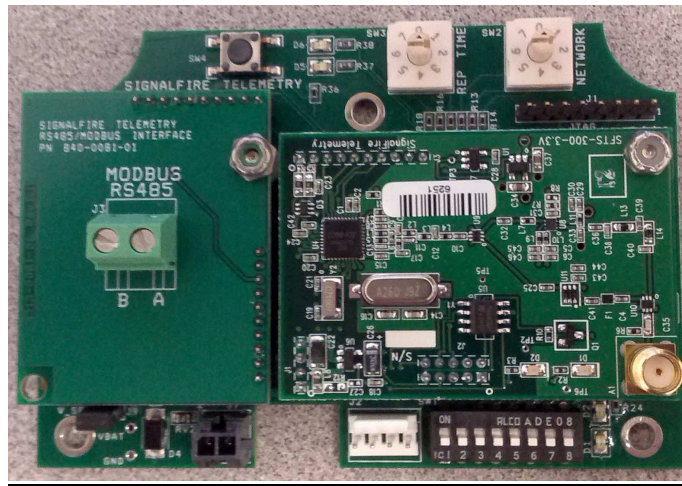


## **SFRSS-A2-485 Remote Sensor Module Instruction Sheet**

The SignalFire A2-485 sensor interface module has the following features:

- Settable (rotary switch) check-in period
- Settable (rotary switch) network address
- RS-485 Modbus interface. Acts as a Modbus master and polls a pre-configured register set from attached Modbus sensor(s) on a schedule and reports the data to the gateway.
- Low power operation from a 3 “D” cell lithium battery pack (external power from 3.5 to 5.0VDC may be used in place of the battery)
- Sends data to a SignalFire Buffered Modbus Gateway



### **Operating Mode**

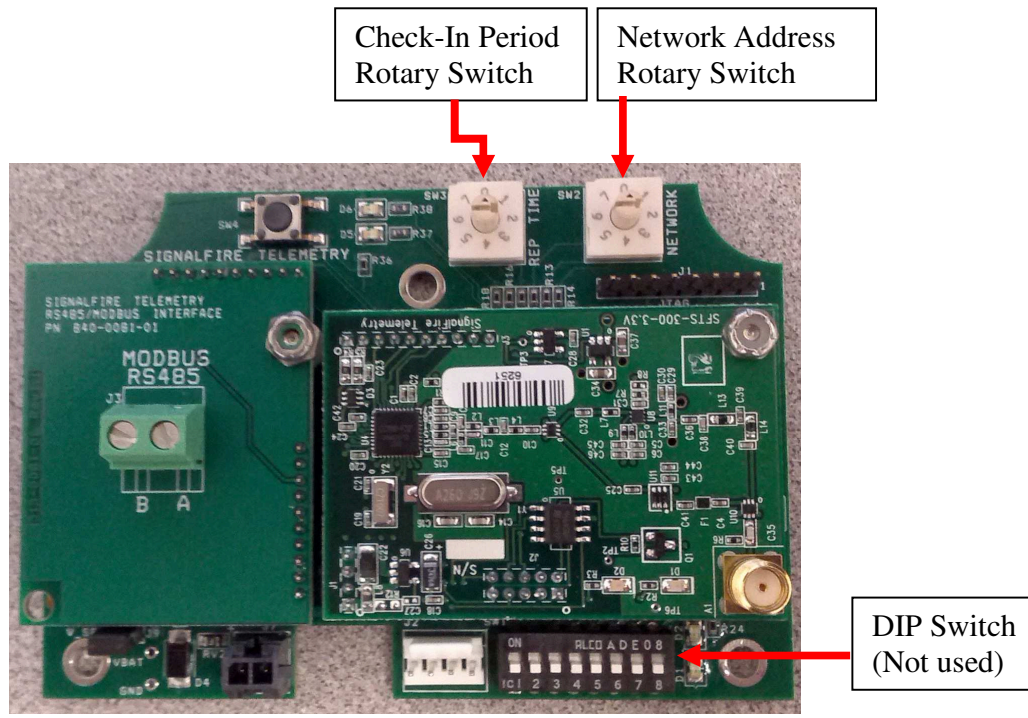
This A2-485 requires that the node is pre-configured with the register map to poll using the SFTToolKit PC application at the time of installation.

The pre-configured set of registers is automatically read from the Modbus sensor device and forwarded to the Modbus gateway on a pre-defined schedule (1 minute to 5 minutes is typical). The register data is then buffered in the gateway and is available to be read by the RTU at any time.

## Setup

The nodes need to be set up for correct operation before being fielded. The configurable items are:

- Network Selection
- Check-in Period Selection



## Network Setting

The network address can be used to create multiple networks using multiple gateways (that are in close proximity with one another). The network address can be selected using rotary switch SW2 in the lower right corner of the board.

The network setting must be the same on all units in the network including the gateway.

**System Check-In Period**

The check-in period is set using rotary switch SW1 in the upper right corner of the board. The switch settings are shown in the following table:

Switch Setting	Check-In Period
0	1 min
1	2 min
2	4.5 min
3	10 min
4	30 min
5	1 hr
6	5 sec
7	15 sec

The default setting is 2 for a check-in period of 4.5 minutes.

*Note: Settings 6 and 7 should only be used for testing or a non-battery pack powered node as they will have a high power draw.*

**Modbus Sensor Connection**

Connect the “A” and “B” RS485 terminals from the A2-485 to the Modbus sensor(s)

## Configuration

To begin configuration, open SFToolkit, and select “Modbus Low Power”. Alternatively, you can choose Auto-Detect on the COM port that the A2-485 node is connected to. The configuration window below will open up. Select the correct COM port and click “Connect/Update” to view all the settings.

Modbus Low Power

File Help

COM Port: COM1 Refresh

COM1 Open

Open Close

Connect/Update

Product	Unknown
File Transfer	Unknown
Radio Connectivity	Unknown
Mainboard Version	Unknown
Radio Version	Unknown
Radio Address	Unknown
Corporate ID	Unknown
Radio Network	Unknown
Radio Network Group	Unknown
Radio Power (dBm)	Unknown
Modbus Baud Rate	Unknown
Modbus UART Mode	Unknown
Command Timeout (ms)	Unknown
Command Pause (ms)	Unknown
Station ID	Unknown
Checkin Interval	Unknown

Settings

Radio Network: Set

Radio Network Group: Set

Checkin Interval: Set

Station ID: Set

Current Program Steps

Baud Rate: Unknown Command Timeout (ms): Unknown

UART Mode: Unknown Command Pause (ms): Unknown

Run Modbus Program Steps

#	SlaveID	Func	Address	Count	Status
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					

Address Offset: 1

SlaveID: Set Checked

Check All

Uncheck All

Move Up

Move Down

Delete

Delete All

Read Current Program Steps from Device

Write New Program Steps to Device

Slave ID: Function Code: 0x03 Address: Reg Count: Register Size: 16-bit

Add New Program Step

Not Connected

### Modbus Program Steps Configuration

If using *pre-configured register set mode*, the register set to poll on each check-in must be defined using program steps. A program step consists of one of the following modbus opcodes:

0x01 MODBUS\_READ\_COILS (limit: 1 coil)  
0x03 MODBUS\_READ\_HOLDING\_REGISTERS  
0x04 MODBUS\_READ\_INPUT\_REGISTERS  
0x05 MODBUS\_WRITE\_SINGLE\_COIL

Up to 34 program steps can be programmed. Any response from a Modbus device (data or exception) will be forwarded to the Modbus Gateway and cached. Use the “Read Current Program Steps from Device” to view the current program steps in the table. They can then be deleted or re-ordered using the buttons to the right of the table. To add a new program step, fill in the 5 boxes at the bottom, and click “Add New Program Step”. If the step is valid, it will be added to the table. Finally, click “Write New Program Steps to Device” to save the changes.

**Note that the register address entered is subtracted by the Address Offset field to the right of the table. Typically, the offset is 1.**

It is important to make sure that, in a given network, there are no duplicate Slave IDs. The gateway will only cache one set of data for each Slave ID, so the duplicate will be overwritten.

For more information on issuing modbus commands and their formats, please see the [Modbus Protocol](#). For device specific information regarding Enron Modbus protocol, please see [Enron Modbus Protocol for CB181 FCUs](#) or [Enron \(AGA7\) Modbus Protocol for 6400 \(5333\) FCUs](#).

## Modbus Register Mapping

The A2-485 Node sends data to a SignalFire Telemetry Modbus gateway. The data that is sent to the gateway is available at the gateway in registers where it can then be read by a Modbus RTU.

In addition to the pre-configured registers read from the attached sensor, the A2-485 will send system information in 16-bit registers listed in the table below. This data is accessible at the same Slave ID as the connected Modbus device.

### Status Registers

Register Number	Register Address (Offset)	Description
49988	9987 or 65524	Major revision number for the mainboard
49989	9988 or 65525	Minor revision number for the mainboard
49990	9989 or 65526	Major revision number for the radio
49991	9990 or 65527	Minor revision number for the radio
49992	9991 or 65528	High 16 bits of SFTS node address
49993	9992 or 65529	Low 16 bits of SFTS node address (the radio ID)
49994	9993 or 65530	Slave ID readback
49995	9994 or 65531	Received signal strength of last packet from the slave
49996	9995 or 65532	Battery voltage of the Modbus client, in millivolts
49997	9996 or 65533	Minutes until this slave will time out, unless new data is received
49998	9997 or 65534	Number of registers cached for this slave device
49999	9998 or 65535	Remote device type. 45 for Sentinel Modbus