



Sage Prime BACnet Quick Start Guide

This document provides a brief overview of the connections and settings that must be used to connect a Sage Prime BACnet meter to a BACnet MS/TP network. This document also contains the BACnet object list for the application and some troubleshooting tips. The latest software and additional information can be downloaded from <https://sagemetering.com/customer-downloads/>.

Wiring the Meter to the BACnet MS/TP Network

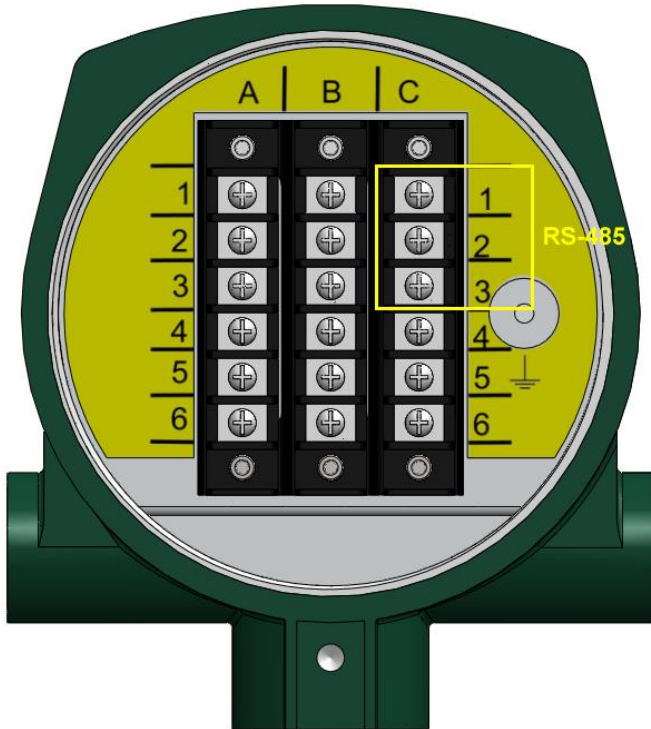


Figure 1: RS-485 Terminals

Table 1: BACnet Network Connections

Terminal	Name	Network Connection
C1	COMM	RS-485 Ground (0V Reference)
C2	B+	RS-485 +
C3	A-	RS-485 -

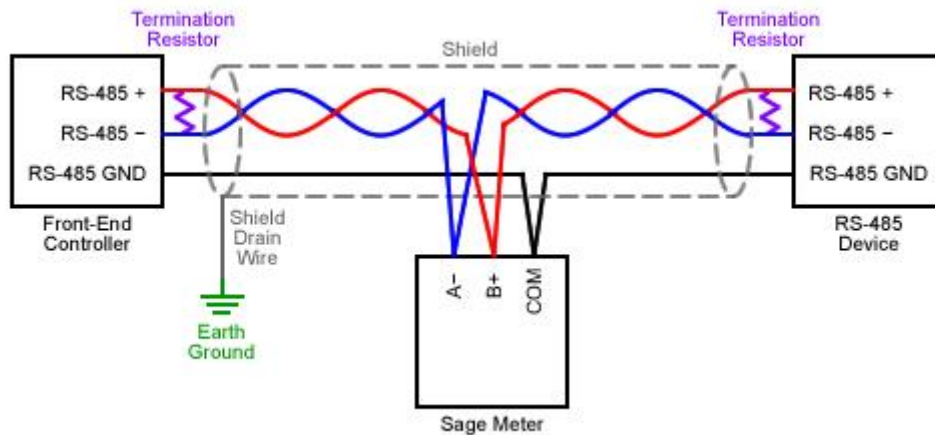


Figure 2: Typical RS-485 Daisy-Chain Wiring



Configuring BACnet Settings

Certain network settings may need to be modified to match a site's network configuration, such as baud rate, MAC address, device instance, etc. The meter's BACnet settings can be configured using any BACnet client. For example, this can be done using a PC, a USB to RS-485 adapter, and the free BACnet explorer tool *Yet Another Bacnet Explorer (Yabe)*, available here <https://sourceforge.net/projects/yetanotherbacnetexplorer/>.

Most settings can be configured by writing to properties of the meter's BACnet Device object. Changes to these settings take effect immediately.

The MAC address and baud rate settings are exposed as Analog Value objects and can be configured by writing to the Present Value property. These settings only take effect after the meter is power cycled or **Binary Value 100 "Apply Changes"** is written to a 1 (this will re-initialize the meter's BACnet communications and may cause the meter to disconnect from the BACnet network briefly).

The BACnet MS/TP settings for the meter are summarized in Table 2.

Table 2: BACnet Settings

Setting	Default Value	BACnet Object	BACnet Property
MAC Address	49	Analog Value 100	Present Value
Baud Rate	9600	Analog Value 101	Present Value
Device Name	Sage Prime	Device	Object Name
Device Instance	1142049	Device	Object Identifier
APDU Timeout	1000	Device	APDU Timeout
Number Of APDU Retries	3	Device	Number Of APDU Retries
Max Master	127	Device	Max Master
Max Info Frames	1	Device	Max Info Frames



Using SageCom™ with Sage Prime BACnet

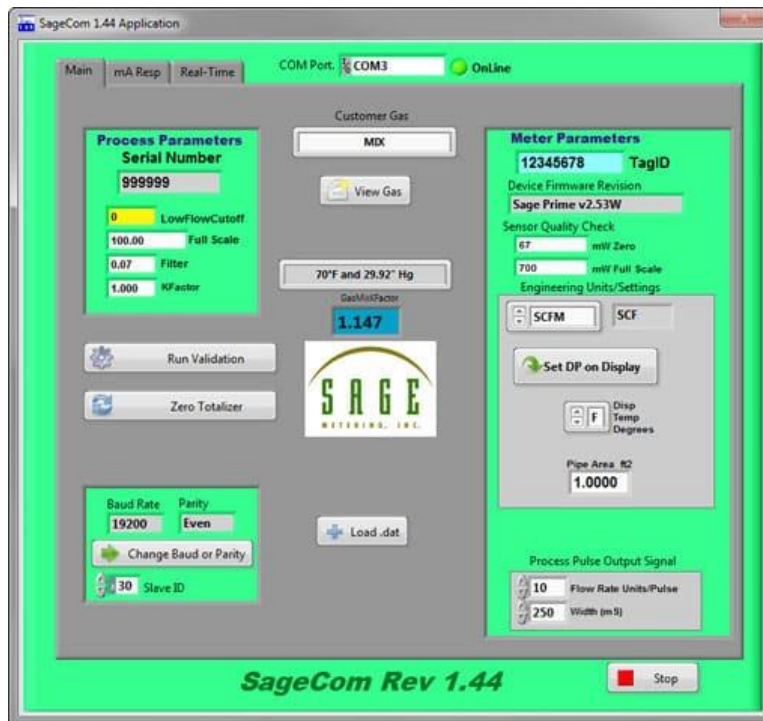


Figure 3: SageCom™ Software

SageCom is a powerful, yet easy-to-use software program which gives the user testing, diagnostics, performance verification, and local configuration capabilities for Sage thermal mass flow meters. SageCom communicates to the meter via RS-485 by connecting a PC (using a USB to RS-485 adapter) to the meter's RS-485 terminals.

During normal operation, the meter's RS-485 port is configured to communicate BACnet MS/TP. In order to use SageCom, the meter must first be put into SageCom mode.

Configuring the Meter for SageCom Mode

1. Connect to the meter via BACnet using any BACnet client.
2. Write a value of 1 to **Binary Value 101 "Enable SageCom"**.
3. Power off the meter.
4. Disconnect the BACnet RS-485 wiring from the meter.
5. Connect the RS-485 wiring from a PC running SageCom to the meter.
6. Power on the meter.
7. Connect to the meter using SageCom.

To restore the meter to BACnet MS/TP mode, simply power cycle the meter.

CAUTION! Do not change the baud rate, parity, or slave ID settings when using SageCom.

If the baud rate, parity, or slave ID settings have been changed from their default values (19200, Even, and 49, respectively), the meter will not communicate on the BACnet MS/TP network and will automatically enter SageCom Mode approximately two minutes after power is applied.



BACnet Object List

Table 3: BACnet Object List

Object Type	Instance Number	Object Name	Units	Default COV Increment	Relinquish Default
Analog Input	1	Serial Number	no-units	0	N/A
Analog Input	2	Flow Rate	no-units	5	N/A
Analog Input	3	Temperature	degrees-Fahrenheit	1	N/A
Analog Input	4	RTD Power	milliwatts	1	N/A
Analog Value	1	K Factor	no-units	0	1
Analog Value	2	Filtering	no-units	0	0.5
Analog Value	3	Low Flow Cutoff	no-units	0	0
Analog Value	4	Full Scale	no-units	0	1200
Analog Value	5	Totalizer	no-units	0	0
Analog Value	100	MSTP MAC Address	no-units	0	49
Analog Value	101	MSTP Baud Rate	no-units	0	9600
Binary Value	100	Apply Changes	N/A	N/A	Inactive
Binary Value	101	Enable SageCom	N/A	N/A	Inactive



Troubleshooting

This section details some troubleshooting tips to follow if any issues are encountered when installing the meter onto a BACnet MS/TP network.

1. Power
 - a. Confirm that the meter is receiving power from the power supply. The PWR LED will illuminate when the meter is receiving power.
 - b. Confirm the power connections match the connections shown in the meter's user's manual.
2. Wiring
 - a. Confirm the wiring matches the connections shown in the Wiring the Meter to the BACnet MS/TP Network section.
3. BACnet Configuration
 - a. Confirm that the meter is configured with the appropriate BACnet settings (baud rate, MAC address, device instance, etc.) as described in the Configuring BACnet Settings section.
4. LEDs
 - a. The PWR LED will illuminate when the meter is powered and will flicker when the meter transmits or receives data on the RS-485 network.
 - i. If this is not observed, check the meter's power.
 - ii. If the meter is powered, but the PWR LED is off, try swapping the RS-485 + and - wires.
 - iii. If the meter is powered, but the PWR LED is off, try removing any termination resistors on the network.
 - b. The COMM LED will light when the meter transmits data on the RS-485 network.
 - i. If this is not observed, confirm that the meter's baud rate matches the network's baud rate.
 - ii. If this is not observed, confirm that the meter's MAC address is unique on the BACnet MS/TP network.
 - iii. If this is not observed, confirm that the max master setting on all devices is higher or equal to the meter's MAC address.
5. Common RS-485 Issues
 - a. Confirm polarity on + and -, try swapping wires if not sure of the polarity.
 - b. Confirm all devices share a common RS-485 ground reference (0V reference).
 - c. Confirm that the baud rate matches on all devices connected to the network.
 - d. Confirm that the meter's MAC address, device instance, and device name are unique on the network, i.e. no other devices use the same values.
 - e. Confirm that the max master setting on all devices is higher or equal to the highest MAC address on the network.
 - f. Try removing any termination resistors installed on the network.
6. SageCom Mode
 - a. The meter may be in SageCom mode and BACnet MS/TP communications is disabled. Refer to the Using SageCom™ with Sage Prime BACnet section for details.