

# TRIDIUM NIAGARA<sup>AX</sup> 3.2 BACNET PICS

## BACnet Protocol Implementation Conformance Statement

**Date:** April 8, 2008

**Vendor Name:** Tridium, Inc.

**Product Name:** Niagara AX BACnet Integration

**Product Model Number:** JACE-2xx (J-2xx), JACE-4xx (J-4xx), JACE-5xx (J-5xx), JACE-6xx (J-6xx), JACE-NXS (J-NXS-X-xx) (JACE-NXS is IP or Ethernet only), JACE-NX (J-NX-AX) (JACE-NX is IP or Ethernet only), SoftJACE (SJ-XX-x) (SoftJACE is IP or Ethernet only), SEC-J2xx, SEC-J6xx, JACE-700 (J-700), JACE-870 (J-870), JACE-2700 (J-2700)

**Application Software Version:** 3.2.20.1 or higher

**Firmware Revision:** 3.2.20 or higher

**BACnet Protocol Revision:** 4

### Product Description:

Niagara AX provides the ability to view, monitor, and control BACnet devices over IP, raw Ethernet, or MS/TP media. Devices, points, schedules, and logs can be learned and managed from Niagara AX. In addition, Niagara points, schedules, histories, and alarming can be exposed to BACnet for monitor and control by foreign BACnet clients.

### BACnet Standardized Device Profile (Annex L):

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

### Additional BACnet Interoperability Building Blocks Supported (Annex K):

<b>Data Sharing</b> DS-RP-A, B DS-RPM-A, B DS-WP-A, B DS-WPM-B DS-COV-A, B DS-COVU-A, B	<b>Device &amp; Network Management</b> DM-DDB-A, B DM-DOB-A, B DM-DCC-B DM-RD-B DM-TS-B DM-UTC-B DM-LM-A, B DM-BR-B
<b>Alarm &amp; Event Management</b> AE-N-A, I-B AE-ACK-A, B AE-ASUM-B AE-ESUM-B AE-INFO-B	<b>Trending</b> T-VMT-A, I-B, E-B T-ATR-A, B
<b>Scheduling</b> SCHED-A, I-B, E-B	<b>Network Management</b> NM-CE-A

### Segmentation Capability:

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

### Standard Object Types Supported:

- The CreateObject and DeleteObject services are not supported, so no objects are dynamically creatable or deletable through BACnet service requests, although these objects are dynamically creatable and deletable through Niagara.
- 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.

### Notes from Table

1. The File\_Size property of File objects is only writable if the underlying system file is changeable.
2. The Setpoint property of Loop objects is writable only if the setpoint is not linked from within Niagara.
3. The Recipient\_List property of the Notification Class object will maintain entries that are internally configured within Niagara.
4. The List\_Of\_Object\_Property\_References property of the Schedule object will maintain entries that are internally configured within Niagara.
5. The Priority\_For\_Writing property of Schedule objects is not important for internal Niagara operation, as the priority at which a point is commanded is determined by the input to which the Schedule output is linked.
6. These Trend Log object properties are not writable if the backing history for the exported Trend Log is a Niagara-generated history. If the history is created as a BACnet Trend Log, then they are writable.
7. Trend Logs in Niagara are either COV or Interval. So the Log\_Interval property cannot be written to a value other than 0 for COV logs, or to 0 for interval logs.

Object Type	Properties
Analog Input	Object_Identifier <b>Object_Name</b> Object_Type Present_Value <b>Description</b> <i>Device_Type</i> Status_Flags Event_State <i>Reliability</i> <b>Out_Of_Service</b> Units <i>Min_Pres_Value</i> <i>Max_Pres_Value</i> <i>Resolution</i> <b>COV_Increment</b> <b>Time_Delay</b> <b>Notification_Class</b> <b>High_Limit</b> <b>Low_Limit</b> <b>Deadband</b> <b>Limit_Enable</b> <i>Event_Enable</i> <i>Acked_Transitions</i> <b>Notify_Type</b> <i>Event_Time_Stamps</i>

Object Type	Properties
Analog Output	<p>Object_Identifier  <b>Object_Name</b>  Object_Type  Present_Value  <b>Description</b>  Device_Type  Status_Flags  Event_State  Reliability  <b>Out_Of_Service</b>  Units  Min_Pres_Value  Max_Pres_Value  Resolution</p> <p>Priority_Array  <b>Relinquish_Default</b>  <b>COV_Increment</b>  <b>Time_Delay</b>  <b>Notification_Class</b>  <b>High_Limit</b>  <b>Low_Limit</b>  <b>Deadband</b>  <b>Limit_Enable</b>  Event_Enable  Acked_Transitions  <b>Notify_Type</b>  Event_Time_Stamps</p>
Analog Value	<p>Object_Identifier  <b>Object_Name</b>  Object_Type  Present_Value  <b>Description</b>  Status_Flags  Event_State  Reliability  <b>Out_Of_Service</b>  Units  Priority_Array  <b>Relinquish_Default</b>  Min_Pres_Value</p> <p>Max_Pres_Value  <b>COV_Increment</b>  <b>Time_Delay</b>  <b>Notification_Class</b>  <b>High_Limit</b>  <b>Low_Limit</b>  <b>Deadband</b>  <b>Limit_Enable</b>  Event_Enable  Acked_Transitions  <b>Notify_Type</b>  Event_Time_Stamps</p>
Binary Input	<p>Object_Identifier  <b>Object_Name</b>  Object_Type  Present_Value  <b>Description</b>  Device_Type  Status_Flags  Event_State  Reliability  <b>Out_Of_Service</b>  Polarity  <b>Inactive_Text</b>  <b>Active_Text</b></p> <p>Change_Of_State_Time  <b>Change_Of_State_Count</b> (0)  Time_Of_State_Count_Reset  <b>Elapsed_Active_Time</b> (0)  Time_Of_Active_Time_Reset  <b>Time_Delay</b>  <b>Notification_Class</b>  <b>Alarm_Value</b>  Event_Enable  Acked_Transitions  <b>Notify_Type</b>  Event_Time_Stamps</p>

Object Type	Properties	
Binary Output	Object_Identifier <b>Object_Name</b> Object_Type Present_Value <b>Description</b> <i>Device_Type</i> Status_Flags Event_State <i>Reliability</i> <b>Out_Of_Service</b> Polarity <b>Inactive_Text</b> <b>Active_Text</b> <i>Change_Of_State_Time</i> <b>Change_Of_State_Count (0)</b>	<i>Time_Of_State_Count_Reset</i> <b>Elapsed_Active_Time (0)</b> <i>Time_Of_Active_Time_Reset</i> <b>Minimum_Off_Time</b> <b>Minimum_On_Time</b> Priority_Array <b>Relinquish_Default</b> <b>Time_Delay</b> <b>Notification_Class</b> <i>Feedback_Value</i> <i>Event_Enable</i> <i>Acked_Transitions</i> <b>Notify_Type</b> <i>Event_Time_Stamps</i>
Binary Value	Object_Identifier <b>Object_Name</b> Object_Type Present_Value <b>Description</b> Status_Flags Event_State <i>Reliability</i> <b>Out_Of_Service</b> <b>Inactive_Text</b> <b>Active_Text</b> <i>Change_Of_State_Time</i> <b>Change_Of_State_Count (0)</b> <i>Time_Of_State_Count_Reset</i>	<b>Elapsed_Active_Time (0)</b> <i>Time_Of_Active_Time_Reset</i> <b>Minimum_Off_Time</b> <b>Minimum_On_Time</b> Priority_Array <b>Relinquish_Default</b> <b>Time_Delay</b> <b>Notification_Class</b> <b>Alarm_Value</b> <i>Event_Enable</i> <i>Acked_Transitions</i> <b>Notify_Type</b> <i>Event_Time_Stamps</i>
Calendar	Object_Identifier <b>Object_Name</b> Object_Type	<b>Description</b> Present_Value <b>Date_List</b>
Device	Object_Identifier Object_Name Object_Type System_Status Vendor_Name Vendor_Identifier Model_Name Firmware_Revision Application_Software_Revision <b>Location</b> <b>Description</b> Protocol_Version Protocol_Revision Protocol_Services_Supported <i>Protocol_Object_Types_Supported</i> Object_List Max_APDU_Length_Accepted	Segmentation_Supported <i>Max_Segments_Accepted</i> <i>Local_Time</i> <i>Local_Date</i> <i>UTC_Offset</i> <i>Daylight_Savings_Status</i> <i>APDU_Segment_Timeout</i> APDU_Timeout Number_Of_APDU_Retries <i>Max_Master</i> <i>Max_Info_Frames</i> Device_Address_Binding Database_Revision <i>Configuration_Files</i> <i>Last_Restore_Time</i> <b>Backup_Failure_Timeout</b> <i>Active_COV_Subscriptions</i>

Object Type	Properties	
File (Stream Access Only)	Object_Identifier <b>Object_Name</b> Object_Type <b>Description</b> File_Type	<b>File_Size</b> <sup>1</sup> Modification_Date <b>Archive</b> Read_Only File_Access_Method
Loop	Object_Identifier <b>Object_Name</b> Object_Type Present_Value <b>Description</b> Status_Flags Event_State <i>Reliability</i> <b>Out_Of_Service</b> Output_Units Manipulated_Variable_Reference Controlled_Variable_Reference Controlled_Variable_Value Controlled_Variable_Units Setpoint_Reference <b>Setpoint</b> <sup>2</sup> Action <b>Proportional_Constant</b>	<i>Proportional_Constant_Units</i> <b>Integral_Constant</b> <i>Integral_Constant_Units</i> <b>Derivative_Constant</b> <i>Derivative_Constant_Units</i> <b>Bias</b> <b>Maximum_Output</b> <b>Minimum_Output</b> Priority_For_Writing <b>COV_Increment</b> <b>Time_Delay</b> <i>Notification_Class</i> <b>Error_Limit</b> <i>Event_Enable</i> <i>Acked_Transitions</i> <i>Notify_Type</i> <i>Event_Time_Stamps</i>
Multi-state Input	Object_Identifier <b>Object_Name</b> Object_Type Present_Value <b>Description</b> <i>Device_Type</i> Status_Flags Event_State <i>Reliability</i> <b>Out_Of_Service</b>	Number_Of_States <b>State_Text</b> <b>Time_Delay</b> <i>Notification_Class</i> <b>Alarm_Values</b> <i>Fault_Values</i> <i>Event_Enable</i> <i>Acked_Transitions</i> <b>Notify_Type</b> <i>Event_Time_Stamps</i>
Multi-state Output	Object_Identifier <b>Object_Name</b> Object_Type Present_Value <b>Description</b> <i>Device_Type</i> Status_Flags Event_State <i>Reliability</i> <b>Out_Of_Service</b> Number_Of_States	<b>State_Text</b> Priority_Array <b>Relinquish_Default</b> <b>Time_Delay</b> <i>Notification_Class</i> <i>Feedback_Value</i> <i>Event_Enable</i> <i>Acked_Transitions</i> <b>Notify_Type</b> <i>Event_Time_Stamps</i>

Object Type	Properties
Multi-state Value	<p>Object_Identifier  <b>Object_Name</b>  Object_Type  Present_Value  <b>Description</b>  Status_Flags  Event_State  Reliability  <b>Out_Of_Service</b>  Number_Of_States</p> <p><i>State_Text</i>  Priority_Array  <b>Relinquish_Default</b>  Time_Delay  <b>Notification_Class</b>  <b>Alarm_Values</b>  Fault_Values  Event_Enable  Acked_Transitions  <b>Notify_Type</b>  Event_Time_Stamps</p>
Notification Class	<p>Object_Identifier  <b>Object_Name</b>  Object_Type  <b>Description</b></p> <p>Notification_Class  <b>Priority</b>  <b>Ack_Required</b>  <b>Recipient_List</b><sup>3</sup></p>
Schedule	<p>Object_Identifier  <b>Object_Name</b>  Object_Type  <b>Description</b>  <b>Effective_Period</b>  <b>Weekly_Schedule</b>  <b>Exception_Schedule</b></p> <p>Schedule_Default  <b>List_Of_Object_Property_References</b><sup>4</sup>  <b>Priority_For_Writing</b><sup>5</sup>  Status_Flags  Reliability  <b>Out_Of_Service</b></p>
Trend Log	<p>Object_Identifier  <b>Object_Name</b>  Object_Type  <b>Description</b>  <b>Log_Enable</b><sup>6</sup>  <b>Start_Time</b>  <b>Stop_Time</b>  Log_DeviceObjectProperty  <b>Log_Interval</b><sup>6,7</sup>  COV_Resubscription_Interval  Client_COV_Increment  Stop_When_Full  Buffer_Size</p> <p>Log_Buffer  <b>Record_Count</b> (0)<sup>6</sup>  Total_Record_Count  Notification_Threshold  Records_Since_Notification  Last_Notify_Record  Event_State  <b>Notification_Class</b>  Event_Enable  Acked_Transitions  <b>Notify_Type</b>  Event_Time_Stamps</p>

### 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): 9600, 19200, 38400, 76800
- 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.

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

### If this product is a communication gateway, describe the types of non-BACnet equipment/networks(s) that the gateway supports:

This product supports communications between BACnet and any third-party system to which Niagara can connect. Contact Tridium for a list of supported protocols.