EdgeTunePower

POWER PLANT CONTROLLER | PPC

iT-500

Platform

www.edgetunepower.com

THE IT-500 PLATFORM

Advanced Power Plant Controller (PPC)

ETP’s iT-500 platform is powered by an advanced Power Plant Controller (PPC), designed for real-time coordination of Inverter-Based Resources (IBRs). Engineered to industrial-grade standards, the iT-500 ensures high performance, reliability, and control. It’s an ideal solution for both hybrid and non-hybrid plants, as well as co-location projects with data centers.

KEY FEATURES

Voltage Control:

Maintain stable voltage levels across your power plant to ensure efficient and reliable operation, minimizing fluctuations that could affect system performance.

Reactive Power Control:

Manage reactive power effectively to support voltage stability and enhance power quality, ensuring your system meets all grid requirements.

Power Factor Control:

Optimize power factor to reduce losses and improve overall performance, enhancing the efficiency of your energy systems.

Frequency Ride-Through Requirements:

Meet critical frequency ride-through requirements to maintain operation during frequency disturbances, stabilizing the grid and preventing outages.

KEY FEATURES

Virtual Inertia Support:

Enhances grid stability by providing synthetic inertia response.

Night Mode Operation:

Optimizes control strategies for nighttime conditions to improve efficiency

Fault Ride-Through (FRT) with Delayed Response

Ensures the system can withstand faults by momentarily holding operation before tripping.

Hysteresis-Free Control

Prevents unwanted oscillations and improves dynamic response

Automatic Voltage Regulation (AVR)

Maintains voltage stability under varying grid conditions

Power Oscillation Damping (POD)

Mitigates power system oscillations to enhance stability.

Reactive Power (Q) Control

Enables dynamic adjustment of reactive power for voltage regulation.

Power Factor Control

Ensures grid code compliance by adjusting power factor as required.

Droop Control

Supports active power and frequency regulation for grid stabilization.

Capacitor Bank & STATCOM Compatibility

Supports both capacitor banks and STATCOM for enhanced reactive power management.

SEAMLESS COMMISSIONING WITH ADVANCED HIL TESTING

Overcoming Commissioning Challenges:

We simplify the commissioning process by addressing key challenges such as integrating control and protection elements, fine-tuning controller settings, and validating protection unit performance.

HIL Simulation for Enhanced Accuracy

Our advanced Hardware-in-the-Loop (HIL) simulations enable comprehensive plant performance testing, ensuring smooth commissioning and aligning operations with original design specifications.

Tailored Power Plant Control

Our Power Plant Controller is designed to meet your plant’s unique requirements, delivering an optimized solution that enhances performance, reliability, and efficiency.

WHY CHOOSE OUR POWER PLANT CONTROLLER?

Reliability:
Engineered for consistent performance under a variety of conditions.

Efficiency:
Advanced features to maximize energy output and minimize operational costs

Flexibility:
Adaptable to different configurations and energy requirements.

Continuous Support:
A dedicated team committed to supporting your system’s success.

Regional Insights:

Our system design leverages expertise in regional electricity markets like ERCOT, AESO, PJM, and MISO to create tailored solutions for each grid's challenges. This approach enhances efficiency, reliability, and sustainability while ensuring compliance with regulations and promoting a resilient energy landscape.

Proven Track Record:

We have a proven history of providing reliable energy solutions across sectors. Our experience enables us to develop innovative strategies that improve operational efficiency and support sustainability. Committed to excellence and adaptability, we are a trusted partner in energy management.

Advanced Voltage Stabilizer:

Delivers excellent voltage control under variable grid conditions, ensuring stable operation and enhancing system reliability.

Power and Voltage Oscillation Damping:

Our controller utilizes advanced technology to stabilize energy systems, reducing power and voltage oscillations for smoother operation and fewer disruptions.

Mitigation of Low-Frequency Oscillations:

Advanced control mechanisms to regulate and mitigate low-frequency oscillations, thereby improving system reliability and performance.

SSO/SSCI Management:

Advanced controllers for Sub-Synchronous Oscillation (SSO) ensure grid synchronization and maintain system stability based on SSO/SSCI frequency and plant latency.

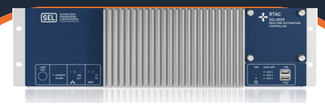
STATE-OF-THE-ART TECHNOLOGY:

EMBRACE THE FUTURE WITH SMART ENERGY SOLUTIONS THAT OPTIMIZE IBR INTEGRATION.

Intelligent energy solutions improve IBR integration, leading to more efficient and dependable management of renewable resources.

REAL-TIME POWER SYSTEM TESTING WITH IT-500

SEL - RTAC



IBR and DER Controllers

Data exchange between the simulator and Device Under Test (DuT) occurs via:

- Industrial Communication Protocols (e.g., IEC-61850)
- Analog and Digital I/O
- Fiber Optic connections.

iT-500 (PPC)

The control commands (or setpoints) and protection trip signals, issued by the DuT, are sent back to the real-time simulator

A wide range of electric grid signals, such as voltage, current, and breaker status, is sent to the DuT.

Protection Relays

Real-Time Simulator:
A real-time simulation shows a complete power system model, including DERs, electrical machines, loads, and transmission and distribution equipment.

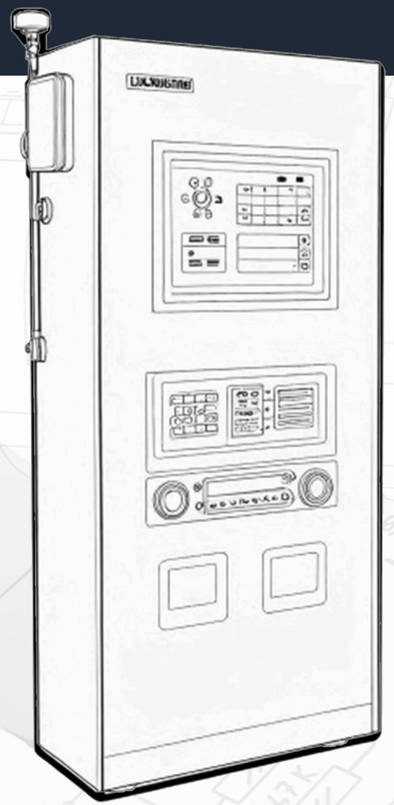
Monitoring Devices

The dynamic performance of a wide range of embedded control and protection components (i.e., DuT) is verified

EdgeTunePower

IT-500 PLATFORM

POWER PLANT CONTROLLER SPECIFICATIONS



Specifications | Physical Features	
High-definition HMI panel	• 12.1" (30.7 cm) TFT Display, 1024 x 768 pixels (XGA) • Arm® Cortex®-A72, Dual-core 1.8 GHz • 1x USB 3.0 Host Port, 2x Ethernet (10/100/1000 Mbps), RJ45, Debian/Linux OS, Firefox Browser
HVAC System	• Condensation prevention • Temperature range: -18°C to +65°C (0°F to +149°F) • Fan Auto/On switch with pilot light, aluminum alloy casing
SEL-RTAC or PLCnext Technology	• Dual Ethernet Ports: 2x Ethernet (10/100 Mbps) for communication and networking • High-speed data exchange and protocol conversion • Rugged Design for Industrial Environments • Supports Multiple Protocols including IEC • 61850, DNP3, and Modbus • Secure Remote Access with integrated firewall and VPN support
Power-supply System	• QUINT POWER, 24 V DC / 10 A, DIN rail mounting
Input-Output Modules	• 64 DI-DO, 32 AI-AO, +-TTL voltage range, resolution +-5 µVoltage
Cabinet Rating	• NEMA 4 / IP65
Cellular-based Module	• Industrial 5G router with fallback to 4G, 3G, and 2G networks, and features two Ethernet ports (10/100/1000 Mbps) for high-speed connectivity.
Single Cabinet Dimensions	• 800 mm (W) x 1200 mm (H) x 400 mm (D) • 31.5" (W) x 47.2" (H) x 15.7" (D)
Performance & Compliance Data	
Grid Code Compliance	• IEEE-2800, CSA 22.3, UL 1741, NERC, FERC, RFC (ReliabilityFirst), SERC, WECC
Warranty	• Standard: 3 years, Extended: 4-10 years
Certifications	• UL and CSA
Compliance	• IEC-61850, IEC 60870-5-101/104, Modbus (IEC 61158), IEC 62351, NERC-CIP
Advanced Features	• Modular and scalable design ensures future readiness, with built-in cybersecurity features for operation in challenging environments

COMPLIANCE WITH INDUSTRY STANDARDS

ERCOT (Electric Reliability Council of Texas):
Meets ERCOT’s stringent requirements.

PJM (PJM Interconnection):
Compliant with PJM standards for performance and integration.

MISO (Midcontinent Independent System Operator):
Aligns with MISO regulations for optimal grid compatibility.

CAISO (California Independent System Operator):
Adheres to CAISO regulations for efficient grid operation and integration.

AESO (Alberta Electric System Operator):
Compliant with AESO standards for grid integration and performance.

NERC (North American Electric Reliability Corporation):
Adheres to reliability standards for robust system performance.

Cybersecurity Compliance:
PPC ensures NERC-CIP cybersecurity compliance.

Modbus (IEC 61158):
Communication protocol widely used for industrial automation.

IEC 60870-5-101/104:
Telecontrol protocols commonly used in SCADA systems.

IEC 62351:
Security standards for communication networks and systems in power system operations.

UL 1741:
Meets safety and performance standards for inverters, converters, controllers, and interconnection equipment

CONTACT US

GET YOUR FREE DEMO TODAY AND EXPLORE OUR ENERGY SOLUTIONS!

Toronto: 2425 Matheson Blvd E 8th Floor, Mississauga, ON L4W 5K4 (REGUS), Room 817

Vancouver: 1021 Kennedy Avenue, North Vancouver, BC, V7R1L6, Canada

Laboratory: Unit 102, 1575 Pemberton Avenue, North Vancouver, BC, V7P2S3, Canada

info@edgetunepower.com
www.edgetunepower.com