

# FT8<sup>®</sup> Control Upgrade with GEN II Software

## GEN II is the best choice for primary turbine control.

PW Power Systems (PWPS) offers our advanced and proven GEN II control system based upon Woodward GAP™ and Citect HMI software. Coupled with the highly reliable Woodward MicroNet™ Plus hardware platform, it provides FT8 fleet customers with consistent and rapid control of their multi-shaft, high-speed, light inertia turbine systems while providing flexibility to make software changes independently. The GEN II control software evolved through work with our affiliate, Energy Services, Inc., which implemented this architecture on over 100 turbine controls retrofit projects featuring various OEM's gas turbines. Operators and asset owners can realize significant benefits while maintaining a robust and reliable high-speed gas turbine control system: improved troubleshooting, flexibility for customer to change logic, improved maintainability, and continued OEM support.

### Key Features of GEN II Controls

- Reliability – Redundant CPU, Network, and CAN-Bus communication; Woodward control modules have operated reliably for over 25 years
- Accuracy and Speed – Consistent and dependable control execution in the 5 to 10 millisecond range for critical, heavily loaded controller events (e.g., surge and flame detection and overspeed)
- Customer Interface – Performance monitoring capabilities; customized, online-programmable alarm set points; and discrete and analog trending capabilities
- Maintenance / Diagnostics – Hot swappable modules; high-speed data logs; and open-architecture logic diagrams allowing online adjustments
- Training and Documentation – Tailored to customer requirements; turbine model simulation for virtual plant operation allows practical operation and familiarity
- Open Architecture Logic Diagrams – Allow live viewing of all logic for rapid diagnostic solutions and minimized downtime

### Controls Upgrade Scope Flexibility

PWPS offers flexible and scalable upgrade solutions to meet customer needs. Upgrades can be deployed to satisfy customer budgetary requirements.

- Modernization flexibility allows you to choose upgrades that optimize your system controls
- PWPS control architecture and software standardization minimize downtime during migration to next generation technology
- Commissioning time and cost is reduced by using fully validated control software tested via high accuracy simulation software

### OEM Support and Spare Parts

PWPS offers sustained, full support from OEM engineers with gas turbine system and product expertise to support control system retrofits and upgrades. PWPS can support all FT8 customers with à la carte parts and service, but some services are accessed more efficiently when part of a fully integrated OEM system solution (e.g., engineering support, lease engines, remote monitoring, and field service).

## PW Power Systems

A Group Company of Mitsubishi Hitachi Power Systems

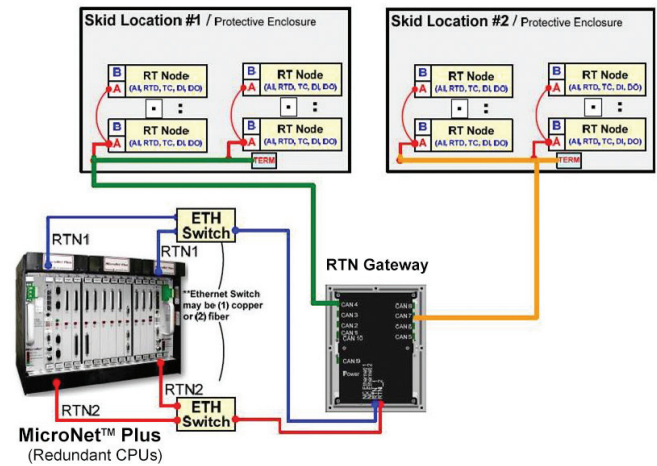


## Design Features for Multiple OEM Power Plants

PWPS has experience with the same software and hardware controlling multiple OEM gas turbines. We can customize a solution to meet your specific needs.

- HMI with same look and operability allows simplified cross-training for operators
- Identical diagnostic and reporting features improve troubleshooting
- Common control design allows for reduced spares inventory and operator familiarity

### MicroNet™ Plus Distributed I/O - Dual CPUs, Single GW, Simplex Nodes



## Cyber Security

- NERC compliant-capable network, computers, and control system
- CPUs available with a cyber protection package including secure password authentication, firewall, and encrypted communication tested to Achilles™ Level 1

## Upgrades for Gas Turbine OEMs

PWPS and its affiliate, Energy Services, Inc., have implemented upgrades and retrofits on installations powered by various gas turbine engines:

- PW Power Systems FT8® and FT4000®
- GE LM6000
- Westinghouse 501
- GE LM2500/LM2500+
- Rolls Royce Trent
- Pratt & Whitney FT4®

## Balance of Plant PLC/DCS Services

PWPS provides flexible BOP solutions to meet customer requirements. We have experience working with equipment and controls supplied by numerous OEMs including Rockwell/Allen Bradley, Honeywell, Siemens, Emerson, Modicon, and ABB.

## Customer Value

PWPS has provided innovative, high-quality control system solutions to the power industry for over 40 years. Our versatile engineering teams have extensive experience developing systems for power generation applications for multiple OEMs. Our dedicated field service group and customer support engineers ensure collaboration from product and system experts throughout the life cycle of your equipment.

**For more information, please contact your Customer Service Manager directly or email us at [GENII@pwps.com](mailto:GENII@pwps.com).**

# PW Power Systems

A Group Company of Mitsubishi Hitachi Power Systems

PW Power Systems, Inc.  
628 Hebron Avenue, Suite 400  
Glastonbury, CT 06033

1-866-POWERALL  
[www.pwps.com](http://www.pwps.com)