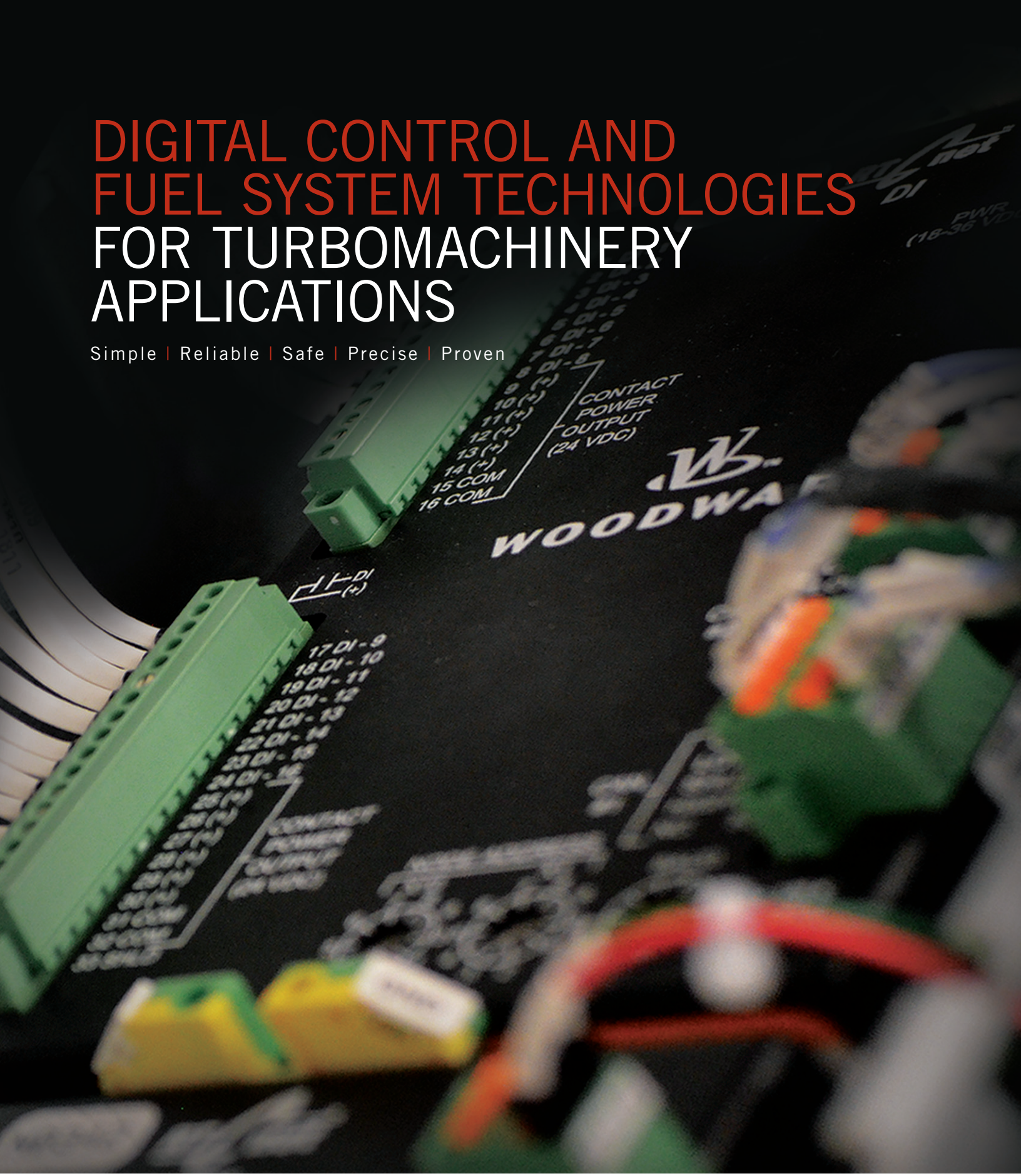
DIGITAL CONTROL AND FUEL SYSTEM TECHNOLOGIES FOR TURBOMACHINERY APPLICATIONS

Simple | Reliable | Safe | Precise | Proven



TURBOMACHINERY CONTROL EXPERTS

Turbines | Compressors | Safety | Actuation

WOODWARD

MOVING TECHNOLOGY FORWARD

WOODWARD IS COMMITTED TO DELIVERING HIGH QUALITY AND RELIABLE TURBINE CONTROL, SOFTWARE, AND FUEL SYSTEMS THAT MEET YOUR NEEDS AND PERFORM TO YOUR EXPECTATIONS.

We collaborate closely with our OEMs and their licensed packagers to provide the competitive advantages to develop systems that enhance profitability and meet the increasing demands and operational needs of the end-user.

Woodward designs and manufactures on-engine hydraulic pumps and actuators, gas, liquid, and water metering valves, shutoff valves, and digital control systems for a wide range of aeroderivative turbine applications. With Woodward's fully integrated control system architectures, costs are significantly reduced while performance and external communications are enhanced. Our extensive field and engineering experience is directly leveraged into new system designs and upgrades for existing gas turbine installations, enabling your turbine to perform better while making your system easier and safer to operate.



MicroNet™ Plus
Woodward's MicroNet™ Plus customizable control system is a flexible, state-of-the-art system specifically designed for controlling gas and steam turbines.

OEM QUALIFIED

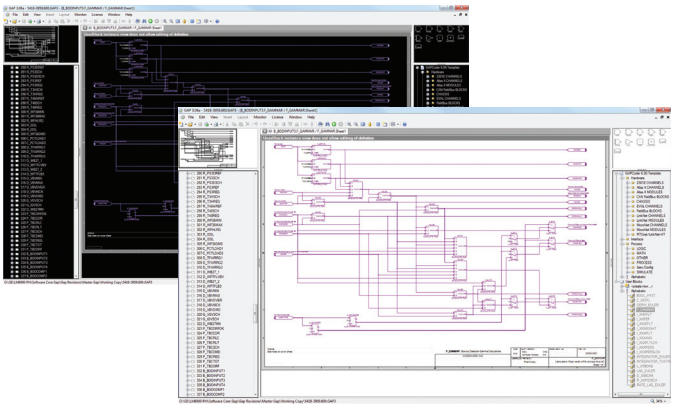
OEM control system qualification is a stringent process in which details of the control system design, architecture and performance are carefully scrutinized and validated to ensure that OEM turbine performance requirements are met. Woodward's MicroNet™ systems meet OEM's demanding performance requirements while addressing the end-user/operator's critical usability requirements. This includes verification of I/O signal processing accuracy, high-speed deterministic software execution, fault detection, and flexible hardware configurations and open architecture.

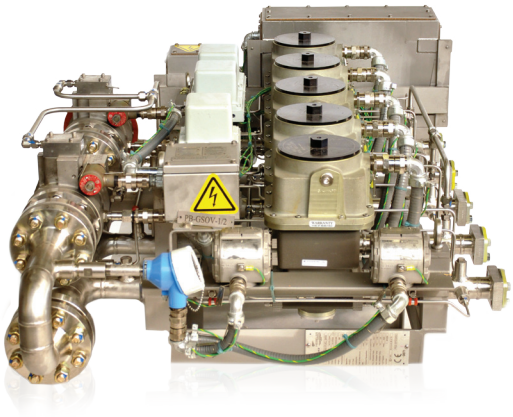
ROBUST SYSTEM ARCHITECTURE

Woodward's deterministic architecture and model-based algorithms are designed in collaboration with gas turbine OEMs to ensure performance and stability at all levels of operation. World class reliability and availability are achieved through implementation of design principles and practices developed from decades of turbomachinery control experience. Our experience provides you with peace of mind.

FEATURES AND BENEFITS

- Controls designed for safe, reliable control in harsh environments
- High-speed data logging enables optimized diagnosis and fast troubleshooting
- Simplex, dual redundant and triple modular redundant (TMR) configurations enhance reliability and availability
- Increased uptime through redundant system architecture, advanced system diagnostics and on-line (hot-swap) repair capability
- Easily integrated with plant control systems (open connectivity)
- Signal isolation provides immunity to EMI/RFI and ground loops
- Flexible and scalable solutions with incremental in-chassis or distributed I/O configurations possible
- Upgrades and modifications ensure long asset life and access to the latest functional capabilities at minimum cost





SIMULATION SOFTWARE TOOLS

Our Graphical Application Program (GAP™) software and NetSim™ simulation tools enable design, optimization and validation of turbine control operation.

FUEL METERING SYSTEMS

Reduce commissioning time and cost through implementation of our fully validated, highly reliable fuel skids. These metering system products perform with all-electric flow metering valves and instrumentation, eliminating the need for hydraulic or pneumatic input.

PRODUCT AND SERVICE SUPPORT

Woodward has provided innovative, high-quality control and fuel system solutions to the turbomachinery market for more than 140 years. Our global engineering teams have vast experience developing systems for turbine power generation and compressor applications. Our dedicated field service and support engineers ensure that our customers have exceptional support throughout the lifecycle of their equipment.

SUPPORT BENEFITS

- Installation and commissioning support is available - 24/7
- Modernization services provide you the confidence in seamless upgrades that optimize your fuel system controls
- Woodward's control architecture and software reuse minimizes downtime during migration to next generation technology while ensuring continued operational integrity of the turbine control
- Low total cost of ownership and easy upgrades to modernize your gas turbine control systems

GLOBAL SUPPORT

Woodward's global support network and our partners provide an extensive range of technical and after-sales support services. This global presence allows us to respond quickly to the needs of our customers anywhere in the world. In today's complex control world, customers have come to recognize our people's expertise beyond the control system and depend on our global teams as critical plant support assets.

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CONTENT

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