



# MOBILE AND INDUSTRIAL EQUIPMENT CONTROLS

PUTTING YOU IN CONTROL  
FROM ENGINE TO OUTPUT



# PRECISE ENGINE CONTROL AND SUPERIOR SYSTEMS INTEGRATION



MOBILE AND INDUSTRIAL EQUIPMENT CONTROLS

**FOUNDED IN 1870**, Woodward is the world's largest independent supplier of energy control solutions for aircraft and industrial engines, turbines, and powered equipment. **Our innovative control, fuel delivery, combustion, and automation systems help customers worldwide develop cleaner, more cost-effective and more reliable equipment.**

Listed on the Nasdaq as WGOV, Woodward is headquartered in Rockford, Illinois and supports the global market from many locations worldwide. Our products serve two major markets:

## **Aircraft Engine Systems**

Turbine engine control and combustion system and component solutions that equip the most complex aircraft propulsion applications in the world with proven fuel, combustion, heat management, and electrical systems.

## **Industrial Controls**

Integrated system and component solutions for industrial gas and diesel engine management, as well as for gas and steam turbines. These products measure, regulate and optimize the volume and mix of fuel and air to improve power output, efficiency and emissions.

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## A CULTURE OF CONTINUOUS IMPROVEMENT

Woodward supports our customers' success by focusing on **quality, delivery, responsiveness, and cost** (QDRC) in all our business relationships.

Woodward targets these QDRC goals by **systematically applying Six Sigma methodologies** to all processes. Woodward also follows **Lean and Kaizen principles**, which yield efficient processes through the elimination of waste and improved utilization of resources. These efficiency improvements combine to continually reduce lead times, turnaround times and work-in-process, while improving on-time delivery, responsiveness, and cost. In addition to these principles, Woodward facilities around the world have achieved comprehensive quality certifications such as ISO 9001, QS 9000, TS 16949, and AS 9100.





## MOBILE AND INDUSTRIAL EQUIPMENT

Whether it's forklifts, excavators, irrigation pumps or wood chippers, Woodward understands the key concerns of original equipment manufacturers (OEMs) today...

Emissions • Safety and Security • Productivity • Noise Abatement • Lower Operating Cost

In addition, our **energy control solutions for mobile equipment** help OEMs provide customers with competitive advantages that enhance their profitability.

Woodward components and energy control systems are used in diverse mobile and industrial equipment applications:

- Agriculture
- Auxiliary Power
- Construction and Off-Highway
- General Industrial
- Lawn and Garden
- Material Handling
- Marine
- Recreation and Utility Vehicles

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- ADVANCED TECHNOLOGY FOCUSED ON CONTROL SOLUTIONS
  - INNOVATIVE, COST-EFFECTIVE SOLUTIONS DRIVING OPERATIONAL EXCELLENCE
  - WELL-DIVERSIFIED GLOBAL STRATEGIES AND MARKET PRESENCE



# TOTAL MOTION CONTROL THROUGH VEHICLE AND ENGINE SYSTEMS INTEGRATION



## ELECTRONIC CONTROLS AND SOFTWARE

- Digital Engine Controllers
- Analog Engine Controllers
- Digital Vehicle Speed Controllers
- Actuators and Solenoids
- Drive-By-Wire Throttles
- PC-Based Calibration Tools



OPTIMIZED INTEGRATION OF FUEL AND COMBUSTION CONTROL FOR PRECISE EQUIPMENT OUTPUT

## FUEL AND AIR DELIVERY

- Electronic Throttles
- Mixers
- Carburetors
- Regulators
- Fuel Lock-Offs

## COMBUSTION CONTROL

- Engine Control Units
- Ignition

## SYSTEMS INTEGRATION

- CAN-BUS Integration
- Safety Interlocks
- MI-07 Systems



◆ Full authority engine control

◆ Gaseous and liquid fuel systems to meet local emissions requirements

◆ CAN-J1939 interface for remote motion control and vehicle networking

◆ Electronic shifting and automatic driveline locks

◆ Full authority engine control



◆ Vehicle ground speed and acceleration control



## MOBILE AND INDUSTRIAL EQUIPMENT CONTROLS



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### EXPERT APPLICATION ENGINEERING

Good control solutions are more than just components and systems. Good solutions also incorporate the experience, expertise, and analytical capabilities that Woodward brings to customers. Backed by knowledge gained from decades of managing and controlling engines of every size, type, and application, Woodward works closely with equipment manufacturers to provide well-integrated solutions that help **make today's engines and equipment operate more cleanly, reliably and efficiently.**

Woodward **teams with you early in the development cycle** to devise innovative technology solutions that shorten your time to market. Through optimization of our integrated systems and components, your equipment can achieve the **highest performance and reliability levels** at the lowest possible installed cost. And, by enabling vehicle network communications for information sharing, our systems can make that equipment **more efficient and productive, safer, more durable, and easier to maintain.**





## YOUR SATISFACTION IS OUR ULTIMATE MEASURE OF SUCCESS

Woodward customer service managers work with you to develop specific control system solutions that meet your support requirements, business objectives and operational needs. Woodward serves customers worldwide through manufacturing facilities and sales offices, central distributors and authorized dealers, and authorized independent service facilities.

### WOODWARD GLOBAL LOCATIONS

- Australia (Kingsgrove, New South Wales)
- Brazil (Campinas, São Paulo)
- China (Beijing)
- China (Suzhou) ▲
- China (Tianjin)
- Germany (Aken/Elbe)
- Germany (Stuttgart)
- India (Ballabgarh, Haryana)
- Japan (Tomisato) ▲
- Korea (Busan)
- The Netherlands (Hoofddorp) ▲
- UK (Cheltenham, England) ▲
- UK (Prestwick, Scotland)
- US (Fort Collins, Colorado)
- US (Loveland, Colorado)
- US (Mundelein, Illinois)
- US (Niles, Illinois) ▲
- US (Rockford, Illinois)
- US (Rockton, Illinois)
- US (Zeeland, Michigan)
- US (Greenville, South Carolina)

▲ Mobile and Industrial Equipment  
Sales Offices



**MOBILE AND INDUSTRIAL EQUIPMENT  
SALES OFFICES**

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