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Athena System Spec

Athena is a flexible, simple, all-in-one solution that combines the world's most advanced light source with intelligent shades and connected apps to deliver a holistic light experience. Athena is an evolving solution that like other modern software solutions, when Internet connected, receives frequent updates and improvements adding new features, bug fixes, and security updates.

The most up-to-date information about the system can be found on our website:
https://www.lutron.com/Athena

For further system architecture and device details see the dynamic system architecture page:
https://www.lutron.com/AthenaSpecs

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Job Name:	Model Numbers:	
Job Number:		

System Functionality

The Lutron Athena system can be installed completely disconnected from the internet or connected to the internet. This is a list of features that the system has regardless of internet connection status.

Specifications

- Scaling Definitions
  - Place is a physical building or a collection of one of more floors under one customer group's control
  - System should be a single floor and a collection of areas that is bounded by devices than can control one another
  - Database is a technical file that is tied 1:1 to a system
- Scaling Technical Limits
  - One (1) place can have up to 100 systems
  - One (1) system can have up to 16 processors/gateways
  - One (1) system can have up to 300 areas
  - One (1) area can have up to 100 zones
  - One (1) zone can have up to 99 switchlegs
- Athena Touchscreens
  - Up to 5 Athena touchscreens per Athena processor

	Limitations per QS Link					
Model	QS Device Count	Wall Controls[1]	Occupancy Sensor Count	Daylight Sensor Count	Switchleg Count	DMX Interface Limit
1L Processors – 1 QS Link	25	50	50	50	256	8
2L/4L Processors – 2 QS Links	99	100	100	100	512	16

- QS Link
  - QS link is topology free (can be daisy-chained, T-tapped, starred, etc.)
  - QS link is NEC® Class 2/PELV and provides power and communication to low-voltage devices
  - Maximum link length of 2000 ft (610 m), using 12 AWG (4.0 mm^2) wires for power pair
  - QS link can be extended an additional 2000 ft (610 m) using the QSPS-10PNL. See Lutron Spec Submittal P/N 085335 at www.lutron.com for details
  - For PDU information, refer to Lutron Spec Submittal P/N 369405 at www.lutron.com

[1] Pico wireless controls, QS keypads, IR keypads.

Job Name:	Model Numbers:	
Job Number:		

System Functionality (cont.)

- Clear Connect – Type X (CCX) Link
  - Utilizes 2.4 GHz wireless to create a self-healing mesh network
  - Maximum of 100 CCX devices per wireless processor
  - All CCX devices associated with a wireless processor must be within 75 ft (23 m) of that processor
  - There must be a minimum of two CCX devices within 25 ft (7.6 m) of the wireless processor
  - Each CCX device must be within 25 ft (7.6 m) of two or more non-battery powered CCX devices
  - Using more than two devices is ideal for creating an ultra-high performance mesh network
  - Groups or clusters of CCX devices must not be separated by more than 25 ft (7.6 m)
  - Refer to the device specification submittal for guidelines to minimize RF interference
  - See Lutron Application Note #745 (P/N 048745) at www.lutron.com for more information on CCX deployment
- Clear Connect – Type A Devices
  - Each device must be within 30 ft (9 m) through walls or 60 ft (18 m) line-of-sight
  - Utilizes sub-GHz RF to create a point-to-point RF network
    - 431.0–437.0 MHz (U.S.A., Canada, Mexico, Brazil)
    - 868.125–869.850 MHz (Europe, U.A.E.)
    - 868.125–868.4755 MHz (China, Singapore)
    - 865.5–866.5 MHz (India)
    - 312.3–314.8 MHz (Japan)
    - 433.05–434.79 MHz (Hong Kong, Macau)
  - Refer to the device specification submittal for guidelines to minimize RF interference
- API Integration
  - 10 certificate-based API integrations per Athena processor
- Area
  - Up to 16 lighting scenes + OFF
  - Up to 31 shade presets
  - Up to 100 zones (99 switch legs per zone)
- Athena Shade Automation – Natural Light Optimization: operational with the following shade types:
  - Lutron Contract Roller shades
  - Lutron Sivoia QS Roller shades
  - Lutron Palladiom Roller shades
  - **Non-Lutron shades are NOT supported with shade automation**
- Athena Tunable White Automation & Natural Show
  - Compatible devices:
    - Athena Wireless Node with DALI-2 type 8 tunable white luminaires
    - Lutron Ketra luminaires
    - Lutron Rania luminaires
  - Does not require internet connectivity or correlated color temperature (CCT) sensors to operate

Job Name:	Model Numbers:	
Job Number:		

System Functionality (cont.)

Features

- Athena can scale to a large commercial tower up to 100 floors per building and up to 1600 processors/gateways
  - Simple system expansion
  - High-end/low-end trim
  - Emergency lighting
  - Load shed/demand response
- OpenADR 2.0b compliant when used with LUT-Q-OPNADR-CPN8589
- Wall controls can control lights and shades
- Activate lighting and shading scenes (controlling intensity, CCT, or color)
  - Turn on/off and raise/lower individual or zones of lighting intensity
  - Open/close and raise/lower individual or groups of shades
- Occupancy and vacancy sensing
  - Programmed to control an area or a single lighting zone
  - Programmable timeout from 1 to 120 minutes
- Continuous daylight harvesting
- Scheduled events/timeclock
  - Defined based on fixed time or astronomic time
  - One-time events or recurring daily/weekly/monthly/yearly
  - Specific date exceptions (e.g., exceptions for holidays/special events)
  - Enable/disable individual scheduled events
  - Schedule events are organized into timeclock groups that can be enabled/disabled
  - Events can be configured to control lights & shades and adjust occupancy or other automation settings
- Integration
  - BACnet/IP via TCP/IP to a processor (requires configuration)
  - RESTful API via TCP/IP to a processor (requires partnership approval)
  - Serial via RS232 connection to a QSE-CI-NWK-E
  - Telnet via RJ45 Ethernet connection to a QSE-CI-NWK-E
  - Contact closures input/output to a QSE-IO
- Athena Shade Automation – Natural Light Optimization
  - Athena shade automation can be enabled or disabled on a button press, timeclock schedule or occupancy/vacancy
  - Does not require sensors
  - Definable automation configuration settings:
    - Building location
    - Façade orientation
    - Preferred shade positions (direct sun, no direct sun, night)
    - Timing of when the automation starts and ends
    - Ability to change shade grouping allowing different automation settings in a single area

  NOTE: Initial setup and configuration settings changes made by Lutron
- Athena Tunable White Automation & Natural Show
  - Mimic natural light throughout the day. Seamlessly exit and re-enter automation without timeclock catch-up events or waiting until the next transition
  - Definable start and end time to align with business hours or astronomic settings
  - Definable minimum and maximum CCT values to mimic natural light or set a specific range
  - Option to include intensity

Job Name:	Model Numbers:	
Job Number:		

System Functionality of an Internet Connected System

Athena provides the most value to users when it is connected to the internet. It adds more features to the system and unlocks software (Lutron app and Lutron dashboard) in addition to the system features listed earlier in this document.

Specifications

- To use Athena connected features, all Athena processors and gateways are required to be connected to the Internet
- More technical details can be found in the Athena IT Implementation Guide (040453) https://assets.lutron.com/a/documents/040453_eng.pdf
- Lutron LTE modem (LUT-LTE-1) can be used in select regions to enable a connected startup
  - Device will be left connected for 30 days post-job closeout and then automatically disabled
- User access
  - Username and password required for user access
  - Same account is used for Lutron Designer, Lutron App, and Lutron Dashboard
  - User permissions
    - Owner: Administrator that cannot be revoked by other administrators
    - Administrator: Full control and data access of the system
- Access sharing
  - User access is shared at a place level and will include all systems within it
  - Owners and administrators can share and revoke access with any myLutron account
  - Access can be shared for 24 hours, 7 days, 7 years, or permanently
- Single sign-on & multi-factor authentication
  - Domain-based identity authentication service enabling SSO, MFA, & 2FA
  - Supports SAML & OIDC
  - Tested with AzureAD & OKTA
  - Requires setup license LSC-SSO-SETUP and an active premium subscription ADB-#Y-NEW
  - More details and technical information can by found in the Athena and myRoom IT Implementation Guide (P/N 040453)at www.lutron.com

Features

- Automatic firmware deployment for new features, bug corrections, and security updates
- No required on-site server for data collection or data processing. Lutron's managed cloud handles these functions. Eliminating points of failure and maintenance schedules
- Lutron can provide out-of-the-box cloud connectivity for Athena systems to allow for secure and seamless start-up, software updates, remote service & support, and fast and easy connectivity without advanced network configuration
  - Lutron provides an LTE modem (LUT-LTE-1) in select regions
  - Internet connection must support outbound requests
- Allows for remote connection from Lutron software (e.g., Dashboard, App, Designer) to the Lutron system
- DALI emergency functional and duration testing and reporting
- Remote diagnostics and troubleshooting 24/7 globally

Job Name:	Model Numbers:	
Job Number:		

Lutron App

The Lutron app is a multi-purpose app used for commissioning, lighting designer aim & focus, and space manager operation and control. The app provides an on-the-go experience for users to control and override lights, shades, and scheduled events all from the palm of your hand.

Specifications

- System processors and mobile device require an internet connection
  - Processor automatic updates must be enabled and the Athena system must be running the latest software
- Supports up to 10 simultaneously connected mobile app clients
- Compatible with the latest operating system versions of Apple and Android mobile devices

Features

- All the below features can be accomplished in the area, on the property, or remotely (anywhere with an internet connection)
- Lighting control (see the “Space Manager Mode: Control Methods” table on the next page)
  - Monitor lighting status of areas, scenes, and zones
  - Activate lighting scenes
  - Adjust lighting zone levels
- Zone and scene adjustments (see “Lighting Designer Mode: Scene Adjustment Methods”)
  - Edit and save existing area scenes with modified lighting zone levels
  - Edit zone and scene names
- Lutron shade control
  - Monitor current status of shade groups and drives
  - Activate shade presets via virtual button press
  - Adjust shade levels
- Other load type controls
  - Contact closure
  - Receptacles
- Athena Shade Automation – Natural Light Optimization
  - Allows a space manager to control and monitor the Lutron shading system as follows:
    - Shade automation within an area can be monitored for the status of the automation
    - Shade automation can be enabled or disabled on a per area basis
  - View the past and planned automated shade activity for the current day
  - View the start and end time of the automation
- Scheduled events/timeclocks
  - Create and edit events to control lighting zones, scenes, and/or Lutron shades
  - Events can be scheduled to occur at fixed times or relative to sunrise/sunset
  - Events can be programmed to occur once or to be recurring
  - Events can be grouped into into timeclock groups for easier navigation and more streamlined enabling/disabling
  - Enable/disable timeclock groups and individual events
  - Test events to preview the event's action(s) at the schedule time
- Share and manage user access
- Load shed/demand response
  - Participate in load shed/demand response programs offered by local utility companies
  - Apply a load shed reduction to the system, thereby reducing the building’s lighting power usage
  - Upon load shed activation, all loads configured to participate will decrease by the configured percentage to reduce the lighting load
- Athena tunable white automation & natural show
  - View when a zone is currently in tunable white automation or a natural show
  - Edit morning ramp up start/end time and evening ramp down start/end time using astronomic or fixed time

Job Name:	Model Numbers:	
Job Number:		

Lutron App (cont.)

Space Manager Mode: Control Methods

Load Type	Switch Toggle	Intensity Continuous Slider (0-100)	CCT Continuous Slider[1]	XY Color Picker	Vibrancy[2]
0–10 V (static white)[3]		X			
Forward- and reverse-phase[3]		X			
EcoSystem (static white)[3]		X			
T-Series (tunable white)[3]		X			
DALI-2 Type 6 (static white)[3]		X			
DALI-2 Type 8 T_c (tunable white)		X	X		
Ketra		X	X	X	X
Rania		X	X		
DMX 1-channel lighting[3]		X			
Switched	X				
Receptacles	X				
Contact Closures (lighting & integration)	X				
Lutron QS Roller Shades & Drapery		X			

[1] Range depends on fixture configuration.
[2] Vibrancy is a Lutron Ketra feature that allows for change in color mixing to change color rendering while maintain a specified CCT.
[3] When these load types are used for tunable white, there will not be a CCT slider in the Lutron app.

Job Name:	Model Numbers:	
Job Number:		

Lutron App (cont.)

Lighting Designer Mode: Scene Adjustment Methods

Note: Slider options in lighting designer mode will match space manager mode.

Load Type	Accessible in the Lighting Designer Mode[1]	Lighting Level	Fade	Delay
0–10 V (static white)	X	X	X	X
Forward- and reverse-phase	X	X	X	X
EcoSystem (static white)	X	X	X	X
DALI-2 Type 6 (static white)	X	X	X	X
DALI-2 Type 8 T_c (tunable white)	X	X	X	
Ketra	X	X	X	
Rania	X	X	X	
DMX 1-channel lighting	X	X	X	X
Switched	X	X		X
Receptacles				
Contact Closures (lighting & integration)	X	X		X
Lutron QS Roller Shades & Drapery				

[1] Sliders are the same as described in the table on the previous page.

Lutron Dashboard

The Lutron Dashboard is a browser-based facility operations and improvement tool that empowers facility and space managers to maximize their efficiency. The full list of specifications and features can be found in the Lutron Dashboard specification submittal (P/N 3691245): https://assets.lutron.com/a/documents/3691245_eng.pdf

Lutron Designer

Lutron Designer is the facility manager's operation tool when the system is offline. It provides core functionality to keep the building running such as diagnostic information and control/editing. It can be used by a facilities team that have a system online as well.

Specifications

- Hardware requirements:
  - Windows 10 or Windows 11 or Windows Server 2016 or newer
  - Core i5 at 2.67 GHz or better
  - 8 GB of RAM or more
  - 4 GB of disk space for software and the installation process (an SSD will increase performance)
  - 1920 x 1080 or higher-resolution monitor
- Requires training from Lutron. There are 3 forms:
  - Online self-paced
  - In-person classroom (training offerings vary by region)
  - Customized in-person (contact Lutron services for details)

Features

- View diagnostics of loads, shades, QS devices, sensors, CCX loads
- View system activity log to understand what has happened in a space
- Live editing of levels for lights and shades
- Create/edit/delete timeclock events
- Define occupancy and daylight settings to change lights or leave them unaffected
- Push firmware updates to the system
- Features requiring in-person classroom training
  - Moving, splitting, and combing areas
  - Re-zoning lights within an area
  - Replacing and addressing devices

Job Name:	Model Numbers:	
Job Number:		

Security Statement

Lutron takes Cybersecurity very seriously. We vigorously monitor the threat landscape and take a proactive approach to security and privacy, continuously working to update and enhance our systems and processes.

At Lutron, we call our approach to cyber security "**Secure Lifecycle**," and we would like to present the following steps we take to protect your security and privacy:

- **Security by Design.** When building a new system, Lutron utilizes a dedicated security team to ensure best practices are implemented. Security is built in. It is not an afterthought or add-on.
- **Third-Party Validation.** Security is complicated. Lutron has a dedicated team of internal experts, we also leverage external experts to double- and triple-check our work and make security recommendations.
- **Continuous Monitoring and Improvements.** Security is a constantly moving target. Lutron uses a dedicated security team to continuously monitor the market for potential threats and, when needed, send out security patches to update installed systems.
- **Ongoing Support.** Lutron has the resources you need to answer questions about security when they arise.

We incorporate a variety of security features into our product designs. These features include recommendations from the National Institute of Standards and Technology (NIST) among others, and they are aimed at meeting our Secure Lifecycle protections. While we do not publish a comprehensive list of our security features, the following list is a small example of some of the techniques employed in our system design for Lutron Athena processors and associated services (such as mobile applications and cloud resources):

1. Secure and authenticated remote access with unique keys for every system's processor.
2. A secure hardware element ("chip") on every processor to guard the keys used for secure communication and authentication.
3. We are enforcing industry-standard encrypted communication and techniques for our integration protocols.
4. Secure commissioning – all communication between the system programming software tool/app and the processors is encrypted and authenticated. Programming a system requires permission to access that system.
5. Security updates pushed out automatically to the processors for urgent security patches.
6. Use of industry-standard techniques for integrations, such as OAuth2.0
7. Signed processor firmware to ensure a firmware update is authentically from Lutron.

If you have additional questions, feel free to reach out via our 24/7 Technical Support line at 1.844.LUTRON1 or email support@lutron.com.

Job Name:	Model Numbers:	
Job Number:		

Compatible Products: North America (120 V~ & 434 MHz Regions)

Load Controls

- QSN-4T5-120-D
- QSN-2DALUNV-D
- QSN-1DALUNV-D
- QSN-2DALUNV-S
- QSN-4S8-120-D
- QSN-4A5-S
- QSN-4A5-D
- QSN-2ECO-120-D
- QSN-4S16-S
- QSN-4T16-S
- QSN-2ECO-S
- QSE-CI-DMX
- QSN2-4T20-S
- QSN2-4T16-S-347
- QSN2-4S20-S
- QSN2-2ECO-S
- QSN-4T20-D
- QSN-4S20-D
- A-WN-D01-RF-*
- A-WN-D01-OCC-*

Wall Controls

- PJ2-*
- PX-*
- QSWA-*
- QSWAS-*
- QSWE-*
- QSWS2-*
- QSWS2-KS-*
- QWP-*
- Q-TOUCH5-WH

Shades

- Contract Roller QS Wired Shades
- Sivoia QS Wired Shades
- Palladiom Wired Shades
- QS Drapery Track

Sensors

- GRX-IRPS
- EC-DIR*
- GRX-CES*
- LOS-*
- LRF2-OCR2B*
- LRF2-DCRB*
- LUT-WS*
- QSM2-*

Accessories

- LUT-19AV-1U
- LUT-5x10-ENC
- LFG*
- LTR-*
- LPFP-*
- L-PED*
- PICO-*
- LUT-LTE-1**
- L-SHMT-WH
- UA-CS-LX
- Q-POE-PNL
- Q-POE-PNL-EM

Power Interfaces

- TVI-LMF-2A
- C5-*
- PHPM-*
- GRX-TVI

Integration Interfaces

- LUT-Q-OPNADR-CPN8589
- QSE-CI-NWK-E
- QSE-IO
- QSE-CI-WCI

* Designates additional model number characters that may vary depending on the specific model chosen.

** Only available in USA and Canada

Job Name:	Model Numbers:	
Job Number:		

Compatible Products: North America (120 V~ & 434 MHz Regions) (cont.)

Emergency

- LUT-ELI-3PH (for certain loads / accessories, refer to spec sheets for details)
- LUT-SHUNT-A-TD (for Ketra and Rania loads)
- LUT-SHUNT-A-TD-5 (for AWN loads)

Power Supplies

- QSPS-*
- L-POEI-BL

Cable

- QS-CBL-*
- GRX-CBL-*
- GRX-PCBL-*

Processors

- QP5-*L-POE
- QP5-*L-POE-EM
- QP6-1L-POE
- A-RF2
- Q-RF
- QP-*L
- QP-2L-UPGRADE

Lighting

- CM-A20*
- CM-S30*
- CM-S38*
- CM-D2*
- CM-D3*
- CM-D4R*
- CM-LS0*
- CM-X96*
- CM-G2*
- CM-N3*
- CM-L3I*
- CM-L4R*

* Designates additional model number characters that may vary depending on the specific model chosen.

Job Name:	Model Numbers:	
Job Number:		

Compatible Products: 220–240 V~ Regions

Load Controls

- QSNE-4A5-230-D
- QSNE-4T10-230-D
- QSN-2DALUNV-D
- QSN-1DALUNV-D
- QSE-CI-4M-D
- QSNE-4S5-230-D
- QSE-CI-DMX

Wall Controls

- Pxy-*
- PX-*
- QSWA-*
- QSWAS-*
- QSWE-*
- QSWS2-*
- QSWS2-KS-*
- QWP-*
- Q-TOUCH5-WH

Shades

- Sivoia QS Wired Shades
- Palladiom Wired Shades
- QS Drapery Track

Sensors

- GRX-IRPS
- EC-DIR*
- GRX CES*
- LOS-*
- LRFx OCR2B*
- LRFx-DCRB*
- LUT-WS*
- QSMx-*

Accessories

- LUT-19AV-1U
- LUT-5x10-ENC
- LFG*
- LTR-*
- LPFP-*
- L-PED*
- PICO-*
- UA-CS-LX
- Q-POE-PNL

Power Interfaces

- C5-*

Integration Interfaces

- QSE-CI-NWK-E
- QSE-IO
- QSE-CI-WCI

Emergency

- LUT-ELI-3PH (for QSN-* load control panels)

Power Supplies

- QSPS-*
- L-POEI-BL

Cable

- QS-CBL-*
- GRX-CBL-*
- GRX-PCBL-*

Processors

- QP-*L
- QP-2L-UPGRADE

* Designates additional model number characters that may vary depending on the specific model chosen.
NOTE: Models with a lowercase "x" or "y" contain region specific RF codes.

Job Name:	Model Numbers:	
Job Number:		

Related Links

- **Athena API Integration Specification (3691208):** https://assets.lutron.com/a/documents/athena_api_spec.pdf
- **Athena O&M Manual (040467):** https://assets.lutron.com/a/documents/040467.pdf
- **Commercial IT Implementation Guide (040453):** https://assets.lutron.com/a/documents/040453_eng.pdf
- **Athena BACnet PICS (3691196):** https://assets.lutron.com/a/documents/3691196.pdf
- **Athena System Components website:** https://www.lutron.com/AthenaSpecs
  - Includes product specification submittals, installation guides, application notes, CSI performance specification, product images, etc.
- **Emergency Lighting Application Note #106 (048106):** https://assets.lutron.com/a/documents/apnote106.pdf

Job Name:	Model Numbers:	
Job Number:		