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# BACnet Protocol Implementation Conformance Statement (PICS)

Date: May 2, 2017
Vendor Name: Lutron Electronics Co., Inc.
Product Name: Quantum BACnet Integration
Applications Software Version: 2.0
Firmware Revision: 3.2
BACnet Protocol Revision: 4
Vendor ID: 176



## Product Description

BACnet IP is embedded in the Quantum processor. There are two types of BACnet devices available in Quantum subsystem devices and area devices:

- The subsystem devices are physical BACnet devices; typically, one per floor of the building.
- The area devices are virtual BACnet devices, typically one per area of the floor. It is typical to have multiple subsystem devices and area devices in a Quantum system. Areas devices are routed through the subsystem device which is also a BACnet router.

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

| | | |
|---|---|---|
| K.1.2 BIBB | Data Sharing | ReadProperty-B (DS-RP-B) |
| K.1.4 BIBB | Data Sharing | ReadPropertyMultiple-B (DS-RPM-B) |
| K.1.8 BIBB | Data Sharing | WriteProperty-B (DS-WP-B) |
| K.1.10 BIBB | Data Sharing | WritePropertyMultiple-B (DS-WPM-B) |
| K.1.12 BIBB | Data Sharing | COV-B (DS-COV-B) |
| K.5.2 BIBB | Device Management | DynamicDeviceBinding-B (DM-DDB-B) |
| K.5.4 BIBB | Device Management | DynamicObjectBinding-B (DM-DOB-B) |
| K.5.6 BIBB | Device Management | DeviceCommunicationControl-B (DM-DCC-B) |

## BACnet Standardized Device Profile (Annex L):

BACnet Application Specific Controller (B-ASC)

## Segmentation Capability:

Segmented requests supported? No. Window Size: n/a
Segmented responses supported? No. Window Size: n/a

## Non-Standard Application Services:

Non-standard application services are not supported.



| Job Name: | Model Numbers: | |
|---|---|---|
| | | |
| Job Number: | | |

### Standard Object Types Supported:

*Device*

1. Dynamically creatable using BACnet CreateObject service? No.
2. Dynamically deletable using BACnet DeleteObject service? No.
3. List of optional properties supported: Active COV_Subscriptions, Description, Location, Profile_Name.
4. List of all properties that are writable where not otherwise required by this standard: None.
5. List of proprietary properties: None.
6. List of any property value range restrictions: None.

*Analog Value*

1. Dynamically creatable using BACnet CreateObject service? No.
2. Dynamically deletable using BACnet DeleteObject service? No.
3. List of optional properties supported: COV_Increment. (See Table for objects that support this property)
4. List of all properties that are writable where not otherwise required by this standard: None.
5. List of proprietary properties: None.
6. List of any property value range restrictions: See Table.

*Binary Value*

1. Dynamically creatable using BACnet CreateObject service? No.
2. Dynamically deletable using BACnet DeleteObject service? No.
3. List of optional properties supported: Active_Text, Inactive_Text.
4. List of all properties that are writable where not otherwise required by this standard: None.
5. List of proprietary properties: None.
6. List of any property value range restrictions: See Table.

*Multi-State Value*

1. Dynamically creatable using BACnet CreateObject service? No.
2. Dynamically deletable using BACnet DeleteObject service? No.
3. List of optional properties supported: State_Text.
4. List of all properties that are writable where not otherwise required by this standard: None.
5. List of proprietary properties: None.
6. List of any property value range restrictions: See Table.

### Data Link Layer Options:

BACnet IP

### Device Address Binding:

Is static device binding supported? No.

### Networking Options:

BACnet/IP Annex J — non-BBMD functionality; the Quantum processor is able to register as a foreign device. The Quantum processor is able to initiate original-broadcast-NPDU.

### Character Sets Supported:

Indicating support for multiple character sets does not imply that they can all be supported simultaneously.

- ANSI X3.4

### BACnet Routing:

Routes between the connected physical BACnet network and a virtual BACnet network.

Router_Busy flag is supported to indicate when router is operational but currently cannot respond.



| Job Name: | Model Numbers: | |
|---|---|---|
| | | |
| Job Number: | | |

| Object Name | Type | Instance | Read | Write | COV | Units | Min PV | Max PV | Inactive Text (0) | Active Text (1) | State Text (Multi-State) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| {Subsystem Name} {Device Instance Number} | DEVICE | Same as device instance number | X | — | — | — | — | — | — | — | — |
| | Notes: The System Name is the logical name of one of the Quantum system's subsystems that typically corresponds to a physical portion of the building, such as a floor. The Instance is the same as the unique Device ID assigned to each subsystem. {SubsystemName} is a text string defined in the Lutron Quantum system configuration software. {DeviceInstanceNumber} is a number defined in the Lutron Quantum system configuration software that is equal to the {Base} number + {System} number +1. {Base} is a 22-bit value set in the Lutron Quantum system configuration software (default 1760000). {System} is an 8-bit value set in the Lutron Quantum system configuration software (0 to 127). | | | | | | | | | | |
| Master Loadshed Enabled | BV | 2 | X | X | X | — | 0 | 1 | Disabled | Enabled | — |
| | Notes: This value determines whether all of the areas in the Quantum subsystem are being controlled via load shedding. When this value is set to Enabled, for all areas in the subsystem that have loadshed allowed, any dimmable lights in each area that are turned On will have their light level reduced by the percentage specified in the loadshed goal value. When Disabled, the lights will dim to their commanded level. | | | | | | | | | | |
| Master Hyperion Enabled | BV | 3 | X | X | X | — | 0 | 1 | Disabled | Enabled | — |
| | Notes: When the Master Hyperion Enabled feature is set to Enabled, for all areas in the Quantum subsystem that have Hyperion configured, the Hyperion feature will control the Lutron Sivoia QS roller shades and set their level automatically depending on the position of the sun. When the Master Hyperion feature is set to Disabled, in all areas of the subsystem, the shades will not be controlled automatically by the Hyperion feature and will not respond to radio window sensors. | | | | | | | | | | |
| Roof-Mount Cloudy Day Sensor: Subsystem Status | BV | 4 | X | X | X | — | 0 | 1 | Dark | Sunny | — |
| | Notes: A Lutron roof-mounted, wired Cloudy Day sensor or a BMS system sensor is used to override all Hyperion controlled shades in the subsystem. Sunny indicates that the Hyperion feature is in control of the shades; Dark indicates that the shades are overridden to open. This feature is independent of the radio window sensor feature. | | | | | | | | | | |

*(continued on next page)*

BV = Binary-Value
PV = Present-Value

| Object Name | Type | Instance | Read | Write | COV | Units | Min PV | Max PV | Inactive Text (0) | Active Text (1) | State Text (Multi-State) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| {TimeclockName} Enabled | BV | 1000 to 1999 | X | X | X | — | 0 | 1 | Disabled | Enabled | — |
| Notes: For each timeclock in the Quantum system, there will be one instance number in the range from 1000 to 1999, that can either Enable or Disable that timeclock in the subsystem, or query its current enable state.<br>Please note that for each such instance, there will be a corresponding instance at the same offset but within the range from 2000 to 2999, a {TimeclockName} Enable Command object, similar but with more functionality.<br>Please note that if there are multiple subsystems, the instance number representing an individual timeclock appears in each subsystem's BACnet system device. To enable or disable the timeclock for all subsystems, write to the same instance number in each subsystem's BACnet system device.<br>Write with 0 to Disable Permanently. The timeclock will no longer affect objects in the subsystem.<br>Write with 1 to Enable Without Catch Up. The timeclock will affect objects in the subsystem as programmed, but only starting with future events.<br>Read {TimeclockName} Enabled will return 0 (Disabled) if the last {TimeclockName} Enable Command was any of the following:<br>• Disable Permanently<br>• Disable Until End of Day Without Catch Up<br>• Disable Until End of Day With Catch Up<br>Read {TimeclockName} Enabled will return 1 (Enabled) if the last {TimeclockName} Enable Command was any of<br>• Enable Without Catch Up<br>• Enable With Catch Up<br>• Enable and Run Previous Event Only<br>{TimeclockName} is a text string defined in the Lutron Quantum system configuration software | | | | | | | | | | | |

BV = Binary-Value
PV = Present-Value

| Object Name | Type | Instance | Read | Write | COV | Units | Min PV | Max PV | Inactive Text (0) | Active Text (1) | State Text (Multi-State) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| {TimeclockName} Enable Command | MSV | 2000 to 2999 | X | X | X | — | 1 | 6 | — | — | 1 = Disable Permanently<br>2 = Disable Until End of Day Without Catch Up<br>3 = Disable Until End of Day With Catch Up<br>4 = Enable Without Catch Up<br>5 = Enable With Catch Up<br>6 = Enable and Run Previous Event Only |
| Notes: For each timeclock in the Quantum system, there will be one instance number in the range from 2000 to 2999, that can either Enable or Disable that timeclock in the subsystem, or query its current enable state.<br>Please note that for each such instance, there will be a corresponding instance at the same offset but within the range from 1000 to 1999, a {TimeclockName} Enabled object, similar but with less functionality.<br>Please note that if there are multiple subsystems, the instance number representing an individual timeclock appears in each subsystem's BACnet system device. To enable or disable the timeclock for all subsystems, write to the same instance number in each subsystem's BACnet system device.<br>WRITING:<br>Write with 1 to Disable Permanently. The timeclock will no longer affect objects in the subsystem.<br>Write with 2 to Disable Until End of Day Without Catch Up. The timeclock will not affect objects in the subsystem until midnight, at which time it will affect objects in the subsystem as programmed, but only starting with future events.<br>Write with 3 to Disable Until End of Day With Catch Up. The timeclock will not affect objects in the subsystem until midnight, at which time it will "catch up", or set objects in the subsystem to the net state that would have occurred had the timeclock been enabled the whole time. Thereafter, it will affect objects in the subsystem as programmed.<br>Write with 4 to Enable Without Catch Up. The timeclock will affect objects in the subsystem as programmed, but only starting with future events.<br>Write with 5 to Enable With Catch Up. The timeclock will "catch up", or set objects in the subsystem to the net state that would have obtained had the timeclock never been disabled (accounting for missed events for up to the last seven days). Thereafter, it will affect objects in the subsystem as programmed.<br>Write with 6 to Enable and Run Previous Event Only. The timeclock will run only the single last scheduled event. Thereafter, it will affect objects in the subsystem as programmed.<br>READING:<br>If timeclock state was last changed by writing to {TimeclockName} Enable Command any of:<br>• Disable Permanently<br>• Disable Until End of Day Without Catch Up<br>• Disable Until End of Day With Catch Up<br>Read thereof will return the same (1, 2, or 3). If timeclock state was last changed by writing to {TimeclockName} Enable Command was any of:<br>• Enable Without Catch Up<br>• Enable With Catch Up<br>• Enable and Run Previous Event Only<br>Read thereof will return the same (4, 5, or 6).<br>If timeclock state was last changed by writing 0 to the {TimeclockName} Enabled instance, then read of {TimeclockName} Enable Command will return 1 (Disable Permanently).<br>If timeclock state was last changed by writing 1 to the {TimeclockName} Enabled instance, then read of {TimeclockName} Enable Command will return 4 (Enable Without Catch Up).<br>{TimeclockName} is a text string defined in the Lutron Quantum system configuration software | | | | | | | | | | |
| {VariableName} Current Variable State | MSV | 4000 to 4999 | X | X | X | — | 1 | {Variable State Count} | — | — | {StateName} |
| Notes: The current value of a "State Variable". The State Variable can be used during the evaluation of conditional logic on button programming as configured in the Quantum system configuration software. The number of states, as well as the state names, must be configured inside the Quantum system configuration software. {VariableName} is a text string defined in the Lutron Quantum system configuration software. {VariableStateCount} is the number of states defined for this variable in the Lutron Quantum system configuration software. {StateName} is a text string defined in the Lutron Quantum system configuration software. | | | | | | | | | | | |

BV = Binary-Value, MSV = Multi-State-Value
PV = Present-Value



| Job Name: | Model Numbers: | |
|---|---|---|
| | | |
| Job Number: | | |

| Object Name | Type | Instance | Read | Write | COV | Units | Min PV | Max PV | Inactive Text (0) | Active Text (1) | State Text (Multi-State) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| {Timeclock Name} / {Timeclock Event} Enabled | BV | 5000 to 5999 | X | X | X | — | 0 | 1 | Disabled | Enabled | — |
| | Notes: For each timeclock event in the Quantum subsystem, there will be one instance in the range of 5000 to 5999 that can be used to enable or disable the individual events in the timeclock. Note that each timeclock may contain more than one event. Also note that the timeclock Event Enabled, Hour, and Minute Instances are all correlated to each other by the last 3 digits of the instance number. {TimeclockName} is a text string defined in the Lutron Quantum system configuration software. | | | | | | | | | | |
| {Timeclock Name} / {Timeclock Event} Hour | AV | 6000 to 6999 | X | X | X | Hours | 0 | 23 | N/A | N/A | — |
| | Notes: For each timeclock event in the Quantum subsystem, there will be one instance in the range of 6000 to 6999 that can be used to set the hour at which each timeclock event will occur. The hour is set in the 24 hour format (0 = 12 midnight). Note that each timeclock may contain more than one event. Note that each timeclock may contain more than one event. Also note that the timeclock Event Enabled, Hour, and Minute Instances are all correlated to each other by the last 3 digits of the instance number. {TimeclockName} is a text string defined in the Lutron Quantum system configuration software. | | | | | | | | | | |
| {Timeclock Name} / {Timeclock Event} Minute | AV | 7000 to 7999 | X | X | X | Minutes | 0 | 59 | N/A | N/A | — |
| | Notes: For each timeclock event in the Quantum subsystem, there will be one instance in the range of 7000 to 7999 that can be used to set the minute at which each timeclock event will occur. The minute of the event can be set from 0 to 59. Note that each timeclock may contain more than one event. Also note that the timeclock Event Enabled, Hour, and Minute Instances are all correlated to each other by the last 3 digits of the instance number. {TimeclockName} is a text string defined in the Lutron Quantum system configuration software. | | | | | | | | | | |

BV = Binary-Value, AV = Analog-Value
PV = Present-Value





Job Name:

Job Number:

Model Numbers: