

MULTIPLE CLIENTS SHARING SERIAL MODBUS SERVERS



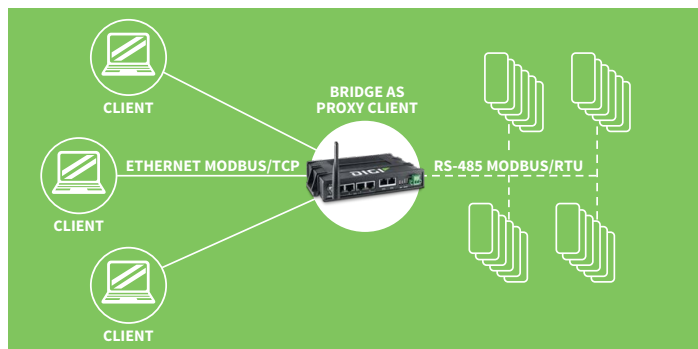
MODBUS SERIAL PROTOCOLS

The Modbus serial protocols are supported on more industrial products by more vendors than any other protocol. Modbus is by far the most commonly deployed protocol across the widest range of industries and applications. Modbus is a fundamental common-interface in many multi-vendor systems.

Modbus TCP enables easy support for multiple Modbus Serial Servers in SCADA, DCS, or HMI systems, including the advanced Digi Connect® EZ solution. Digi Connect EZ is designed to modernize operational infrastructure with enhanced network connectivity. The simple, click-to-connect technology provides options with 1, 2, 4, 8, 16, or 32 serial ports.

The answer is simple: use a bridge to make them all look like Modbus servers. Both Modbus TCP and Modbus RTU share the same command structure, so it is clean and efficient to map between the two. With Modbus TCP a SCADA, DCS, or HMI system can easily and flexibly access the full Modbus standard 247 end devices per client including support for RS485 mutidrop of up to 31 devices from each 485 enabled port. Modbus TCP to Modbus serial bridges enable more flexible and resilient communication between Modbus devices and redundant SCADA systems.

MULTIPLE CLIENTS SHARE MODBUS/RTU DEVICES



Each bridge device has a single IP address and can support connecting multiple modbus devices, including via RS-485 and multi-drop. Addressing a specific server is now defined by an IP address plus a server address. This server address in Modbus TCP is formally called a “unit id” or a “bridge destination index” in the Modbus device. The bridge accepts a Modbus device TCP request, converts it to Modbus RTU (or Modbus ASCII). The serial response is converted to become a Modbus TCP response. In most situations the Modbus TCP Client can be completely unaware that it is talking to a Modbus serial server.

The use of bridges for TCP to serial has an interesting side effect — a wonderful case of “two + two = five”. Serial Modbus is limited to a sole client presiding over a group of servers. Since Modbus TCP allows many concurrent sessions (or sockets), many Modbus TCP clients can connect to the bridge at the same time. To the serial server, the bridge acts as the sole client. To the remote Modbus TCP clients, the bridge acts like the group of servers, transparently managing the many concurrent transactions so that each client thinks it has sole access to all the servers. The only real impact between the clients is that they compete for the limited serial bandwidth — likely only 2 to 10 messages per second per serial line can be handled. This shows itself to the clients as increasingly sluggish server responses when more clients access the bridge.

SERIAL BRIDGES ARE NOT CREATED EQUAL

Modbus TCP to serial bridges are available from many sources, but they are not all created equal. Make sure you carefully evaluate your needs before making an investment. Some of the common features that differentiate products:

- 1 **Mounting:** DIN rail, panel mount, or free standing
- 2 **Serial media:** EIA-232, EIA-422, EIA-485 2 or 4-wire (some support only one, some support many)
- 3 **How many concurrent Modbus TCP sockets?** 4, 8, 32, or more (many clients require 1 socket per serial server, so this limits the size of your multi-drop)

DIGI'S MODBUS BRIDGE — DIGI CONNECT® EZ 4i



- Supports multiple remote clients per gateway.
- DIN rail, 9-30 VDC power.
- Software-selectable RS-232/422/485.
- Dual 10/100/1000 Ethernet with optional Wi-Fi, industrial temp, C1D2 rating and LTE.
- Easy configuration by [Digi Navigator](#).
- Does NOT suffer the network over-run problem common in older Modbus bridge products (including Modicon CEV).
- Serial ports can be used to manage multiple Modbus devices or to allow connection of a local HMI or serial client.
- Ideal for applications requiring COM ports, serial tunneling or TCP/UDP sockets.

Explore Our Serial Connectivity Solutions