BACnet Protocol Implementation Conformance Statement

Date: 16-06-2023
Vendor Name: FlowCon International
Product Name: FlowCon FN Actuator with BACnet
Product Model Number: FN.0.2-BUS
Software Version: 2.04
BACnet Protocol Revision: 1.22

Product Description:
Electrical modulating actuator with BUS communication (BACnet or Modbus) for PICV: FlowCon Green and FlowCon GreEQ.

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 BIBBs:

DS-RP-B	Data Sharing - Read Property - B
DS-RPM-B	Data Sharing - Read Property Multiple - B
DS-WP-B	Data Sharing - Write Property - B
DS-WPM-B	Data Sharing - Write Property Multiple - B
DS-COV-B	Data Sharing - Change Of Value - B

Device Management BIBBs:

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
DM-TS-B	Device Management - Time Synchronization - B
DM-RD-B	Device Management - Reinitialize Device - B
DM-R-B	Device Management - Restart - B

Segmentation Capability: This device does not support segmentation.

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, 57600 and 115200
☐ MS/TP slave (Clause 9), baud rate(s): 9600, 19200, 38400, 57600 and 115200
☐ 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
☐ 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

Character Sets Supported:
Indicating support for multiple character sets does not imply that they can all be supported simultaneously.
☑ UFT-8
☐ IBM™/Microsoft™ DBCS
☐ ISO 8859-1
☐ ISO 10646 (UCS-2)
☐ ISO 10646 (UCS-4)
☐ JIS X 0208
☐ ISO 10646 (UTF-8)

List of Objects

Analog Input (AI):

#	Name	Description	R/W	Present-Value Options
1	Serial number, software version	Actuator firmware serial number and software version	R	Serial number x (e.g. 9). Software version x.xx (e.g. 2.03).
2	Analog input P1	Measured input value at port 1	R	Unit depending on selected sensor type (°C, °K or %).
3	Analog input P2	Measured input value at port 2	R	Unit depending on selected sensor type (°C, °K or %).
4	Target position	Target position for the actuator piston	R	0 to 15. Unit in millimeters.
5	Actual position	Actual position of the actuator piston	R	0 to 15. Unit in millimeters.
6	Actual value control signal	Actual flow rate in percent og max. flow setting	R	0 to 100. Unit is %.
7	Actual volume flow rate	Actual flow rate calculated based on valve parameters	R	0 to 65535. Unit is l/hours.
8	Differential temperature	Actual water ΔT calculated based on measured supply and return temperatures	R	-200 to +200. Unit is °K.
9	Flush timer, actual value	Timer: Remaining time until start of flushing procedure	R	0 to 4320. Unit in hours until last hour then in minutes.
10	Valve blocking protection timer, actual value	Timer: Remaining time until start of valve blocking protection procedure	R	0 to 4320. Unit in hours.
11	Operating hours	Life statistics: Total operating time of the actuator	R	0 to 1193046. Unit in hours.
12	Distance counter	Life statistics: Total travel distance of the actuator	R	0 to 4294967295. Unit is millimeters.
13	Overall stroke	Total stroke (distance between upper and lower end postion)	R	0 to 15. Unit in millimeters.
15	Actual volume flow rate limitation	Max. flow depending on selected valve	R	50 to 50000. Unit is l/hours. *Automatic and depending on selection in MSV.8.*
16	Actual value of thermal power	Current calculated value of thermal power going through the valve. Calculated value only valid for PICVs	R	0 to 65535. Unit is kW.
17	Energy, running day	Current day from 00:00. Calculated value only valid for PICVs	R	0 to 65535. Unit is kWh.
18	Energy, 24 hours back	Current time and 24 hours back. Calculated value only valid for PICVs	R	0 to 65535. Unit is kWh.

Analog Output (AO):

#	Name	Description	R/W	Present-Value Options
1	Analog output P2	Output value of port 2, for configuration of sensor / output type port 2. ~0 to 10V output	R/W	0 to 100. Unit is %.

Analog Value (AV):

#	Name	Description	R/W	Present-Value Options
1	External control signal	External Volume flow rate set point (actuating signal)	R/W	0 to 100 (-10 to 110). Unit is %.
2	Minimum control signal	Set minimum control signal limit	R/W	0 to 100. Unit is %.
3	Maximum control signal	Set maximum control signal limit	R/W	0 to 100. Unit is %.
4	Supply temperature	Supply water temperature	R/(W)	-50 to +150. Unit is °C. *Write-protected when source is Port 1 or Port 2.*
5	Return temperature	Return water temperature	R/(W)	-50 to +150. Unit is °C. *Write-protected when source is Port 1 or Port 2.*
6	Correction value P1	Correction factor for port 1	R/W	-5 to +5.
7	Correction value P2	Correction factor for port 2	R/W	-5 to +5.

Analog Value (AV), continued:

#	Name	Description	R/W	Present-Value Options
8	Emergency position	Failsafe position in case of BUS communication failure or invalid control function	R/W	0 to 100. Unit in %. <u>30</u>
10	Valve blocking protection timer	Set valve block protection timer, i.e. the time between two valve block protection procedures	R/W	0 to 4320. Unit is hours. *0=not active.*
11	Hydraulic balancing value for heating	Range between minimum and maximum flow rate of selected valve in heating mode	R/W	0 to 65535. Unit is l/hours.
12	Hydraulic balancing value for cooling	Range between minimum and maximum flow rate of selected valve in cooling mode	R/W	0 to 65535. Unit is l/hours.
13	Valve lift	Valve stroke length	R/W	0.5 to 9. Unit is millimeters. <u>*0= automatic stroke length detection.*</u> *When changed, automatic adaption is activated.*
14	Medium energy constant	Energy constant for used hydraulic medium	R/W	180 to 18000. Unit is $J/(kg*°K)$. *<u>4183</u>= water.*
15	Xp	Xp - proportional gain contant of PI controller	R/W	2 to 6000.
16	Tn	Tn - time constant of PI controller	R/W	0 to 720. Unit is seconds.
17	Room temperature actual value	Actual room temperature	R/(W)	-50 to +150. Unit is °C. *Write-protected when source is Port 1 or Port 2.*
18	Room temperature setpoint	Room temperature setpoint	R/W	0 to 50. Unit is °C.
19	Thermal power setpoint	Thermal power setpoint. Positive values for heating and cooling	R/W	0 to 5000. Unit is kW.
20	Return temperature setpoint	Return water temperature setpoint	R/W	0 to 120. Unit is °C.
22	Maximum thermal power limiting value	Set max. value for thermal power. Positive values for heating and cooling	R/W	0 to 5000. Unit is kW. *0= not active.*
23	Return temperature limiting value	Return water temperature limiting value.	R/W	0 to 120. Unit is °C. *0= not active.*
28	MAC address	MAC address	R/(W)	1 to 127. *Writeable when actuator DIP switches are set to 63.*
29	Close when adjusting range	Upper and lower end position range where actuator remains in end position	R/W	0 to 5. Unit is %.
30	Kvs value of the selected valve			*NO FUNCTION.* Value is set by valve selection in MSV.8.
31	Xp thermal power limitation	Gain constant for power limitation	R/W	2 to 6000.
32	Xp return temperature limitation	Gain constant for return water temperature limitation	R/W	2 to 6000.
35	Flush timer	Set flush timer, i.e. the time between two flushing procedures	R/W	0 to 4320. Unit in hours. *0= not active.*

Binary Input (BI):

#	Name	Description	R/W	Present-Value Options
1	Binary input P1	Input in port 1	R	0= Off 1= On
2	Binary input P2	Input in port 2	R	0= Off 1= On
3	Actuator is busy	Operating status: Actuator mode	R	0= Normal operation (no message shown) 1= Actuator is not available for control signal
4	Actuator in malfunction	Operating error status: Hardware fault	R	0= Normal operation (no message shown) 1= Hardware fault (Port 1 or Port 2 range exceeded or similar malfunction)

Binary Input (BI), continued:

#	Name	Description	R/W	Present-Value Options
5	Error during valve adaption	Operating error status: Valve calibration error	R	0= Normal operation (no message shown) 1= Error during valve adaption
6	Error: valve blocking	Operating error status: Valve blocking error	R	0= Normal operation (no message shown) 1= Error, valve is blocked
7	Warning: leak detected	Operating error status: Leak detection warning	R	0= No warning 1= Leak detected (ΔT above 8 °K when valve is closed for more than 6 hours)
8	Limit function active	External control signal overwritten due to exceeded limit value	R	

Binary Value (BV):

#	Name	Description	R/W	Present-Value Options
1	P1 inversion (binary input)	Port 1 direct or inverse operating mode (binary input)	R/W	0= Direct 1= Inverted *Works with MSV.2= 2.*
2	P2 inversion (binary input)	Port 2 direct or inverse operating mode (binary input)	R/W	0= Direct 1= Inverted *Works with MSV.3= 2.*
3	P2 inversion (analog output)	Port 2 direct or inverse operating mode (analog output)	R/W	0= Direct 1= Inverted *Works with MSV.3= 9.*
4	Inversion of the valve actuating direction	Actuator direction	R/W	0= Normally closed 1= Normally open

Multi-State Input (MSI):

#	Name	Description	R/W	Present-Value Options
1	Status of HVAC mode (Changeover)		R	1= Shut-off 2= Heating 3= Cooling

Multi-State Value (MSV):

#	Name	Description	R/W	Present-Value Options
1	Service command	Service command	R/W	1= Normal operation mode 2= Calibration mode 3= Test run mode 4= Synchronize valve 5= Reset error messages 6= Reset BUS 7= Reset to factory settings
2	Sensor type P1	Port 1 sensor type	R/W	1= OFF 2= Binary input 3= 0-10V input 4= KP10 5= Ni1000-DIN 6= Ni1000-LG 7= PT1000 8= Potentiometer 10°K 9= Potentiometer 10°K +/-3°K 10= Potentiometer 10°K +/-5°K
3	Sensor/Output type P2	Port 2 sensor type / output	R/W	1= OFF 2= Binary input 3= 0-10V input 4= KP10 5= Ni1000-DIN 6= Ni1000-LG 7= PT1000 8= Potentiometer 10°K 9= 0-10V output (set in AO.1) 10= 0-10V Y position feedback (set in AI.6) 11= Changeover signal for 6-way valve (set in MSV.9)
4	Operating mode	Operating mode	R/W	1= External control signal (set in AV.1) 2= Open ~ 100% 3= Closed ~ 0% 4= Minimum position (set in AV.2) 5= Res. 6= Maximum position (set in AV.3) 7= Room temperature (set in AV.17 and AV.18) 8= Control by thermal power (set in AI.16 and AV.19) 9= Return water temperature (set in AV.5 and AV.20)

Multi-State Value (MSV), continued:

#	Name	Description	R/W	Present-Value Options
5	Source of supply and return temperature	Water temperature source, supply and return	R/W	1= BUS (set in AV.4 and AV.5) 2= Port 1 supply, Port 2 return 3= Port 2 supply, Port 1 return 4= Port 1 supply, BUS return 5= Port 2 supply, BUS return 6= BUS supply, Port 1 return 7= BUS supply, Port 2 return
6	Communication failure mode	Action in case of communication failure	R/W	1= fail in place 2= close (after 120 seconds) 3= open (after 120 seconds) 4= fail position, set in AV.8 (after 120 seconds)
7	Select RS485 baud rate	RS-485 baud rate	R/W	1= Default (38400) 2= 9600 3= 19200 4= 38400 5= 57600 6= 76800 7= 115200 *Changes are only effective after restart of actuator*
8	Select valve type	Select valve type and control characteristics	R/W	1= Linear (generic) 2= Green.0 3= Green.1 4= Green.2 5= Green.1HF 6= GreEQ.0 7= GreEQ.1 8= GreEQ.2 9= EQ% (generic) 10= User-Valve
9	Choose HVAC mode (Changeover)	HVAC mode (changeover mode)	R/W	1= Shut-off 2= Heating 3= Cooling 4= Automatic based on supply temperature (MSV.3≠11)
10	Select source for room temperature	Room temperature source	R/W	1= BUS (set AV.17) 2= Port 1 3= Port 2
11	LED mode	LED indication	R/W	1= OFF 2= ON without BUS 3= ON with BUS
12	Actuating speed	Actuator speed	R/W	1= 22 s/mm 2= 28 s/mm 3= 16 s/mm
13	Actuator Control Curve	Actuator Control Curve (input and feedback)	R/W	0= Linear 1= Equal%

Network Port (NP):

#	Name	Description	R/W	Present-Value Options
1	Network port MS/TP			