

## Lutron Residential and Commercial Systems Rules

This document is meant to be a collection point for the rules that apply to different Lutron systems. This document is not meant to be an individual product specification for each piece of hardware, but rather provides definition to the interaction between these devices within the system. The rules outlined by this document are limits for system designs.

The systems whose rules are outlined in this document are:

- [Quantum \(versions 3.0 and higher\)](#)
- [Athena](#)
- [QS Standalone](#)
- [myRoom](#)
- [Vive](#)
- [Limelight](#)
- [GRAFIK Eye 4000](#)
- [XPS](#)
- [LCP128](#)
- [KetraNet Standalone](#)
- [HomeWorks with a QS processor \(versions 14.0 to 15.4\)](#)
- [HomeWorks with a QSX processor \(versions 16.0 and higher\)](#)
- [RadioRA 2](#)
- [RA2 Select](#)
- [Caséta Wireless](#)

For more information on the rules or other applications, please contact Lutron or see the appropriate product specification submittal.

<b>Job Name:</b>	<b>Model Numbers:</b>
<b>Job Number:</b>	

## Quantum (versions 3.0 and higher)

### General System Rules

- For Quantum systems requiring more than 25 subsystems on a single server, contact Lutron for quoting options.
- For Quantum subsystems requiring more than 8 processors per subsystem, contact Lutron for quoting options.
- For Quantum subsystems requiring more than 50 areas, contact Lutron for quoting options.
- Note:** Typically 1 subsystem per floor.
- Devices in one subsystem cannot control devices in another subsystem.
- For A/V Integration, each processor supports 8 concurrent Telnet logins.
- Maximum of 100 zones per area and 99 switch legs per zone.
- Each processor has 2 links. Links have a possible configuration of QS, Power Panel, EcoSystem DBI (EcoSystem only available in QP2 hubs), or DMX input.
  - 512 switch legs per link. Switch legs are the smallest controllable outputs and include:
    - Dimmed or switched circuits
    - Digitally addressable devices (ballasts, drivers, and interfaces) **Note:** T-Series drivers count as two (2) switch legs
    - A single DMX channel
    - Contact closure outputs
    - QS Shade Drives
  - QS Link Rules
    - 99 QS devices per QS link
    - 100 occupancy sensors
    - 100 daylight or radio window sensors
    - 100 wall controls (e.g., Pico wireless controls, QS Keypad, IR)
    - QS link is topology free (can be daisy-chained, T-tapped, starred, etc)
    - Maximum link run of 2000 ft (610 m), using 12 AWG (4.0 mm<sup>2</sup>) 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](http://www.lutron.com) for details
    - For PDU information, refer to Lutron Spec Submittal P/N 369405 at [www.lutron.com](http://www.lutron.com)

- Power Panel Link Rules
  - 32 circuit selectors per power panel link
  - Power panel link must be daisy chained
  - Maximum link run of 2000 ft (610 m), using 12 AWG (4.0 mm<sup>2</sup>) wires for power pair (Link Terminators required)

### Quantum-supported Applications

- Q-control+ App can have 20 concurrent users when connected to server.
- Q-control+ App can have 2 concurrent users when connected directly to processor.
- GreenGlance supports up to 10 client connections (not supported in Quantum 3.4).
- Personna PC supports up to 10,000 users (not supported in Quantum 3.4).
  - Supports up to 20 concurrent users.
  - Supports up to 10,000 user accounts.

### EcoSystem Loop Rules

- 64 digital addresses per loop. Addresses include:
  - EcoSystem ballasts/drivers
  - EcoSystem interfaces (e.g., BMJ, XPJ, BMF, TVI-LMF)
  - EcoSystem enabled fixtures
- Maximum number of devices wired to EcoSystem loop.
  - 64 wall controls (GRAFIK Eye QS does not support using wall controls connected to EcoSystem devices).
  - 32 occupancy sensors
  - 16 daylight sensors
- Maximum of 16 daylight sensors can control devices on a single loop regardless of where they come into the system (wireless on QS link, wired on QS link, or wired on EcoSystem loop).

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## Quantum (versions 3.0 and higher)

(continued)

### T-Series Loop Rules

- 64 digital addresses per loop
  - Each T-Series driver consumes 2 addresses
- Supports up to 16 T-Series groups of control

### Digital Lead Length Comparison

- The digital lead lengths for EcoSystem and T-Series are limited by the wire gauge used for E1/E2 or T1/T2 as follows:

Wire Gauge*	Maximum T-Series Lead Length	Maximum EcoSystem Lead Length
12 AWG	1000 ft **	2200 ft
14 AWG	1000 ft **	1400 ft
16 AWG	900 ft	900 ft
18 AWG	550 ft	550 ft

Wire Size*	Maximum T-Series Lead Length	Maximum EcoSystem Lead Length
4.0 mm <sup>2</sup>	300 m **	828 m
2.5 mm <sup>2</sup>	300 m **	517 m
1.5 mm <sup>2</sup>	300 m **	310 m
1.0 mm <sup>2</sup>	207 m	207 m
0.75 mm <sup>2</sup>	155 m	155 m

\* Check Product's terminal block wire size range. If product does not accept the wire size used for the digital link, connect up to 3 ft (1.0 m) of rated wire. Then connect digital link wire up to the length allowed in the above table.

\*\* Do not exceed cable lengths of 1000 ft (300 m)

### DALI® Loop Rules

- 64 digital addresses per loop.
- Supports up to 16 zones of control per loop.
- Quantum Vue allows control of individual addresses.

### Interface Rules

- DMX interface supports 32 output DMX channels. Up to 16 DMX interfaces per QS link.
  - 1 Quantum zone = 1 channel for intensity (value of 1–100) OR 3 channels for RGB control (value of 1–100) OR 1 channel for integration (value of 1–255).
  - GRAFIK Eye QS zone mapping for 1 channel intensity only.
- Up to 10 QSE-CI-NWK-E per QS link.
- QSE-CI-NWK-E can control loads in any area and it can monitor status of up to 10 areas.
- Maximum of 2 concurrent incoming Telnet connections on a QSE-CI-NWK-E.
- LUT-ELI can be shared between panel link and emergency QS devices, refer to Application Note #106 for more information.
- LUT-ELI can be wired up to 32 devices total (QS devices, circuit selectors, and EcoSystem bus supplies).
- LUT-ELI signal line (for QS devices and EcoSystem bus supplies) can be run up to 2000 ft (610 m) with 18 AWG (1.0 mm<sup>2</sup>) wire.

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## Quantum (versions 3.0 and higher)

(continued)

### Controls/Sensors Rules

- Multiple QS sliders on a single control count as one QS device unless mounted with a keypad, then the keypad also counts as one QS device.
- QS sliders can only control zones in its area.
- Zone Chaining - QS sliders can only control zones in the same area. When partitioning, the slider can affect zones in other combined areas.
- Up to 16 Quantum QS Slider Control units in an area.
- QS Sensor Module (QSM) can support wired and wireless devices. Below is a breakdown of the devices:
  - 4 wired sensors/controls
  - 10 wireless occupancy/vacancy sensors
  - 10 Pico wireless controls
  - 10 wireless daylight or radio window sensors
- When using wired or wireless sensors/remotes (occupancy, daylight, radio window, Pico wireless control) in a Quantum system, sensors should be associated to a QSM. A sensor associated to a GRAFIK Eye control unit will only be able to control that GRAFIK Eye control unit. This may limit the sequence of operations available for that sensor.

### Server Requirements

- A server is required if:
  - Reporting or Green Glance is required
  - Historical activity data is required
  - iPad (Q Control+) with multiple subsystems
  - Remote Access
  - Persona PC
  - Alerts and Alarms
  - Quantum Vue

### Limitations per Area

- Up to 16 scenes + OFF (includes scenes for DMX input on slider control)
- Up to 31 shade presets
- Up to 100 zones (99 switch legs per zone)

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## Athena

### General System Rules

- Maximum combined total of 16 Athena Edge processors and Clear Connect Gateways - Type X per system. For Athena systems requiring more than 16 processors and gateways, contact Lutron for quoting options.
- 5 Athena touchscreens per Athena Edge processor.
- Maximum of 100 zones per area and 99 switch legs per zone.
- Each Athena Edge processor has 1 or 2 QS links, depending on model number.
  - 1-Link Athena Edge processors support up to 256 switch legs per link.
  - 2-Link Athena Edge processors support up to 512 switch legs per link.
  - Switch legs are the smallest controllable outputs and include:
    - Dimmed or switched circuits
    - Digitally addressable devices (ballasts, drivers, and interfaces) **Note:** T-Series drivers count as two (2) switch legs
    - A single DMX channel
    - Contact closure outputs
    - QS Shade Drives
- QS Link Rules
  - 1-Link Athena Edge processors QS link can support up to:
    - 25 QS devices
    - 50 occupancy/vacancy sensors
    - 50 daylight sensors
    - 50 wall controls (e.g., Pico wireless controls, QS keypads, IR)
  - 2-Link Athena Edge processors QS link can support up to:
    - 99 QS devices
    - 100 occupancy/vacancy sensors
    - 100 daylight sensors
    - 100 wall controls (e.g., Pico wireless controls, QS keypads, IR)
  - QS link is topology free (can be daisy-chained, T-tapped, starred, etc.)
  - Maximum link length of 2000 ft (610 m), using 12 AWG (4.0 mm<sup>2</sup>) 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](http://www.lutron.com) for details.
  - For PDU information, refer to Lutron Spec Submittal P/N 369405 at [www.lutron.com](http://www.lutron.com)

### EcoSystem Link Rules

- EcoSystem connections made via EcoSystem Energi Savr Node.
- 64 digital addresses per link. Addresses include:
  - EcoSystem ballasts/drivers
  - EcoSystem interfaces (e.g., BMJ, XPJ, BMF, TVI-LMF)
  - EcoSystem enabled fixtures
- Maximum number of devices wired to EcoSystem link.
  - 64 wall controls
  - 32 occupancy sensors
  - 16 daylight sensors
- Maximum of 16 daylight sensors can control devices on a single loop regardless of where they come into the system (wireless on QS link, wired on QS link, or wired on EcoSystem loop).

### T-Series Loop Rules

- T-Series connections made via T-Series Energi Savr Node
- 64 digital addresses per loop
  - Each T-Series driver consumes 2 addresses
- Supports up to 16 T-Series groups of control

### API Integration Rules

- 10 certificate-based API integrations per Athena Edge processor.
- 16 unique usernames/passwords for API integrations per Athena system.
- 16 username/password logins for API integration per Athena Edge processor.

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## Athena (continued)

### Digital Lead Length Comparison

- The digital lead lengths for EcoSystem and T-Series are limited by the wire gauge used for E1/E2 or T1/T2 as follows:

Wire Gauge *	Maximum T-Series Lead Length	Maximum EcoSystem Lead Length
12 AWG	1000 ft **	2200 ft
14 AWG	1000 ft **	1400 ft
16 AWG	900 ft	900 ft
18 AWG	550 ft	550 ft

Wire Size *	Maximum T-Series Lead Length	Maximum EcoSystem Lead Length
4.0 mm <sup>2</sup>	300 m **	828 m
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1.5 mm <sup>2</sup>	300 m **	310 m
1.0 mm <sup>2</sup>	207 m	207 m
0.75 mm <sup>2</sup>	155 m	155 m

\* Check Product's terminal block wire size range. If product does not accept the wire size used for the digital link, connect up to 3 ft (1.0 m) of rated wire. Then connect digital link wire up to the length allowed in the above table.

\*\* Do not exceed cable lengths of 1000 ft (300 m).

### DALI® Loop Rules

- 64 digital addresses per loop.
- Energi Savr Node for DALI supports up to 16 zones of control per loop.
- Energi Savr Node DALI Universal supports up to 64 zones of control per loop.

### Interface Rules

- DMX interface supports 32 output DMX channels. Up to 16 DMX interfaces per QS link.
  - 1 Athena zone = 1 channel for intensity (value of 1–100) OR 3 channels for RGB control (value of 1–100) OR 1 channel for integration (value of 1–255).
- Up to 10 QSE-CI-NWK-E per QS link.
- QSE-CI-NWK-E can control loads in any area and it can monitor status of up to 10 areas.
- Maximum of 2 concurrent incoming Telnet connections on a QSE-CI-NWK-E.
- LUT-ELI signal line can be shared between up to 32 QS devices total, up to 2000 ft (610 m) with one 18 AWG (1.0 mm<sup>2</sup>) wire; refer to Application Note #106 (P/N 048106) at [www.lutron.com](http://www.lutron.com) for more information.

### Controls/Sensors Rules

- QS Sensor Module (QSM) can support wired and wireless devices. Below is a breakdown of the devices:
  - 4 wired sensors/controls
  - 10 wireless occupancy/vacancy sensors
  - 10 Pico wireless controls
  - 10 wireless daylight or radio window sensors
- When using wired or wireless sensors/remotes (occupancy, daylight, radio window, Pico wireless control) in a system, sensors should be associated to a QSM.

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## Athena (continued)

### Limitations per Area

- Up to 16 scenes + OFF
- Up to 31 shade presets
- Up to 100 zones (99 switch legs per zone)

### Clear Connect Gateway-Type X Rules

- Maximum combined total of 16 Athena Edge processors and Clear Connect Gateway - Type X devices per system. For Athena systems requiring more than 16 processors and gateways, contact Lutron for quoting options.
- Maximum of 100 Clear Connect-Type X devices per gateway
- Must be home run and powered by an IEEE 802.3af-2003 or 802.3at-2009 compliant Power over Ethernet (PoE) supply, Lutron model Q-POE-PNL or by others.
- Maximum of 328 ft (100 m) wire run between Gateway and Ethernet switch; cable must be Cat5e or better.
- Maximum wireless range of 71 ft (22 m) to furthest Clear Connect-Type X device.
- At least two Clear Connect-Type X devices must be mounted within 25 ft (7.7 m) of the gateway.
- Must be mounted at least 5 ft (1.5 m) away from any WiFi Access Points (WAP).
- Must be mounted at least 5 ft (1.5 m) away from any Lutron Vive wireless hubs (HJS-x).
- Each Clear Connect-Type X device must be mounted within 25 ft (7.7 m) of at least two other Clear Connect-Type X devices that are associated to the same Clear Connect-Type X Gateway.
- There should be a path from the Clear Connect-Type X Gateway to all Clear Connect-Type X devices associated with the Gateway with the distance between each device not exceeding 25 ft (7.7 m).
- Radio Powr Savr sensors (LRFx) must be mounted at least 4 ft (1.2 m) away from any gateways or WiFi access points (WAP) and at least 2 ft (0.6 m) away from any Clear Connect-Type X devices.
- See App Note # 745 "Clear Connect System Type X Best Practices" (P/N 048745) on [www.lutron.com](http://www.lutron.com), available to users with a myLutron login, for further details.

### Ketra N3 Satellite Rules

- N3 can control G2, L3I, and/or L4R linear fixtures.
- One N3 is needed for each zone of Ketra linear fixtures (G2, L3I, and/or L4R), with the following limitations:
  - 40 ft (12 m) maximum of linear fixture length (the 40 ft can be made of one or several types of linears in any order)
  - 100 ft (31 m) maximum run length (fixture length plus cable length from N3 to end of last fixture)
  - One continuous strip of cable/linear fixture from N3 output; cable cannot be t-tapped
  - Fixture runs can be broken into multiple sections connected by daisy-chained cables
  - Linear fixtures must be connected in a specific orientation, with a distinct "in" and "out" end
- Each N3 Satellite counts as one device toward the maximum Clear Connect Gateway-Type X limit, regardless of the number of linear fixtures.
- N3 Satellites or their linear fixture outputs do not count toward the limit of Athena switch legs.
- An N3 system consists of the N3 satellite and all of its associated components: all connected leader/jumper cables and all of its linear fixtures (G2, L3I, L4R). A single N3 satellite (with all associated components) cannot be within 20 ft (7.1 m) or greater than 4 other N3 satellites (and associated components), including throughout the entire length of cables and fixtures.

### Ketra X96 Controller Rules

- X96 can control Lightbar Slim (LS0) linear fixtures.
- One X96 is needed for each zone of Ketra linear fixtures with the following limitations:
  - No more than 8 segments of linear fixtures
  - No more than 50 ft (16.5 m) of cable
  - No more than 15 ft (4.6 m) or 24 ft (7.3 m) of total fixture length (defined on individual spec)
  - One continuous strip of cable/linear fixture from N3 output; cable cannot be t-tapped
  - Fixture runs can be broken into multiple sections connected by daisy-chained cables
  - Linear fixtures must be connected in a specific orientation, with a distinct "in" and "out" end
  - Only one lens/output type of Lightbar Slim can be used with a single X96 controller
- Each X96 controller counts as one device toward the maximum Clear Connect Gateway-Type X limit regardless of the number of linear fixtures.
- X96 controller or their linear fixture outputs do not count toward the limit of Athena switch legs.

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## QS Standalone

### General Link Rules

- 512 switch legs per system. Switch legs are the smallest controllable outputs and include:
  - Dimmed or switched circuits
  - Digitally addressable devices (ballasts and interfaces)
  - A single DMX channel
  - Contact closure outputs
  - QS shade drives
- 100 QS devices
- 100 occupancy sensors
- 100 daylight sensors
- 100 wall controls (e.g., Pico wireless controls, QS Keypad, IR)
- 100 zones of control
- QS link is topology free (can be daisy-chained, T-tapped, starred, etc)
- Maximum link run of 2000 ft (610 m), using 12 AWG (4.0 mm<sup>2</sup>) wires for power pair
- QS link can be extended up to an additional 2000 ft (610 m) using the QSPS-10PNL. See Lutron Spec Submittal P/N 085335 at [www.lutron.com](http://www.lutron.com) for details

### EcoSystem Loop Rules

- 64 digital addresses per loop. Addresses include:
  - EcoSystem ballasts / drivers
  - EcoSystem interfaces (e.g., BMJ, XPJ, BMF, TVI-LMF)
  - EcoSystem enabled fixtures
- Maximum number of devices wired to EcoSystem loop:
  - 64 wall controls (GRAFIK Eye QS does not support using wall controls connected to EcoSystem devices)
  - 32 occupancy sensors
  - 16 daylight sensors
- Maximum of 16 daylight sensors can talk to a single loop regardless of where they come into the system (wireless to QS link, wired to QS link, or wired to EcoSystem loop)

### DALI® Loop Rules

- 64 digital addresses per loop.
- Supports up to 16 DALI® zones of control per loop.

### Interface Rules

- 32 DMX channels per QSE-CI-DMX control interface.
  - Maximum 1 QSE-CI-DMX per QS link for QS Standalone.
  - 1 GRAFIK Eye zone = 1 channel for intensity OR 3 channels for RGB control.
- Up to 10 QSE-CI-NWK-E.
  - QSE-CI-NWK-E can control loads in any area and it can monitor status of up to 10 areas.
  - Maximum of 2 concurrent incoming Telnet connections on a QSE-CI-NWK-E.
- LUT-ELI can wire up to 32 devices total.
- LUT-ELI signal line (for QSGs, ESNs, and DBIs) can be run up to 2000 ft (610 m) with 18 AWG (1.0 mm<sup>2</sup>) wire.

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## QS Standalone (continued)

### Load Control Rules

- GRAFIK Eye unit limitations:
  - 4 occupancy sensors per zone in zone mode
  - 16 occupancy sensors per unit in scene mode
  - 1 daylight sensor can either control zone(s) of light or groups of EcoSystem ballasts
    - 1 sensor per zone or group (no sensor averaging)
    - 1 sensor can talk to multiple zones or groups
    - Each zone or group can be calibrated independently
    - Limit of 16 daylight groups per GRAFIK Eye EcoSystem unit
  - 30 total wireless devices associated directly to QSG (includes occupancy sensors, daylight sensors, Pico wireless controls, QS wireless shade drives, and other QSG units)
  - 25 timeclock events per daily schedule
- Energi Savr Node Softswitch/0–10 V== limitations:
  - Associations per unit:
    - 16 occupancy sensors
    - Maximum of 2 daylight sensors assigned to a single area, averaged together
- Energi Savr Node EcoSystem/DALI® limitations:
  - Associations per unit:
    - 128 remote occupancy sensors and 4 local wired sensors
    - Maximum 16 occupancy sensors assigned to a single area
    - 128 remote daylight sensors and 4 local wired daylight sensors
    - Maximum 2 daylight sensors assigned to a single area, averaged together
    - 4 daylight rows
- Energi Savr Node phase adaptive limitations:
  - Associations per unit:
    - 16 remote occupancy sensors and 4 local wired occupancy sensors
    - 8 daylight sensors
    - Maximum 2 daylight sensors to a single area, averaged together
  - Cannot control switched loads
- QSM can support wired and wireless devices. Below is a breakdown of the devices:
  - 4 wired sensors/controls
  - 10 wireless occupancy/vacancy sensors
  - 10 Pico wireless controls
  - 10 wireless daylight or radio window sensors
- Each standalone QS wireless shade and Sivoia QS wireless Triathlon shade can support up to 10 Pico wireless controls

### Limitations per Area

- Up to 16 scenes + OFF

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## myRoom Prime

### QS Link Rules

- 1 QS link maximum per myRoom Prime system.
- 50 QS devices per QS link.
- 50 zones per system.
- 50 switch legs per link. Switch legs are the smallest controllable outputs and include dimmed or switched circuits.
- 15 occupancy sensors total (wired and wireless), 50 wireless Pico controls. Wired and wireless occupancy sensors cannot be combined in the same system.
- QS link is topology-free (can be daisy-chained, T-tapped, starred, etc.).
- Maximum link run of 2000 ft (610 m), using 12 AWG (4.0 mm<sup>2</sup>) wires for power pair.

### Controls/Sensors Rules

- QSM can support wired and wireless devices. Below is a breakdown of the devices:
  - 4 wired sensors/controls
  - 10 wireless occupancy/vacancy sensors
  - 10 Pico wireless controls
- 4 door contact sensors maximum; one door contact per CCI (door contact is provided by others).
- In myRoom Prime, power cycles to lighting controls may cause the lights to turn on.
- To prevent the lights from turning on, install uninterruptable power supplies to controls or upgrade to myRoom Plus.
- Sequence programming is not available in myRoom Prime. There is no processor to track the sequence state.

### Shade Rules

- Only wired Alena drapes or Sivoia QS wired drapes/shades are compatible with a myRoom Prime system.
- “Tilting” shades, such as Venetian blinds, are not compatible.
- No third-party shade control is allowed in myRoom Prime.
- A keypad cannot have a single button for Open/Stop/Close/Stop functionality. Use at least two buttons: One for Open/Stop, and another for Close/Stop. Three buttons may also be used: One for Open, one for Stop, and another for Close.
- Raise buttons and Lower buttons are also allowed on Palladiom keypads, also known as “Single Scene Raise” and “Single Scene Lower” button types. “Master Raise/Lower” is not allowed. Note that “Master Raise/Lower” will raise/lower the last button affected on that control station. “Single Scene Raise/Lower” will raise/lower the lighting preset assigned to the button.

### Palladiom Thermostat and HVAC Rules

- Only one Palladiom thermostat may connect to the FCU controller.
- Maximum of 6 HVAC zones per guestroom.
- Maximum 1 thermostat controlling each zone.
- No companion thermostats allowed.

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## myRoom Plus

### General System Rules

- 1 system can have up to 2 processors.
- 1 system can have up to 200 zones and switch legs.
  - One processor can control 100 zones (50 per link).
  - One processor can control up to 200 switch legs (100 per link).
- Switch legs are the smallest controllable outputs and include:
  - Dimmed or switched circuits
  - Digitally addressable devices (ballasts, drivers, and interfaces)
  - A single DMX channel
  - Contact closure outputs
  - QS shade drives
- Supports 16 concurrent Telnet logins (connected directly to processor).
- Processors are offered in 1 or 2 link models. Links have a possible configuration of QS link, wireless link, or thermostat link.

### Palladiom Thermostat and HVAC Rules

- Maximum of 6 HVAC zones per processor.
- Maximum 1 thermostat controlling each zone.
- Only one Palladiom thermostat may connect to the FCU controller.
- Up to three “companion” thermostats may connect to the “primary” thermostat connected to the FCU controller.
- Temperature may only be monitored by the “primary” thermostat.
- No temperature averaging between thermostats is available.

### QS Link Rules

- Maximum 4 QS links per system.
- 50 QS devices per QS link.
- 50 occupancy sensors.
- 50 wall controls (e.g., Pico wireless controls, QS Keypad, IR) per QS link.
- QS link is topology-free (can be daisy-chained, T-tapped, starred, etc.).
- Maximum link run of 2000 ft (610 m), using 12 AWG (4.0 mm<sup>2</sup>) wires for power pair.
- QS link can be extended up to an additional 2000 ft (610 m) using the QSPS-10PNL. See Lutron Specification Sheet (P/N 085335) at [www.lutron.com](http://www.lutron.com) for details.

### Controls/Sensors Rules

- QSM can support wired and wireless devices. Below is a breakdown of the devices:
  - 4 wired sensors/controls
  - 10 wireless occupancy/vacancy sensors
  - 10 Pico wireless controls

### 3rd-Party Control

- Other than “Processor 1”, each processor has a maximum of 5 outbound telnet connections.
- “Processor 1” can have up to 3 outbound telnet connections if remote access is enabled. If remote access is disabled, the processor can have up to 5 outbound telnet connections.

### Shade Rules

- Alena drapes or Sivoia QS drapes/shades are compatible with myRoom Plus. Note that wireless versions of the shades and drapes require a hybrid RF repeater and a second link on the myRoom processor. A keypad may have a single button for Open/Stop/Close/Stop functionality with these shade options in myRoom Plus.
- “Tilting” shades, such as Venetian blinds, are not compatible.
- Some third-party shades are compatible with myRoom Plus via integration. However, myRoom Vue cannot monitor shade levels. A keypad cannot have a single button for Open/Stop/Close/Stop functionality with third-party shades.

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## Vive (with hub)

### General System Rules (maximums)

- 64 hubs networked together via wired ethernet port.
- 700 Lutron load controllers per hub.
- 71 ft (21.6 m) between wireless devices and hub.
- 30 ft (9 m) through construction between:
  - Sensors and load controllers
  - Remote controls and load controllers
- 60 ft (18 m) through open air between:
  - Sensors and load controllers
  - Remote controls and load controllers
- Up to 4 total Vive hubs can be wired to a LUT-ELI.
  - Refer to Application Note #628 (P/N 048628) for more information.

### Controls/Sensors Limits

- Any load controlling device can be controlled by:
  - 10 occupancy/vacancy sensors
  - 10 Pico wireless controls (hub does NOT count as a Pico wireless control)
- Any load controlling device, except for PowPak 20 A Switch Module and Integrated Wireless Receptacle, can also be controlled by:
  - 1 daylight sensor (either Radio Powr Savr sensor or fixture control sensor, but cannot be both)
  - 1 daylight sensor can control up to 2 separate rows
- Up to 15 Pico wireless controls per hub can have range extension enabled.
- Up to 14 areas per hub can have the occupancy sensor range extension enabled.

### Contact Closure Input

- CC1: Load shed only
- CC2: Scene with or without control lockout, fire alarm integration, or Emergency

### Programming/User Interface

- Supports 1 login with up to 3 concurrent users
- Limit 50 timeclock events

### Vive Vue Management Suite

- Supports up to 100 Vive hubs
- Supports up to 20 concurrent users and up to 10,000 user accounts

## Vive (without hub)

### Control/Sensor Limits

- Any load controlling device can be controlled by:
  - 10 occupancy/vacancy sensors
  - 10 Pico wireless controls (hub does NOT count as a Pico wireless control)
- Any load controlling device, except for PowPak 20 A Switch Module & Integrated Wireless Receptacle, can also be controlled by:
  - 1 daylight sensor (either Radio Powr Savr sensor or fixture control sensor, but cannot be both)
  - 1 daylight sensor can control multiple load controllers separately, which allows multi-row daylighting
- All wireless devices have the following ranges:
  - 30 ft (9 m) through construction between:
    - Sensors and load controllers
    - Remote controls and load controllers
  - 60 ft (18 m) through open air between:
    - Sensors and load controllers
    - Remote controls and load controllers
- PowPak EcoSystem (Energi TriPak only, not supported by Vive hub)\*
  - Maximum 32 digital addresses
  - Works with all EcoSystem ballasts, drivers, and interfaces (except C5-XPJ-16A)
  - 9 zones maximum
  - 2 daylight rows maximum
  - Maximum number of each wireless device:
    - 9 Pico wireless controls
    - 6 Radio Powr Savr sensors
    - 1 daylight sensor

\* For EcoSystem in a Vive system, use FCJS-ECO Fixture Controller Modules or the RMJS-ECO32-SZ PowPak.

<b>Job Name:</b>	<b>Model Numbers:</b>
<b>Job Number:</b>	

## Limelight

### Definitions

- A Limelight lighting control system consists of a single gateway and up to 800 Radio Sensor Modules (RSMs).
- A single customer site may contain multiple control systems (i.e., multiple gateways).
- All systems (gateways) of a site can be made accessible with a single customer login.

### Wireless System Best Practices

RF range recommendations	Parking Garage	Flat Lot
3 nodes within this distance of the gateway	50 ft (15.2 m)	150 ft* (45.7 m)
Max distance from the gateway to any one node	500 ft (152.4 m)	3000 ft (914.4 m)
Max distance from node to node**	50 ft (15.2 m)	150 ft (45.7 m)
Gateway proximity to dense metal obstructions (including electrical panels)	Minimum 2 ft (0.6 m) away	Minimum 2 ft (0.6 m) away
Max number of luminaires controlled by a single gateway	Up to 800, as long as no other range restrictions are violated. Nodes should be no farther than 4 floors above or below the gateway (i.e., If the gateway is on floor 1, then nodes can be on floors 1–5. If the gateway is on floor 5, then nodes can be on floors 1–9).	Up to 800, as long as no other range restrictions are violated

\* If the gateway is not at or above ground level the spacing guidelines for Parking Garage should be used: 50 ft (15.2 m).

\*\* There should be a path from the Limelight gateway to all RSMs associated with the gateway with the distance between each device not exceeding 50 ft (15.2 m) in a parking garage or 150 ft (45.7 m) in a flat lot.

Job Name:	Model Numbers:
Job Number:	

## GRAFIK Eye 4000

### General System Rules (maximums)

- 8 main unit addresses (GRAFIK Eye 4000 and Slider).
- 16 control stations.
- 32 circuit selectors.
- 64 zones.
- 512 circuits.
- LUT-ELI must be daisy chained to link and can wire up to 32 circuit selectors.
- Maximum 8 AC motor group control units on the link.
- See “Lutron Integration Protocol” P/N 040249 at [www.lutron.com](http://www.lutron.com) for integration command set.

## XPS

### General System Rules (maximums)

- 512 circuits.
- 32 control stations (includes keypads, AV interfaces, and IO interfaces).
- 16 panels.
- 32 global scenes and OFF per system.
- 2 CCIs per panel.
- 1 expansion module per system. With expansion panel, new system maximums:
  - 96 control stations (includes keypads, AV interfaces, and IO interfaces)
- Timeclock events.
  - 7 daily schedules with up to 25 events per day
  - 40 holiday schedules
- LUT-ELI must be daisy chained to link and can wire up to 32 LCD controllers.
- See “Lutron Integration Protocol” P/N 040249 at [www.lutron.com](http://www.lutron.com) for integration command set.

## LCP128

### General System Rules (maximums)

- 128 circuits.
- 32 controls (includes keypads, AV interfaces, and IO interfaces).
- 8 panels.
- 32 global scenes and OFF per system.
- 2 CCIs per panel.
- Timeclock events.
  - 7 daily schedules with up to 25 events per day
  - 40 holiday schedules
- LUT-ELI must be daisy chained to link and can wire up to 32 LCD controllers.
- See “Lutron Integration Protocol” P/N 040249 at [www.lutron.com](http://www.lutron.com) for integration command set.

<b>Job Name:</b>  <b>Job Number:</b>	<b>Model Numbers:</b>
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## KetraNet Standalone

(For commercial applications only.)

### Wireless Range Limits

- Wireless Ketra products have a wireless range limit dependent on various factors. The following guidelines are provided for best performance:
  - Device-to-device wireless range should not exceed 50 ft (15.25 m) in radius.
    - No obstructions between devices: 50 ft (15.25 m) wireless range limit
    - Few (non-metal) obstructions between devices: 30 ft (9 m) wireless range
    - Large/metal obstructions between devices: 11 ft (3.35 m) wireless range
  - All devices in a KetraNet system must be within 100 ft (30.5 m) of the N4.

### N4 Hub

- An N4 hub can connect to 49 other KetraNet wireless devices, making the total device limit 50 per a KetraNet system when including the N4.
  - Each N3 counts as 1 device. Linear fixtures (e.g., G2, L4R, etc.) connected to the N3 do NOT add to the total N4 device limit of 49.
  - Each Ketra Lamp (A20, S30, S38, D4R, and D3) counts as 1 device.
  - Each X2 Keypad or X2 Repeater counts as 1 device.
- An N4 must be within 328 ft (100 m) of a network switch (standard Ethernet limitation).
  - Each N4 must be homerun from a network switch.

### N3 Satellite

- One N3 is needed for Ketra Linear Fixtures (G2, L4R, L3I, P4), with the following limitations:
  - 40 ft (12 m) maximum for linear fixture length (40 1 ft [.31 m] segments)
  - 100 ft (31 m) maximum run length (fixture length plus cable length from N3 to end of last fixture)
- N3 output cable cannot be t-tapped
  - One continuous strip of cable/linear fixtures (no T-tap)
  - Fixture runs and cable runs can be broken up
  - Multiple linear fixture types can be combined on one N3 output
  - Linear fixtures must be connected in a specific orientation, with a distinct “in” and “out” end

- The N3 has 4 communication ports (COM ports), which can be configurable to 0–10 V<sub>AC</sub> input/output and contact closure input/output. Supported use cases are:
  - 0–10 V<sub>AC</sub> Input – daylight harvesting (photocell integration) from a 0–10 V<sub>AC</sub> PowPak.
  - 0–10 V<sub>AC</sub> Output – 0–10 V<sub>AC</sub> load control (RMJS-8T-DV-B or FCJS-010) requires a contact closure COM port output and an auxiliary power pack (PP-DV) for switching of 0–10 V<sub>AC</sub> load.
  - Contact Closure Input (Maintained Contacts Only)
    - Occupancy sensors control (dry contact only) requires a switching PowPak with CCO (RMJS-5RCCO1-DV-B) or a low-voltage CCO PowPak (RMJS-CCO1-24-B) with an auxiliary power pack (PP-DV).
    - Scene/Show Selection.
    - Binary logic support such that 4 inputs can be configured to select between 16 scenes/shows preset in Ketra Design Studio.
  - Contact Closure Output (maintained contacts only)
    - For control of 3rd party, maintained contact devices.

### Installation Limitations

- A single installation should have no more than ten N4 devices (ten KetraNet wireless devices)
- Maximum 500 wireless devices per installation (one N4 and 49 wireless devices per KetraNet system)
- Maximum number of scenes per installation:
  - 80 scenes if there are more than or equal to 256 groups
  - 120 scenes if there are less than 256 groups
- Maximum 512 groups per installation
- These installation limitations do not limit project size, as multiple installations can be used per project; installations are separate systems, and do not communicate with each other

<b>Job Name:</b>	<b>Model Numbers:</b>
<b>Job Number:</b>	

## HomeWorks with a QS Processor (versions 14.0 to 15.4)

### General System Rules

- 1 system can have up to 16 processors
- 1 system can have up to 10,000 switch legs
- Supports 16 concurrent Telnet logins (connected directly to processor)
- Each processor has either one or two links. Links have a possible configuration of QS link, wireless link, Power Panel link, or H48 link
  - QS Link Rules
    - 32 QS links maximum
    - 99 QS devices per QS link
    - 512 switch legs per link. Switch legs are the smallest controllable outputs and include:
      - Dimmed or switched circuits
      - EcoSystem or DALI® digitally addressable devices (ballasts, drivers, and interfaces)
      - A single DMX channel
      - Contact closure outputs
      - Sivoia QS shade drives
    - 100 occupancy sensors
    - 100 wall controls (e.g., Pico wireless controls, QS Keypad, IR) per QS link
    - QS link is topology free (can be daisy-chained, T-tapped, starred, etc.)
    - Maximum link run of 2000 ft (610 m), using 12 AWG (4.0 mm<sup>2</sup>) wires for power pair
    - QS link can be extended up to an additional 2000 ft (610 m) using the QSPS-10PNL. See Lutron Spec Submittal P/N 085335 at [www.lutron.com](http://www.lutron.com) for details
  - Power Panel Link Rules (RPMs)
    - 32 Power Panel links maximum
    - 16 module interfaces per Power Panel link
    - 256 switch legs per Power Panel link
    - Power panel link must be daisy-chained
    - Maximum link run of 2000 ft (610 m), using 12 AWG (4.0 mm<sup>2</sup>) wires for power pair
    - Panel link can be extended up to 3 times using the MX-RPTR for a total distance of 8000 ft (2438 m)
  - Clear Connect Wireless - Type A Link Rules
    - Maximum link quantity per region
      - 15 links: USA, Canada, Mexico
      - 6 links: UK, Europe, UAE
      - 2 links: China, India, Singapore, Hong Kong
- 4 repeaters per wireless link
- 95 devices per wireless link
- 100 switch legs per wireless link
- 5 wireless temperature sensors per wireless link
- 2500 ft<sup>2</sup> (250 m<sup>2</sup>) coverage per repeater
- 30 ft (9 m) from any non-repeater to repeater
- 60 ft (18 m) between repeaters
- 1000 ft (305 m) wire run between repeaters for applications requiring greater distances (pool house, boat house, guest house, etc.)
- KetraNet Rules
  - 10 N4 interfaces per HomeWorks QS system
    - 49 Ketra devices per N4
- Ketra N3 Satellite Limitations:
  - One N3 is needed for Ketra Linear Fixtures (G2), with the following limitations:
    - 40 ft (12 m) maximum for linear fixture length (40 1 ft [.31 m] segments)
    - 100 ft (31 m) maximum run length (fixture length plus cable length from N3 to end of last fixture)
  - N3 output cable cannot be t-tapped
    - One continuous strip of cable/linear fixtures (no T-tap)
    - Fixture runs and cable runs can be broken up
    - Linear fixtures must be connected in a specific orientation, with a distinct "in" and "out" end
- H48/Q96 Link Rules
  - 32 H48/Q96 links maximum
  - 4 H48/Q96 interfaces per H48/Q96 link
  - 1000 ft (305 m) maximum wire run between processor and H48/Q96 unit(s), daisy chain only
  - 500 ft (152 m) maximum wire run off of each H48 bus output, but cannot exceed 1000 ft (305 m) total wire distance
  - 48 HomeWorks wired Maestro devices per H48 interface
  - 96 Sivoia QED shades per HWI-Q96 interface
  - 256 Sivoia QED shades per H48/Q96 link
  - HWI-Q96 and Sivoia QED shades requires a license purchase (HQ-HWI-Q96-SW) to allow activation and transfer
  - Link translator (HQ-HWI-LX) required when the wire run between processors and interfaces on an H48/Q96 link type exceeds 50 ft (15 m) (link terminator also required)

(continued on next page...)

<b>Job Name:</b>	<b>Model Numbers:</b>
<b>Job Number:</b>	

## HomeWorks with a QS Processor (versions 14.0 to 15.4) (continued)

### General System Rules (continued)

- HWI Link Rules
  - 32 keypads maximum.
  - 4000 ft (1220 m) maximum wire run for 18 AWG wire.
  - HWI keypad requires license (HQ-HWI-KP-SW).
  - HWI link can be daisy-chained, starred, or T-tapped topology.
- GRX/WPM Link Rules
  - 8 GRX/WPM devices maximum.
  - 2000 ft (610 m) maximum wire run.
  - GRX/WPM link requires license (HQ-HWI-GRX-SW).
  - GRX/WPM link must be daisy-chained.
- HVAC Controller
  - Temperature sensing can utilize either a single wired sensor or up to 4 wireless sensors per HVAC Controller (wireless sensors are averaged together).
  - Up to 5 wireless sensors per Main Repeater link.
  - A wireless sensor assigned to an RF link and attached to an HVAC Controller on another Main Repeater link will count towards the 5 wireless sensors per RF link limit on both Main Repeater links.

### Interface Rules

- DMX interface supports 32 output DMX channels. Up to 16 DMX interfaces per QS link.
- HVAC Controller
  - Temperature sensing can utilize either a single wired sensor or up to 4 wireless sensors per HVAC Controller (wireless temperature sensors are averaged together).
  - Up to 5 wireless temperature sensor per RF link.
  - A wireless temperature sensor assigned to an RF link and attached to an HVAC Controller on another RF link will count towards the 5 wireless temperature sensors per RF link limit on both RF links.
- VCRX
  - The visor control can listen to up to 10 transmitters.

### Controls/Sensors Rules

- QSM can support wired and wireless devices. Below is a breakdown of the devices:
  - 4 wired sensors/controls
  - 10 wireless occupancy/vacancy sensors
  - 10 wireless Pico wireless controls
  - 10 wireless daylight or radio window sensors

### Palladiom Thermostat

- 32 thermostats per link.
- 3 temperature keypads per Palladiom HVAC Controller.
- No wireless temperature sensor.
- 2 part solution (SMC55-HWQS or third-party HVAC control).
- 4 temperature keypads per third-party interface.

### Third-Party Control

- Other than “Processor 1”, each processor has a maximum of 5 outbound telnet connections (combination of third-party HVAC or other).
- “Processor 1” can have up to 3 outbound telnet connections if remote access is enabled. If remote access is disabled, the processor can have up to 5 outbound connections.
- Remote access can be optionally switched off if using Lutron Connect Bridge or not using remote access.

### Mobile Applications

- Requires one Lutron Connect Bridge per residence.
- Lutron Connect mobile application is a free download from the app store.
- App supports iOS and Android mobile device platforms.
- Free remote access
  - Up to (15) mobile devices can simultaneously connect over the Internet to the HomeWorks QS system.

<b>Job Name:</b>	<b>Model Numbers:</b>
<b>Job Number:</b>	

## HomeWorks with a QS Processor (versions 14.0 to 15.4) (continued)

### MDU System Rules

- 1 processor
- 1 QS link, 1 RF link
- 50 total lighting and shades zones
- 50 total devices
- QS wired link
  - 50 devices per link
  - 50 zones per link
  - 2000 ft (600 m) maximum wire length
- Clear Connect Wireless - Type A link
  - 50 devices per link (includes repeaters)
  - 50 zones per link
  - 4 repeaters maximum
  - RF distance - 60 ft (18 m) from repeater to repeater, 30 ft (9 m) from device to repeater
- Network link
  - Standard ethernet wiring (328 ft [100 m] maximum) used to connect processors to network
  - 10/100 Mbit Ethernet
- DALI® Loop Rules
  - 64 digital addresses per loop
  - Supports up to 16 zones of control per loop

Job Name:	Model Numbers:
Job Number:	

## HomeWorks with a QSX Processor (versions 16.0 and higher)

### General System Rules

- 1 system can have up to 16 combined HomeWorks QSX processors and Clear Connect Wireless Gateways-Type X; at least one HomeWorks QSX processor is required per system
- 1 system can have up to 10,000 switch legs
- Each processor has either one or two links, depending on model number. Links have a possible configuration of QS link or Clear Connect Wireless - Type A link
  - QS Link Rules
    - 32 QS links maximum
    - 99 QS devices per QS link
    - 512 switch legs per link. Switch legs are the smallest controllable outputs and include:
      - Dimmed or switched circuits
      - HomeWorks Digital addressable devices (controllers and interfaces)
      - A single DMX channel
      - Contact closure outputs
      - Sivoia QS shade drives
    - 100 occupancy sensors
    - 100 wall controls (e.g., Pico wireless controls, QS Keypad, IR) per QS link
    - QS link is topology free (can be daisy-chained, T-tapped, starred, etc.)
    - Maximum link run of 2000 ft (610 m), using 12 AWG (4.0 mm<sup>2</sup>) wires for power pair
    - QS link can be extended up to an additional 2000 ft (610 m) using the QSPS-10PNL. See Lutron Spec Submittal P/N 085335 at [www.lutron.com](http://www.lutron.com) for details
  - Clear Connect Wireless - Type A Link Rules
    - Maximum link quantity per region
      - 15 links: USA, Canada, Mexico
      - 6 links: UK, Europe, UAE
      - 2 links: China, India, Singapore, Hong Kong
    - 4 repeaters per link
    - 95 devices per link
    - 100 switch legs per link
    - 5 wireless temperature sensors per link
    - 2500 ft<sup>2</sup> (250 m<sup>2</sup>) coverage per repeater
    - 30 ft (9 m) from any non-repeater to repeater
    - 60 ft (18 m) between repeaters
    - 1000 ft (305 m) wire run between repeaters for applications requiring greater distances (pool house, boat house, guest house, etc.)

### Interface Rules

- DMX interface supports 32 output DMX channels. Up to 16 DMX interfaces per QS link.
- VCRX
  - The visor control can listen to up to 10 transmitters.

### Controls/Sensors Rules

- QSM can support wired and wireless devices. Below is a breakdown of the devices:
  - 4 wired sensors/controls
  - 10 wireless occupancy/vacancy sensors
  - 10 wireless Pico wireless controls
  - 10 wireless daylight or radio window sensors

### Mobile Applications

- The Lutron App mobile application is a free download from the app store.
- App supports iOS and Android mobile device platforms.
- Free remote access.
  - Up to (15) mobile devices can simultaneously connect over the Internet to the HomeWorks system.

### Homeworks Digital Bus Rules

- 64 digital addresses per bus.
- HomeWorks Digital module supports up to 64 zones of control per bus.

<b>Job Name:</b>	<b>Model Numbers:</b>
<b>Job Number:</b>	



## HomeWorks with a QSX Processor (versions 16.0 and higher) (continued)

### MDU System Rules

- 1 processor
- 1 QS link, 1 Clear Connect Wireless - Type A link
- 50 total lighting and shades zones
- 50 total devices
- QS wired link
  - 50 devices per link
  - 50 zones per link
  - 2000 ft (600 m) maximum wire length
- Clear Connect Wireless - Type A link
  - 50 devices per link (includes repeaters)
  - 50 zones per link
  - 4 repeaters maximum
  - RF distance - 60 ft (18 m) from repeater to repeater, 30 ft (9 m) from device to repeater
- Network link
  - Standard ethernet wiring (328 ft [100 m] maximum) used to connect processors to network
  - 10/100 Mbit Ethernet

### HomeWorks Clear Connect Gateway - Type X Rules

- Maximum of 15 Clear Connect Gateway - Type X per system. For HomeWorks systems requiring more than 15 gateways, contact your local Lutron representative for quoting options.
- Maximum of 100 Clear Connect - Type X devices per Gateway.
- Must be home run and powered by an IEEE 802.3af-2003 or 802.3at-2009 compliant Power over Ethernet (PoE) supply, Lutron model Q-POE-PNL or by others.
- Maximum of 328 ft (100 m) wire run between the Gateway and Ethernet switch; cable must be Cat5e or better.
- Maximum wireless range of 71 ft (22 m) to furthest Clear Connect - Type X device.
- At least 2 Clear Connect - Type X devices must be mounted within 25 ft (7.7 m) of the Gateway.
- Each Clear Connect-Type X device must be mounted within 25 ft (7.7 m) of at least two other Clear Connect-Type X devices that are associated to the same Clear Connect-Type X Gateway.
- There should be a path from the Clear Connect-Type X Gateway to all Clear Connect-Type X devices associated with the Gateway with the distance between each device not exceeding 25 ft (7.7 m).
- Radio Powr Savr Sensors (LRFx) must be mounted at least 4 ft (1.2 m) away from any gateways or WiFi Access Points (WAP) and at least 2 ft (0.6 m) away from any Clear Connect-Type X devices.

- Must be mounted at least 5 ft (1.5 m) away from any Wi-Fi Access Points (WAP), 2.4 GHz Wi-Fi routers and hotspots, 2.4 GHz Wi-Fi devices like thermostats or voice recognizing control devices, Microwave ovens, 2.4 GHz wireless video equipment and baby monitors, Lutron Vive wireless hubs (HJS-x).
- See App Note # 745 "Clear Connect System Type X Best Practices" (P/N 048745) on [www.lutron.com](http://www.lutron.com), available to users with a myLutron login, for further details.

### Ketra N3 Satellite Rules

- One N3 is needed for each zone of Ketra linear fixtures (G2), with the following limitations:
  - 40 ft (12 m) maximum for linear fixture length (40 1 ft [31 m] segments).
  - 100 ft (31 m) maximum run length (fixture length plus cable length from N3 to end of last fixture).
  - One continuous strip of cable/linear fixture from N3 output; cable cannot be t-tapped.
  - Fixture runs can be broken into multiple sections connected by daisy-chained cables.
  - Linear fixtures must be connected in a specific orientation, with a distinct "in" and "out" end.
- Each N3 Satellite counts as one device toward the maximum Clear Connect Gateway-Type X limit, regardless of the number of linear fixtures.
- N3 Satellites do not count toward the limit of QSX switch legs.
- An N3 system consists of the N3 satellite and all of its associated components: all connected leader/jumper cables and all of its linear fixtures (G2, L3I, L4R). A single N3 satellite (with all associated components) cannot be within 20 ft (7.1 m) or greater than 4 other N3 satellites (and associated components), including throughout the entire length of cables and fixtures.

### Ketra X96 Controller Rules

- X96 can control Lightbar Slim (LS0) linear fixture.
- One X96 is needed for each zone of Ketra linear fixtures with the following limitations:
  - No more than 8 segments of linear fixtures
  - No more than 50 ft (16.5m) of cable
  - No more than 15 ft (4.6 m) or 24 ft (7.3 m) of total fixture length (defined on individual spec)
  - One continuous strip of cable/linear fixture from N3 output; cable cannot be t-tapped
  - Fixture runs can be broken into multiple sections connected by daisy-chained cables
  - Linear fixtures must be connected in a specific orientation, with a distinct "in" and "out" end
  - Only one lens/output type of Lightbar Slim can be used with a single X96 controller
- Each X96 controller counts as one device toward the maximum Clear Connect Gateway-Type X limit regardless of the number of linear fixtures.
- X96 controller or their linear fixture outputs do not count toward the limit of Athena switch legs.

Job Name:	Model Numbers:
Job Number:	



## RadioRA 2

### General System Rules

- 2 main repeaters maximum.\*
- 8 auxiliary repeaters maximum (4 auxiliary repeaters per main repeater).
- 1 wireless link per main repeater. Link limits:
  - 100 devices (including repeaters).
  - 100 zones (includes shades, HVAC zones, dimmers/switches, and VCRX outputs).
  - 5 wireless temp sensors.
  - 2500 ft<sup>2</sup> (762 m<sup>2</sup>) coverage per repeater.
  - 30 ft (9 m) from any non-repeater to repeater.
  - 60 ft (18 m) between repeaters.
  - 1000 ft (305 m) wire run between repeaters for applications requiring greater distances (pool house, boat house, guest house, etc.).

### Interface Rules

- HVAC Controller
  - Temperature sensing can utilize either a single wired sensor or up to 4 wireless sensors per HVAC Controller (wireless sensors are averaged together).
  - Up to 5 wireless sensors per Main Repeater link.
  - A wireless sensor assigned to an RF link and attached to an HVAC Controller on another Main Repeater link will count towards the 5 wireless sensors per RF link limit on both Main Repeater links.
- VCRX
  - The visor control can listen to up to 10 transmitters.

### Mobile Applications

- Requires one Lutron Connect Bridge per residence.
- Lutron Connect mobile application is a free download from the *App Store* online marketplace.
- The app supports iOS and Android® mobile device platforms.
- Free remote access
  - Up to 7 mobile devices can simultaneously connect over the Internet to the RadioRA 2 system.

\* Two Main Repeater systems require the Inclusive version of programming software for commissioning.

### Shade Rules

- Each shade Electronic Drive Unit (EDU) counts as 1 zone on the wireless link.
- Sivoia QS Wireless and Sivoia QS Triathlon shades are compatible with RadioRA 2 systems.

<b>Job Name:</b>	<b>Model Numbers:</b>
<b>Job Number:</b>	

## RA2 Select

### General System Rules

- 1 main repeater maximum.
- 4 wireless repeaters maximum.
- Main repeater. Link limits:
  - 100 devices (including repeaters).
  - 100 zones (includes shades, dimmers/switches, and Pico wireless controls).
  - 2500 ft<sup>2</sup> (762 m<sup>2</sup>) coverage per repeater.
  - 30 ft (9 m) from any non-repeater to repeater.
  - 60 ft (18 m) between repeaters.

### App Rules

- Lutron app is a free download from the *App Store* online marketplace.
- App supports iOS and Android® mobile device platforms.
- Free remote access
  - Up to (7) mobile devices can simultaneously connect over the Internet to the RA2 Select system.

### Shade Rules

- Each shade Electronic Drive Unit (EDU) counts as 1 zone on the wireless link.
- Sivoia QS Wireless and Sivoia QS Triathlon shades are compatible with RA2 Select systems.

Job Name:  Job Number:	Model Numbers:
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# Caséta Wireless

## General System Rules

- With Smart Bridge:
  - 1 Smart Bridge per system.
  - Supports up to 75 devices (includes load controllers, Pico wireless controls, wireless shades, and Smart Bridge).
  - Allows 1 login with 10 concurrent users.
  - Supports up to 100 scenes.
  - Supports up to 50 timeclock events.
  - All Serena shade types are supported.
  - All Sivoia QS wireless shades, Sivoia QS wireless Triathlon shades, and Serena shades are supported with the Smart Bridge PRO with the exception of horizontal sheer blinds and Venetian blinds.
  - 1 lamp dimmer can be used as a range extender.
- Without Smart Bridge:
  - Up to 10 total Pico wireless controls, and occupancy sensors can be associated with one load controller.

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<b>Job Name:</b>	<b>Model Numbers:</b>
<b>Job Number:</b>	