

Modbus Gateways

Why Modbus?

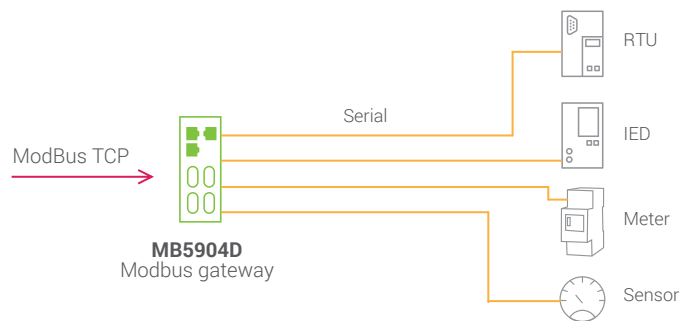
Modbus is one of the most popular and trusted protocols, with Modbus RTU (for serial connection) and Modbus TCP/IP (for Ethernet Networks) are normally used as the backbone preference in industrial automation, substation automation, and building automation solutions. To address the slow migration of communication standards from Serial- to Ethernet-based devices, ATOP has a complete range of Modbus Gateway devices to act converters to facilitate this migration, while extending the life of previous investment costs.

Product Line Overview

Entry level - Modbus Gateway

FEATURES

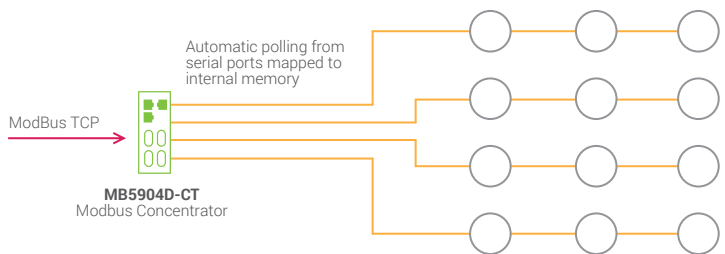
- Low-cost, easy to apply.
- Seamlessly provides conversion between ethernet-based Modbus TCP and serial-based Modbus RTU/ ASCII.
- Suitable for periodic data polling. Frequent pollings may cause long latencies and Modbus TCP Timeouts.



Advanced - Concentrator

FEATURES

- Suitable for frequent polling requests from multiple devices.
- Allows data to be polled automatically from slave devices. Data will be available for master polling at all times.
- Faster responsiveness, removing the risk of Modbus TCP timeouts.
- Customizable register mapping to optimize different masters needing to access different data structures.
- Supports link status and data timestamp access.

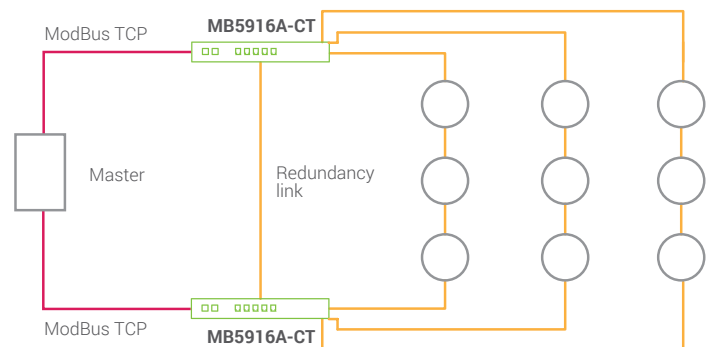


Top of the line - Redundant Concentrator

FEATURES

- All features of the Advanced Concentrator.
- Redundant architecture for the most mission critical applications. Automatic link recovery in case of Ethernet or Serial link failure.
- Supports link status and data timestamp access.
- High performance, reliability, and EMC protection.

Automatic polling from serial ports with link failure recovery mechanism.



Modbus Redundant Concentrator Success Story



Modbus Redundant Concentrator

Challenge: To manage through a Modbus TCP SCADA a large low-voltage substation infrastructure is Modbus RTU-based. The infrastructure is very complex, with each switchboard involving around 190 slaves that need to be accessed simultaneously for data, diagnostics, and configuration.

Location: Malaysia, Petrochemical and Refinery Complex

Protocol used: Modbus TCP/Modbus RTU.

Requirements: Short failure recovery time; very efficient Modbus polling in an environment with a high density of devices.

Challenges

- Supporting system integrator to define the topology.
- Customizing hardware with redundant Modbus concentrators with fiber uplink – 16 serial ports.
- Adjusting command priority to ensure each poll command can be executed within 600ms.
- Integration of customer's device management tool.
- On-site setup, config., test and troubleshooting.
- User-friendly configuration: development of a colored-block UI to identify memory area and enable easy set up of the memory mapping.

Solution provided

- Modbus redundant concentrators designed and set up in pairs, with redundancy fiber link between them and COM links that start from one device and end with the another.
- Software customization and optimization.
- Managed Ethernet switches providing the backbone to the customer's EWS.

Results achieved

- 600 ms complete polling for more than 100 slaves, each with 20 registers (19200 bps).
- 500 ms secondary recovery to handle primary device downtime or device failure.
- Multi-write command to map different slaves simultaneously to improve efficiency.

Network Topology

