

BACnet Protocol Implementation Conformance Statement

Date: October 24th 2023
Vendor Name: FlowCon International
Product Name: FlowCon FIT Intelligent Interface - part of FlowCon FIT Energy System
Product Model Number: ACC40023
Applications Software Version: 1.05 Firmware Revision: 2.4.3 BACnet Protocol Revision: 12

Product Description:

BACnet Intelligent Interface for FlowCon FIT valves is intended for pressure independent flow management control securing continuously correct Delta T for energy optimization, optimal room comfort or a SMART control combination, depending on control mode setting.

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
DS-RPM-B	Data Sharing - Read Property Multiple - B
DM-RD-B	Device Management - Reinitialize Device- 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, 76800 and 115200
- MS/TP slave (Clause 9), baud rate(s): 9600, 19200, 38400, 57600, 76800 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, 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 a gateway (for SM.0.0.0.5/6) and non gateway (for SM.0.0.0.3/4).

Standard Object types Supported:

Object Type	Supported	Dynamically Creatable	Dynamically Deletable	Optional Properties Supported	Writable Properties
Device Priority Property	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Max_Master Max_Info_Frame Description #1000 to #1026	Object_Identifier Object_Name Max_Master Description #1000 to #1002
Analog Value (AV)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Reliability Description	Present_Value ¹
Binary Value (BV)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Reliability Active_Text Inactive_Text Description	Present_Value ²
Multi-state Value (MSV)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Description Reliability States_Text	Present_Value ³

Note 1: Present_Value property is writable for objects AV.4 and AV.62 and AV.11, AV.12, AV.138, AV.139, AV.141, AV.143 and object AV.164 under specific conditions.
 Note 2: Present_Value property is writable for objects BV.17, BV.18, BV.53, BV.54, BV.62 and BV.63 and object BV.56 under specific conditions.
 Note 3: Present_Value property is writable for objects MSV.1, MSV.2, MSV.3, MSV.4, MSV.5, MSV.6, MSV.7, MSV.38 and MSV.39 and object MSV.43 under specific conditions.

Proprietary Properties

ID	Data type	Meaning	Writable
Proprietary property #1000	Unsigned type	Represents the physical layer MAC address. This value range from 0 to 127.	<input checked="" type="checkbox"/>
Proprietary property #1001	Unsigned type	Represents the MS/TP baud rate. Available values are: 9600, 19200, 38400, 57600, 76800 and 115200.	<input checked="" type="checkbox"/>

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

List of Objects

Analog Input (AI):

ID	Name	Description	R/W	Present-Value Options
1	WaterTemperature1	T1, temperature sensor 1	R	-30 to 500. Unit as per MSV.3.
2	WaterTemperature2	T2, temperature sensor 2	R	-30 to 500. Unit as per MSV.3.
3	WaterTempDelta	ΔT , numerical valve of T1-T2	R	0 to 500. Unit as per MSV.3.
4	WaterTempDeltaTarget	ΔT Target	R/W	<u>10</u> 0 to 200. Unit as per MSV.3. <i>FIT system is controlled by ΔT Target if MSV.4= 1</i>
5	WaterTempDeltaDead-band	ΔT Target deadband	R/W	<u>0.5</u> 0.1 to 100. Units as per MSV.3, default °C.
6	RoomTemperature	Room temperature	R/W	<u>23</u> -100 to 500. Units as per MSV.3, default °C.
7	RoomTargetTemp	Room temperature target	R/W	<u>23</u> -100 to 500. Units as per MSV.3, default °C.
8	RoomTargetDeadband	Room temperature target deadband	R/W	<u>1</u> 0.1 to 100. Units as per MSV.3, default °C.
9	TargetEvalInterval	Time interval for temperature check	R/W	<u>10</u> 3 to 3600. Unit is seconds.
10	EnergyConsumption	Energy consumption in BTU or kW	R	0 to 1000. Unit as per MSV.3.
11	Temp1Correct	Correction value for temperature sensor 1	R	<u>0</u> -10.0 to 10.0. Unit as per MSV.3.
12	Temp2Correct	Correction value for temperature sensor 2	R	<u>0</u> -10.0 to 10.0. Unit as per MSV.3.
13	Pressure1	P1, pressure sensor 1	R	0 to 1000. Unit as per MSV.6. <i>Works in config. 1, 2 and 4.</i>
14	Pressure2	P2, pressure sensor 2	R	0 to 1000. Unit as per MSV.6. <i>Works in config. 1, 2 and 4.</i>
15	PressureDelta	ΔP , numerical valve of P1-P2	R	0 to 1000. Unit as per MSV.6. <i>Works in config. 1, 2 and 4.</i>
16	Press1Correct	Correction value for pressure sensor 1	R/W	<u>0</u> -10.0 to 10.0. Unit as per MSV.6. <i>Works in config. 1, 2 and 4.</i>
17	Press2Correct	Correction value for pressure sensor 2	R/W	<u>0</u> -10.0 to 10.0. Unit as per MSV.6. <i>Works in config. 1, 2 and 4.</i>
18	SystemOnCounter	Standard counter in minutes, counting the minutes the system is on	R	<u>0</u> to 50.000.000. Unit is minutes.
62	MaxFlow	Maximum flow rate	R/W	0 to 277100. Unit as per MSV.39. Range adapts to selected valve in MSV.7 or MSV.38 and selected unit in MSV.39
68	FlowRate	Current flow rate	R	0 to 277100. Unit as per MSV.39. Range adapts to selected valve in MSV.7 or MSV.38 and selected unit in MSV.39 <i>In config. 1 object is controlled by PICV actuator. In config. 2, 3 and 4 object is controlled by FIT.</i>
98	MotorPosition	Motor position / valve opening	R	0 to 100. Unit is %. <i>In config. 1 object is controlled by PICV actuator. In config. 2, 3 and 4 object is mirrored AV.141</i>
138	ControlSigMin	Analog control signal minimum value	R/W	0 to 10. Unit is Volts. <i>NO FUNCTION.</i>
139	ControlSigMax	Analog control signal maximum value	R/W	0 to 10. Unit is Volts. <i>NO FUNCTION.</i>
140	BatteryCapacity	Actuator battery capacity	R	0 to 100. Unit is %. <i>Works in config. 1.</i>
141	AnalogControlSignal	Analog control signal value	R/W	10 to 100, for MSV.4=4 or 5. Unit is %. 0 to 100, for MSV.4=1, 2 or 3. Unit is %.
143	BACnetFallbackTimeout	BACnet control fallback timeout	R/W	1 to 60. Unit is minutes. Default= <u>10</u> for MSV.4=2. Default= <u>60</u> for MSV.4=1, 3, 4 or 5 <i>Works in config. 1.</i>

Analog Value (AV), continued:

ID	Name	Description	R/W	Present-Value Options
164	FeedbackSignal	Feedback signal value	R	2 to 10. Unit is Volts. <i>NO FUNCTION.</i>
165	WaterT1	FIT writes T1 back to the actuator display	R/W	-30 to 500. Unit is converted to °C. <i>Works in config. 1. FIT overwrites this value.</i>
166	WaterT2	FIT writes T2 back to the actuator display	R/W	-30 to 500. Unit is converted to °C. <i>Works in config. 1. FIT overwrites this value.</i>
167	WaterdT	FIT writes ΔT back to the actuator display	R/W	0 to 500. Unit is converted to °C. <i>Works in config. 1. FIT overwrites this value.</i>
168	dP	FIT writes ΔP back to the actuator display	R/W	0 to 1000. Unit is converted to kPaD <i>Works in config. 1. FIT overwrites this value.</i>

Binary Value (BV):

ID	Name	Description	R/W	Present-Value Options
1	PressureDeltaAlarm		R	0= OFF 1= ON <i>Works in config. 1, 2 and 4.</i>
2	RestartUnit	Restart unit	R/W	0= Not activate 1= Activated
17	RotationDirection	Motor rotation direction	R/W	0= NO 1= NC <i>Works in config. 1.</i>
18	FailsafeDirection	Failsafe rotation direction	R/W	0= Open 1= Close <i>Works in config. 1.</i>
53	FlushMode	Flush mode enable	R/W	0= Disabled 1= Enabled <i>Works in config. 1.</i>
54	Password	Password enable	R/W	0= Disabled 1= Enabled <i>Works in config. 1.</i>
55	OvertorquedAlarm	Overtorqued alarm	R	0= Off 1= On <i>Works in config. 1.</i>
56	OvertorquedInPastAlarm	Overtorqued in past alarm	R/W	0= Off 1= On <i>Works in config. 1.</i>
57	OverTemperatureAlarm	Critical over temperature alarm	R	0= Off 1= On <i>Works in config. 1.</i>
58	HighTemperatureAlarm	Uncritical high temperature alarm	R	0= Off 1= On <i>Works in config. 1.</i>
59	PowerFailAlarm	Power failure / out of range alarm	R	0= Off 1= On <i>Works in config. 1.</i>
60	NoCtrlSignalAlarm	No control signal alarm	R	0= Off 1= On <i>Works in config. 1.</i>
61	BattErrorAlarm	Battery error alarm	R	0= Off 1= On <i>Works in config. 1.</i>
62	BACnetFallback-Alarm	BACnet fallback alarm	R/W	0= Off 1= On <i>Works in config. 1.</i>
63	Autostroke	Activate auto-stroke. After auto-cycle FIT will proceed to normal operation and reset to 0=disabled	R/W	0= Disabled 1= Enabled <i>Works in config. 1.</i>

Multi-State Value (MSV):

ID	Name	Description	R/W	Present-Value Options
1	Baud Rate	FIT baud rate	R/W	1= 9600 2= 19200 3= 38400 4= 57600 5= 76800 6= 115200
2	MS/TP MAC Address	FIT MS/TP MAC address	R/W	0 to 127
3	Temperature and Energy Units	FIT workable temperature and energy units	R/W	1= °C and BTU/h 2= °F and BTU/h 3= °C and kW 4= °F and kW

Multi-State Value (MSV), continued:

ID	Name	Description	R/W	Present-Value Options
4	Flow Control	<p>FIT direct control mode</p> <p>When set to direct ΔT Control, FlowCon FIT will work as an energy valve based on a system defined target ΔT. When set to direct Comfort Control, FlowCon FIT will work as a PICV for room comfort control. When set to Smart Control, FlowCon FIT will prioritize room temperature setting and within designated range optimize the ΔT.</p> <p>When set to any 90% close-mode, FlowCon FIT will as minimum be opened 10% to avoid dead end leg.</p>	R/W	<p>1= ΔT Control (Delta T Target) 2= Comfort Control (Set Flow) 3= Smart Control (Room temp. in combi with ΔT) 4= ΔT Control 90% close 5= Smart Control 90% close</p> <p>Comfort Control is also recommended under commissioning or during system verification.</p>
5	Configuration	!! FIT configuration !!	R/W	<p>1= SM.0.0.0.5/6 2= SM.0.0.0.3/4 3= FN/FH w/o pressure sensors 4= FN/FH w pressure sensors</p>
6	Pressure Units	FIT workable pressure unit	R/W	1= kPa 2= psi
7	ValveModelG	FIT valve model number based on FlowCon Green	R/W	<p>1= <u>Green.0</u> 2= Green.1 3= Green.2 4= Green.3 Works in config. 3 and 4</p>
38	ValveModel	FIT valve model number based on FlowCon SM	R/W	<p>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 12= SM.6.2 Works in config. 1 and 2 Controlled by PICV actuator in config. 1; Default= <u>1</u> Controlled by FIT in config. 2; Default= <u>2</u> (1 not available)</p>
39	FlowScaleUnit	Flow scale unit	R/W	<p>1= l/sec 2= GPM 3= l/hr Controlled by PICV actuator in config. 1 Controlled by FIT in config. 2, 3 and 4</p>
40	ControlSignalMode	Control signal mode	R	<p>1= 2-10VDC 2= 4-20mA 3= Digital 4= BACnet Only BACnet is valid, 1/2/3 have no function Works in config. 1. Controlled by FIT.</p>
41	FeedbackSignalMode	Feedback signal mode	R	<p>1= 2-10VDC 2= 0-10VDC 3= 4-20mA 4= <u>Auto</u> NO FUNCTION.</p>
43	BACnetFallbackAction	BACnet control fallback action	R	<p>1= <u>Close</u> 2= Stop 3= Open 4= Midway Works in config. 1. Controlled by PICV actuator.</p>
44	PressureRange_kPaD	PICV pressure range as per MSV.38	R	<p>1= NA (SM.0.0) 2= 32-320 (SM.1.1) 3= 40-320 (SM.2.1) 4= 30-800 (SM.3.0) 5= 30-800 (SM.3.1) 6= 35-800 (SM.3.2) 7= 30-800 (SM.4.1) 8= 35-800 (SM.4.2) 9= 50-800 (SM.4.3) 10= 30-800 (SM.5.1) 11= 35-800 SM.5.2) 12= 35-800 (SM.6.2)</p> <p>Works in config. 1. Controlled by PICV actuator.</p>
45	ActuatorState	Actuator operation state	R	<p>1= <u>Normal</u> 2= Calibration 3= Flush 4= Auto-stroke 5= Alarm 6= Failsafe Works in config. 1. Controlled by PICV actuator.</p>
46	ControlCurveMode	Actuator control mode	R/W	<p>1= <u>Linear flow</u> 2= Equal% 3= Linear rotation 4= Linear signal Only Linear flow is valid, 2/3/4 have no function Works in config. 1. Controlled by PICV actuator.</p>