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ENC Series

BACnet Protocol Implementation Conformance Statement

Date: June 13, 2008

Vendor Name: TAC

Product Name: I/A Series® Enterprise Network Controller

Product Model Number: ENC-410 and ENC-520 Series

Applications Software Version: 3.2.20.1 or higher (Release 3.2)

Firmware Revision: 3.2.20 or higher (Release 3.2)

BACnet Protocol Revision: 4

Product Description

The TAC I/A Series ENC-410 and ENC-520 Enterprise Network Controllers (ENCs) are compact, embedded-processor platforms with flash memory for backup. These ENCs and the Enterprise Network Server provide bi-directional communications between the TAC I/A Series and a BACnet system operating at BACnet Conformance Class 4. It provides integrated control, supervision, and network management solutions for a network of BACnet™ MS/TP-based controllers, for building control. When connected over an Ethernet network, these ENCs can also share data between BACnet, LonWorks™, and TAC systems. A complete set of Java®-based control, application, logging, and user interface “objects” are included in a library. In addition to these functions, the ENC-410 includes a number of physical I/O points.

Specifically designed for mechanical room, factory floor, and other commercial environments, the ENC-410 or ENC-520 can be wall-mounted using its integral metal enclosure. In a small building application, a single ENC can be used to support a network of BACnet, LonWorks, or TAC devices that can be accessed directly over the Ethernet LAN, remotely over the Internet, or via dial-up modem.

BACnet Standardized Device Profile (Annex L)

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

BACnet Interoperability Building Blocks Supported (Annex K in BACnet 2004)

DS-RP-A	DS-RP-B	DS-RPM-A	DS-RPM-B	DS-WP-A	DS-WP-B	DS-WPM-B
DS-COV-A	DS-COV-B	DS-COVU-A	DS-COVU-B	DM-DDB-A	DM-DDB-B	DM-DOB-A
DM-DOB-B	DM-DCC-B	DM-RD-B	DM-TS-B	DM-UTC-B	DM-LM-A	DM-LM-B
DM-BR-B	AE-N-A	AE-N-I-B	AE-ACK-A	AE-ACK-B	AE-ASUM-B	AE-ESUM-B
AE-INFO-B	T-VMT-A	T-VMT-I-B	T-VMT-E-B	T-ATR-A	T-ATR-B	SCHED-A
SCHED-E-B	SCHED-I-B	NM-CE-A				

Segmentation Capability

- Able to transmit segmented messages **Window Size:** 10
- Able to receive segmented messages **Window Size:** 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.
- Not all instances support all optional properties.
- For writable properties, any range limitations are expressed in parentheses following the property name.

Object Type	Optional Properties	Writable Properties	Required Properties
Analog Input	Description Device_Type Reliability Min_Pres_Value Max_Pres_Value Resolution COV_Increment Time_Delay Notification_Class High_Limit Low_Limit Deadband Limit_Enable Event_Enable Acked_Transitions Notify_Type Event_Time_Stamps	Object_Name Description Out_Of_Service COV_Increment Time_Delay Notification_Class High_Limit Low_Limit Deadband Limit_Enable Notify_Type	Object_Identifier Object_Type Present_Value Status_Flags Event_State Units
Analog Output	Description Device_Type Reliability Min_Pres_Value Max_Pres_Value Resolution COV_Increment Time_Delay Notification_Class High_Limit Low_Limit Deadband Limit_Enable Event_Enable Acked_Transitions Notify_Type Event_Time_Stamps	Object_Name Description Out_Of_Service Relinquish_Default COV_Increment Time_Delay Notification_Class High_Limit Low_Limit Deadband Limit_Enable Notify_Type	Object_Identifier Object_Type Present_Value Status_Flags Event_State Units Priority_Array
Analog Value	Description Reliability Priority_Array Relinquish_Default Min_Pres_Value Max_Pres_Value COV_Increment Time_Delay Notification_Class High_Limit Low_Limit Deadband Limit_Enable Event_Enable Acked_Transitions Notify_Type Event_Time_Stamps	Object_Name Description Out_Of_Service Relinquish_Default COV_Increment Time_Delay Notification_Class High_Limit Low_Limit Deadband Limit_Enable Notify_Type	Object_Identifier Object_Type Present_Value Status_Flags Event_State Units

Object Type	Optional Properties	Writable Properties	Required Properties
Binary Input	Description Device_Type Reliability Inactive_Text Active_Text Change_Of_State_Time Change_Of_State_Count (0) Time_Of_State_Count_Reset Elapsed_Active_Time (0) Time_Of_Active_Time_Reset Time_Delay Notification_Class Alarm_Value Event_Enable Acked_Transitions Notify_Type Event_Time_Stamps	Object_Name Description Out_Of_Service Inactive_Text Active_Text Change_Of_State_Count (0) Elapsed_Active_Time (0) Time_Delay Notification_Class Alarm_Value Notify_Type	Object_Identifier Object_Type Present_Value Status_Flags Event_State Polarity
Binary Output	Description Device_Type Reliability Inactive_Text Active_Text Change_Of_State_Time Change_Of_State_Count (0) Time_Of_State_Count_Reset Elapsed_Active_Time (0) Time_Of_Active_Time_Reset Minimum_Off_Time Minimum_On_Time Time_Delay Notification_Class Feedback_Value Event_Enable Acked_Transitions Notify_Type Event_Time_Stamps	Object_Name Description Out_Of_Service Inactive_Text Active_Text Change_Of_State_Count (0) Elapsed_Active_Time (0) Minimum_Off_Time Minimum_On_Time Relinquish_Default Time_Delay Notification_Class Notify_Type	Object_Identifier Object_Type Present_Value Status_Flags Event_State Polarity Priority_Array
Binary Value	Description Reliability Inactive_Text Active_Text Change_Of_State_Time Change_Of_State_Count (0) Time_Of_State_Count_Reset Elapsed_Active_Time (0) Time_Of_Active_Time_Reset Minimum_Off_Time Minimum_On_Time Priority_Array Relinquish_Default Time_Delay Notification_Class Alarm_Value Event_Enable Acked_Transitions Notify_Type Event_Time_Stamps	Object_Name Description Out_Of_Service Inactive_Text Active_Text Change_Of_State_Count (0) Elapsed_Active_Time (0) Minimum_Off_Time Minimum_On_Time Relinquish_Default Time_Delay Notification_Class Alarm_Value Notify_Type	Object_Identifier Object_Type Present_Value Status_Flags Event_State
Calendar	Description	Object_Name Description Date_List	Object_Identifier Object_Type Present_Value

Object Type	Optional Properties	Writable Properties	Required Properties
Device	Location Description Protocol_Object_Types_Supported Max_Segments_Accepted Local_Time Local_Date UTC_Offset Daylight_Savings_Status APDU_Segment_Timeout Max_Master Max_Info_Frames Configuration_Files Last_Restore_Time Active_COV_Subscriptions	Location Description Backup_Failure_Timeout	Object_Identifier Object_Name Object_Type System_Status Vendor_Name Vendor_Identifier Model_Name Firmware_Revision Application_Software_Revision Protocol_Version Protocol_Revision Protocol_Services_Supported Object_List Max_APDU_Length_Accepted Segmentation_Supported APDU_Timeout Number_Of_APDU_Retries Device_Address_Binding Database_Revision
File (stream access only)	Description	Object_Name Description File_Size ^a Archive	Object_Identifier Object_Type File_Type Modification_Date Read_Only File_Access_Method
Loop	Description Reliability Proportional_Constant Proportional_Constant_Units Integral_Constant Integral_Constant_Units Derivative_Constant Derivative_Constant_Units Bias Maximum_Output Minimum_Output COV_Increment Time_Delay Notification_Class Error_Limit Event_Enable Acked_Transitions Notify_Type Event_Time_Stamps	Object_Name Description Out_Of_Service Setpoint ^b Proportional_Constant Integral_Constant Derivative_Constant Bias Maximum_Output Minimum_Output COV_Increment Time_Delay Error_Limit	Object_Identifier Object_Type Present_Value Status_Flags Event_State Output_Units Manipulated_Variable_Reference Controlled_Variable_Reference Controlled_Variable_Value Controlled_Variable_Units Setpoint_Reference Action Priority_For_Writing
Multistate Input	Description Device_Type Reliability State_Text Time_Delay Notification_Class Alarm_Values Fault_Values Event_Enable Acked_Transitions Notify_Type Event_Time_Stamps	Object_Name Description Out_Of_Service State_Text Time_Delay Notification_Class Alarm_Values Notify_Type	Object_Identifier Object_Type Present_Value Status_Flags Event_State Number_Of_States
Multistate Output	Description Device_Type Reliability State_Text Time_Delay Notification_Class Feedback_Value Event_Enable Acked_Transitions Notify_Type Event_Time_Stamps	Object_Name Description Out_Of_Service State_Text Relinquish_Default Time_Delay Notification_Class Notify_Type	Object_Identifier Object_Type Present_Value Status_Flags Event_State Number_Of_States Priority_Array

Object Type	Optional Properties	Writable Properties	Required Properties
Multistate Value	Description Reliability State_Text Priority_Array Relinquish_Default Time_Delay Notification_Class Alarm_Values Fault_Values Event_Enable Acked_Transitions Notify_Type Event_Time_Stamps	Object_Name Description Out_Of_Service State_Text Relinquish_Default Time_Delay Notification_Class Alarm_Values Notify_Type	Object_Identifier Object_Type Present_Value Status_Flags Event_State Number_Of_States
Notification Class	Description	Object_Name Description Priority Ack_Required Recipient_List ^c	Object_Identifier Object_Type Notification_Class
Schedule	Description Weekly_Schedule Exception_Schedule	Object_Name Description Effective_Period Weekly_Schedule Exception_Schedule Schedule_Default List_Of_Object_Property_References ^d Priority_For_Writing ^e Out_Of_Service	Object_Identifier Object_Type Status_Flags Reliability
Trend Log	Description Start_Time Stop_Time Log_DeviceObjectProperty Log_Interval ^f COV_Resubscription_Interval Client_COV_Increment Notification_Threshold Records_Since_Notification Last_Notify_Record Notification_Class Event_Enable Acked_Transitions Notify_Type Event_Time_Stamps	Object_Name Description Log_Enable ^{f g} Start_Time Stop_Time Log_Interval ^f Record_Count (0) ^f Notification_Class Notify_Type	Object_Identifier Object_Type Stop_When_Full Buffer_Size Log_Buffer Total_Record_Count Event_State

a. The File_Size property of File objects is only writable if the underlying system file is changeable.

b. The Setpoint property of Loop objects is writable only if the setpoint is not linked from within Niagara.

c. The Recipient_List property of the Notification Class object will maintain entries that are internally configured within Niagara.

d. The List_Of_Object_Property_References property of the Schedule object will maintain entries that are internally configured within Niagara.

e. 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.

f. 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.

g. Trend Logs in Niagara are either COV or Interval. Therefore, the Log_Interval property cannot be written to a value other than 0 (zero) for COV logs, or to 0 (zero) for interval logs

Data Link Layer Options

BACnet IP, (Annex J)

Able to register as a Foreign Device

ISO 8802-3, Ethernet (10BASE5, 10BASE2, 10BASET, Fiber) (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, 19.2k, 38.4k, 76.8k bps

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 – List all routing configurations, e.g., ARCNET-Ethernet, Ethernet-MS/TP, etc.:

Ethernet-BACnet/IP, Ethernet-MS/TP, MS/TP-BACnet/IP

Annex H.3, BACnet Tunneling Router over UDP/IP

BACnet/IP Broadcast Management Device (BBMD)

Does the BBMD support registrations by Foreign Devices? Yes No

MS/TP Slave Proxy

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 (ICS-4)

JIS C 6226

Non-BACnet Equipment and Network(s) Supported

If this product is a communication gateway, describe the non-BACnet equipment and network(s) that the gateway supports:

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

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