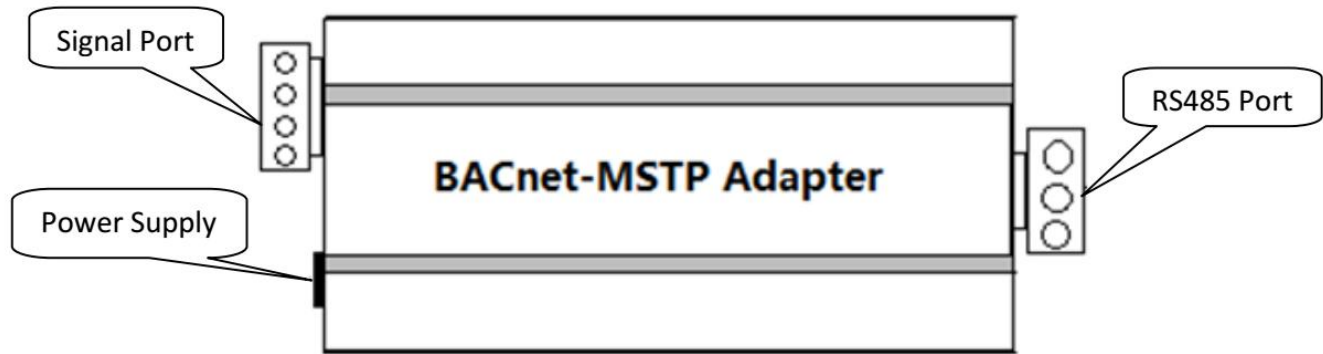# BACnet Interface for EF10/TP10

Spire Metering offers EF10 ultrasonic flowmeter and TP10 BTU meter with various output interface options to accommodate a wide range of application needs:

- Pulse output, opto-isolated
- RS485 interface with MODBUS support
- Ethernet
- BACnet/MSTP
- RF or GPRS wireless

This document describes the BACnet MSTP interface only. For other information, please refer to the datasheet or contact support@spiremt.com directly.

The EF10 and TP10 meters can provide BACnet/MSTP interface for BMS integration and facility resources management. This is implemented by adding a BACnet-to-Modbus adapter to the meter.

The BACnet-Modbus adapter communicates with the meter's RS485/Modbus interface using Modbus protocol on one side. It communicates with BACnet/MSTP network master using BACnet protocol.

The BACnet adapter meets the BTL standard and has been proven to be robust, reliable and flexible. The BACnet adapter has two banks of DIP switches which enable the users to quickly configure the serial protocol settings without the need for any 3rd party software. Settings available via the DIP Switches include:

√ MAC address (Default: 0)
√ Baud rate (Default: Auto baud setting, used for BACnet/MSTP)
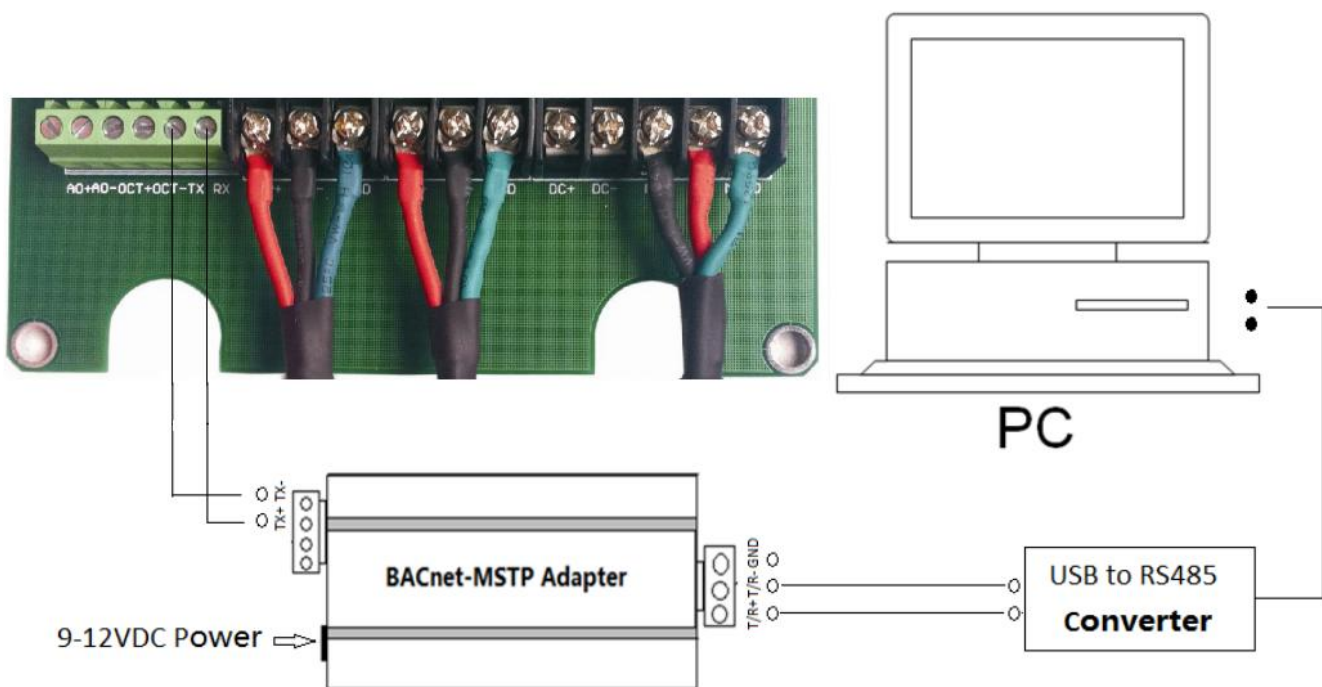√ Node ID

The BACnet adapter supports the following protocols:

- BACnet/MSTP
- Metasys N2
- Modbus RTU
- Modbus ASCII
- Allen Bradley DF1
-
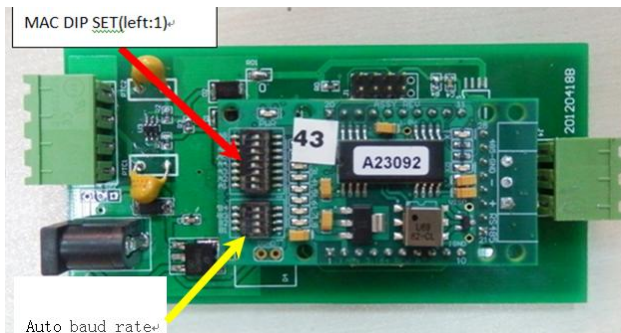
BACnet MSTP Module

Wiring diagram:

Appendix A:

BACnet Points Table

Index	Variable Name	Data Type	Notes
1	Flow Rate	REAL	Unit: m3/h (cubic meter per hour)
2	Energy flow rate	REAL	Unit: GJ/h (gigajoule per hour)
3	Velocity	REAL	Unit: m/s (Meter per second)
4	Temperature 1	REAL	Unit: ˚C (degree Celsius)
5	Temperature 2	REAL	Unit: ˚C (degree Celsius)
9	Net flow accumulator	FLOAT	Unit: m3 (cubic meter)
10	Positive flow accumulator	FLOAT	Unit: m3 (cubic meter)
11	Negative flow accumulator	FLOAT	Unit: m3 (cubic meter)
12	Net energy accumulator	FLOAT	Unit: GJ (gigajoule)
13	Positive energy accumulator	FLOAT	Unit: GJ (gigajoule)
14	Negative energy accumulator	FLOAT	Unit: GJ (gigajoule)
15	Error code	BIT	Bit0 no received signal Bit1 low received signal Bit2 poor received signal Bit3 pipe empty Bit4 hardware failure Bit5 receiving circuits gain in adjustment Bit6 frequency at the frequency output over flow Bit7 current at 4-20mA over flow Bit8 RAM check-sum error Bit9 main clock or timer clock error Bit10 parameters check-sum error Bit11 ROM check-sum error Bit12 temperature circuits error Bit13 reserved Bit14 internal timer over flow Bit15 analog input over range

Example for data from factory testing software:
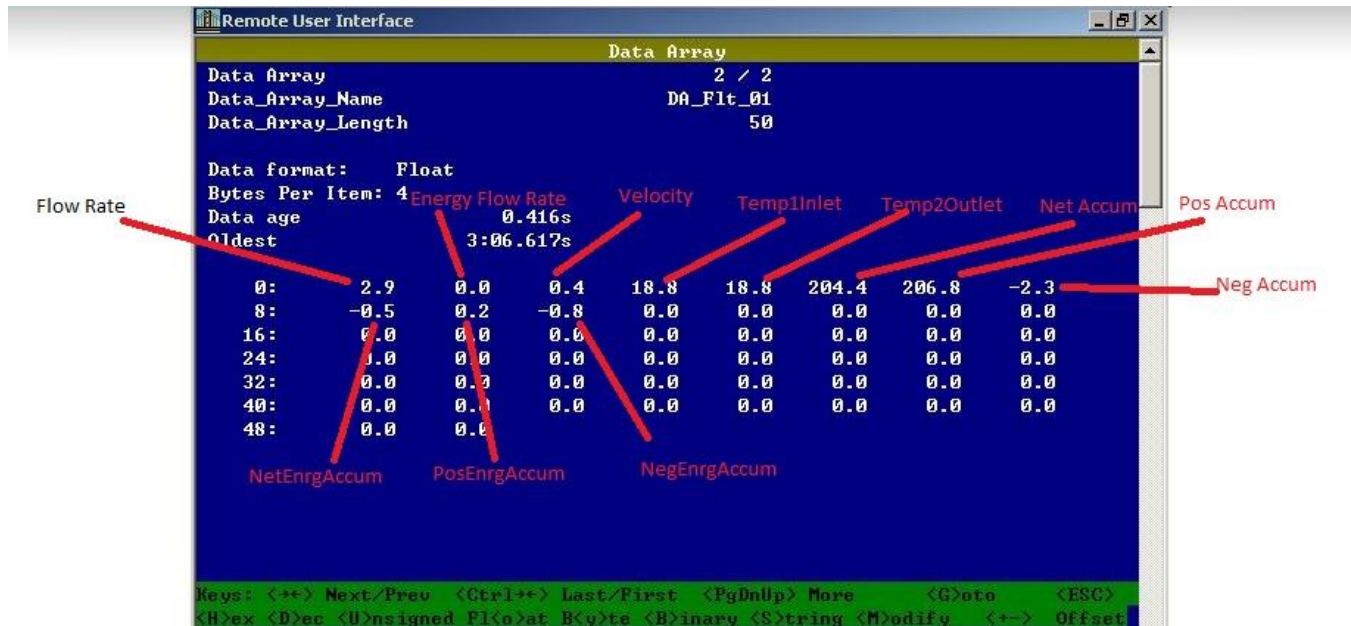
PIC Statement:

1.1.1	BACnet Standarized Device Profile (Annex L)
X	BACnet Application Specific Controller (B-ASC)

1.1.2	BACnet Interoperability Building Blocks Supported (Annex K):	
X	K.1.2	BIBB - Data Sharing - ReadProperty-B (DS-RP-B)
X	K.1.4	BIBB - Data Sharing - ReadPropertyMultiple-B (DS-RPM-B)
X	K.1.8	BIBB - Data Sharing - WriteProperty-B (DS-WP-B)
X	K.1.10	BIBB - Data Sharing - WritePropertyMultiple-B (DS-WPM-B)
X	K.1.12	BIBB - Data Sharing - COV-B (DS-COV-B)
X	K.2.2	BIBB - Alarm and Event-Notification Internal-B (AE-N-I-B)
X	K.2.5	BIBB - Alarm and Event-ACK-B (AE-ACK-B)
X	K.2.11	BIBB - Alarm and Event-Information-B (AE-INFO-B)
X	K.5.1	BIBB - Device Management - Dynamic Device Binding-A (DM-DDB-A)
X	K.5.2	BIBB - Device Management - Dynamic Device Binding-B (DM-DDB-B)
X	K.5.4	BIBB - Device Management - Dynamic Object Binding-B (DM-DOB-B)
X	K.5.6	BIBB - Device Management - DeviceCommunicationControl-B (DM-DCC-B)
X	K.5.12	BIBB - Device Management - TimeSyncronization-B (DM-TS-B)
X	K.5.22	BIBB - Device Management – List Manipulation-B (DM-LM-B)

1.1.3 Segmentation Capability:

None

1.1.4 Standard Object Types Supported

X	Device Object
X	Analog Input
X	Analog Output
X	Analog Value
X	Binary Input
X	Binary Output
X	Binary Value
X	Multi State Input
X	Multi State Output
X	Multi State Value
X	Notification Class Object

1.1.5 Unsupported Properties and Restrictions

1. Does not support BACnet CreateObject

2. Does not support BACnet DeleteObject

3. No proprietary properties exist

1.1.6 Data Link Layer Options:

X	BACnet IP, (Annex J)
X	MS/TP master (Clause 9), baud rate up to 76.8 Kbps
X	MS/TP slave (Clause 9), baud rate up to 76.8 Kbps

1.1.7 Device Address Binding:

Not supported

1.1.8 Networking Options:

	Router, Clause 6 – List all routing configurations, e.g., ARCNET-Ethernet, Ethernet-MS/TP, etc.
	Annex H, BACnet Tunneling Router over IP
X	BACnet/IP Broadcast Management Device (BBMD)
X	Registrations by Foreign Devices

1.1.9 Character Sets Supported:

Where support for multiple character sets is indicated, this does not imply that they can all be supported simultaneously.

X	ISO 10646 (UTF-8) / ANSI X3.4..
	ISO 10646 (UCS-2).
	IBM/Microsoft DBCS
	ISO 10646 (ICS-4)
	ISO 8859-1
	JIS C

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