

# MicroNet™ Plus and MicroNet TMR® Platforms

## IEC 61508 SIL-3 Certification

### Safety

Safety is a major concern for owners and operators of rotating equipment in industrial environments. In an attempt to reduce the injuries and deaths in these environments, the International Electrotechnical Commission (IEC) created functional safety standards IEC61511 and IEC61508.



### Woodward's Role in Safety

To meet today's safety requirements, Woodward has updated its MicroNet™ Plus and MicroNet TMR® platforms' capabilities and related certifications. These updates include safety certified hardware, safety certified software, and safety certified production and engineering processes. Woodward's MicroNet-Plus and MicroNet TMR platforms are now certified for use in IEC61508 SIL-1, SIL-2 or SIL-3 (safety integrity level) applications.



### MicroNet Plus

In accordance with IEC 61508, TÜV Rheinland has approved the MicroNet Plus to be integrated into SIL-3 based safety systems using the following architecture:

- Triple or dual redundant I/O with 2-out-of-3, HSS or LSS based voting
- Dual redundant CPUs with synchronized memory and 1 millisecond transfer times
- Dual redundant power supplies with current sharing
- SIL-2 and SIL-3 based I/O routed through independent MicroNet Safety Module coverage



### MicroNet TMR

In accordance with IEC 61508, TÜV Rheinland has approved the MicroNet TMR to be integrated into SIL-3 based safety systems using the following architecture:

- Triple or dual redundant I/O with 2-out-of-3, HSS or LSS based voting
- Triple redundant CPUs with 2-out-of-3 voting, double shared I/O information, and synchronized execution code
- Dual redundant power supplies with current sharing
- SIL-2 and SIL-3 based I/O routed through independent MicroNet Safety Module

## Application

These MicroNet platforms can now be integrated as a safety PLC to create an IEC 61508 SIL-3 safety certified system. Both the MicroNet Plus and MicroNet TMR have been assessed by TÜV for use as a safety control platform in a complete SIL-3 safety system (MPUs, controller, trip solenoids, trip valves, wiring, etc.).

The MicroNet controller platform is a state-of-the-art digital control platform designed to reliably control and protect steam turbines, gas turbines, and compressor trains used in system-critical applications where the chance of a safety issues or large economic losses may be possible.

Typical Application Experience/Use:

- Refrigeration Compressors (ethylene, propylene)
- Methane and Syn Gas Compressors
- Gas Cracker Compressors
- Charge Gas Compressors
- Hydrogen Recycle Compressors
- Critical Turbine Generator Sets

The MicroNet Plus' dual redundant and the MicroNet TMR's 2-out-of-3 voted architecture ensures that correct decisions are made, correct responses are performed, and the prime-mover continues to safely operate no matter the single point failure. The MicroNet TMR's superior architecture and diagnostic coverage combine to create a system with more than 99.99% availability and 99.999% reliability.

For IEC61508 SIL-3 based applications, a safety certified MicroNet Safety Module (MSM) is required as part of the MicroNet system. The MSM functions as the system's SIL-3 logic solver, and its fast (12 millisecond) response time and integrated overspeed and acceleration detection/protection functionality make it ideal for applications on critical high-speed rotating motors, compressor, turbines, or engines. For more information on the MicroNet Safety Module, refer to Woodward product spec 03375.

“MicroNet’s deterministic rate group structure, coupled with its fast 10 millisecond scan rates, will make it the best safety controller on the market for use in turbine safety systems.”

Chief Rotary Equipment Engineer

## The Control that Doesn't Blink



*During the blink of an eye*, the MicroNet turbomachinery controls precisely and reliably scan key operating parameters over *40 times per second*. The MicroNet reacts instantly to plant, turbine, or compressor safety conditions, making it the ideal choice for new or retrofit safety systems on critical turbomachinery.



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