

## Description

The Modbus TCP/IP Driver allows the FieldServer to transfer data to and from devices over Ethernet using Modbus TCP/IP Protocol. The Modbus TCP/IP driver uses port 502. This port is configurable. The driver was developed for Modbus Application Protocol Specification V1.1a from Modbus-IDA. The specification can be found at [www.modbus.org](http://www.modbus.org). The FieldServer can emulate both a Client and a Server simultaneously on the same Ethernet port. When configured as a client, the Modbus TCP/IP driver can send up to ten concurrent polls.

The information that follows describes how to expand upon the factory defaults provided in the configuration files included with the FieldServer.

## Modbus Data Address Formats

There are various register addressing models followed by vendors. FieldServer uses the following three formats:

- **Modicon\_5-Digit** – Use this format where addresses are defined in 0xxxx, 1xxxx, 3xxxx or 4xxxx format. These respectively refer to Coil, Discrete Input, Input Register, and Holding Register data types. A maximum of 9999 registers can be configured for each type, in the range x0001 - x9999. This is FieldServer driver's default format.
- **ADU** – Application Data Unit address. Use this format where addresses of each type are defined in the range 1-65536. They mirror a scenario where a device's physical inputs or outputs are numbered starting from 1.
- **PDU** – Protocol Data Unit address. Use this format where addresses of each type are defined in the range 0-65535. PDU addresses match the actual address bytes “on the wire” in the Modbus messages.

As an example, the key difference between ADU and PDU is that if the address format is ADU and the configured address is 1, the driver will poll register 0. If address format is PDU and the configured address is 1, the driver will poll register 1.

**NOTE 1:** If a vendor document shows addresses in extended Modicon (i.e. 6 digit) format like 4xxxxx then consider these addresses as xxxxx (just omit the first digit) and use either ADU or PDU.

**NOTE 2:** The purpose of providing three different ways of addressing the Modbus registers is to allow the user to choose the addressing system most compatible with the address list being used. At the protocol level, the same protocol specification is used for all three with the exception of the limited address range for Modicon\_5-Digit.

## Connection Facts

FieldServer Mode	Nodes	Comments
Client	1	Only 1 client node allowed on Multidrop systems
Server	255	Actual electrical loading may reduce number of usable server nodes

## Formal Driver Type

Ethernet, Client or Server

## Compatibility

FieldServer Model	Compatible	FieldServer Model	Compatible
ProtoCessor	Yes	QuickServer FS-QS-10xx	Yes
ProtoCarrier	Yes	QuickServer FS-QS-12xx	Yes
ProtoNode	Yes	QuickServer FS-QS-20xx	Yes
ProtoAir	Yes	QuickServer FS-QS-22xx	Yes
BACnet IoT Gateway	No	QuickServer FS-QS-3x10-F	Yes
Modbus IoT Gateway	Yes		

## Connection Information

Connection Type: Ethernet

Ethernet Speeds Supported: 10Base-T, 100Base-T

## Devices Tested

Device	Tested (Factory, Site)
Quantum PLCs	Customer
Fix Intellution	Factory
Wonderware Intouch	Factory
GE Cimplicity	Customer
Others	Contact factory

## Communication Functions

Function Codes Supported	
Function Codes	Description
01	Read Discrete Output Status (0xxxx)
02	Read Discrete Input Status (1xxxx)
03	Read Output Registers (4xxxx)
04	Read Input Registers (3xxxx)
05	Force Single Coil (0xxxx)
06	Preset Single Register (4xxxx)
15	Force Multiple Coils (0xxxx)
16	Preset Multiple Registers (4xxxx)
17	Report Slave ID
EX	Exception Status
FF	FIFO