

BACnet Protocol Implementation Conformance Statement

Date: April 7, 2006
Vendor Name: Carel SpA
Product Name: BACnet pCOWeb/pCONet
Product Model Number: pCOWeb@/pCONet@
Applications Software Version: 1.03
Firmware Revision: A???-B???/485??? – B???
BACnet Protocol Revision: 2
Product Description: Provides BACnet 8802.3 Ethernet, BACnet/IP (pCOWeb) and MS/TP (pCONet) connectivity to Carel pCO² series controllers

BACnet Standardized Device Profile (Annex L):
BACnet Application Specific Controller (B-ASC)

List all BACnet Interoperability Building Blocks Supported (Annex K):

DS-RP-B, DS-RPM-B, DS-WP-B, DS-WPM-B, DS-COVP-B, DM-DDB-A, DM-DDB-B, DM-DOB-B, DM-DCC-B, DM-TS-B, DM-UTC-B, AE-N-I-B, AE-ACK-B, AE-INFO-B

Segmentation Capability:
Segmentation not supported

Standard Object Types Supported:
No dynamic Creation or Deletion supported
No proprietary object types supported

Device Object:

Optional Properties Supported:

Daylight_Savings_Time
Description
Location
Local_Date
Local_Time
Max_Info_Frames (MS/TP only)
Max_Master (MS/TP only)
Profile_Name
UTC_Offset

Standard Properties Used In a Non-standard Way:

Process_Identifier
Recipient

Proprietary Properties Supported:

Proprietary Property 1000 (Enable_Alarming BOOLEAN DataType)
Proprietary Property 1001 (MSTP_TS Unsigned DataType, MS/TP only)

Writable Properties:

APDU_Timeout
Daylight_Savings_Time
Description
Location
Max_Info_Frames (MS/TP only)
Max_Master (MS/TP only)
Number_Of_APDU_Retries
Object_Identifier
Process_Identifier
Recipient
UTC_Offset
Proprietary Property 1000 (Enable_Alarming BOOLEAN DataType)
Proprietary Property 1001 (MSTP_TS Unsigned DataType, MS/TP only)
Proprietary Property 1002 (MSTP_BAUD Unsigned DataType, MS/TP only)
Proprietary Property 1003 (LAN Type 0=8802-3 Ethernet, 1=BACnet/IP)
Proprietary Property 1004 (BACnet/IP UDP Unsigned DataType)

Restrictions:

Description, Location (limited to 64 characters)

Analog Value Objects:**Optional Properties Supported:**

Acked_Transitions
Deadband
Description
Event_Enable
Event_Time_Stamps
High_Limit
Limit_Enable
Low_Limit
Notify_Type
Reliability
Time_Delay

Standard Properties Used In a Non-standard Way:

Ack_Required
Issue_Confirmed_Notifications
Priority

Writable Properties:

Object_Identifier *
Ack_Required
Deadband
Description
Event_Enable
High_Limit
Issue_Confirmed_Notifications
Limit_Enable
Low_Limit
Notification_Class
Object_Name
Present_Value
Priority
Units

* Note: The Analog Values 1001 through 1207 may be programmed as either Analog Value or Multi-State Value types by writing to the Object_Identifier property

Property Range Restrictions:

Description (limited to 64 characters)

Object_Name (limited to 32 characters)

Binary Value Objects:

Optional Properties Supported:

Acked_Transitions

Active_Text

Alarm_Value

Description

Event_Enable

Event_Time_Stamps

Inactive_Text

Notify_Type

Reliability

Time_Delay

Standard Properties Used In a Non-standard Way:

Ack_Required

Issue_Confirmed_Notifications

Priority

Writable Properties:

Ack_Required

Active_Text

Alarm_Value

Description

Event_Enable

Inactive_Text

Issue_Confirmed_Notifications

Notification_Class

Object_Name

Present_Value

Priority

Property Range Restrictions:

Description (limited to 64 characters)

Object_Name, Active_Text, Inactive_Text (limited to 32 characters)

Multi-state Value Objects:

Optional Properties Supported:

Acked_Transitions

Alarm_Values

Description

Event_Enable

Event_Time_Stamps

Fault_Values

Notify_Type

Reliability

State_Text

Time_Delay

Standard Properties Used In a Non-standard Way:

Ack_Required

Issue_Confirmed_Notifications

Priority

Writable Properties:

Object_Identifier *
Ack_Required
Alarm_Values
Description
Event_Enable
Fault_Values
Issue_Confirmed_Notifications
Notification_Class
Object_Name
Present_Value
Priority
State_Text

* Note: The Analog Values 1001 through 1207 may be programmed as either Analog Value or Multi-State Value types by writing to the Object_Identifier property

Property Range Restrictions:

Description (limited to 64 characters)
Object_Name, State_Text (limited to 32 characters)
Number_of_States (limited to 32)

Notification Class Objects:**Optional Properties Supported:**

Description

Writable Properties:

Ack_Required
Priority
Recipient_List

Property Range Restrictions:

Object Instance (1-16, i.e. there are always sixteen (16) Notification Class Objects)
Description (limited to 64 characters)
Recipient_List (limited to 1)

Data Link Layer Options:

8802.3 Ethernet (clause 7), BACnet/IP (Annex J), MS/TP master (Clause 9), baud rate(s): 9600, 19200, 38400, 78600

Device Address Binding:

Static device binding is not supported. (No client functionality is included).

Networking Options:

When configured for BACnet/IP as the Data Link, a pCOWeb allows registration as a Foreign Device to a single specified BACnet BBMD. The Time-to-Live is programmable.

Character Sets Supported:

ANSI X3.4

BACnet/pCO Mapping

For each pCOWeb/pCONet there can be a maximum of 621 BACnet objects, in addition to the Device Object. Of the 621 objects, there can be up to 207 Analog Values, 207 Analog Values or Multi-state Values and 207 Binary Values. The number of each type can be configured prior to use. From the factory all 621 objects are mapped. Object_Identifier are assigned according to the following table:

Object Type	Instance Range	pCO Mapping
Analog Value	1-207	A001-A207
Analog Value or Multi-state Value	1001-1207	I001-I207
Binary Value	1-207	D001-D207

From the factory, I001-I2007 are mapped as Analog Value 1001-Analog Value 1207. Each of these may be reprogrammed as Multi-state Values on an individual basis, by writing the the Object_Identifier property. BACnet objects for which there are no corresponding physical pCO points return an *unreliable-other* (7) value for the Reliability property of the corresponding object and an undetermined value for the Present_Value property (usually=0 or 0.0).

The Object_Name properties for all the objects are writable and can be up to 32 characters in length. By default objects are named **A001-A207**, **I001-I207** and **D001-D207** corresponding to their pCO mapping.

Alarming

BACnet Intrinsic Alarming is supported for the Analog Values (Out_of_Range event types), Binary Values (Change_of_State event types) and Multi-state Values (Change_of_State event types). All optional properties related to Intrinsic Alarming are included and writable where appropriate. Use of Notification Class Objects may be optionally bypassed. In this scheme, if an object's Notification_Class property is set to 0, three standard BACnet properties that are normally included in Notification Class objects, specifically Ack_Required, Issue_Confirmed_Notifications and Priority, are included for each Analog Value, Binary Value and Multi-state Value object and take the place of the Notification Class. Although these properties are not standard or optional for Analog Value, Binary Value and Multi-state Value objects, they are treated in a standard BACnet way. Also in this scheme, two properties, Process_Identifier and Recipient, are included for the Device Object and take the place of the Notification Class Object. Although these properties are not standard or optional for Device objects, they are treated in a standard BACnet way. The Recipient property is limited to the Object_Identifier of a Device object. If the Notification_Class for an object is 0, it will be reported as 1 in alarm events.

For all alarms, always a Message included of the form:

"nnnnnn (BVxxx) ChangeOfState v"
"nnnnnn (AVxxx) OutOfRange vvv.v"

where:

nnnnn is the Object_Name
xxx is the object instance
v is the value

COV Subscriptions

The DS-COVP-B BIBB supports a maximum 64 simultaneous subscriptions. The following properties are eligible for COV reporting:

- Present_Value
- Status_Flags
- Reliability
- Event_State
- Out_of_Service

Default Factory Settings

Default values for the pCOWeb/pCONet are as follows:

pCOWeb	pCONet	Property	Default Value
Yes	Yes	Device Instance	77000
Yes	No	LAN type	BACnet/IP
Yes	No	BACnet/IP UDP	BAC0 (hexadecimal)
No	Yes	MS/TP Station Address	0
No	Yes	Max_Master	127
No	Yes	Max_Info_Frames	20
No	Yes	MS/TP Baud rate	38400
Yes	Yes	Alarming Enabled*	False
Yes	Yes	Number of pCO Analogs Mapped	207
Yes	Yes	Number of pCO Integers Mapped	207
Yes	Yes	Number of pCO Digitals Mapped	207
Yes	No	IP Address for BBMD	None
Yes	No	Foreign Device Time-To-Live	0 (seconds)

* This is not accessible through proprietary property and must be enabled using the BACnet html page for the pCOWeb or the BACset configuration tool for both the pCOWeb and pCONet.