



Integration Note

Manufacturer:	Lutron
Model Number(s):	Homeworks QS Lighting and Climate Control
Minimum Core Module Version:	ELAN 5.4 International Templates, Fan Controllers: ELAN 6.4.200 Lutron Palladiom Keypads & Thermostat: ELAN 8.2.500
Comments:	Lutron Designer Software v2.1.0 or newer
Document Revision Date:	6/14/18

OVERVIEW AND SUPPORTED FEATURES

The Lutron Homeworks QS system is a communicating lighting system that supports RS-232 or Ethernet for enabling reliable feedback and control in ELAN.

Installing a Lutron lighting system can be broken down into the following basic steps:

1. Work with the client to determine what lights will be controlled, where switches will be installed, and where keypads will be installed. Follow Lutron guidelines and the **Lutron Programming Overview** below.
2. Install and test the Lutron system, again according to Lutron standard procedures with the additional requirement of a communication connection to the ELAN system. Refer to the connection diagrams below for details on wiring the Lutron hardware to the ELAN system.
3. Program the Lutron system: refer to **Lutron Programming Overview** below. Also see the **Connection Diagrams** for additional notes and details on communication setup.
4. Integrate the lighting system into the ELAN system and test proper operation. See **ELAN Configuration Details** below.

LUTRON LIGHTING SYSTEMS SUPPORT THE FOLLOWING FEATURES:

Automatic Device Discovery: The ELAN system can query the Lutron controller for compatible devices and automatically add them to the configurator. **Note:** The auto discovery is only possible via Ethernet connection. See Lutron Programming Overview for notes on discovering devices automatically.

Lighting Load Control: Control and feedback of lighting load devices in the Lutron system are supported.

Scene Control: Control and tracking of scenes from virtual and simulated keypads. See Lutron Programming Overview for details.

Schedule Control: Multiple schedules can be set using the Viewer software, and are automatically tied to the System Mode. This requires that all built in Lutron scheduling functionality is disabled.

Virtual Keypads: The configurator will automatically add pre-designed templates to emulate real Lutron keypads to the system. These keypads are available for use in building custom control pages or for adding directly to the ELAN user interface.

Phantom Buttons: Control and tracking of Phantom Buttons from the ELAN user interface is supported.

HVAC: Control and tracking of HVAC climate is supported. See the HVAC section under Lutron Programming Overview below for detailed information and limitations.

Devices Supported: The devices in the table below are supported for control and feedback in the ELAN system. See the Lutron Programming Overview section below for important information and limitations for each device type.

Fahrenheit and Celsius display: The Lutron thermostat temperature values may be displayed in whole number values in Fahrenheit or Celsius units on the ELAN user interface (the one decimal place option is not supported for this system). **NOTE:** Behind the scenes the Lutron devices communicate to the system controller in Fahrenheit values and as a result of units conversions there may be an inconsistency of a degree or so between the Lutron UI and the ELAN UI when Celsius mode is selected.

Fade Rate: In ELAN version 8.0.278 and newer, there is a setting per device in the configurator to specify the fade rate for that device. The units are in seconds. Note that this parameter may not be applicable to all Lutron device types.

LUTRON LIGHTING SYSTEMS DO NOT SUPPORT THE FOLLOWING FEATURES:

Any feature not specifically noted as “supported” is not supported.

Pico wireless controls: These devices are not directly compatible with ELAN Software.

Advanced Keypad/Phantom Button programming: Advanced button programming such as multi-tap and press and hold, reverse LED logic can affect the command and response of the keypad buttons and is not directly supported with ELAN. See Lutron Programming below for details.

Radio Powr Savr: The ELAN software does not directly recognize the status of the Radio Powr Savr. See notes about how to add functionality below.

Devices not listed below: Devices that are not listed in the table below are not compatible with control from the ELAN System. See the Lutron Programming Overview section below for important information and limitations for each device type that is supported.

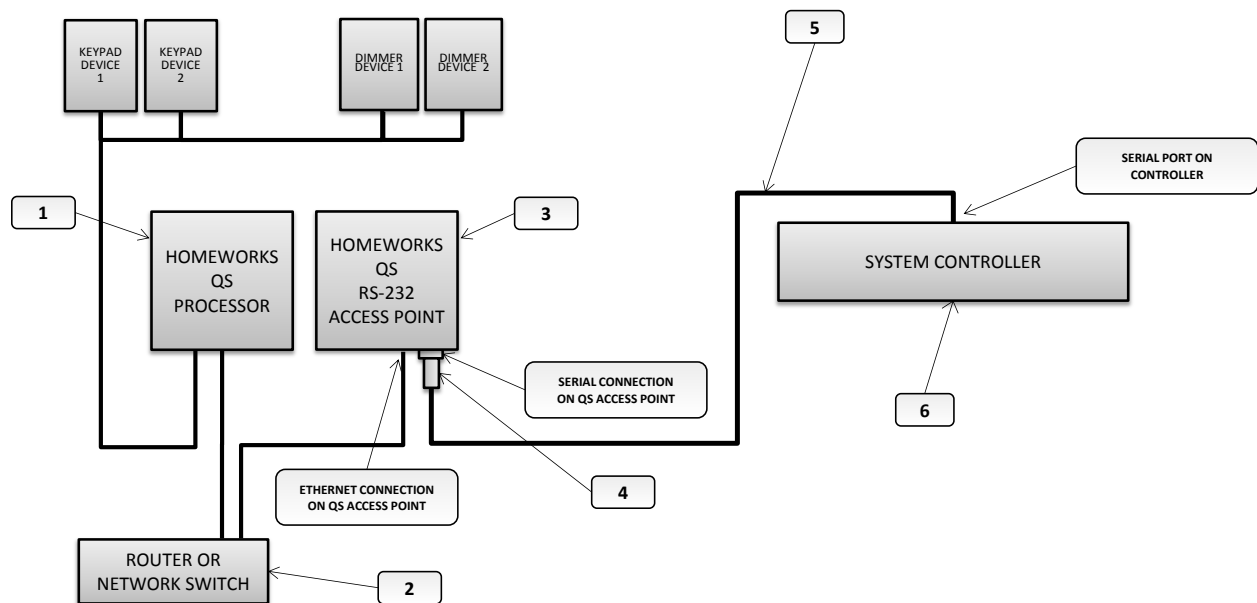
Supported QS Devices	
Main Repeater/Aux Repeater	HQP6-2-120
Dimmers & Switches	HQRD-6D, HQRD-6ND, HQRD-10D, HQRD-10ND, HQRD-6NA, HQRD-F6AN, HQR-3LD
Visor Control Receiver	HQR-VCRX
GRAFIK Eye	QSG
Plug-in Modules	HQR-3PD, HQR-15APS
Wall Mount Keypads	HQRD-W1RLD, HQRD-W2RLD, HQRD-W3BD, HQRD-W3BRL, HQRD-W3BSRL, HQRD-4S, HQRD-W5BRL, HQRD-W5BRLIR, HQRD-W6BRL, HQRD-W7B
Palladiom Keypads	HQWT-2W, -3W, -4W, -RW, -22W, -24W, -42W, -44W, -2RW, -4RW, -RRW
Table Top Keypads	T5RL, T10RL, T15RL
Hybrid Keypad	WQRD-H1RLD, WQRD-H21RLD, WQRD-H3BSRL, WQRD-H4S, WQRD-H5BRL, WQRD-H16RL
HVAC Control	LR-HVAC-1, LR-HWLHVAC, HQWT-T
Shades	Sivoia QS Wireless Shades
Fan Controller*	HQRD-2ANF
International Keypads*	HWIS-2B-I, HWIS-3B-I, HWIS-4B-I, HWIS-5BRL-I, HWIS-6BRL-I, HWIS-7BRL-I, HWIS-8BRL-I, HWIS-10BRL-I
<i>Devices not present in this table are not supported.</i>	
<i>*Devices require minimum ELAN core module listed at the top of this document.</i>	

IMPORTANT: Lutron systems must be programmed using **Lutron Designer software**, or they are not compatible with external control.

CONNECTION DIAGRAM: RS-232 CONTROL

Refer to the **Bill of Materials** and **Wiring Diagram** that follow. Refer to the **RS-232 Connection Options** Integration Note for alternative connections methods.

Important Note: The Discover Devices button for automatic device discovery does not work on Lutron systems controlled via serial connections. Refer to the Automatic Device Discovery section below.

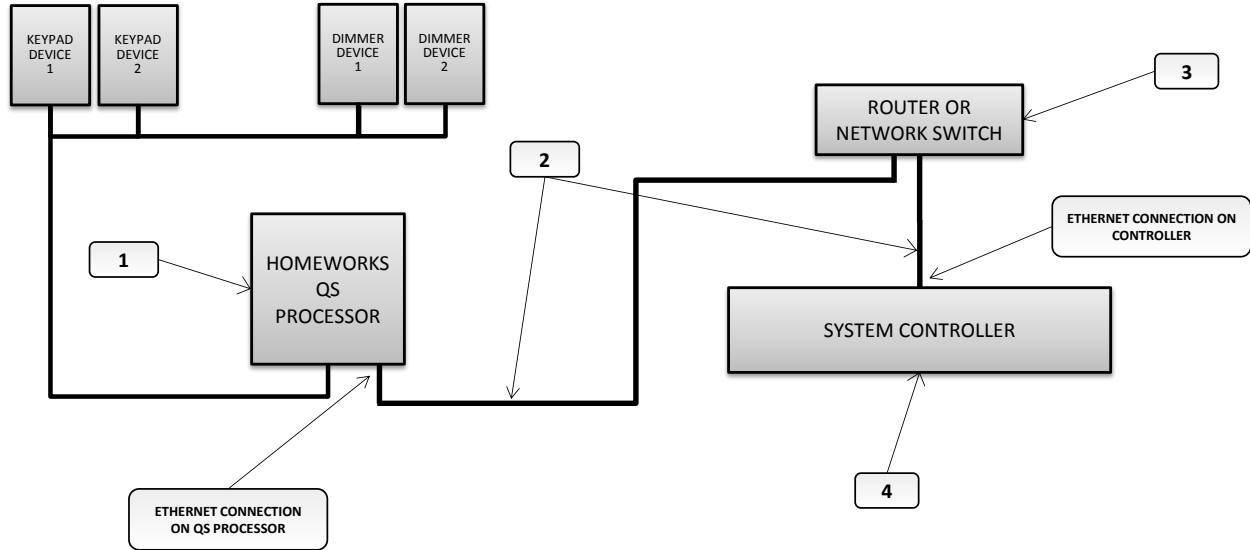


BILL OF MATERIALS

#	Device	Manufacturer	Part Number	Protocol	Connector Type	Notes
1	Homeworks QS Processor	Lutron	HQP6-2	Ethernet	RJ-45 Female	
2	Network Device	Various	Various	Ethernet	RJ-45 Female	
3	Homeworks QS RS-232	Lutron	QSE-CI-NWK	Ethernet x RS-232	RJ-45 Female x DB-9 Female	
4	DB-9M to RJ-45 Adapter	Elan	HA-CB-307	RS-232	DB-9 Male X RJ-45 Female	
5	Cat5 Cable Assy.	Installer	N/A	RS-232	RJ-45 Male X RJ-45 Male	Must terminate all 8 conductors
6	Controller	Elan	Various (ex. HC-12)	RS-232	RJ-45 Female	

CONNECTION DIAGRAM: ETHERNET CONTROL

Refer to the **Bill of Materials** and **Wiring Diagram** that follow.



BILL OF MATERIALS

#	Device	Manufacturer	Part Number	Protocol	Connector Type	Notes
1	Homeworks QS Processor	Lutron	HQP6-2	Ethernet	RJ45 Female	
2	Cat5 Cable Assy.	Installer	N/A	Ethernet	RJ-45 Male X RJ-45 Male	
3	Network Device	Various	Various	Ethernet	RJ-45 Female	
4	Controller	Elan	Various (ex. HC-12)	Ethernet	RJ-45 Female	

LUTRON PROGRAMMING OVERVIEW

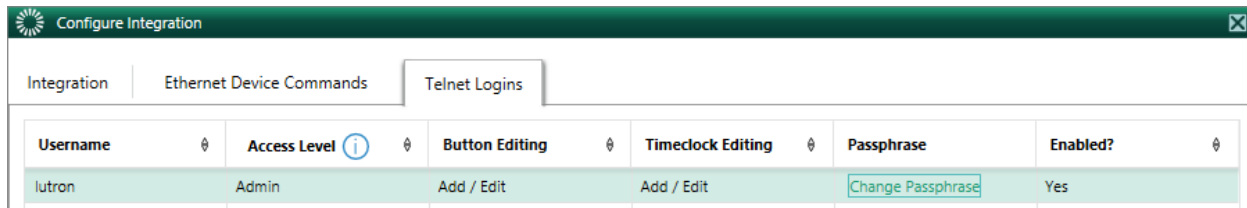
The Lutron system must be fully programmed using **Lutron Designer** software prior to integration with ELAN. Program the Lutron system according to standard Lutron programming procedures, with the following additional considerations:

Ethernet Control:

- For reliable control, assign the Homeworks QS Processor a static IP address that is outside of the DHCP pool and on the same network as the ELAN Controller.
- To allow ELAN to log into and control the Lutron processor you will need to create a telnet login with the following credentials, refer to the screenshot below:

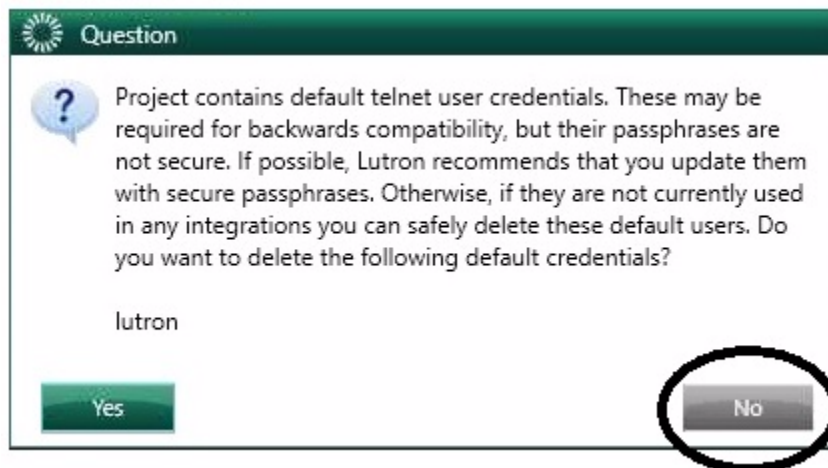
Username: lutron

Passphrase: integration



Username	Access Level	Button Editing	Timeclock Editing	Passphrase	Enabled?
lutron	Admin	Add / Edit	Add / Edit	Change Passphrase	Yes

- Finally, Activate the processor on the Activate tab to apply this configuration information.
- **IMPORTANT:** Upon transferring the configuration to the Lutron Processor, a dialog box will pop up advising you to delete the telnet login. Click NO. This telnet login is required for ELAN Control



- **Serial Control:** No additional special programming steps are required for serial control.

Serial Control:

- No additional special programming steps are required for serial control.

Automatic Device Discovery: The ELAN system automatically reads in the compatible Lutron devices from the QS Processor.

The Lutron QS system does not support automatic device discovery over a serial (RS-232) connection. In order to automatically read in the system configuration you will need to configure the QS system for Ethernet control then read in the system or alternatively you can manually add in the QS devices.

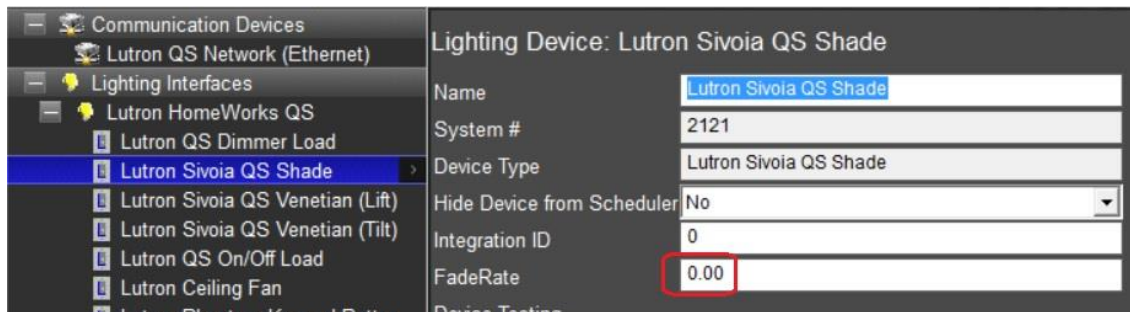
Use the following procedure to automatically read in the QS programming:

1. Once all of the Lutron programming is complete perform a transfer to send all of the Lutron program information to the QS Processor. This step is critical since the ELAN system must read the programming from the processor.
2. If the system is configured for serial control then delete the serial communication device.
3. Add a new communication device for Ethernet control, refer to the ELAN Configuration Details below.
4. Add the Homeworks QS Lighting Interface if it does not already exist.
5. Click the **Discover Devices** button at the bottom of the QS lighting interface page.
6. Once the query is complete the configurator page will refresh showing all of the devices that were discovered.
7. If serial control is to be used you must reconfigure the communication device. Once the query is complete and the configuration is read in you must delete the Ethernet communication device and add serial communication device for control. Refer to the ELAN Configuration Details section below for details.
8. Any time changes are made to the QS configuration you will need to repeat this procedure to re-read in the system configuration and sync the ELAN configuration with the QS system. Some notes below about re-discovering a QS system:
 - a. The ELAN system will not delete any devices automatically from the configurator. If devices are deleted in the QS system they will need to be manually deleted from the configurator.
 - b. The ELAN system will not rename devices automatically once they are discovered. If a device is renamed in the QS system and rediscovered it will need to be renamed manually in the configurator.

Lutron Devices: Review the following notes about the various QS devices prior to programming your system to understand how the ELAN driver handles them.

- **Switches**: All programmed Lutron switches are automatically added to the configurator as a On/Off Load. They will display in the configurator tree with the Room Name and Zone Name. The ELAN system will control and track the state of the load. To control a load individually from the UI it will need to be connected to a virtual keypad or a custom control on a custom viewer tab.
- **Dimmers**: All programmed Lutron switches are automatically added to the configurator as a dimmer load. They will display in the configurator tree with the Room Name and Zone Name. The ELAN system will control and track the dim level of the load. To control a load individually from the UI it will need to be connected to a virtual keypad or a custom control on a custom viewer tab.
- **Phantom Buttons**: All programmed Lutron Phantom Buttons are automatically added to the configurator as a Phantom Keypad Button. They will display in the configurator tree with the Phantom Button Label. To control a Phantom Button individually from the UI it will need to be connected to a virtual keypad or a custom control on a custom viewer tab.
- **Keypads and Table Top Keypads**: All programmed Lutron keypads are automatically added to the configurator as a keypad. They will display in the configurator tree with the Room Name, Location, and Device Name. The discovered keypads will automatically generate a virtual keypad interface that can be added to the UI for tracking and control. Alternatively, the individual keypad buttons can be added to custom tabs using the Light Scene Button (from keypad) custom control.
 - For proper control and tracking from the ELAN system all keypad buttons must be programmed as a Single Action, Toggle Control, or Dual Action button type.
 - For proper control and tracking from the ELAN system all keypad buttons must be programmed as with Room, Scene, or Pathway LED logic.
 - Keypad Contact Closure Inputs (CCI) are not directly supported. If tracking of these is required then configure a dummy Lutron switch in the QS software and program the keypad input to turn it on and off in the Lutron software. The Lutron software will transfer the knowledge of the switch to the repeater even though it does not physically exist. Then the ELAN system will read it in as an on/off load and its state can be tracked.
- **Hybrid Keypads**: All programmed Lutron hybrid keypads are automatically added to the configurator as both a keypad and a dimmer load. The keypad will display in the configurator tree with the Room Name and Location; the load will display in the tree with the Room Name and Zone Name. The discovered keypads will automatically generate a virtual keypad interface that can be added to the UI for tracking and control. Alternatively, the individual keypad buttons can be added to custom tabs using the Light Scene Button (from keypad) custom control. To control a hybrid load individually from the UI it will need to be connected to a virtual keypad or one of the available custom controls on a custom viewer tab.
- **GRAFIK Eye**: All programmed Lutron GRAFIK Eyes are automatically added to the configurator as both a GRAFIK Eye keypad and a dimmer load is added for each of its zones. The keypad will display in the configurator tree with the Room Name and Location; the loads will display in the tree with the Room Name and Zone Name. The discovered keypads will automatically generate a virtual keypad interface that can be added to the UI for tracking and control. Alternatively, the individual keypad buttons can be added to custom tabs using the Light Scene Button (from keypad) custom control. To control a GRAFIK Eye load individually from the UI it will need to be connected to a virtual keypad or one of the available custom controls on a custom viewer tab. (NOTE: GRAFIK Eye keypads programmed with zero extra columns will be discovered as having three columns. If this interface is to be added to the UI then delete any unused buttons.)

- **QS Shades:** All programmed Lutron shades are automatically added to the configurator as a shade. They will display in the configurator tree with the Room Name and Zone Name. The ELAN system will control and track the level of the shade. To control a shade individually from the UI it will need to be connected to a virtual keypad or a custom control on a custom viewer tab. To control multiple shades at the same time use Phantom Buttons.
 - **NOTE:** In systems programmed with Lutron 10.5 and newer the fade rate setting in ELAN configurator for that device must be 0 [zero]. See example below:



- **QS Blinds:** All programmed Lutron blinds are automatically added to the configurator as both a venetian tilt device and a venetian lift device to allow individual control of these functions. They will display in the configurator tree with the Room Name and Zone Name. The ELAN system will control and track the both the level and the tilt of the blind. To control a blind individually from the UI it will need to be connected to a virtual keypad or a custom control on a custom viewer tab. To control multiple shades at the same time use Phantom Buttons.
 - **NOTE:** In systems programmed with Lutron 10.5 and newer the fade rate setting in ELAN configurator for that device must be 0 [zero]. See example above.
- **Visor Control Receiver:** All programmed Lutron VCRx devices are automatically added to the configurator as both a keypad and an on/off load is added for each input or output. The keypad will display in the configurator tree with the Room Name and Location; the loads will display in the tree with the Room Name and Input or Output Name. The discovered keypads will automatically generate a virtual keypad interface that can be added to the UI for tracking and control. Alternatively, the individual keypad buttons can be added to custom tabs using the Light Scene Button (from keypad) custom control. To control a VCRx input or output individually from the UI it will need to be connected to a virtual keypad or one of the available custom controls on a custom viewer tab.
- **Motion Sensors:** Lutron Motion sensors are not directly compatible with the ELAN system. If tracking of these is required then configure a dummy Lutron switch in the QS Designer software and program the motion sensor to turn it on and off. The Lutron software will transfer the knowledge of the switch to the repeater even though it does not physically exist. Then the ELAN system will read it in as an on/off load and its state can be tracked.
- **HVAC:** All programmed Lutron HVAC Controllers and/or TouchPRO/Palladiom Thermostats are automatically added to the configurator climate tab as a thermostat device. They will display in the configurator tree with the Room Name and Zone Name. The ELAN system will control and track the status of the Thermostat. A thermostat zone page will be automatically added to the UI for control. The ELAN software supports the following functionality:
 - Monitoring and display of Room Temperature
 - Monitoring and control of HVAC modes including Off, Heat, Cool, Auto, and Emergency Heat.
 - Monitoring and control of Heat and Cool set points.
 - Monitoring and control of the fan mode, Auto or On.
 - Scheduling- Scheduling from the ELAN software is supported only when all climate schedules in the Lutron system have been deleted.

The ELAN software does NOT support the following on the Lutron climate systems:

- ECO mode- ECO mode is not supported. If the ECO mode is activated then ELAN may temporarily lose tracking of the current set points. Adjusting set points from either the ELAN interface or a Lutron interface will take the tstat out of ECO mode and restore proper communication and control.
- HVAC Usage tracking or history- the Lutron tstats do not provide notice when their relays are active. As such, ELAN UI will not indicate when heating or cooling is active (blinking set points) and will not plot the system usage on the history graph.
- The Lutron tstats have a 3 degree set point deadband (minimum separation between heat and cool set points). The ELAN UI uses a two degree deadband. When adjusting setpoints from ELAN there may be small delay if one setpoint is pushed and requires a re-sync with the ELAN interface.

ELAN CONFIGURATION DETAILS

The following table provides settings used in the ELAN Configurator. Please refer to the Configurator Reference Guide for more details.

- “<Select from list>” in the Configurator. Select the appropriate item from the list (or drop-down)
- “<User Defined>”, etc. Type in the desired name for the item.
- “<Auto Detect>”, etc. The system will auto detect this variable.

Refer to the **ELAN System Programming Details** below for additional information.

Devices	Variable Name	Settings (Serial)	Settings (Ethernet)
Communication Devices <See Note 1 & 2>	Name	<User Defined> (Default: Lighting)	<User Defined> (Default: Lighting)
	Type	Serial Port	Ethernet
	Communication Type	Lutron QS Network (RS-232)	Lutron QS Network (Ethernet) (See Note 3)
	Location	<User Defined> (Not Required)	<User Defined> (Not Required)
	COM Port/IP Address	<Select Com Port from list>	<User Defined> (Enter IP address of Processor)
	Port	N/A	<23>
Lighting Interface	Name	<User Defined> (Default: Lutron Homeworks QS)	<User Defined> (Default: Lutron Homeworks QS)
	Device Type	Lutron Homeworks QS	Lutron Homeworks QS
	COM Device	<Select from list> (Default: Lighting)	<Select from list> (Default: Lighting)
	<<Click Discover Devices to query the repeater and automatically add the supported Lutron devices (See Notes 1 & 2)>>		
Lighting Devices	Name	<Auto Detect>	
	System #	<Auto Detect>	
	Device Type	<Auto Detect>	
	Hide Device from Scheduler	<User Defined> (Default: No)	
	Location	<Select from list> (Not Required)	
	Integration ID	<Auto Detect>	
Keypad Interfaces	Name	<Auto Detect> (See Note 4)	
	Interface Device	<Auto Detect> (Default: Lutron Homeworks QS)	
	Keypad Type	<Auto Detect>	See Note 5
	Lighting Device	<Auto Detect>	
And / Or:			
Custom Tab	Create Custom Lighting Interfaces using the available custom lighting controls, see the Online Help or Training Guide for details.		
Thermostats	Name	<User Defined> (Default: Thermostat1, etc.)	
	Location	<User Defined> (Not Required)	
	Com Device	<Auto Detect>	
	Thermostat #	<Auto Detect>	
	Heating Unit	<Select from list>	
	Cooling Unit	<Select from list>	
HVAC Units	Name	<User Defined>	
	Model	Generic HVAC Unit	
	Controls Heat	<Select from list>	
	Controls Cooling	<Select from list>	
	Controls Fan	<Select from list>	
Schedules	HVAC Schedule	<Select from list>	Select desired number of schedules
	Programs	<Select from list>	Select desired weekly programs
	Monday - Sunday	<Select days>	Select days that go together
	Periods per Day	<Select from list>	1, 2 or 4 periods per day
Global Options	Units	<Select from list>	Fahrenheit or Celsius
	Temporary Hold Mode	<Select from list>	Timed Hold or Hold until next schedule period
	Temporary Hold Default Time	<Select from list>	Select default Temporary Hold time
	Outside Temperature Sensor	<Select from list>	Choose optional sensor if installed or choose Internet
	Outside Humidity Sensor	<Select from list>	Choose optional sensor if installed or choose Internet
Notes:			
1. An Ethernet communication device is required for auto discovery of device. The Discover Devices button will not work when configured with a serial communication device.			
2. If serial control is desired then first add the Ethernet communication device for discovery then delete it and add a serial type communication device for control.			
3. The g! controller logs into the Lutron Processor using its default Telnet login, username=lutron; password=integration			
4. GRAFK Eye Devices that are configured with zero extra columns will populate in the configurator as if they include 3 extra columns. If this interface is to be used on the g! UI then delete all unused buttons from the keypad interface for proper display.			
5. If Lutron Keypad device populates a blank keypad, right-click the keypad interface and choose "Change Template" and select the correct model number.			

COMMON MISTAKES

1. Discover Devices does not work. The automatic device discovery is not compatible over serial communication device. See the Automatic Device Discovery section above for details.
2. Discover Devices does not pull in all devices.
 - a. The built in ELAN functionality limits the number of devices on a system. In a larger system you will need a ELAN Pro App.
 - b. The ELAN system does not support all Lutron device types. Refer to the Lutron Devices listing above for details on device compatibility for any that are having issues discovering.
 - c. Lutron Programming not transferred to the QS processor. The ELAN system reads in the programming from the QS processor, be sure to perform a transfer to the processor from the Lutron software after any changes have been made. See Automatic Discovery above for details.
3. ELAN system not logging in. The QS supports only one Telnet login per user/password. The ELAN system requires the Lutron default login of username: lutron and password: integration. Make sure there are no other PCs or controllers using this login when connecting to an ELAN system.
4. Shades not working. In systems programmed with Lutron version 10.5 and newer the setting for the shade fade rate in the ELAN configurator must be zero. To access this fade rate setting use ELAN software version 8.0 or newer.