled control over your power grid with applications like island re-synchronisation, coordinated voltage/ frequency control, and wide area control.

Control takes the concept of power grid management to the millisecond and offers the most advanced real-time edge software for time-critical applications.

Using Control and its unique ability to control grids of any voltage level, allows dynamic, responsive engagement with the grid and gives you:

- Enhanced resilience through avoidance of shutdown methods.
- Cost-efficiency via renewable energy sources.
- Remote operation reduces the need for onsite personnel.
- Millisecond precision in controlling renewables, replacing standard generators.
- Cleaner operation by reducing reliance on fossil fuel generators.
- Multi-vendor compatibility with equipment from various manufacturers (technology-agnostic).

A truly real-time control system for dynamic grid management, Control will ensure stability and optimal performance in the net zero future.

Omega

Enabling autonomous power grid management with the Omega suite

Industry solutions

Real-time flexibility coordination

Challenge

DSOs face difficulties in balancing supply and demand due to the variability of renewable energy, leading to potential instability.

Solution

Utilise adaptive optimisation and digital twin technology to analyse scenarios and coordinate flexibility resources effectively and autonomously.

Applicable to:

DSOs managing significant adoption of flexibility resources and participating in flexibility marketplaces, DSOs aiming to automate the processes of flexibility assessment, procurement, and dispatch.

Dynamic congestion strategies for distribution grids

Challenge

DSOs encounter thermal overloads and voltage violations, leading to underutilised capacity, frequent disconnections, and costly reinforcements.

Solution

Implement adaptive and wide-area voltage optimisation to dynamically manage grid assets, prevent overloads, and maintain stability.

Applicable to:

DSOs operating in regions with high renewable penetration and facing congestion due to capacity constraints; DSOs facing regulatory incentives or penalties, utilities seeking to defer CAPEX on grid reinforcements through operational improvements.

Dynamic control of integrated AC/DC grids

Challenge

Hybrid AC/DC grids pose challenges, requiring precise coordination of diverse energy resources for voltage and frequency stability, power flow efficiency, and interoperability.

Solution

Provide millisecond-level control across hybrid grids, ensuring dynamic balancing and coordinated operation and effective resource allocation.

Applicable to:

Utilities managing multi-terminal DC systems, microgrids, or regions with a mix of AC/DC systems requiring real-time, multi-vendor coordination and control, DSOs serving rapid electrification and mixed voltage systems

Autonomous control for critical grid infrastructure

Challenge

Critical grid sections are increasingly vulnerable to disruptions from extreme weather, cyber-attacks, and equipment failures, risking service continuity.

Solution

Employ predictive dispatch and dynamic control to maintain stability and continuity, even under adverse conditions.

Applicable to:

Utilities managing critical grid infrastructure, islanded grids, or microgrids in areas prone to extreme weather or requiring heightened cybersecurity measures, islands or weakly interconnected grids.

Omega

Enhancing existing SCADA/ADMS with the Omega suite

As the industry seeks to optimise grid operations, integrate distributed energy resources, and ensure grid reliability, utilities are looking for ways to enhance the capabilities of their existing SCADA/ADMS infrastructure. Specifically designed to offer an intelligent, and adaptive platform, the Omega suite works alongside existing systems, adding value by enabling seamless integration and expanding operational efficiency.

Adding value to SCADA and ADMS to enable autonomous grid management

Capability	SCADA/ADMS Today	With Omega suite
Control Logic	Rule-based, reactive	Real-time, physics-informed optimisation
Asset Management	Per-asset, siloed control	Holistic, multi-asset orchestration
Interoperability	Vendor-locked & fragmented	Protocol-agnostic, plug-and-play
Voltage Management	Localised, rule-based VVC	Grid-wide voltage optimisation
Congestion Handling	Post-event shedding	Preventive power flow coordination
Black Start & Sync	Manual, operator-led	Autonomous, safe reconnection
Data & Forecasting	Historical logging, manual analysis	Live profiling of generation/ load, predictive insights

SMPnet

CASE STUDY

Community DSO Project

NORTHERN POWERGRID

Client:
Northern Powergrid

Product:
Aware & Optisys

Location:
United Kingdom

Smart communities have a role to play and taking control as the grid manages increasingly complex systems and intermittent generation.

Northern Powergrid (NPg) have instigated a UK industry-first demonstrator project to develop and trial a future framework for Community Distribution System Operation - empowering communities to have greater control over their energy and assets.

SMPnet deployed two grid management products from the Omega suite, interfacing with metering points, communicating with the NODES marketplace, and coordinating with behind-the-meter optimisation platforms provided by ev.energy and CleanWatts, managing flexibility allocation, network operation and timing decisions for flexibility requirements at the last mile of the network in coordination with the upstream network's needs.

SMPnet deployment includes:

- Real-time flexibility coordination to optimise local energy use.
- Integration of DERs, including solar PV, batteries, and EV chargers.
- Precise, physics-based assessments of grid conditions to deploy flexibility solutions efficiently.
- Dynamic grid control to avoid congestion and improve grid performance.
- Provision of market integration tools to enable flexibility trading on platforms like NODES.
- Real-time monitoring, forecasting, and reporting through Omega's advanced analytics and digital twin capabilities

Over two years, Omega suite deployment is expected to show enhanced grid resilience via real-time flexibility coordination solutions. Once complete, Community DSO Project will create a blueprint for how smart communities can play a role as the grid manages increasingly complex systems and intermittent generation, feeding energy into every system level.

**This first Community DSO network trial has been awarded to the Condor Consortium, led by Electric Places CIC. The collaboration involves several key partners which includes SMPnet, NODES, Cleanwatts, ev.energy, Energise Barnsley, Whitley Bay Big Local and Knaresborough Community Energy and partners TNEI, and LCP Delta.*

SMPnet

CASE STUDY

Constellation Project – Autonomous Power Grid Management

UK Power Networks
Delivering your electricity

Client:
UK Power Networks

Product:
Aware & Optisys

Location:
United Kingdom

Autonomous grid management enabling adaptive, real-time control and scalable substation intelligence.

The Constellation project is part of UK Power Networks' innovation programme, exploring autonomous systems to manage future distribution networks. It is the first large-scale UK DSO project validating virtualised autonomous substation management, demonstrating CIM-based data ingestion and automation, and combining adaptive wide-area voltage optimisation with physics-informed digital twins.

SMPnet is deploying its Omega suite, integrating Aware and Optisys, to deliver real-time grid visibility, wide-area voltage optimisation, and millisecond-level control within UK Power Networks' virtual substation environment. The solution integrates with SCADA, DERMS, and ADMS, enabling interoperability and standardised data exchange.

Working closely with UK Power Networks and the PNDC, SMPnet is deploying its Omega suite within UK Power Networks digital infrastructure to deliver real-time adaptive optimisation. The solution enables substation-level coordination, dynamic voltage control, and real-time decision-making across the network.

Key deployment features include:

- Successful parsing and integration of full CIM-based UK Power Networks grid models.
- Sub-minute execution for PF and OPF simulations, with active and reactive power dispatch and stability objectives, proving scalability.
- Integration readiness with SCADA, DERMS, and ADMS systems in multi-protocol environments.

Over the 18-month project, Omega suite deployment will demonstrate autonomous substation management at scale, providing UK Power Networks with a vendor-agnostic blueprint for operational efficiency, resilience, and enhanced renewable integration, with full control-room deployment by early 2026.

SMPnet Omega

Vision

Our vision is to be the trusted partner for utility companies in advanced power grid management. Through cutting-edge software, we provide unparalleled analytics, optimisation, and real-time control. Together, we shape a future of sustainable energy integration and efficient grid management, revolutionising the industry for a sustainable planet.

“SMPnet have successfully utilised Omega technology to address network distribution challenges, including power island re-synchronisation. Excited about its potential, we look forward to further collaboration to overcome various challenges across our business units.”

Patxi Pazos,
Technology Transfer and Projects

Iberdrola

“Partnering with SMPnet and their Omega suite transforms our grid management approach within the Community DSO project, delivering enhanced flexibility and autonomous operations. Their expertise keeps us ahead in the fast-evolving energy landscape, and we look forward to more collaboration.”

Maurice Lynch,
Head of System Flexibility

NORTHERN POWERGRID

SMPnet

Take the first step towards a smarter energy future

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kiwa certified
ISO 27001:2022