LUTRON

Integrating Audio Visual Control Systems with Quantum Systems

Overview

A Quantum system is capable of integrating with Audio/Visual (A/V) control systems using multiple methods including, Ethernet TCP/IP, serial RS-232, BACnet/IP, and contact closures. This application note provides details for each of the integration methods, the control/monitoring capabilities available to the A/V control system, and recommended design practices.

Inputs To and Feedback From the Quantum System

Telnet

Telnet is a two-way, text based application layer protocol. It can be used on a variety of physical layers. In Quantum, the QSE-CI-NWK-E control interface can use either RS-232 or Ethernet as the physical layer. The Quantum processor can only use Ethernet. Telnet connections to the QSE-CI-NWK-E or processor can send/receive commands to/from the Quantum system. This connection can be used to simulate button presses, monitor real button presses, control light levels, monitor light levels, and more. For full capabilities see the Lutron Integration Protocol document at www.lutron.com/TechnicalDocumentLibrary/040249.pdf

QSE-CI-NWK-E

The QSE-CI-NWK-E can connect to A/V control systems via Ethernet (RJ45) or RS-232 (DB9). The QSE-CI-NWK-E has two Telnet connections that have predetermined logins (found in the Lutron Integration Protocol document) that cannot be changed. Any input to the QSE-CI-NWK-E is capable of controlling anything in a maximum of 10 areas on the same Quantum subsystem. Up to 10 QSE-CI-NWK-E devices can be on a QS link. More information can be found at:

www.lutron.com/TechnicalDocumentLibrary/qse-ci-nwk-e_ENG_24_09_2009.pdf

Quantum Processor

The Quantum processor supports up to 16 Telnet connections per Quantum processor. A subsystem consists of a maximum of 16 processors. The Telnet logins are configurable. Each Quantum system can have 16 configurable logins; however, each processor can have 16 unique connections. For example, it is possible to have 2 processors and each processor has 16 unique connections over Telnet; however, the logins are the same for both processors. Since the processors have unique IP addresses it is possible to connect to them independently. Since the Quantum processor only supports the Ethernet physical layer, the processor and the device that is connecting to it (via Telnet) must both be on the same network. If they are on separate Virtual Local Area Networks (VLANs), successful connection will require coordination between the local IT department, the A/V integrator, and Lutron Field Service. An integration meeting held prior to the installation of the system is recommended. For more information about this meeting, see the LSC-INT-VISIT document at www.lutron.com/TechnicalDocumentLibrary/3601225a.pdf

If RS-232 is needed, either a QSE-CI-NWK-E can be used or a converter (by others) can be used to convert to Ethernet. There are many devices that have this capability; however, two devices that Lutron has had success with are Digi One SP and B&B Electronics ES1A converters. Lutron does not take responsibility for the configuration, operation, or maintenance of these devices.

Design Considerations when using Telnet

Telnet connections to a Quantum processor may be shut down by a router on the network if the router does not hear TCP traffic. Early coordination with the IT department can avoid these issues.

The Quantum processor has faster response times than the QSE-CI-NWK; however, both devices can be slowed down by network traffic. To avoid traffic concerns, the QSE-CI-NWK has the ability to be on an isolated network or a direct RS-232 connection.

A QSE-CI-NWK is a good solution for room by room integration, or if RS-232 is needed. If integration requires control of large sections of a system, connecting directly to the Quantum processor offers better performance, more logins, and login flexibility.

Inputs To and Feedback From the Quantum System (continued)

BACnet

The Quantum processor is BACnet Testing Laboratory (BTL) listed device and a BACnet Application Specific Controller (B-ASC). The processor functions as a BACnet server (-B side) and can respond to client requests as well as transmit based on Change of Value (COV). Detailed Protocol Implementation Conformance Statements (PICS) are available **here**.

Many objects in the Quantum PICS support Change of Variable (COV) subscriptions. This allow the Quantum processor to proactively update a subscribed device when the state of the object changes. For example, when the occupancy state of a room changes, the processor can automatically relay that information over BACnet/IP to other controllers on the network.

Clause 22 of the BACnet standard requires 3rd party testing (e.g., BTL) as a conformance requirement. BTL listed products can be found at **www.bacnetinternational.net/btl/**

Contact Closure Input (CCI)

The Quantum system is capable of accepting CCIs through multiple different hardware controls. A CCI can be programmed to do a wide variety of actions in a Quantum system including, activating a scene, disabling a keypad, setting a QS shade level, enable a timeclock, and enabling occupancy sensors.

Outputs From the Quantum System

Custom Output Strings via Ethernet

The Quantum processor is capable of sending custom output strings of either ASCII or Hex via Ethernet that can be triggered by a button press or contact closure in the system. The button press or contact closure must be on the same subsystem as the processor sending the string. The device being controlled needs to have a defined syntax and command structure to determine which strings to send. For an example of how Lutron defines incoming strings, see the Lutron Integration Protocol document at **www.lutron.com/TechnicalDocumentLibrary/040249.pdf**

The processor sending the output string must be on the same network as the device receiving the string and a TCP connection must be allowed between those two devices. This should be kept in mind when the network is designed.

Contact Closure Output (CCO)

A QSE-IO is capable of being used in a Quantum system to send CCOs to a third-party system. CCOs can either be maintained, momentary, or pulsed. An output can be triggered by a wide variety of actions including, pressing a keypad button, a timeclock event, and a Contact Closure Input (CCI) to the Quantum system.

Further Support

Please contact your Lutron Sales Representative or System Sales Engineer for assistance on any integration project.

Pre-sale support: systemsalesengineers@lutron.com

Post-sale support: systemsupport@lutron.com or 1.844.LUTRON1 (1.844.588.7661)

Lutron Contact Numbers

WORLD HEADQUARTERS
USA
Lutron Electronics Co., Inc.
7200 Suter Road
Coopersburg, PA 18036-1299
TEL: +1.610.282.3800
FAX: +1.610.282.1243

support@lutron.com

www.lutron.com/help

North & South America
Customer Assistance
USA, Canada, Caribbean:
1.844.LUTRON1 (1.844.588.7661)
Mexico:
+1.888.235.2910
Central/South America:
+1.610.282.6701

EUROPEAN HEADQUARTERS
United Kingdom
Lutron EA Ltd.
6 Sovereign Close
London, E1W 3JF United Kingdom
TEL: +44.(0)20.7702.0657
FAX: +44.(0)20.7480.6899
FREEPHONE (UK): 0800.282.107
Technical Support: +44.(0)20.7680.4481

lutronlondon@lutron.com

ASIAN HEADQUARTERS
Singapore
Lutron GL Ltd.
390 Havelock Road
#07-04 King's Centre
Singapore 169662
TEL: +65.6220.4666
FAX: +65.6220.4333
Technical Support: 800.120.4491

lutronsea@lutron.com

Asia Technical Hotlines
Northern China: 10.800.712.1536
Southern China: 10.800.120.1536
Hong Kong: 800.901.849
Indonesia: 001.803.011.3994
Japan: +81.3.5575.8411
Macau: 0800.401
Taiwan: 00.801.137.737
Thailand: 001.800.120.665853
Other Countries: +65.6220.4666