

Unlocking IIoT Benefits in New and Legacy Modbus Systems



Exploring the ways all-in-one Modbus monitoring, data-logging and alarm devices provide enterprises of all sizes with the tools they need to easily join the IIoT revolution.

For many manufacturers, the Industrial Internet of Things (IIoT) has paved the way to better efficiency, predictive maintenance capabilities and data-driven decision making. Yet across the industry landscape, the realities of implementation have varied significantly. Whereas major corporations have invested millions of dollars in comprehensive digital transformation efforts, organizations across the spectrum — including those operating with legacy equipment and protocols — have found it difficult to justify the cost and complexity of traditional IIoT implementations.

This is the case for many facilities still using Modbus — a communication standard that serves as the backbone for many critical industrial and control systems due to its simplicity, reliability and open architecture. The challenge has never been whether these new and legacy systems could provide valuable data — they absolutely can — but rather how enterprises of all sizes can use ModBus to their advantage to efficiently collect, process and visualize information without investing in complex custom solutions or complete system overhauls.

Fortunately, a new architectural approach is emerging that specifically addresses this gap — one that leverages self-contained data collection units designed to seamlessly integrate with both new and legacy Modbus devices. This approach offers a straightforward entry point into the world of IIoT, allowing more organizations, especially small- and medium-sized companies, to begin their digital transformation journey with minimal investment and technical overhead.

What is Modbus?



Developed in 1979, Modbus is one of the most widely used protocols in industrial automation. As an open standard with a straightforward message format, it ensures compatibility between devices from different manufacturers while remaining easy to implement and debug. It offers flexibility through support for multiple communication modes (RTU, ASCII, TCP/IP) and physical media (RS-232, RS-485, Ethernet), and it has proven its reliability over decades of use in harsh industrial environments.

The Modbus protocol's simplicity reduces deployment time and effort, making it cost-effective due to its minimal hardware requirements. Its widespread adoption spans many industries, including industrial automation, building automation, energy management and transportation.

The IIoT Gateway Device

When combined with standalone, universal monitoring devices, Modbus presents a unique opportunity for enterprises of all sizes to begin to take advantage of the IIoT — particularly when it comes to collecting data at the sensor level. These self-contained data collection units enable companies that already use Modbus to reliably monitor their buildings, plants and machinery without incurring the high costs associated with more complex IIoT systems. At the same time, they have their own alerting and data storage capabilities, enhancing the device's functionality as a monitoring solution.

In addition, these Modbus monitoring devices are very accessible, requiring no special technical skills or IT specialists for installation and operation. They offer the ability to connect a variety of sensors and data-logging devices, allowing users to monitor and analyze various parameters, such as energy consumption, current, voltage, temperature, humidity, motion and noise levels.



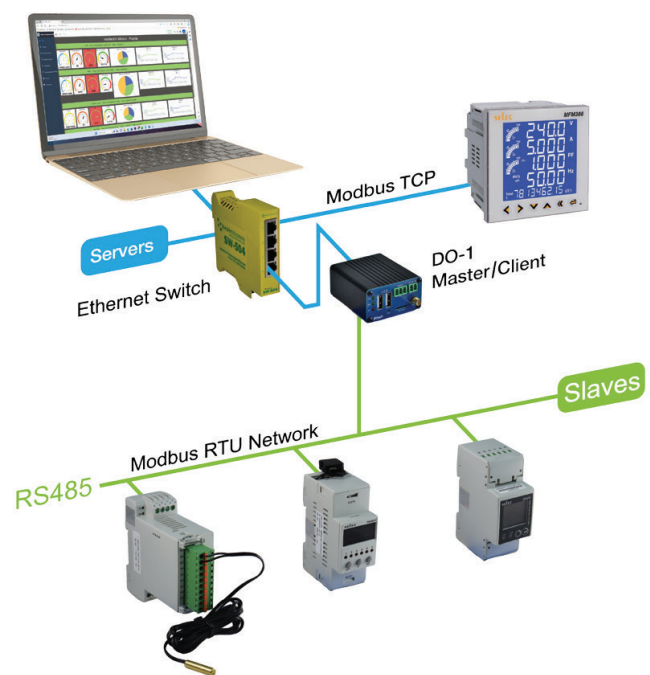
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Here's a rundown of this device's capabilities:

Monitoring and Alerting

Capable of monitoring up to 128 Modbus RTU/TCP devices, devices like the Altech DO-1 are a versatile choice for many applications. Their web-based software facilitates configuration and supports the creation of custom dashboards to visualize data. They also support individual alert or event settings with email notifications, enabling users to receive real-time alerts about the status of their monitored systems.



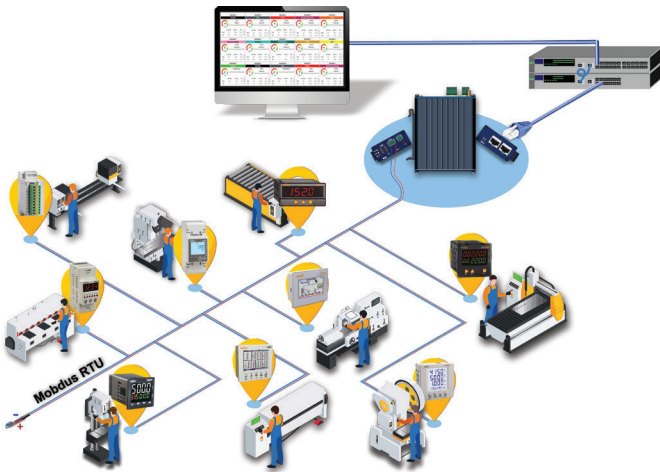
A diagram of Modbus system architecture, in which the DO-1 monitoring device integrates field-level RS485 devices into the Ethernet-based monitoring system.

Data Collection and Analysis

These monitoring devices offer robust data collection capabilities that allow users to extract filters for data to Excel or CSV files for analysis and reporting. The device is equipped with a real-time clock with 30-day battery backup, ensuring continuous operation even during power outages.

Connectivity and storage.

Devices support dual power input and offer 5 gigabytes (GB) of internal data storage with the option to expand up to 128 GB using an external SD card. They also feature a compact design with an optional DIN rail adapter for easy installation. Connectivity options include WiFi, with Bluetooth available as an optional feature.



Modbus monitoring devices support many applications in factory automation, providing an all-in-one monitoring solution that offers simplicity, security and flexibility.

The Benefits of Modbus Monitoring Devices

Developed to help companies monitor their buildings, plants and machines in a cost-effective and simple way, these monitoring devices support integration with both new and legacy Modbus networks, taking advantage of the protocol's widespread use across industries to enable fast, efficient data monitoring.

Here are some of the benefits — particularly for small- and medium-sized enterprises:

Cost-Effectiveness

The simplicity and ease of implementation of Modbus monitoring devices contribute to their cost-effectiveness. They have minimal hardware requirements and no subscription or license fees, making them an economical choice for companies looking to enhance their IIoT capabilities. This is especially the case for many small- and medium-sized organizations that might not otherwise consider a monitoring solution.

Real-time Data Exchange

Modbus monitoring devices facilitate real-time data exchange, enabling companies to monitor and control processes efficiently, improving operational efficiency and reducing downtime. They also unlock proactive maintenance capabilities, allowing operators to analyze data, set thresholds and identify potential issues before they cause major problems.

Flexibility

Modbus monitoring devices support both Modbus RTU and Modbus TCP protocols. This dual support allows for flexible integration into existing networks, whether they are based on serial communication (RS485) or Ethernet. The ability to seamlessly switch between these protocols enhances the adaptability of Modbus devices in various industrial settings.

Robustness and Reliability

Designed to operate in harsh industrial environments, Modbus devices can withstand electrical noise, temperature fluctuations and mechanical stress, ensuring consistent performance and maintaining uninterrupted operations in industrial settings.

Scalability

The Modbus protocol supports multiple physical layers and transmission methods, supporting flexible configurations. This scalability ensures Modbus monitoring devices can grow with the expanding demands of industrial operations, accommodating additional devices and increased data loads as needed.

Security Considerations

Industries can integrate Modbus devices with secure networks and protocols to mitigate potential security risks, ensuring safe and secure data transmission.

Get Started

Simplified monitoring solutions for Modbus devices are democratizing access to industrial data, providing enterprises of all sizes with the tools they need to easily join the IIoT revolution. By removing the traditional barriers to entry, these solutions are opening the door to valuable operational insights that were previously inaccessible.

[Learn more at altechcorp.com](https://altechcorp.com)

Applications for Modbus Monitoring Devices

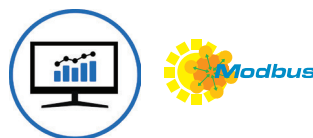
Modbus monitoring devices are suitable for many applications — from industrial automation and process control to smart building and energy management systems.

Examples include:

- Liquid level monitoring
- Building energy monitoring
- Machine monitoring in factories
- Monitoring greenhouses
- Remote machine status monitoring and data logging
- Monitoring warehouse sensors — e.g., light, load, motion and proximity sensors
- Monitoring sensors in server rooms and data centers
- Vibration monitoring in rotating devices
- Airflow monitoring
- Pressure monitoring
- Flow monitoring



The DO-1 Modbus monitoring device from Altech.



Front view



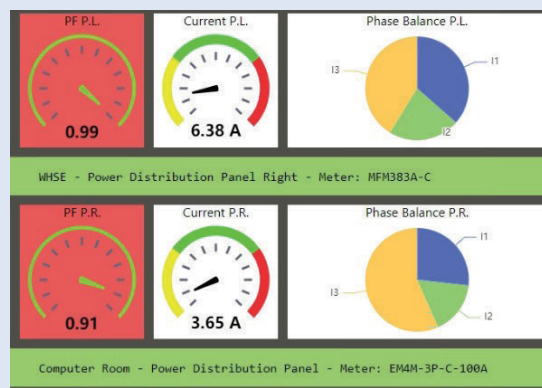
Rear view



Shown with optional antenna

About Altech's DO-1

The DO-1 is an all-in-one monitoring, data-logging and alarm device for industrial applications. It functions as a universal monitoring solution that can connect to and monitor up to 128 Modbus RTU/TCP devices simultaneously, collecting data from various sensors including temperature, humidity, pressure, vibration, energy and more. What sets the DO-1 apart is its user-friendly approach; it requires no programming knowledge, features a web-based interface for easy configuration and allows users to create custom dashboards and set up alarm notifications.



The device offers significant flexibility and cost-effectiveness with no subscription or licensing fees. It includes 5GB of internal storage, supports remote access capabilities and maintains data privacy by storing information locally rather than in the cloud. The DO-1 can be accessed via local area network, WiFi or internet, making it suitable for applications ranging from energy monitoring in buildings to machine monitoring in factories.

The DO-1 Modbus monitoring device from Altech.