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niagara⁴

TRIDIUM NIAGARA 4
BACNET PICS

BACnet Protocol Implementation Conformance Statement

Date: 10 April 2019
Vendor Name: Tridium, Inc.
Product Name: JACE-8000
Product Model Number: 12977
Application Software Version: Tridium 4.7.110.26
Firmware Revision: 4.7.110.26
BACnet Protocol Revision: 14

Product Description:
Niagara 4 provides the ability to view, monitor, and control BACnet devices over IP, raw Ethernet, or MS/TP media. Devices, points, schedules, alarms, and logs can be learned and managed from Niagara 4.

Niagara points, schedules, histories, and alarming can be exposed to BACnet for monitor and control by foreign BACnet clients. In addition, BACnet objects like trendlog, schedule, calendar and event enrollment can be dynamically created, deleted and modified in Niagara by foreign BACnet clients.

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)**
☐ **BACnet Advanced Application Controller (B-AAC)**
☐ **BACnet Application Specific Controller (B-ASC)**
☐ **BACnet Smart Sensor (B-SS)**
☐ **BACnet Smart Actuator (B-SA)**

Additional BACnet Interoperability Building Blocks Supported (Annex K):

Data Sharing	Device & Network Management
DS-RP-A, B	DM-DDB-A, B
DS-RPM-A, B	DM-DOB-B
DS-WP-A, B	DM-ADM-A
DS-WPM-A, B	DM-ANM-A
DS-COV-A, B	DM-TS-A, B
DS-COVP-B	DM-UTC-A, B
DS-V-A	DM-ATS-A
DS-M-A	DM-MTS-A
	DM-DCC-B
	DM-RD-B
	DM-BR-B
	DM-R-B
	DM-OCD-B
	DM-LM-A, B
Alarm & Event Management	**Trending**
AE-N-A	T-V-A
AE-N-I-B	T-VMT-I-BT-VMT-E-B
AE-N-E-B	T-ATR-A, B
AE-ACK-A, B	
AE-ASUM-B	
AE-ESUM-B	
AE-INFO-B	
AE-VN-A	
AE-VM-A	
Scheduling	**Network Management**
SCHED-VM-A	NM-RC-B
SCHED-I-B	
SCHED-E-B	

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Segmentation Capability:

Feature	Supported	Window size
Transmit Segmented Messages	yes	10
Receive Segmented Messages	yes	any

Standard Object Types Supported:
- Calendar, Event-Enrollment, Notification-Class, Schedule, and Trend-Log Object types can be dynamically created and deleted
- No general range restrictions exist; however, certain specific applications may have specific range restrictions.
- All potentially available properties are listed for each object type.
- Optional properties are listed in *italics*. Not all instances support all optional properties.
- Writable properties are listed in **bold**. Any range limitations are expressed in parentheses following the property name.

Object Type	Properties	
Analog Input	Object_Identifier Object_Name Object_Type Present_Value ***Description*** *Device_Type* Status_Flags Event_State *Reliability* **Out_Of_Service** Update_Interval Units *Min_Pres_Value* *Max_Pres_Value*	*Resolution* ***COV_Increment*** Time_Delay (O) Notification_Class *(O)* High_Limit (O) Low_Limit (O) Deadband (O) Limit_Enable (O) Event_Enable (O) **Acked_Transitions (O)** Notify_Type (O) **Event_Time_Stamps (O)** **Event-message-texts(O)** Event-Detection-Enable (O) Property List

Object Type	Properties	
Analog Output	Object_Identifier	*COV_Increment*
	Object_Name	*Time_Delay (O)*
	Object_Type	*Notification_Class (O)*
	Present_Value	*High_Limit (O)*
	Description	*Low_Limit (O)*
	Device_Type	*Deadband (O)*
	Status_Flags	*Limit_Enable (O)*
	Event_State	*Event_Enable (O)*
	Reliability	*Acked_Transitions (O)*
	Out_Of_Service	*Notify_Type (O)*
	Units	*Event_Time_Stamps (O)*
	Min_Pres_Value	*Event-message-texts(O)*
	Max_Pres_Value	*Event-Detection-Enable (O)*
	Resolution	Property List
	Priority_Array	
	Relinquish_Default	
Analog Value	Object_Identifier	*COV_Increment* **(O)**
	Object_Name	*Time_Delay* **(O)**
	Object_Type	*Notification_Class (O)*
	Present_Value	*High_Limit (O)*
	Description	*Low_Limit* **(O)**
	Status_Flags	*Deadband (O)*
	Event_State	*Limit_Enable (O)*
	Reliability	*Event_Enable (O)*
	Out_Of_Service	*Acked_Transitions (O)*
	Units	*Notify_Type (O)*
	Priority_Array	*Event_Time_Stamps (O)*
	Relinquish_Default	*Event-message-texts(O)*
	Min_Pres_Value	*Event-Detection-Enable (O)*
	Max_Pres_Value	Property List
	Resolution	

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Object Type	Properties	
Binary Input	Object_Identifier Object_Name Object_Type Present_Value *Description* *Device_Type* Status_Flags Event_State *Reliability* **Out_Of_Service** Polarity ***Inactive_Text*** Active_Text	*Change_Of_State_Time (O)* ***Change_Of_State_Count*** (0) *Time_Of_State_Count_Reset (O)* ***Elapsed_Active_Time*** (0) *Time_Of_Active_Time_Reset (O)* ***Time_Delay (O)*** ***Notification_Class (O)*** ***Alarm_Value (O)*** ***Event_Enable (O)*** *Acked_Transitions (O)* ***Notify_Type (O)*** *Event_Time_Stamps (O)* *Event-message-texts(O)* ***Event-Detection-Enable (O)*** Property List
Binary Output	Object_Identifier Object_Name Object_Type **Present_Value** *Description* *Device_Type* Status_Flags Event_State *Reliability* **Out_Of_Service** Polarity ***Inactive_Text*** ***Active_Text*** *Change_Of_State_Time (O)* ***Change_Of_State_Count*** (0)	*Time_Of_State_Count_Reset (O)* ***Elapsed_Active_Time*** (0) *Time_Of_Active_Time_Reset (O)* ***Minimum_Off_Time*** ***Minimum_On_Time*** Priority_Array **Relinquish_Default** ***Time_Delay (O)*** ***Notification_Class (O)*** *Feedback_Value (O)* ***Event_Enable (O)*** *Acked_Transitions (O)* ***Notify_Type (O)*** *Event_Time_Stamps (O)* *Event-message-texts(O)* ***Event-Detection-Enable (O)*** Property List

Object Type	Properties	
Binary Value	Object_Identifier Object_Name Object_Type **Present_Value** *Description* Status_Flags Event_State *Reliability* **Out_Of_Service** *Inactive_Text* *Active_Text* *Change_Of_State_Time (O)* ***Change_Of_State_Count** (0)* Time_Of_State_Count_Reset (O)	*Elapsed_Active_Time* (0) *Time_Of_Active_Time_Reset (O)* **Minimum_Off_Time** **Minimum_On_Time** *Priority_Array* **Relinquish_Default** **Time_Delay (O)** **Notification_Class (O)** **Alarm_Value (O)** **Event_Enable (O)** *Acked_Transitions (O)* **Notify_Type (O)** *Event_Time_Stamps (O)* *Event-message-texts(O)* **Event-Detection-Enable (O)** Property List
Calendar	Object_Identifier **Object_Name** Object_Type	*Description* Present_Value **Date_List** Property List

Object Type	Properties	
Device	Object_Identifier Object_Name Object_Type System_Status Vendor_Name Vendor_Identifier Model_Name Firmware_Revision Application_Software_Revision *Location* *Description* Protocol_Version Protocol_Revision Protocol_Services_Supported Protocol_Object_Types_Supported Object_List Max_APDU_Length_Accepted	Segmentation_Supported *Max_Segments_Accepted* *Local_Time* *Local_Date* *UTC_Offset* *Daylight_Savings_Status* *APDU_Segment_Timeout* APDU_Timeout Number_Of_APDU_Retries **Time Synchronization Recipients** *Max_Master* *Max_Info_Frames* Device_Address_Binding Database_Revision *Configuration_Files* *Last_Restore_Time* ***Backup_Failure_Timeout*** Backup Preparation Time Restore Preparation Time Restore Completion Time Backup and Restore State *Active_COV_Subsriptions* Last Restart Reason Time of Device Restart **Restart Notification Recipients** **UTC Time Synchronization Recipients** **Time Synchronization Interval** **Align Interval** **Interval Offset** Serial Number Property List
File (Stream Access Only)	Object_Identifier **Object_Name** Object_Type *Description* File_Type	**File_Size** Modification_Date **Archive** Read_Only File_Access_Method Property List

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Object Type	Properties	
Event Enrollment	Object_Identifier	**Object-Property-reference**
	Object_Name	Event-State
	Object_Type	**Event-Enable**
	Description	*Acked_Transitions (O)*
	Event-Type	Notification-Class
	Notify-Type	*Event_Time_Stamps (O)*
	Event-Parameters	*Event-message-texts(O)*
	Status_Flags	***Event-Detection-Enable (O)***
	Reliability	*Property List*
Loop		*Proportional_Constant_Units*
	Object_Identifier	***Integral_Constant***
	Object_Name	*Integral_Constant_Units*
	Object_Type	***Derivative_Constant***
	Present_Value	*Derivative_Constant_Units*
	Description	***Bias***
	Status_Flags	***Maximum_Output***
	Event_State	***Minimum_Output***
	Reliability	Priority_For_Writing
	Out_Of_Service	***COV_Increment***
	Update_interval	***Time_Delay***
	Output_Units	***Notification_Class***
	Manipulated_Variable_Reference	***Error_Limit***
	Controlled_Variable_Reference	**Deadband**
	Controlled_Variable_Value	***Event_Enable***
	Controlled_Variable_Units	*Acked_Transitions*
	Setpoint_Reference	*Notify_Type*
	Setpoint	*Event_Time_Stamps*
	Action	*Event Message Texts*
	Proportional_Constant	***Event Detection Enable***
		Property List
Multi-state Input		Number_Of_States
	Object_Identifier	State_Text
	Object_Name	Time_Delay (O)
	Object_Type	Notification_Class (O)
	Present_Value	Alarm_Values (O)
	Description	Fault_Values (O)
	Device_Type	**Event_Enable (O)**
	Status_Flags	**Acked_Transitions (O)**
	Event_State	Notify_Type (O)
	Reliability	**Event_Time_Stamps (O)**
	Out_Of_Service	**Event Message Texts**
		Event Detection Enable
		Property List

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Multi-state Output	Object_Identifier Object_Name Object_Type **Present_Value** *Description* *Device_Type* Status_Flags Event_State *Reliability* **Out_Of_Service** Number_Of_States	*State_Text* Priority_Array **Relinquish_Default** *Time_Delay (O)* *Notification_Class (O)* *Feedback_Value (O)* ***Event_Enable (O)*** *Acked_Transitions (O)* ***Notify_Type (O)*** *Event_Time_Stamps (O)* *Event Message Texts* ***Event Detection Enable*** *Property List*
Multi-state Value	Object_Identifier Object_Name Object_Type **Present_Value** *Description* Status_Flags Event_State *Reliability* **Out_Of_Service** Number_Of_States	*State_Text* *Priority_Array* ***Relinquish_Default*** ***Time_Delay (O)*** ***Notification_Class (O)*** ***Alarm_Values (O)*** ***Fault_Values (O)*** ***Event_Enable (O)*** *Acked_Transitions (O)* ***Notify_Type (O)*** *Event_Time_Stamps (O)* *Event Message Texts* ***Event Detection Enable*** *Propery List*
Notification Class	Object_Identifier **Object_Name** Object_Type *Description*	Notification_Class **Priority** **Ack_Required** **Recipient_List** Property List
Schedule	Object_Identifier **Object_Name** Object_Type *Description* Present Value **Effective_Period** *Weekly_Schedule* *Exception_Schedule*	**Schedule_Default** **List_Of_Object_Property_References** **Priority_For_Writing** Status_Flags Reliability **Out_Of_Service** Property List

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Object Type	Properties	
Trend Log	Object_Identifier **Object_Name** Object_Type *Description* **Enable** *Start_Time* *Stop_Time* *Log_DeviceObjectProperty* *Log_Interval* *COV_Resubscription_Interval* *Client_COV_Increment* **Stop_When_Full** Buffer_Size	Log_Buffer **Record_Count** Total_Record_Count Logging Type Trigger Status Flags *Notification_Threshold* *Records_Since_Notification* *Last_Notify_Record* Event_State *Notification_Class* *Event_Enable* *Acked_Transitions* *Notify_Type* *Event_Time_Stamps* *Event Message Texts* *Event Detection Enable* *Property List*
Large Analog Value	Object_Identifier Object_Name Object_Type **Present_Value** *Description* Status_Flags Event_State *Reliability* **Out_Of_Service** Units *Priority_Array* **Relinquish_Default** *Min_Pres_Value* *Max_Pres_Value* *Resolution*	*COV_Increment* **(O)** *Time_Delay* **(O)** *Notification_Class (O)* *High_Limit* **(O)** *Low_Limit* **(O)** *Deadband (O)* *Limit_Enable (O)* *Event_Enable (O)* *Acked_Transitions (O)* *Notify_Type (O)* *Event_Time_Stamps (O)* *Event-message-texts(O)* *Event-Detection-Enable (O)* Property List

Object Type	Properties	
Integer Value	Object_Identifier Object_Name Object_Type **Present_Value** *Description* Status_Flags Event_State *Reliability* **Out_Of_Service** Units *Priority_Array* **Relinquish_Default** *Min_Pres_Value* *Max_Pres_Value* *Resolution*	*COV_Increment* (O) ***Time_Delay* (O)** ***Notification_Class* (O)** ***High_Limit*** (O) ***Low_Limit* (O)** ***Deadband*** (O) ***Limit_Enable*** (O) ***Event_Enable* (O)** *Acked_Transitions (O)* ***Notify_Type* (O)** *Event_Time_Stamps (O)* *Event-message-texts(O)* ***Event-Detection-Enable* (O)** Property List
Positive Integer Value	Object_Identifier Object_Name Object_Type **Present_Value** *Description* Status_Flags Event_State *Reliability* **Out_Of_Service** Units *Priority_Array* **Relinquish_Default** *Min_Pres_Value* *Max_Pres_Value* *Resolution*	***COV_Increment* (O)** ***Time_Delay* (O)** ***Notification_Class* (O)** ***High_Limit*** (O) ***Low_Limit* (O)** ***Deadband*** (O) ***Limit_Enable*** (O) ***Event_Enable* (O)** *Acked_Transitions (O)* ***Notify_Type* (O)** *Event_Time_Stamps (O)* *Event-message-texts(O)* ***Event-Detection-Enable* (O)** Property List
Characterstring Value	Object_Identifier Object_Name Object_Type **Present_Value** *Description* Status_Flags Event_State *Reliability* **Out_Of_Service** Units *Priority_Array* **Relinquish_Default** Property List	

Object Type	Properties
Structured-View	Object_Identifier **Object_Name** Object_Type *Description* Node-type Node-Subtype Subordinate-List Subordinate-annotations Property-List

Data Link Layer Options:

☒ BACnet IP, (Annex J)
☒ BACnet IP, (Annex J), Foreign Device
☒ ISO 8802-3, Ethernet (Clause 7)
☐ ANSI/ATA 878.1, 2.5 Mb. ARCNET (Clause 8)
☐ ANSI/ATA 878.1, RS-485 ARCNET (Clause 8), baud rate(s) _____
☒ MS/TP master (Clause 9), baud rate(s): <u>9600, 19200, 38400, 76800, 115200</u>
☐ 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: _____
☐ 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 – Routing configurations: Ethernet-IP, Ethernet-MS/TP, IP-MS/TP
☐ Annex H, BACnet Tunneling Router over IP
☒ BACnet/IP Broadcast Management Device (BBMD)
     Does the BBMD support registrations by Foreign Devices? ☒ Yes ☐ No

Character Sets Supported:

Indicating support for multiple character sets does not imply that they can all be
supported simultaneously.

☒ ISO 10646 (UTF-8)	☐ IBM™/Microsoft™ DBCS	☐ ISO 8859-1
☒ ISO 10646 (UCS-2)	☐ ISO 10646 (UCS-4)	☐ JIS X 0208