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Product Technical Brief

Universal Industrial Gateway

Technical Solution Overview

Empowering Innovation for over 40 years

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Core Functionality

Universal Industrial Gateway is engineered as a robust, compact industrial communication platform. Its physical dimensions (see Hardware and Dimensions) make it well suited for installation in existing control panels or electrical closets where space is limited. It supports DIN rail mounting via an integrated latch, simplifying installation and reducing deployment time.

Connectivity is a cornerstone of Universal Industrial Gateway's versatility. It provides six ports for flexible device connectivity, including two Ethernet ports and both RS-232 and RS-485 serial ports. The dual Ethernet ports can be configured in two distinct ways:

- as two ports on a single network sharing one IP and MAC address, or
- as two fully independent ports, each with its own IP address, MAC address, and subnet mask, while maintaining full access to all connected devices.

This capability is particularly valuable in data center environments, where logical or physical network segmentation is often required. Universal Industrial Gateway enables the creation of a dedicated OT network isolated from the primary IT network, aligning with cybersecurity best practices for critical infrastructure. Fully isolated serial ports extend connectivity to legacy equipment that lacks Ethernet support, preserving existing investments while enabling modern data integration.

Power requirements are flexible, with support for a 10–32 VDC input range compatible with standard industrial power supplies. Internally, Universal Industrial Gateway supports up to 100 tag pairs per map and up to 50 tag maps, providing ample scalability for most data center retrofit and expansion projects. Data configuration supports common industrial data types—including SINT, INT, REAL, BOOL, and STRING—and includes byte-swapping and word-swapping options to ensure interoperability across heterogeneous systems.

Universal Industrial Gateway functions as a universal protocol bridge through native support for twelve industrial communication protocols. This broad protocol coverage allows seamless integration between modern Ethernet-based systems and older serial-based equipment commonly found in legacy facilities. The following protocols are particularly relevant in data center environments:

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Comprehensive Protocol Support for Diverse Environments

Protocol	Typical Applications	Typical Applications
Modbus TCP	Power Distribution Units (PDUs), UPS systems, chillers, power meters	Real-time power consumption (kW), energy usage (kWh), voltage, current, power factor, breaker status, temperature, humidity
Modbus RTU / ASCII	Legacy PDUs, backup generators, HVAC sensors, older access control systems	Polling and data exchange with serial-based devices that predate Ethernet networking
EtherNet/IP	Modern CRACs, CRAHs, Variable Frequency Drives (VFDs)	Real-time fan speeds, temperature setpoints, operational status, alarms, and control commands
EtherNet/IP-PCCC	Legacy Rockwell Automation controllers (PLC-5, SLC 500)	Data access and integration with older Rockwell-based control systems
S7comm (ISO-TCP)	Siemens S7 PLCs controlling cooling plants, electrical switchgear, or security systems	Read/write access to Siemens PLC data for monitoring and control
DF1 (P2P / PCCC)	Legacy Rockwell / Allen-Bradley controllers	Serial communication with non-Ethernet Rockwell controllers
DirectNET CCM TI-HostLink PPI	Older PLCs from multiple vendors	Protocol bridging to legacy proprietary control systems

Universal Industrial Gateway can simultaneously bridge multiple protocols within a single installation. For example, it can connect a Modbus RTU-based PDU to a DCIM system using EtherNet/IP while also exchanging data with a Siemens PLC via S7comm. This multi-protocol concurrency significantly reduces integration complexity and eliminates the need for multiple dedicated gateways.

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Configuration & Usability

No-Code, Browser-Based Design

Configuration of Universal Industrial Gateway is designed for accessibility, requiring no specialized programming expertise. A browser-based interface provides a consistent configuration experience across all supported protocols, eliminating the need for additional software and reducing both cost and complexity.

Initial setup is straightforward. After DIN rail mounting, the user connects a 10–32 VDC power supply and an Ethernet cable. Universal Industrial Gateway boots and displays a default IP address, which can be entered into a web browser to access the configuration interface. As a security best practice, the default password should be changed immediately.

Configuration follows a logical, guided workflow outlined in the product documentation. Users first configure network settings, then define Devices within the interface—each corresponding to a physical PLC, meter, or controller and assigned the appropriate protocol and address. The core functionality is implemented through Tags and Tag Maps. Tags represent individual data points such as temperatures, power values, or status bits. Tag Maps define how data moves between source and destination tags—for example, mapping a Modbus RTU value to an EtherNet/IP register.

Universal Industrial Gateway supports two execution modes for data exchange:

- **On Change**, which pushes data only when a value changes—ideal for alarms, events, or control logic.
- **Periodic**, which transfers data on a fixed interval—ideal for trending, logging, and energy analysis.

The Live Tag Map Viewer provides real-time visibility into data flow, allowing users to quickly validate configuration and troubleshoot communication issues.

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The Spectrum Controls Solution

Industrial environments generate vast amounts of valuable operational data, but that data is often locked inside disconnected systems—modern Ethernet-based equipment, legacy serial devices, and proprietary controllers that were never designed to communicate with one another. This fragmentation limits visibility, increases operational risk, and makes it difficult to fully leverage existing assets.

Universal Industrial Gateway solves this problem by creating a unified communication layer across diverse industrial systems. By natively bridging multiple protocols and device generations, it enables real-time access to operational data without requiring costly rip-and-replace upgrades. Existing equipment remains in service while becoming part of a modern, connected architecture.

With unified data access, organizations can move from reactive operations to data-driven decision-making. Real-time monitoring enables faster troubleshooting and more informed control actions, while historical data collection supports trend analysis, performance optimization, and predictive maintenance. Subtle changes in process variables, electrical characteristics, or device behavior can be identified early—reducing unplanned downtime and extending asset life.

From an architectural standpoint, Universal Industrial Gateway supports secure network segmentation and controlled data exchange between operational and enterprise systems. This allows organizations to modernize safely, aligning with best practices while maintaining operational integrity.

Universal Industrial Gateway turns isolated industrial systems into connected, intelligent assets. It provides a scalable foundation for operational efficiency, risk reduction, and long-term digital transformation—allowing organizations to extract more value from the infrastructure they already own.

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For over 40 years, Spectrum Controls has been a trusted manufacturer of cutting edge industrial I/O, and is the first company to build licensed, core-technology I/O modules for Rockwell Automation® as a proud Technology Partner.

Focusing on expanding the capabilities of control systems, we offer a myriad of solutions to tackle the unique projects you face including high- density I/O, universal analog input, and specialized modules to harness the full capability of any system. All of our licensed hardware includes full TechConnect™ Support through Rockwell Automation support channels.

Our Universal Industrial Gateway combines the capabilities of multiple typical gateways into a single module that allows for seamless communication between multiple devices with a choice of 12 different protocols.

For visual communications in critical production environments, InView industrial LED displays offer robust hardware and class-leading ease of use thanks to our EasyTag technology.

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