



OpSys

The Complete Renewable Energy
Ecosystem

Powering the Future of Renewable Energy

Design & Engineering Services

End-to-End Solutions for the Energy Transition

OpSys provides a comprehensive suite of design and engineering services to support renewable energy projects from conception to commissioning. Our team of expert engineers leverages deep industry knowledge and cutting-edge software tools to deliver optimized, compliant, and bankable project designs.

Our Core Engineering Services

Power System Network Design: We design and model robust electrical networks for renewable power plants, ensuring stability, reliability, and optimal power flow. Our services include load flow analysis, short circuit studies, and protection coordination.

Grid Code Compliance Studies: We conduct detailed grid code compliance studies for solar, wind, and battery storage projects to ensure seamless and compliant grid interconnection.

Substation Design: Our expertise covers the complete design of high-voltage and medium-voltage substations, from initial layout and single-line diagrams to detailed protection and control system engineering.

CAD Engineering: We provide comprehensive 2D and 3D CAD engineering services, including detailed equipment layouts, cable routing, and construction drawings.

Electrical Engineering: Our team offers a full spectrum of electrical engineering services, including equipment sizing, specification development, and detailed design of all AC and DC systems.

Technical Documentation: We prepare comprehensive technical documentation including design basis reports, equipment specifications, test procedures, and commissioning plans.

AI Applications in Renewable Energy

The AI Revolution in Renewable Energy

Artificial Intelligence (AI) is transforming the renewable energy landscape, unlocking new levels of efficiency, reliability, and profitability. By leveraging machine learning, predictive analytics, and intelligent automation, OpSys is at the forefront of this revolution.

AI Applications

Key AI Application Areas

- **Predictive Maintenance:** AI algorithms analyze real-time sensor data to predict equipment failures before they occur, reducing downtime by up to 40%.
- **Energy Forecasting:** Accurately predict energy production with 95%+ accuracy for day-ahead forecasts.
- **Grid Optimization:** AI-powered algorithms balance supply and demand in real-time, improving grid stability.
- **Anomaly Detection:** Machine learning models detect subtle anomalies 2-3 weeks before they become critical.
- **Asset Performance Management:** Increase energy yield by 3-5% through intelligent optimization.
- **Automated Trading:** Improve trading margins by 10-15% with AI-driven strategies.

OpSys REMS - Renewable Energy Management System

The Next Generation of Renewable SCADA

Our state-of-the-art SCADA system, now infused with Artificial Intelligence, provides unparalleled visibility and predictive control over your renewable energy assets.



Real-time SCADA Dashboard



AI-Powered Analytics

Expanded SCADA Capabilities

1. **Real-time Monitoring:** Instantaneous access to live data (1ms resolution)
2. **Advanced Control:** Secure asset operations with setpoint adjustments
3. **Customizable Dashboards:** Drag-and-drop interface
4. **Alarm, Event & SOE:** Intelligent alarm filtering and root cause analysis
5. **Customized Reporting:** Flexible reporting engine
6. **Template-Based Engineering:** Pre-built templates
7. **Browser-Based Access:** Secure, web-based client
8. **RBAC:** Granular role-based access control
9. **Cyber Security:** IEC 62443 compliant
10. **Data Sheets:** Comprehensive technical documentation

AI-Powered Analytics & Insights

- **Predictive Maintenance:** AI models predict failures before they occur
- **Anomaly Detection:** Machine learning algorithms detect anomalies in real-time
- **Performance Forecasting:** Leverage AI to forecast energy production

OpSys REMS - Technical Data Sheet

SCADA Technical Specifications

Feature	Specification
Supported Protocols	IEC 60870-5-104, IEC 61850, DNP3, Modbus TCP/RTU, OPC UA
Data Acquisition	Up to 1 million tags, 1ms resolution, hot-standby redundancy
Historical Data	Unlimited storage, high-speed query engine, data compression
Client Access	Web-based (HTML5), Mobile App (iOS/Android), Desktop Client
Security	TLS 1.3 encryption, OAuth 2.0, Active Directory integration
Redundancy	Hot-standby server redundancy, geo-redundancy options
Deployment	Cloud (AWS, Azure, Google Cloud), On-Premise, Hybrid

Substation Automation Technical Specifications

Feature	Specification
IEC 61850 Support	GOOSE, MMS, Sampled Values (SV), Edition 2.1
Control Functions	Breaker control, interlocking, tap changer control, synchronization
Protection Integration	SEL, Siemens, GE, ABB, Schneider Electric, and other major relay vendors
Power Quality	THD, power factor, voltage/frequency monitoring (IEC 61000-4-30 Class A)
FDIR	Automated fault detection, isolation, and restoration logic
Hardware Compatibility	OpCon™ series controllers, third-party RTUs, IEDs, and PLCs

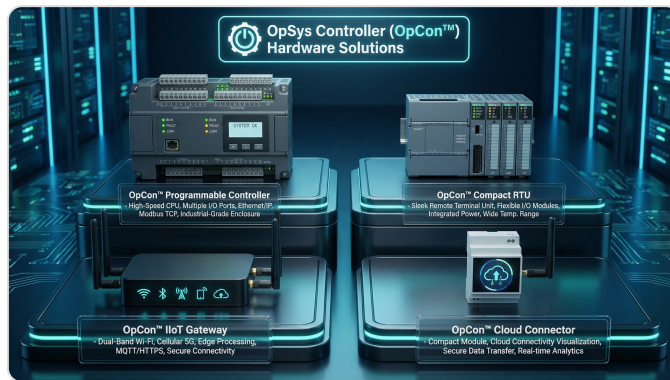
Key Platform Benefits

- **AI-Driven Insights:** Go beyond data visualization with proactive AI-driven insights
- **Unified Visibility:** A single pane of glass for all your renewable energy assets
- **Enhanced Operational Efficiency:** Automate routine tasks and optimize operations
- **Maximized Asset Performance:** Leverage advanced analytics and predictive maintenance

OpSys Controller (OpCon™)

The Foundation of Your Digital Energy System

OpCon™ is our suite of enterprise-grade, intelligent communication hardware designed for the demanding environment of renewable energy and substation automation.



OpCon™ Programmable Controller

Specification	Details
Processor	ARM Cortex-A9 Dual-Core, 1.2 GHz
Memory	2GB DDR3 RAM, 16GB eMMC Storage
I/O	16x DI, 8x DO, 8x AI, 4x AO (expandable via modules)
Communication	2x Gigabit Ethernet, 2x RS-485, CAN Bus, Optional Fiber Optic
Protocols	IEC 61850, IEC 60870-5-104, DNP3, Modbus TCP/RTU, OPC UA
Operating Temp	-40°C to +70°C

OpCon™ Compact RTU

Specification	Details
Processor	ARM Cortex-A8, 1.0 GHz
Memory	1GB DDR3 RAM, 8GB eMMC Storage
I/O	8x DI, 4x DO, 2x AI (expandable)
Communication	2x Ethernet, RS-485, Optional Cellular (4G/5G) or Wi-Fi
Protocols	DNP3, Modbus TCP/RTU, IEC 60870-5-101/104

OpCon™ IIoT Gateway & Cloud Connector

OpCon™ IIoT Gateway

Specification	Details
Connectivity	Wi-Fi, Cellular (4G/5G), Ethernet, LoRaWAN, Bluetooth
Cloud Integration	AWS IoT Core, Azure IoT Hub, Google Cloud IoT, MQTT, HTTPS
Edge Computing	Docker container support, Python/Node.js runtime, local data processing
Security	Hardware encryption (AES-256), secure boot, TLS 1.3, OTA firmware updates
Protocols	Modbus, DNP3, IEC 60870-5-104, MQTT, OPC UA, RESTful API

OpCon™ Cloud Connector

Specification	Details
Connectivity	Cellular (4G/5G), Ethernet, Wi-Fi
Cloud Platforms	AWS IoT, Azure IoT, Google Cloud, OpSys Cloud
Configuration	Zero-touch provisioning, web-based configuration, mobile app
Data Protocols	Modbus RTU/TCP, MQTT, HTTPS, JSON/XML

Why Choose OpCon™?

- **Industrial-Grade Reliability:** Designed for harsh environments with extended temperature ranges
- **Cybersecurity First:** Built-in security features including hardware encryption and IEC 62443 compliance
- **Flexible Deployment:** Support for cloud, on-premise, and hybrid architectures
- **Future-Proof:** Regular firmware updates and support for emerging protocols

AI-Based Power Plant Controller (OpPPC™)

Intelligent, Autonomous Plant Control

OpPPC™ is a state-of-the-art AI-based Power Plant Controller designed to provide autonomous, optimized control for renewable energy power plants. It ensures grid stability, maximizes revenue, and guarantees compliance with the most stringent grid codes worldwide.



Key Features

- **AI-Enhanced Control Algorithms:** Predictive control using machine learning models
- **Hybrid Plant Management:** Manages Solar PV, Wind, and BESS as a unified virtual power plant
- **Grid Code Compliance:** Pre-programmed with grid codes from over 50 countries
- **Market Integration:** Direct interfaces with energy markets for real-time economic dispatch
- **Advanced BESS Control:** Optimized charging/discharging strategies
- **Fault Ride-Through:** Advanced FRT capabilities for grid disturbances

Technical Specifications

Feature	Specification
Processor	Quad-core industrial-grade CPU with dedicated AI accelerator (GPU/TPU)
Control Loop	Sub-second control loop (100-500ms) for rapid response
Communication	IEC 61850, DNP3, Modbus TCP, OPC UA, 4G/5G cellular, Ethernet
HMI	15" industrial touchscreen with real-time visualization
Security	Built-in firewall, encrypted communication (TLS 1.3), IEC 62443 compliant
Redundancy	Hot-standby redundancy with automatic failover (< 1 second)

Energy Trading Platform

Maximize Revenue with Intelligent Energy Trading

Our AI-powered Energy Trading Platform enables you to participate in energy markets and maximize the revenue from your renewable assets.



Platform Features

- **Real-time Market Data:** Live feeds from all major electricity markets
- **AI-Powered Bidding Strategy:** Optimal bidding strategies based on market trends
- **Automated Trading:** Execute trades automatically based on pre-defined strategies
- **Portfolio Management:** Manage your entire portfolio from a single interface
- **Risk Management:** Advanced tools for managing market and operational risk
- **Settlement & Reconciliation:** Automated settlement processing

Supported Markets

Market Type	Description
Day-Ahead Market	Bid for electricity delivery 24 hours in advance
Intraday Market	Trade electricity closer to real-time
Balancing Market	Provide balancing services and frequency regulation
Capacity Market	Commit capacity for future delivery
REC Trading	Trade Renewable Energy Certificates

Plant Accounting & Settlement System

Streamlined Financial Management

Our Plant Accounting & Settlement System automates the entire financial workflow of your power plant, from invoice generation to settlement reconciliation.



System Features

- **Automated Invoice Generation:** Generate invoices based on meter data and contractual agreements
- **Settlement Reconciliation:** Reconcile settlements with grid operators and market operators
- **Revenue & Cost Tracking:** Detailed tracking of all revenue streams and operational costs
- **Financial Reporting:** Comprehensive financial reports for stakeholders and investors
- **Compliance Management:** Ensure compliance with financial and regulatory requirements
- **Performance Incentives:** Track and calculate performance-based incentives

Key Capabilities

Capability	Description
Revenue Breakdown	Detailed breakdown by energy source, market type, and time period
Cost Allocation	Allocate costs across different categories (O&M, capital expenses, grid charges)
Cash Flow Projections	AI-powered cash flow projections based on generation forecasts
Audit Trail	Complete audit trail of all financial transactions
Multi-Currency Support	Support for multiple currencies and automatic exchange rate updates

OpAmp - Asset Management Platform

Optimize Performance and Reliability

OpAmp is our comprehensive asset management platform, combining a Central Monitoring System (CMS) and a Computerized Maintenance Management System (CMMS) to optimize the performance and reliability of your renewable energy assets.



Central Monitoring System (CMS) Features

Feature	Description
Sensors	Devices that collect data from various sources, such as Inverters, Meters, and WMS sensors
Data Acquisition	Collects data from the sensors and converts it into digital signals for analysis and storage
Analysis & Visualization	Dashboards of the data collected, enabling them to make informed decisions
Control Systems	Operations to control various processes and components of the power plant remotely

CMMS & AI Analytics Features

Feature	Description
Predictive Maintenance	Uses machine learning to analyze performance data to predict failures before they occur
AI-Powered Anomaly Detection	Continuously monitor your assets to detect anomalies and alert you in real-time
Performance Forecasting	Leverage historical data and machine learning models to forecast energy production
Energy Production Analysis	BI/AI tools analyze energy production patterns and identify areas where energy is being wasted

Get Started with OpSys Today

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Our Solutions

REMS
SCADA
&
Substation
Automation

OpCon™
Controllers
&
Gateways

OpPPC™
AI
Power
Plant
Controller

Trading
Energy
Trading
Platform

Accounting
Plant
Accounting
System

OpAmp
Asset
Management

Powering the Future of Renewable Energy