# BACnet Protocol Implementation Conformance Statement
## UPC, XPC

**OEMCtrl®**

Date: **12/08/2011**
Vendor Name: **OEMCtrl**
Product Name: **UPC,  XPC**
Product Model Number: **UPC, XPC**
Applications Software Version: **<user specified>**    Firmware Revision: **4.02**
BACnet Protocol Revision: **9**

**Product Description:**

The UPC (Unitary Protocol Converter)  can convert between two open protocols, or from a proprietary protocol to an open protocol, to integrate with virtually any Building Automation System. One of the unique things about the UPC is the ability to select the open protocol you want with the simple flip of a DIP switch. Choose from BACnet, Modbus, N2 Bus, or LonWorks. The UPC also offers the ability to plug in an optional backlit LCD display/keypad to allow you to view any of the points in your system.

The XPC (Unitary Protocol Converter) sets a new standard for multiple equipment protocol conversion. It can convert between two open protocols, or from a proprietary protocol to an  open protocol, to integrate with virtually any Building Automation System. One of the unique things about the XPC is the ability to select the open protocol you want with the simple flip of a DIP switch. Choose from BACnet, Modbus, N2 Bus, or LonWorks. The XPC also offers the ability to plug in an optional backlit LCD display/keypad to allow you to view any of the points in your system.

**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)**

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

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

**Segmentation Capability:**

☒ Able to transmit segmented messages          Window Size _____1_____
☒ Able to receive segmented messages          Window Size _____1_____

**Standard Object Types Supported:**

An object type is supported if it may be present in the device. For each standard Object Type supported provide the following data:

    1) Whether objects of this type are dynamically creatable using the CreateObject service

    2) Whether objects of this type are dynamically deletable using the DeleteObject service

    3) List of the optional properties supported

    4) List of all properties that are writable where not otherwise required by this standard

    5) List of proprietary properties and for each its property identifier, datatype, and meaning

    6) List of any property range restrictions

    **(List of object types starts on page 3 …)**

**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) **156k baud_**
☒ MS/TP master (Clause 9), baud rate(s): **9600, 19200, 38400, 78600_**
☐ MS/TP slave (Clause 9), baud rate(s): _____
☒ Point-To-Point, EIA 232 (Clause 10), baud rate(s): **9600, 19200, 38400, 57600, 115200**
☒ Point-To-Point, modem, (Clause 10), baud rate(s): **9600, 19200, 38400, 57600, 115200**
☐ 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.

☐ 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:** Various protocols, depending on which firmware is loaded.

**Analog Value (PAR):**

1. Creatable?  NO
2. Deletable?  NO
3. Optional properties supported:
   - acked-transitions
   - cov-increment
   - deadband
   - description
   - event-enable
   - event-time-stamps
   - high-limit
   - limit-enable
   - low-limit
   - notification-class
   - notify-type
   - priority-array
   - reliability
   - relinquish-default
   - time-delay
4. Writeable properties:
   - cov-increment
   - deadband
   - description
   - event-enable
   - high-limit
   - limit-enable
   - low-limit
   - notification-class
   - notify-type
   - out-of-service
   - present-value
   - relinquish-default
   - time-delay
   - units
5. Proprietary properties:  None
6. Range restrictions:

| | |
|---|---|
| description | limited to 50 octets in length |
| present-value | limited by min-pres-value and max-pres-value properties |
| relinquish-default | limited by min-pres-value and max-pres-value properties |
| notification-class | must be valid notification-class |
| time-delay | 0 to 4294967295 |

**Analog Value (RS):**
1. Creatable?  NO
2. Deletable?  NO
3. Optional properties supported:
    reliability
    cov-increment
4. Writeable properties:
    out-of-service
    present-value
    units
    cov-increment
5. Proprietary properties:  None
6. Range restrictions:  None

**Analog Value (STAT):**

1. Creatable?  NO
2. Deletable?  NO
3. Optional properties supported:
    acked-transitions
    cov-increment
    deadband
    description
    event-enable
    event-time-stamps
    high-limit
    limit-enable
    low-limit
    notification-class
    notify-type
    reliability
    time-delay
4. Writeable properties:
    cov-increment
    deadband
    description
    event-enable
    high-limit
    limit-enable
    low-limit
    notification-class
    notify-type
    out-of-service
    time-delay
    units
5. Proprietary properties:  None
6. Range restrictions:

| | |
|---|---|
| description | limited to 50 octets in length |
| notification-class | must be valid notification-class |
| time-delay | 0 to 4294967295 |

**Binary Value (PAR):**

1. Creatable?  NO
2. Deletable?  NO
3. Optional properties supported:

   acked-transitions

   active-text

   alarm-value

   change-of-state-count

   change-of-state-time

   description

   elapsed-active-time

   event-enable

   event-time-stamps

   inactive-text

   minimum-off-time

   minimum-on-time

   notification-class

   notify-type

   priority-array

   reliability

   relinquish-default

   time-delay

   time-of-active-time-reset

   time-of-state-count-reset

4. Writeable properties:

   active-text

   alarm-value

   change-of-state-count

   description

   elapsed-active-time

   event-enable

   inactive-text

   minimum-off-time

   minimum-on-time

   notification-class

   notify-type

   out-of-service

   present-value

   relinquish-default

   time-delay

5. Proprietary properties:  None
6. Range restrictions:

   active-text                     limited to 50 octets in length

   change-of-state-count           0 to 4294967295

   description                     limited to 50 octets in length

   elapsed-active-time             0 to 4294967295

   inactive-text                   limited to 50 octets in length

   minimum-off-time                0 to 4294967295

| | |
|---|---|
| minimum-on-time | 0 to 4294967295 |
| notification-class | must be valid notification-class |
| time-delay | 0 to 4294967295 |

**Binary Value (CLOCK):**

1. Creatable?  NO
2. Deletable?  NO
3. Optional properties supported:

>   acked-transitions
>
>   active-text
>
>   alarm-value
>
>   change-of-state-count
>
>   change-of-state-time
>
>   description
>
>   elapsed-active-time
>
>   event-enable
>
>   event-time-stamps
>
>   inactive-text
>
>   minimum-off-time
>
>   minimum-on-time
>
>   notification-class
>
>   notify-type
>
>   priority-array
>
>   reliability
>
>   relinquish-default
>
>   time-delay
>
>   time-of-active-time-reset
>
>   time-of-state-count-reset

4. Writeable properties:

>   active-text
>
>   alarm-value
>
>   change-of-state-count
>
>   description
>
>   elapsed-active-time
>
>   event-enable
>
>   inactive-text
>
>   minimum-off-time
>
>   minimum-on-time
>
>   notification-class
>
>   notify-type
>
>   out-of-service
>
>   present-value
>
>   relinquish-default
>
>   time-delay

5. Proprietary properties:  None
6. Range restrictions:

| | |
|---|---|
| active-text | limited to 50 octets in length |
| change-of-state-count | 0 to 4294967295 |
| description | limited to 50 octets in length |
| elapsed-active-time | 0 to 4294967295 |
| inactive-text | limited to 50 octets in length |
| minimum-off-time | 0 to 4294967295 |

| minimum-on-time | 0 to 4294967295 |
| notification-class | must be valid notification-class |
| time-delay | 0 to 4294967295 |

**Binary Value (STAT):**

1. Creatable?  NO
2. Deletable?  NO
3. Optional properties supported:
   - acked-transitions
   - active-text
   - alarm-value
   - change-of-state-count
   - change-of-state-time
   - description
   - elapsed-active-time
   - event-enable
   - inactive-text
   - minimum-off-time
   - minimum-on-time
   - notification-class
   - notify-type
   - reliability
   - time-delay
   - time-of-active-time-reset
   - time-of-state-count-reset
   - event-time-stamp
4. Writeable properties:
   - active-text
   - alarm-value
   - change-of-state-count
   - description
   - elapsed-active-time
   - event-enable
   - inactive-text
   - minimum-off-time
   - minimum-on-time
   - notification-class
   - notify-type
   - out-of-service
   - time-delay
5. Proprietary properties:  None
6. Range restrictions:

| Property | Restriction |
|---|---|
| active-text | limited to 50 octets in length |
| change-of-state-count | 0 to 4294967295 |
| description | limited to 50 octets in length |
| elapsed-active-time | 0 to 4294967295 |
| inactive-text | limited to 50 octets in length |
| minimum-off-time | 0 to 4294967295 |
| minimum-on-time | 0 to 4294967295 |
| notification-class | must be valid notification-class |
| time-delay | 0 to 4294967295 |

**Binary Value (MODULE ALARM):**

1. Creatable?  NO
2. Deletable?  NO
3. Optional properties supported:
   - acked-transitions
   - alarm-value
   - description
   - event-enable
   - event-time-stamps
   - notification-class
   - notify-type
   - time-delay
4. Writeable properties:
   - alarm-value
   - event-enable
   - notification-class
   - notify-type
   - out-of-service
   - time-delay
5. Proprietary properties:  None
6. Range restrictions:
   | | |
   |---|---|
   | notification-class | must be valid notification-class |
   | time-delay | 0 to 4294967295 |

**Calendar:**

1. Creatable?  NO
2. Deletable?  NO
3. Optional properties supported:
   description
4. Writeable properties:
   date-list

   description
5. Proprietary properties:  None
6. Range restrictions:
   date-list                                   limited to 30 BACnetCalendarEntrys
   description                                 limited to 50 octets in length

**Device:**

1. Creatable? NO
2. Deletable? NO
3. Optional properties supported:
   active-cov-subscriptions
   active-vt-sessions
   apdu-segment-timeout
   backup-failure-timeout
   configuration-files
   database-revision
   multi-max-master
   multi-max-info-frames
   multi-mstp-network-numbers
   description
   last-restore-time
   list_of_session_keys
   local_date
   local_time
   location
   max-segments-accepted
   vt-classes-supported
   utc-offset
   time-synchronization-recipients
   max-master
   max-info-frames
   last-restart-reason
   time-of-device-restart
   restart-notification-recipients
   utc-time-synchronization-recipients
   time-synchronization-interval
   align-intervals
   interval-offset

4. Writeable properties:
   object-identifier
   object-name
   location
   description
   local-time
   local-date
   utc-offset
   apdu-segment-timeout
   apdu-timeout
   number-of-apdu-retries
   time-recipient
   max-master
   max-master-frames
   multi-max-master
   multi-max-info-frames
   backup-failure-timeout
   last-restart-reason

restart-notification-recipients
utc-time-synchronization-recipients
time-synchronization-interval
align-intervals
interval-offset

5. Proprietary properties:

| Property no. | Property name |
|---|---|
| 4146 | file-free-size |
| 4147 | file-overhead-size |
| 4149 | auto-identity-scheme |
| 4150 | auto-identity-base |
| 4153 | serial-number |
| 4162 | test-mode |

6. Range restrictions:

| | |
|---|---|
| description | limited to 50 octets in length |
| location | limited to 50 octets in length |
| max-master | 1 to 127 |
| object-identifier | must be a valid device identifier |
| object-name | limited to 50 octets in length |
| utc-offset | -780 to 780 |
| last-restart-reason | limited to BACnetRestartReason |
| restart-notification-recipients | 0 to 10 BACnetRecipients |
| last-restart-reason | limited to BACnetRestartReason |

**File:**

1. Creatable?  NO
2. Deletable?  NO
3. Optional properties supported:
   description
4. Writeable properties:
   archive
   description
   file-type
   file-size
   modification-date
   read-only
5. Proprietary properties:  None
6. Range restrictions:

| | |
|---|---|
| description | limited to 50 octets in length |
| file-type | limited to 50 octets in length |

**Loop Object (BACnet PID)**:

1. Creatable? No
2. Deletable? No
3. Optional properties supported:
   Description
   Update_interval
   Proportional_constant
   Proportional_constant_units
   Integral_constant
   Integral_constant_units
   Derivative_constant
   Derivative_constant_units
   Bias
   COV_increment
4. Writable properties:
   Description
   Update_interval
   Action
   Proportional_constant
   Integral_constant
   Derivative_constant
   Bias
5. Proprietary properties:
   Continuous_proportional
   Deadband
   Ramp_time
6. Range Restriction:

| Property no. | Property name | Property Restrictions | DataType |
|---|---|---|---|
| 4163 | Continuous_proportional | Can only be 0 or 1 | Boolean |
| 4164 | Deadband | Must be >=0 | Real |
| 4165 | Ramp_time | Must be >=0 | Real |

**Multi-State Value (PAR):**

1. Creatable?  NO
2. Deletable?  NO
3. Optional properties supported:
   > acked-transitions
   > alarm-values
   > description
   > event-enable
   > event-time-stamps
   > fault-values
   > notification-class
   > notify-type
   > priority-array
   > reliability
   > relinquish-default
   > state-text
   > time-delay
4. Writeable properties:
   > alarm-values
   > description
   > event-enable
   > fault-values
   > notification-class
   > notify-type
   > out-of-service
   > present-value
   > relinquish-default
   > time-delay
5. Proprietary properties:  None
6. Range restrictions:

| | |
|---|---|
| description | limited to 50 octets in length |
| notification-class | must be valid notification-class |
| present-value | must be valid state |
| relinquish-default | must be valid state |
| time-delay | 0 to 4294967295 |

**Multi-State Value (CLOCK):**

1. Creatable?  NO
2. Deletable?  NO
3. Optional properties supported:
   > acked-transitions
   > alarm-values
   > description
   > event-enable
   > event-time-stamps
   > fault-values
   > notification-class
   > notify-type
   > priority-array
   > reliability
   > relinquish-default
   > state-text
   > time-delay
4. Writeable properties:
   > alarm-values
   > description
   > event-enable
   > fault-values
   > notification-class
   > notify-type
   > out-of-service
   > present-value
   > relinquish-default
   > time-delay
5. Proprietary properties:  None
6. Range restrictions:

   | | |
   |---|---|
   | description | limited to 50 octets in length |
   | notification-class | must be valid notification-class |
   | present-value | must be valid state |
   | relinquish-default | must be valid state |
   | time-delay | 0 to 4294967295 |

**Multi-State Value (STAT):**

1. Creatable?  NO
2. Deletable?  NO
3. Optional properties supported:
   - acked-transitions
   - alarm-values
   - description
   - event-enable
   - event-time-stamps
   - fault-values
   - notification-class
   - notify-type
   - reliability
   - state-text
   - time-delay
4. Writeable properties:
   - alarm-values
   - description
   - event-enable
   - fault-values
   - notification-class
   - notify-type
   - out-of-service
   - time-delay
5. Proprietary properties:  None
6. Range restrictions:

| | |
|---|---|
| description | limited to 50 octets in length |
| notification-class | must be valid notification-class |
| present-value | must be valid state |
| time-delay | 0 to 4294967295 |

**Notification Class:**

1. Creatable?  NO
2. Deletable?  NO
3. Optional properties supported:
   description
4. Writeable properties:
   ack-required
   description
   priority
   recipient-list
5. Proprietary properties:  None
6. Range restrictions:  None

| | |
|---|---|
| description | limited to 50 octets in length |
| recipient-list | limited to 5 BACnetDestinations |

**Program:**

1. Creatable? NO
2. Deletable? NO
3. Optional properties supported:
   - description
   - description-of-halt
   - instance-of
   - program-location
   - reason-for-halt
   - reliability
4. Writeable properties:
   - description
   - program-change
   - program-location
5. Proprietary properties: None
6. Range restrictions:

   | | |
   |---|---|
   | description | limited to 50 octets in length |
   | program-location | limited to 50 octets in length |

**Schedule (ENUM):**

1. Creatable?  NO
2. Deletable?  NO
3. Optional properties supported:
   - description
   - exception-schedule
   - weekly-schedule
4. Writeable properties:
   - description
   - effective-period
   - exception-schedule
   - priority-for-writing
   - weekly-schedule
   - list-of-prop-reference
   - schedule-default
   - reliability
   - out-of-service
5. Proprietary properties:  None
6. Range restrictions:

| | |
|---|---|
| description | limited to 50 octets in length |
| exception-schedule | limited to 30 BACnetSpecialEvents, each being limited to 6 BACnetTimeValues |
| present-value | 0 to 4294967295 |
| relinquish-default | 0 to 4294967295 |
| weekly-schedule | limited to 6 BACnetTimeValues per BACnetDailySchedule |
| schedule-default | 0 to 4294967295 |
| reliability | limited to 4 BACnetReliability |
| out-of-service | limited to Boolean |

**Schedule (UNS):**

1. Creatable?  NO
2. Deletable?  NO
3. Optional properties supported:
   > description
   > exception-schedule
   > weekly-schedule
4. Writeable properties:
   > description
   > effective-period
   > exception-schedule
   > priority-for-writing
   > weekly-schedule
   > list-of-prop-reference
   > schedule-default
   > reliability
   > out-of-service
5. Proprietary properties:  None
6. Range restrictions:

| | |
|---|---|
| description | limited to 50 octets in length |
| exception-schedule | limited to 30 BACnetSpecialEvents, each being limited to 6 BACnetTimeValues |
| present-value | 0 to 4294967295 |
| relinquish-default | 0 to 4294967295 |
| weekly-schedule | limited to 6 BACnetTimeValues per BACnetDailySchedule |
| schedule-default | 0 to 4294967295 |
| reliability | limited to 4 BACnetReliability |
| out-of-service | limited to Boolean |

**Trend-log (of a non-BACnet property, COV or polled):**

1. Creatable?  NO
2. Deletable?  NO
3. Optional properties supported:

   acked-transitions
   client-cov-increment
   cov-resubscription-interval
   description
   event-enable
   event-time-stamps
   last-notify-record
   log-interval
   notification-class
   notification-threshold
   notify-type
   records-since-notification
   start-time
   stop-time
   align-intervals
   interval-offset
   reliability

4. Writeable properties:

   buffer-size
   client-cov-increment
   cov-resubscription-interval
   description
   event-enable
   log-enable
   log-interval
   notification-class
   notification-threshold
   notify-type
   record-count
   start-time
   stop-time
   stop-when-full

5. Proprietary properties:  None
6. Range restrictions:

| | |
|---|---|
| description | limited to 50 octets in length |
| log_interval | 0 to 4294967295 |
| notification_class | must be valid notification_class |
| notification_threshold | 0 to 4294967295 |
| record_count | can only be written to 0 |
| logging-type | limited to 3 BACnetLoggingType |
| align-intervals | limited to Boolean |
| interval-offset | 0 to 4294967295 in hundredths of seconds |

| trigger | limited to Boolean |
|---------|--------------------|
| reliability | limited to 4 BACnetReliability |

**Trend-log (of a non-BACnet property, triggered):**

1. Creatable?  NO
2. Deletable?  NO
3. Optional properties supported:
   - acked-transitions
   - client-cov-increment
   - cov-resubscription-interval
   - description
   - event-enable
   - event-time-stamps
   - last-notify-record
   - log-interval
   - notification-class
   - notification-threshold
   - notify-type
   - records-since-notification
   - start-time
   - stop-time
   - reliability
   - trigger

4. Writeable properties:
   - buffer-size
   - client-cov-increment
   - cov-resubscription-interval
   - description
   - event-enable
   - log-enable
   - notification-class
   - notification-threshold
   - notify-type
   - record-count
   - start-time
   - stop-time
   - stop-when-full
   - trigger

5. Proprietary properties:  None
6. Range restrictions:

| description | limited to 50 octets in length |
|-------------|-------------------------------|
| log_interval | 0 to 4294967295 |
| notification_class | must be valid notification_class |
| notification_threshold | 0 to 4294967295 |
| record_count | can only be written to 0 |

| logging-type | limited to 3 BACnetLoggingType |
| align-intervals | limited to Boolean |
| interval-offset | 0 to 4294967295 in hundredths of seconds |
| trigger | limited to Boolean |
| reliability | limited to 4 BACnetReliability |