



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

**APPLICABILITY & EFFECTIVITY**

Effective for all systems manufactured after December 2017.

Driver Version:	1.01
Document Revision:	1.A

## Technical Support

Please call us for any technical support needs related to 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 (3-9000-674 REV 2.1). 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

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

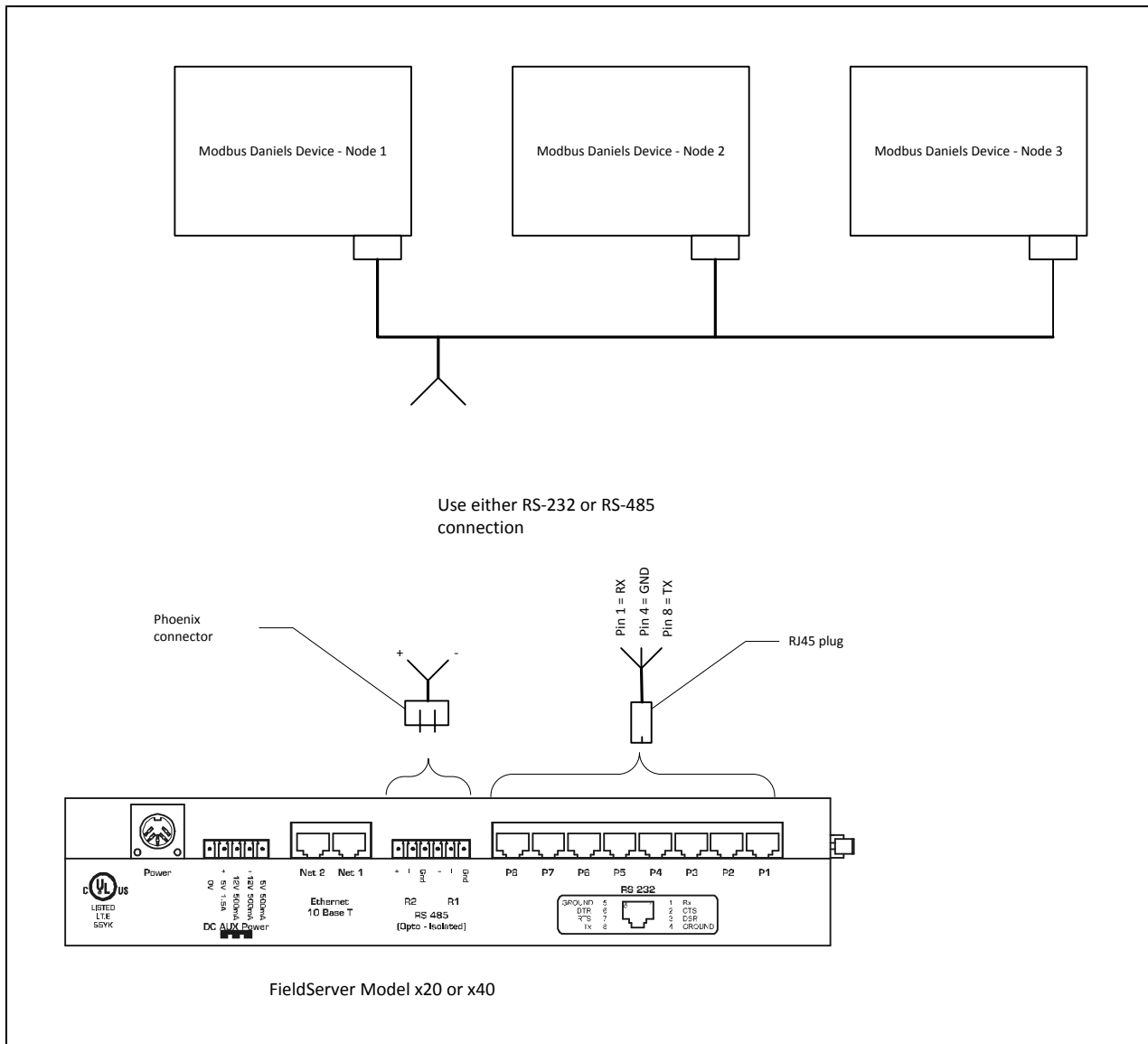
### 2.2 Provided by the Supplier of 3<sup>rd</sup> Party Equipment

#### 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.



## 4 DATA ARRAY PARAMETERS

Data Arrays are “protocol neutral” data buffers for storage of data to be passed between protocols. It is necessary to declare the data format of each of the Data Arrays to facilitate correct storage of the relevant data.

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
    
```

## 5 CONFIGURING THE FIELDSEVER AS A MODBUS DANIELS CLIENT

For detailed information on FieldServer configuration, 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.

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:** In the tables below, \* indicates an optional parameter, with bold legal values as the default.

### 5.1 Client Side Connection Parameters<sup>1</sup>

Section Title	Connections	
Column Title	Function	Legal Values
Port	Specify which port the device is connected to the FieldServer.	P1-P2, R1-R2 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
    
```

### 5.2 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.	P1-P2, R1-R2 Serial Port

<sup>1</sup> Handshaking is not supported.

**Example**

```
// Client Side Nodes

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

**5.3 Client Side Map Descriptors**
**5.3.1 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.	<b>RDBC</b> – Node Type set to Block Mode; FC16 is used; length of 1 is used <b>WRBC</b> – FC16 is used; length of MD is used <b>WRBX</b> – FC16 is used; length of MD is used

**5.3.2 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) 1-800 (Coil, DI)
Address	Starting address of read block.	0000 – 6999 ( Coil ) 7000 – 7999 ( Float ) 10000 ( DI ) 30000 ( AI ) 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

**5.3.3 Timing Parameters**

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



### 5.4 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 function will also execute writes from the Data Array to the remote device when a change is detected, but only when used in conjunction with writeable addresses.

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