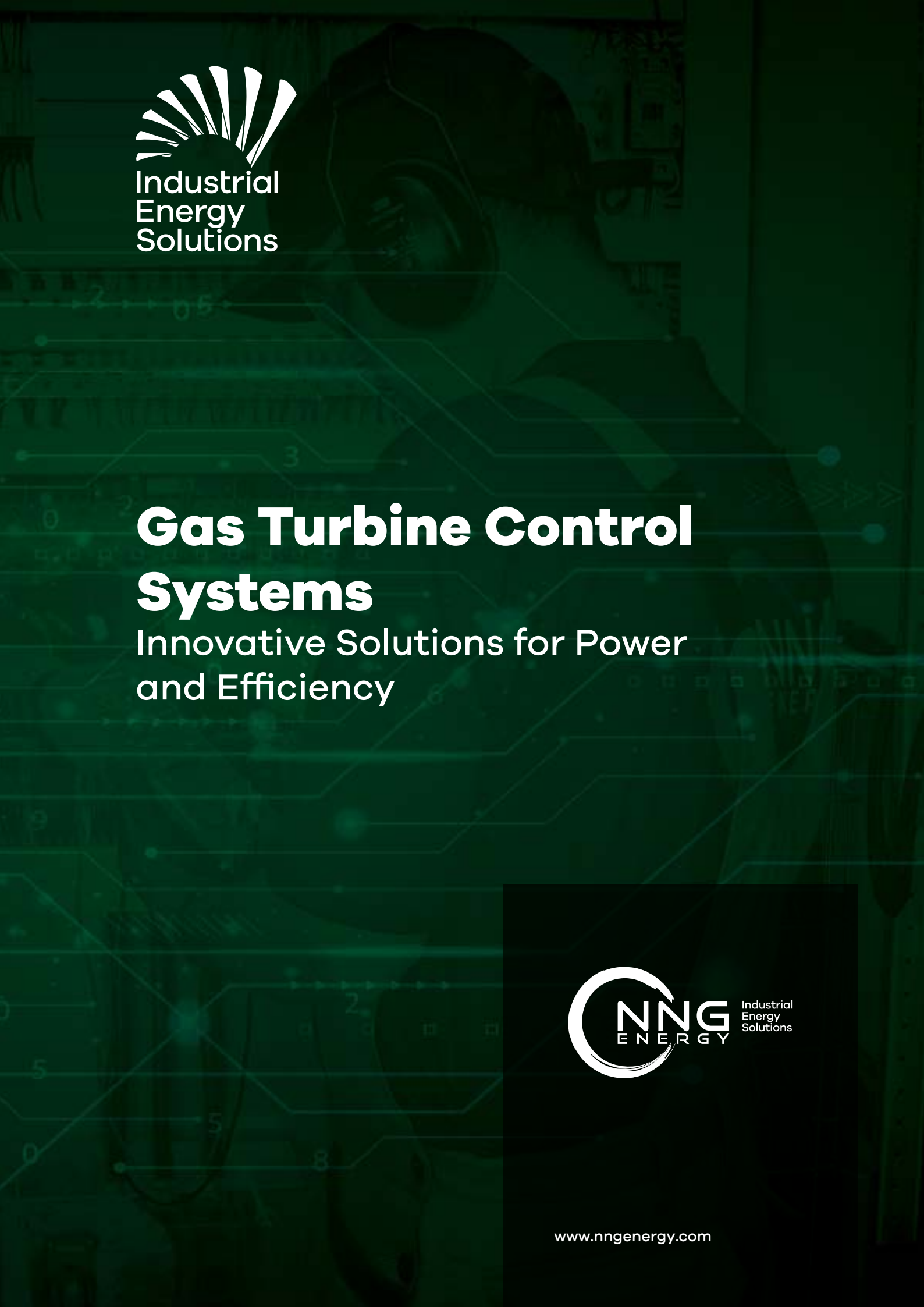


Industrial
Energy
Solutions

Gas Turbine Control Systems

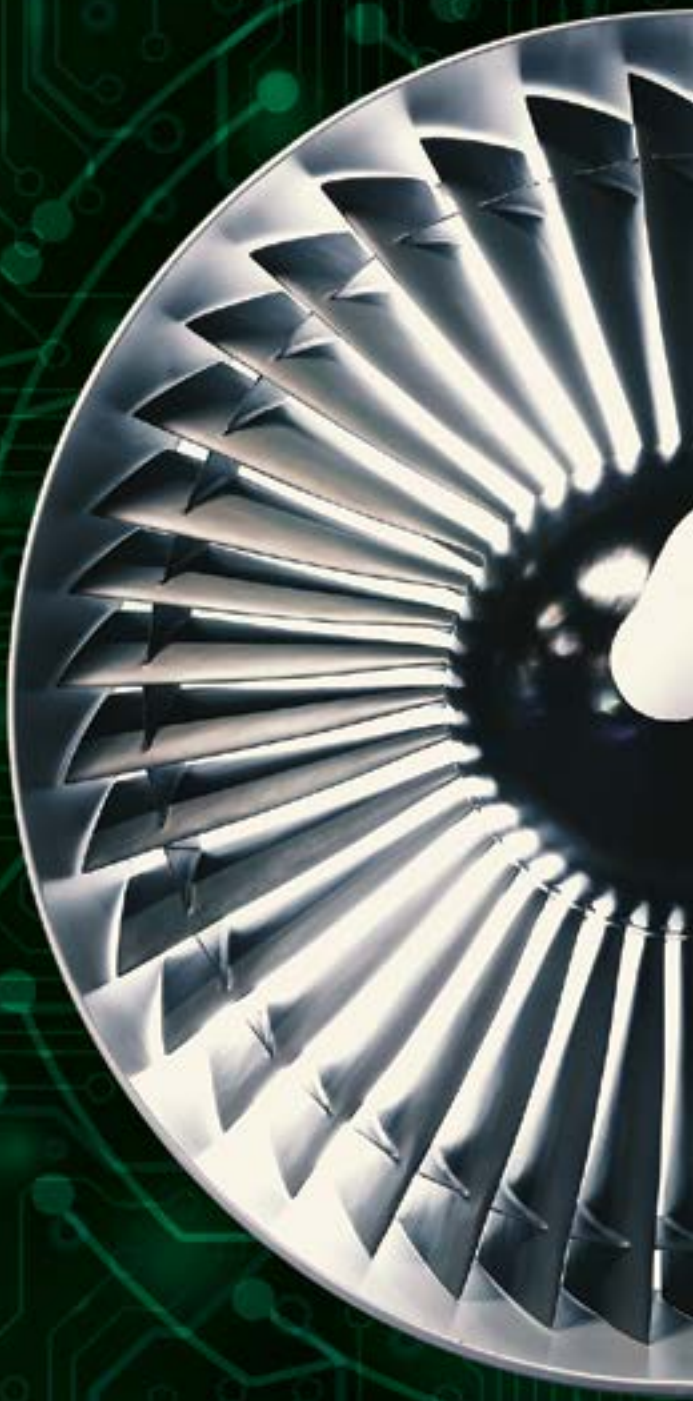
Innovative Solutions for Power and Efficiency

NNG ENERGY Industrial Energy Solutions

www.nngenergy.com

Powering the Future: Advanced Gas Turbine Control

Modern energy production demands efficiency and safety.
Our state-of-the-art control systems ensure optimal performance and security, making a difference in the energy sector.



Advanced Technology for Maximum Efficiency

Our company's gas turbine control systems are designed to revolutionize energy production by integrating advanced automation, high-precision control, and robust safety mechanisms. Utilizing cutting-edge technology, our solutions ensure seamless operation, maximize efficiency, and enhance reliability in gas turbine applications.

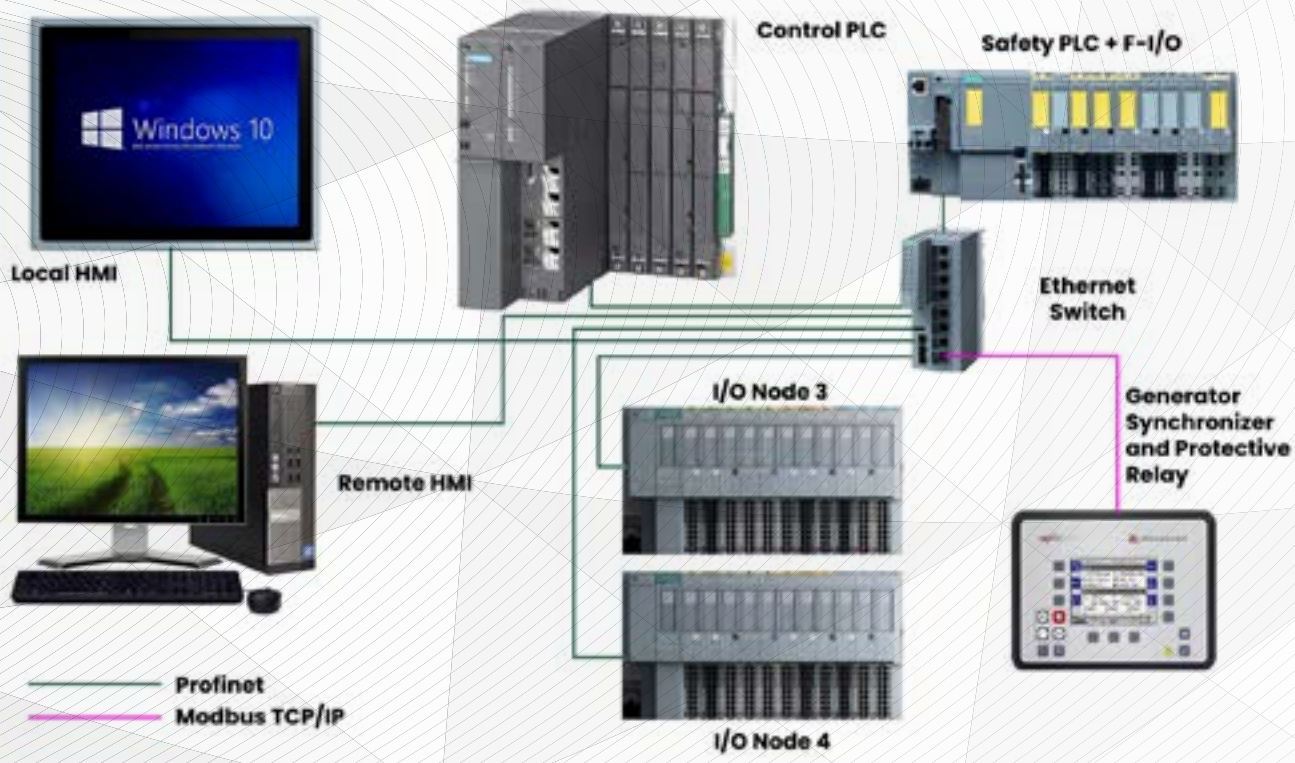
Seamless Operation with Intelligent Control

With intelligent control systems, real-time monitoring, and fail-safe security features, we provide a future-proof solution that minimizes operational risks and optimizes power generation. Whether for industrial applications, power plants, or critical infrastructure, our control systems adapt to the dynamic needs of modern energy production.

Let's Shape the Future of Energy Together

For a customized solution tailored to your requirements, or to learn more about how our innovative technology can improve your energy systems, feel free to contact our expert team.

Intelligent Control, Maximum Efficiency
Key Features of Our System



- ✓ **Advanced Automation:** Siemens S7-414 PLC enables automatic startup, acceleration, and monitoring.
- ✓ **Safety Measures:** Siemens S7-1512SP-F fail-safe CPU ensures system security.
- ✓ **User-Friendly Interface:** Easy monitoring and control via Siemens WinCC HMI software.
- ✓ **Integrated Synchronization:** Woodward EasyGen 3200-XT ensures generator synchronization and protection.
- ✓ **Voltage Control:** The generator output voltage is precisely regulated, enhancing energy quality and system stability.
- ✓ **Vibration and Overspeed Protection:** CEMB vibration monitoring cards and Braun Overspeed Protection relay ensure mechanical safety.
- ✓ **Differential and Current Protection:** MRDT4 protection relay ensures generator security.

The Brain Behind the Power:
System Components & Functions

Siemens S7-414 PLC Control System

This advanced controller fully automates the operational processes of your gas turbine, optimizing its performance. With high processing capacity, it ensures fast and reliable operation.

Main Functions:

- ✓ Primary Fuel Supply Control
- ✓ Turbine Exhaust Temperature Control and Limitation
- ✓ Speed Regulator Control
- ✓ Minimum/Maximum Fuel Limitations
- ✓ Fuel Demand Selection
- ✓ Fuel Valve Position Control (Feedback)
- ✓ Alarm and Fault Monitoring

Siemens S7-1512SP-F Safety System

This independently operating fail-safe CPU ensures the safe shutdown of the system in hazardous conditions such as overspeed, high exhaust temperature, or low oil pressure, thereby protecting your equipment. The safety system evaluates signals from gas detectors and fire detection systems, bringing the unit to a predefined safe state.

- ✓ Emergency Shutdown Function
- ✓ Gas Valve Tightness Check
- ✓ Flame Monitoring
- ✓ Ignition Time Monitoring
- ✓ Start-Up Time Monitoring
- ✓ Overspeed Monitoring
- ✓ Gas Leak Monitoring
- ✓ Control Heartbeat Monitoring

The inputs of the safety system are directly connected to safety modules in an acceptable manner. Since the system is designed to be fault-tolerant (fail-safe), it will automatically shut down in case of any input failure.

Siemens WinCC HMI Software
Thanks to its user-friendly interface, operators can easily monitor and manage the system's status. Real-time data allows for quick intervention.

Woodward EasyGen-3200XT Synchronization Device
This device integrates the synchronization and protection functions of generators, ensuring uninterrupted and safe energy production.

Leroy Somer D700 Digital Automatic Voltage Regulator
The generator output voltage is precisely regulated, enhancing energy quality and system stability.

MRDT4 Differential and Overcurrent Protection Relay
The MRDT4 is an advanced protection relay that ensures the safety of the gas turbine generator with differential protection and overcurrent protection functions.

Braun Overspeed Protection Relay
The Braun Overspeed Protection relay continuously monitors the turbine speed and activates the emergency shutdown mechanism if the safe speed limits are exceeded.

CEMB Vibration Monitoring Cards
The CEMB Vibration Monitoring Cards continuously track the vibration levels of the turbine, gearbox, and generator system.

Seamless Connectivity, **Enhanced Integration**

Profinet Network Structure

Our system connects all I/O nodes (S7-414 CPU, Safety PLCs, and HMIs) using the Profinet protocol.

Modbus TCP/IP

The Woodward EasyGen 3200-XT device has been integrated into the HMIs via Modbus TCP/IP for monitoring generator parameters.

NNG ENERGY
Industrial Energy Solutions

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