

BACnet® Protocol Implementation Conformance Statement (PICS)

Date: July 4, 2012

Vendor Name: Lutron Electronics Co., Inc.

Product Name: Quantum® BACnet® Integration

Applications Software Versions: 2.0

Firmware Revisions: 2.0, 2.1, 2.2, and 2.3

BACnet® Protocol Revision: 4

Vendor ID: 176



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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 main BACnet® devices; typically, one main device per floor of the building. The area devices are virtual BACnet® devices of the subsystem device, typically one per room of the building. It is normal to have multiple subsystem devices and virtual devices in a project.

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)

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.**
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 the BACnet® CreateObject service? **No.**
2. Dynamically deletable using BACnet® DeleteObject service? **No.**
3. List of optional properties supported: **Reliability, 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: **Reliability, 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: **Reliability, 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:

Other: These devices are virtual devices and are represented by a six octet address equal to the 48-bit device instance of the virtual device.

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

Job Name: Job Number:	Model Numbers:
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Object Name	Type	Instance	Read	Write	COV	Units	Min PV	Max PV	Inactive Text (0)	Active Text (1)	State Text (Multi-State)	Notes
{AreaName} {Instance}	DEVICE	{Base} + {System} + 1	X	—	—	—	—	—	—	—	—	The Area Name is the logical name that typically corresponds to a physical location in a building. The Instance is the same as the unique Device ID assigned to each area.
Lighting Level	AV	2	X	X	—	%	0	100	—	—	—	The intensity level of all lighting fixtures in the area. The light level will be an analog value between 0% and 100%. If the lighting fixtures in the area are at different light levels, this value will be set to the level of the highest intensity in that area.
Lighting State	BV	3	X	X	X	—	0	1	Off	On	—	The Lighting State will be on if any of the lighting fixtures in the area are in the On state; if all lighting fixtures are off, the Lighting State will be set to Off.
Lighting Scene	MSV	4	X	X	—	—	1	Number of scenes defined for this area in Q-Design	—	—	{SceneName}	Displays to which lighting preset the lighting fixtures in that area are currently set. If the value is set to 1, the Off Scene will be selected, which will turn all lights off. All other scenes are defined within the Quantum® software suite. If lights are currently not set to a valid lighting scene, the value will be set to an unknown preset level.
Daylighting Enabled	BV	5	X	X	—	—	0	1	Disabled	Enabled	—	When set to Enabled, any daylight sensors programmed to control that area will limit the light level that the lighting fixtures in the area can produce. When set to Disabled, daylight sensors will not affect the lighting fixtures in that area.
Daylighting Level	AV	6	X	X	—	%	0	100	—	—	—	A target value between 0% and 100% that limits all lighting fixtures in the area that are controlled by a daylight sensor to a maximum value when daylighting is enabled. When set to 100%, lights will be at their maximum level. When set to 0%, lights will be at their minimum level.
Permanently Disable Occupancy	BV	7	X	X	—	—	0	1	False	True	—	When set to True, occupancy sensors will not affect the lights in the area. When set to False, occupancy sensors will affect the lights in the area as programmed.

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AV = Analog-Value, BV = Binary-Value, MSV = Multi-State-Value

{AreaName} is a text string defined in the Lutron® Quantum® system configuration software

{Instance} 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)

{SceneName} is a text string of the name of each scene that is defined in the Lutron® Quantum® system configuration software

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)	Notes
Occupancy State	MSV	8	X	—	X	—	1	4	—	—	1 = Unoccupied 2 = Occupied 3 = Inactive 4 = Unknown	A read-only property that indicates the occupancy of the entire area. Occupied means that at least one sensor in the area is indicating occupancy. Unoccupied means that all of the sensors in the area are indicating unoccupied. Inactive indicates that the area is controlled by Afterhours programming, not occupancy sensor-controlled, and that Afterhours mode is not currently active. Unknown indicates that not all of the sensors in the area have reported their status.
Unoccupied Level	AV	9	X	X	—	—	0	216	—	—	—	The light level to which the lights in the area will be set when an area transitions to unoccupied. Values: 0 = Off (default) 1-100 = Light Level Percentage 101 = Unaffected 102 = Daylighting 200 = Off Scene, 201-216 = Scene 1 through 16
Occupied Level	AV	10	X	X	—	—	0	216	—	—	—	The light level to which the lights in the area will be set when an area transitions to occupied. Values: 0 = Off 1-100 = Light Level Percentage 101 = Unaffected, 102 = Daylighting, 200 = Off Scene, 201-216 = Scene 1 through 16
Additional Occupied Timeout	AV	11	X	X	—	min	0	42	—	—	—	After all sensors in the area indicate unoccupied, this value will indicate the number of additional minutes that the system will wait before changing the lights to the unoccupied level. Note: the sensor itself has a built-in timeout as well.
Loadshed Allowed	BV	12	X	X	—	—	0	1	No	Yes	—	When loadshed is Enabled, determines whether the area is being controlled via load shedding. When set to Yes, any dimmable lights in the area that are turned on will have their light level reduced by the percentage specified in the Loadshed Goal value. When set to No, the lights will dim to their commanded level.
Loadshed Goal	AV	13	X	X	—	—	0	90	—	—	—	The percentage by which the light level will be reduced when Loadshed Allowed is set to True. Range: 0% to 90%

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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)	Notes
Occupancy Mode	MSV	14	X	X	—	—	1	4	—	—	1 = Inactive 2 = Occupancy and Vacancy 3 = Vacancy 4 = Not Applicable	Allows the way that the occupancy sensors control the lights to be easily modified. When set to Inactive, the occupancy sensor will not control the lights in the area. When set to Occupancy & Vacancy, the sensors will turn lights to their occupied level when occupied and to their unoccupied level when unoccupied. When set to Vacancy, the sensors will turn lights off only when an area changes to unoccupied. Not Applicable indicates that the area is not controlled by occupancy sensors.
Number of Lamp Failures	AV	15	X	—	X	—	0	none	—	—	—	For all digitally-controlled EcoSystem® or DALI® ballasts controlled by an Energi Savr Node™ or Quantum® Bus Supply, the number of lamp failures in the area will be displayed. If the value is 0, there are no lamp failures for the area.
Number of Devices Not Responding	AV	16	X	—	X	—	0	none	—	—	—	For any QS device, Quantum® Bus Supply, and EcoSystem® or DALI® digital ballast controlled by an Energi Savr Node™, Quantum® Bus Supply, or Circuit Selector, the number of devices that are programmed into the system but are not responding will be displayed. If the value is 0, there are no device failures for the area.
Hyperion™ Enabled	BV	17	X	X	—	—	0	1	Disabled	Enabled	—	When set to Enabled, the Hyperion™ feature of the Quantum® system will control the Lutron® Sivoia® QS roller shades and set their level automatically depending on the position of the sun. When set to Disabled, in an area of the subsystem, the shades will not be controlled automatically by the Hyperion™ feature.
Total Power	AV	18	X	—	X	watts	0	none	—	—	—	A calculated value that indicates the total instantaneous power consumption for all of the lighting loads in the area.
Maximum Power	AV	19	X	—	—	watts	0	none	—	—	—	The maximum connected lighting load of the area. This value is the maximum value that Total Power can achieve. Maximum Power minus Total Power equals the power being saved.

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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)	Notes
Hyperion™ mode Sunny or Dark	BV	20	X	X	—	—	0	1	Dark	Sunny	—	A Lutron® roof-mounted, wired Cloudy Day sensor or a BMS system sensor is used to override all Hyperion™ controlled shades in the area. 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 window shadow sensor feature.
{ZoneName} Level	AV	1000 to 1999	X	X	—	%	0	100	—	—	—	The light level intensity of a specific zone of lighting within an area. The light level will be an analog value between 0% and 100%. There can be multiple lighting zones defined within each area. Each lighting fixture in the area will be assigned to one and only one lighting zone. Each will have a unique instance ID from 1000 to 1999.
{ShadeGroupName} Level	AV	2000 to 2999	X	X	—	%	0	100	—	—	—	The shade level of a specific shade group of Lutron® Sivoia® QS shades within an area. The shade level will be an analog value between 0% and 100%. 100% equals fully open; 0% equals fully closed. There can be multiple shade groups within each area; each will have a unique instance ID from 2000 to 2999.
{ShadeGroupName} Preset	MSV	3000 to 3999	X	X	—	—	1	34	—	—	{PresetName}	Displays to which shade preset the shade motors of each shade group in an area are currently set. If the value is set to 1, the shade group will be Open. If the value is 31, the group will be Closed. If a preset is not selected, the shade group preset will be set to an unknown preset value. All other states are defined through the Quantum® software suite.

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{ZoneName} is a text string defined in the Lutron® Quantum® system configuration software

{ShadeGroupName} is a text string defined in the Lutron® Quantum® system configuration software

{PresetName} is a text string defined in the Lutron® Quantum® system configuration software

PV = Present-Value

Job Name:	Model Numbers:
Job Number:	