Vortex Flow Meters

VN2000 Flow Meters

BACnet® MS/TP Communication Protocol

INTRODUCTION

BACnet MS/TP is a communication protocol for building automation and control networks for up to 128 devices on an EIA-485 wired system. The protocol is supported and maintained by the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) Standing Standard Project Committee 135.

The VN2000 transmitter offers optional BACnet MS/TP communications with these features:

- The connection is not terminated and operates at 9600, 19.2k, 38.4k and 76.8k baud
- The maximum length is 4000 ft (1200 m)
- Valid MAC addresses are 0…127
- Valid device IDs (Device Object Identifiers) are 0…4194302

The baud rate, address and device ID can be programmed through the keypad interface in program mode level 2 (-C). See the VN2000 Transmitter user manual VRX-UM-02233-EN for setup and wiring instructions.

Object Description	BACnet Object (Access Point)	Notes	Available Units
Reset Totalizer	BV-1	Binary Value 1	—
Flow Rate(Flow Model) Energy Rate (BTU Model)	AI1	Analog Input 1	Gallons, Liters, Cubic Feet, Cubic Meters, Lb, Kg, BTU, KBTU, TON, TNN Per Second, Minute, Hour, Day
Net Totalizer	PIV-2	Positive Integer Value 2	
Temperature 1	AI3	Analog Input 3	°C or °F
Temperature 2 (BTU)	AI4	Analog Input 4	°C or °F
Pressure	AI5	Analog Input 5	Psig or bar

Table 1: VN2000 BACnet object model

TEMPERATURE1 (AI-3)

For BTU/energy meters (where two temperatures are used), *Temperature* is the supply temperature. The register value will not be a live reading for meters that do not have an RTD temperature or are overwritten.

For Gas and BTU/energy meters, if the temperature is overridden with a manual temperature override, this register returns the value set in the manual temperature override.

For steam meters, if the temperature sensor is overwritten with a manual pressure input, the register value will be invalid.

RETURN TEMPERATURE2 (AI-4)

For BTU/energy applications, *Return Temperature* reports the return temperature used in the BTU rate calculation determination. If the temperature is overridden with a manual temperature override, this register returns the value set in the manual temperature override.

PRESSURE (AI-5)

For meters with a pressure input, *Pressure* reports the pressure used in the flow rate calculation.

For meters without a pressure input, the value will not be a live reading for meters.

For steam meters, if the temperature is overridden with a manual pressure input, this register returns the value set in the manual pressure override.

Similarly, for gas applications, if the pressure sensor is overridden with a manual pressure override, the register returns the value set in the manual pressure override.

ANNEX A—PROTOCOL IMPLEMENTATION CONFORMANCE STATEMENT (NORMATIVE)

BACnet Protocol Implementation Conformance Statement

Date:	010/27/2017
Vendor Name:	Badger Meter, Inc
Product Name:	Vortex Flow meter
Product Model Number:	VN2000
Application Software Version:	3.00
Firmware Revision:	14.01
BACnet Protocol Revision:	14
Product Description:	Vortex flow meter

Vortex Flow Meter Measure volumetric, mass flow rate or BTU/energy of steam, gas or liquids.

BACnet Standardized Device Profile (Annex L)

☐ BACnet Operator Workstation (B-OWS)

☐ BACnet Building Controller (B-BC)

☐ BACnet Advanced Application Controller (B-AAC)

■ BACnet Application Specific Controller (B-ASC)

☐ BACnet Smart Sensor (B-SS)

☐ BACnet Smart Actuator (B-SA)

List all BACnet Interoperability Building Blocks Supported (Annex K)

- Data Sharing-ReadProperty-B (DS-RP-B)
- Data Sharing-WriteProperty-B (DS-WP-B)
- Data Sharing-ReadProperty Multiple-B (DS-RPM-B)
- Data Sharing-WriteProperty Multiple-B (DS-WPM-B)
- Device Management-Dynamic Device Binding-B (DM-DDB-B)
- Device Management-Dynamic Object Binding-B (DM-DOB-B)
- Device Management-DeviceCommunicationControl-B (DM-DCC-B)
- Device Management-Reinitialize Device-B (DM-RD-B)

Segmentation Capability: (Segmentation is not supported)

☐ Segmented requests supported Window Size_____

☐ Segmented responses supported Window Size_____

Standard Object Types Supported

- 1 Device Object
- 4 Analog Input Objects
- 1 Positive Integer Value Object
- 1 Binary Output Object

Data Link Layer Options

☐ BACnet IP, (Annex J)

☐ BACnet IP, (Annex J), Foreign Device

☐ ISO 8802-3, Ethernet (Clause 7)

☐ ANSI/ATA 878 1, 2 5 Mb ARCNET (Clause 8)

☐ ANSI/ATA 878 1, RS-485 ARCNET (Clause 8), baud rate(s):_____

■ MS/TP master (Clause 9), baud rate(s): 19200, 38400, 76800, 115200

☐ MS/TP slave (Clause 9), baud rate(s): _____

☐ Point-To-Point, EIA 232 (Clause 10), baud rate(s):_____

☐ Point-To-Point, modem, (Clause 10), baud rate(s):_____

☐ LonTalk, (Clause 11), medium:_____

☐ Other: _____

Device Address Binding

Is static device binding supported? (This is currently necessary for two-way communication with MS/TP slaves and certain other devices)
☐ Yes ■ No

Networking Options

☐ Router, Clause 6 - List all routing configurations, e g , ARCNET-Ethernet, Ethernet-MS/TP, etc

☐ Annex H, BACnet Tunneling Router over IP

☐ BACnet/IP Broadcast Management Device (BBMD)

Does the BBMD support registrations by Foreign Devices? ☐ Yes ☐ No

Character Sets Supported

Indicating support for multiple character sets does not imply that they can all be supported simultaneously

☐ ANSI X3 4 ☐ IBM ☐ Microsoft ☐ DBCS ☐ ISO 8859-1

☐ ISO 10646 (UCS-2) ☐ ISO 10646 (UCS-4) ☐ JIS C 6226 ■ UTF-8

If this product is a communication gateway, describe the types of non-BACnet equipment/networks(s) that the gateway supports:

Not supported

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