Modbus RTU & ASCII

Description

The Modbus RTU and Modbus ASCII drivers allow the FieldServer to transfer data to and from devices using Modbus RTU or Modbus ASCII protocol respectively. Data can be transferred over either RS 232 or RS-485. The driver was developed for Modbus Application Protocol Specification V1.1a from Modbus-IDA. The specification can be found at www.modbus.org.

The FieldServer can emulate either a Server or Client.

Modbus Data Address Format

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 mapped of 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 the address format is PDU and the configured address is 1, the driver will poll register 1.

Note 1: If 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

Serial, Client or Server

Compatibility

FieldServer Model	Compatible
ProtoCessor	Yes
ProtoCarrier	Yes
ProtoNode	Yes
ProtoAir	Yes
BACnet IoT Gateway	No
Modbus IoT Gateway	Yes

FieldServer Model	Compatible
QuickServer FS-QS-10xx	Yes
QuickServer FS-QS-12xx	Yes
QuickServer FS-QS-20xx	Yes
QuickServer FS-QS-22xx	Yes
QuickServer FS-QS-3x10-F	Yes

Propel Item: T28600-01
Revision: 3.C
Protocol Number: FS-8700-01

Connection Information

Connection Type: RS-232 or RS-485 (two wire, half-duplex)

Baud Rates: 110 – 115200, standard baud rates only

Data Bits: 7, **8**

Parity: Even, Odd, **None**

Multidrop Capability: Yes

Devices Tested

Device	Tested (Factory, Site)
Modbus RTU Devices	Factory
Modbus ASCII Devices	Factory
Liebert Sitelink	Customer
Square D Activar 58	Customer
Triatek	Customer
WonderWare InTouch	Factory
Fix Intellution	Factory
GE Cimplicity	Customer
Modscan	Factory
GE PLEPM	Factory
ABB Extrel	Customer
Controls	Customer
Eurotherm Chessel	Customer
MSA Sentry	Factory
Magnatek	Customer

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

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