The Lutron® Quantum® system is the total light management system that incorporates lighting controls, motorized window shades, digital ballasts and LED drivers, centralized dimming and switching panels, and sensors together under one system/software umbrella. It is a processor-based system and the processor(s) reside in the hubs shown in the diagram above. In a typical building, you will typically have at least 1 hub per floor connected over the building network or a dedicated network for the lighting system.

The Quantum® system can seamlessly and reliably integrate with other building systems. The BACnet/IP protocol is the primary means of integration. BACnet is embedded or native in the Quantum® processors, which means no external interfaces or gateways are required in order to communicate with other systems. Only a single point of connection is needed on the Quantum® network for total and complete communication to the entire system. The diagram above shows a Quantum® server which is used for historical data logging for the reports used in the Quantum® software. It is NOT required for BACnet integration; only a Lighting Management Hub is required.

Additionally, the Quantum® system has been tested by BACnet Testing Laboratories (BTL) and is certified to comply with all of their necessary interoperability requirements.

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The Automated Logic® WebCTRL® integration with third party mechanical and electrical building subsystems is easy due to its open architecture and support for industry standards. The WebCTRL® system is capable of supporting multiple protocols over a TCP/IP network allowing many equipment items to be connected directly to the main WebCTRL® backbone. Equipment using BACnet can be connected to an IP, ARCNET, MS/TP, or Point to Point (PTP) network segment. The Open Systems Integration from Automated Logic® allows for seamless interconnection to equipment using BACnet, Modbus, N2, JBUS, or LonWorks, as well as an extensive list of proprietary protocols.

Automated Logic® continually develops innovative third party integration solutions to add to their integration resume. Please contact your local Automated Logic® dealer for a current listing of all integration applications or to discuss your custom integration requirements.
Integration Overview

An Automated Logic® WebCTRL® server and an LGR High Speed router are used to monitor and control the Lutron® Quantum® lighting system using the BACnet protocol. The BACnet protocol is a non-proprietary open communication software standard published by ASHRAE.

Topology

Communication Protocol

- Communication between Automated Logic® and Lutron® is BACnet/IP
- BACnet/IP uses Broadcast UDP and Peer-to-Peer UDP on any standard Ethernet network

BACnet Testing Laboratories Listing

Automated Logic® and Lutron® devices are BTL Listed:

- WebCTRL® Server is BTL-Listed as B-AWS
- LGR High Speed Router is BTL-Listed as B-BC
- Lutron® Quantum® Lighting Control System is BTL-Listed as B-ASC
How to Set Up Integration:

What needs to be done in the Lutron® Quantum® system

1. BACnet is native to the Quantum® processor. However, in order to enable this capability, a BACnet software license must be purchased for the job.

2. With the BACnet software license, the Lutron® service representative will turn on the BACnet capability during system startup.

3. If the Quantum® processor and Automated Logic® systems are not on the same subnet, a BACnet Broadcast Management Device (BBMD) is required by the integrator. The Quantum® processor supports foreign device registration of BBMD. The IP address of the BBMD should be given to the Lutron® field service representative during setup (if required).

What needs to be done in the WebCTRL® system

1. BACnet is also native to the WebCTRL® system but no additional license is required as all necessary licenses are included with each copy of the WebCTRL® system.

2. In order to interface with a Lutron® Quantum® System, an Automated Logic® engineer would:
   - Gather lighting monitoring, control and trending requirements from the Lutron® representative.
   - Create a Logicbuilder program that reflects those requirements.
   - Download the program into an Automated Logic® controller.
   - Address each network interface point with the appropriate Lutron® BACnet address.
   - Link each BACnet point to the Lutron® Quantum® hub and test operation.

3. The Automated Logic® engineer will likely need to make BACnet adjustments based on system size. Details of such adjustments are in the “Lutron® Lighting Integration Guide” published by Automated Logic®.

4. Much of the Lutron® system information can also be displayed graphically in the WebCTRL® front end. The Automated Logic® engineer can collaborate with the local Lutron® representative to create such graphics.

What to Integrate:

Data Sharing

Lutron® exposes objects as Analog objects, Binary objects and Multi-State objects. This allows Automated Logic® applications like WebCTRL® Graphics to use BACnet services to monitor and command the objects.

Most devices and objects from the Lutron® system are virtual BACnet objects. Virtual devices are area-based so they correspond to a geographical area of the building (e.g., conference room, private office, etc.). Virtual device names are job specific and created at the time of Lutron® database creation, which is done in-house at Lutron® just prior to startup. To simplify the integration process, it is recommended that the integrator and Lutron® field service representative coordinate on area naming conventions. For a summary of Lutron® BACnet objects, naming conventions, and functionality, reference the additional tables located in the Lutron® BACnet PIC statement. To get the latest PICS statement that corresponds to the Quantum® software version you are running, contact any Lutron® representative or find them at www.lutron.com/quantum under the “Product Specification Submittals” section.

BACnet Scheduling

Lutron does not currently support the BACnet Schedule Object. There are two approaches that can be employed for scheduling the Quantum® system.

Approach 1: The Automated Logic® WebCTRL® supports the Schedule which can be used to directly command the Lutron® objects. The Schedule can be viewed and modified using WebCTRL® Scheduler application.

Approach 2: The Lutron® Quantum® system can support the schedule and the Quantum Vue™ software can be used to view and modify events. The Automated Logic® system can enable/disable an entire timeclocks, per subsystem, through BACnet binary objects.
BACnet Trending

Lutron does not support the BACnet Trend Log object. However, Lutron’s system does share historical information (e.g., power usage, occupancy, etc.) through binary, analog, and multi-state objects, which can be used for trending. The LGR supports the Trend Log object which can trend the Lutron® lighting objects. The Trend Log object data is archived by the WebCTRL® system. The reporting module within Lutron® Quantum Vue™ software can also be used to view historical trends of these objects.

BACnet Alarming

Lutron does not support the alarming object. However, the Lutron® system does share asset and maintenance data appropriate for alarms (e.g., lamp failure, ballast failures, low battery failures on wireless devices, etc.) through binary, analog, and multi-state objects. The LGR supports the Event Enrollment object which can be used to alarm the Lutron® objects to display in the Alarm Status or Graphics application at WebCTRL®. The alerts module within Lutron® Quantum Vue™ software can also be used to configure and view alerts.

Common Integration Examples

• A BMS system can trigger loadshed events in the Quantum® system. In particular, WebCTRL® supports the OpenADR protocol through an add-on program which can be used to communicate with utility companies and participate in automated demand reduction events. The fact that WebCTRL® can now manage the lighting load as well as the HVAC load may enable the customer to negotiate better utility rates.

• Occupancy sensor status can be shared with the HVAC system to set back temperatures and minimize ventilation when areas become unoccupied.

• Quantum® energy usage information can be shared with the BMS to eliminate the need to add costly energy meters.

Lessons Learned:

Important Integration Notes:

• Use BACnet/IP to integrate to Lutron®. Do not use BACnet MS/TP.

• To simplify the integration process, it is recommended that the integrator and Lutron® field service representative or project manager assigned to the job coordinate on area/point naming conventions when designing the job. This will make it easier to align the Lutron® lighting zones with the WebCTRL® GEO tree and to integrate lighting and HVAC control, but it cannot be done if this coordination is postponed until installation.

• Coordinate with Lutron to disable Lutron® schedule if BACnet schedules are used.

• “Who-Is” requests should be separated by a minimum of 10 seconds. More frequent requests may cause communication issues due to the number of points available in the Lutron® system through a single IP address.

Key contacts if you need assistance on a job:

Lutron®:

Pre-Sale Support: systemsalesengineers@lutron.com
Post-Sale Support: 1.800.523.9466; systemsupport@lutron.com

Automated Logic®:

Your local Automated Logic® representative.
A list can be found on: http://www.automatedlogic.com/locations/
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