

BACnet Protocol Implementation Conformance Statement

Date: March 26th 2012
Vendor Name: FlowCon International
Product Name: SM actuator with BACnet
Product Model Number: SM.0.0.0.5 / SM.0.0.0.6 (BM000MNB / BM010MNB)
Applications Software Version: 1.09 **Firmware Revision:** 1.09 **BACnet Protocol Revision:** 4

Product Description:

BACnet actuator for FlowCon SM valves intended for management of flow in dynamic self balancing control valves.

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):

DS-RP-B Data Sharing - Read Property - B
 DS-WP-B Data Sharing - Write Property - B
 DM-DDB-B Device Management - Dynamic Device Binding - B
 DM-DOB-B Device Management - Dynamic Object Binding - B
 DM-DCC-B Device Management - Device Communication Control - B

Segmentation Capability: This device does not support segmentation.

- Segmented requests supported Window Size:
- Segmented responses supported Window Size:

Standard Object types Supported:

| Object Type | Supported | Dynamically Creatable | Dynamically Deletable | Optional Properties Supported | Writable Properties |
|-------------------------|-------------------------------------|--------------------------|--------------------------|---|---|
| Analog Value (AV) | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Reliability Description | Present_Value ¹ Out_of_Service ² |
| Binary Value (BV) | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Reliability Active_Text Inactive_Text Description | Present_Value ³ |
| Device | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Max_Master Max_Info_Frame Description #1000 to #1025 | Object_Identifier Object_Name Max_Master Description #1000 to #1002 #1023 to #1024 |
| Multi-state Value (MSV) | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Description Reliability States_Text | Present_Value ⁴ Out_of_Service ⁵ |

Note 1: Present_Value property is writable for objects AV.62 and objects AV.138, AV.139, AV.141, AV.143 under specific conditions.

Note 2: Out_of_Service property is writable for object AV.141 under specific conditions. The object can automatically return to normal after a programmable period, see Proprietary property #1002 of Device object.

Note 3: Present_Value property is writable for objects BV.17, BV.18, BV.53, BV.54, BV.63 and objects BV.56 under specific conditions.

Note 4: Present_Value property is writable for objects MSV.38, MSV.39, MSV.40 and MSV.41 and object MSV.43 under specific conditions.

Note 5: Out_of_Service property is writable for object MSV.42 under specific conditions. The object can automatically return to normal after a programmable period, see Proprietary property #1002 of Device object.

Proprietary Properties

| ID | Data type | Meaning | Writable |
|----------------------------|--|--|-------------------------------------|
| Proprietary property #1000 | Unsigned type | This proprietary property represents the physical layer MAC address. This value range from 0 to 254. Default: 0 | <input checked="" type="checkbox"/> |
| Proprietary property #1001 | Unsigned type | This proprietary property represents the MS/TP baud rate. Available values are: 9600, 19200, 38400, 76800. Default: 9600 | <input checked="" type="checkbox"/> |
| Proprietary property #1002 | Unsigned type | This proprietary property represents period of time after which an object in out-of-service will automatically return to normal. This value range is 0-120 minutes. 0 means no automatic return to normal. Default: 15 minutes | <input checked="" type="checkbox"/> |
| Proprietary property #1003 | Unsigned type | This proprietary property represents the number of times the motor was active, i.e. start-stop cycle event counter | |
| Proprietary property #1004 | Real type | This proprietary property represents the device internal temperature in °C | |
| Proprietary property #1005 | Unsigned type | This proprietary property represents the over temperature alarm event counter | |
| Proprietary property #1006 | Unsigned type | This proprietary property represents the high temperature alarm event counter | |
| Proprietary property #1007 | Unsigned type, failsafe configuration only | This proprietary property represents the battery error alarm event counter | |
| Proprietary property #1008 | Unsigned type | This proprietary property represents the over torqued alarm event counter | |
| Proprietary property #1009 | Unsigned type | This proprietary property represents the over torqued in past alarm event counter | |
| Proprietary property #1010 | Unsigned type | This proprietary property represents the power fail/out of range alarm event counter | |
| Proprietary property #1011 | Unsigned type | This proprietary property represents the no control signal alarm event counter | |
| Proprietary property #1012 | Unsigned type | This proprietary property represents the BACnet fallback alarm event counter | |
| Proprietary property #1013 | Real type | This proprietary property represents the maximum temperature value reached by the device in °C | |
| Proprietary property #1014 | Unsigned type | This proprietary property represents the number of periods the maximum value was reached | |
| Proprietary property #1015 | Real type | This proprietary property represents the minimum temperature value reached by the device in °C | |
| Proprietary property #1016 | Unsigned type | This proprietary property represents the number of periods the minimum value was reached | |
| Proprietary property #1017 | Real type | This proprietary property represents the motor torque in NM | |
| Proprietary property #1018 | Unsigned type | This proprietary property represents the motor current in mA | |
| Proprietary property #1019 | Real type, failsafe configuration only | This proprietary property represents the battery voltage in V | |
| Proprietary property #1020 | Unsigned type, failsafe configuration only | This proprietary property represents the battery charge current in mA | |
| Proprietary property #1021 | Real type, failsafe configuration only | This proprietary property represents the battery temperature in °C | |
| Proprietary property #1022 | Unsigned type, failsafe configuration only | This proprietary property represents the number of battery charge done | |
| Proprietary property #1023 | Unsigned type | This proprietary property represents an option of calibrating the control signal | <input checked="" type="checkbox"/> |
| Proprietary property #1024 | Unsigned type | This proprietary property represents an option of calibrating the feedback signal | <input checked="" type="checkbox"/> |
| Proprietary property #1025 | Unsigned type | This proprietary property represents a real-time control signal ADC reading. | |
| Proprietary property #1026 | Unsigned type | This proprietary property represents a real-time feedback signal PWM control value. | |

All proprietary properties of this device exist within the Device object.

Proprietary Range Restrictions

| ID | Present-Value Range Restriction and Units | | | |
|--------|--|-----------------------|-------------|----------------|
| | If MSV.40=1 | If MSV.40=2 | If MSV.40=3 | If MSV.40=4 |
| AV.62 | Input will be rounded off to specific discrete values depending on values of MSV.38 and MSV.39 | | | |
| AV.68 | 0 - AV.62, unit according to MSV.39 | | | |
| AV.98 | 0-100% | | | |
| AV.138 | 0.0 – (AV.139-3.0) V | 0.0 – (AV.139-6.0) mA | - | - |
| AV.139 | (AV.138+3.0) – 10.0 V | (AV.138+6.0) – 20 mA | - | - |
| AV.140 | Failsafe configuration only, 0-100% | | | |
| AV.141 | AV.138 – AV.139 V | | - | 0.0 – 100.0 % |
| AV.143 | - | - | - | 1 – 60 minutes |
| AV.164 | Range and unit according to MSV.41 | | | |

Data Link Layer Options:

- BACnet IP, (Annex J)
- BACnet IP, (Annex J), Foreign Device
- ISO 8802-3, Ethernet (Clause 7)
- ASTM 878.1, 2.5 Mb. ARCNET (Clause 8)
- ASTM 878.1, RS-485 ARCNET (Clause 8) baud rate(s):
- MS/TP master (Clause 9), baud rate(s): 9600, 19200, 38400, 76800
- MS/TP slave (Clause 9), baud rate(s): 9600, 19200, 38400, 76800
- Point-To-Point, EIA 232 (Clause 10), baud rate(s): max. EIA 232
- Point-To-Point, modem, (Clause 10), baud rate(s): max. modem
- 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: This device has no special 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 Broadcast Management Device (BBMD)
 - Does the BBMD support registrations by Foreign Devices? Yes No
 - Does the BBMD support network address translation? Yes No

Network Security Options:

- Non-secure Device - is capable of operating without BACnet Network Security
- Secure Device - is capable of using BACnet Network Security (NS-SD BIBB)
 - Multiple Application-Specific Keys:
 - Supports encryption (NS-ED BIBB)
 - Key Server (NS-KS BIBB)

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

If this product is a communication gateway, describe the types of non-BACnet equipment/networks(s) that the gateway supports: This device is not a gateway.

List of Objects

| ID | Name | Description | Present-Value Options |
|--------|-------------------------|---|---|
| AV.62 | MaximumFlow | Maximum output flow rate | Units as per MSV.39 |
| AV.68 | FlowRate | Current output flow rate | Units as per MSV.39 |
| AV.98 | MotorPosition | Motor position / valve opening | 0.0-100.0% |
| AV.138 | ControlSigMin | Analog control signal minimum value | If MSV.40 = 2-10V 0.0Vdc to (AV.139 – 3.0Vdc) If MSV.40 = 4-20mA 0.0mA to (AV.139 – 6.0mA) |
| AV.139 | ControlSigMax | Analog control signal maximum value | If MSV.40 = 2-10V (AV.138+ 3.0Vdc) to 10.0Vdc If MSV.40 = 4-20mA (AV.138 + 6.0mA) to 20.0mA |
| AV.140 | BatteryCapacity | Battery capacity | 0-100%. |
| AV.141 | AnalogControlSignal | Analog control signal value | If MSV.40 = 2-10V (AV.138)V-(AV.139)V If MSV.40 = 4-20mA (AV.138)mA-(AV.139)mA |
| AV.143 | BACnetFallbackTimeout | BACnet control value | If MSV.40 = BACnet 0.0-100.0% |
| | | BACnet control fallback timeout | If MSV.40 = BACnet 1 to 60 minutes |
| AV.164 | FeedbackSignal | Feedback signal value | Units and range as per MSV.41 |
| BV.17 | RotationDirection | Motor rotation direction | 0= NO 1= NC |
| BV.18 | FailsafeDirection | Failsafe rotation direction | 0= OPEN 1= CLOSE |
| BV.53 | FlushMode | Flush mode enable | If MSV.40 = 2-10V If MSV.40 = 4-20mA 0= Disabled 1= Enabled |
| BV.54 | Password | Password enable | 0= Disabled 1= Enabled |
| BV.55 | OvertorquedAlarm | Overtorqued alarm | 0= Off 1= On |
| BV.56 | Overtorqued-InPastAlarm | Overtorqued in past alarm | 0= Off 1= On |
| BV.57 | OverTemperatureAlarm | Critical over temperature alarm | 0= Off 1= On |
| BV.58 | HighTemperatureAlarm | Uncritical high temperature alarm | 0= Off 1= On |
| BV.59 | PowerFailAlarm | Power failure / out of range alarm | 0= Off 1= On |
| BV.60 | NoCtrlSignalAlarm | No control signal alarm | If MSV.40 = 2-10V If MSV.40 = 4-20mA 0= Off 1= On |
| BV.61 | BattErrorAlarm | Battery error alarm | 0= Off 1= On |
| BV.62 | BACnetFallback-Alarm | BACnet fallback alarm | If MSV.40 = BACnet 0= Off 1= On |
| BV.63 | Autostroke | Activate auto-stroke, returns to disabled | 0= Disabled 1= Enabled |
| MSV.37 | Language | User interface language | 1= ENG |
| MSV.38 | ValveModel | Valve model number | 1= SM.0.0 2= SM.1.1 3= SM.2.1 4= SM.3.0 5= SM.3.1 6= SM.3.2 7= SM.4.1 8= SM.4.2 9= SM.4.3 10= SM.5.1 11= SM.5.2 |
| MSV.39 | FlowScaleUnit | Flow scale unit | 1= L/sec 2= GPM 3= L/hr |
| MSV.40 | ControlSignalMode | Control signal mode | 1= 2-10Vdc 2= 4-20mA 3= Digital 4= BACnet |
| MSV.41 | FeedbackSignalMode | Feedback signal mode | 1= 2-10Vdc 2= 0-10Vdc 3= 4-20mA If MSV.40 = 2-10V If MSV.40 = 4-20mA also 4 = Auto (mode as MSV.40 and range AV.138-AV.139) |
| MSV.42 | DigitalControl-Signal | Digital Control Signal Value | If MSV.40 = Digital 1= CLOSE 2= STOP 3= OPEN |
| MSV.43 | BACnetFallbackAction | BACnet control fallback action | If MSV.40 = BACnet 1= CLOSE (default) 2= STOP 3= OPEN 4= MIDWAY |
| MSV.44 | PressureRange_kPad | Device pressure range as per MSV.38 | 1= NA (SM.0.0) 2= 32-320 (SM.1.1) 3= 40-320 (SM.2.1) 4= 35-400 (SM.3.0) 5= 35-400 (SM.3.1) 6= 80-400 (SM.3.2) 7= 35-400 (SM.4.1) 8= 60-400 (SM.4.2) 9= 60-400 (SM.4.3) 10= 35-400 (SM.5.1) 11= 60-400 (SM.5.2) |
| MSV.45 | ActuatorState | Actuator Operation State | 1=NORMAL 2=CALIBRATION 3=FLUSH 4=AUTO-STROKE 5=ALARM 6=FAILSAFE |

Note: For other conditions than specified in the Present-Value options column, the object is unused.