FlowCon international

A Griswold Controls LLC./FlowCon International Company

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)	☑	☐	☐	Reliability Description	Present_Value[1] Out_of_Service[2]
Binary Value (BV)	☑	☐	☐	Reliability Active _Text Inactive_Text Description	Present_Value[3]
Device	☑	☐	☐	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)	☑	☐	☐	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	☑
Proprietary property #1001	Unsigned type	This proprietary property represents the MS/TP baud rate. Available values are: 9600, 19200, 38400, 76800. Default: 9600	☑
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	☑
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	☑
Proprietary property #1024	Unsigned type	This proprietary property represents an option of calibrating the feedback signal	☑
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.