



## Product Implementation Conformance Statement for the b3xxx Series

**Date:** October 4, 2005

**Vendor Name:** TAC

**Product Name:** Continuum

**Product Model Number:** b3xxx Series (See Table below)

**Applications Software Version:** 4.4

**Firmware Revision:** 4.4

**BACnet Protocol Version:** 1

**BACnet Protocol Revision:** 4

### Product Description

The b3xxx Series of programmable controllers are BACnet Advanced Application Controllers (B-AAC). The models are functionally similar, but have different input and output capabilities. The table below details the differences.

Model Name	Number and Type of Inputs	Number and Type of Outputs	Expansion Modules Support	Smart Sensor Support
<b>b3920</b>	16 Universal Inputs	8 Analog Outputs, 8 Digital Outputs	Yes	Yes
<b>b3800</b>	8 Universal Inputs	8 Digital Outputs	No	Yes
<b>b3804</b>	8 Universal Inputs	4 Analog Outputs, 4 Digital Outputs	No	Yes
<b>b3810</b>	8 Universal Inputs	8 Digital Outputs	Yes	Yes
<b>b3814</b>	8 Universal Inputs	4 Analog Outputs, 4 Digital Outputs	Yes	Yes
<b>b3865</b>	1 Flow Sensor 4 Universal Inputs	1 Actuator Output, 3 Digital Outputs	No	Yes

<b>b3866</b>	1 Flow Sensor 4 Universal Inputs	1 Actuator Output, 2 Analog Outputs, 3 Digital Outputs	No	Yes
<b>b3867</b>	4 Universal Inputs	2 Analog Outputs, 5 Digital Outputs	No	Yes
<b>b3850</b>	1 Flow Sensor 4 Universal Inputs	4 Digital Outputs	Yes	Yes
<b>b3851</b>	4 Universal Inputs	4 Digital Outputs	Yes	Yes
<b>b3853</b>	2 Flow Sensors 4 Universal Inputs	4 Digital Outputs	Yes	Yes
<b>b3608</b>	8 Universal Inputs		No	No
<b>b3624</b>	24 Universal Inputs		No	No
<b>b3885</b>	1 Flow Sensor 2 Universal Inputs	1 Actuator Output 2 Digital Outputs	No	No
<b>b3887</b>	3 Universal Inputs	5 Digital Outputs	No	Yes

### BACnet Standardized Device Profile (Annex L)

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

## BACnet Interoperability Building Blocks (BIBBs) Supported

BIBB	Name	BACnet Service	Init	Exec
DS-RP-A <sup>1</sup>	Data Sharing - ReadProperty-A	ReadProperty	X	
DS-RP-B	Data Sharing - ReadProperty-B	ReadProperty		X
DS-RPM-B	Data Sharing - ReadPropertyMultiple-B	ReadPropertyMultiple		X
DS-RPC-B	Data Sharing - ReadPropertyConditional-B	ReadPropertyConditional		X
DS-WP-A <sup>1</sup>	Data Sharing - WriteProperty-A	WriteProperty	X	
DS-WP-B	Data Sharing - WriteProperty-B	WriteProperty		X
DS-WPM-B	Data Sharing - WritePropertyMultiple-B	WritePropertyMultiple		X
DS-COV-A	Data Sharing - COV-A	SubscribeCOV	X	
		ConfirmedCOVNotification		X
		UnconfirmedCOVNotification		X
DS-COV-B	Data Sharing - COV-B	SubscribeCOV		X
		ConfirmedCOVNotification	X	
		UnconfirmedCOVNotification	X	
AE-N-I-B	Alarm and Event-Notification-B	ConfirmedEventNotification	X	
		UnconfirmedEventNotification	X	
AE-ACK-B	Alarm and Event-ACK-B	AcknowledgeAlarm		X
AE-INFO-B	Alarm and Event-Information-B	GetEventInformation		X
SCHED-I-B	Scheduling-Internal-B			
T-VMT-I-B	Trending - Viewing and Modifying Trends Internal-B	ReadRange		X
T-ATR-B <sup>1</sup>	Trending – Automated Trend Retrieval-B	ConfirmedEventNotification	X	
		ReadRange		X
DM-DDB-A	Device Management-Dynamic Device Binding-A	Who-Is	X	
		I-Am		X
DM-DDB-B	Device Management-Dynamic Device Binding-B	Who-Is		X
		I-Am	X	
DM-DOB-A	Device Management-Dynamic Object Binding-A	Who-Has	X	
		I-Have		X
DM-DOB-B	Device Management-Dynamic Object Binding-B	Who-Has		X
		I-Have	X	
DM-DCC-B	Device Management-DeviceCommunicationControl-B	DeviceCommunicationControl		X

<sup>1</sup> Not supported by b3885 and b3887.

## BACnet Interoperability Building Blocks (BIBBs) Supported – Cont.

BIBB	Name	BACnet Service	Init	Exec
DM-TS-B	Device Management-TimeSynchronization-B	TimeSynchronization		X
DM-UTC-B	Device Management-UTCTimeSynchronization-B	UTCTimeSynchronization		X
DM-RD-B	Device Management-ReinitializeDevice-B	ReinitializeDevice		X
DM-BR-B <sup>1</sup>	Device Management-Backup and Restore-B	AtomicReadFile		X
		AtomicWriteFile		X
		ReinitializeDevice		X
DM-OCD-B	Device Management-Object Creation and Deletion-B	CreateObject		X
		DeleteObject		X

<sup>1</sup> A single stream-based file object is provided, to support Backup and Restore. Record-based access is *not* supported. The file has a proprietary format, which is produced by the controller during a Backup operation. Any attempt to write the file using data not obtained by reading it, will result in an error.

### Segmentation Capability

<b>X</b>	Able to transmit segmented messages	Window Size: 1
<b>X</b>	Able to receive segmented messages	Window Size: 1

### Standard Object Types Supported

Object Type	Supported	Creatable <sup>1</sup>	Deletable <sup>1</sup>
Analog Input	X		
Analog Output	X		
Analog Value	X	X	X
Binary Input	X		
Binary Output	X		
Binary Value	X	X	X
Calendar	X	X	X
Command	X	X	X
Device	X		
Event Enrollment	X	X	X
File	X		
Loop	X	X	X
Multi-state Input	X		
Multi-state Output	X		
Multi-state Value	X	X	X
Notification Class	X	X	X
Program	X		
Schedule	X	X	X
Trend Log	X	X	X

<sup>1</sup> Except for Device and File, instances of all supported object types can be created, deleted and configured using CyberStation.

## Object Types and Properties Supported

Properties that are Writable and Optional are indicated. See Restrictions on Object Identifiers and Names, below. All other strings are restricted to 32 characters. Unsigned values are limited to 4 294 967 294.

All Input and Output objects restrict Out\_Of\_Service to **true** if Channel is not configured.

Analog Input		
Property	W	O
COV_Increment	X	
Description	X	X
Event_State		
Object_Identifier		
Object_Name		
Object_Type		
Out_Of_Service	X	
Present_Value	X	
Status_Flags		
Units	X	

Binary Input		
Property	W	O
Active_Text	X	X
Description	X	X
Event_State		
Inactive_Text	X	X
Object_Identifier		
Object_Name		
Object_Type		
Out_Of_Service	X	
Polarity	X	
Present_Value	X	
Status_Flags		

Analog Output		
Property	W	O
COV_Increment	X	
Description	X	X
Event_State		
Object_Identifier		
Object_Name		
Object_Type		
Out_Of_Service	X	
Present_Value	X	
Priority_Array		
Relinquish_Default	X	
Status_Flags		
Units	X	

Binary Output		
Property	W	O
Active_Text	X	X
Description	X	X
Event_State		
Inactive_Text	X	X
Object_Identifier		
Object_Name		
Object_Type		
Out_Of_Service	X	
Polarity	X	
Present_Value	X	
Priority_Array		
Relinquish_Default	X	
Status_Flags		

Analog Value		
Property	W	O
COV_Increment	X	
Description	X	X
Event_State		
Object_Identifier		
Object_Name	X	
Object_Type		
Out_Of_Service	X	
Present_Value	X	
Priority_Array		
Relinquish_Default	X	
Status_Flags		
Units	X	

Binary Value		
Property	W	O
Active_Text	X	X
Description	X	X
Event_State		
Inactive_Text	X	X
Object_Identifier		
Object_Name	X	
Object_Type		
Out_Of_Service	X	
Present_Value	X	
Priority_Array		
Relinquish_Default	X	
Status_Flags		

Calendar		
Property	W	O
Date_List	X	
Description	X	X
Object_Identifier		
Object_Name	X	
Object_Type		
Present_Value		

Dates are restricted to years 1989-2105. See Interpretation of Wildcards in Dates, below.

Command		
Property	W	O
Action	X	
Action_Text	X	X
All_Writes_Successful		
Description	X	X
In_Process		
Object_Identifier		
Object_Name	X	
Object_Type		
Present_Value	X	

Action is restricted to reference objects in the same device.

Device		
Property	W	O
Active_COV_Subscriptions		
APDU_Segment_Timeout	X	
APDU_Timeout	X	
Application_Software_Version		
Backup_Failure_Timeout	X	
Configuration_Files		
Database_Revision		
Daylight_Savings_Status	X	
Description	X	X
Device_Address_Binding		
Firmware_Revision		
Infinity_Path		X
Last_Restore_Time		
Local_Date		
Local_Time		
Location	X	X
Max_APDU_Length_Accepted		
Max_Info_Frames	X	
Max_Master	X	
Max_Segments_Accepted		
Model_Name		
Number_Of_APDU_Retries	X	
Object_Identifier		
Object_List		
Object_Name	X	
Object_Type		
Protocol_Object_Types_Supported		
Protocol_Revision		
Protocol_Services_Supported		
Protocol_Version		
Segmentation_Supported		
Serial_Number		X
System_Status		
UTC_Offset	X	
Vendor_Identifier		
Vendor_Name		

Infinity\_Path is a proprietary property. See "Infinity Path Property" below.

Max\_Info\_Frames is restricted to the range 1..127.

Number\_Of\_APDU\_Retries is restricted to the range 0..255.

Serial\_Number is a proprietary property – See "Serial Number Property" below.

Event Enrollment		
Property	W	O
Acked_Transitions		
Description	X	X
Event_Enable	X	
Event_Parameters	X	
Event_State		
Event_Time_Stamps		
Event_Type		
Notification_Class	X	
Notify_Type	X	
Object_Identifier		
Object_Name	X	
Object_Property_Reference	X	
Object_Type		

Event\_Type limited to Change\_Of\_State, Change\_Of\_Value, Floating\_Limit, Out\_Of\_Range and Buffer\_Ready.

Object\_Property\_Reference must reference Present\_Value of point in same controller.

File		
Property	W	O
Archive	X	
File_Access_Method		
File_Size	X	
File_Type		
Modification_Date		
Object_Identifier		
Object_Name		
Object_Type		
Read_Only		

File\_Size is writable when in Restore mode. Values limited to zero and current file size.

Loop		
Property	W	O
Action	X	
Bias	X	X
Controlled_Variable_Reference	X	
Controlled_Variable_Units	X	
Controlled_Variable_Value		
Derivative_Constant	X	X
Derivative_Constant_Units	X	X
Description	X	X
Event_State		
Integral_Constant	X	X
Integral_Constant_Units	X	X
Manipulated_Variable_Reference	X	
Maximum_Output	X	X
Minimum_Output	X	X
Object_Identifier		
Object_Name	X	
Object_Type		
Out_Of_Service	X	
Output_Units	X	
Present_Value	X	
Priority_For_Writing	X	
Proportional_Constant	X	X
Proportional_Constant_Units	X	X
Reliability		X
Setpoint	X	
Setpoint_Reference	X	
Status_Flags		
Update_Interval	X	X

Present\_Value is writable only when Out\_Of\_Service is true.

Multistate Input		
Property	W	O
Description	X	X
Event_State		
Number_Of_States		
Object_Identifier		
Object_Name		
Object_Type		
Out_Of_Service	X	
Present_Value	X	
State_Text		X
Status_Flags		

Multistate Output		
Property	W	O
Description	X	X
Event_State		
Number_Of_States		
Object_Identifier		
Object_Name		
Object_Type		
Out_Of_Service	X	
Present_Value	X	
Priority_Array		
Relinquish_Default	X	
State_Text		X
Status_Flags		

Program		
Property	W	O
Description	X	X
Object_Identifier		
Object_Name		
Object_Type		
Out_Of_Service	X	
Program_Change	X	
Program_State		
Status_Flags		

Read\_Property of Program\_Change always return Ready.

Multistate Value		
Property	W	O
Description	X	X
Event_State		
Number_Of_States		
Object_Identifier		
Object_Name	X	
Object_Type		
Out_Of_Service	X	
Present_Value	X	
Priority_Array		
Relinquish_Default	X	
State_Text		X
Status_Flags		

Cyberstation can configure the State\_Text.

Schedule		
Property	W	O
Description	X	X
Effective_Period	X	
Exception_Schedule	X	X
Following_Transition_Time		
List_Of_Obj_Property_References	X	
Next_Transition_Time		
Object_Identifier		
Object_Name	X	
Object_Type		
Out_Of_Service	X	
Present_Value	X	
Previous_Transition_Time		
Priority_For_Writing	X	
Reliability		
Schedule_Default	X	
Status_Flags		
Weekly_Schedule	X	

In Effective\_Period and Exception\_Schedule, dates are restricted to years 1989-2105. See Interpretation of Wildcards in Dates, below.

List\_Of\_Obj\_Property\_References is limited to internal objects.

Present\_Value is writable only when Out\_Of\_Service is true.

Previous\_Transition\_Time, Next\_Transition\_Time and Following\_Transition\_Time are proprietary properties – See “Support for Optimum Start-Stop” below.

Notification Class		
Property	W	O
Ack_Required	X	
Notification_Class		
Description	X	X
Object_Identifier		
Object_Name	X	
Object_Type		
Priority	X	
Recipient_List	X	

Trend Log		
Property	W	O
Buffer_Size	X	
COV_Resubscription_Interval		X
Description	X	X
Event_State		
Log_Buffer		
Log_Device_Object_Property	X	
Log_Enable	X	
Log_Interval	X	
Object_Identifier		
Object_Name	X	
Object_Type		
Record_Count	X	
Start_Time	X	
Stop_Time	X	
Stop_When_Full	X	
Total_Record_Count		

Log\_Device\_Object\_Property is limited to reference objects in the same device.

In Start\_Time and Stop\_Time, dates are restricted to years 1989-2105.

Buffer\_Size is required to be at least 2 but is otherwise limited only by available memory.

### Data Link Layer Options

	BACnet IP
	BACnet IP, Foreign Device
	ISO 8802_3, Ethernet
	ANSI/ATA 878.1, 2.5 MB ARCNET
	ANSI/ATA 878.1, RS_485, baud rate(s)_____
<b>X</b>	MS/TP master, baud rate(s)_____ 9600,19200,38400,76800
	MS/TP slave, baud rate(s)_____
	Point-To-Point, EIA 232, baud rate(s)_____
	Point-To-Point, modem, baud rate(s)_____
	LonTalk, medium: _____
	Other

### Device Address Binding

Static Device Binding Supported	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
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## Networking Options

<input type="checkbox"/>	Router	List all routing configurations _____
<input type="checkbox"/>	Annex H, BACnet Tunneling Router over IP	
<input type="checkbox"/>	BACnet/IP Broadcast Management Device (BBMD)	
<input type="checkbox"/>	Support registrations by foreign devices	

## Character Sets Supported

<input checked="" type="checkbox"/>	ANSI X3.4	<input checked="" type="checkbox"/>	ISO 8859-1
<input type="checkbox"/>	ISO 10646 (UCS-2)	<input type="checkbox"/>	ISO 10646 (UCS-4)
<input type="checkbox"/>	IBM /Microsoft DBCS	<input type="checkbox"/>	JIS C 6626

## Serial Number Property

Every TAC device has a unique serial number, assigned at the factory. The serial number is made available by the Serial\_Number property of the Device object. The property identifier is 515, and the data type is Unsigned.

## Infinity Path Property

TAC devices can also be accessed via the proprietary Infinity protocol, which requires specific path information to access each device. Accordingly, the Infinity\_Path property (identifier 517) of the Device object provides an unsigned integer value composed as follows:

Byte Position	bCX controllers	b3xxx controllers
Lowest	ACC Net ID of the device	ACC Net ID of the parent bCX device [bCX or other BACnet router]
Second	0	Commport Id [in the parent bCX] of the MSTP network
Third	0	MSTP Mac address of the controller

## Support for Optimum Start-Stop

The controller includes a proprietary extension that can be used, together with Plain English programming, to optimize the start and stop times for heating and cooling systems based on scheduled occupancy times. The extension consists of three proprietary properties of the Schedule object type:

Name	Identifier	Meaning
Previous_Transition_Time	512	The time when the Schedule's Present_Value most recently changed value
Next_Transition_Time	513	The time when the Schedule's Present_Value is next scheduled to change value
Following_Transition_Time	514	The time when the Schedule's Present_Value is next scheduled to change value after the time indicated by Next_Transition

These properties are unsigned integer values, each giving a date and time expressed as the number of seconds after midnight, January 1, 1970. The Plain English language, which is used to specify the behavior of Program objects, includes the ability to compare these times with the present time, and to compute time intervals.

Each transition indicates a scheduled change in the value of the Schedule's Present\_Value attribute. When determining a transition, time-value pairs that do not change the value are not considered transitions.

## Restrictions on Object Identifiers and Names

The instance number portion of the Object\_Identifier property has a restricted range, which depends to some extent on the object type. The following table gives the valid range of instance numbers:

Object Type	Minimum	Maximum
Device	1	4194302
File <sup>1</sup>	1	1
All others	1	200

For all object types, the Object\_Name is limited to 16 characters. The first character must be alphabetic, and the remaining characters must be alphabetic, numeric, or one of '\_' or '.'.

## Interpretation of Wildcards in Dates

The BACnet specification [ANSI/ASHRAE Standard 135-2001] is open to multiple interpretations regarding the meaning of wildcards in dates, especially when used to specify date ranges. The following describes how the controllers, especially in the context of the Schedule properties Exception\_Schedule and Effective\_Period, and the Calendar property Date\_List, interpret wildcards.

For purposes of comparing dates, the day-of-week fields are not used. That is, they are totally redundant. When comparing dates, a wildcard field is considered equal to the corresponding field in the date being compared. A date falls within the range if it is not before the StartDate and not after the EndDate.

Because the day-of-week field is redundant, its value must be either unspecified or consistent with the other fields. Because it can be consistent with those fields only if they are specified, the controllers allow the day-of-week to be specified only if the other three fields are specified as well.

Accordingly, the following conditions in a date range are treated as errors and will prevent a WriteProperty from completing:

1. A day-of-week is specified but two or fewer of the other fields in the Date are specified.
2. A day-of-week is specified, but is inconsistent with the Date specified by the other fields.
3. A year field is specified, which is outside the range limit of 1989 – 2105.
4. The endDate is earlier than the StartDate.
5. Any of the specified fields are out of range (e.g., 31<sup>st</sup> day of February).

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<sup>1</sup> Only one file object exists (for backup and restore) and users do not create objects of this type.