



**FieldServer**  
**FS-8700-15 Modbus Daniels**  
**Driver Manual**  
(Supplement to the FieldServer Instruction Manual)

**APPLICABILITY & EFFECTIVITY**

**Effective for all systems manufactured after November 2015**

Driver Version: 1.00  
Document Revision: 0

## Contact Information:

Thank you for purchasing the FieldServer.

Please call us for Technical support of the FieldServer product.

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## 1 MODBUS DANIELS DESCRIPTION

The Modbus Daniels driver allows the FieldServer to transfer data to and from devices over either RS-232 or RS-485 using Modbus Daniels protocol. The FieldServer can only emulate a Client.

Modbus Daniels is an inclusion into Modbus ASCII, allowing floats to be used. Modbus Daniels is designed to support floats in the address range 7000 to 7999. The “Double” data type is not supported. Other standard Modbus data types are supported.

### Max Nodes Supported

| FieldServer Mode | Nodes | Comments  |
|------------------|-------|---|
| Client           | 255   | The maximum achievable number of devices on the network may be less depending on device loading and network speed characteristics. Only one client device allowed on multidrop systems. |

## 2 DRIVER SCOPE OF SUPPLY

### 2.1 Supplied by Sierra Monitor Corporation for this driver

| Sierra Monitor Corporation PART # | Description                       |
|-----------------------------------|-----------------------------------|
| FS-8915-10                        | UTP cable (7 foot) for RS-232 use |
| FS-8917-01                        | RJ45 to DB25M connection adapter  |
| SPA59132                          | RS-485 connection adapter         |
| FS-8700-15                        | Driver Manual                     |

### 2.2 Provided by the Supplier of 3<sup>rd</sup> Party Equipment

#### 2.2.1 Required 3<sup>rd</sup> Party Hardware

| Part # | Description  |
|--------|--|
|        | The Modbus Daniels device must be set to use Modbus ASCII protocol |

### 3 HARDWARE CONNECTIONS

The FieldServer is connected to the Modbus Daniels Device as shown in the connection drawing.

Configure the Modbus Daniels device according to manufacturer's instructions.

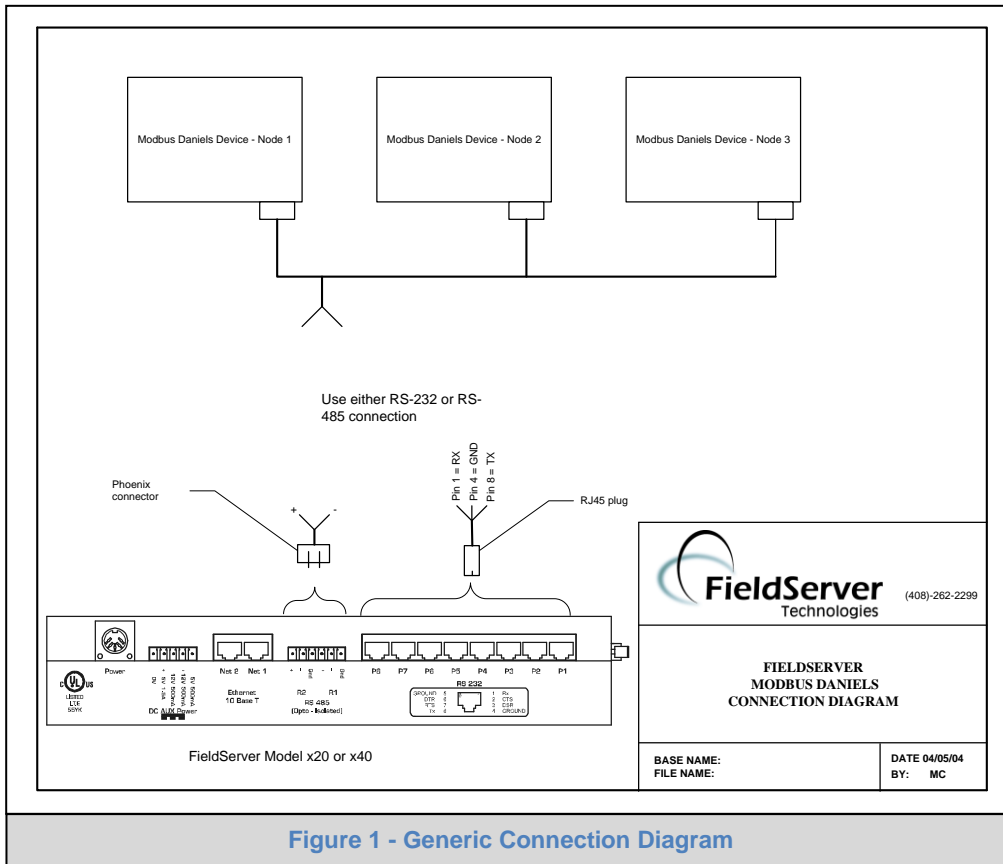


Figure 1 - Generic Connection Diagram

## 4 CONFIGURING THE FIELD SERVER AS A MODBUS DANIELS CLIENT

For a detailed discussion on FieldServer configuration, please refer to the FieldServer Configuration Manual. The information that follows describes how to expand upon the factory defaults provided in the configuration files included with the FieldServer (See “.csv” sample files provided with the FS).

This section documents and describes the parameters necessary for configuring the FieldServer to communicate with a Modbus Daniels Server.

### 4.1 Data Arrays/Descriptors

The configuration file tells the FieldServer about its interfaces, and the routing of data required. In order to enable the FieldServer for Modbus Daniels communications, the driver independent FieldServer buffers need to be declared in the “Data Arrays” section, the destination device addresses need to be declared in the “Client Side Nodes” section, and the data required from the servers needs to be mapped in the “Client Side Map Descriptors” section. Details on how to do this can be found below.

Note that in the tables, \* indicates an optional parameter, with the bold legal value being the default.

| Section Title     |  |   |
|-------------------|--|---|
| Data_Arrays       |  |   |
| Column Title      | Function   | Legal Values  |
| Data_Array_Name   | Provide name for Data Array  | Up to 15 alphanumeric characters  |
| Data_Array_Format | Provide data format. Each Data Array can only take on one format.  | Float, Bit, UInt16, SInt16, Packed_Bit, Byte, Packed_Byte, Swapped_Byte |
| Data_Array_Length | Number of Data Objects. Must be larger than the data storage area required by the Map Descriptors for the data being placed in this array. | 1-10,000  |

**Example**

```

// Data Arrays
Data_Arrays
Data_Array_Name      , Data_Format      , Data_Array_Length
DA_AI_01             , UInt16           , 200
DA_AO_01             , UInt16           , 200
DA_DI_01             , Bit              , 200
DA_DO_01             , Bit              , 200
    
```

## 4.2 Client Side Connection Parameters

| Section Title |   |   |
|---------------|---|---|
| Connections   |   |   |
| Column Title  | Function  | Legal Values  |
| Port          | Specify which port the device is connected to the FieldServer | FS-X40 Serves: P1-P8, R1-R2<br>FS-X20 Serves: Serial Port |
| Protocol      | Specify protocol used   | Modbus_Daniels  |
| Baud*         | Specify baud rate   | 110 – 115200, standard baud rates only, 9600              |
| Parity*       | Specify parity  | Even, Odd, None, Mark, Space                              |
| Data_Bits*    | Specify data bits   | 7, 8  |
| Stop_Bits*    | Specify stop bits   | 1   |
| Poll_Delay*   | Time between internal polls                                   | 0-32000 seconds, 1 second                                 |

### Example

```
// Client Side Connections

Connections
Port      , Protocol      , Baud   , Parity  , Poll_Delay
P1        , Modbus_Daniels      , 9600   , Even   , 0.100s
```

## 4.3 Client Side Node Descriptors

| Section Title |   |   |
|---------------|---|---|
| Nodes         |   |   |
| Column Title  | Function  | Legal Values  |
| Node_Name     | Provide name for node   | Up to 32 alphanumeric characters                          |
| Node_ID       | Modbus station address of physical server node                | 1-255   |
| Protocol      | Specify protocol used   | Modbus_Daniels  |
| Connection    | Specify which port the device is connected to the FieldServer | FS-X40 Serves: P1-P8, R1-R2<br>FS-X20 Serves: Serial Port |

### Example

```
// Client Side Nodes

Nodes
Node_Name  , Node_ID  , Protocol  , Connection
PLC 1     , 1        , Modbus_Daniels  , P1
```



## 4.4 Client Side Map Descriptors

### 4.4.1 FieldServer Specific Map Descriptor Parameters

| Column Title        | Function   | Legal Values  |
|---------------------|--|---|
| Map_Descriptor_Name | Name of this Map Descriptor                                      | Up to 32 alphanumeric characters                            |
| Data_Array_Name     | Name of Data Array where data is to be stored in the FieldServer | One of the Data Array names from "Data Array" section above |
| Data_Array_Offset   | Starting location in Data Array                                  | 0 to maximum specified in "Data Array" section above        |
| Function            | Function of Client Map Descriptor                                | RDBC, WRBC, WRBX  |

### 4.4.2 Driver Related Map Descriptor Parameters

| Column Title           | Function                        | Legal Values   |
|------------------------|---------------------------------|--|
| Node_Name              | Name of Node to fetch data from | One of the node names specified in "Client Node Descriptor" above  |
| Data_Type*             | Data type                       | Register, Coil, AI, DI   |
| Length                 | Length of Map Descriptor        | 1-125 (Register, AI)<br>1-800 (Coil, DI)   |
| Address                | Starting address of read block  | 0000 – 6999 ( Coil )<br>7000 – 7999 ( Float )<br>10000 ( DI )<br>30000 ( AI )<br>40000 – 49999 ( Register) |
| Data_Array_Low_Scale*  | Scaling zero in Data Array      | -32767 to 32767, 0   |
| Data_Array_High_Scale* | Scaling max in Data Array       | -32767 to 32767, 100   |
| Node_Low_Scale*        | Scaling zero in Connected Node  | -32767 to 32767, 0   |
| Node_High_Scale*       | Scaling max in Connected Node   | -32767 to 32767, 100   |

### 4.4.3 Timing Parameters

| Column Title  | Function                     | Legal Values |
|---------------|------------------------------|--------------|
| Scan_Interval | Rate at which data is polled | ≥0.001s      |

4.5 Map Descriptor Example.

| Map_Descriptor_Name | Data_Array_Name | Data_Array_Offset | Function | Node_Name | Address | Length | Scan_Interval |
|---------------------|-----------------|-------------------|----------|-----------|---------|--------|---------------|
| CMD_AI              | DA_AI           | 0                 | RDBC     | PLC 1     | 30000   | 20     | 1s            |

The data array where the read data will be stored is specified here. This data array and its format must be specified under the data arrays section.

Note the use of the RDBC function here which will cause this map descriptor to continuously read data every scan interval from the remote device.

The remote Modbus Daniels device is specified here with the node name previously declared under the nodes section.