BACnet Protocol Implementation Conformance Statement

This document contains the BACnet Protocol Implementation Conformance Statement (PICS) and BACnet® Interoperability Building Blocks (BIBBs) for the Sontay Smart Sensor as required by the American National Standards Institute/ American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ANSI/ASHRAE) Standard 135-2016, BACnet protocol. BACnet interoperability building blocks are collections of one or more BACnet services. This document includes a listing of the BIBBs currently supported by this device.

The Sontay Smart Sensor is a native BACnet-Application Specific Controller (B-ASC) with BACnet MS/TP capabilities.

BACnet Standardized Device Profile (Annex L)

	BACnet Operator Workstation (B-OWS)
	BACnet Building Controller (B-BC)
	BACnet Advanced Application Controller (B-AAC)
x	BACnet Application Specific Controller (B-ASC)
	BACnet Smart Sensor (B-SS)
	BACnet Smart Actuator (B-SA)

BACnet Interoperability Building Blocks (BIBBs) (Annex K)

The table below lists all the BIBBs that are required for the BACnet Application Specific Controller (B-ASC) profile. The BIBBS that are not required for B-ASC Profile but supported in this product are also listed.

Application Services (B-ASC)	**BIBB**
Data Sharing - Read Property - B	DS-RP-B
Data Sharing - Write Property - B	DS-WP-B
Device Management - Dynamic Device Binding - B	DM-DDB-B
Device Management - Dynamic Object Binding - B	DM-DOB-B
Device Management - Device Communication Control - B	DM-DCC-B
Data Sharing - Read Property Multiple - B	DS-RPM-B
Device Management - Reinitialize Device - B	DM-RD-B

Standard Device Binding Methods Supported

The table below lists all the standard Device Binding methods supported by this device.

	Send Who-Is, receive I-Am (BIBB DM-DDB-A)
X	Receive Who-Is, send I-Am (BIBB DM-DDB-B)
	Send Who-Has, receive I-Have (BIBB DM-DOB-A)

X	Receive Who-Has, send I-Have (BIBB DM-DOB-B)
	Manual configuration of recipient device's network number and MAC address
	None of the above

BACnet object table

Depending on the options required at the time of ordering, not all the BACnet objects referred to in this section may be visible or discoverable.

1. The Device Object

Property Name /ID	R/W	Range	Default
Object Identifier	RW		662 + MAC Address
Object Name	RW	32 Characters Max	
Object Type	RO		8
System Status	RO		STATUS_OPERATIONAL
Vendor Name	RO		Sontay Ltd.
Vendor Identifier	RO		662
Model Name	RO		Smart Sensor (tbc)
Firmware_Revision	RO		tbc
Description	RW		SmartSensor
Location	RW		
Application_Software_Version	RO		tbc
Protocol Version	RO		1
Protocol Revision	RO		19
Protocol_Services_Supported	RO		Read Property = Supported Write Property = Supported
Protocol_Object_Types_Supported	RO		Device = Supported Analog Input = Supported Analog Output = Supported Analog Value = Supported Binary Input = Supported Binary Output = Supported Binary Value = Supported Multistate = Supported
Max_APDU-length	RO		480
Segmentation Support	RO		No
APDU Timeout	RO		3000ms
Number APDU Retries	RO		3
MaxMaster	RO		127
Max_Info_Frames	RO		1
Device_Address_Binding	RO		
Object_List	RO		AI-0, AI-1, AI-2, AI-3, AI-4, AI-5, AI-6, AI-7, AI-8, AO-01, AO-1, AO-2, AV-0, AV-1, AV-2, AV-3, AV-4, AV-5, AV-6, AV-7, AV-8, AV-9, AV-10, AV-11, AV-12, AV-13, AV-14, AV-15, AV-16, AV-17, AV-18, AV-19, AV-20, AV-21, BI-0,BI-1, BI-2, BO-0, BO-1, BV-0, BV-1, BV-2, BV-3, BV-4, BV-5, BV-6, BV-7, BV-8, BV-9, BV-10, BV-11, BV-12, BV-13, MSV-0, MSV-1, MSV-2, MSV-3, MSV-4, MSV-5, MSV-6
Property_List	RO		System-status (112) Vendor-name (121) Vendor-identifier (120) Model-name (70) Firmware-revision (44)

Property Name /ID	R/W	Range	Default
			Application-software-version (12) Protocol-version (98) Protocol-revision (139) Protocol-services-supported (97) Protocol-object-types-supported (96) Object-list (76) Max_APDU-length (62) Segmentation-supported (107) APDU-timeout (11) Number-of-APDU-retries (73) Device-address-binding (30) Database-revision (155) Location Description
Database Revision	RO		

2. The Network Port Object

Property Identifier	R/W	Range	Default
Object_Identifier	RW	32 Characters Max.	
Object_Name	RW	32 Characters Max.	
Object_Type	RO	Network Port	
Status_Flags	RO	In_Alarm Fault Overridden Out_Of_Service	
Reliability	RO		
Out_Of_Service	RO		
Network_Type	RO	MS/TP	
Protocol_Level	RO	Physical	
Network_Number	RW	0 - 65334	
Network_Number_Quality	RO	Unknown Configured	
Changes_Pending	RO		
APDU_Length	RW	>50	480
Routing_Table	RO		
Link_Speed	RW	9k6, 19k2, 38k4, 76k8	76k8
Property_List	RO	Status_Flags Reliability Out_Of_Service Network_Type Protocol_Level Network_Number Network_Number_Quality Changes_Pending APDU_Length Routing_Table Link_Speed Property_List MAC_Address Max_Master Max_Info_Frames	
MAC_Address	RW	0-255	1
Max_Master	RW	0-127	127
Max_Info_Frames	RW		

3. Analog Inputs

Object Name	Type & Instance	Description	Range & Definition	Notes
RH&T Temperature Value	AI-0	AI-0, Temperature	-99.9 - 999.9°C/°F, precision 1	All properties are RO except Description and Units. Present_Value is dependent on **AV-2**, **AV-3** and **AV-4** Units are dependent on **BV-3**
RH Value	AI-1	AI-1, Relative Humidity	0 - 100% RH, precision 1	All properties are RO except Description. Present_Value is dependent on **AV-5**.
CO2 Value	AI-2	AI-2, CO_2	0-5000ppm, precision 0	All properties are RO except Description. Present_Value is dependent on **BV-10**.
Setpoint Value	AI-3	AI-3, Setpoint	0-100%, precision 1	All properties are RO except Description. Present_Value is dependent on **AV-0** and **AV-1**.
Light Level Value	AI-4	AI-4, Light Level	0-10000 lux, precision 0	All properties are RO except Description
Air Quality Value	AI-5	AI-5, IAQ	0-1000 ppb, precision 0	All properties are RO except Description
CO Value	AI-6	AI-6, CO	0-500ppm, precision 0	All properties are RO except Description
Aux AI	AI-7	AI-7, Aux AI	0-100%, precision 1	All properties are RO except Description and Units. Present_Value and Units are dependent on **BV-3** and **BV-7**.
Thermistor Temperature Value	AI-8	AI-8, Thermistor Temperature	-99.9 - 999.9°C/°F, precision 1	All properties are RO except Description and Units. Present_Value is dependent on **AV-2**, **AV-3** and **AV-4** Units are dependent on **BV-3**

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	analog-input,0	RO
Object_Name	CharacterString	"AI-0, Temperature"	RO
Object_Type	BACnetObjectType	analog-input (0)	RO
Present_Value	REAL	-20 to +70	RO
Description	CharacterString	Temperature	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	°C or °F (64)	RW
Property_List	CharacterString	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	analog-input,1	RO
Object_Name	CharacterString	"AI-1, Relative Humidity"	RO
Object_Type	BACnetObjectType	analog-input (0)	RO
Present_Value	REAL	0-100	RO

Description	CharacterString	Relative Humidity	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	percent (98)	RO
Property_List	CharacterString	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

Property	**Property Data Type**	**Default Value**	**Access**
Object_Identifier	BACnetObjectIdentifier	analog-input,2	RO
Object_Name	CharacterString	"AI-2, CO_2"	RO
Object_Type	BACnetObjectType	analog-input (0)	RO
Present_Value	REAL	0-5000	RO
Description	CharacterString	CO_2	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	ppm (96)	RO
Property_List	CharacterString	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

Property	**Property Data Type**	**Default Value**	**Access**
Object_Identifier	BACnetObjectIdentifier	analog-input,3	RO
Object_Name	CharacterString	"AI-3, Setpoint"	RO
Object_Type	BACnetObjectType	analog-input (0)	RO
Present_Value	REAL	0-100	RO
Description	CharacterString	Setpoint	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	percent (98)	RO
Property_List	CharacterString	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

Property	**Property Data Type**	**Default Value**	**Access**
Object_Identifier	BACnetObjectIdentifier	analog-input,4	RO
Object_Name	CharacterString	"AI-4, Light Level"	RO
Object_Type	BACnetObjectType	analog-input (0)	RO
Present_Value	REAL	0 to 10000	RO
Description	CharacterString	Light Level	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	lux	RO
Property_List	CharacterString	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service	RO

		Units	

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	analog-input,5	RO
Object_Name	CharacterString	"AI-5, IAQ"	RO
Object_Type	BACnetObjectType	analog-input (0)	RO
Present_Value	REAL	0-10	RO
Description	CharacterString	IAQ	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	ppb	RO
Property_List	CharacterString	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	analog-input,6	RO
Object_Name	CharacterString	"AI-6, CO"	RO
Object_Type	BACnetObjectType	analog-input (0)	RO
Present_Value	REAL	0-1000	RO
Description	CharacterString	CO	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	ppm (96)	RO
Property_List	CharacterString	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	analog-input,7	RO
Object_Name	CharacterString	"AI-7, Aux AI"	RO
Object_Type	BACnetObjectType	analog-input (0)	RO
Present_Value	REAL	Depends on input type setting	RW
Description	CharacterString	Aux AI	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	Depends on input type setting	RW
Property_List	CharacterString	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	analog-input,8	RO
Object_Name	CharacterString	"AI-8, Thermistor Temperature"	RO
Object_Type	BACnetObjectType	analog-input (0)	RO
Present_Value	REAL	-20 to +70	RO
Description	CharacterString	Thermistor Temperature	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F} (1)	RO

Property	Property Data Type	Default Value	Access
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0) (1)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	°C or °F (64)	RW
Property_List	CharacterString	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service	RO

- AI-7 is used specifically for the auxiliary analogue input, whether it's set for 0-10Vdc input or 10K3A1 thermistor input (using BV-7).
- AI-8 is used specifically for the on-board 10K3A1 thermistor (if this option is fitted).

4. Analogue Outputs

Object Name	Type & Instance	Description	Range & Definition	Notes
analog-output, 0	AO-0	AO-0, Analog Output 0	0-10Vdc, Precision: 1	All properties are RO except Present_Value, Description and Units. Present_Value is dependent on **MSV-2**
analog-output, 1	AO-1	AO-1, Analog Output 1	0-10Vdc, Precision: 1	All properties are RO except Present_Value, Description and Units. Present_Value is dependent on **MSV-3**
analog-output, 2	AO-2	AO-2, Analog Output 2	0-10Vdc, Precision: 1	All properties are RO except Present_Value, Description and Units. Present_Value is dependent on **MSV-4**

Note: The source of each analogue output can be defined as follows:

- AO-0 = MSV-2
- AO-1 = MSV-3
- AO-2 = MSV-4

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	analog-output,0	RO
Object_Name	CharacterString	"AO-0"	RO
Object_Type	BACnetObjectType	analog-output (1)	RO
Present_Value	REAL	Dependent on MSV-2	RW
Description	CharacterString	none	RW
Current_Command_Priority	BACnetOptionalUnsigned		RO
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	Vdc	RW
Priority_Array	BACnetPriorityArray		RO
Relinquish_Default	REAL		RO
Poperty_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags	RO

		Event_State Reliability Out_Of_Service Units	

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	analog-output,1	RO
Object_Name	CharacterString	"AO-1"	RO
Object_Type	BACnetObjectType	analog-output (1)	RO
Present_Value	REAL	Dependent on MSV-3	RW
Description	CharacterString	none	RW
Current_Command_Priority	BACnetOptionalUnsigned		RO
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	Vdc	RW
Priority_Array	BACnetPriorityArray		RO
Relinquish_Default	REAL		RO
Poperty_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	analog-output,2	RO
Object_Name	CharacterString	"AO-2"	RO
Object_Type	BACnetObjectType	analog-output (1)	RO
Present_Value	REAL	Dependent on MSV-4	RW
Description	CharacterString	none	RW
Current_Command_Priority	BACnetOptionalUnsigned		RO
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	Vdc	RW
Priority_Array	BACnetPriorityArray		RO
Relinquish_Default	REAL		RO
Poperty_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

5. Analog Values

Object Name	Type & Instance	Description	Range & Definition	Notes
Low Setpoint Limit	AV-0	AV-0, Low limit for setpoint range	0 – 50% Precision: 1	All properties are RO except Description and Present_Value.

Object Name	Type & Instance	Description	Range & Definition	Notes
High Setpoint Limit	AV-1	AV-1, Low limit for setpoint range	50 – 100% Precision: 1	All properties are RO except Description and Present_Value.
Temperature Offset	AV-2	AV-2, Offset for current temperature	°C: -10.0 - 10.0 °C °F: -18.0 - 18.0 °F Precision: 1	All properties are RO except Description, Units and Present_Value. See **BV-3**
Temperature Output High Range	AV-3	AV-3, Temperature Output High Range	°C: +40.0 to +110.0℃ °F: +104 to +230.0°F Precision: 0	All properties are RO except Description, Units and Present_Value. See **BV-3**
Temperature Output High Range	AV-4	AV-4, Temperature Output Low Range	°C: -20.0 to +40.0℃ °F: -4 to +104.0°F Precision: 0	All properties are RO except Description, Units and Present_Value. See **BV-3**
RH Offset	AV-5	AV-5, Offset for current RH	-10.0 to +10.0 %RH Precision: 1	All properties are RO except Description and Present_Value.
MAC Address	AV-6	AV-6, MAC Address	0 - 127 (confined by Max-master) Precision: 0	All properties are RO except Description and Present_Value. May be set using DIP switch DS1
Device Instance	AV-7	AV-7, Device Instance	0 - 4194302 Precision: 0	All properties are RO except Description and Present_Value. Default = "662"+MAC
LED "Good" Switching Level	AV-8	AV-8, LED "Good" Switching Level LED = Green	Dependent on MSV-0	All properties are RO except Description and Present_Value. Present_Value may be dependent on **MSV-0**.
LED "Fair" Switching Level	AV-9	AV-9, LED "Fair" Switching Level LED = Amber	Dependent on MSV-0	All properties are RO except Description and Present_Value. Present_Value may be dependent on **MSV-0**.
LED "Bad" Switching Level	AV-10	AV-10, LED "Bad" Switching Level LED = Red	Dependent on MSV-0	All properties are RO except Description and Present_Value. Present_Value may be dependent on **MSV-0**.
PIR Off Delay	AV-11	AV-11, PIR Off Delay	0 to 900 seconds Precision 0	All properties are RO except Description and Present_Value. Controls how long the Present_Value of **BI-1** remains TRUE after PIR detection goes FALSE.
Calculated Enthalpy	AV-12	AV-12, Calculated Enthalpy	-20 to 250 kJ/kg Precision 1	All properties are RO except Description and Present_Value.
Calculated Dewpoint	AV-13	AV-13, Calculated Dewpoint	-50 to 50 °C Precision 1	All properties are RO except Description and Present_Value. Units depend on **BV-3**

Object Name	Type & Instance	Description	Range & Definition	Notes
AO1 Fallback Value	AV-14	AV-14, The value outputted by AO-0 if network comms fail.	0 - 5000 Precision: 1	All properties are RO except Description, Units and Present_Value. See **MSV-2**
AO1 Fallback Value	AV-15	AV-15, The value outputted by AO-1 if network comms fail.	0 - 5000 Precision: 1	All properties are RO except Description, Units and Present_Value. See **MSV-3**
AO1 Fallback Value	AV-16	AV-16, The value outputted by AO-2 if network comms fail.	0 - 5000 Precision: 1	All properties are RO except Description, Units and Present_Value. See **MSV-4**
LCD Contrast	AV-17	AV-17, LCD Contrast	0-100% Precision: 0	All properties are RO except Description and Present_Value.
LCD Brightness	AV-18	AV-18, LCD Brightness	0-100% Precision: 0	All properties are RO except Description and Present_Value.
MS Button Off Delay	AV-19	AV-19, On time when MS is pressed	0 – 7200 Precision: 0	All properties are RO except Description and Present_Value. Controls how long the Present_Value of **BI-2** remains TRUE after the MS is pressed and released.
Calculated Absolute Humidity	AV-20	AV-20, Calculated Absolute Humidity	0 to 50 g/m³ Precision 1	All properties are RO except Description and Present_Value.
DI1 Pulse Count	AV-21	AV-21, DI1 Pulse Count	0-4096 Precision: 0	All properties are RO except Description and Present_Value.

Notes:

- AV-14, AV-15 & AV-16 (analogue fallback values) are used to allow a user to set an override value for the AOs in the event that network comms (BACnet or Modbus) are lost, for whatever reason. This could be vitally important if values to the AOs are being written over the network (from a control strategy external to the device). For example, if a AO was being set to 100% over the network to run an electric heater element in a duct, this should only be allowed if there is a fan running. Fan "proving" is commonly accomplished by a differential pressure switch across the fan, which may be connected to another BACnet/Modbus device other than the SmartSensor, or even hardwired to a BMS controller. The control strategy reads the status of the fan, and if running (DP switch ON), it can send a 100 value to the AO on the SmartSensor to switch the heater element ON. However, if the system is running well, but there's a sudden break in comms to the SmartSensor – and while comms are down the fan in the duct stops running, the AO will still be at 100%, as the message to switch it OFF can't get through. However, if the AOs are (for example) not outputting network values but mapped measurement values (such as temperature and RH), the outputted values – if the SmartSensor was still running – would still be correct, as the values it uses are local from the on-board sensor elements. In this case, the user may not want to have the AOs output override by a fallback value in the case of lost comms.

- When the traffic light LED is mapped to a sensor value, the "Good", "Fair" and "Bad" levels operate as thresholds. Depending on the type of sensor, these levels may require a "Good" level to be higher than a "Fair" or "Bad" level (for example, light level). Alternatively, these levels may require a "Good" level to be lower than a "Fair" or "Bad" level (for example, CO_2). The 'Bad' level is currently only used when the traffic light LED is mapped to network.

- AV-8, AV-9 and AV-10 can be used to control, *via* the network, the colour of the traffic light LED (if fitted). MSV-0 ***MUST*** be set to "Network" to enable this feature.

Traffic light operation when in network mode

Good	Fair	Bad	LED Colour
AV-8	AV-9	AV-10	
1	0	0	Green
0	1	0	Orange
0	0	1	Red

Traffic light operation when not in network mode (Good > Bad)

Good	Fair	Bad	LED Colour
AV-8	AV-9	AV-10	
Signal <	X	X	Green
Signal >	Signal <	X	Orange
Signal >	Signal >	Signal <	Red
Signal >	Signal >	Signal >	Red

Traffic light operation when not in network mode (Good < Bad)

Good	Fair	Bad	LED Colour
AV-8	AV-9	AV-10	
Signal <	X	X	Green
Signal <	Signal >	X	Orange
Signal <	Signal <	Signal >	Red
Signal <	Signal <	Signal <	Red

– MS Button Off Delay AV-19 can be used to ensure that, when the MS momentary switch (if fitted) is pressed, it's change of status reaches its destination. The physical action of the MS button is momentary – it's only in an ON state while it's being pressed. It reverts back to an OFF status as soon as it's released. AV-19 is used to keep the ON status for the time (in seconds) set. This gives enough time to ensure the ON status is received, even after the MS button is released. Set AV-19 to the minimum time required for the status to be reliably received.

– Changing the BACnet device instance (object identifier) can be achieved by changing the value in AV-7. Note that, by default, the device instance is a concatenation of Sontay's BACnet vendor ID (662) and the MAC address (set by either the DIP switches in DS1) or AV-6. Changing the device instance after discovery will require the device to be re-discovered. To return to the default device instance, while the PCB is powered change the setting of the MAC address using DS1, power off the PCB, set the MAC to the required address using DS1 and then power the PCB.

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	analog-value,0	RO
Object_Name	CharacterString	"AV-0, Low Setpoint Limit"	RO
Object_Type	BACnetObjectType	analog-value (2)	RO
Present_Value	REAL	0	RW
Description	CharacterString	Low Setpoint Limit	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	percent (98)	RO
Poperty_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	analog-value,1	RO
Object_Name	CharacterString	"AV-1, High Setpoint Limit"	RO
Object_Type	BACnetObjectType	analog-value (2)	RO
Present_Value	REAL	0	RW
Description	CharacterString	High Setpoint Limit	RW

Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	percent (98)	RO
Poperty_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	analog-value,2	RO
Object_Name	CharacterString	"AV-2, Temperature Offset"	RO
Object_Type	BACnetObjectType	analog-value (2)	RO
Present_Value	REAL	0	RW
Description	CharacterString	Temperature Offset	RO
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	°C or °F (64)	RO
Poperty_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	analog-value,3	RO
Object_Name	CharacterString	"AV-3, Temperature Output High Range"	RO
Object_Type	BACnetObjectType	analog-value (2)	RO
Present_Value	REAL	0	RW
Description	CharacterString	Temperature Output High Range	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	°C or °F (64)	RO
Poperty_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	analog-value,4	RO
Object_Name	CharacterString	"AV-4, Temperature Output Low Range"	RO
Object_Type	BACnetObjectType	analog-value (2)	RO
Present_Value	REAL	0	RW
Description	CharacterString	Temperature Output Low Range	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	°C or °F (64)	RO

Poperty_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	analog-value,5	RO
Object_Name	CharacterString	"AV-5, RH Offset"	RO
Object_Type	BACnetObjectType	analog-value (2)	RO
Present_Value	REAL	0	RW
Description	CharacterString	RH Offset	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	percent (98)	RO
Poperty_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	analog-value,6	RO
Object_Name	CharacterString	"AV-6, MAC Address"	RO
Object_Type	BACnetObjectType	analog-value (2)	RO
Present_Value	REAL		RW
Description	CharacterString	MAC Address	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	no-units (95)	RO
Poperty_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	analog-value,7	RO
Object_Name	CharacterString	"AV-7, Device Instance"	RO
Object_Type	BACnetObjectType	analog-value (2)	RO
Present_Value	REAL	"662" + MAC	RW
Description	CharacterString	Device Instance	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	no-units (95)	RO
Poperty_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	analog-value,8	RO

Object_Name	CharacterString	"AV-8, LED "Good" Switching Level"	RO
Object_Type	BACnetObjectType	analog-value (2)	RO
Present_Value	REAL		RW
Description	CharacterString	LED "Good" Switching Level	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	no-units (95)	RO
Poperty_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	analog-value,9	RO
Object_Name	CharacterString	"AV-9, LED "Fair" Switching Level"	RO
Object_Type	BACnetObjectType	analog-value (2)	RO
Present_Value	REAL		RW
Description	CharacterString	LED "Fair" Switching Level	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	no-units (95)	RO
Poperty_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	analog-value,10	RO
Object_Name	CharacterString	"AV-10, LED "Bad" Switching Level"	RO
Object_Type	BACnetObjectType	analog-value (2)	RO
Present_Value	REAL		RW
Description	CharacterString	LED "Bad" Switching Level	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	no-units (95)	RO
Poperty_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	analog-value,11	RO
Object_Name	CharacterString	"AV-11, PIR OFF Delay"	RO
Object_Type	BACnetObjectType	analog-value (2)	RO
Present_Value	REAL	120	RW
Description	CharacterString	PIR OFF Delay	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO

Units	BACnetEngineeringUnits	Seconds	RO
Poperty_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

Property	**Property Data Type**	**Default Value**	**Access**
Object_Identifier	BACnetObjectIdentifier	analog-value,12	RO
Object_Name	CharacterString	"AV-12, Calculated Enthalpy"	RO
Object_Type	BACnetObjectType	analog-value (2)	RO
Present_Value	REAL	45	RW
Description	CharacterString	Calculated Enthalpy	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	kJ/kg	RO
Poperty_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

Property	**Property Data Type**	**Default Value**	**Access**
Object_Identifier	BACnetObjectIdentifier	analog-value,13	RO
Object_Name	CharacterString	"AV-13, Calculated Dewpoint"	RO
Object_Type	BACnetObjectType	analog-value (2)	RO
Present_Value	REAL	10 to 900 seconds	RW
Description	CharacterString	Calculated Dewpoint	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	Dependent on BV-4	RO
Poperty_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

Property	**Property Data Type**	**Default Value**	**Access**
Object_Identifier	BACnetObjectIdentifier	analog-value,14	RO
Object_Name	CharacterString	"AV-14, AO-0 Fallback Value"	RO
Object_Type	BACnetObjectType	analog-value (2)	RO
Present_Value	REAL	0 - 5000	RW
Description	CharacterString	AO-0 Fallback Value	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	Dependent on MSV-3	RW
Poperty_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability	RO

		Out_Of_Service Units	

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	analog-value,15	RO
Object_Name	CharacterString	"AV-15, AO-1 Fallback Value"	RO
Object_Type	BACnetObjectType	analog-value (2)	RO
Present_Value	REAL	0 - 5000	RW
Description	CharacterString	AO-1 Fallback Value	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	Dependent on MSV-4	RW
Poperty_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	analog-value,16	RO
Object_Name	CharacterString	"AV-16, AO-2 Fallback Value"	RO
Object_Type	BACnetObjectType	analog-value (2)	RO
Present_Value	REAL	0 - 5000	RW
Description	CharacterString	AO-2 Fallback Value	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	Dependent on MSV-4	RW
Poperty_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	analog-value,17	RO
Object_Name	CharacterString	"AV-17, LCD Contrast"	RO
Object_Type	BACnetObjectType	analog-value (2)	RO
Present_Value	REAL	0 - 100	RW
Description	CharacterString	LCD Contrast	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	percent (98)	RO
Poperty_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	analog-value,18	RO
Object_Name	CharacterString	"AV-18, LCD Brightness"	RO
Object_Type	BACnetObjectType	analog-value (2)	RO
Present_Value	REAL	0 - 100	RW
Description	CharacterString	LCD Brightness	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	percent (98)	RO
Poperty_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	analog-value,19	RO
Object_Name	CharacterString	"AV-19, MS Button Off Delay"	RO
Object_Type	BACnetObjectType	analog-value (2)	RO
Present_Value	REAL	30	RW
Description	CharacterString	MS Button Off Delay	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	seconds (98)	RO
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	analog-value, 20	RO
Object_Name	CharacterString	"AV-20, Calculated Absolute Humidity"	RO
Object_Type	BACnetObjectType	analog-value (2)	RO
Present_Value	REAL	45	RW
Description	CharacterString	Calculated Absolute Humidity	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	g/m³	RO
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

Property	Property Data Type	Default Value	Access

Object_Identifier	BACnetObjectIdentifier	analog-value,21	RO
Object_Name	CharacterString	"AV-21, DI1 Pulse Count"	RO
Object_Type	BACnetObjectType	analog-value (2)	RO
Present_Value	REAL	0	RW
Description	CharacterString	DI1 Pulse Count	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Units	BACnetEngineeringUnits	No units	RO
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

6. Binary Inputs

Object Name	Type & Instance	Description	Range & Definition	Notes
DI1 Input Status	BI-0	BI-0, DI1 Input Status	0: Off 1: On	All properties are RO except Description and Polarity.
PIR Input Status	BI-1	BI-1, PIR Input Status	0: Off 1: On	All properties are RO except Description and Polarity.
MS Status	BI-2	BI-2, MS Status	0: Off 1: On	All properties are RO except Description and Polarity.

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	binary-input,0	RO
Object_Name	CharacterString	"BI-0, DI1 Status"	RO
Object_Type	BACnetObjectType	binary-input (3)	RO
Present_Value	BACnetBinaryPV	inactive (0)	RO
Description	CharacterString	DI1 Status	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Polarity	BACnetPolarity	normal (0)	RW
Poperty_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	binary-input,1	RO
Object_Name	CharacterString	"BI-1, PIR Input Status"	RO
Object_Type	BACnetObjectType	binary-input (3)	RO
Present_Value	BACnetBinaryPV	inactive (0)	RO
Description	CharacterString	PIR Input Status	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO

Polarity	BACnetPolarity	normal (0)	RW
Poperty_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	binary-input,2	RO
Object_Name	CharacterString	"BI-2, MS Status"	RO
Object_Type	BACnetObjectType	binary-input (3)	RO
Present_Value	BACnetBinaryPV	inactive (0)	RO
Description	CharacterString	MS Status	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Polarity	BACnetPolarity	normal (0)	RW
Poperty_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Units	RO

7. Binary Outputs

Object Name	Type & Instance	Description	Range & Definition	Notes
DO1 Output	BO-0	BO-0, DO1 Output	0: Off 1: On	All properties are RO except Description, Present_Value and Polarity.
DO2 Output	BO-1	BO-1, DO2 Output	0: Off 1: On	All properties are RO except Description, Present_Value and Polarity.

Note: Each BO status can be changed depending on the setting of MSV-6

- Each can be written to only by the network
- BO-0 only can be switched by the network OR pressing the MS button (if fitted)
- BO-1 only can be switched by the network OR pressing the MS button (if fitted)
- BO-0 and BO-1 can be switched by the network OR pressing the MS button (if fitted)

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	binary-output(0)	RO
Object_Name	CharacterString	"BO-0, Digital Output 1"	RO
Object_Type	BACnetObjectType	binary-output (1)	RO
Present_Value	BACnetBinaryPV	inactive (0)	RW
Description	CharacterString	Digital Output 1	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Polarity	BACnetPolarity	normal (0)	RW
Priority_Array	BACnetPriorityArray		RO
Relinquish_Default	BACnetBinaryPV		RO
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State	RO

		Out_Of_Service Polarity Priority_Array Relinquish_Default	

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	binary-output(1)	RO
Object_Name	CharacterString	"BO-1, Digital Output 2"	RO
Object_Type	BACnetObjectType	binary-output (2)	RO
Present_Value	BACnetBinaryPV	inactive (0)	RW
Description	CharacterString	Digital Output 2	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Polarity	BACnetPolarity	normal (0)	RW
Priority_Array	BACnetPriorityArray		RO
Relinquish_Default	BACnetBinaryPV		RO
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Out_Of_Service Polarity Priority_Array Relinquish_Default	RO

8. Binary Values

Object Name	Type & Instance	Description	Range & Definition	Notes
ABC Logic State	BV-0	BV-0, ABC Logic State	0: Off 1: On	All properties are RO except Description, Present_Value, Active Text and Inactive Text.
ABC logic reset	BV-1	BV-1, ABC logic reset	0: Off 1: On	All properties are RO except Description, Present_Value, Active Text and Inactive Text.
CO2 calibration	BV-2	BV-2, CO2 calibration	0: Off 1: On	All properties are RO except Description, Present_Value, Active Text and Inactive Text.
Temperature Units	BV-3	BV-3, Temperature Units	0: °C 1: °F	All properties are RO except Description, Present_Value, Active Text and Inactive Text.
DI1 Type	BV-4	BV-4, DI1 Type	0: VFC 1: Pulse counting	All properties are RO except Description, Present_Value, Active Text and Inactive Text.
DI1 VFC Contact Type	BV-5	BV-5, DI1 VFC Contact Type	0: NO 1: NC	All properties are RO except Description, Present_Value, Active Text and Inactive Text.
DI1 Pulse Count Reset	BV-6	BV-6, DI1 Pulse Count Reset	0: Off 1: On	All properties are RO except Description, Present_Value, Active Text and Inactive Text.
AI-1 Input Type	BV-7	BV-7, AI-1 Input Type	0: 0-10Vdc 1: 10K3A1 thermistor	All properties are RO except Description, Present_Value, Active Text and Inactive Text.
CO2 Range	BV-8	BV-8, CO2 Range	0: 0 - 2000ppm 1: 0 - 5000ppm	All properties are RO except Description, Present_Value, Active Text and Inactive Text.
LCD Backlight Enable	BV-9	BV-9, LCD Backlight Enable	0: Disabled 1: Enabled	All properties are RO except Description, Present_Value, Active Text and Inactive Text.

Object Name	Type & Instance	Description	Range & Definition	Notes
DO1 Fallback Value	BV-10	BV-10, DO1 Fallback Value	0: Off 1: On	All properties are RO except Description, Present_Value, Active Text and Inactive Text.
DO2 Fallback Value	BV-11	BV-11, DO2 Fallback Value	0: Off 1: On	All properties are RO except Description, Present_Value, Active Text and Inactive Text.
Occupancy Status	BV-12	BV-12, Occupancy Status	0: Off 1: On	All properties are RO except Description, Present_Value, Active Text and Inactive Text.
Thermistor Select	BV-13	BV-13, Thermistor Select	0: On-board thermistor 1:**AI-7**	All properties are RO except Description, Present_Value, Active Text and Inactive Text. Dependent on **BV-7**

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	binary-value,0	RO
Object_Name	CharacterString	"BV-0, ABC Logic State"	RO
Object_Type	BACnetObjectType	binary-value (5)	RO
Present_Value	BACnetBinaryPV	inactive (0)	RW
Description	CharacterString	"ABC Logic State"	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Active Text	String	On	RW
Inactive Text	String	Off	RW
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Active Text Inactive Text	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	binary-value,1	RO
Object_Name	CharacterString	" BV-1, ABC Logic Reset"	RO
Object_Type	BACnetObjectType	binary-value (5)	RO
Present_Value	BACnetBinaryPV	inactive (0)	RW
Description	CharacterString	ABC logic reset	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Active Text	String	Reset	RW
Inactive Text	String	No Reset	RW
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Active Text Inactive Text	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	binary-value,2	RO
Object_Name	CharacterString	" BV-2, CO_2 Calibration"	RO
Object_Type	BACnetObjectType	binary-value (5)	RO
Present_Value	BACnetBinaryPV	inactive (0)	RW
Description	CharacterString	CO_2 calibration	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO

Property	Property Data Type	Default Value	Access
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Active Text	String	Calibration Enabled	RW
Inactive Text	String	Calibration Disabled	RW
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Active Text Inactive Text	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	binary-value,3	RO
Object_Name	CharacterString	"BV-3, Temperature Units"	RO
Object_Type	BACnetObjectType	binary-value (5)	RO
Present_Value	BACnetBinaryPV	inactive (0)	RW
Description	CharacterString	Temperature Units	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Active Text	String	°F	RW
Inactive Text	String	°C	RW
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Active Text Inactive Text	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	binary-value,4	RO
Object_Name	CharacterString	"BV-4, DI1 Type"	RO
Object_Type	BACnetObjectType	binary-value (5)	RO
Present_Value	BACnetBinaryPV	inactive (0)	RW
Description	CharacterString	DI1 Type	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Active Text	String	Pulse Counting	RW
Inactive Text	String	VFC Input	RW
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Active Text Inactive Text	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	binary-value,5	RO
Object_Name	CharacterString	"BV-5, DI1 VFC Contact Type"	RO
Object_Type	BACnetObjectType	binary-value (5)	RO
Present_Value	BACnetBinaryPV	inactive (0)	RW
Description	CharacterString	DI1 VFC Contact Type	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Active Text	String	NC	RW
Inactive Text	String	NO	RW

Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Active Text Inactive Text	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	binary-value,6	RO
Object_Name	CharacterString	"BV-6, DI1 Pulse Count Reset"	RO
Object_Type	BACnetObjectType	binary-value (5)	RO
Present_Value	BACnetBinaryPV	inactive (0)	RW
Description	CharacterString	DI1 Pulse Count Reset	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Active Text	String	Reset	RW
Inactive Text	String	No Reset	RW
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Active Text Inactive Text	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	binary-value,7	RO
Object_Name	CharacterString	"BV-7, AI-1 Input Type"	RO
Object_Type	BACnetObjectType	binary-value (5)	RO
Present_Value	BACnetBinaryPV	inactive (0)	RW
Description	CharacterString	AI-1 Input Type	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Active Text	String	10K3A1 Thermistor	RW
Inactive Text	String	0-10Vdc	RW
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Active Text Inactive Text	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	binary-value,8	RO
Object_Name	CharacterString	"BV-8, CO2 Range"	RO
Object_Type	BACnetObjectType	binary-value (5)	RO
Present_Value	BACnetBinaryPV	inactive (0)	RW
Description	CharacterString	CO2 Range	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Active Text	String	5000 ppm	RW
Inactive Text	String	2000 ppm	RW
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service	RO

		Active Text Inactive Text	

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	binary-value,9	RO
Object_Name	CharacterString	"BV-9, LCD Backlight Enable"	RO
Object_Type	BACnetObjectType	binary-value (5)	RO
Present_Value	BACnetBinaryPV	inactive (0)	RW
Description	CharacterString	LCD Backlight Enable	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Active Text	String	Enabled	RW
Inactive Text	String	Disabled	RW
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Active Text Inactive Text	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	binary-value,10	RO
Object_Name	CharacterString	"BV-10, DO1 Fallback Status"	RO
Object_Type	BACnetObjectType	binary-value (5)	RO
Present_Value	BACnetBinaryPV	inactive (0)	RW
Description	CharacterString	DO1 Fallback Status	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Active Text	String	Enabled	RW
Inactive Text	String	Disabled	RW
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Active Text Inactive Text	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	binary-value,11	RO
Object_Name	CharacterString	"BV-11, DO2 Fallback Status"	RO
Object_Type	BACnetObjectType	binary-value (5)	RO
Present_Value	BACnetBinaryPV	inactive (0)	RW
Description	CharacterString	DO2 Fallback Status	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	RO
Event_State	BACnetEventState	normal (0)	RO
Reliability	BACnetReliability	no-fault-detected (0)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Active Text	String	Enabled	RW
Inactive Text	String	Disabled	RW
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Active Text Inactive Text	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	binary-value,12	RO
Object_Name	CharacterString	"BV-12, Occupancy Status"	RO
Object_Type	BACnetObjectType	binary-value (5)	RO
Present_Value	BACnetBinaryPV	inactive (0)	RW
Description	CharacterString	Occupancy Status	See Note
Status_Flags	BACnetStatusFlags	{F,F,F,F} (2)	RO
Event_State	BACnetEventState	normal (0) (2)	RO
Reliability	BACnetReliability	no-fault-detected (0) (2)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Active Text	String	Occupied	RW
Inactive Text	String	Unoccupied	RW
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Active Text Inactive Text	RO

Property	Property Data Type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	binary-value,13	RO
Object_Name	CharacterString	"BV-13, Thermistor Select"	RO
Object_Type	BACnetObjectType	binary-value (5)	RO
Present_Value	BACnetBinaryPV	inactive (0)	RW
Description	CharacterString	Thermistor Select	See Note
Status_Flags	BACnetStatusFlags		RO
Event_State	BACnetEventState	normal (0) (2)	RO
Reliability	BACnetReliability	no-fault-detected (0) (2)	RO
Out_Of_Service	BOOLEAN	FALSE	RO
Active Text	String	AI-8	RW
Inactive Text	String	On board thermistor	See Note
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Active Text Inactive Text	RO

Notes:

- Pulse Counter Reset BV-6 can be used to reset the pulse count value held in AV-21. With a setting of "No Reset", the pulse count will increment each time the DI-1 (BI-0) goes high. Setting BV-6 to "Reset" will cause the value in AV-21 to be reset to 0.
  IMPORTANT: Note that while BV-6 is set to "Reset", AV-21 will not increment, so it is important to set BV-6 back to "No Reset" after zeroing to pulse count value.

- BV-10 & BV-11 (digital fallback values) are used to allow a user to set an override value for the AOs in the event that network comms (BACnet or ModBus) are lost, for whatever reason. This could be vitally important if values to the DOs are being written over the network (from a control strategy external to the device). For example, if a DO was being set to on over the network to run an electric heater element in a duct, this should only be allowed if there is a fan running. Fan "proving" is commonly accomplished by a differential pressure switch across the fan, which may be connected to another BACnet/ModBus device other than the SmartSensor, or even hardwired to a BMS controller. The control strategy reads the status of the fan, and if running (DP switch ON), it can send an ON value to the DO on the SmartSensor to switch the heater element ON. However, if the system is running well, but there's a sudden break in comms to the SmartSensor – and while comms are down the fan in the duct stops running, the DO will still be ON, as the message to switch it OFF can't get through.

- BV-13 is used specifically to select which thermistor is used to map to an analogue output. The analogue output used for this must be set to "Active Thermistor", using MSV-2, MSV-3 or MSV-4. (See also BV-7).

– BV-12 (occupancy status) is writeable only if the PIR option is NOT fitted. If the PIR option is fitted, BV-12 is read only, and its status is dependent on the PIR status BI-1 and the PIR off delay value AV-11.

9. Multistate Values

Object Name	Type & Instance	Description	Range & Definition	Notes
Traffic light LED	MSV-0	MSV-0, Traffic light LED	1: Temperature 2: RH 3: CO2 4: SP 5: LL 6: IAQ 7: CO 8: AI-1 9: Network	All properties are RO except Description, Present_Value and Description.
Temperature measurement range	MSV-1	MSV-1, Temperature measurement range	1: -10°C to +40°C 2: 0°C to +40°C 3: -10°C to +60°C 4: -10°C to +110°C 5: -20°C to +50°C 6: User Defined (see AV-3 and AV-4)	All properties are RO except Description, Present_Value and Description
AO-0 Output Type	MSV-2	MSV-2, AO0 Output Type	1: Temperature 2: RH 3: CO2 4: SP 5: LL 6: IAQ 7: CO 8: Dew Point 9: Enthalpy 10: Absolute Humidity 11: Active Thermistor 12: Network	All properties are RO except Description, Present_Value and Description
AO-1 Output Type	MSV-3	MSV-3, AO-1 Output Type	1: Temperature 2: RH 3: CO2 4: SP 5: LL 6: IAQ 7: CO 8: Dew Point 9: Enthalpy 10: Absolute Humidity 11: Active Thermistor 12: Network	All properties are RO except Description, Present_Value and Description
AO-2 Output Type	MSV-4	MSV-4, AO-2 Output Type	1: Temperature 2: RH 3: CO2 4: SP 5: LL 6: IAQ 7: CO 8: Dew Point 9: Enthalpy 10: Absolute Humidity 11: Active Thermistor 12: Network	All properties are RO except Description, Present_Value and Description
Fan Speed	MSV-5	MSV-5, Fan Speed	1: Off 2: Low 3: Medium 4: High 5: Auto	All properties are RO except Description, Present_Value and Description
DO Control	MSV-6	MSV-6, DO Control	1: Network 2: MS switch controls DO1 only 3: MS switch controls DO2 only 4: MS switch controls DO1 and DO2	All properties are RO except Description, Present_Value and Description

Property	Data type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	Multistate Value 0	R
Object_Name	CharacterString	MSV-0, Traffic light LED	R
Object_Type	BACnetObjectType	MULTI_STATE_VALUE	R
Present_Value	Unsigned		RW
Description	CharacterString	Source value for traffic light LED	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	R
Event_State	BACnetEventState	Normal	R
Reliability	BACnetReliability	no-fault-detected (0)	R
Out_Of_Service	BOOLEAN	FALSE	R
Number_Of_States	Unsigned (1..1000)	7	R
State_Text	BACnetARRAY[N] of CharacterString	1: Temperature 2: RH 3: CO2 4: SP 5: LL 6: IAQ 7: CO 8: AI-7 9: Network	R
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Number_Of_States State_Text	R

Property	Data type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	Multistate Value 1	R
Object_Name	CharacterString	MSV-1, Traffic light LED	R
Object_Type	BACnetObjectType	MULTI_STATE_VALUE	R
Present_Value	Unsigned		RW
Description	CharacterString	Temperature measurement range	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	R
Event_State	BACnetEventState	Normal	R
Reliability	BACnetReliability	no-fault-detected (0)	R
Out_Of_Service	BOOLEAN	FALSE	R
Number_Of_States	Unsigned (1..1000)	6	R
State_Text	BACnetARRAY[N] of CharacterString	1: -10 to +40C 2: 0 to 40C 3: -10 to +60C 4: -10 to +110C 5: -20 to +50C 6: User defined (see AV-3and AV-4)	R
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Number_Of_States State_Text	R

Property	Data type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	Multistate Value 2	R
Object_Name	CharacterString	MSV-2, AO-0 Output Type	R
Object_Type	BACnetObjectType	MULTI_STATE_VALUE	R
Present_Value	Unsigned		RW
Description	CharacterString	AO-0 Output Type	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	R
Event_State	BACnetEventState	Normal	R
Reliability	BACnetReliability	no-fault-detected (0)	R
Out_Of_Service	BOOLEAN	FALSE	R
Number_Of_States	Unsigned (1..1000)	10	R

State_Text	BACnetARRAY[N] of CharacterString	1: Temperature 2: RH 3: CO2 4: SP 5: LL 6: IAQ 7: CO 8: Dew Point 9: Enthalpy 10: Absolute Humidity 11: Active Thermistor 12: Network	R
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Number_Of_States State_Text	R

Property	**Data type**	**Default Value**	**Access**
Object_Identifier	BACnetObjectIdentifier	Multistate Value 3	R
Object_Name	CharacterString	MSV-3, AO-1 Output Type	R
Object_Type	BACnetObjectType	MULTI_STATE_VALUE	R
Present_Value	Unsigned		RW
Description	CharacterString	AO-1 Output Type	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	R
Event_State	BACnetEventState	Normal	R
Reliability	BACnetReliability	no-fault-detected (0)	R
Out_Of_Service	BOOLEAN	FALSE	R
Number_Of_States	Unsigned (1..1000)	10	R
State_Text	BACnetARRAY[N] of CharacterString	1: Temperature 2: RH 3: CO2 4: SP 5: LL 6: IAQ 7: CO 8: Dew Point 9: Enthalpy 10: Absolute Humidity 11: Active Thermistor 12: Network	R
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Number_Of_States State_Text	R

Property	**Data type**	**Default Value**	**Access**
Object_Identifier	BACnetObjectIdentifier	Multistate Value 4	R
Object_Name	CharacterString	MSV-4, AO-2 Output Type	R
Object_Type	BACnetObjectType	MULTI_STATE_VALUE	R
Present_Value	Unsigned		RW
Description	CharacterString	AO3 Output Type	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	R
Event_State	BACnetEventState	Normal	R
Reliability	BACnetReliability	no-fault-detected (0)	R
Out_Of_Service	BOOLEAN	FALSE	R
Number_Of_States	Unsigned (1..1000)	10	R
State_Text	BACnetARRAY[N] of CharacterString	1: Temperature 2: RH 3: CO2 4: SP 5: LL 6: IAQ 7: CO	R

		8: Dew Point 9: Enthalpy 10: Absolute Humidity 11: Active Thermistor 12: Network	
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Number_Of_States State_Text	R

Property	Data type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	Multistate Value 5	R
Object_Name	CharacterString	MSV-5, Fan Speed	R
Object_Type	BACnetObjectType	MULTI_STATE_VALUE	R
Present_Value	Unsigned		RW
Description	CharacterString	Fan Speed	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	R
Event_State	BACnetEventState	Normal	R
Reliability	BACnetReliability	no-fault-detected (0)	R
Out_Of_Service	BOOLEAN	FALSE	R
Number_Of_States	Unsigned (1..1000)	5	R
State_Text	BACnetARRAY[N] of CharacterString	1: Off 2: Low 3: Medium 4: High 5: Auto	R
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Number_Of_States State_Text	R

Property	Data type	Default Value	Access
Object_Identifier	BACnetObjectIdentifier	Multistate Value 6	R
Object_Name	CharacterString	MSV-6, DO Control	R
Object_Type	BACnetObjectType	MULTI_STATE_VALUE	R
Present_Value	Unsigned		RW
Description	CharacterString	DO Control	RW
Status_Flags	BACnetStatusFlags	{F,F,F,F}	R
Event_State	BACnetEventState	Normal	R
Reliability	BACnetReliability	no-fault-detected (0)	R
Out_Of_Service	BOOLEAN	FALSE	R
Number_Of_States	Unsigned (1..1000)	4	R
State_Text	BACnetARRAY[N] of CharacterString	1: Network 2: MS switch controls DO1 only 3: MS switch controls DO2 only 4: MS switch controls DO1 & DO2	R
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Number_Of_States State_Text	R

Data Link Layer Options

X	MS/TP master (Clause 9), baud rate(s):	9.6k, 19.2k, 38.4k, 76.8k
X	MS/TP slave (Clause 9), baud rate(s):	9.6k, 19.2k, 38.4k, 76.8k

Device Address Binding

	Static device binding supported for MS/TP Slaves and other devices

Character Sets Supported

X	ANSI X3.4 / UTF-8
	IBM/Microsoft DBCS
	ISO 8859-1
	ISO 10646 (UCS-2)
	ISO 10646 (ICS-4)
	JIS C 6226

Modbus register table

Note: All Holding register type

Register Address	Description	Notes	R/W
40000	Modbus Address	MB=21 (15h); LB=1-247 (1h-F7h)	R
40001	Modbus Baud Rate	Type: uINT, Factor: 0.01, No units, 9600, 19200, 38400 (default), 57600	R
40002	Prod Name_12	ASCI characters: MB Name (0); LB Name (1), Valid ASCII char: 32 (20h) - 124 (7Ch), Empty = 0	RW
40003	Prod Name_34	ASCI characters: MB Name (2); LB Name (3), Valid ASCII char: 32 (20h) - 124 (7Ch), Empty = 0	RW
40004	Prod Name_56	ASCI characters: MB Name (4); LB Name (5), Valid ASCII char: 32 (20h) - 124 (7Ch), Empty = 0	RW
40005	Prod Name_78	ASCI characters: MB Name (6); LB Name (7), Valid ASCII char: 32 (20h) - 124 (7Ch), Empty = 0	RW
40006	System Status	Type: Bit String, Factor: 1, No units	R
40007	System Status 2	Type: Bit String, Factor: 1, No units	R
40008	CO_2	Type: uINT, Factor 1, Units: ppm , Range: See 40034, Resolution: 0	R
40009	CO	Type: uINT, Factor 1, Units: ppm, Range: 0 - 500ppm, Resolution: 0	R
40010	IAQ	Type: uINT, Factor 1, Units: ppb, Range: 0 - 1000, Resolution: 0	R
40011	RH	Type: uINT, Factor 10, Units : %RH, Range: 5.0 - 100 %RH, Resolution : 1	R
40012	Temperature from RH&T	Type: sINT, Factor 100, Units : °C/°F, Range: -10 - 100.0°C, Resolution : 1	R
40013	Analogue Input 1	Type: uINT, Factor 10, Units: No Units, Range : 0 – 100%, Resolution: 1	R
40014	Light level	Type: uINT, Factor 1, Units: No Units, Range : 0 - 1000, Resolution: 1	R
40015	PIR Status	Type: Bit String, Factor 1, No Units, 0: Unoccupied 1: Occupied	R
40016	MS Status	Type: Bit String, Factor 1, No Units, 0: Inactive 1: Active	R
40017	Digital Input	Type: Bit String, Factor 1, No Units, 0: Inactive 1: Active	R
40018	Fan Speed	Type: uINT, Factor 1, Units: No Units, 0: OFF 1: Low, 2: Medium, 3: High, 4: Auto, Resolution: 0	RW
40019	Occupancy Status	Type: uINT, Factor 1, Units: No Units, 0: Unoccupied 1: Occupied, Resolution: 0	RW
40020	Analogue Output 1 Type	Type: uINT, Factor 100, Resolution : 1 0: Temperature 1: RH, 2: CO2, 3: SP, 4: LL, 5: IAQ, 6: CO, 7: Dewpoint, 8: Enthalpy, 9: Absolute Humidity, 10: Active Thermistor, 11: Network, Resolution: 1	RW
40021	Analogue Output 2 Type	Type: uINT, Factor 100, Resolution : 1 0: Temperature 1: RH, 2: CO2, 3: SP, 4: LL, 5: IAQ, 6: CO, 7: Dewpoint, 8: Enthalpy, 9: Absolute Humidity, 10: Active Thermistor, 11: Network, Resolution: 1	RW
40022	Analogue Output 3 Type	Type: uINT, Factor 100, Resolution : 1 0: Temperature 1: RH, 2: CO2, 3: SP, 4: LL, 5: IAQ, 6: CO, 7: Dewpoint, 8: Enthalpy, 9: Absolute Humidity, 10: Active Thermistor, 11: Network, Resolution: 1	RW
40023	Analogue Output 1 Status	Type: uINT, Factor 1, Units: %, Range: 1 - 100, Resolution: 1 (see 40020)	RW
40024	Analogue Output 2 Status	Type: uINT, Factor 1, Units: %, Range: 1 - 100, Resolution: 1 (see 40021)	RW
40025	Analogue Output 3 Status	Type: uINT, Factor 1, Units: %, Range: 1 - 100, Resolution: 1 (see 40022)	RW
40026	Temp Offset	Type: sINT, Factor 100, Units: °C/°F, Range: +5.00, Resolution: 1	RW
40027	RH Offset	Type: sINT, Factor 100, Units: %RH, Range: +5.00, Resolution: 1	RW
40028	Setpoint	Type sINT, Factor 1, Units: °C/°F, Range: -100°C/°F, Resolution: 1	RW
40029	Setpoint Lo Limit	Type sINT, Factor 1, Units: °C/°F, Range: -100°C/°F, Resolution: 1	RW
40030	Setpoint Hi Limit	Type: sINT, Factor 1, Units: °C/°F, Range: 27 - 100°C/°F, Resolution : 1	RW
40031	Temperature Low Limit	Type sINT, Factor 1, Units: °C/°F, Range: -100°C/°F, Resolution: 1	RW
40032	Temperature Hi Limit	Type: sINT, Factor 1, Units: °C/°F, Range: 27 - 100°C/°F, Resolution : 1	RW
40033	CO_2 Range	Type: uINT, Factor 1, Units: PPM, Range: 0: 0 – 2000 1: 0 - 5000 ppm, Resolution: 0	RW
40034	PIR Off Delay	Type: uINT, Factor 1, Units: Seconds, Range: 10 - 900 seconds, Resolution: 0	RW
40035	LCD Brightness	Type: uINT, Factor 1, Units: %, Range: 1 - 100, Resolution: 0	RW

Register Address	Description	Notes	R/W
40036	LCD Contrast	Type: uINT, Factor 1, Units: %, Range: 1 - 100, Resolution: 0	RW
40037	IAQ Good Level (for LCD only)	Type: uINT, Factor 1, Units: No Units, Range: 0 - 1000, Resolution : 0	RW
40038	IAQ Fair Level (for LCD only)	Type: uINT, Factor 1, Units: No Units, Range: 0 - 1000, Resolution : 0	RW
40039	IAQ Bad Level (for LCD only)	Type: uINT, Factor 1, Units: No Units, Range: 0 - 1000, Resolution : 0	RW
40040	IAQ Sensitivity	Type: uINT, Factor 1, Units: No Units, Range : 0 - 100, Resolution: 0	RW
40041	IAQ Response	Type: uINT, Factor 1, Units: No Units, Range: 0 - 10, Resolution : 0	RW
40042	LED Good Level	Type: uINT, Factor 1, Units: No Units, Range : 0 - 5000, Resolution: 0	RW
40043	LED Fair Level	Type: uINT, Factor 1, Units: No Units, Range : 0 - 5000, Resolution: 0	RW
40044	LED Bad Level	Type: uINT, Factor 1, Units: No Units, Range : 0 - 5000, Resolution: 0	RW
40045	LED Traffic Light Source	Type: uINT, Factor 1, Units: No Units, 0: Temperature 1: RH, 2: CO_2, 3: SP, 4: LL, 5: IAQ, 6: CO, 7: Network, Resolution: 0	RW
40046	Temperature Range	Type: uINT, Factor 1, Units: No Units, 0: 0 to 40, 1: -10 to 40, 2: -10 to 60, 3: -10 to 110, 4: -20 to 50, 5: see 40031 and 40032, Resolution: 0	RW
40047	Digital Input 1 Type	Type: Bit String, Factor 1, No Units, 0: VFC 1: Pulse	RW
40048	Digital Input 1 VFC Contact Type	Type: Bit String, Factor 1, No Units, 0: NO 1: NC	RW
40049	Digital Input 1 Pulse Counter Reset	Type: Bit String, Factor 1, No Units, 0: Reset Inactive 1: Reset Active	RW
40050	Digital Output 1 Output	Type: Bit String, Factor 1, No Units, 0: OFF 1: ON	RW
40051	Digital Output 2 Output	Type: Bit String, Factor 1, No Units, 0: OFF 1: ON	RW
40052	Temperature Units	Type: Bit String, Factor 1, No Units, 0: °C 1: °F	RW
40053	LCD Backlight Enable	Type: Bit String, Factor 1, No Units, 0: Backlight Off 1: Backlight On	RW
40054	Analogue Input 1 Type	Type: Bit String, Factor 1, No Units, 0: 0-10Vdc 1: Thermistor	RW
40055	CO_2 ABC Logic State	Type: Bit String, Factor 1, No Units, 0: ABC OFF 1: ABC ON	RW
40056	CO_2 ABC Logic Reset	Type: Bit String, Factor 1, No Units, 0: ABC Reset OFF 1: ABC Reset ON	RW
40057	Manual CO_2 ABC Calibration	Type: Bit String, Factor 1, No Units, 0: Manual ABC Disabled 1: Manual ABC Enabled	RW
40058	Analogue Output 1 Fallback Value	Type: uINT, Factor 1, Units: %, Range: 1 - 100, Resolution: 0	RW
40059	Analogue Output 2 Fallback Value	Type: uINT, Factor 1, Units: %, Range: 1 - 100, Resolution: 0	RW
40060	Analogue Output 3 Fallback Value	Type: uINT, Factor 1, Units: %, Range: 1 - 100, Resolution: 0	RW
40061	Digital Input 1 Pulse Count	Type: uINT, Factor 1, Units: %, Range: 1 - 65535, Resolution: 0	RW
40062	Calculated Enthalpy	Type: uINT, Factor 1, Units: kJ/kg, Range: -20 to 250 kJ/kg, Resolution: 0	R
40063	Calculated Dewpoint	Type: sINT, Factor 1, Units: °C, Range: -50 to 50 °C, Resolution: 1	R
40064	Calculated Absolute Humidity	Type: uINT, Factor 1, Units: kJ/kg, Range: 0 to 100 g/m³, Resolution: 1	R
40065	MS Button Off Delay	Type: uINT, Factor 1, Units: seconds, Range: 1 - 7200, Resolution: 0	RW
40066	Thermistor Temperature	Type: sINT, Factor 100, Units : °C/°F, Range: -10 - 100.0°C, Resolution : 1	R
40067	Thermistor Source	Type: uINT, Factor 1, Units: None, Range: 0 to 1, Resolution: 1, 0: On board thermistor 1: Register 40066	RW
40068	DO Control	Type: uINT, Factor 1, Units: None, Range: 0 to 4, Resolution: 0, 0: Network 1: MS switch controls DO1 only 2: MS switch controls DO2 only 3: MS switch controls DO1 & DO2	RW
40069	DO1 Fallback Value	Type: uINT, Factor 1, Units: None, Range: 0 to 1, Resolution: 1, 0: Off 1: On	RW
40070	DO2 Fallback Value	Type: uINT, Factor 1, Units: None, Range: 0 to 1, Resolution: 1, 0: Off 1: On	RW
40071	Occupancy Off Text_12	ASCI characters: MB Name (0); LB Name (1), Valid ASCII char: 32 (20h) - 124 (7Ch), Empty = 0	RW
40072	Occupancy Off Text_34	ASCI characters: MB Name (2); LB Name (3), Valid ASCII char: 32 (20h) - 124 (7Ch), Empty = 0	RW
40073	Occupancy Off Text_56	ASCI characters: MB Name (4); LB Name (5), Valid ASCII char: 32 (20h) - 124 (7Ch), Empty = 0	RW

Register Address	Description	Notes	R/W
40074	Occupancy Off Text_78	ASCI characters: MB Name (6); LB Name (7), Valid ASCII char: 32 (20h) - 124 (7Ch), Empty = 0	RW
40075	Occupancy Off Text_910	ASCI characters: MB Name (8); LB Name (9), Valid ASCII char: 32 (20h) - 124 (7Ch), Empty = 0	RW
40076	Occupancy Off Text_1112	ASCI characters: MB Name (10); LB Name (11), Valid ASCII char: 32 (20h) - 124 (7Ch), Empty = 0	RW
40077	Occupancy Off Text_1314	ASCI characters: MB Name (12); LB Name (13), Valid ASCII char: 32 (20h) - 124 (7Ch), Empty = 0	RW
40078	Occupancy Off Text_1516	ASCI characters: MB Name (14); LB Name (15), Valid ASCII char: 32 (20h) - 124 (7Ch), Empty = 0	RW
40079	Occupancy Off Text_1718	ASCI characters: MB Name (16); LB Name (17), Valid ASCII char: 32 (20h) - 124 (7Ch), Empty = 0	RW
40080	Occupancy Off Text_1920	ASCI characters: MB Name (18); LB Name (19), Valid ASCII char: 32 (20h) - 124 (7Ch), Empty = 0	RW
40081	Occupancy On Text_12	ASCI characters: MB Name (0); LB Name (1), Valid ASCII char: 32 (20h) - 124 (7Ch), Empty = 0	RW
40082	Occupancy On Text_34	ASCI characters: MB Name (2); LB Name (3), Valid ASCII char: 32 (20h) - 124 (7Ch), Empty = 0	RW
40083	Occupancy On Text_56	ASCI characters: MB Name (4); LB Name (5), Valid ASCII char: 32 (20h) - 124 (7Ch), Empty = 0	RW
40084	Occupancy On Text_78	ASCI characters: MB Name (6); LB Name (7), Valid ASCII char: 32 (20h) - 124 (7Ch), Empty = 0	RW
40085	Occupancy On Text_910	ASCI characters: MB Name (8); LB Name (9), Valid ASCII char: 32 (20h) - 124 (7Ch), Empty = 0	RW
40086	Occupancy On Text_1112	ASCI characters: MB Name (10); LB Name (11), Valid ASCII char: 32 (20h) - 124 (7Ch), Empty = 0	RW
40087	Occupancy On Text_1314	ASCI characters: MB Name (12); LB Name (13), Valid ASCII char: 32 (20h) - 124 (7Ch), Empty = 0	RW
40088	Occupancy On Text_1516	ASCI characters: MB Name (14); LB Name (15), Valid ASCII char: 32 (20h) - 124 (7Ch), Empty = 0	RW
40089	Occupancy On Text_1718	ASCI characters: MB Name (16); LB Name (17), Valid ASCII char: 32 (20h) - 124 (7Ch), Empty = 0	RW
40090	Occupancy On Text_1920	ASCI characters: MB Name (18); LB Name (19), Valid ASCII char: 32 (20h) - 124 (7Ch), Empty = 0	RW

Notes:

- Depending on the options required at the time of ordering, not all the Modbus registers referred to in this section may be active.
- Traffic light operation when in network mode

Traffic light operation when in network mode

Good 40042	Fair 40043	Bad 40044	LED Colour
1	0	0	Green
0	1	0	Orange
0	0	1	Red

Traffic light operation when not in network mode (Good > Bad)

Good 40042	Fair 40043	Bad 40044	LED Colour
Signal <	X	X	Green
Signal >	Signal <	X	Orange
Signal >	Signal >	Signal <	Red
Signal >	Signal >	Signal >	Red

Traffic light operation when not in network mode (Good < Bad)

Good 40042	Fair 40043	Bad 40044	LED Colour
Signal <	X	X	Green
Signal <	Signal >	X	Orange
Signal <	Signal <	Signal >	Red
Signal <	Signal <	Signal <	Red

- Pulse Counter Reset 40049 can be used to reset the pulse count value held in 40061. With a setting of "No Reset", the pulse count will increment each time the DI-1 (40017) goes high. Setting 40049 to "Reset" will cause the value in 40061 to be reset to 0.
  IMPORTANT! Note that while 40049 is set to "Reset", 40061 will not increment, so it is important to set 40049 back to "No Reset" after zeroing to pulse count value.

- MS Button Off Delay 40065 can be used to ensure that, when the MS momentary switch (if fitted) is pressed, it's change of status reaches its destination. The physical action of the MS button is momentary – it's only in an ON state while it's being pressed. It reverts back to an OFF status as soon as it's released. 40065 is used to keep the ON status for the time (in seconds) set. This gives enough time to ensure the ON status is received, even after the MS button is released. Set 40065 to the minimum time required for the status to be reliably received.

- 40067 is used specifically to select which thermistor is used to map to an analogue output. The analogue output used for this must be set to "Active Thermistor", using 40020, 40021 or 40022. (See also 40054).

- 40019 (occupancy status) is writeable only if the PIR option is NOT fitted. If the PIR option is fitted, 40019 is read only, and its status is dependent on the PIR status 40015 and the PIR off delay value 40034.

- 40013 is used specifically for the auxiliary analogue input, whether it's set for 0-10Vdc input or 10K3A1 thermistor input (using 40054).

- 40066 is used specifically for the on-board 10K3A1 thermistor (if this option is fitted).

- Each BO status can be changed depending on the setting of 40068
    - Each can be written to only by the network
    - BO-0 only can be switched by the network OR pressing the MS button (if fitted)
    - BO-1 only can be switched by the network OR pressing the MS button (if fitted)
    - BO-0 and BO-1 can be switched by the network OR pressing the MS button (if fitted)

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