Power Plant Controller (PPC)

Master your plant operations with intelligent control and seamless integration

PROTASIS® PPC delivers precise control of active and reactive power for utility-scale, renewable, hybrid, and industrial power plants

PROTASIS
engineering & consulting
with power, we perform

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CHALLENGES & MARKET NEEDS

Complexity is increasing in modern power plants and industrial facilities

Operators of power and industrial plants face multiple challenges: fluctuating generation, active & reactive power management, frequency stability, and operational compliance. High availability and precise control are critical to avoid costly downtime or penalties.

Key challenges:

- Precise active and reactive power control at the Point of Common Coupling (PCC)
- Compliance with the latest RfG network code (Requirements for Generators - EU 2016/631)
- Adapting to comply with different grid connection codes
- Frequency regulation and over-/under-frequency response
- Coordination of multiple inverters and heterogeneous assets
- Secure, real-time communication with SCADA/Energy Management Systems (EMS)
- Operation in both utility and industrial environments
- High availability, fault-tolerant operation, seamless mode transitions

THE SOLUTION

PROTASIS® PPC
Intelligent control for RES power generation and industrial operations

PROTASIS® PPC provides modular, PI-based closed-loop control for active power, reactive power, voltage and power factor. It guarantees smooth transitions between control modes and optimizes plant or industrial process performance.

01 | **Core Functionalities:**

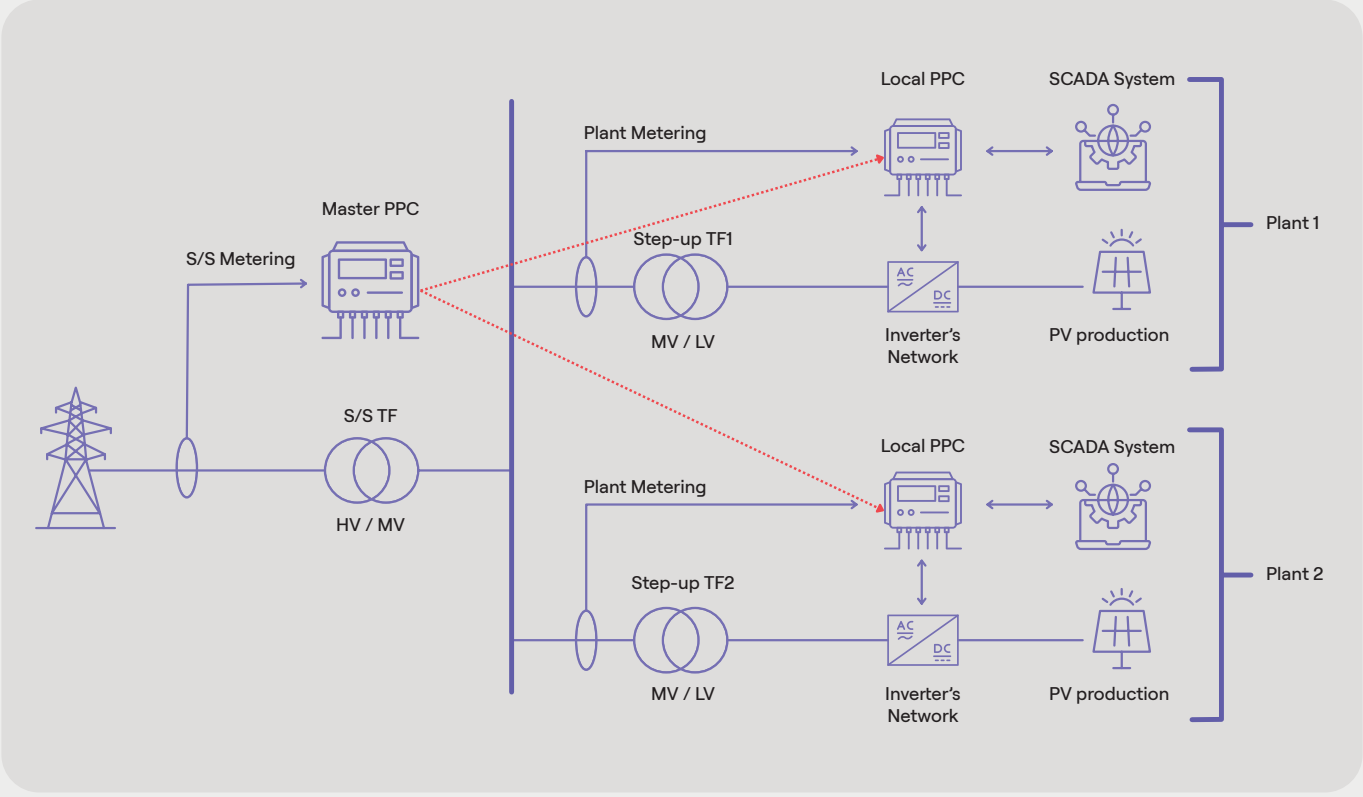
- Active power control: proportional integral (PI) controller, regulating the active power reference of the inverters; two-stage controller for input/output setpoints
- Reactive power control: closed-loop control of power factor, reactive power, and voltage compensation for both grid and industrial loads; supports low active power periods, night-time operation
- Power limit control: total plant capability curve dynamically limits output; prioritizes active or reactive power based on configuration
- Power tracking compensation: optimizes plant contribution during over-frequency events
- Frequency regulation: FSM, LFSM-U/O modes with adjustable droop curves
- Seamless mode switching for uninterrupted operation

02 | **Testing & Validation:**

- Certified by SGS according to NTS v2.1 and EU Regulation 2016/631
- Validated through Hardware-In-the-Loop (HIL) tests at the National Technical University of Athens
- Tested with Real-Time Digital Simulator (RTDS®), the global benchmark for real-time power system testing

SGS

Certificado de conformidad



03 | Technical Highlights:

- Two-stage proportional integral controllers (input/output)
- Compliance with RfG network code (Requirements for Generators – EU 2016/631)
- Adaptive design to comply with different grid connection codes and country-specific requirements
- Seamless mode switching without output fluctuations
- Dynamic integration with inverters and industrial loads
- Supports operations via both the local owner's SCADA and the remote TSO Energy Management System
- Hardwired interfaces: BI/BO, AI/AO cards
- Protocol interfaces: IEC-61850, MODBUS, IEC-60870-5-104/101, DNP3
- High-availability architecture for uninterrupted operations
- Scalable and modular for future expansions

04 | Applications:

- Utility-scale hybrid power plants
- Industrial plants requiring precise active/reactive power management
- Microgrids with dynamic load and generation coordination
- Plants requiring seamless local/remote control and mode transitions
- Facilities integrating multiple inverter types or third-party assets

PROTASIS

PRODUCT FUNCTIONALITIES & BENEFITS

Precise Control and Optimized Performance for every plant asset

Why choose PROTASIS® PPC?

Efficiency & Optimization
- Reduces energy losses and operational inefficiencies
- Optimizes active and reactive power dispatch
- Enhances inverter utilization and plant performance
- Supports dynamic load management in industrial environments

Reliability & Stability
- Certified by SGS (NTS v2.1) and compliant with EU Regulation 2016/631
- Seamless transition between control modes
- High-availability and redundant architecture
- Reliable response to frequency deviations and over-frequency events

Flexibility & Scalability
- Modular design adaptable to any industrial or utility plant
- Supports IEC-61131 function blocks and various communication protocols
- Integrates multiple inverter types and third-party assets
- Scales from small industrial plants to utility-scale power plants

Advanced Monitoring & Control
- Full SCADA and EMS integration with local/remote visibility
- Real-time monitoring, alarms, and historical data analysis
- Optimized energy tracking and power limitation
- Cybersecure architecture for safe industrial and grid operation

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PROTASIS, and its operations, are certified according to the latest applicable international standards, regarding the respective Management Systems

ISO 9001 : 2015 | ISO 14001 : 2015 | ISO 37001 : 2017 | ISO 45001 : 2018 | ISO 27001 : 2022

SUCCESS STORY

PROTASIS® PPC installed in 750 RES plants, compliant with Greek DNO requirements

The PROTASIS® Power Plant Controller (PPC), has been deployed across Greece to meet HEDNO's legislative requirements introduced in 2024. Designed for remote monitoring and control of RES plants, PPC ensures full compliance with national regulations and the RfG code.

01 | **Project Highlights:**

- Operational at nearly 750 sites connected to the distribution network
- Full compliance with legislative requirements set by the Greek DNO and the RfG code
- Future-proof design supporting evolving grid and network needs
- Local and remote control via Distribution Operator and RES Aggregator control centers
- Seamless integration of inverters, measurement devices, and software from internationally recognized manufacturers
- Rapid and straightforward installation, supported by technical guidance and expert support
- Comprehensive training and after-sales services for operators and technicians

02 | **Testing & Validation:**

Communication and functional tests were performed in collaboration with HEDNO across multiple sites, ensuring full compatibility with the DNO's Distribution Management System. These tests confirmed optimal system performance, regulatory compliance, and seamless integration into existing infrastructure.

03 | **Project Impact:**

The project demonstrates how PROTASIS® PPC can reliably manage distributed RES plants at scale while maintaining compliance with evolving grid codes, delivering operational efficiency, and enabling secure, remote supervisory control.

Take full control of your plant operations with PROTASIS® PPC, delivering compliance, reliability, and intelligent performance in any environment

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