



Go-IoTehf

DINGO-Stack, BACnet and BACnet/WS PICS

Version 2018 R4

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start on right (odd number) pages.**

CHAPTER 1

BACnet PICS

DINGO-StackBACnet Protocol Implementation Conformance Statement (PICS)

This chapter describes the DINGO-Stack BACnet PICS by the format defined by ASHRE.

BACnet/WS PICS are discussed in a separate chapter "BACnet/WS PICS" on page 63

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General

Date:	19th Sept. 2018
Vendor Name:	Go-IoT ehf (Vendor ID: 710)
Product Name:	DINGO-Stack-BACnet
Product Model Number:	000-000
Application Software Version:	2018 R4
Firmware Revision:	2018 R4
BACnet Protocol Revision:	1, Rev. 14

Product Description

DINGO-Stack-BACnet is a BACnet Controller (BC) implementation for Linux-based platforms, like Raspberry Pi, DINGO Backbone, UniPi Neuron, Ubuntu, etc. It provides access to BACnet-networks acting either as a BACnet-Client or as a BACnet-Server. An optional module of it implements the BACnet/WS (Web Services) standard.

This product can access other BACnet devices as BACnet-client, but also the DINGO-Stack Peripheral Manager which enables none BACnet devices as BACnet devices. This includes Modbus, M-Bus, 1-Wire, enOcean and more. As such it function as a BACnet Gateway for those protocols.

BACnet Standardized Device Profile (Annex L)

- BACnet Advanced Operator Workstation (B-AWS)
- BACnet Operator Workstation (B-OWS)
- BACnet Operator Display (B-OD)
- BACnet Building Controller (B-BC)¹
- BACnet Advanced Application Controller (B-AAC)
- BACnet Application Specific Controller (B-ASC)
- BACnet Smart Sensor (B-SS)
- BACnet Smart Actuator (B-SA)

¹ Version 2018 R4 and higher.

BACnet Interoperability Building Blocks (Annex K)

Data Sharing	Alarm & Event Management	Scheduling	Trending	Device & Network Management
DS-RP-A, -B	AE-N-I-B ¹	SCHED-I-B1	T-ATR-B ¹	DM-DDB-A, -B
DS-RPM-A, -B	AE-ACK-B ¹	SCHED-E-B ¹	T-VMT-I-B	DM-DOB-A, -B
DS-WP-A, -B	AE-INFO-B ¹		T-VMT-E-B	DM-TS-A, -B
DS-WPM-A, -B	AE-ESUM-B ¹		T-VMMV-I-B ¹	DM-UTC-A, -B
DS-COV-A, -B			T-VMMV-E-B ¹	DM-RD-B ¹
DS-COVP-A				DM-ATS-A
DS-M-A				DM-LM-A, -B ¹
DS-AM-A				

¹ Version 2018 R4 and higher.

Segmentation Capability

- Able to transmit segmented messages¹. Window Size: 0-16
- Able to transmit segmented messages¹. Window Size: 0-16

¹ Version 2018 R4 and higher.

Object Types

Accumulator

Dynamically Creatable: No
 Dynamically Deletable: No
 Proprietary Properties: None
 DINGO-Stack Version: 2018 R4

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Object_Identifier	BACnetObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	(up to 128 characters)
Object_Type	BACnetObjectType	R	R	
Present_Value	Unsigned	R ¹	R	
Description	CharacterString	O	R	(up to 128 characters)
Device_Type	CharacterString	O	R	(up to 128 characters)
Status_Flags	BACnetStatusFlags	R	R	
Event_State	BACnetEventState	R	R	
Reliability	BACnetReliability	O	R	
Out_Of_Service	BOOLEAN	R	W	
Scale	BACnetScale	R	R	
Units	BACnetEngineeringUnits	R	R	
Prescale	BACnetPrescale	O	R	
Max_Pres_Value	Unsigned	R	R	
Value_Change_Time	BACnetDateTime	O ²	R	
Value_Before_Change	Unsigned	O ^{2,3}	R	
Value_Set	Unsigned	O ^{2,3}	W	
Logging_Record	BACnetAccumulatorRecord	O	-	
Logging_Object	BACnetObjectIdentifier	O	-	
Pulse_Rate	Unsigned	O ^{1,4}	-	
High_Limit	Unsigned	O ⁴	-	
Low_Limit	Unsigned	O ⁴	-	
Limit_Monitoring_Interval	Unsigned	O ⁴	-	
Notification_Class	Unsigned	O ⁴	-	
Time_Delay	Unsigned	O ⁴	-	
Limit_Enable	BACnetLimitEnable	O ⁴	-	



Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Event_Enable	BACnetEventTransitionBits	O ⁴	-	
Acked_Transitions	BACnetEventTransitionBits	O ⁴	-	
Notify_Type	BACnetNotifyType	O ⁴	-	
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O ⁴	-	
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O ⁵	-	
Profile_Name	CharacterString	O	R	(up to 128 characters)

¹ This property is required to be writable when Out_Of_Service is TRUE.

² These properties are required if either Value_Before_Change or Value_Set is writable.

³ Either Value_Before_Change or Value_Set may be writable, but not both.

⁴ These properties are required if the object supports intrinsic reporting.

⁵ This property, if present, is required to be read-only.

Analog Input

Dynamically Creatable: No
 Dynamically Deletable: No
 Proprietary Properties: None
 DINGO-Stack Version: 2017 R1

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Object_Identifier	BACnetObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	(up to 128 characters)
Object_Type	BACnetObjectType	R	R	
Present_Value	REAL	R ¹	R	
Description	CharacterString	O	R	(up to 128 characters)
Device_Type	CharacterString	O	R	(up to 128 characters)
Status_Flags	BACnetStatusFlags	R	R	
Event_State	BACnetEventState	R	R	
Reliability	BACnetReliability	O	R	
Out_Of_Service	BOOLEAN	R	W	
Update_Interval	Unsigned	O	R	
Units	BACnetEngineeringUnits	R	R	
Min_Pres_Value	REAL	O	R	
Max_Pres_Value	REAL	O	R	
Resolution	REAL	O	R	
COV_Increment	REAL	O ²	R	
Time_Delay	Unsigned	O ^{3,5}	-	
Notification_Class	Unsigned	O ^{3,5}	-	
High_Limit	REAL	O ^{3,5}	-	
Low_Limit	REAL	O ^{3,5}	-	
Deadband	REAL	O ^{3,5}	-	
Limit_Enable	BACnetLimitEnable	O,5 ³	-	
Event_Enable	BACnetEventTransitionBits	O ^{3,5}	-	
Acked_Transitions	BACnetEventTransitionBits	O ^{3,5}	-	
Notify_Type	BACnetNotifyType	O ^{3,5}	-	
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O ^{3,5}	-	
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O ^{4,5}	-	



Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O ⁵	-	
Event_Detection_Enable	BOOLEAN	O ^{3,5}	-	
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O ⁵	-	
Event_Algorithm_Inhibit	BOOLEAN	O ^{5,6}	-	
Time_Delay_Normal	Unsigned	O ⁵	-	
Reliability_Evaluation_Inhibit	BOOLEAN	O ⁷	W	
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R	
Profile_Name	CharacterString	O	R	(up to 128 characters)

¹ This property is required to be writable when Out_Of_Service is TRUE.

² This property is required if, and shall be present only if, the object supports COV reporting.

³ These properties are required if the object supports intrinsic reporting.

⁴ This property, if present, is required to be read-only.

⁵ These properties shall be present only if the object supports intrinsic reporting.

⁶ Event_Algorithm_Inhibit shall be present if Event_Algorithm_Inhibit_Ref is present.

⁷ If this property is present, then the Reliability property shall be present.

Analog Output

Dynamically Creatable: No
 Dynamically Deletable: No
 Proprietary Properties: None
 DINGO-Stack Version: 2018 R4

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Object_Identifier	BACnetObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	(up to 128 characters)
Object_Type	BACnetObjectType	R	R	
Present_Value	REAL	W	W	
Description	CharacterString	O	R	(up to 128 characters)
Device_Type	CharacterString	O	R	(up to 128 characters)
Status_Flags	BACnetStatusFlags	R	R	
Event_State	BACnetEventState	R	R	
Reliability	BACnetReliability	O	R	
Out_Of_Service	BOOLEAN	R	W	
Units	BACnetEngineeringUnits	R	R	
Min_Pres_Value	REAL	O	R	
Max_Pres_Value	REAL	O	R	
Resolution	REAL	O	R	
Priority_Array	BACnetPriorityArray	R	R	
Relinquish_Default	REAL	R	R	
COV_Increment	REAL	O ¹	R	
Time_Delay	Unsigned	O ^{2,4}	-	
Notification_Class	Unsigned	O ^{2,4}	-	
High_Limit	REAL	O ^{2,4}	-	
Low_Limit	REAL	O ^{2,4}	-	
Deadband	REAL	O ^{2,4}	-	
Limit_Enable	BACnetLimitEnable	O ^{2,4}	-	
Event_Enable	BACnetEventTransitionBits	O ^{2,4}	-	
Acked_Transitions	BACnetEventTransitionBits	O ^{2,4}	-	
Notify_Type	BACnetNotifyType	O ^{2,4}	-	
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O ^{2,4}	-	
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O ^{3,4}	-	



Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O ⁴	-	
Event_Detection_Enable	BOOLEAN	O ^{2,4}	-	
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O ⁴	-	
Event_Algorithm_Inhibit	BOOLEAN	O ^{4,5}	-	
Time_Delay_Normal	Unsigned	O ⁴	-	
Reliability_Evaluation_Inhibit	BOOLEAN	O ⁶	W	
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R	
Profile_Name	CharacterString	O	R	(up to 128 characters)

¹ This property is required if, and shall be present only if, the object supports COV reporting.

² These properties are required if the object supports intrinsic reporting.

³ This property, if present, is required to be read-only.

⁴ These properties shall be present only if the object supports intrinsic reporting.

⁵ Event_Algorithm_Inhibit shall be present if Event_Algorithm_Inhibit_Ref is present.

⁶ If this property is present, then the Reliability property shall be present.

Analog Value

Dynamically Creatable: No
 Dynamically Deletable: No
 Proprietary Properties: None
 DINGO-Stack Version: 2018 R4

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Object_Identifier	BACnetObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	(up to 128 characters)
Object_Type	BACnetObjectType	R	R	
Present_Value	REAL	R ⁴	W	Commandable
Description	CharacterString	O	R	(up to 128 characters)
Status_Flags	BACnetStatusFlags	R	R	
Event_State	BACnetEventState	R	R	
Reliability	BACnetReliability	O	R	
Out_Of_Service	BOOLEAN	R	W	
Units	BACnetEngineeringUnits	R	R	
Priority_Array	BACnetPriorityArray	O ¹	R	
Relinquish_Default	REAL	O ¹	R	
COV_Increment	REAL	O ²	R	
Time_Delay	Unsigned	O ^{3,6}	-	
Notification_Class	Unsigned	O ^{3,6}	-	
High_Limit	REAL	O ^{3,6}	-	
Low_Limit	REAL	O ^{3,6}	-	
Deadband	REAL	O ^{3,6}	-	
Limit_Enable	BACnetLimitEnable	O ^{3,6}	-	
Event_Enable	BACnetEventTransitionBits	O ^{3,6}	-	
Acked_Transitions	BACnetEventTransitionBits	O ^{3,6}	-	
Notify_Type	BACnetNotifyType	O ^{3,6}	-	
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O ^{3,6}	-	
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O ^{5,6}	-	
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O ⁶	-	
Event_Detection_Enable	BOOLEAN	O ^{3,6}	-	
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O ⁶	-	



Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Event_Algorithm_Inhibit	BOOLEAN	O ^{6,7}	-	
Time_Delay_Normal	Unsigned	O ⁶	-	
Reliability_Evaluation_Inhibit	BOOLEAN	O ⁸	W	
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R	
Profile_Name	CharacterString	O	R	(up to 128 characters)

¹ These properties are required if, and shall be present only if, Present_Value is commandable.

² This property is required if, and shall be present only if, the object supports COV reporting.

³ These properties are required if the object supports intrinsic reporting.

⁴ If Present_Value is commandable, then it is required to be writable. This property is required to be writable when Out_Of_Service is TRUE.

⁵ This property, if present, is required to be read-only.

⁶ These properties shall be present only if the object supports intrinsic reporting.

⁷ Event_Algorithm_Inhibit shall be present if Event_Algorithm_Inhibit_Ref is present.

⁸ If this property is present, then the Reliability property shall be present.

Averaging

Dynamically Creatable: No
 Dynamically Deletable: No
 Proprietary Properties: None
 DINGO-Stack Version: 2018 R4

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Object_Identifier	BACnetObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	(up to 128 characters)
Object_Type	BACnetObjectType	R	R	
Minimum_Value	REAL	R	R	
Minimum_Value_Timestamp	BACnetDateTime	O	R	
Average_Value	REAL	R	R	
Variance_Value	REAL	O	R	
Maximum_Value	REAL	R	R	
Maximum_Value_Timestamp	BACnetDateTime	O	R	
Description	CharacterString	O	R	(up to 128 characters)
Attempted_Samples	Unsigned	W ¹	W	
Valid_Samples	Unsigned	R	R	
Object_Property_Reference	BACnetDeviceObject-PropertyReference	W ¹	W	
Window_Interval	Unsigned	W ¹	W	
Window_Samples	Unsigned	W ¹	W	
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R	
Profile_Name	CharacterString	O	R	(up to 128 characters)

¹ If any of these properties are written to using BACnet services, then all of the buffer samples shall become invalid, 'Attempted_Samples' shall become zero, 'Valid_Samples' shall become zero, 'Minimum_Value' shall become INF 'Average_Value' shall become NaN and 'Maximum_Value' shall become -INF.



Binary Input

Dynamically Creatable:	No
Dynamically Deletable:	No
Proprietary Properties:	None
DINGO-Stack Version:	2017 R1

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Object_Identifier	BACnetObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	
Object_Type	BACnetObjectType	R	R	
Present_Value	BACnetBinaryPV	R ¹	R	
Description	CharacterString	O	R	(up to 128 characters)
Device_Type	CharacterString	O	R	(up to 128 characters)
Status_Flags	BACnetStatusFlags	R	R	
Event_State	BACnetEventState	R	R	
Reliability	BACnetReliability	O	R	(up to 128 characters)
Out_Of_Service	BOOLEAN	R	W	
Polarity	BACnetPolarity	R	R	
Inactive_Text	CharacterString	O ²	R	(up to 128 characters)
Active_Text	CharacterString	O ²	R	(up to 128 characters)
Change_Of_State_Time	BACnetDateTime	O ³	R	
Change_Of_State_Count	Unsigned	O ³	W	only 0 (zero) allowed for Write; count at least up to 65535
Time_Of_State_Count_Reset	BACnetDateTime	O ³	R	
Elapsed_Active_Time	Unsigned32	O ⁴	W	only 0 (zero) allowed for Write
Time_Of_Active_Time_Reset	BACnetDateTime	O ⁴	R	
Time_Delay	Unsigned	O ^{5,7}	-	
Notification_Class	Unsigned	O ^{5,7}	-	
Alarm_Value	BACnetBinaryPV	O ^{5,7}	-	
Event_Enable	BACnetEventTransitionBits	O ^{5,7}	-	
Acked_Transitions	BACnetEventTransitionBits	O ^{5,7}	-	
Notify_Type	BACnetNotifyType	O ^{5,7}	-	
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O ^{5,7}	-	
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O ^{6,7}	-	

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O ⁷	-	
Event_Detection_Enable	BOOLEAN	O ^{5,7}	-	
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O ⁷	-	
Event_Algorithm_Inhibit	BOOLEAN	O ^{7,8-}	-	
Time_Delay_Normal	Unsigned	O ⁷	-	
Reliability_Evaluation_Inhibit	BOOLEAN	O ⁹	W	
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R	
Profile_Name	CharacterString	O	R	(up to 128 characters)

¹ This property is required to be writable when Out_Of_Service is TRUE.

² If one of the optional properties Inactive_Text or Active_Text is present, then both of these properties shall be present.

³ If one of the optional properties Change_Of_State_Time, Change_Of_State_Count, or Time_Of_State_Count_Reset is present, then all of these properties shall be present.

⁴ If one of the optional properties Elapsed_Active_Time or Time_Of_Active_Time_Reset is present, then both of these properties shall be present.

⁵ These properties are required if the object supports intrinsic reporting.

⁶ This property, if present, is required to be read-only.

⁷ These properties shall be present only if the object supports intrinsic reporting.

⁸ Event_Algorithm_Inhibit shall be present if Event_Algorithm_Inhibit_Ref is present.

⁹ If this property is present, then the Reliability property shall be present.



Binary Output

Dynamically Creatable: No
 Dynamically Deletable: No
 Proprietary Properties: None
 DINGO-Stack Version: 2017 R1

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Object_Identifier	BACnetObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	
Object_Type	BACnetObjectType	R	R	
Present_Value	BACnetBinaryPV	W	W	
Description	CharacterString	O	R	Depending on the UTF- 8 characters between 25 and 101 characters.
Device_Type	CharacterString	O	R	Depending on the UTF- 8 characters between 25 and 101 characters.
Status_Flags	BACnetStatusFlags	R	R	
Event_State	BACnetEventState	R	R	
Reliability	BACnetReliability	O	R	
Out_Of_Service	BOOLEAN	R	W	
Polarity	BACnetPolarity	R	R	
Inactive_Text	CharacterString	O ¹	R	Depending on the UTF- 8 characters between 25 and 101 characters.
Active_Text	CharacterString	O ¹	R	Depending on the UTF- 8 characters between 25 and 101 characters.
Change_Of_State_Time	BACnetDateTime	O ²	R	
Change_Of_State_Count	Unsigned	O ²	W	only 0 (zero) allowed for Write; count at least up to 65535
Time_Of_State_Count_Reset	BACnetDateTime	O ²	R	
Elapsed_Active_Time	Unsigned32	O ³	W	only 0 (zero) allowed for Write
Time_Of_Active_Time_Reset	BACnetDateTime	O ³	R	
Minimum_Off_Time	Unsigned32	O	W	
Minimum_On_Time	Unsigned32	O	W	
Priority_Array	BACnetPriorityArray	R	R	
Relinquish_Default	BACnetBinaryPV	R	R	

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Time_Delay	Unsigned	O ^{4,6}	-	
Notification_Class	Unsigned	O ^{4,6}	-	
Feedback_Value	BACnetBinaryPV	O ⁴	-	
Event_Enable	BACnetEventTransition Bits	O ^{4,6}	-	
Acked_Transitions	BACnetEventTransition Bits	O ^{4,6}	R	
Notify_Type	BACnetNotifyType	O ^{4,6}	-	
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O ^{4,6}	-	
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O ^{5,6}	-	
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O ⁶	-	
Event_Detection_Enable	BOOLEAN	O ^{4,6}	-	
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O ⁶	-	
Event_Algorithm_Inhibit	BOOLEAN	O ^{6,7}	-	
Time_Delay_Normal	Unsigned	O ⁶	-	
Reliability_Evaluation_Inhibit	BOOLEAN	O ⁸	W	
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R	
Profile_Name	CharacterString	O	R	(up to 128 characters)

¹ If one of the optional properties Inactive_Text or Active_Text is present, then both of these properties shall be present.

² If one of the optional properties Change_Of_State_Time, Change_Of_State_Count, or Time_Of_State_Count_Reset is present, then all of these properties shall be present.

³ If one of the optional properties Elapsed_Active_Time or Time_Of_Active_Time_Reset is present, then both of these properties shall be present.

⁴ These properties are required if the object supports intrinsic reporting.

⁵ This property, if present, is required to be read-only.

⁶ These properties shall be present only if the object supports intrinsic reporting.

⁷ Event_Algorithm_Inhibit shall be present if Event_Algorithm_Inhibit_Ref is present.

⁸ If this property is present, then the Reliability property shall be present.



Binary Value

Dynamically Creatable:	No
Dynamically Deletable:	No
Proprietary Properties:	None
DINGO-Stack Version:	2018 R4

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Object_Identifier	BACnetObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	(up to 128 characters)
Object_Type	BACnetObjectType	R	R	
Present_Value	BACnetBinaryPV	R ¹	W	Commandable
Description	CharacterString	O	R	(up to 128 characters)
Status_Flags	BACnetStatusFlags	R	R	
Event_State	BACnetEventState	R	R	
Reliability	BACnetReliability	O	R	
Out_Of_Service	BOOLEAN	R	W	
Inactive_Text	CharacterString	O ²	R	(up to 128 characters)
Active_Text	CharacterString	O ²	R	(up to 128 characters)
Change_Of_State_Time	BACnetDateTime	O ³	R	
Change_Of_State_Count	Unsigned	O ³	W	only 0 (zero) allowed for Write
Time_Of_State_Count_Reset	BACnetDateTime	O ³	R	
Elapsed_Active_Time	Unsigned32	O ⁴	W	only 0 (zero) allowed for Write
Time_Of_Active_Time_Reset	BACnetDateTime	O ⁴	R	
Minimum_Off_Time	Unsigned32	O	W	
Minimum_On_Time	Unsigned32	O	W	
Priority_Array	BACnetPriorityArray	O ⁵	R	
Relinquish_Default	BACnetBinaryPV	O ⁵	R	
Time_Delay	Unsigned	O ^{6,8}	-	
Notification_Class	Unsigned	O ^{6,8}	-	
Alarm_Value	BACnetBinaryPV	O ^{6,8}	-	
Event_Enable	BACnetEventTransitionBits	O ^{6,8}	-	
Acked_Transitions	BACnetEventTransitionBits	O ^{6,8}	-	
Notify_Type	BACnetNotifyType	O ^{6,8}	-	

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O ^{6,8}	-	
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O ^{7,8}	-	
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O ⁸	-	
Event_Detection_Enable	BOOLEAN	O ^{6,8}	-	
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O ⁸	-	
Event_Algorithm_Inhibit	BOOLEAN	O ^{8,9}	-	
Time_Delay_Normal	Unsigned	O ⁸	-	
Reliability_Evaluation_Inhibit	BOOLEAN	O ¹⁰	W	
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R	
Profile_Name	CharacterString	O	R	(up to 128 characters)

¹ If Present_Value is commandable, then it is required to be writable. This property is required to be writable when Out_Of_Service is TRUE.

² If one of the optional properties Inactive_Text or Active_Text is present, then both of these properties shall be present.

³ If one of the optional properties Change_Of_State_Time, Change_Of_State_Count, or Time_Of_State_Count_Reset is present, then all of these properties shall be present.

⁴ If one of the optional properties Elapsed_Active_Time or Time_Of_Active_Time_Reset is present, then both of these properties shall be present.

⁵ These properties are required if, and shall be present only if, Present_Value is commandable.

⁶ These properties are required if the object supports intrinsic reporting.

⁷ This property, if present, is required to be read-only.

⁸ These properties shall be present only if the object supports intrinsic reporting.

⁹ Event_Algorithm_Inhibit shall be present if Event_Algorithm_Inhibit_Ref is present.

¹⁰ If this property is present, then the Reliability property shall be present.



Device

Dynamically Creatable:	No
Dynamically Deletable:	No
Proprietary Properties:	None
DINGO-Stack Version:	2017 R1

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Object_Identifier	BACnetObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	(up to 128 characters)
Object_Type	BACnetObjectType	R	R	
System_Status	BACnetDeviceStatus	R	R	
Vendor_Name	CharacterString	R	R	(up to 128 characters)
Vendor_Identifier	Unsigned16	R	R	
Model_Name	CharacterString	R	R	(up to 128 characters)
Firmware_Revision	CharacterString	R	R	
Application_Software_Version	CharacterString	R	R	
Location	CharacterString	O	W	(up to 128 characters)
Description	CharacterString	O	R	(up to 128 characters)
Protocol_Version	Unsigned	R	R	
Protocol_Revision	Unsigned	R	R	
Protocol_Services_Supported	BACnetServicesSupported	R	R	
Protocol_Object_Types_Supported	BACnetObjectTypesSupported	R	R	
Object_List	BACnetARRAY[N]of BACnetObjectIdentifier	R	R	
Structured_Object_List	BACnetARRAY[N]of BACnetObjectIdentifier	O	W	DINGO-Stack 2.0 and up.
Max_APDU_Length_Accepted	Unsigned	R	R	
Segmentation_Supported	BACnetSegmentation	R	R	
Max_Segments_Accepted	Unsigned	O1	R	
VT_Classes_Supported	List of BACnetVTClass	O2	-	
Active_VT_Sessions	List of BACnetVTSession	O2	-	
Local_Time	Time	O3,4,15	R	

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Local_Date	Date	O3,4,15	R	
UTC_Offset	INTEGER	O4	W	
Daylight_Savings_Status	BOOLEAN	O4	W	
APDU_Segment_Timeout	Unsigned	O1	W	
APDU_Timeout	Unsigned	R	R	
Number_Of_APDU_Retries	Unsigned	R	W	
Time_Synchronization_Recipients	List of BACnetRecipient	O5	W	
Max_Master	Unsigned(1..127)	O6	-	
Max_Info_Frames	Unsigned	O6	-	
Device_Address_Binding	List of BACnetAddressBinding	R	R	
Database_Revision	Unsigned	R	R	
Configuration_Files	BACnetARRAY[N] of BACnetObjectIdentifier	O7	-	
Last_Restore_Time	BACnetTimeStamp	O7	-	
Backup_Failure_Timeout	Unsigned16	O8	-	
Backup_Preparation_Time	Unsigned16	O	-	
Restore_Preparation_Time	Unsigned16	O	-	
Restore_Completion_Time	Unsigned16	O	-	
Backup_And_Restore_State	BACnetBackupState	O	-	
Active_COV_Subscriptions	List of BACnetCOVSubscription	O9	R	
Slave_Proxy_Enable	BACnetArray[N] of BOOLEAN	O10	-	
Manual_Slave_Address_Binding	List of BACnetAddressBinding	O10	-	
Auto_Slave_Discovery	BACnetArray[N] of BOOLEAN	O11	-	
Slave_Address_Binding	List of BACnetAddressBinding	O12	-	
Last_Restart_Reason	BACnetRestartReason	O13	-	
Time_of_Device_Restart	BACnetTimeStamp	O13	-	
Restart_Notification_Recipients	List of BACnetRecipient	O13	-	
UTC_Time_Synchronization_Recipients	List of BACnetRecipient	O5	W	
Time_Synchronization_Interval	Unsigned	O14	W	
Align_Intervals	BOOLEAN	O14	W	
Interval_Offset	Unsigned	O14	W	
Serial_Number	CharacterString	O	R	(up to 128 characters)



Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R	
Profile_Name	CharacterString	O	R	(up to 128 characters)

¹ These properties are required if, and shall be present only if, segmentation of any kind is supported.

² These properties are required if, and shall be present only if, the VT Services are supported.

³ If the device supports the execution of the TimeSynchronization service, then these properties shall be present.

⁴ If the device supports the execution of the UTCTimeSynchronization service, then these properties shall be present.

⁵ If present, this property shall be writable.

⁶ These properties are required if the device is an MS/TP master node.

⁷ These properties are required if, and shall be present only if, the device supports execution of the backup and restore procedures.

⁸ This property is required if, and shall be present only if, the device supports the backup and restore procedures. If present, this property shall be writable.

⁹ This property is required if, and shall be present only if, the device supports execution of either the SubscribeCOV or SubscribeCOVProperty service.

¹⁰ This property is required if, and shall be present only if, the device is capable of being a Slave-Proxy device.

¹¹ This property is required if, and shall be present only if, the device is capable of being a Slave-Proxy device that implements automatic discovery of slaves.

¹² This property shall be writable if the device is directly connected to an MS/TP network.

¹³ These properties are required if the device supports the restart procedure as described in Clause 19.3.

¹⁴ These properties are required if, and shall be present only if, Time_Synchronization_Recipients or UTC_Time_Synchronization_Recipients is present. If present, these properties shall be writable.

¹⁵ These properties shall be present if the device is capable of tracking date and time.

¹⁶ These properties are required if, and shall be present only if, the device supports execution of the backup and restore procedures as described in Clause 19.1 and cannot respond to subsequent communications within the minimum value it will accept in its APDU_Timeout property.

¹⁷ This property is required if, and shall be present only if, the device supports execution of the restart procedure as described in Clause 19.3.

Group

Dynamically Creatable: No
Dynamically Deletable: No
Proprietary Properties: None
DINGO-Stack Version: NO SUPPORT

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Object_Identifier	BACnetObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	(up to 128 characters)
Object_Type	BACnetObjectType	R	R	
Description	CharacterString	O	R	(up to 128 characters)
List_Of_Group_Members	List of ReadAccessSpecification	R	W	
Present_Value	List of ReadAccessResult	R	R	
Profile_Name	CharacterString	O	R	(up to 128 characters)



Multi-state Input

Dynamically Creatable:	No
Dynamically Deletable:	No
Proprietary Properties:	None
DINGO-Stack Version:	2018 R4

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Object_Identifier	BACnetObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	(up to 128 characters)
Object_Type	BACnetObjectType	R	R	
Present_Value	Unsigned	R ¹	R	
Description	CharacterString	O	R	(up to 128 characters)
Device_Type	CharacterString	O	R	(up to 128 characters)
Status_Flags	BACnetStatusFlags	R	R	
Event_State	BACnetEventState	R	R	
Reliability	BACnetReliability	O	R	
Out_Of_Service	BOOLEAN	R	W	
Number_Of_States	Unsigned	R	R	
State_Text	BACnetARRAY[N] of CharacterString	O	R	(up to 128 characters)
Time_Delay	Unsigned	O ^{3,5}	-	
Notification_Class	Unsigned	O ^{3,5}	-	
Alarm_Values	BACnetLIST of Unsigned	O ^{3,5}	-	
Fault_Values	BACnetLIST of Unsigned	O ⁷	-	
Event_Enable	BACnetEventTransitionBits	O ^{3,5}	-	
Acked_Transitions	BACnetEventTransitionBits	O ^{3,5}	-	
Notify_Type	BACnetNotifyType	O ^{3,5}	-	
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O ^{3,5}	-	
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O ^{4,5}	-	
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O ⁵	-	
Event_Detection_Enable	BOOLEAN	O ^{3,5}	-	
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O ⁵	-	
Event_Algorithm_Inhibit	BOOLEAN	O ^{5,6}	-	
Time_Delay_Normal	Unsigned	O ⁵	-	
Reliability_Evaluation_Inhibit	BOOLEAN	O ⁷	W	

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R	
Profile_Name	CharacterString	O	R	(up to 128 characters)

¹ This property is required to be writable when Out_Of_Service is TRUE.

² Footnote removed.

³ These properties are required if the object supports intrinsic reporting.

⁴ This property, if present, is required to be read-only.

⁵ These properties shall be present only if the object supports intrinsic reporting.

⁶ Event_Algorithm_Inhibit shall be present if Event_Algorithm_Inhibit_Ref is present.

⁷ If this property is present, then the Reliability property shall be present.



Multi-state Output

Dynamically Creatable:	No
Dynamically Deletable:	No
Proprietary Properties:	None
DINGO-Stack Version:	2018 R4

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Object_Identifier	BACnetObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	(up to 128 characters)
Object_Type	BACnetObjectType	R	R	
Present_Value	Unsigned	W	W	
Description	CharacterString	O	R	(up to 128 characters)
Device_Type	CharacterString	O	R	(up to 128 characters)
Status_Flags	BACnetStatusFlags	R	R	
Event_State	BACnetEventState	R	R	
Reliability	BACnetReliability	O	R	
Out_Of_Service	BOOLEAN	R	R	
Number_Of_States	Unsigned	R	R	
State_Text	BACnetARRAY[N] of CharacterString	O	R	(up to 128 characters)
Priority_Array	BACnetPriorityArray	R	R	
Relinquish_Default	Unsigned	R ¹	R	
Time_Delay	Unsigned	O, ³	-	
Notification_Class	Unsigned	O ^{1,3}	-	
Feedback_Value	Unsigned	O ¹	-	
Event_Enable	BACnetEventTransitionBits	O ^{1,3}	-	
Acked_Transitions	BACnetEventTransitionBits	O ^{1,3}	-	
Notify_Type	BACnetNotifyType	O ^{1,3}	-	
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O ^{1,3}	-	
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O ^{2,3}	-	
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O ³	-	
Event_Detection_Enable	BOOLEAN	O ^{1,3}	-	
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O ³	-	
Event_Algorithm_Inhibit	BOOLEAN	O ^{3,4}	-	
Time_Delay_Normal	Unsigned	O ³	-	

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Reliability_Evaluation_Inhibit	BOOLEAN	O ⁵	R	
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R	
Profile_Name	CharacterString	O	R	(up to 128 characters)

¹ These properties are required if the object supports intrinsic reporting.

² This property, if present, is required to be read-only.

³ These properties shall be present only if the object supports intrinsic reporting.

⁴ Event_Algorithm_Inhibit shall be present if Event_Algorithm_Inhibit_Ref is present.

⁵ If this property is present, then the Reliability property shall be present.



Multi-state Value

Dynamically Creatable:	No
Dynamically Deletable:	No
Proprietary Properties:	None
DINGO-Stack Version:	2018 R4

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Object_Identifier	BACnetObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	(up to 128 characters)
Object_Type	BACnetObjectType	R	R	
Present_Value	Unsigned	R ¹	W	
Description	CharacterString	O	R	(up to 128 characters)
Status_Flags	BACnetStatusFlags	R	R	
Event_State	BACnetEventState	R	R	
Reliability	BACnetReliability	O ⁽²⁾	W	no-fault-detected not allowed when Present_Value = Fault_Value
Out_Of_Service	BOOLEAN	R	W	
Number_Of_States	Unsigned	R	R	
State_Text	BACnetARRAY[N] of CharacterString	O	R	(up to 128 characters)
Priority_Array	BACnetPriorityArray	O ³	R	
Relinquish_Default	Unsigned	O ³	W	
Time_Delay	Unsigned	O ^{4,6}	-	
Notification_Class	Unsigned	O ^{4,6}	-	
Alarm_Values	List of Unsigned	O ^{4,6}	-	
Fault_Values	List of Unsigned	O ⁸	-	
Event_Enable	BACnetEventTransitionBits	O ^{4,6}	-	
Acked_Transitions	BACnetEventTransitionBits	O ^{4,6}	-	
Notify_Type	BACnetNotifyType	O ^{4,6}	-	
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O ^{4,6}	-	
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O ^{5,6}	-	
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O ⁶	-	
Event_Detection_Enable	BOOLEAN	O ^{3,6}	R	
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O ⁶	-	

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Event_Algorithm_Inhibit	BOOLEAN	O ^{6,7}	-	
Time_Delay_Normal	Unsigned	O ⁶	-	
Reliability_Evaluation_Inhibit	BOOLEAN	O ⁸	W	
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R	
Profile_Name	CharacterString	O	R	(up to 128 characters)

1 If Present_Value is commandable, then it is required to also be writable. This property is required to be writable when Out_Of_Service is TRUE.

2 Footnote removed.

3 These properties are required if, and shall be present only if, Present_Value is commandable.

4 These properties are required if the object supports intrinsic reporting.

5 This property, if present, is required to be read-only.

6 These properties shall be present only if the object supports intrinsic reporting.

7 Event_Algorithm_Inhibit shall be present if Event_Algorithm_Inhibit_Ref is present.

8 If this property is present, then the Reliability property shall be present.



Program

Dynamically Creatable:	No
Dynamically Deletable:	No
Proprietary Properties:	None
DINGO-Stack Version:	2018 R4

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Object_Identifier	BACnetObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	(up to 128 characters)
Object_Type	BACnetObjectType	R	R	
Program_State	BACnetProgramState	R	R	
Program_Change	BACnetProgramRequest	W	W	
Reason_For_Halt	BACnetProgramError	O ¹	R	
Description_Of_Halt	CharacterString	O ¹	R	(up to 128 characters)
Program_Location	CharacterString	O	-	
Description	CharacterString	O	R	(up to 128 characters)
Instance_Of	CharacterString	O	R	(up to 128 characters)
Status_Flags	BACnetStatusFlags	O	-	
Reliability	BACnetReliability	R	R	
Out_Of_Service	BOOLEAN	O	-	
Event_Detection_Enable	BOOLEAN	R	R	
Notification_Class	Unsigned	O ^{2,3}	-	
Event_Enable	BACnetEventTransitionBits	O ^{2,3}	-	
Event_State	BACnetEventState	O ^{2,3}	-	
Acked_Transitions	BACnetEventTransitionBits	O ^{2,3}	-	
Notify_Type	BACnetNotifyType	O ^{2,3}	-	
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O ^{2,3}	-	
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O ³	-	
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O ³	-	
Reliability_Evaluation_Inhibit	BOOLEAN	O ⁴	W	
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R	
Profile_Name	CharacterString	O	R	(up to 128 characters)

¹ If one of the optional properties Reason_For_Halt or Description_Of_Halt is present, then both of these properties shall be present.

² These properties are required if the object supports intrinsic reporting.

³ These properties shall be present only if the object supports intrinsic reporting.

⁴ If this property is present, then the Reliability property shall be present.

Pulse Converter

Dynamically Creatable: No
 Dynamically Deletable: No
 Proprietary Properties: None
 DINGO-Stack Version: 2017 R1

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Object_Identifier	BACnetObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	(up to 128 characters)
Object_Type	BACnetObjectType	R	R	
Description	CharacterString	O	W	(up to 128 characters)
Present_Value	REAL	R ¹	R	
Input_Reference	BACnetObjectProperty Reference	O	W	
Status_Flags	BACnetStatusFlags	R	R	
Event_State	BACnetEventState	R	R	
Reliability	BACnetReliability	O	W	
Out_Of_Service	BOOLEAN	R	W	
Units	BACnetEngineeringUnits	R	W	
Scale_Factor	REAL	R	W	
Adjust_Value	REAL	W	W	
Count	Unsigned	R	R	
Update_Time	BACnetDateTime	R	R	
Count_Change_Time	BACnetDateTime	R	R	
Count_Before_Change	Unsigned	R	R	
COV_Increment	REAL	O ²	W	
COV_Period	Unsigned	O ²	W	
Notification_Class	Unsigned	O ^{3,5}	-	
Time_Delay	Unsigned	O ^{3,5}	-	
High_Limit	REAL	O ^{3,5}	-	
Low_Limit	REAL	O ^{3,5-}	-	
Deadband	REAL	O ^{3,5}	-	
Limit_Enable	BACnetLimitEnable	O ^{3,5}	-	
Event_Enable	BACnetEventTransitionBits	O ^{3,5}	-	
Acked_Transitions	BACnetEventTransitionBits	O ^{3,5}	-	
Notify_Type	BACnetNotifyType	O ^{3,5}	-	



Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O ^{3,5}	-	
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O ^{3,5}	-	
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O ⁵	-	
Event_Detection_Enable	BOOLEAN	O ^{3,5}	-	
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O ⁵	-	
Event_Algorithm_Inhibit	BOOLEAN	O ^{5,6}	-	
Time_Delay_Normal	Unsigned	O ⁵	-	
Reliability_Evaluation_Inhibit	BOOLEAN	O ⁷	R	
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R	
Profile_Name	CharacterString	O	R	(up to 128 characters)

¹ This property is required to be writable when Out_Of_Service is TRUE.

² These properties are required if, and shall be present only if, the object supports COV reporting.

³ These properties are required if the object supports intrinsic reporting.

⁴ This property, if present, is required to be read-only.

⁵ These properties shall be present only if the object supports intrinsic reporting.

⁶ Event_Algorithm_Inhibit shall be present if Event_Algorithm_Inhibit_Ref is present.

⁷ If this property is present, then the Reliability property shall be present.

Schedule

Dynamically Creatable: No
 Dynamically Deletable: No
 Proprietary Properties: None
 DINGO-Stack Version: 2018 R4

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Object_Identifier	BACnetObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	(up to 128 characters)
Object_Type	BACnetObjectType	R	R	
Present_Value	Any	R	R	
Description	CharacterString	O	R	(up to 128 characters)
Effective_Period	BACnetDateRange	R	W	
Weekly_Schedule	BACnetARRAY[7]of BACnetDailySchedule	O ¹	R	
Exception_Schedule	BACnetARRAY[N]of BACnetSpecialEvent	O ¹	R	
Schedule_Default	Any	R	W	
List_Of_Object_Property_References	List of BACnetDeviceObject PropertyReference	R	W	
Priority_For_Writing	Unsigned(1..16)	R	W	
Status_Flags	BACnetStatusFlags	R	R	
Reliability	BACnetReliability	R	R	
Out_Of_Service	BOOLEAN	R	W	
Event_Detection_Enable	BOOLEAN	O ^{2,3}	-	
Notification_Class	Unsigned	O ^{2,3}	-	
Event_Enable	BACnetEventTransitionBits	O ^{2,3}	-	
Event_State	BACnetEventState	O ^{2,3}	-	
Acked_Transitions	BACnetEventTransitionBits	O ^{2,3}	-	
Notify_Type	BACnetNotifyType	O ^{2,3}	-	
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O ^{2,3}	-	
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O ³	-	(up to 128 characters)
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O ³	-	(up to 128 characters)
Reliability_Evaluation_Inhibit	BOOLEAN	O	W	
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R	
Profile_Name	CharacterString	O	R	(up to 128 characters)



¹ At least one of these properties is required.

² These properties are required if the object supports intrinsic reporting.

³ These properties shall be present only if the object supports intrinsic reporting.

Trend Log

Dynamically Creatable: No
 Dynamically Deletable: No
 Proprietary Properties: Reset_Adjust_Value (512)
 DINGO-Stack Version: 2017 R1

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Object_Identifier	BACnetObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	(up to 128 characters)
Object_Type	BACnetObjectType	R	R	
Description	CharacterString	O	R	(up to 128 characters)
Enable	BOOLEAN	W	W	
Start_Time	BACnetDateTime	O ^{1,2}	W	
Stop_Time	BACnetDateTime	O ^{1,2}	W	
Log_DeviceObjectProperty	BACnetDeviceObjectPropertyReference	O ⁸	W	
Log_Interval	Unsigned	O ^{1,3}	W	
COV_Resubscription_Interval	Unsigned	O	W	
Client_COV_Increment	BACnetClientCOV	O	W	
Stop_When_Full	BOOLEAN	R	R	
Buffer_Size	Unsigned32	R	R	
Log_Buffer	BACnetLIST of BACnetLogRecord	R	R	
Record_Count	Unsigned32	W	W	
Total_Record_Count	Unsigned32	R	R	
Logging_Type	BACnetLoggingType	R	W	
Align_Intervals	BOOLEAN	O ⁵	W	
Interval_Offset	Unsigned	O ⁵	W	
Trigger	BOOLEAN	O	W	
Status_Flags	BACnetStatusFlags	R	R	
Reliability	BACnetReliability	O	R	
Notification_Threshold	Unsigned32	O ^{4,7}	-	
Records_Since_Notification	Unsigned32	O ^{4,7}	-	
Last_Notify_Record	Unsigned32	O ^{4,7}	-	
Event_State	BACnetEventState	R	R	
Notification_Class	Unsigned	O ^{4,7}	-	
Event_Enable	BACnetEventTransitionBits	O ^{4,7}	-	
Acked_Transitions	BACnetEventTransitionBits	O ^{4,7}	-	



Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Notify_Type	BACnetNotifyType	O ^{4,7}	-	
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O ^{4,7}	-	
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O ^{6,7}	-	
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O ⁷	-	
Event_Detection_Enable	BOOLEAN	O ^{4,7}	-	
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O ⁷	-	
Event_Algorithm_Inhibit	BOOLEAN	O ^{7,9}	-	
Reliability_Evaluation_Inhibit	BOOLEAN	O ¹⁰	W	
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R	
Profile_Name	CharacterString	O	R	(up to 128 characters)
Reset_Adjust_Value (512)	ProprietaryResetAdjustValue	P ¹¹	W	Used only when logging from Pulse Converter

¹ These properties are required if the monitored property is a BACnet property.

² If present, these properties are required to be writable.

³ If present, this property is required to be writable when Logging_Type has the value POLLED or the value COV. Also, if present this property is required to be read-only if Logging_Type has the value TRIGGERED.

⁴ These properties are required if the object supports intrinsic reporting.

⁵ These properties are required if, and shall be present only if, the object supports clock-aligned logging.

⁶ This property, if present, is required to be read-only.

⁷ These properties shall be present only if the object supports intrinsic reporting.

⁸ This property is required if, and shall be present only if, the monitored property is a BACnet property.

⁹ Event_Algorithm_Inhibit shall be present if Event_Algorithm_Inhibit_Ref is present.

¹⁰ If this property is present, then the Reliability property shall be present.

¹¹ This property is used by TrendLog and TrendLogMultiple. It is of type enumerated. When set to a non zero value and the TL or TLM are logging from a Pulse Converter object (PC), property Count_Before_Change, the PC property Adjust_Value is written with zero by the TL or TLM just before polling the PC for a new value. This will cause the PC-property Count_Before_Change to be set. Valid values for this property are.

0) Do not write zero to PC property Adjust_Value before reading Count_Before_Change

1) Read the PC property Count_Before_Change and log it without any scaling.

2) Read both the Count_Before_Change and Scale_Factor and log Count_Before_Change * Scale_Factor

Structured View

Dynamically Creatable: No
Dynamically Deletable: No
Proprietary Properties: None
DINGO-Stack Version: 2018 R4

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Object_Identifier	BACnetObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	(up to 128 characters)
Object_Type	BACnetObjectType	R	R	
Description	CharacterString	O	R	(up to 128 characters)
Node_Type	BACnetNodeType	R	R	
Node_Subtype	CharacterString	O	R	
Subordinate_List	BACnetARRAY[N] of BACnetDeviceObjectReference	R	W	
Subordinate_Annotations	BACnetARRAY[N] of CharacterString	O	W	
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R	
Profile_Name	CharacterString	O	R	(up to 128 characters)



Trend Log Multiple

Dynamically Creatable: No
 Dynamically Deletable: No
 Proprietary Properties: Reset_Adjust_Value (512)
 DINGO-Stack Version: 2018 R4

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Object_Identifier	BACnetObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	(up to 128 characters)
Object_Type	BACnetObjectType	R	R	
Description	CharacterString	O	R	(up to 128 characters)
Status_Flags	BACnetStatusFlags	R	R	
Event_State	BACnetEventState	R	R	
Reliability	BACnetReliability	O	R	
Enable	BOOLEAN	W	W	
Start_Time	BACnetDateTime	O ¹	W	
Stop_Time	BACnetDateTime	O ¹	W	
Log_DeviceObjectProperty	BACnetARRAY[N] of BACnetDeviceObjectPropertyReference	R	W	
Logging_Type	BACnetLoggingType	R	R	
Log_Interval	Unsigned	R ²	R	
Align_Intervals	BOOLEAN	O ³	R	
Interval_Offset	Unsigned	O ³	R	
Trigger	BOOLEAN	O	W	
Stop_When_Full	BOOLEAN	R	R	
Buffer_Size	Unsigned32	R	R	
Log_Buffer	BACnetLIST of BACnetLogMultipleRecord	R	R	
Record_Count	Unsigned32	W	W	
Total_Record_Count	Unsigned32	R	R	
Notification_Threshold	Unsigned32	O ^{4,6}	-	
Records_Since_Notification	Unsigned32	O ^{4,6}	-	
Last_Notify_Record	Unsigned32	O ^{4,6}	-	
Notification_Class	Unsigned	O ^{4,6}	-	
Event_Enable	BACnetEventTransitionBits	O ^{4,6}	-	
Acked_Transitions	BACnetEventTransitionBits	O ^{4,6}	-	
Notify_Type	BACnetNotifyType	O ^{4,6}	-	

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O ^{4,6}	-	
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O ^{5,6}	-	
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O ⁶	-	
Event_Detection_Enable	BOOLEAN	O ^{4,6}	-	
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O ⁶	-	
Event_Algorithm_Inhibit	BOOLEAN	O ^{6,7}	-	
Reliability_Evaluation_Inhibit	BOOLEAN	O ⁸	W	
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R	
Profile_Name	CharacterString	O	R	(up to 128 characters)
Reset_Adjust_Value (512)	BACnetLIST of ProprietaryResetAdjustValue	P ⁹	W	Used only when logging from Pulse Converter

¹ If present, these properties are required to be writable.² This property is required to be writable when Logging_Type has the value POLLED and is required to be readonly when Logging_Type has the value TRIGGERED.

³ These properties are required if, and shall be present only if, the object supports clock-aligned logging.

⁴ These properties are required if the object supports intrinsic reporting.

⁵ This property, if present, is required to be read-only.

⁶ These properties shall be present only if the object supports intrinsic reporting.

⁷ Event_Algorithm_Inhibit shall be present if Event_Algorithm_Inhibit_Ref is present.

⁸ If this property is present, then the Reliability property shall be present.

⁹ This property is used by TrendLog and TrendLogMultiple. It is of type enumerated. When set to a non zero value and the TL or TLM are logging from a Pulse Converter object (PC), property Count_Before_Change, the PC property Adjust_Value is written with zero by the TL or TLM just before polling the PC for a new value. This will cause the PC-property Count_Before_Change to be set. Valid values for this property are:

0) Do not write zero to PC property Adjust_Value before reading Count_Before_Change

1) Read the PC property Count_Before_Change and log it without any scaling.

2) Read both the Count_Before_Change and Scale_Factor and log Count_Before_Change * Scale_Factor



CharacterString Value

Dynamically Creatable:	No
Dynamically Deletable:	No
Proprietary Properties:	None
DINGO-Stack Version:	2018 R4

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Object_Identifier	BACnetObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	(up to 128 characters)
Object_Type	BACnetObjectType	R	R	
Description	CharacterString	O	R	(up to 128 characters)
Present_Value	CharacterString	R ¹	W	
Status_Flags	BACnetStatusFlags	R	R	
Event_State	BACnetEventState	O ³	-	
Reliability	BACnetReliability	O	R	
Out_Of_Service	BOOLEAN	O	W	
Priority_Array	BACnetPriorityArray	O ²	R	
Relinquish_Default	CharacterString	O ²	R	
Time_Delay	Unsigned	O ^{3,5}	-	
Notification_Class	Unsigned	O ^{3,5}	-	
Alarm_Values	BACnetARRAY[N] of BACnetOptionalCharacterString	O ^{3,5}	-	
Fault_Values	BACnetARRAY[N] of BACnetOptionalCharacterString	O ⁷	-	
Event_Enable	BACnetEventTransitionBits	O ^{3,5}	-	
Acked_Transitions	BACnetEventTransitionBits	O ^{3,5}	-	
Notify_Type	BACnetNotifyType	O ^{3,5}	-	
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O ^{3,5}	-	
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O ^{4,5}	-	
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O ⁵	-	
Event_Detection_Enable	BOOLEAN	O ^{3,5}	-	
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O ⁵	-	
Event_Algorithm_Inhibit	BOOLEAN	O ^{5,6}	-	
Time_Delay_Normal	Unsigned	O ⁵	-	
Reliability_Evaluation_Inhibit	BOOLEAN	O ⁷	W	

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R	
Profile_Name	CharacterString	O	R	(up to 128 characters)

¹ If Present_Value is commandable, then it is required to be writable. This property is required to be writable when Out_Of_Service is TRUE.

² These properties are required if, and shall be present only if, Present_Value is commandable.

³ These properties are required if the object supports intrinsic reporting.

⁴ This property, if present, is required to be read-only.

⁵ These properties shall be present only if the object supports intrinsic reporting.

⁶ Event_Algorithm_Inhibit shall be present if Event_Algorithm_Inhibit_Ref is present.

⁷ If this property is present, then the Reliability property shall be present.



DateTime Value

Dynamically Creatable:	No
Dynamically Deletable:	No
Proprietary Properties:	None
DINGO-Stack Version:	2018 R4

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Object_Identifier	BACnetObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	(up to 128 characters)
Object_Type	BACnetObjectType	R	R	
Description	CharacterString	O	R	(up to 128 characters)
Present_Value	BACnetDateTime	R ¹	W	
Status_Flags	BACnetStatusFlags	R	R	
Event_State	BACnetEventState	O	-	
Reliability	BACnetReliability	O	R	
Out_Of_Service	BOOLEAN	O	W	
Priority_Array	BACnetPriorityArray	O ²	R	
Relinquish_Default	BACnetDateTime	O ²	R	
Is_UTC	BOOLEAN	O	R	
Reliability_Evaluation_Inhibit	BOOLEAN	O ³	W	
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R	
Profile_Name	CharacterString	O	R	(up to 128 characters)

¹ If Present_Value is commandable, then it is required to be writable. This property is required to be writable when Out_Of_Service is TRUE.

² These properties are required if, and shall be present only if, Present_Value is commandable.

³ If this property is present, then the Reliability property shall be present.

Large Analog Value

Dynamically Creatable: No
 Dynamically Deletable: No
 Proprietary Properties: None
 DINGO-Stack Version: 2018 R4

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Object_Identifier	BACnetObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	(up to 128 characters)
Object_Type	BACnetObjectType	R	R	
Description	CharacterString	O	R	(up to 128 characters)
Present_Value	Double	R ¹	W	
Status_Flags	BACnetStatusFlags	R	R	
Event_State	BACnetEventState	O ⁴	-	
Reliability	BACnetReliability	O	R	
Out_Of_Service	BOOLEAN	O	W	
Units	BACnetEngineeringUnits	R	R	
Priority_Array	BACnetPriorityArray	O ²	R	
Relinquish_Default	Double	O ²	R	
COV_Increment	Double	O ³	R	
Time_Delay	Unsigned	O ^{4,6}	-	
Notification_Class	Unsigned	O ^{4,6}	-	
High_Limit	Double	O ^{4,6}	-	
Low_Limit	Double	O ^{4,6}	-	
Deadband	Double	O ^{4,6}	-	
Limit_Enable	BACnetLimitEnable	O ^{4,6}	-	
Event_Enable	BACnetEventTransitionBits	O ^{4,6}	-	
Acked_Transitions	BACnetEventTransitionBits	O ^{4,6}	-	
Notify_Type	BACnetNotifyType	O ^{4,6}	-	
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O ^{4,6}	-	
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O ^{5,6}	-	
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O ⁶	-	
Event_Detection_Enable	BOOLEAN	O ^{4,6}	-	
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O ⁶	-	



Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Event_Algorithm_Inhibit	BOOLEAN	O ^{6,7}	-	
Time_Delay_Normal	Unsigned	O ⁶	-	
Reliability_Evaluation_Inhibit	BOOLEAN	O ⁸	W	
Min_Pres_Value	Double	O	R	
Max_Pres_Value	Double	O	R	
Resolution	Double	O	R	
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R	
Profile_Name	CharacterString	O	R	(up to 128 characters)

¹ If Present_Value is commandable, then it is required to be writable. This property is required to be writable when Out_Of_Service is TRUE.

² These properties are required if, and shall be present only if, Present_Value is commandable.

³ This property is required if, and shall be present only if, the object supports COV reporting.

⁴ These properties are required if the object supports intrinsic reporting.

⁵ This property, if present, is required to be read-only.

⁶ These properties shall be present only if the object supports intrinsic reporting.

⁷ Event_Algorithm_Inhibit shall be present if Event_Algorithm_Inhibit_Ref is present.

⁸ If this property is present, then the Reliability property shall be present

BitString Value

Dynamically Creatable:	No
Dynamically Deletable:	No
Proprietary Properties:	None
DINGO-Stack Version:	2018 R4

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Object_Identifier	BACnetObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	(up to 128 characters)
Object_Type	BACnetObjectType	R	R	
Description	CharacterString	O	R	(up to 128 characters)
Present_Value	BIT STRING	R ¹	W	
Bit_Text	BACnetARRAY[N] of CharacterString	O	R	
Status_Flags	BACnetStatusFlags	R	R	
Event_State	BACnetEventState	O ³	-	
Reliability	BACnetReliability	O	R	
Out_Of_Service	BOOLEAN	O	W	
Priority_Array	BACnetPriorityArray	O ²	R	
Relinquish_Default	BIT STRING	O ²	R	
Time_Delay	Unsigned	O ^{3,5}	-	
Notification_Class	Unsigned	O ^{3,5}	-	
Alarm_Values	BACnetARRAY[N] of BIT STRING	O ^{3,5}	-	
Bit_Mask	BIT STRING	O ^{3,5}	-	
Event_Enable	BACnetEventTransitionBits	O ^{3,5}	-	
Acked_Transitions	BACnetEventTransitionBits	O ^{3,5}	-	
Notify_Type	BACnetNotifyType	O ^{3,5}	-	
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O ^{3,5}	-	
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O ^{4,5}	-	
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O ⁵	-	
Event_Detection_Enable	BOOLEAN	O ^{3,5}	-	
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O ⁵	-	
Event_Algorithm_Inhibit	BOOLEAN	O ^{5,6}	-	
Time_Delay_Normal	Unsigned	O ⁵	-	



Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Reliability_Evaluation_Inhibit	BOOLEAN	O ⁷	W	
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R	
Profile_Name	CharacterString	O	R	(up to 128 characters)

¹ This property is required to be writable when Out_Of_Service is TRUE.

² These properties are required if, and shall be present only if, Present_Value is commandable.

³ These properties are required if the object supports intrinsic reporting.

⁴ This property, if present, is required to be read-only.

⁵ These properties shall be present only if the object supports intrinsic reporting.

⁶ Event_Algorithm_Inhibit shall be present if Event_Algorithm_Inhibit_Ref is present.

⁷ If this property is present, then the Reliability property shall be present.

OctetString Value

Dynamically Creatable:	No
Dynamically Deletable:	No
Proprietary Properties:	None
DINGO-Stack Version:	2018 R4

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Object_Identifier	BACnetObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	(up to 128 characters)
Object_Type	BACnetObjectType	R	R	
Description	CharacterString	O	R	(up to 128 characters)
Present_Value	OCTET STRING	R ¹	W	
Status_Flags	BACnetStatusFlags	R	R	
Event_State	BACnetEventState	O	-	
Reliability	BACnetReliability	O	R	
Out_Of_Service	BOOLEAN	O	W	
Priority_Array	BACnetPriorityArray	O ²	R	
Relinquish_Default	OCTET STRING	O ²	R	
Reliability_Evaluation_Inhibit	BOOLEAN	O ³	W	
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R	
Profile_Name	CharacterString	O	R	(up to 128 characters)

¹ This property is required to be writable when Out_Of_Service is TRUE.

² These properties are required if, and shall be present only if, Present_Value is commandable.

³ If this property is present, then the Reliability property shall be present.



Time Value

Dynamically Creatable:	No
Dynamically Deletable:	No
Proprietary Properties:	None
DINGO-Stack Version:	2018 R4

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Object_Identifier	BACnetObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	(up to 128 characters)
Object_Type	BACnetObjectType	R	R	
Description	CharacterString	O	R	(up to 128 characters)
Present_Value	Time	R ¹	W	
Status_Flags	BACnetStatusFlags	R	R	
Event_State	BACnetEventState	O	-	
Reliability	BACnetReliability	O	R	
Out_Of_Service	BOOLEAN	O	W	
Priority_Array	BACnetPriorityArray	O ²	R	
Relinquish_Default	Time	O ²	R	
Reliability_Evaluation_Inhibit	BOOLEAN	O ³	W	
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R	
Profile_Name	CharacterString	O	R	(up to 128 characters)

¹ If Present_Value is commandable, then it is required to be writable. This property is required to be writable when Out_Of_Service is TRUE.

² These properties are required if, and shall be present only if, Present_Value is commandable.

³ If this property is present, then the Reliability property shall be present.

Integer Value

Dynamically Creatable:	No
Dynamically Deletable:	No
Proprietary Properties:	None
DINGO-Stack Version:	2018 R4

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Object_Identifier	BACnetObjectIdentifier	R	R	(up to 128 characters)
Object_Name	CharacterString	R	R	
Object_Type	BACnetObjectType	R	R	
Description	CharacterString	O	R	(up to 128 characters)
Present_Value	INTEGER	R ¹	W	
Status_Flags	BACnetStatusFlags	R	R	
Event_State	BACnetEventState	O ⁴	-	
Reliability	BACnetReliability	O	R	
Out_Of_Service	BOOLEAN	O	W	
Units	BACnetEngineeringUnits	R	R	
Priority_Array	BACnetPriorityArray	O ²	R	
Relinquish_Default	INTEGER	O ²	R	
COV_Increment	Unsigned	O ³	R	
Time_Delay	Unsigned	O ^{4,6}	-	
Notification_Class	Unsigned	O ^{4,6}	-	
High_Limit	INTEGER	O ^{4,6}	-	
Low_Limit	INTEGER	O ^{4,6}	-	
Deadband	Unsigned	O ^{4,6}	-	
Limit_Enable	BACnetLimitEnable	O ^{4,6}	-	
Event_Enable	BACnetEventTransitionBits	O ^{4,6}	-	
Acked_Transitions	BACnetEventTransitionBits	O ^{4,6}	-	
Notify_Type	BACnetNotifyType	O ^{4,6}	-	
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O ^{4,6}	-	
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O ^{5,6}	-	
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O ⁶	-	
Event_Detection_Enable	BOOLEAN	O ^{4,6}	-	
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O ⁶	-	



Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Event_Algorithm_Inhibit	BOOLEAN	O ^{6,7}	-	
Time_Delay_Normal	Unsigned	O ⁶	-	
Reliability_Evaluation_Inhibit	BOOLEAN	O ⁸	W	
Min_Pres_Value	INTEGER	O	R	
Max_Pres_Value	INTEGER	O	R	
Resolution	INTEGER	O	R	
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R	
Profile_Name	CharacterString	O	R	(up to 128 characters)

¹ If Present_Value is commandable, then it is required to be writable. This property is required to be writable when Out_Of_Service is TRUE.

² These properties are required if, and shall be present only if, Present_Value is commandable.

³ This property is required if, and shall be present only if, the object supports COV reporting.

⁴ These properties are required if the object supports intrinsic reporting.

⁵ This property, if present, is required to be read-only.

⁶ These properties shall be present only if the object supports intrinsic reporting.

⁷ Event_Algorithm_Inhibit shall be present if Event_Algorithm_Inhibit_Ref is present.

⁸ If this property is present, then the Reliability property shall be present.

Positive Integer

Dynamically Creatable:	No
Dynamically Deletable:	No
Proprietary Properties:	None
DINGO-Stack Version:	2018 R4

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Object_Identifier	BACnetObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	(up to 128 characters)
Object_Type	BACnetObjectType	R	R	
Description	CharacterString	O	R	(up to 128 characters)
Present_Value	Unsigned	R ¹	W	
Status_Flags	BACnetStatusFlags	R	R	
Event_State	BACnetEventState	O ⁴	-	
Reliability	BACnetReliability	O	R	
Out_Of_Service	BOOLEAN	O	W	
Units	BACnetEngineeringUnits	R	R	
Priority_Array	BACnetPriorityArray	O ²	R	
Relinquish_Default	Unsigned	O ²	R	
COV_Increment	Unsigned	O ³	-	
Time_Delay	Unsigned	O ^{4,6}	-	
Notification_Class	Unsigned	O ^{4,6}	-	
High_Limit	Unsigned	O ^{4,6}	-	
Low_Limit	Unsigned	O ^{4,6}	-	
Deadband	Unsigned	O ^{4,6}	-	
Limit_Enable	BACnetLimitEnable	O ^{4,6}	-	
Event_Enable	BACnetEventTransitionBits	O ^{4,6}	-	
Acked_Transitions	BACnetEventTransitionBits	O ^{4,6}	-	
Notify_Type	BACnetNotifyType	O ^{4,6}	-	
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O ^{4,6}	-	
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O ^{5,6}	-	
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O ⁶	-	
Event_Detection_Enable	BOOLEAN	O ^{4,6}	-	
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O ⁶	-	



Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Event_Algorithm_Inhibit	BOOLEAN	O ^{6,7}	-	
Time_Delay_Normal	Unsigned	O ⁶	-	
Reliability_Evaluation_Inhibit	BOOLEAN	O ⁸	W	
Min_Pres_Value	Unsigned	O	R	
Max_Pres_Value	Unsigned	O	R	
Resolution	Unsigned	O	R	
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R	
Profile_Name	CharacterString	O	R	(up to 128 characters)

¹ If Present_Value is commandable, then it is required to be writable. This property is required to be writable when Out_Of_Service is TRUE.

² These properties are required if, and shall be present only if, Present_Value is commandable.

³ This property is required if, and shall be present only if, the object supports COV reporting.

⁴ These properties are required if the object supports intrinsic reporting.

⁵ This property, if present, is required to be read-only.

⁶ These properties shall be present only if the object supports intrinsic reporting.

⁷ Event_Algorithm_Inhibit shall be present if Event_Algorithm_Inhibit_Ref is present.

⁸ If this property is present, then the Reliability property shall be present.

Date Value

Dynamically Creatable: No
 Dynamically Deletable: No
 Proprietary Properties: None
 DINGO-Stack Version: 2018 R4

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Object_Identifier	BACnetObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	(up to 128 characters)
Object_Type	BACnetObjectType	R	R	
Description	CharacterString	O	R	(up to 128 characters)
Present_Value	Date	R ¹	W	
Status_Flags	BACnetStatusFlags	R	R	
Event_State	BACnetEventState	O	-	
Reliability	BACnetReliability	O	R	
Out_Of_Service	BOOLEAN	O	W	
Priority_Array	BACnetPriorityArray	O ²	R	
Relinquish_Default	Date	O ²	R	
Reliability_Evaluation_Inhibit	BOOLEAN	O ³	W	
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R	
Profile_Name	CharacterString	O	R	(up to 128 characters)

¹ If Present_Value is commandable, then it is required to be writable. This property is required to be writable when Out_Of_Service is TRUE.

² These properties are required if, and shall be present only if, Present_Value is commandable.

³ If this property is present, then the Reliability property shall be present.



DateTime Pattern

Dynamically Creatable:	No
Dynamically Deletable:	No
Proprietary Properties:	None
DINGO-Stack Version:	2018 R4

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Object_Identifier	BACnetObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	(up to 128 characters)
Object_Type	BACnetObjectType	R	R	
Description	CharacterString	O	R	(up to 128 characters)
Present_Value	BACnetDateTime	R ¹	W	
Status_Flags	BACnetStatusFlags	R	R	
Event_State	BACnetEventState	O	-	
Reliability	BACnetReliability	O	R	
Out_Of_Service	BOOLEAN	O	W	
Is_UTC	BOOLEAN	O	R	
Priority_Array	BACnetPriorityArray	O ²	R	
Relinquish_Default	BACnetDateTime	O ²	R	
Reliability_Evaluation_Inhibit	BOOLEAN	O ³	W	
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R	
Profile_Name	CharacterString	O	R	(up to 128 characters)

¹ If Present_Value is commandable, then it is required to be writable. This property is required to be writable when Out_Of_Service is TRUE.

² These properties are required if, and shall be present only if, Present_Value is commandable.

³ If this property is present, then the Reliability property shall be present.

Time Pattern

Dynamically Creatable:	No
Dynamically Deletable:	No
Proprietary Properties:	None
DINGO-Stack Version:	2018 R4

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Object_Identifier	BACnetObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	(up to 128 characters)
Object_Type	BACnetObjectType	R	R	
Description	CharacterString	O	R	(up to 128 characters)
Present_Value	Time	R ¹	W	
Status_Flags	BACnetStatusFlags	R	R	
Event_State	BACnetEventState	O	-	
Reliability	BACnetReliability	O	R	
Out_Of_Service	BOOLEAN	O	W	
Priority_Array	BACnetPriorityArray	O ²	R	
Relinquish_Default	Time	O ²	R	
Reliability_Evaluation_Inhibit	BOOLEAN	O ³	W	
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R	
Profile_Name	CharacterString	O	R	(up to 128 characters)

¹ If Present_Value is commandable, then it is required to be writable. This property is required to be writable when Out_Of_Service is TRUE.

² These properties are required if, and shall be present only if, Present_Value is commandable.

³ If this property is present, then the Reliability property shall be present



Date Pattern Value

Dynamically Creatable:	No
Dynamically Deletable:	No
Proprietary Properties:	None
DINGO-Stack Version:	2018 R4

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Object_Identifier	BACnetObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	(up to 128 characters)
Object_Type	BACnetObjectType	R	R	
Description	CharacterString	O	R	(up to 128 characters)
Present_Value	Date	R ¹	W	
Status_Flags	BACnetStatusFlags	R	R	
Event_State	BACnetEventState	O	-	
Reliability	BACnetReliability	O	R	
Out_Of_Service	BOOLEAN	O	W	
Priority_Array	BACnetPriorityArray	O ²	R	
Relinquish_Default	Date	O ²	R	
Reliability_Evaluation_Inhibit	BOOLEAN	O ³	W	
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R	
Profile_Name	CharacterString	O	R	(up to 128 characters)

¹ If Present_Value is commandable, then it is required to be writable. This property is required to be writable when Out_Of_Service is TRUE.

² These properties are required if, and shall be present only if, Present_Value is commandable.

³ If this property is present, then the Reliability property shall be present.

Global Group

Dynamically Creatable: No
 Dynamically Deletable: No
 Proprietary Properties: None
 DINGO-Stack Version: 2018 R4

Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Object_Identifier	BACnetObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	(up to 128 characters)
Object_Type	BACnetObjectType	R	R	
Description	CharacterString	O	R	(up to 128 characters)
Group_Members	BACnetARRAY[N] of BACnetDeviceObjectPropertyReference	R	R	
Group_Member_Names	BACnetARRAY[N] of CharacterString	O	R	(up to 128 characters)
Present_Value	BACnetARRAY[N] of BACnetPropertyAccessResult	R	R	
Status_Flags	BACnetStatusFlags	R	R	
Event_State	BACnetEventState	R	R	
Member_Status_Flags	BACnetStatusFlags	R	R	
Reliability	BACnetReliability	O	R	
Out_of_Service	BOOLEAN	R	W	
Update_Interval	Unsigned	O	R	
Requested_Update_Interval	Unsigned	O	R	
COV_Resubscription_Interval	Unsigned	O	R	
Client_COV_Increment	BACnetClientCOV	O	R	
Time_Delay	Unsigned	O ^{1,4}	-	
Notification_Class	Unsigned	O ^{1,4}	-	
Event_Enable	BACnetEventTransitionBits	O ^{1,4}	-	
Acked_Transitions	BACnetEventTransitionBits	O ^{1,4}	-	
Notify_Type	BACnetNotifyType	O ^{1,4}	-	
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O ^{1,4}	-	
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O ^{3,4}	-	
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O ⁴	-	
Event_Detection_Enable	BOOLEAN	O ^{1,4}	-	
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O ⁴	-	
Event_Algorithm_Inhibit	BOOLEAN	O ^{4,5}	-	



Property Identifier	Property Datatype	Conformance Code	Go-IoT	Property Range Restrictions
Time_Delay_Normal	Unsigned	O ⁴	-	
COVU_Period	Unsigned	O ²	R	
COVU_Recipients	BACnetLIST of BACnetRecipient	O ²	W	
Reliability_Evaluation_Inhibit	BOOLEAN	O ⁶	W	
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R	
Profile_Name	CharacterString	O	R	(up to 128 characters)

¹ These properties are required if the object supports intrinsic reporting.

² These properties are required if the object sends periodic unsubscribed COV notifications for Present_Value. These properties are required to be writable if present.

³ This property, if present, is required to be read-only.

⁴ These properties shall be present only if the object supports intrinsic reporting.

⁵ Event_Algorithm_Inhibit shall be present if Event_Algorithm_Inhibit_Ref is present.

⁶ If this property is present, then the Reliability property shall be present.

Data Link Layer Options

- BACnet IP, (Annex J)
- BACnet IP, (Annex J), Foreign Device
- ISO 8802-3, Ethernet (Clause 7)
- ATA 878.1, 2.5 Mb. ARCNET (Clause 8)
- ATA 878.1, EIA-485 ARCNET (Clause 8), baud rate(s) _____
- MS/TP master (Clause 9), baud rate(s): _____
- MS/TP slave (Clause 9), baud rate(s): _____
- Point-To-Point, EIA 232 (Clause 10), baud rate(s): _____
- Point-To-Point, modem, (Clause 10), baud rate(s): _____
- LonTalk, (Clause 11), medium: _____
- BACnet/ZigBee (ANNEX O)
- 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

- Router, Clause 6 - List all routing configurations, e.g., ARCNET-Ethernet, Ethernet-MS/TP, etc.
- Annex H, BACnet Tunneling Router over IP (see below)
- BACnet/IP Broadcast Management Device (BBMD)¹

Does the BBMD support registrations by Foreign Devices? Yes No

Does the BBMD support network address translation? Yes No

¹ Version 2018 R4 and higher.

Annex H, BACnet Tunneling Router over IP

Below is a brief overview of what parts of Annex H are supported.

H.1 Mapping Non-BACnet Networks onto BACnet Routers.

- » Modbus over TCP/IP
- » Modbus over RS485
- » M-Bus
- » 1-Wire
- » PINGO (over power line)
- » enOcean (wireless)

H.2 Multiple "Virtual" BACnet Devices in a Single Physical Device

Those are configured in DINGO Manager

H.6 Using BACnet with the BACnet/WS Web Services Interface (Annex N)

For further information refer to chapter "BACnet/WS PICS" on page 63 below.

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.

- | | | |
|---|---|-------------------------------------|
| <input checked="" type="checkbox"/> ISO 10646 (UTF-8) | <input type="checkbox"/> IBM™/Microsoft™ DBCS | <input type="checkbox"/> ISO 8859-1 |
| <input type="checkbox"/> ISO 10646 (UCS-2) | <input type="checkbox"/> ISO 10646 (UCS-4) | <input type="checkbox"/> JIS X 0208 |

BACnet Gateways

The DINGO-Stack can operate as communication gateway to the below none BACnet protocols.

- » Modbus over TCP/IP
- » Modbus over RS485
- » M-Bus
- » 1-Wire
- » PINGO (over power line)
- » enOcean (wireless)

For details refer to Go-IoT web site, pages:

[Go-IoT Buses](#)

and

[Go-IoT PINGO](#)

CHAPTER 2

BACnet/WS PICS

DINGO-Stack BACnet/WS Protocol Implementation Conformance Statement (PICS)

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General

Date:	26th Sept. 2017
Vendor Name:	Go-IoT ehf (Vendor ID: 710)
Product Name:	DINGO-Stack-BACnet/WS
Public IP Address / Domain:	-
UI Homepage, if any:	-
Contact Email:	info@go-iot.io
BACnet Protocol Revision:	1, Rev. 14

Product Description

The BACnet/WS module is a free standing software module. It is only needed to be installed on one device (or computer) in the network of devices to be accessed from the LAN or WAN (the Internet). This module does not only enable BACnet/WS access to our DINGO and WINGO products, but also any other BACnet device on the network, from whatever vendor it is.

Key features are:

- » CRUD operations via simple POST-, GET-, PUT- and DELETE-requests.
- » Supports Change Of Value (COV) subscriptions by web socket push notifications.
- » Supports XML and JSON for structured data.
- » Supports plain text for primitive data.
- » Runs under HTTP and HTTPS.
- » Contains authorization - OAuth 2.0 (available soon).

BACnet/WS is very easy to use. You are welcome to test it on our live demo BACnet network here...

Details

Implements: Client Server External Auth. Server

Security: TLS Cert Config Refresh Tokens
 Int. Auth Server User Ext. Auth Server Multiple Audience
 Multiple Scopes Extended Scopes

Modification: PUT POST DELETE

Locales: Default Locale: EN-US
 Multiple Locales: _____

Resources: /.well-known If not, Prefixes: _____
 /.info /.data /.auth
 /.defs /.subs /.trees
 /.bacnet /.multi

Logs: Histories Events

Subscriptions: Logs COV

Functions: tagged() historyPeriodic() exists()
 remote() contains()
 startsWith() endsWith()

Queries: alt filter select metadata
 skip max-results depth descendant-depth
 published-gt published-ge published-lt published-le
 sequence-gt sequence-ge sequence-lt sequence-le
 locale reverse errorPrefix errorText
 priority

Formats: xml json plain media



Implementation Details

No specific limitations, and/or Functionalities required in peer.